

# **Boot Code**

User Manual

For Emulex<sup>®</sup> Adapters

P007454-01A Rev. A

Emulex Connects™ Servers, Storage and People



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## SE EMULEX

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## Introduction

This manual describes installing, updating, enabling, and configuring Emulex® Fibre Channel (FC) boot code. This manual also describes the Emulex boot from SAN implementation and its operation with distinct hardware and operating system requirements. Boot from SAN is booting servers directly from

disk operating system images located on a storage area network (SAN) by way of Emulex LightPulse<sup>®</sup> adapters using Emulex FC boot code.

When booting from SAN, the storage device is typically identified by its World Wide Port Name (WWPN) and a logical unit number (LUN). By extending the server system boot basic input/output system (BIOS), boot from SAN functionality is provided by the boot BIOS contained on an Emulex adapter in the server. When properly configured, the adapter then permanently directs the server to boot from a logical unit (disk) on the SAN as if it were a local disk.

Emulex provides the following types of boot code:

- x86 BootBIOS works with the existing system BIOS on x64 and x86 systems.
- OpenBoot works with the existing system firmware on Sun SPARC systems. OpenBoot is also called FCode.
- EFIBoot provides system boot capability through the use of the EFI (Extensible Firmware Interface) Shell. It also functions on UEFI 2.1-based x64 platforms through the HII (Human Interface Infrastructure) interface.

**Note:** Emulex drivers support multipath boot configurations. Refer to your storage vendor's documentation for details on how to configure multipath booting.

#### **Emulex Boot Code Files**

In addition, Emulex is unique in providing Universal Boot images that contain x86 BootBIOS, OpenBoot, and EFIBoot boot code and Pair Boot boot code images that contain x86 BootBIOS and EFIBoot boot code. These images provide multi-platform support for boot from SAN. Universal Boot and Pair Boot transparently determine your system platform type and automatically execute the proper boot code image in the adapter. These code images reside in adapter flash memory, allowing easier adapter portability and configuration between servers.

Universal Boot contains the following types of boot code:

- x86 BootBIOS
- OpenBoot
- EFIBoot

Pair Boot contains the following types of boot code:

- x86 BootBIOS
- EFIBoot

## **Boot from SAN**

This document provides instructions for installing and using all of the types of boot code provided by Emulex.

**Note:** Not all procedures are required. Emulex host bus adapters (HBAs) usually ship from the factory with the latest version of boot code installed and enabled, so you do not need to install or enable boot code in those cases. However, if boot code is not installed, you must install it, and if it is not enabled, you must enable it. And you may want to update the boot code if a newer version is available on the Emulex website at http://www.emulex.com.

This section describes how to set up a system to boot from SAN. This specific procedure to follow is determined by the system architecture and the operating system.

Architecture	Operating System	Procedure
	Windows 2008	Install Windows Server 2008 on an FC Boot Disk
	Windows 2003	(x86, x64 and itanium) on page 5. Install Windows Server 2003 on an FC Boot Disk (x86, and x64 and Itanium) on page 6.
x86 and x64	Linux	Configure Boot from SAN on Linux or VMware (x86
	VMware	and x64) on page 7.
	Solaris (SFS driver)	<i>Configure Boot from SAN on Linux or VMware (x86 and x64) on page 7.</i>
SPARC and PowerPC	Linux	<i>Configure Boot from SAN on Linux (PowerPC)</i> on page 7.
	Solaris (SFS driver)	Configure Boot from SAN on Solaris SFS (SPARC) on page 8.
	Solaris (LPFC driver)	Configure Boot from SAN on Solaris LPFC (SPARC) on page 9.
	Windows 2008 Windows 2003	Configure Boot from SAN on Windows Server 2008 and Windows Server 2003 (Itanium) on page 3.
EFI-based systems	Linux	<i>Configure Boot from SAN on Linux (Itanium)</i> on page 7.

#### Table 1: Boot from SAN Procedures

#### Windows Server 2008 and Windows Server 2003

## Configure Boot from SAN on Windows Server 2008 and Windows Server 2003 (x86 and x64)

- 1. If necessary, install or update the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 2. If necessary, enable the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 3. Enable the adapter to boot from SAN (see *Enable an Adapter to Boot from SAN* on page 17).

- 4. By default, the boot adapter uses auto topology with loop first. You can set the boot adapter to use a different topology (see *Change Topology* on page 24).
- 5. Configure boot devices (see *Configure Boot Devices* on page 17).
- 6. If desired, configure the boot options on the adapter (see *Configure Adapter Parameters* on page 21).
- 7. Install the operating system on an FC boot disk:
  - For Windows Server 2008, see Install Windows Server 2008 on an FC Boot Disk (x86, x64 and Itanium) on page 5.
  - For Windows Server 2003, see Install Windows Server 2003 on an FC Boot Disk (x86, and x64 and Itanium) on page 6.

## Configure Boot from SAN on Windows Server 2008 and Windows Server 2003 (Itanium)

- 1. If necessary, install or update the boot code on the adapter (see *Update a Single Adapter* on page 60).
- 2. If necessary, enable the boot code on the adapter (see *Enable or Disable the BIOS* on page 40).
- 3. Configure boot devices (see *Configure Boot Devices* on page 49).
- 4. If desired, configure the boot options on the adapter (see *Configure Adapter Parameters* on page 41 and *Configure Boot Parameters* on page 45).
- 5. Install the operating system on an FC boot disk:
  - For Windows Server 2008, see Install Windows Server 2008 on an FC Boot Disk (x86, x64 and Itanium) on page 5.
  - For Windows Server 2003, see Install Windows Server 2003 on an FC Boot Disk (x86, and x64 and Itanium) on page 6.
  - For a new installation of Windows 2008 UEFI Aware OS on a UEFI-based xx64 Server, see the following section.

## New Installation of Windows 2008 UEFI- Aware Operating System on a UEFI-based x64 Server

This installation procedure assumes LUN(s) are created in the SAN storage device and zoned appropriately to the host adapter's WWN.

- 1. From the server system UEFI setup, ensure that CD/DVD is the first device in the Boot Order list.
- 2. Enable Boot from SAN in the Emulex UEFI configuration utility.
- 3. Configure the Boot target and LUN in Emulex UEFI configuration utility to point to the desired target.
- 4. Boot the host server with the Windows Server 2008 DVD inserted. Follow the on-screen prompts to install the appropriate version of Windows Server 2008.
- 5. The Windows installation exposes all available/visible LUNs as disks and partitions numbered 0 to N, where N is the highest number available. These numbers typically are the LUN numbers assigned by the array.
- 6. Select the disk on which you want to install the operating system.
- 7. Follow system prompts in the Windows installation.

**Note:** The OS image is installed with the GPT disk partition. See *The GUID Partition Table* on page 4 for a brief description of GPT disk partitions.



- 8. After the installation is complete, a Boot Option variable called Windows Boot Manager is populated with a Media Device path pointing to the Windows boot loader utility. The Windows Boot Manager can be found in the Start Options menu of the Host Server UEFI.
- 9. The Windows Boot Manager option is inserted as the first boot option in the Boot Order list of the Host Server UEFI. The CD/DVD boot is the second device in the Boot Order list.
- 10. Upon reboot, the system boots from the LUN set up on the SAN.

#### Direct a UEFI-Based Server to a Windows Server 2008 OS Image (Installed as UEFI-Aware) Already Installed on the SAN

This installation procedure assumes a LUN exists in the SAN storage device, is zoned appropriately to the host adapter's WWN, and an EFI-aware operating system resides on the target LUN.

- 1. Enable Boot From SAN in the Emulex UEFI configuration utility.
- 2. Configure the Boot Target and LUN in Emulex UEFI configuration utility to point to your desired target.
- 3. Select **Boot Manager** from the System UEFI configuration manager.
- 4. Select Add Boot Option.
- 5. Identify the desired target in the list, and continue down the explorer path until you locate the bootmgfw.efi file. This file is the boot loader utility for your Windows 2008 EFI-aware operating system installation.
- 6. Input a boot device description (e.g. Win2K8\_UEFI\_SAN) and optional data (if desired) for this device and select **Commit Changes**.
- 7. From the Boot Manager, select Change Boot Order.
- 8. Move your previous input description name (Win2K8\_UEFI\_SAN) to the desired position in the boot order.
- 9. Select **Commit Changes**. The Start Options list now reflects the boot order changes.

Upon reboot, the server is able to boot from this target LUN on the SAN.

#### The GUID Partition Table

The Globally Unique Identifier (GUID) Partition Table (GPT) was introduced as part of the Extensible Firmware Interface (EFI) initiative. GPT provides a more flexible mechanism for partitioning disks than the older Master Boot Record (MBR) partitioning scheme that has been common to PCs. MBR supports 4 primary partitions per hard drive and a maximum partition size of 2TB. If the disk is larger than two terabytes (the maximum partition size in a legacy MBR), the size of this partition is marked as 2 TB and the rest of the disk is ignored.

The GPT disk itself can support a volume up to 2^64 blocks in length (for 512-byte blocks, this is 9.44 ZB. A zettabyte is 1 billion terabytes. The GPT disk can also theoretically support unlimited partitions.

**Note:** Microsoft Windows Server 2008 by default installs with a GPT formatted disk on an UEFI-Aware Server.

See also: http://www.microsoft.com/whdc/device/storage/GPT\_FAQ.mspx



#### Install Windows Server 2008 on an FC Boot Disk (x86, x64 and Itanium)

This procedure installs Windows Server 2008 onto an unformatted FC disk drive and configures the system to boot from the SAN disk drive.

**Note:** The computer's system BIOS may require that another controller take precedence over the Emulex adapter during boot. If this occurs, you must disconnect or disable the other adapter. This allows you to configure and build your operating system on the drive connected to the Emulex adapter.

- 1. From http://www.emulex.com, download the distribution executable file for the latest version of the Emulex driver to your local drive. The file you download is an executable (.exe) file.
- 2. In Windows Explorer, double-click the distribution executable file. A window displays the driver version information.
- 3. Click **Next** to access the Location window, or click **Cancel** to close the window. If you click **Next**, the default installation location is displayed. If desired, browse to a different location.
- 4. Click **Install** to continue the installation. A progress window is displayed. As each task is completed, the corresponding checkbox is automatically selected. After all tasks are completed, a confirmation window is displayed.
- 5. Clear the Run AutoPilot Installer checkbox and click **Finish** to close the distribution executable file.
- 6. In Windows Explorer, navigate to the folder you specified in step 3.
- In the \AutoPilot Installer\Drivers\drivername folder, open the folder that corresponds to your computer type, such as x86. drivername is the type of driver you downloaded (for example, Storport Miniport).
- 8. Copy all the files in this folder onto a formatted floppy disk or a USB device.
- 9. Boot the target system with the Windows Server 2008 setup media. The Install Windows splash screen is displayed.
- 10. Verify and if necessary change the Language, Time and Date, and Keyboard values. Click **Next**. Another splash screen is displayed.
- 11. Click Install Now. The Where do you want to install Windows? screen is displayed.
- 12. Click **Load Driver**. Browse to the floppy disk or USB device specified in step 8 where the driver is located to load the Storport Miniport driver for the appropriate operating system. Once selected, the correct driver location and driver are displayed under the Select driver to be installed screen.
- 13. Select **Next.** After the driver is loaded, the Where do you want to install Windows? screen is displayed.
- 14. Select the same drive you configured as the boot device (for x86 and x64 systems, see *Configure Boot Devices* on page 17. For Itanium systems, see *Configure Boot Devices* on page 17).



#### Install Windows Server 2003 on an FC Boot Disk (x86, and x64 and Itanium)

This procedure installs Windows Server 2003 onto a previously-unformatted FC disk drive and configures the system to boot from the SAN disk.

**Note:** The computer's system BIOS may require that another controller take precedence over the Emulex adapter during boot. If this occurs, you must disconnect or disable the other adapter. This allows you to configure and build your operating system on the drive connected to the Emulex adapter.

- 1. From http://www.emulex.com, download the distribution executable file for the latest version of the Emulex driver to your local drive. The file you download is an executable (.exe) file.
- 2. In Windows Explorer, double-click the distribution executable file. A window is displayed with driver version information.
- 3. Click **Next** to access the Location window, or click **Cancel** to close the window. If you click **Next**, the default installation location is displayed. If desired, browse to a different location.
- 4. Click **Install** to continue the installation. A progress window is displayed. As each task is completed, the corresponding checkbox is automatically selected. After all tasks are completed, a confirmation window is displayed.
- 5. Clear the Run AutoPilot Installer checkbox and click **Finish** to close the distribution executable file.
- 6. In Windows Explorer, navigate to the folder you specified in step 3.
- In the \AutoPilot Installer\Drivers\drivername folder, open the folder that corresponds to your computer type, such as x86.drivername is the type of driver you downloaded (for example, Storport Miniport).
- 8. Copy all the files in this folder onto a formatted floppy disk or USB floppy.
- 9. Boot the target system with the Windows Server 2003 setup media.
- 10. Follow the prompts that appear on the screen until the following message is displayed:

Press F6 if you need to install a third party SCSI or RAID driver

11. Press **<F6>**. The following message is displayed:

Setup could not determine the type of one or more mass storage devices installed on your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices(s): <additional information> S=Specify Additional Device ENTER=continue F3=Exit.

12. Press **<S>** to specify additional devices. The following message is displayed:

Please insert the disk labeled Manufacturer-supplied hardware support disk into Drive A:. Press ENTER when ready. ENTER=continue ESC=cancel F3=Exit

- 13. Insert the floppy disk or USB floppy onto which you copied the driver files in step 8 and press **<Enter>**. A list of devices is displayed.
- 14. Select the adapter from the list and press **<Enter>**. The following message is displayed:

Setup will load support for the following mass storage device(s): Emulex xxxxx PCIxx Fibre Channel Adapter

- 15. Press <Enter>.
- 16. Remove the USB floppy or floppy disk that contains the driver files.
- 17. Follow the remaining prompts to complete the installation.

#### Linux and VMware

#### Configure Boot from SAN on Linux or VMware (x86 and x64)

- 1. If necessary, install or update the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 2. If necessary, enable the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 3. Enable the adapter to boot from SAN (see *Enable an Adapter to Boot from SAN* on page 17).
- 4. By default, the boot adapter uses auto topology with loop first. If you want to set the boot adapter to use a different topology, change it (see *Change Topology* on page 24).
- 5. Configure boot devices (see *Configure Boot Devices* on page 17).
- 6. If desired, configure the boot options on the adapter (see *Configure Adapter Parameters* on page 21).
- 7. Use the driver on the operating system distribution disk to boot the system. If necessary, you can then update the driver to the desired version.

#### Configure Boot from SAN on Linux (PowerPC)

- 1. If necessary, install or update the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 2. If necessary, enable the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).

**Note:** If you are installing SLES 10, step 3 can be eliminated as the install process updates the system's boot order to point to the newly installed device.

3. See the system documentation for instructions on accessing the System Management Services (SMS) feature to set the boot list. SMS is resident in the system firmware.

#### Configure Boot from SAN on Linux (Itanium)

- 1. If necessary, install or update the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 2. If necessary, enable the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 3. Configure boot devices (see *Configure Boot Devices* on page 49).
- 4. If desired, configure the boot options on the adapter (see *Configure Adapter Parameters* on page 41 and *Configure Boot Parameters* on page 45).
- 5. Use the driver on the operating system distribution disk to boot the system. If necessary, you can then update the driver to the desired version.

#### Solaris

#### Configure Boot from SAN on Solaris SFS (x86 and x64)

- 1. If necessary, install or update the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 2. If necessary, enable the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 3. Enable the adapter to boot from SAN (see *Enable an Adapter to Boot from SAN* on page 17).
- 4. By default, the boot adapter uses auto topology with loop first. You can set the boot adapter to use a different topology (see *Change Topology* on page 24).
- 5. Configure boot devices (see *Configure Boot Devices* on page 17).
- 6. If desired, configure the boot options on the adapter (see *Configure Adapter Parameters* on page 21).
- 7. Boot the Solaris installation CD and follow the prompts.

**Note:** If you need help determining the LUNs to select for boot from SAN, see the following section.

#### Determine LUNs to Select for Boot from SAN

- 1. Open a terminal window and leave it open.
- In the terminal window, select the LUN you are going to use as the SAN boot disk (not the local drive) using the luxadm probe command. This shows all the available LUNs. Record this LUN information, which is used throughout this procedure. LUN 0 is used in the example:

#### luxadm probe

```
Found Fibre Channel device(s):
Node WWN:50060e8003823800 Device Type:Disk device
Logical Path:/dev/rdsk/c5t226000C0FF9833AFd6s2
Node WWN:50060e8003823800 Device Type:Disk device
Logical Path:/dev/rdsk/c5t226000C0FF9833AFd6s2
Node WWN:50060e8003823800 Device Type:Disk device
```

- 3. Copy the /dev/rdsk/nnn part of the path statement for a drive.
- 4. In the terminal window, use the luxadm display command to show the WWPN or the LUN for which you selected the path in the prior step:

luxadm display </dev/rdsk/nnn>

5. Record this LUN or WWPN information for use in the procedure.

#### Configure Boot from SAN on Solaris SFS (SPARC)

- 1. If necessary, install or update the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 2. If necessary, enable the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 3. Type the following at the OBP prompt:

show-devs

The ID information for each found adapter is displayed, such as:

/pci@5d,700000/lpfc@1

4. Enable boot from SAN on each Emulex adapter in the system by typing the following set of commands, replacing adapter\_id with the ID information (such as shown above), for each Emulex adapter in turn. There is a space between the first quotation mark and the first character of the adapter ID.

```
" adapter_id" select-dev [for example, " /pci@5d,700000/lpfc@1" select-dev]
set-sfs-boot
unselect-dev
```

5. After all Emulex adapters have been enabled to boot from SAN, reboot the system with the following command:

reset-all

6. After the system reboots, boot the Solaris installation CD and follow the prompts.

#### Configure Boot from SAN on Solaris LPFC (SPARC)

```
Note: Solaris PCI code is used in the example paths displayed in this section. You must enter similar path names, specific to your system. If you have a Solaris SBus system: Change pci references to sbus and change emlx references to lpfs.
```

For example, the command to select the Emulex adapter for a PCI system (LPFC driver) is:

```
" /pci@lf,4000/emlx@2" select-dev
```

- 1. If necessary, install or update the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 2. If necessary, enable the boot code on the adapter (see *Install, Update, and Enable Boot Code* on page 14).
- 3. Type the following at the OBP prompt:

show-devs

The ID information for each found adapter is displayed, such as:

/pci@5d,700000/emlx@2

4. Enable boot from SAN on each Emulex adapter in the system by typing the following set of commands, replacing *adapter\_id* with the ID information (such as shown above), for each Emulex adapter in turn. There is a space between the first quotation mark and the first character of the adapter ID.

```
" adapter_id" select-dev [for example, " /pci@5d,700000/emlx@2" select-dev]
set-sd-boot
werelest dev
```

- unselect-dev
- 5. After all Emulex adapters have been enabled to boot from SAN, reboot the system with the following command:

reset-all

- 6. Install the operating system on an FC boot disk:
  - To install the operating system from a network image, see *Install Solaris from a Network Image* on page 10.
  - To migrate an operating system image from a local SCSI disk to an FC device, see *Install Solaris by Migrating an Image from a Local SCSI Disk* on page 11.

Install Solaris from a Network Image

The system must have a DVD drive and must be part of the site's network and naming service. If you use a naming service, the system must already be in a service, such as NIS, NIS+, DNS, or LDAP. If you do not use a naming service, you must distribute information about this system by following your site's policies.

**Note:** This procedure assumes that the system is running the Volume Manager. If you are not using the Volume Manager to manage media, refer to *Sun Microsystems System Administration Guide: Devices and File Systems.* 

- 1. Log on as a superuser or equivalent.
- 2. Insert the Solaris DVD in the system's drive.
- 3. Create a directory to contain the DVD image.

# mkdir -p install\_dir\_path

Install\_dir\_path specifies the directory where the DVD image is to be copied.

4. Change to the Tools directory on the mounted disc.

# cd /cdrom/cdrom0/Solaris\_10/Tools

Note: For Solaris 10 only: remove the SUNWemlxu and SUNWemlxs from the /install\_dir\_path/Solaris/Tools/Boot Unzip the lpfc driver /temp pkgadd -R /install\_dir\_path/Solaris/Tools/Boot -d /temp Modify the lpfc.conf file to use persistent binding. For more information, refer to the *Emulex LPFC Driver for Solaris User Manual*.

5. Copy the DVD image in the drive to the install server's hard disk.

# ./setup\_install\_server install\_dir\_path

*install\_dir\_path* specifies the directory where the DVD image is to be copied.

**Note:** The setup\_install\_server command indicates whether you have enough disk space available for the Solaris Software disc images. To determine available disk space, use the df -kl command.

6. Decide whether you need to make the install server available for mounting:

If the install server is on the same subnet as the system to be installed or you are using DHCP, you do not need to create a boot server. Proceed to Step 7.

If the install server is not on the same subnet as the system to be installed and you are not using DHCP, complete the following steps.

a. Verify that the path to the install server's image is shared appropriately.

# share | grep install\_dir\_path

*install\_dir\_path* specifies the path to the installation image where the DVD image was copied:

- If the path to the install server's directory is displayed and anon=0 is displayed in the options, proceed to Step 7.
- If the path to the install server's directory is not displayed or you do not have anon=0 in the options, continue and make the install server available to the boot server. Using the share command, add this entry to the /etc/dfs/dfstab file.

```
share -F nfs -o ro,anon=0 -d "install server directory"
install_dir_path
```

b. Verify that the nfsd daemon is running.

• If the install server is running the current Solaris release, or compatible version, type the following command.

# svcs -l svc:/network/nfs/server:default

If the nfsd daemon is online, continue to Step c. If the nfsd daemon is not online, start it.

# svcadm enable svc:/network/nfs/server

• If the install server is running the Solaris 9 OS, or compatible version, type the following command.

# ps -ef | grep nfsd

If the nfsd daemon is running, continue to Step c. If the nfsd daemon is not running, start it.

# /etc/init.d/nfs.server start

c. Share the install server.

# shareall

7. Change directories to root (/).

# cd /

- 8. Eject the Solaris DVD.
- (Optional) Patch the files that are located in the miniroot on the net install image that was created by setup\_install\_server. Patching a file might be necessary if a boot image has problems. Refer to the Sun Microsystems Solaris 10 10/08 Installation Guide.

Install Solaris by Migrating an Image from a Local SCSI Disk

1. Type the following at the OBP prompt:

show-devs

The ID information for each found adapter is displayed, such as:

/pci@5d,700000/lpfc@1 select-dev

- 2. Select the Emulex adapter on which you want to enable boot from SAN by entering the path to the adapter, for example:
  - " /pci@5d,700000/lpfc@1" select-dev
- 3. To view the current boot device ID, type:

```
show-devs
" /pci@5d,700000/lpfc@1" select-dev /* to select lpfc@1 (for example) */
.boot-id
```

Make a note of the WWPN, DID, or ALPA returned from the probe and write down the corresponding boot entry.

4. To enable boot from SAN, set the boot device ID to the SAN device from which you want to boot, for example:

```
" /pci@5d,700000/lpfc@1" select-dev
wwpn|did|alpa lun target_id set-boot-id
unselect-dev
```

where wwpn|did|alpa is the device WWPN, DID, or ALPA of the storage device. lun is the LUN number in hexadecimal. To enter it in decimal, enter d# [lun]. target\_id is the target ID in hexadecimal. To enter it in decimal, enter d# [target\_id].

**Note:** Emulex recommends using the WWPN in most cases. The DID and ALPA may change between boots, causing the SAN boot to fail, unless the DID and ALPA are specifically configured to not change between boots.

Example 1: alpa=e1, lun=100 (decimal) and target id=10 (decimal):

alpa el d# 100 d# 10 set-boot-id

Example 2: wwpn=50000034987AFE, lun=af (hexadecimal) and target id=10 (decimal):

wwpn 50000034987AFE af d# 10 set-boot-id

Example 3: did=6312200, lun=25 (hexadecimal) and target id=f (hexadecimal):

did 6312200 25 f set-boot-id

5. Boot to the original local disk to set up the newly defined FC disk. Type:

```
boot local_disk
```

where *local\_disk* is the complete path or the alias of the original boot disk.

**Note:** If the FC disk is not found when the system is rebooted, enter touch / reconfigure and reboot. If the disk is still not discovered, edit the /kernel/drv/lpfc.conf file and change the topology from 4 to 2 (or from 2 to 4). It may also be necessary to add an entry for the boot drive to the sd.conf file.

6. Run the format utility:

format

- 7. Select the target disk to become the new boot disk (for example, c1t1d0).
- 8. Select the partition option and partition the disk as desired.
- 9. Select the label option and write a volume label to the target disk.

For help with the format utility, see the man page "man format".

10. Install the boot on partition 0 of the target disk. (Type this command as one line.)

```
installboot /usr/platform/ `uname -i`/lib/fs/ufs/bootblk /dev/rdsk/clt1d0s0
```

11. Create a filesystem for each partition that contains a mounted filesystem:

newfs -v /dev/rdsk/clt1d0s0 (becomes root)
newfs -v /dev/rdsk/clt1d0s6 (becomes usr)
newfs -v /dev/rdsk/clt1d0s7 (becomes export/home)

12. Create temporary mount points for the new partitions:

```
mkdir root2
mkdir usr2
mkdir export2
```

13. Mount, copy, then unmount the usr2 file system:

```
mount /dev/dsk/clt1d0s6 /usr2
c0t0d0s6 ufsdump 0f - /dev/rdsk/c0t0d0s6 | (cd /usr2; ufsrestore rf -)
umount /usr2
```

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#### 14. Copy the export/home file system:

```
mount /dev/dsk/clt1d0s7 /export2
ufsdump 0f - /dev/rdsk/c0t0d0s7 | (cd /export2; ufsrestore rf -)
umount /export2
```

#### 15. Perform copy:

```
mount /dev/dsk/clt1d0s0 /root2
ufsdump 0f - /dev/rdsk/c0t0d0s0 | (cd /root2; ufsrestore rf -)
```

 Edit /root2/etc/vfstab, changing the controller number, target number and LUN number to point to the new FC boot disk. For example, if the FC boot disk is c1t1d0, replace all local disk entries of c0t0d0 with c1t1d0.

#### Currently file shows:

```
/dev/dsk/c0t0d0s1 (swap)
```

```
/dev/dsk/c0t0d0s0 and /dev/rdsk/c0t0d0s0 (root)
/dev/dsk/c0t0d0s6 and /dev/rdsk/c0t0d0s6 (usr)
/dev/dsk/c0t0d0s7 and /dev/rdsk/c0t0d0s7 (export)
```

#### Edit file to show:

```
/dev/dsk/clt1d1s1 (swap)
```

```
/dev/dsk/cltld0s0 and /dev/rdsk/cltld0s1 (root)
/dev/dsk/cltld0s6 and /dev/rdsk/cltld0s6 (usr)
/dev/dsk/cltld0s7 and /dev/rdsk/cltld0s7 (export)
```

#### 17. Reboot the system:

```
sync
sync
halt
reset-all
```

#### 18. Boot to disk:

boot disk

The system should boot to the FC disk.

#### 19. View the current dump device setting:

dumpadm

20. Change the dump device to the swap area of the FC drive:

dumpadm -d /dev/dsk/cltld0s1

where /dev/dsk/c1t1d0s1 is a sample path to the swap area of the FC drive.

## Install, Update, and Enable Boot Code

Use Emulex utilities to install boot code, update boot code to a newer version, and enable boot code. The utility that you will use depends on the operating system and, in some cases the driver type or system architecture. Table 2 indicates the utilities you can use to install and update boot code, and Table 3 indicates the utilities you can use to enable boot code.

Operating System	HBAnyware Utility	HBAcmd Utility	EFI Utility	emlxadm	Offline Utilities
Windows	Х	Х	Х		Х
Linux	Х	Х	Х		Х
Solaris LPFC	Х	Х			Х
Solaris emlxs (SFS)	Х	Х		Х	
VMWare	Х	Х			Х

Table 2: Utilities that Install and Update Boot Code

After you decide which utility to use, see the appropriate procedure:

- HBAnyware utility: See the HBAnyware Utility User Manual.
- HBAcmd utility: See the HBAnyware Utility User Manual.
- EFI utility: See *EFIBoot* on page 37.
- emlxadm: See the FCA Utilities User Manual.
- Offline utility: See the Offline Utilities User Manual.

#### Table 3. Utilities that Enable Boot Code

Operating System	HBAnyware Utility	HBAcmd Utility	EFI Utility	Offline Utilities
Windows	Х	Х	Х	Х
Linux	Х	Х	Х	Х
Solaris LPFC	Х	Х		Х
Solaris emlxs (SFS) <sup>a</sup>				
VMware	Х	Х		

a. Boot code for Solaris emlxs (SFS) systems in enabled automatically when it is installed, so no utility is needed.



## **Emulex BIOS Utility**

Before using the Emulex BIOS utility, ensure that the boot code is loaded and enabled on the adapter as described in *Install, Update, and Enable Boot Code* on page 14.

**Note:** This section reflects the most recent release of the BIOS utility. Some selections may not be available if you are using an older version of the utility.

#### Start the Emulex BIOS Utility

1. Turn on the computer and press and hold down **<Alt>** or **<Ctrl>** and press **<E>** immediately (within five seconds) when the bootup message to start the BIOS utility is displayed. An adapter listing is displayed (Figure 1).



Figure 1: Adapter Listing screen

**Note:** If the bootup message does not appear, you must enable x86 BootBIOS. See *Enable an Adapter to Boot from SAN* on page 17 for more information.

2. Select the adapter to configure by entering its number. The main configuration menu is displayed (Figure 2).



Figure 2: Main Configuration menu

Under normal circumstances, you would first configure boot devices using the BIOS Utility (page 17). However, in the following two situations, you must perform the indicated procedure first:

- The adapter is not enabled to boot from SAN: You must enable the adapter's BIOS to boot from SAN (See *Enable an Adapter to Boot from SAN* on page 17).
- You want to use a topology other than the default (auto topology with loop first): You must change the topology setting before configuring boot devices (See *Change Topology* on page 24).

#### Enable an Adapter to Boot from SAN

To enable an adapter to boot from SAN:

From the Main configuration menu, select **Enable/Disable Boot from SAN**. Adapters are disabled by default. At least one adapter must be enabled to boot from SAN in order to use remote boot functionality.

Once you enable an adapter, the status of the boot BIOS changes as shown in Figure 3.



Figure 3: BIOS status screen

#### **Configure Boot Devices**

This option supports FC\_AL: (public and private loop) and fabric point-to-point. When operating in loop (FC\_AL) topology, the system automatically determines whether you are configured for a public or private loop. The BIOS looks for a fabric loop (FL\_Port) first. If a fabric loop is not detected, the BIOS looks for a private loop. For the "Configure Boot Devices" option, the eight boot entries are zero by default (<D> key).

**Note:** If it is necessary to change the topology, do so before you configure boot devices. The default topology is auto topology with loop first. For FC-AL, each adapter has a default ALPA of 01 (Hex).

To configure boot devices:

1. On the main configuration menu (Figure 2), select **Configure Boot Devices**.

A list of eight boot devices is shown (Figure 4). Emulex recommends that you configure only the bootable devices. The primary boot device is the first entry shown, and it is the first bootable device.

If the first boot entry fails due to a hardware error, the system can boot from the second bootable entry. If the second boot entry fails, the system boots from the third bootable entry and so on.

01: LP100 Mem Base: Port Name:	100DC-S: F404240( 89ABCD) Tope	ð Firmware ( EFØ1234567 blogy: Auto	Bus Jersion: TS1. Not Topology: Loop	s <b>#: 00 Dec</b> 90A4 Boot de Name: p First (1	p#: 10 F t BIOS: 6543212 Default>	unc#: 00 Enabled! 30FCBA985	,
		List (	of Saved Boot 1	Devices:			
1	Unused	DID:00000	WWPN:00000000	00000000	LUN:00	Primary	Boot
2.	Unused	DID:00000	WWPN:0000000	00000000	LUN:00		
3.	Unused	DID:000000	WWPN:0000000	00000000	LUN:00		
1 <b>4</b> .	Unused	DID:000000	WVPN:0000000	00000000	LUN:00		
2	Unused	DID:000000	WWPN:00000000	00000000	LUN:00		
	Unused	DID:000000	WWPN - 000000000	00000000	LUN-00		
	Inused	DID:000000	UUPN: 00000000	00000000	LUN:00		
	ontasoat	515,0000000		00000000			
		1	N AN DIM N				
		S ES	sc) to Previous	s menu			

Figure 4: List of Saved Boot Devices screen

2. Select a boot entry. A screen similar to Figure 5 is displayed.

Ø1 :	LP1000	ØDC-S :	Im le	t Light	Pulse Bl	OS Utility, TL Bus#: 00 D	2.11a0 ev#: 10 Func#: 0	ø
nem Port	Base: Name:	F40424 89ABC To	DEF0123	Auto	Version: Topolog	Node Name: y: Loop First	654321230FCBA9	87
		1.4	11-2-5					
00. 01. 02. 03.	Clear DID:01 DID:01 DID:01 DID:01	select 0100 W 04E4 W 04E8 W	ed boot WPN:500 WPN:210 WPN:210	entry 1805F3 10000C 10000C	9004C699 50798EAF 507990A9	LUN:01COMPAQ LUN:00SEAGATE LUN:00SEAGATE	MSA1000 UOLUME ST318453FC ST318453FC	4.32 0005 0005
				kı	isc> to P	revious Menu		
		Соруг	iglit (c	> 1997	-2009 Em	alex. All vigh	ts reserved.	

Figure 5: Device Selection list Example (Array) screen

**Note:** To minimize the amount of time needed to locate the boot device, Emulex recommends that you select the drive with the lowest ALPA as the boot device.

3. Select **<00>** to clear the selected boot entry, or select a device to configure booting by WWPN or DID.

4. If you select a device, you are asked for the starting LUN. Enter the starting LUN (Figure 6). The starting LUN can be any number from 0 to 255.

01: LF Mem Bas Port Na	10000DC-S: e: F4042400 Firmware U me: 89ABCDEF01234567 Topology: Auto	Bus#: 00 Dev#: 10 Func#: 00 Jersion: TS1.90A4 Boot BIOS: Enabled! Node Name: 654321230FCBA987 Topology: Loop First (Default)
DID:0	10100 WWPN:500805F3 0004	10699
Ø1 -	LUN:01	COMPAQ MSA1000 UOLIME 4.32
02.	LUN:02	COMPAQ MSA1000 VOLUME 4.32
03.	LUN:03	COMPAQ MSA1000 VOLUME 4.32
04.	LUN:04	COMPAQ MSA1000 VOLUME 4.32
05.	LUN:05	COMPAQ MSA1000 VOLUME 4.32
06.	LUN:06	COMPAQ MSA1000 VOLUME 4.32
07.	LUN:07	COMPAQ MSA1000 VOLUME 4.32
08.	LUN:08	COMPAQ MSA1000 VOLUME 4.32
	<†/↓> to Highlight	Option, <enter> to Select Option.</enter>

Figure 6: LUN listing screen

You can define 256 LUNs per adapter, but the screen displays only 16 consecutive LUNs at a time. In front of each entry, B#D or B#W specifies the boot entry number and whether the device boots by DID or WWPN. For example, B1D means that boot entry 1 boots from the DID. B2W means that boot entry 2 boots from WWPN.

5. Type the two digits corresponding to the entry you are selecting. The boot devices menu (Figure 7) displays the following options:

lem Bas Port Na	e: F404240 me: 89ABCD Top	Ø Firmware Version: TS1.90A4 Boot BIOS: EF01234567 Node Name: 6543212 ology: Auto Topology: Loop First (Default)	Disabled! 30FCBA987
DID:0 01. 02. 03. 04. 05. 06. 07. 08.	010100 WWP LUN:01 LUN:02 LUN:03 LUN:04 LUN:05 LUN:06 LUN:07 LUN:08	DID:010100 WWPN:500805F3 0004C699 LUN:01 1. Boot this device via WWPN 2. Boot this device via DID <esc> to Previous Menu &lt;1/4&gt; to Highlight, <enter> to Select</enter></esc>	OLUME 4.32 OLUME 4.32 OLUME 4.32 OLUME 4.32 OLUME 4.32 OLUME 4.32 OLUME 4.32 OLUME 4.32
	<t 4=""></t>	to Highlight Option, <enter> to Select Option</enter>	ion.

Figure 7: Boot Devices menu

 Select the boot method you want. If you select to boot the device by WWPN, the WWPN of the earlier selected entry is saved in the flash memory. However, during the initial BIOS scan, the utility issues a Name Server Inquiry GID\_PN (Get Port Identifier). Then, based on this DID, it continues with the remainder of the scanning.

If you select to boot this device by DID, the earlier selected entry is saved in the flash memory.

	Emulex LightPulse BIOS Utility, TL2.11e0
01: LP10000D( Mem Base: F40 Port Name: 89	C-S: Bus#: 00 Dev#: 10 Func#: 00 042400 Firmware Version: TS1.90A4 Boot BIOS: Disabled! 9ABCDEF01234567 Node Name: 654321230FCBA987 Topology: Auto Topology: Loop First (Default)
	List of Saved Boot Devices:
1. Use 2. Une 3. Une 4. Une 5. Une 6. Une 7. Une 8. Une	ed         DID:000000         WWPN:500805F3         0004C699         LUN:01         Primary Boot           used         DID:000000         WWPN:0000000         00000000         LUN:00           used         DID:000000         WWPN:00000000         00000000         LUN:00
<	↑/↓> to Highlight Option, <enter> to Select Option.</enter>
-G	apyright (c) 1997-2009 Enulex. All rights reserved.

Figure 8: Primary Boot Device Set Up screen

- 7. Press **<Esc>** until you exit the BIOS utility.
- 8. Reboot the system for the new boot path to take effect.

#### **Configure Adapter Parameters**

The BIOS utility has numerous options that can be modified to provide for different behavior. Use the BIOS utility to perform the following tasks:

- Change default ALPA of the adapter
- Change PLOGI retry timer
- Select a topology
- Enable or disable spinup delay
- Set autoscan
- Enable or disable EDD 3.0
- Enable or disable the start unit command
- Enable or disable the environment variable
- Enable or disable auto boot sector
- Select a link speed

**Note:** The default topology is auto topology with loop first. Change this topology setting, if necessary, before configuring boot devices.

To access the adapter configuration menu, when the main configuration menu (Figure 2) is displayed, select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed.

Change Default ALPA of this Adapter Change PLOGI Retry Timer Topology Selection Enable or Disable Spinup Delay Auto Scan Setting Enable or Disable EDD 3.0
Enable or Disable Start Unit Command Enable or Disable Environment Variable Enable or Disable Auto Boot Sector Link Speed Selection

Figure 9: Adapter Configuration menu

Default settings are acceptable for most installations. To reset all values to their defaults, from the main configuration menu (Figure 2) select **Reset Adapter Defaults**.



#### Change the Default ALPA (Arbitrated Loop Physical Address)

The default value of the ALPA for the adapter BIOS is 00 (hex).All adapters or boot drives can be configured to other ALPAs rather than their default values.

```
Note: This option applies only to arbitrated loop (FC-AL).
```

To change the default ALPA:

- 1. On the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select Change Default ALPA of this adapter. Information similar to Figure 10 is displayed.



Figure 10: Change Default ALPA screen

- 3. Change the default ALPA, use the arrow keys to scroll through the valid ALPAs. Table 4 below lists the valid ALPA values.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.

**Note:** If the adapter's ALPA is changed, it does not show on the NVRAM ALPA until the system has been reset.

Tal	ble	4:	Valid	ALPA	Values	

0x00	0x01	0x02	0x04	0x08	0x0F	0x10	0x17
0x18	0x1B	0x1D	0x1E	0x1F	0x23	0x25	0x26
0x27	0x29	0x2A	0x2B	0x2C	0x2D	0x2E	0x31
0x32	0x33	0x34	0x35	0x36	0x39	0x3A	0x3C
0x43	0x45	0x46	0x47	0x49	0x4A	0x4B	0x4C
0x4D	0x4E	0x51	0x52	0x53	0x54	0x55	0x56
0x59	0x5A	0x5C	0x63	0x65	0x66	0x67	0x69
0x6A	0x6B	0x6C	0x6D	0x6E	0x71	0x72	0x73
0x74	0x75	0x76	0x79	0x7A	0x7C	0x80	0x81
0x82	0x84	0x88	0x8F	0x90	0x97	0x98	0x9B

0x00	0x01	0x02	0x04	0x08	0x0F	0x10	0x17
0x9D	0x9E	0x9F	0xA3	0xA5	0xA6	0xA7	0xA9
0xAA	0xAB	0xAC	0xAD	0xAE	0xB1	0xB2	0xB3
0xB4	0xB5	0xB6	0xB9	0xBA	0xBC	0xC3	0xC5
0xC6	0xC7	0xC9	0xCA	0xCB	0xCC	0xCD	0xCE
0xD1	0xD2	0xD3	0xD4	0xD5	0xD6	0xD9	0xDA
0xDC	0xE0	0xE1	0xE2	0xE4	0xE8	0xEF	

#### Table 4: Valid ALPA Values (Continued)

#### Change the PLOGI Retry Timer

This option is especially useful for Tachyon-based RAID arrays. In rare situations, a Tachyon-based RAID array may reset itself and the port may go offline temporarily. When the port returns to operation, the PLOGI (port log in) retry interval scans the loop to discover this device. The PLOGI retry interval is the time it takes for one PLOGI to scan the whole loop (if 126 ALPAs are on the loop). You can choose:

- No PLOGI Retry: 0 msec default
- 50 msec takes 5 to 6 seconds per device.
- 100 msec takes 12 seconds per device.
- 200 msec takes 22 seconds per device.

To set the interval for the PLOGI retry timer:

- 1. On the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select Change PLOGI Retry Timer. Information similar to Figure 11 is displayed.

	Englex LightPulse BIOS Stillity, TL2.11a0
01: LP100 Men Base: Port Name:	00DC-S: F4042400 Firmware Version: TS1.90A4 Boot BIOS: Disabled! 89ABCDEF01234567 Topology: Auto Topology: Loop First (Default)
	PLOGI Retry Timer is: 000
	No PLOGI Retry @ msec (Default)
	Change FLOGI Retry Timer to 100 msec
	Ghange Flodi hetry limer to 200 mset
	(Esc) to Previous Menu
	<1/4> to Highlight Option, (Enter) to Select Option.
	Copyright (c) 1997-2009 Emulex. All rights reserved.
gure 11: Change t	he PLOGI Retry Timer screen

- 3. Select the retry timer interval.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system



#### Change Topology

Emulex drivers support arbitrated loop and point-to-point topologies. If it is necessary to change the topology, do so before you configure boot devices. The default topology is auto topology with loop first. For FC-AL, each adapter has a default ALPA of 01 (Hex).You can configure:

- · Auto topology with loop first default
- Auto topology with point-to-point first
- FC-AL
- Fabric point-to-point.

To select the adapter topology:

- 1. On the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select **Topology Selection**. Information similar to Figure 12 is displayed.



Figure 12: Topology menu

- 3. Select the topology for the adapter.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.



#### Enable or Disable the Spinup Delay

This option allows you to enable or disable the disk spinup delay. The factory default setting is disabled.

If at least one boot device has been defined, and the spinup delay is enabled, the BIOS searches for the first available boot device.

- If a boot device is present, the BIOS boots from it immediately.
- If a boot device is not ready, the BIOS waits for the spinup delay and, for up to three additional minutes, continues the boot scanning algorithm to find another multi-boot device.

If boot devices have not been defined, and auto scan is enabled, then the BIOS waits for five minutes before scanning for devices.

- In a private loop, the BIOS attempts to boot from the lowest target ALPA it finds.
- In an attached fabric, the BIOS attempts to boot from the first target found in the NameServer data.

To enable or disable the spinup delay:

- 1. On the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select Enable or Disable Spinup Delay. Information similar to Figure 13 is displayed.



Figure 13: Enable or Disable Spinup Delay screen

- 3. Enable or disable spinup delay.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.

#### Set Auto Scan

This option allows you to set auto scan and enable the first device in the boot entry list to issue a Name Server Inquiry. Auto scan is available only if none of the eight boot entries are configured to boot from DID or WWPN. The factory default is disabled. If there is more than one adapter with the same PCI Bus number in the system, and each has a boot drive attached, the first PCI-scanned adapter is the boot adapter. The first adapter is usually in the lowest PCI slot in the system.

Use the Boot Devices menu (Figure 7) to configure up to eight boot entries for fabric point-to-point, public loop, or private loop configurations. The first adapter is usually in the lowest PCI slot in the system. This device is the only boot device and it is the only device exported to the multi-boot menu.

Auto scan options:

- Autoscan disabled default.
- Any first device The first adapter issues a Name Server Inquiry and the first D\_ID from the inquiry becomes the boot device. The adapter attempts to log in to a public loop first. If it fails, it logs in to a private loop. The first successfully scanned device becomes the boot device. This device only is exported to the multi-boot menu.
- First LUN 0 device
- First NOT LUN 0 device (device other than LUN 0)

To set auto scan:

- 1. From the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select Auto Scan Setting. Figure 14 is displayed.



Figure 14: Set Auto Scan menu

- 3. Select the auto scan option:
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.

#### Enable or Disable EDD 3.0

Enhanced Disk Drive (EDD) 3.0 provides additional data to the O/S boot loader during the INT-13h function 48h (get device parameters) call. This information includes the path to the boot device and disk size. The default setting for EDD 3.0 is disabled.

Note: An x86 series system could hang during Windows 2000 Server installation if EDD 3.0 is enabled.

To enable or disable EDD 3.0:

- 1. From the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select **Enable or Disable EDD 3.0**. Figure 15 is displayed.



Figure 15: Enable or Disable EDD 3.0 screen

- 3. Enable or disable EDD 3.0.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.

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#### Enable or Disable the Start Unit Command

You must know the specific LUN to issue the SCSI start unit command. The default setting is disabled.

To enable or disable the start unit command:

- 1. From the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select Enable or Disable Start Unit Command. Figure 16 is displayed.

Emulex Light	Pulse BIOS Utility, TL2.11a0
01: LP10000DC-S: Mem Base: F4042400 Firmware Port Name: 89ABCDEF01234567 Topology: Auto	Bus#: 00 Dev#: 10 Func#: 00 Version: TS1.90A4 Boot BIOS: Disabled! Node Name: 654321230FCBA987 D Topology: Loop First (Default)
Start U	nit Command is: Disabled
	Enable Disable
< <1/4> to Highlig	Esc> to Previous Menu yht Option, <enter> to Select Option.</enter>
Copyright (c) 1995	7-2009 Emulex. All rights reserved

Figure 16: Enable or Disable Start Unit Command screen

- 3. Enable or disable the start unit command.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.

### **DE EMULEX**

#### Enable or Disable the Environment Variable

This option sets the boot controller order if the system supports the environment variable. The default setting is disabled.

To enable or disable the environment variable:

- 1. From the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select Enable or Disable Environment Variable. Figure 17 is displayed.

Emulex LightPulse BIOS Utility, TL2.11m0
01: LP10000DC-S: Bus#: 00 Dev#: 10 Func#: 00 Mem Base: F4042400 Firmware Version: TS1.90A4 Boot BIOS: Disabled! Port Name: 89ABCDEF01234567 Node Name: 654321230FCBA987 Topology: Auto Topology: Loop First (Default)
Environment Variable is: Disabled
Enable Disable
<pre><esc> to Previous Menu <t t=""> to Highlight Option, <enter> to Select Option.</enter></t></esc></pre>
Copyright (c) 1997-2009 Emuley, All rights reserved.

Figure 17: Enable or Disable Environment Variable screen

- 3. Enable or disable the environment variable.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.

#### Enable or Disable Auto Boot Sector

This option automatically defines the boot sector of the target disk for the migration boot process, which applies only to HP MSA1000 arrays. If there is no partition on the target, the default boot sector format is 63 sectors. The default setting is disabled.

To enable or disable auto sector format select:

- 1. From the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select Enable or Disable Auto Boot Sector. Figure 18 is displayed.

Englas LightPulse BIOS Stility, TL2.11m0
01: LP10000DC-S: Mem Base: F4042400 Firmware Version: TS1.90A4 Boot BIOS: Disabled! Port Name: 89ABCDEF01234567 Topology: Auto Topology: Loop First (Default)
Auto Boot Sector is: Disabled
Enable Disable
<pre></pre>
Copyright (c) 1997-2009 Enuloy, All rights reserved.

Figure 18: Enable or Disable Auto Sector Format Select screen

- 3. Enable or disable auto boot sector.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.

#### **Change Link Speed**

The default link speed is Auto Select, which automatically selects the link speed based on the adapter model.

Possible link speeds (depend upon your adapter model):

- Auto Select default
- 1 Gb/s
- 2 Gb/s
- 4 Gb/s
- 8 Gb/s

Note: Emulex's 8 G/bs adapters do not support 1 G/bs link speed.

To change the adapter's link speed:

- 1. From the main configuration menu (Figure 2), select **Configure Advanced Adapter Parameters**. The adapter configuration menu is displayed (Figure 9).
- 2. Select Link Speed Selection. A menu similar to Figure 19 is displayed.

Topology: Auto Topology: Loop First (Default) Link Speed is: Auto Select (Default) Auto Select (Default)	
Link Speed is: Auto Select (Default) Auto Select (Default)	
Auto Select (Default)	
Auto Select (Default)	
1 Gigapaud	
2 digabatu	
(Esc) to Previous Henu	
<1/4> to Highlight Option, (Enter) to Select Option.	

Figure 19: Link Speed Selection menu

- 3. Change the link speed.
- 4. Press **<Esc>** until you exit the BIOS utility.
- 5. Reboot the system.
## **Reset to Default Values**

The BIOS utility enables you to reset BIOS boot parameters to their factory default settings.

These defaults are listed in Table 5.

## Table 5: Adapter Defaults

Parameter	Default	Valid Values		
Boot from SAN	Disabled	Enabled Disabled		
ALPA Value	0x00 Fibre	See ALPA reference table ( <i>Change the Default ALPA (Arbitrated Loop Physical Address</i> ) on page 22.		
EDD 3.0	EDD 2.1	Disabled (EDD 2.1) Enabled (EDD 3.0)		
PLOGI Retry Timer	Disabled	Disabled 50 msec 100 msec 200 msec		
Spinup Delay	Disabled	Enabled Disabled		
Auto Scan	Disabled	Enabled Disabled		
Start Unit	Disabled	Enabled Disabled		
Environmental Variable	Disabled	Enabled Disabled		
Auto Boot Sector	Disabled	Enabled Disabled		
Topology	Auto (start FC-AL)	Auto (start FC-AL) Point-to-Point Auto (start Point-to-Point) FC-AL		
Link Speed	0	0 = Auto select 1 = 1 Gb/s 2 = 2 Gb/s 4 = 4 Gb/s 8 = 8 Gb/s		



To reset parameters to their factory default settings:

1. On the main configuration menu (Figure 2) select **Reset Adapter Defaults**. A screen is displayed that asks if you want to reset to the defaults.



Figure 20: BIOS Utility screen

2. Press <Y>.

All settings revert to their factory default values.

#### **Use Multi-Path Boot from SAN**

Multi-boot BIOS is in compliance with the BIOS Boot Specification (BBS). The system must have a Multiboot system BIOS in order to take advantage of this feature. Multi-boot BIOS allows you to select any boot disk in the system BIOS setup menu. The boot disk can be an FC drive, a SCSI drive, an IDE drive, a USB device, or floppy drive. The Emulex BIOS supplies the first eight drives to the system BIOS menu. The Multi-boot BIOS can override the FC drive that is selected in the BIOS utility.

For example, the system has eight FC disks only. The boot disk has ALPA 02. However, you can select ALPA 23 in the system BIOS setup menu. The boot device is the FC disk with ALPA 23 instead of ALPA 02, as is set in the BIOS utility.

If your system supports Multi-boot BBS, the local boot disk (drive C) is the first entry in Multi-boot on the system BIOS setup menu. The list of entries is determined by the list of configured boot entries in the BIOS utility. For example:

Adapter 1: boot\_entry0, boot\_entry1
Adapter 2: boot\_entry2, boot\_entry3

The order of boot entries exported to Multi-boot (BBS) is

```
boot_entry0, boot_entry1, boot_entry2, and boot_entry3.
```

However, Multi-boot allows changing the boot order in the server BIOS, which allows any disk to become the C drive.

# **OpenBoot**

OpenBoot commands are supported by the Sun SPARC system.

## **Attribute Commands**

#### .boot-id

Syntax: ..boot-id Description: Shows the current boot device id. Parameters: None

#### devalias

Syntax: .devalias Description: Shows the boot list. Parameters: None

#### .fcode

Syntax: ..fcode Description: Shows the current version of OpenBoot. Parameters: None

#### host-did

Syntax: .host-did Description: Shows the actual current ALPA of the adapter. Parameters: None

#### .nvram

Syntax: ..nvram

Description: Shows the current flags for OpenBoot.

```
show-devs
"/pci@lf,0/pci@l/lpfc@l" select-dev
/* select lpfc@l (for example) */
.nvram
```

Parameters: None

#### probe-scsi-all

Syntax: probe-scsi-all Description: Shows the current SCSI and FC devices. Parameters: None

#### show-devs

Syntax: .show-devs Description: Shows a list of the devices found. Parameters: None

#### .topology

Syntax: ..topology Description: Shows the current topology. Parameters: None

## **Functional Commands**

#### .remove-boot-id

Syntax: .remove-boot-id

Description: Removes the boot id from boot list.

```
"/pci@lf,0/pci@l/lpfc@l" select-dev
remove-boot-id /* to clear boot id settings */
unselect-dev
or
"/pci@lf,0/pci@l/lpfc@l" select-dev
set-default-mode /* to clear boot id settings */
unselect-dev
```

Parameters: None

#### set-default-mode

Syntax: set-default-mode Description: Resets to the default value mode. Parameters: None

#### set-link-speed

Syntax: set-link-speed

Description: Shows the current link-speed setting. Changes and sets the link speed. The default is 0=Auto Select Link Speed.

Parameters: 0=Auto Select Link Speed (Default),1=1 Gb/s Link Speed -- Only, 2=2 Gb/s Link Speed -- Only, 4=4 Gb/s Link Speed -- Only

#### set-max-lun

Syntax: set-max-lun

Description: Shows the current maximum LUN support. Changes and sets the support setting, the default max lun is 256.

Parameters: 0=Set Max Lun to 255 (Default), 1=Set Max Lun to 1023, 2=Set Max Lun to 2047, 3=Set Max Lun to 4095

#### set-post-linkup

Syntax: set-post-linkup

Description: Controls if a linkup is to occur during a POST. The default is off.

Parameters: 0=Set Linkup Switch OFF (Default), 1=Set Linkup Switch ON

#### Table 6: OpenBoot Signature Table

Signature	OpenBoot signature
Valid_flag	internal flag for OpenBoot
Host_did	shows host DID number
Enable_flag	internal flag for OpenBoot
Topology_flag	topology flag for OpenBoot
Link_Speed_Flag	set link speed
Diag_Switch	set fcode diag switch
Boot_id	shows target ID number
Lnk_timer	internal use for OpenBoot
Plogi_timer	internal use for OpenBoot
LUN	shows boot LUN in use
DID	shows boot ID in use
WWPN	shows boot WWPN in use

**Note:** Target ID can be bound to either DID (destination ID) or WWPN (worldwide port name) and saved in an adapter NVRAM. It can also be saved in an environmental variable boot-device.

# **EFIBoot**

The Emulex EFIBoot boot code can be used on server platforms with EFI or UEFI-based system firmware, with or without an EFI shell. If your system firmware is EFI version 1.1 or UEFI version 2.0, the EFI utility can be invoked from the EFI Shell prompt. If your system firmware is UEFI 2.1, it expects the HII (Human Interface Infrastructure) interface to be present and implemented by the server manufacturer. Using EFIBoot code with the HII interface is described later in the chapter.

**Note:** This section reflects the most recent release of the EFI utility. Some selections may not be available if you are using an older version of the utility.

```
Note: EFIBoot is not supported on converged network adapters (CNAs) such as the LP21000 and LP21002.
```

**Note:** If you have several adapters in your system, the EFI system firmware or boot code uses the highest version driver that is on one of your adapters. Adapters with older versions of EFIBoot are managed by the more recent version, but only as long as the adapter with the most recent version is in the system. The adapters must be updated to actually update and not just use the most recent version available.

## Install the EFI Utility

Before you install the EFI utility, download the EFIBoot zip file and extract the contents to a floppy disk, CD, USB device, or hard drive. The EFIBoot zip file includes the prg file, the elxcliversion efi file (where *version* corresponds to the EFIBoot code version), and the readme.txt file. The elxcliversion.efi file contains the EFI utility.

To install the EFI utility:

1. Start your system. A menu similar to Figure 21 is displayed. The menu items vary depending on the configuration of your system.

```
EFI Boot Manager ver 1.10 [14.61] Firmware ver 2.01 [4322]
```

Please select a boot option

```
Red Hat Linux Advanced Workstation
Windows XP 64-Bit Edition Version 2003
EFI Shell [Built-in]
CDROM
Boot Option Maintenance Menu
System Configuration Menu
```

Use 1 and 4 to change option(s). Use Enter to select an option

Figure 21: Boot Option menu

- 2. Select EFI Shell from the menu. An EFI shell starts and the shell prompt is displayed.
- 3. Change to the drive where the Emulex EFIBoot file was extracted. To see a list of drives, type:

map -r <Enter>

A list of drive names is displayed (Figure 22).

```
Shell> map -r
Device mapping table
fs0 : Acpi(PNP0A03.0)/Pci(1F|0)/Acpi(PNP0604.0)
blk0 : Acpi(PNP0A03.0)/Pci(1F|0)/Acpi(PNP0604.0)
blk1 : Acpi(PNP0A03.0)/Pci(1F|1)/Ata(Secondary,Master)
```

Shell>

Figure 22: Drive List example

- 4. Change to the desired drive by entering the drive name followed by a colon. For example, type: fs0:
- 5. Load the EFI utility file:

load filename.efi <Enter>

where filename is the The following message is displayed:

```
load elxcli400A2.efi
```

load:Image fs0: \elxcli400A2.efi loaded at 0x3FCD7000 - Success

The EFI utility is now resident in memory, and can be accessed through the  $\mathtt{drvcfg}\,$  shell command.

**Note:** The utility is available only until the next reboot. However, if the driver.prg file has been stored in the flash memory on the adapter, the utility is available at every startup as long as the adapter is in the system.

## Start the EFI Utility

To access the main EFI utility:

1. View Emulex driver image handle information. At the shell prompt type:

drivers <Enter>

A list of drivers is displayed (Figure 23).

fsi	8:\> drive	ers		1.00				
0 RV	VERSION	->-a-u	CH G		HO	HC	DRIVER NAME	IHAGE NAME
15	00000001	8			1	1	DebugPort Driver	73E9457A-CEA1-4
52	00000001	D	-		1		National(R) PC8741x SIO Driver	C5DAC13B-8D24-4
SB	000000000	7	-		-	-	BIOSTINTIOI VGA Mini Port Driver	BBDAC3A1-BO6F-4
SC	00000000	7			-		BIOSTINTI61 Keyboard Driver	5479662B-6AE4-4
50	000000000	7	-	-	-	-	BIOS[UNDI] Simple Network Protocol	DOCAR91E-2DE4-4
5E	00000010	2	-		-	-	BIOS[INT13] Block Io Driver	4495E47E-4209-4
SF	00000024	?	-	-	-	-	BIOS[INT10] Video Driver	29CF55F8-B675-4
60	00000010	D			2	-	Platform Console Nanagement Driver	51CCF399-4FDF-4
61	00000010	D	-		1	-	Platform Console Nanagement Driver	51CCF399-4F0F-4
62	00000010	в	-		1	1	Console Splitter Driver	408EDCEC-CF6D-4
63	00000010	2	-		7.7		Console Splitter Driver	408EDCEC-CF6D-4
66	00000010	6	-		2	2	Console Splitter Driver	408EDCEC-CF6D-4
65	00000010	8			2	5	Console Splitter Driver	408EDCEC-CF6D-4
69	00000010	D.	-		1	-	UGA Console Driver	CCCB8C28-4B24-1
6A	00000010	8	-	-	1	1	Serial Terminal Driver	9E863906-A40F-4
6B	00000010	?	-	-	-	-	VGA Class Driver	BF89F10D-820S-4
6C	00000010	0	-		9	-	Generic Disk I/O Driver	490E1CEA-B81C-1
C2	00032013	8	Х	Х	1	26	Enules SCSI Pass Thru Driver	Welxcli320a3.c

Figure 23: Driver Listing screen

2. Run the drvcfg command followed by the driver image handle for the Emulex SCSI Pass Thru Driver, for example, C2 (your driver image handle number may be different):

drvcfg -s c2 **<Enter>** 

A list of all the adapters in the system is displayed (Figure 24). Your list may vary depending on the boot package you are using. Locate the adapter to enable, update, configure or troubleshoot. Use the up/down arrows on your keyboard to select it, and press **<Enter>**.

	Emulex FC EFI-Bios	Utility, Ver: 4.00A0
Em	lex Adapters in th	is System: 001 thru 006
001: LP11002	PCI-X 133HHz	Seg#: 00 Bus#: 80 Dev#: 01 Func#: 00
002: LP11002 003: LP1150-F4	PCI-X 133MHZ PCI-X 66MHz	Seg#: 00 Bus#: 80 Dev#: 01 Func#: 01 Seg#: 08 Bus#: 80 Dev#: 02 Func#: 08
004: LP10000DC-S	PCI-X 66HHz	Segl: 00 BusH: E0 DevII: 01 FuncII: 00
005: LP10000DC-S	PCI-X 66HHz PCT-X 66HHz	Segl: 00 Busil: E0 Devil: 01 Funcil: 01 Segl: 00 Busil: F0 Devil: 02 Funcil: 00
	of the second se	Contraction and the activity of Function

Figure 24: Adapter Listing screen

The EFI Main Utility menu is displayed (Figure 25).

	Emulex FC EFI-Bios	Utility, Ver: 6.00A0
001: LP11002	PCI-X 193NHz HBA Status: Not Ready EFI Boot : BE9.20A0	Seg∦: 00 Bus#: C0 Dev#: 01 Func#: 00 Boot Bios : Enabled Firmware : BS2.70R5
	1. Setup U	tilitu
	2. Firmwar	e Update

Figure 25: Main EFI-Bios Utility menu

### **EFI Utility Conventions**

The EFI utility has menus and configuration screens with a navigation bar at the bottom of the each one:

- Press the up/down arrows on your keyboard to move through and select menu options or configuration fields. Screens with adapter listings and information display up to eight rows at a time. If applicable, press the up/down arrows to scroll to additional adapters.
- Press the left and right arrows to scroll through pages of information.
- Press **<Enter>** to select a menu option, to select a row in a configuration screen, or to change a configuration default.
- Usually, press **<Esc>** to return to the previous menu. There are a few exceptions to this convention.
- Press <F1> to view online help for a menu item.

# **Configure EFIBoot via EFI Shell Invocation**

The EFI utility has many options that can be modified to provide for different behavior. Use the EFI utility to do the following tasks:

- Enable or disable the BIOS
- Configure HBA parameters
- Configure boot parameters
- Reset an adapter to its default values
- Save and restore configurations

**Note:** You must issue a **connect -r** command in the EFI shell or reboot for any changes to take effect.

## Enable or Disable the BIOS

The BIOS must be enabled before it can be configured.

To enable the BIOS:

1. From the Main EFI-Bios Utility menu, select **1**. **Setup Utility** and press **<Enter>**. The EFI-BIOS Setup Utility menu is displayed (Figure 26).

		Em	ile	ex FC EFI-Bios Setup Utility, Ver: 4.00A0	
001:	LP11002 Boot Port S_ID	Bios Name		PCI-X         66MHz         Seg#: 00 Bus#: 80 Dev#: 01           Enabled         Firmware         : BS2.10A7         I/O Base         : 820           10000000003354127         Node Name         : 20000000003354127           000001         Link Speed: NA         Topology         : Inv	Func#: 00 0 alid
				1. Enable or Disable BIOS	
				2. Configure HBA Parameters 3. Configure Boot Parameters	
				<ol> <li>Reset to Default Values</li> <li>Save/Restore Adapter Config</li> </ol>	

Figure 26: EFI-BIOS Setup Utility menu

 Select 1. Enable or Disable BIOS and press <Enter>. The current BIOS status is displayed (Figure 27).



Figure 27: BIOS Status screen

 If the current status is disabled, select Enabled and press <Enter>. The status changes to enabled (Figure 28).



Figure 28: BIOS Enabled screen.

**Note:** You can configure EFIBoot systems for up to eight boot devices. Configure one boot device at a time.

Note: Press <Esc> to return to the EFI utility menu.

## **Configure Adapter Parameters**

The EFI utility enables you to configure the following adapter parameters:

- Default arbitrated loop physical address (ALPA)
- Topology
- Port login (PLOGI) retry timer
- Link speed

From the EFI-BIOS Setup Utility menu (Figure 26) select **2. Configure HBA Parameters** and press **<Enter>**. The Adapter Configuration (Figure 29) is displayed.

	Emulex FC EFI-Bios Setup Utility, Ver: 4.00A0
001: LP11002 Boot Port S_ID	PCI-X         133MHz         SegH:         00         BusH:         C0         DevH:         01         FuncH:         00           Bios         : Enabled         Firmware         : BS2.11A7         I/O         Base         : 3000           Name         : 10000000094A9681         Node         Name         : 20000000094A9681         :           : 010000         Link         Speed:         4Gb/s         Topology         : PtPt
	<ol> <li>Default ALPA of this adapter</li> <li>Topology Selection</li> <li>PLOGI Retry Timer</li> <li>Force Link Speed</li> </ol>

Figure 29: Adapter Configuration menu

### Change the Default ALPA

When a device is connected to an FC arbitrated loop, the loop initialization process (LIP) automatically assigns an ALPA to the device. This number is assigned to the device as long as it is connected to the loop and powered up. When the device is removed from the loop or turned off, as it is reconnected or

when another LIP occurs, the device may be assigned a different ALPA. The HardALPA=0xn parameter allows you to permanently assign an ALPA to a host adapter. This does not alter the adapter flash memory. The default for this parameter is 0x00. All valid ALPA values are listed in Table 7.

0x00	0x01	0x02	0x04	0x08	0x0F	0x10	0x17
0x18	0x1B	0x1D	0x1E	0x1F	0x23	0x25	0x26
0x27	0x29	0x2A	0x2B	0x2C	0x2D	0x2E	0x31
0x32	0x33	0x34	0x35	0x36	0x39	0x3A	0x3C
0x43	0x45	0x46	0x47	0x49	0x4A	0x4B	0x4C
0x4D	0x4E	0x51	0x52	0x53	0x54	0x55	0x56
0x59	0x5A	0x5C	0x63	0x65	0x66	0x67	0x69
0x6A	0x6B	0x6C	0x6D	0x6E	0x71	0x72	0x73
0x74	0x75	0x76	0x79	0x7A	0x7C	0x80	0x81
0x82	0x84	0x88	0x8F	0x90	0x97	0x98	0x9B
0x9D	0x9E	0x9F	0xA3	0xA5	0xA6	0xA7	0xA9
0xAA	0xAB	0xAC	0xAD	0xAE	0xB1	0xB2	0xB3
0xB4	0xB5	0xB6	0xB9	0xBA	0xBC	0xC3	0xC5
0xC6	0xC7	0xC9	0xCA	0xCB	0xCC	0xCD	0xCE
0xD1	0xD2	0xD3	0xD4	0xD5	0xD6	0xD9	0xDA
0xDC	0xE0	0xE1	0xE2	0xE4	0xE8	0xEF	

#### Table 7: Valid ALPA Values

To change the default ALPA:

1. On the Adapter Configuration menu, select **1. Default ALPA of this adapter** and press **<Enter>**. A screen similar to Figure 30 is displayed.



Figure 30: Default ALPA Setup screen

2. Select the HardALPA value field, use the up/down arrows to change the default value, and press **<Enter>**. The new value is displayed.

Note: Press <Esc> to return to the EFI utility menu.

## Change the Topology

Emulex drivers support arbitrated loop and point-to-point topologies.

To change the topology:

1. On the Adapter Configuration menu, select **2. Topology Selection** and press **<Enter>**. The screen shown in Figure 31 is displayed.

001:	LP11002 Boot	Bios	PCI-X	133HHz Firmware	Seg#: 00	Bus#: C0 Dev A7 T/O Base	#: 01 Func#: 00
	Port S_ID	Name	: 1000000 : 010000	0C94A9681 Link Spe	Node Name ed: 4Gb/s	: 2000000000094 Topology	A9681 : PtPt
		Curr	ent Topol	ogy is: AUT	0 Loop Fir	st – default.	
			AU	TO Loop Fir	st - defau Point fir	lt.	
			Po	int to Poin	t.	st.	

Figure 31: Topology Options screen

2. Use the up/down arrows to select a different topology and press **<Enter>**. The screen is refreshed with the new value.

**Note:** The presence of a fabric is detected automatically.

Press **<Esc>** to return to the EFI utility menu.

### Change the PLOGI Retry Timer

This option allows you to set the interval for the port login (PLOGI) retry timer. This option is especially useful for Tachyon-based RAID arrays. Under very rare occasions, a Tachyon-based RAID array resets itself and the port goes offline temporarily in the loop. When the port comes to life, the PLOGI retry interval scans the loop to discover this device.

To change timer values:

1. On the Adapter Configuration menu, select **3. PLOGI Retry Timer** and press **<Enter>**. The screen shown in Figure 32 is displayed.

	Emulex FC EFI-Bios Setup Utility, Ver: 4.0000
001:	LP11002         PCI-X         133MHz         Seg#: 00         Bus#: C0         Dev#: 01         Func#: 00           Boot Bios : Enabled         Firmware : BS2.11A7         I/O         Base : 3000         Port Name : 10000000C94A9681         Node Name : 20000000C94A9681         S_ID         : 010000         Link         Speed: 4Gb/s         Topology : PtPt
	PLOGI Retry Timer is: Disabled - NO RETRIES. Disable - Default 50 msec. 100 msec. 200 msec.

Figure 32: PLOGI Retry Timer Setup screen

2. Use the up/down arrows to select a retry timer option and press **<Enter>**. The screen is refreshed with the new value.

```
Note: Press <Esc> to return to the EFI utility menu.
```

The time it takes for one PLOGI to scan the whole loop (if 126 ALPAs are on the loop) is shown below:

- 50 msec takes 5 to 6 seconds per device.
- 100 msec takes 12 seconds per device.
- 200 msec takes 22 seconds per device.

## Change the Link Speed

Use this feature to change, or force, the link speed between ports instead of auto negotiating. The supported link speeds depend upon the adapter. The screen (Figure 33) will only show options that are valid for the current adapter.

To change the link speed:

1. On the Adapter Configuration menu, select **4. Force Link Speed** and press **<Enter>**. A screen similar to Figure 33 is displayed. Possible link speeds depend upon your adapter model.



Figure 33: Force Link Speed Setup screen

2. Use the up/down arrows to select a link speed and press < Enter>.

Possible link speed choices:

- 1 Gb/s
- 1 and 2 Gb/s
- 1, 2, and 4 Gb/s
- 2, 4, and 8 Gb/s

Note: Emulex 8 Gb/s adapters do not support 1 Gb/s link speed.

3. The screen is refreshed with the new value.

Note: Press <Esc> to return to the EFI utility menu.

# **Configure Boot Parameters**

The EFI utility enables you to configure the following boot parameters:

- Device path
- Maximum LUNs per target
- Boot target scan
- Boot devices
- Delay device discovery

To configure boot parameters, from the EFI-BIOS Setup Utility menu (Figure 26) select **3. Configure Boot Parameters** and press **<Enter>**. The menu shown in Figure 34 is displayed.

	Emulex FC EFI-Bios Setup Utility,	Ver: 4.0000
001	01: LP11002 PCI-X 133HHz SegH: 00 Boot Bios : Enabled Firmware : BS2.111 Port Name : 10000000C94A9681 Node Name S_ID : 010000 Link Speed: 4Gb/s	Bus#: C0 Dev#: 01 Func#: 00 77 I/O Base : 3000 : 20000000C94A9681 Topology : PtPt
	<ol> <li>Device Path Selection</li> <li>Maximum Luns/Target</li> <li>Boot Target Scan</li> <li>Configure Boot Device</li> <li>Delay Device Discover</li> </ol>	1 25 7

Figure 34: Boot Configuration menu

### **Change the Device Path**

This option allows you to make the FC driver appear as a SCSI driver. This is useful for older Itanium systems that do not have native support in the EFI system firmware or boot code for FC device paths.

To change the device path:

1. On the Boot Configuration menu, select **1**, **Device Path Selection** and press **<Enter>**. The screen shown in Figure 35 is displayed.

Emulex FC EFI-Bios Setup Utility, Ver: 4,00H0						
001:	LP11002 PCI-X 133HHz SegH: 00 BusH: C0 DevH: 01 FuncH: 00 Boot Bios : Enabled Firmware : BS2.11A7 I/O Base : 3000 Port Name : 10000000C94A9681 Node Name : 20000000C94A9681 S_ID : 010000 Link Speed: 46b/s Topology : PtPt					
	Device Path set to FIBRE.					
	FIBRE — default SCSI					

Figure 35: Device Path screen

2. Use the up/down arrows to change the path and press **<Enter>**. The screen is refreshed with the new value.

**Note:** The device path is typically not changed. The SCSI device path is used for legacy systems.

Press **<Esc>** to return to the EFI utility menu.

## Change the Maximum LUNs per Target Setting

The maximum number of LUNs represents the maximum number of LUNs that are polled during device discovery. The minimum value is 1, the maximum value is 4096. The default is 256.

To change the maximum number of LUNs:

1. On the Boot Configuration menu, select **2. Maximum LUNs/Target** and press **<Enter>**. The screen shown in Figure 36 is displayed.

Emulex FC EFI-Bios Setup Utility, Ver: 4.00A0			
001:	LP11002 PCI-X 133HHz SegH: 00 BusH: C0 DevH: 01 FuncH: 00 Boot Bios : Enabled Firmware : BS2.11A7 I/O Base : 3000 Port Name : 100000000094A9681 Node Name : 20000000094A9681 S_ID : 010000 Link Speed: 46b/s Topology : PtPt		
	Current Maximum Luns/Target is 0256 decimal. Maximum Luns/Target: 0256		

Figure 36: Current Maximum LUNs screen

2. Use the up/down arrows to change the maximum LUN value (between 1 and 4096) and press **<Enter>**. The screen is refreshed with the new value.

Note: 256 is the default and typical number of LUNs in a device.

Press any key to return to the configuration menu.

## Set Up Boot Target Scan

This option is available only if none of the eight boot entries are configured to boot from DID or WWPN. The Configure Boot Devices menu is used to configure up to eight boot entries for fabric point-to-point, public loop or private loop configurations.

With boot scan enabled, the first device issues a Name Server Inquiry.

To set up a boot target scan:

1. On the Boot Configuration menu, select **3. Boot Target Scan** and press **<Enter>**. The screen shown in Figure 37 is displayed.

Emulex FC EFI-Bios Setup Utility, Ver: 4.00A0			
001: LP11002 PCI-X 133HHz Seg⊭: 00 Bus#: C0 Dev#: 01 Func#: 00 Boot Bios : Enabled Firmware : BS2.11A7 I/O Base : 3000 Port Name : 108008080C94A9681 Node Name : 280080808C94A9681 S_ID : 018008 Link Speed: 46b/s Topology : PtPt			
Current Boot Scan Setting is NVRAM Targets. Boot Path From NVRAM Targets Boot Path Discovered Targets Do Not Create Boot Path Boot scan from EFIFCScanLevel			

Figure 37: Boot Scan Options screen

2. Use the up/down arrows to select a boot scan setting and press **<Enter>**.

The boot scan options are:

- Boot Path from NVRAM Targets Boot scan discovers only LUNs that are saved to the adapter's non-volatile random access memory (NVRAM). Select up to eight attached devices to use as potential boot devices. Limiting discovery to a set of eight selected targets can greatly reduce the time it takes for the EFIBoot driver to complete discovery.
- Boot Path from Discovered Targets Boot scan discovers all devices that are attached to the FC
  port. Discovery can take a long time on large SANs if this option is used.
- Boot Scan from EFIFCScanLevel Allows third-party software to toggle between Boot Path from NVRAM and Boot Path from Discovered Targets by manipulating an EFI system NVRAM variable. After the scan is set to EFIFCScanLevel, the scan method can be changed without entering the EFI Boot configuration utility.

If EFIFCScanLevel is selected, the scan is determined by the value of the EFIFCScanLevel variable maintained by the EFI system firmware or boot code. The value of this variable can be changed either by using the menu in the EFIBoot Configuration utility, or by using third-party software from the EFI shell command prompt.

If you select Boot Scan from EFIFCScanLevel:

• If the EFIFCScanLevel variable already exists, the screen in Figure 38 shows the current setting and allows you to select a new setting.

Emulex FC EFI-Bios Setup Utility, Ver: 6,0000			
001: LP11002 Boot Port S_ID	PCI-X         133MHz         Seg#: 00         Bus#: C0         Dev#: 01         Func#: 00           Bios : Enabled         Firmware : BS2.11A7         I/O         Base : 3000           Name : 10000000094A9681         Node Name : 200000000094A9681         010000         Link Speed: 46b/s         Topology : PtPt		
Current EFIFCScanLevel Setting is NVRAM Targets.			

Figure 38: Existing EFIFCScanLevel Variable screen

• If the EFIFCScanLevel variable does not exist in the EFI BIOS NVRAM store, the EFIBoot configuration utility prompts you to create it, as shown in Figure 39.



Figure 39: No Existing EFIFCScanLevel Variable screen

Press  $<\mathbf{Y}>$  for Yes or  $<\mathbf{N}>$  for no. If you press  $<\mathbf{Y}>$  to create the variable, the utility creates it and presents you with a menu to select the initial value. Valid values are NVRAM and Discovered Targets. A new variable is created and the boot path is changed.

**Note:** If you have a large SAN and set the boot path to "Boot Path Discovered Targets," discovery takes a long time.

Press **<Esc>** to return to the EFI utility menu.

## **Configure Boot Devices**

This list allows you to select up to eight boot devices that will be enumerated by the boot driver. Whether they are used for boot or not depends on how you configure the boot manager in the EFI system firmware or boot code.

To configure an EFI boot device:

1. On the Boot Configuration menu, select **4. Configure Boot Devices** and press **<Enter>**. The screen shown in Figure 40 is displayed.

Emulex FC EFI-Bios Setup Utility, Ver: 4,0000			
001: LP11002 Boot Port S_ID	PCI-X         133MHz         Seg#: 00         Bus#: C0         Dev#: 01         Func#: 00           Bios         : Enabled         Firmware         : BS2.11A7         I/O         Base         : 3000           Name         : 100000000294R9681         Node         Name         : 200000000294R9681           : 010000         Link         Speed: 46b/s         Topology         : PtPt		
	91: DID:000000 WHN:00000000 00000000 02: DID:000000 WHN:00000000 00000000 03: DID:000000 WHN:00000000 00000000 04: DID:000000 WHN:00000000 00000000 05: DID:000000 WHN:00000000 00000000 06: DID:000000 WHN:00000000 00000000 07: DID:000000 WHN:00000000 00000000 08: DID:000000 WHN:00000000 00000000		

Figure 40: Device Rows screen

2. Select a device row and press **<Enter>**. The screen shown in Figure 41 displays the selected device row.

Emulex FC EFI-Bios Setup Utility, Ver: 4,0000				
001: LP11002 Boot Bios : Port Name : S_ID :	PCI-X         133MHz         SegH: 00 BusH: C0 DevH: 01 FuncH: 00           Enabled         Firmware         : BS2.11A7         I/O Base         : 3000           100000000094A9681         Node Name         : 20000000094A9681         010000           0100000         Link Speed: 46b/s         Topology         : PtPt			
01:	S_ID : 010000 Link Speed: 4Gb/s Topology : PtPt Selected Boot Device in Flash: 01: DID:000000 WWN:00000000 00000000 LUN: 0000 1. Scan Targets 2. Clear Flash Boot Info			



Note: Press <Esc> to return to the list of devices.

NOI: LPIIOO2 Boot Bi Port Na S_ID	PCI-X 133MHz SegH: 00 BusH: C0 DevH: 01 FuncH: 0 os : Enabled Firmware : BS2.11A7 I/O Base : 3000 me : 10000000C94A9681 Node Name : 20000000C94A9681 : 010000 Link Speed: 4Gb/s Topology : PtPt
	Here are targets numbers 001 thru 001: 001: DID:010400 WHN:500805F3 0004C699

3. Select **1. Scan Targets** and press **<Enter>**. The system scans the adapter and shows your targets, as shown in Figure 42.

Figure 42: Target Listing screen

**Note:** Eight targets are displayed per screen. If more than eight targets are configured, press the right arrow key to view additional targets eight at a time.

4. Select a target row and press **<Enter>**. LUNs for the target are displayed, as shown in Figure 43.

Emulex FC EFI-Bios Setup Utility, Ver: 4.00R0					
001:	LP11002 Boot Port S_ID	PCI-X 133NHz Seg#: 00 Bus#: C0 Dev#: 01 Func#: 00 Bios : Enabled Firmware : BS2.11A7 I/O Base : 3000 Name : 10000000C94A9681 Node Name : 20000000C94A9681 : 010000 Link Speed: 4Gb/s Topology : PtPt			
	Here are Luns numbers 0000 thru 0007:				
		0001: Mode: Peripheral dev LUN: 0000 0002: Mode: Peripheral dev LUN: 0001 0003: Mode: Peripheral dev LUN: 0002 0002: Mode: Peripheral dev LUN: 0002			
		8005: Mode: Peripheral dev LUN: 8084 8086: Mode: Peripheral dev LUN: 8085 8087: Mode: Peripheral dev LUN: 8085			
		0006: Mode: Peripheral dev LUN: 0005 0007: Mode: Peripheral dev LUN: 0006 0008: Mode: Peripheral dev LUN: 0007			

Figure 43: LUN Listing Screen

**Note:** Eight LUNs are displayed per screen. If more than eight LUNs are configured for the target, press the right arrow key to view more LUNs.

 Emulex FC EFI-Bios Setup Utility, Ver: 4.00R0

 001: LP11002
 PCI-X 133MHz
 SegH: 00 BusH: C0 DevH: 01 FuncH: 00

 Boot Bios : Enabled
 Firmware : BS2.11A7 I/O Base : 3000

 Port Name : 10000000C94A9681
 Node Name : 20000000C94A9681

 S\_ID
 : 010000
 Link Speed: 46b/s
 Topology : PtPt

 Selected Boot Device:

 001: DID:010400
 HWN:500805F3 0004C699
 Mode: Per LUN: 0000

 1. Boot this device via WWN.
 2. Boot this device via DID.

5. Select a LUN and press < Enter>. The screen shown in Figure 44 is displayed.

Figure 44: LUN Boot Options menu

Note: Press <Esc> to return to the list of devices.

6. Select **1. Boot this device via WWN** and press **<Enter>**. Figure 45 shows the LUN selected in step 5.

Emulex FC EFI-Bios Setup Utility, Ver: 4,00A0			
001: LP11002 Boot Port S_ID	PCI-X 133HHz SegH: 00 Bus#: C0 DevH: 01 Func#: 00 Bios : Enabled Firmware : BS2.11A7 I/O Base : 3000 Name : 10000000094A9681 Node Name : 20000000094A9681 : 010000 Link Speed: 46b/s Topology : PtPt		
01: 62: 63: 64: 65: 66: 87: 68:	DID:000000 WHN:500805F3 0004C699 Mode: Per LUN: 0000 DID:000000 WHN:00000000 0000000 DID:000000 WHN:00000000 0000000 DID:000000 WHN:00000000 00000000 DID:000000 WHN:00000000 00000000 DID:000000 WHN:00000000 0000000 DID:000000 WHN:00000000 0000000 DID:000000 WHN:00000000 00000000 DID:000000 WHN:00000000 00000000		



Note: Press <Esc> to return to the EFI utility menu.

## **Cancel a Boot Device**

To cancel boot device:

1. On the Boot Configuration menu, select **4. Configure Boot Devices** and press **<Enter>**. The screen shown in Figure 46 is displayed.

001: LP11002 PCI-X 133HHz SegH: 00 BusH: C0 DevH: 01 FuncH: 00 Boot Bios : Enabled Firmware : BS2.11A7 I/O Base : 3000 Port Name : 10000000C94A9681 Node Name : 20000000C94A9681 S_ID : 010000 Link Speed: 4Gb/s Topology : PtPt			
01: 62: 63: 84: 85: 86: 97: 88:	DID:000000 WWN:500805F3 0004C699 Mode: Per LUN: 0000 DID:000000 WWN:00000000 00000000 DID:000000 WWN:00000000 00000000		

Figure 46: Boot LUNs

2. Select a device row and press **<Enter>**. The screen shown in Figure 47 is displayed.

Emulex FC EFI-Bios Setup Utility, Ver: 4.0000			
001: LP11002 PCI-X 133MHz Seg#: 00 Bus#: CO Dev#: 01 Func#: 00 Boot Bios : Enabled Firmware : BS2.11A7 I/O Base : 3000 Port Name : 10000000C94A9681 Node Name : 20000000C94A9681 S_ID : 010000 Link Speed: 4Gb/s Topology : PtPt			
Selected Boot Device in Flash: 01: DID:000000 WWN:0000000 00000000 LUN: 0000			
1. Scan Targets 2. Clear Flash Boot Info			

Figure 47: Selected Boot Device

3. Select **2. Clear Flash Boot Info** and press **<Enter>**. The system clears the target as the remote boot device.

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## **Change Device Discovery Delay**

This parameter sets a delay to occur after an loop initialization and before a scan is initiated to discover the target. The default is off or 0 seconds.

**Note:** Change the default if you have an HP MSA1000 or HP MSA1500 RAID array and if both of the following conditions exist:

1. The MSA array is direct connected or part of an arbitrated loop (for example, daisy chained with a JBOD).

2. The boot LUN is not reliably discovered. In this case, a delay may be necessary to allow the array to complete a reset.

**Caution:** Do not change the delay device discovery time if your MSA array is connected to a fabric switch. Setting it to any other time guarantees that the maximum delay time is seen on every loop initialization.

If both of the above conditions exist, typically set this parameter to 20 seconds. However, the delay only needs be enough for the array to be reliably discovered after a reset. Your value may be different.

To change the delay device discovery value:

1. On the Boot Configuration menu, select **5. Delay Device Discovery** and press **<Enter>**. The screen shown in Figure 48 is displayed.

001 :	LP11002 PCI-X 133MHz Seg#: 00 Bus#: C0 Dev#: 01 Func#: 00 Boot Bios : Enabled Firmmare : BS2.11A7 I/O Base : 3000 Port Name : 10000000C94A9681 Node Name : 20000000C94A9681 S_ID : 010000 Link Speed: 4Gb/s Topology : PtPt				
	Current Device Discovery Delay Timer is 0000 seconds.				
	Delay Device Discovery: 0000				

Figure 48: Delay Device Discovery screen

2. Use the left /right arrows to select values in 10-second increments and press < Enter>.

# **Reset to Default Values**

The EFI utility enables you to reset EFI boot parameter to their factory default settings. These defaults are listed in Table 8.

#### Table 8: Adapter Defaults

Parameter	Default	Valid Values
Enable/Disable BIOS	Disabled	Enabled Disabled
ALPA Value	0x00 Fibre	See ALPA reference table
Device Path	FC	Fibre Channel (FC) SCSI
PLOGI Retry Timer	Disabled	Disabled 50 msec 100 msec 200 msec
Boot Target Scan	Boot path from NVRAM targets	Boot path from NVRAM targets Boot path discovered targets Do not create boot path
Max LUNs Setting	256	0–4096
Topology	Auto (start FC-AL)	Auto (start FC-AL) Point-to-Point Auto (start Point-to-Point) FC-AL
Delay Device Discovery	0000	0000–0255
Link Speed	0	0 = Auto select 1 = 1 Gb/s 2 = 2 Gb/s 4 = 4 Gb/s 8 = 8 Gb/s



To reset parameters to their factory default settings:

1. From the EFI-BIOS Setup Utility menu (Figure 26) select **4. Reset to Default Values** and press **<Enter>**. The screen shown in Figure 49 is displayed.



Figure 49: Force Defaults Dialog screen

2. Press **<Y>**. All settings revert to their factory default values.

## **Save and Restore Configurations**

The EFI utility enables you to save a specific configuration to a file and to restore a previously saved configuration from NVRAM or a file. This allows you to easily apply a specific configuration across multiple adapters or systems, and to restore the appropriate settings if unintended changes are made.

To save or restore a configuration, from the EFI-BIOS Setup Utility menu (Figure 26) select **5. Save/Restore Adapter Config** and press **<Enter>**. The screen shown in Figure 50 is displayed.



Figure 50: Save Configuration menu



## Save the Configuration to a File

Saving a configuration to a file allows you to reuse the configuration at a later time, such as to restore a changed configuration or to migrate the configuration across other adapters or systems.

The file must be saved to a formatted storage medium with a valid file system recognized by the EFI system firmware or boot code. This can include partitioned and formatted hard drives with a file allocation table (FAT) file system, floppy disk, or USB device.

To save a configuration to a file:

1. On the Save Configuration menu, select **1. Save Configuration to File**. The screen shown in Figure 51 prompts you to enter a directory path to the file where the configuration is to be saved.

001:	LP11002 PCI-X 133HHz SegH: 00 BusH: C0 DevH: 01 FuncH: 00 Boot Bios : Disabled Firmware : BS2.11A7 I/O Base : 3000 Port Name : 10000000C94A9681 Node Name : 20000000C94A9681 S_ID : 010000 Link Speed: 4Gb/s Topology : PtPt
	Save Adapter Config - Save Adapter Configuration to a File Directory Path :

Figure 51: Save Configuration Path screen

2. After you enter the directory path, you are prompted to enter the file name. Do so, and then press **<Enter>**. The screen shown in Figure 52 displays the status of the save.

	Emulex FC EFI-Bios Setup Utility, Ver: 4.00A0
001:	LP11002 PCI-X 133MHz SegH: 00 BusH: C0 DevH: 01 FuncH: 00 Boot Bios : Enabled Firmware : BS2.70A5 I/O Base : C100 Port Name : 10000000094A9681 Node Name : 2000000009354127 S_ID : 010000 Link Speed: 46b/s Topology : PtPt
	Save Adapter Config - Save Adapter Configutation to a File
	Directory Path : \ Filename : lp11002.cfg File Sucessfully Opened!
	Hriting to FileDone
	Hit ESC to EXIT

Figure 52: Completed Save Configuration to a File screen

## **Batch Configuration**

Batch configuration migrates an adapter's configuration across several adapters at the same time.

Note: No other adapter functions can be performed while batch configuration is in progress.

There are two ways to perform batch configuration:

- 1. Migrate the configuration of one adapter to other adapters in the system.
- 2. Migrate the configuration stored in a previously saved configuration file to the adapters in the system. This allows configurations to be migrated across systems.

To migrate the configuration of one adapter to other adapters in the system:

1. On the Save Configuration menu, select **2. Batch Configure Adapters**. You are prompted to select a source for the configuration (Figure 53).

Emulex FC EFI-Bios Setup Utility, Ver: 6.00A0
001: LP11002 PCI-X 133NHz SegH: 00 BusH: C0 DevH: 01 FuncH: 00 Boot Bios : Enabled Firmware : BS2.70A5 I/O Base : C100 Port Name : 10000000C9354127 Node Name : 20000000C9354127 S_ID : 010000 Link Speed: 46b/s Topology : PtPt
Select Source for Adapter Configuration Data:
1. Read Configuration From NVRAM 2. Read Configuration From File

Figure 53: Select Source for Adapter Configuration Data menu

 Select 1. Read Configuration from NVRAM and press <Enter>. A list of the adapters in the system is displayed (Figure 54).

Enul	lex FC EFI-Bios Se	tup Utility, Ver: 4	.0000
		an an the state of the second state of the	
Select	Source Rdapter Fo	or Configuration: OU	01 thru 004
001: LP11002	PCI-X 133MHz	Seg#: 00 Bus#:	C0 Dev#: 01 Func#: 00
002: LP11002	PCI-X 133HHz	Segil: 00 Busil:	C0 Dev#: 01 Func#: 01
003: LP1150-F4	PCI-X 66MHz	Seglt: 00 Bustl:	E0 Devil: 01 Funcil: 00
004: LP9802	PCI-X 66HHz	Seg#: 00 Bus#:	L0 Dev#: 02 Func#: 00

Figure 54: Select Source Adapter for Configuration listing screen

 Use the up and down arrows on your keyboard to select the source adapter for the configuration and press <Enter>. A menu of all adapters in your system, except the source adapter, is displayed (Figure 55).

Select Adapters T	o Be Batch Configured: 001 thru 003
[ ] 001: LP11002 [x] 002: LP1150-F4 [x] 003: LP9802	Seg#: 00 Bus#: C0 Dev#: 01 Func#: 01 Seg#: 00 Bus#: E0 Dev#: 01 Func#: 00 Seg#: 00 Bus#: E0 Dev#: 02 Func#: 00

Figure 55: Select Adapters to be Batch Configured listing screen

- 4. Select (check) the adapters that are to be batch configured. To select an adapter, highlight the row and press the space bar.
- 5. Press **<P>** to configure the selected adapters. If the adapters are configured successfully, a screen similar to Figure 56 is displayed.



Figure 56: Successful Batch Configuration screen

If all adapters are not configured successfully, a screen similar to Figure 57 is displayed.



Figure 57: Unsuccessful Adapter Configuration screen

To migrate the configuration stored in a configuration file to the adapters in the system:

- 1. On the Save Configuration menu, select, **2. Batch Configure Adapters**. You are prompted to select a source for the configuration (Figure 53).
- 2. Select **2. Read Configuration From File**. The screen shown in Figure 58 prompts you to enter a directory path to the previously saved configuration file.

Emulex FC	EFI-Bios Setup Utility, Ver: 4.00A0	
Restore Adapter (	Config - Restore Adapter Configuratio	n from a File
Directory Path Filename	: hp11002.cfg	

Figure 58: Read Configuration Path screen

- 3. Enter the directory path and file name and press **<Enter>**. A list of the adapters in the system is displayed (Figure 55).
- 4. Select (check) the adapters that are to be batch configured. To select an adapter, highlight the row and press the space bar.
- 5. Press **<P>** to configure the selected adapters. If the adapters are configured successfully, the screen shown in Figure 56 is displayed.

If all adapters are not configured successfully, the screen shown in Figure 57 is displayed.

## Update an Adapter's Firmware or Boot Code

## Update a Single Adapter

```
Note: If you are updating boot code on an adapter that is already attached to a boot device, it is recommended that you use the EFI utility, and not another utility such as the HBAnyware utility, to perform the update.
```

To update the boot code using the EFI utility:

- 1. On the main EFI utility menu, select 2. Firmware Update and press < Enter>.
- 2. On the Firmware Update Utility menu, select 1. Update Selected Adapter and press < Enter>.

001:	LP11002	PCI-X 133MHz HBA Status: Not Ready EFI Boot : BE3.20A0	Seg#: 00 Bus#: C0 Dev#: 01 Func#: 00 Boot Bios : Enabled Firmware : BS2.70A5
	elected Adapter de Update		



3. Enter the directory path and filename in the screen that is displayed (Figure 60). Press < Enter>.

001: LP11002	PCI-X EFI Boot : Firmware : Port Name :	133NHz S BE3.20A0 BS2.70A5 100000000C94A9681	eg⊯: 00 Bus SLI - 2 SLI - 3 Kernel	#: C0 Dev#: 01 : B2D2.11A7 : B3D270X2r1 : 1.31A0	Func#: 0
Direr Filer	ctory Path name	: fs0;∖ : be400a0.pr	0		

Figure 60: Directory Path and Filename Information

001:	LP11002 PCI- EFI Boot : Firmware : Port Name :	133HHz         Seg#:         00         Bus#:         CO         Dev#:         01         Func#:         0           BE3.20A0         SLI - 2         :         B2D2.11A7         BS2.11A7         SLI - 3         :         B3D270X2r1           10000000094A9681         Kernel         :         1.31A0
	Directory Path Filename File Open Validate Adapter Flash Erase Flash Program Wakeup Program	: fs0:\temp\ebc : be400a0.prg : Done : Done : Done : Done : Done : Done : Done

The boot code is updated on the selected adapter. Information similar to Figure 61 is displayed.

Figure 61: Successful Boot Code Update screen

4. Reboot the system for this change to take effect.

### Update Firmware or Boot Code Across Multiple Adapters

- 1. On the main EFI utility menu select **2. Firmware Update** and press **<Enter>**. The Firmware Update Utility menu is displayed (Figure 59).
- 2. Select **2. Batch Mode Update**, and press **<Enter>**. A list of all adapters of the model selected when you started the EFI utility is displayed (Figure 62).

	mulex	FC EFI-E	ios F	irmware l	pda	le Uti	lity	/, Vei	r: 4	.00A0	
H	001: 002:	Сояра LP11002 LP11002	tible	adapters Segil: Segil:	in 00 00	this Bus#: Bus#:	Syst C0 C0	len: I Devil Devil	001 : 01 : 01	thru 00 Func#: Func#:	2 00 01



3. Check the adapters you want to update. To select an adapter, use the up/down arrow keys to highlight it, and press the space bar.

4. Press **<P>** to update the firmware or boot code. You are prompted for a directory path and file name for the firmware or boot code image file (Figure 63). Enter the path and file name, and then press **<Enter>**.



Figure 63: Batch Mode Update path screen

The boot code update begins on the first adapter. Information similar to Figure 64 is displayed for each adapter:

	En	ulex FC EFI-Bios Firmware	Update Utility, Ver: 4.000	10					
001:	LP11002	PCI-X 133HHz HBA Status: Not Ready EFI Boot : BE3.20A0	SegH: 00 BusH: CO DevH: Boot Bios : Enabled Firmware : BS2.70A5	01 FuncH: 00					
Updating adapter number: 001 of 002									
Validate Adapter Humber: 001 of 002 Validate Adapter : Done. Flash Erase : Done. Flash Program : Done. HakeUp Parameter : Updated									

Figure 64: Boot Code Update Progress screen

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After all adapters are updated, a listing with success or failure status is displayed (Figure 65).



Figure 65: Successful Batch Update screen

# **EFIBoot Reference**

# **Driver Handle Table Column Definitions**

To view Emulex driver handle information, at the shell prompt type:

drivers

A list of drivers is displayed.

fs	0: V> driv	ers		in.				
D.		100	C.	Ϋ́				
ň		p.	ž	â				
Ÿ.	VERSION	E	G	i i	HD	HC	DRIVER NAME	Ĩ
==			-	-				
15	60000001	B		1.180	1	1	DebugPort Driver	73
52	00000001	D			1	-	National(R) PC8741x SIO Driver	C5
SB	00000000	7	-	-	-	-	BIOSIINTIOI VGA Mini Port Driver	BB
5C	000000000	7		-	-	-	BIOSIINT161 Keyboard Driver	54
50	666666666	?			-	-	BIOS[UNDI] Simple Network Protocol	DØ
5E	00000010	?	-		-	-	BIOS[INT13] Block Io Driver	44
SF	00000024	?	-		<i></i>	-	BIOS[INT10] Video Driver	29
60	00000010	D			2	-	Platform Console Nanagement Driver	51
61	00000010	D	-		1		Platform Console Nanagement Driver	51
62	00000010	в		-	1	1	Console Splitter Driver	40
63	00000010	2	-	-			Console Splitter Driver	40
66	00000010	8	-		2	2	Console Splitter Driver	40

Figure 66: Driver Listing screen

Driver Handle Table Column Definitions

Drv - The device driver handle number.

**Version** - The driver version.

**Type** - The device type. D indicates a device driver. B indicates a bus driver.

Cfg - If this column is marked with an X, the driver is supported by the EFI utility (configuration protocol).

Diag - If this column is marked with an X, the driver is supported by the EFI diagnostic protocol.

**#D** - The number of devices for the driver.

**#C** - The number of child devices for the driver (bus drivers only).

Driver Name and Image Name - The driver and image name.



## **Topology Information**

#### Arbitrated Loop Operation

- FC-AL (Loop) topology only is used. After successful loop initialization, the driver attempts login with FL\_PORT (switched fabric loop port).
- If FL\_PORT login is successful, public loop operation is entered.
- If FL\_PORT login is unsuccessful, private loop mode is entered.

#### **Point-to-Point Operation**

- If F\_PORT (point-to-point) login is successful, fabric mode is used.
- If F\_PORT login is unsuccessful, N\_PORT-to-N\_PORT direct connection topology is used.
- If a switch is discovered, the driver performs the following tasks:
  - FL\_PORT login (FC-AL topology) or F\_PORT login (Point-to-Point topology).
  - Simple Name Server login.
  - State Change Registration.
  - Symbolic Name Registration.
  - FCP Type Registration if RegFcpType is set to 1.
  - Driver logs out and re-logs in. The name server indicates that registration is complete.
  - Simple Name Server Query for devices (the registry parameter SnsAll determines whether all N\_PORTS are requested or only SCSI FCP N\_PORTS).
  - Discovery/device creation occurs for each target device described by the name server.
  - RSCN and LOGO/PRLO are handled by the driver. Reception of either causes new discovery/logins to take place.

**Note:** In a fabric environment, the order in which disk devices are created is based on the name server response data (which is not guaranteed to be in any special order). Between successive boots, the same device may be identified with a different physical device number. However, any devices that have been assigned a device letter through the disk administrator continue to use that letter regardless of the physical device number.

# Configure EFIBoot via UEFI HII (Human Interface Infrastructure) in a UEFI 2.1 System

Note: EFIBoot is not supported on converged network adapters (CNAs) such as the LP21000 and LP21002

**Note:** If you have several adapters in your system, the UEFI system firmware or boot code uses the highest version driver that is on one of your adapters. Adapters with older versions of EFIBoot are managed by the more recent version, but only as long as the adapter with the most recent version is in the system. The adapters must be updated to actually update and not just use the most recent version available.

## Start the Emulex Configuration Utility

Depending on the OEM UEFI configuration, the Emulex Configuration Utility may appear under different setup menus in the OEM system firmware or BIOS. This description applies to systems where the Emulex Utility is found under "System Settings."

To start the Emulex Configuration utility:

1. From the System Settings screen, select Emulex Configuration Utility and press <Enter>.

Processors		Emulex HBA
Menory		Configuration Utility
Devices and 170 Fort Power	S	HELP
Legacu Support		
Integrated Managemen	t Module	
System Security		
Al. I HEPT D		
Hdapters and UEFI Dr	ivers	
Adapters and UEFI Dr Emulex Configuration Network	ivers Utility Ver:4.12A0	
Hdapters and UEFI Dr Emulex Configuration Network	ivers 1 Utility Ver:4.12A0	
Hdapters and UEFI Dr Emulex Configuration Network	iUtility Ver:4.12A0	
Hdapters and UEFI Dr Emulex Configuration Network	ivers Utility Ver:4.12A0	
Hdapters and UEFI Dr Emulex Configuration Network	ivers 1 Utility Ver:4.12A0	
Hdapters and UEFI Dr Emulex Configuration Network	ivers Utility Ver:4.12A0	

Figure 67: System Settings screen

2. The Emulex Configuration Utility screen appears with **Emulex Configuration Setup Utility** selected. Press **<Enter>**.

Emulex Configuration Utility Ver:4.12A0		
Emulex Configuration	Setup Utility	
†∔=Move Highlight	<enter>=Select Entry</enter>	Esc=Exit

Figure 68: Emulex Configuration Setup Utility screen

A list of all the adapters in the system is displayed. Your list may vary depending on the installed adapters. Locate the adapter you want to configure. Use the up/down arrows on your keyboard to select it, and press **<Enter>**.

Emulex Adapters in this System: Exit Emulex HBA Configuration Utility 001: LPe1205-CIOv PCIe2.5Gb/s , x8 002: LPe1205-CIOv PCIe2.5Gb/s , x8	Exit Emulex HBA Configuration Utility			
†4=Move Highlight <enter>=Select Entry</enter>	Esc=Exit			

Figure 69: Adapter Selection screen
The Emulex Adapter Configuration Main Menu is displayed. Select the function you want and press **<Enter**>.

SegW: 000 BusW: 24 DevW: 00 FuncW: 01 LPe1205-CIOv Node Name : 2FFF0000C9B00000 Back to Display Adapters and RECONNECT DEVICES Set Boot from SAN <disable> Scan for Fibre Devices Add Boot Device Delete Boot Device Change Boot Device Order Configure HBA and Boot Parameters Set Emulex Adapter to Default Settings Display Adapter Info</disable>	Adapters and RECONNECT DEVICES
--	-----------------------------------

Figure 70: Emulex Adapter Configuration Main Menu menu



### **EFI Utility Conventions in UEFI/HII**

The EFI utility has menus and configuration screens. Use the following methods to navigate them:

- Press the up/down arrows on your keyboard to move through and select menu options or configuration fields. When multiple adapters are listed, use the up/down arrows to scroll to the additional adapters.
- Press the <+>, <->, or <**Enter**> keys to change numeric values.
- Press **<Enter>** to select a menu option, to select a row in a configuration screen, or to change a configuration default.
- Use the navigation entries on the page to move about the utility.
- Select Commit to save changes. Select Discard to not save changes.
- Ensure you select **Back to Display Adapters and RECONNECT DEVICES** from the Main menu when you are finished configuring an adapter. You are returned to the adapter list.

# Configure EFIBoot in UEFI/HII

The EFI utility has numerous options that can be modified to provide for different behavior. Use the EFI utility to do the following tasks:

- Set Boot from SAN
- Scan for Fibre Devices
- Add and delete boot devices
- Change boot device order
- Configure HBA and boot parameters
- Set adapters to their default settings
- Display adapter information

### Set Boot from SAN

To set boot from SAN:

- 1. From the Adapter Selection screen, select the adapter whose boot from SAN setting you want to change and press **<Enter**>.
- 2. From the Main menu, select **Boot from SAN**. The current boot setting is displayed. Press **<Enter>**. A Disable/Enable menu appears.

001: LPe1205-CIOU Seg#: 000 Bus#: 24 De LPe1205-CIOU Node Nam Back to Display Adapt Set Boot from SAN Scan for Fibre Device Add Boot Device Delete Boot Device Change Boot Device Or Configure HBA and Boo Set Emulex Adapter to Display Adapter Info	PCIe2.5Gb/s , x8 off: 00 Func#: 01 e : 2FFF0000C9B00000 ers and RECONNECT DEVICES ' KDis s Disable Enable der t Parameters Default Settings	Set to Enable to SCAN Fabric. NOTE: Your selection will be AUTO saved to NURAM
*1. Mana 112-11-12-14	(Enter)-Complete Entry	Fee=Fxit

#### Figure 71: Main Menu, Boot from SAN Options menu

3. Make your selection and press **<Enter>**. The utility displays the new boot from SAN setting.

001: LPe1205-CIOv Socili, 000 Pupil, 24 Po	PCIe2.5Gb/s , x8	Set to Enable to SCAN
LPe1205-CIOv Node Nam	e : 2FFF0000C9B00000	NOTE: Your selection
Back to Display Adaptors and PECONNECT DENTCES		will be AUTO saved to
Set Boot from SAN (Enable)		novnin
Scan for Fibre Device Add Boot Device	5	
Delete Boot Device		
Change Boot Device Order Configure HBA and Boot Parameters		
Set Emulex Adapter to	Default Settings	
Display Adapter Info		

Figure 72: New Boot from SAN setting

## Scan for Fibre Devices

To scan for Fibre devices:

1. From the Adapter Selection screen, select the adapter that you want to scan for Fibre devices and press <**Enter**>.



 From the Main menu, select Scan for Fibre Devices and press <Enter>. A list of the discovered targets is displayed. This is only a list of discovered target devices to determine SAN connectivity. To add or configure boot devices, see the following sections.

LPe1205-CIOu Node Name : 20000000C95B3679 Here are the discovered targets: Go to Configuration Main Menu 0001: SEAGATE ST336854FC 0004 0002: SEAGATE ST336854FC 0004 0003: SEAGATE ST336854FC 0004 0004: SEAGATE ST336854FC 0004 0005: SEAGATE ST336854FC 0004	WWN: 21000011 C6810A27 Port ID: 010F02
↑↓=Move Highlight	Esc=Exit

Figure 73: Discovered Targets screen

# **Add Boot Devices**

To add a boot device:

1. From the Adapter Selection screen, select the adapter to which you want to add a boot device and press **<Enter>**.

2. From the Main menu, select **Add Boot Device** and press **<Enter>**. A screen appears displaying the discovered targets.

SAN Discovery Target 1	List
LPe1205-CIOv Node Name : 20000000C95B3679 Here are the discovered targets: Go to Configuration Main Menu 0001: SEAGATE ST336854FC 0004 0002: SEAGATE ST336854FC 0004 0003: SEAGATE ST336854FC 0004 0004: SEAGATE ST336854FC 0004 0005: SEAGATE ST336854FC 0004	WWN: 21000011 C6810A27 Port ID: 010F02
14=Move Highlight <enter>=Select Entry</enter>	Esc=Exit

Figure 74: Discovered Targets screen

3. Select the target you want and press **<Enter>**. A list of bootable LUNS is displayed.

LPe1	1205-CIOv Node Name : 20000	0000C95B3679	
WWN: 21000011 C6810A2 Return to Previous Pa LUN:0000 Mode: Peripl	27 age aeral dev	SEAGATE ST336854FC 0004	
†↓=Move Highlight	<enter>=Select Entry</enter>	Esc=Exit	

Figure 75: Boot Device screen

4. Select the boot device you want to add and press **<Enter>**. A menu appears enabling you to commit or discard your changes.

SAN Di	scovery Target List	
LUN:0000 Mode: Peripheral dev LPe1205-CIOv Node Name : 200000 <u>Commit Changes</u> Discard Changes	00C95B3679	Commit Changes and Go to the Previous Page
↑↓=Move Highlight <enter></enter>	=Select Entry	Esc=Exit

Figure 76: Commit/Discard Changes menu screen

5. Select **Commit Changes** and press **<Enter>**.

## **Delete Boot Devices**

To delete boot devices:

1. From the Adapter Selection screen, select the adapter from which you want to delete a boot devices and press <**Enter**>.

2. From the Main menu, select **Delete Boot Device** and press **<Enter>**. A list of boot devices is displayed.

01: UWN:21000011 C6810A27 [] 02: UWN:21000011 C681095D [] 03: UWN:21000011 C6810936 [] 04: UWN:00000000 00000000 [] 05: UWN:00000000 00000000 [] 06: UWN:00000000 00000000 [] 07: UWN:00000000 00000000 [] 08: UWN:00000000 00000000 [] 01scard Changes Commit Changes	
---	--

Figure 77: Boot Device screen

3. Select the boot device you want to delete and press the space bar. The device appears with an **X** beside it.

01:       WWN:21000011       C6810A27       []]         02:       WWN:21000011       C681095D       [X]]         03:       WWN:21000011       C6810936       []]         04:       WWN:00000000       00000000       []]         05:       WWN:00000000       00000000       []]         05:       WWN:00000000       00000000       []]         06:       WWN:00000000       00000000       []]         07:       WWN:00000000       00000000       []]         08:       WWN:00000000       00000000       []]         08:       WWN:00000000       00000000       []]         09:       WWN:00000000       00000000       []]         09:       WWN:000000000       00000000       []]         09:       WWN:000000000       00000000       []]         00:       Scard       Changes       []]         Commit       Changes       []]       []]	
---	--

Figure 78: Selected Boot device appears with an X

4. Select Commit Changes and press <Enter>.

# **Change Boot Device Order**

To change boot device order:

- 1. From the Adapter Selection screen, select the adapter whose boot device order you want to change and press <**Enter**>.
- 2. From the Main menu, select **Change Boot Device Order** and press **<Enter>**. A screen displaying the discovered targets appears.



Figure 79: Discovered Targets screen

3. Select **Boot Device Order** and press **<Enter>**. A screen appears displaying the boot device order.

more T		
oot Device Order	<pre>&lt;01: WWN:21000011 C6810A27&gt; &lt;02: WWN:21000011 C681095D&gt; &lt;03: WWN:21000011 C6810936&gt; &lt;04: WWN:00000000 000000000&gt; &lt;05: WWN:00000000 000000000&gt; &lt;06: WWN:00000000 000000000&gt; &lt;06: WWN:00000000 000000000&gt; &lt;07: WWN:000000000 000000000&gt; &lt;07: WWN:000000000 00000000000000000000000000</pre>	Change Boot Device Order
14=Move Highlight	<enter>=Select Entry</enter>	Esc=Exit

#### Figure 80: Boot Device Order screen

4. Press **<Enter>**. The Boot Device Order menu screen appears.

eanorn 1 Boot Device Order	<01: WWN: <u>21000011</u> C6810A27>	Change Boot Device   Order
	01: WWN:21000011 C6810A27	
	02: WWN:21000011 C681095D	
	03: WWN:21000011 C6810936	
	04: WWN:00000000 00000000	
	05: WWN:0000000 0000000	
	07: UUN:00000000 0000000	
	08: WWN:00000000 00000000	
	<07: WWN:00000000	
	00000000>	
<ul> <li>=Move Selection Up</li> <li><enter>=Confirm Chang</enter></li> </ul>	- =Move Selection Down es	Esc=Exit

Figure 81: Boot Device Order menu screen



- 5. From the menu, select the device whose boot order you want to change. Use the <+> or <-> keys to change the order of the selected device and press **<Enter>**. A screen appears showing the new boot device order.
- 6. Press **<Enter>** and choose **Commit Changes**.

# **Configure Adapter Parameters**

The EFI utility enables you to configure the following adapter parameters:

- Topology
- Port login (PLOGI) retry timer
- Link speed

To configure adapter parameters:

- 1. From the Adapter Selection screen, select the adapter whose parameters you want to configure and press <**Enter**>.
- 2. From the Main menu, select **Configure HBA and Boot Parameters** and press **<Enter>**. The Configuration menu screen appears.

LPe1205-CIOv Node Name : 3 Configure HBA Parameters	2FFF0000C9B00000	Discard Changes and Go to the Previous Page
Discard Changes		
Commit Changes		
Topology Selection	<auio -<br="" first="" loop="">default.&gt;</auio>	
PLOGI Retry Timer	<disable -="" default=""></disable>	
Force Link Speed	<auto -<br="" negotiate="">Default &gt;</auto>	
Configure Boot Parameters		
Maximum Luns/Target	[256]	
Boot Target Scan Nethod	<boot from="" nuram<="" path="" td=""><td></td></boot>	

Figure 82: Adapter Configuration menu screen

## Change the Topology

Emulex drivers support arbitrated loop and point-to-point topologies. You can configure:

- Auto Loop first default
- Auto point to point first
- Point to point
- FCAL

To change the topology:

- 1. From the Adapter Selection screen, select the adapter whose topology you want to change and press <**Enter**>.
- 2. From the Configure HBA Parameters menu, navigate to **Topology Selection** and press **<Enter>**. The Topology menu screen appears.

LPe1205-CIOv Node Nam Configure HBA Paramet	e : 2FFF0000C9B00000 ers	Topology Selection
Discard Changes		
Commit Changes		
Copology Selection	AUTO Loop First - default.	
	AUTO Point to Point first.	
PLOGI Retry Timer	Point to Point.	
Force Link Speed	FCAL.	
Configure Boot Parame	ters	
laximum Luns/Target	IZ56J	
Boot Target Scan Meth	od <boot from="" nvram<="" path="" td=""><td></td></boot>	

Figure 83: Topology menu screen

3. Select a topology and press **<Enter>**. The screen is refreshed with the new value.

**Note:** The presence of a fabric is detected automatically.

Press **<Esc>** to return to the EFI utility menu.

4. Select Commit Changes and press < Enter>.



### Change the PLOGI Retry Timer

This option allows you to set the interval for the PLOGI retry timer. This option is especially useful for Tachyon-based RAID arrays. Under very rare occasions, a Tachyon-based RAID array resets itself and the port goes offline temporarily in the loop. When the port comes to life, the PLOGI retry interval scans the loop to discover this device.

You can choose:

- Disable Default
- 50 Msec
- 100 Msec
- 200 Msec

To change timer values:

- 1. From the Adapter Selection screen, select the adapter whose PLOGI retry timer information you want to change and press <**Enter**>.
- 2. From the Configure HBA Parameters menu, navigate to **PLOGI Retry Timer** and press **<Enter>**. The PLOGI Retry Timer menu appears.

Configure HBA Parameters	2FFF000009800000	PLUGI Ketry limer
Discard Changes		
Commit Changes Topology Selection	Disable - Default	
	50 msec.	
PLOGI Retry Timer	100 msec.	
Force Link Speed	200 msec.	
Configure Boot Parameters		
Maximum Luns/Target	[256]	
Boot Target Scan Method	<boot from="" nuram<="" path="" td=""><td></td></boot>	
th-Mouse Highlight	Enton>-Complete Entru	Fee-Fxit

Figure 84: PLOGI Retry Timer menu screen

3. Select a retry timer option and press **<Enter>**. The screen is refreshed with the new value.

Note: Press <Esc> to return to the EFI utility menu.

4. Select Commit Changes and press < Enter>.



### **Change the Link Speed**

Use this feature to change, or force, the link speed between ports instead of auto-negotiating. The supported link speeds depend upon the adapter. The menu only displays options that are valid for the selected adapter.

Possible link speed choices:

- Auto negotiate Default
- 1 Gb/s
- 2 Gb/s
- 4 Gb/s
- 8 Gb/s

To change the link speed:

- 1. From the Adapter Selection screen, select the adapter whose link speed you want to change and press <**Enter**>.
- 2. From the Configure HBA Parameters menu, navigate to **Force Link Speed** and press **<Enter>**. The Force Link Speed menu appears.

LPe1205-CIOv Node Nam Configure HBA Paramet	e : 2FFF0000C9B00000 ers	Force Link Speed
Discard Changes		
Commit Changes	Auto negotiate - Default	
Topology Selection	1 Gb/s link speed	
	2 Gb/s link speed	
PLOGI Retry Timer	4 Gb/s link speed	
Force Link Speed	8 Gb/s link speed	
Configure Boot Parame	ters	
Maximum Luns/Target	[256]	
Boot Target Scan Meth	od <boot from="" nuram<="" path="" td=""><td></td></boot>	

Figure 85: Force Link Speed menu screen

3. Select a link speed and press <Enter>.

Note: Emulex's 8 G/bs adapters do not support 1 G/bs link speed.

4. The screen is refreshed with the new value.

**Note:** Press **<Esc>** to return to the EFI utility menu.

5. Select **Commit Changes** and press **<Enter>**.

# **Configure Boot Parameters**

You can change the:

- Maximum LUNS/targets
- Boot target scan method
- Device discovery delay

### Change the Maximum LUNs per Target

The maximum number of LUNs represents the maximum number of LUNs that are polled during device discovery. The minimum value is 1, the maximum value is 4096. The default is 256.

To change the maximum number of LUNs:

- 1. From the Adapter Selection screen, select the adapter whose maximum LUNs per target information you want to change and press <**Enter**>.
- 2. From the Configure Boot Parameters menu, navigate to **Maximum LUNs/Target** and press **<Enter>**. The screen becomes editable.

LPe1205-CIOv Node Name : 2FFF00000C9B00000 Configure HBA Parameters		Maximum Luns/Target
Discard Changes		
Topology Selection	<auto first.="" point="" to=""></auto>	
PLOGI Retry Timer	<50 msec.>	
F <mark>orce Link Speed</mark> Configure Boot Parameters	<1 Gb/s link speed>	
laximum Luns/Target Boot Target Scan Method	[256] <boot from="" nuram<br="" path="">Targets &gt;</boot>	

Figure 86: Maximum LUNs/Target screen

3. Type the maximum LUN value (between 1 and 4096) and press **<Enter>**. The screen is refreshed with the new value.

**Note:** 256 is the default and typical maximum number of LUNs in a target device. A higher number of maximum LUNs causes the discovery to take more time.

4. Select Commit Changes and press < Enter>.

### **Change Boot Target Scan Method**

This option is available only if none of the eight boot entries are configured to boot from DID or WWPN. The Configure Boot Devices menu is used to configure up to eight boot entries for fabric point-to-point, public loop or private loop configurations. With boot scan enabled, the first device issues a Name Server Inquiry.

The boot scan options are:

- Boot Path from NVRAM Targets Boot scan discovers only LUNs that are saved to the adapter's NVRAM. Select up to eight attached devices to use as potential boot devices. Limiting discovery to a set of eight selected targets can greatly reduce the time it takes for the EFIBoot driver to complete discovery.
- Boot Path from Discovered Targets Boot scan discovers all devices that are attached to the FC port. Discovery can take a long time on large SANs if this option is used.
- Do not create a boot path.
- Boot Scan from EFIFCScanLevel Allows third-party software to toggle between Boot Path from NVRAM and Boot Path from Discovered Targets by manipulating an EFI system NVRAM variable. After the scan is set to EFIFCScanLevel, the scan method can be changed without entering the EFI Boot configuration utility.

If EFIFCScanLevel is selected, the scan is determined by the value of the EFIFCScanLevel variable maintained by the UEFI system firmware or boot code. The value of this variable can be changed either by using the menu in the EFIBoot Configuration utility, or by using third-party software.

To change the boot target scan method:

- 1. From the Adapter Selection screen, select the adapter whose boot target scan method you want to change and press <**Enter**>.
- 2. From the Configure Boot Parameters menu, navigate to **Boot Target Scan Method** and press **<Enter>**. The Boot Target Scan Method menu appears.



Figure 87: Boot Target Scan Method menu screen

# **SEMULEX**

3. Select a boot scan setting and press < Enter>. The screen is refreshed with the new value.

**Note:** If you have a large SAN and set the boot path to "Boot Path Discovered Targets," discovery takes a long time.

Press **<Esc>** to return to the EFI utility menu.

4. Select Commit Changes and press < Enter>.

#### Change Device Discovery Delay

This parameter sets a delay to occur after an loop initialization and before a scan is initiated to discover the target. The default is off or 0 seconds.

**Note:** Change the default if you have an HP MSA1000 or HP MSA1500 RAID array and if both of the following conditions exist:

1. The MSA array is direct connected or part of an arbitrated loop (for example, daisy chained with a JBOD).

2. The boot LUN is not reliably discovered. In this case, a delay may be necessary to allow the array to complete a reset.

**Caution:** Do not change the delay device discovery time if your MSA array is connected to a fabric switch. Setting it to any other time guarantees that the maximum delay time is seen on every loop initialization.

If both of the above conditions exist, typically set this parameter to 20 seconds. However, the delay only needs to be enough for the array to be reliably discovered after a reset. Your value may be different.

To change the delay device discovery value:

1. From the Adapter Selection screen, select the adapter whose device discovery delay settings you want to change and press <**Enter**>.

2. From the Configure Boot Parameters menu, **Delay Device Discovery** and press **<Enter>**. The screen becomes editable.

Configure HBA Parameters		
Discard Changes		Delay Device Discovery
Commit Changes		
Topology Selection	<auto first.="" point="" to=""></auto>	
PLOGI Retry Timer	<50 msec.>	
Force Link Speed Configure Boot Parameters	<1 Gb/s link speed>	
Maximum Luns/Target Boot Target Scan Method	[123] <boot discovered<br="" path="">Targets &gt;</boot>	
Delay Device Discovery		
†↓++=Move Highlight +/	'- =Adjust Value	Esc=Exit
†↓++=Move Highlight +/	'- =Adjust Value	Esc=Exit

Figure 88: Delay Device Discovery screen

- 3. Use the +/- keys to change the delay device discovery value in increments of 10 seconds and press **<Enter>**. The screen is refreshed with the new value.
- 4. Select Commit Changes and press <Enter>.

### **Reset Emulex Adapters to Default Values**

The EFI utility enables you to clear the NVRAM target list and set all boot device WWNNs back to 0. These defaults are listed in Table 9.

Table 9: Adapter Defaults

Parameter	Default	Valid Values
Enable/Disable BIOS	Disabled	Enabled
		Disabled
ALPA Value	0x00 Fibre	See ALPA reference table
PLOGI Retry Timer	Disabled	Disabled
		50 msec
		100 msec
		200 msec
Boot Target Scan	Boot path from	Boot path from NVRAM targets
	NVRAM targets	Boot path discovered targets
		Do not create boot path
Max LUNs Setting	256	0–4096
Topology	Auto (start FC-AL)	Auto (start FC-AL)
		Point-to-Point
		Auto (start Point-to-Point)
		FC-AL
Delay Device Discovery	0000	0000–0255

#### Table 9: Adapter Defaults (Continued)

Parameter	Default	Valid Values
Link Speed	0 (Auto-select)	<pre>&lt;0&gt; = Auto Select (the adapter's speed is selected automatically based on its model). &lt;1&gt; = 1 Gb/s &lt;2&gt; = 2 Gb/s &lt;4&gt; = 4 Gb/s &lt;8&gt; = 8 Gb/s</pre>

To set Emulex adapters to their default settings:

- 1. From the Adapter Selection screen, select the adapter whose default settings you want to change and press **<Enter**>.
- 2. From the Main menu, select **Set Emulex Adapters to Default Settings** and press **<Enter>**. A menu screen appears enabling you to set defaults or cancel default settings.

Set Emulex Adapter to Default Settings			
LPe1205-CIOv Node Name Seg#: 000 Bus#: 24 Dev Set Adapter Defaults Cancel Set Defaults	: 2FFF0000C9B00000 #: 00 Func#: 01	Set Adapter Defaults	
†∔=Move Highlight	<enter>=Select Entry</enter>	Esc=Exit	

Figure 89: Adapter Defaults menu screen

3. Select Set Adapter Defaults and press < Enter>. The Adapter Selection screen appears.

Adapter Selection			
Emulex Adapters in t Exit Emulex HBA Conf 001: LPe1205-CIOu 002: LPe1205-CIOu	his System: Iguration Utility PCIe2.5Gb/s , x8 PCIe2.5Gb/s , x8	Exit Emulex HBA Configuration Utility	
†‡=Move Highlight	<enter>=Select Entry</enter>	Esc=Exit	

Figure 90: Adapter Selection screen

- 4. Select the adapter whose setting you want to return to their defaults and press **<Enter>**. The Main Configuration Menu appears.
- 5. Select **Set Emulex Adapter to Default Settings** and press **<Enter>**. The Adapter Default Settings menu screen appears.

Set Emulex Adapter to Default Settings			
LPe1205-CIOv Node Nam Seg#: 000 Bus#: 24 De Set Adapter Defaults Cancel Set Defaults	ne : 2FFF0000C9B00000 ev#: 00 Func#: 01	Set Adapter Defaults	
†↓=Move Highlight	<enter>=Select Entry</enter>	Esc=Exit	

Figure 91: Adapter Defaults menu screen

6. Select **Set Adapter Defaults** and press **<Enter**>. The adapter is returned to its default settings. Press **<Esc**> to return to the adapter list.

# **Display Adapter Information**

The Adapter Information screen displays the following information about the selected adapter:

- HBA status
- Boot from SAN status
- Link Speed
- Topology
- Firmware version
- Universal Boot version
- EFI Boot version

To display adapter information:

- 1. From the Adapter Selection screen, select the adapter whose information you want to view and press <**Enter**>.
- 2. From the Adapter configuration Main menu, select **Display Adapter Info** and press **<Enter>**. A screen appears displaying information about the selected adapter.

Controller Information		
001: LPe1205-CIDv H Seg#: 000 Bus#: 24 Dev Go to Configuration Ma HBA Status: Ready Boot from SAN: Enabled Link Speed: 8Gb/s Topology = Auto Loo Firmware : US1.11A3 Universal : UU5.11A0 EFI Boot : 4.12A0	PCIe2.5Gb/s , x8 v#: 00 Func#: 01 in Menu p First	Go to Configuration Main Menu
t∔=Move Highlight	<enter>=Select Entru</enter>	Esc=Exit

Figure 92: Adapter Information screen



# Troubleshooting

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

# x86 BootBIOS

#### The Bootup Message Does Not Appear As the System Boots

Situation: You want to access the BIOS utility, but the bootup message does not appear.

**Resolution:** Make sure that x86 BootBIOS has been loaded and enabled.

#### **Retry This Adapter Message**

Situation: The message "Retry This Adapter" appears during BIOS scanning.

**Resolution:** Check the hardware configuration or reconfigure the adapter BIOS using the BIOS utility.

#### Cannot Mount Root File System Message (Solaris SFS Driver)

Situation: The message "Cannot Mount Root File System" appears during bootup.

**Resolution:** Make sure the correct storage device is identified in the scsi\_vhci.conf file. The XP128 storage array is used in the following example:

```
# cd /kernel/drv
# pg scsi_vhci.conf
#
# Copyright 2004 Sun Microsystems, Inc. All rights reserved.
# Use is subject to license terms.
#
# pragma ident "@(#)scsi_vhci.conf 1.9 04/08/26 SMI"
# name="scsi_vhci" class="root";
.
.
.
device-type-scsi-options-list =
"HP OPEN-3*4", "symmetric-option";
symmetric-option = 0x100000;
#
```

#### Cannot Find UNIX Kernel Message (Solaris SFS Driver)

Situation: The message "Cannot Find UNIX Kernel" appears during bootup.

**Resolution:** Set up the correct LUN to boot in the BIOS utility. The correct LUN can be seen at the end of the Device Address line when you issue a luxadm display <device> command. See the luxadm documentation from Sun for more information.

#### No Such Partition Message (Solaris SFS Driver)

Situation: The message "No Such Partition" appears during bootup.

**Resolution:** Make sure the correct boot device is selected at the GRUB menu. See the GRUB documentation from Sun and the /boot/grub/menu.lst for more information.

## **OpenBoot**

#### The System Cannot mount or fsck /etc/vfstab a FC Boot Disk (Solaris LPFC Driver)

Situation: During the boot process, the system cannot mount or fsck /etc/vfstab a FC boot disk.

Resolution: Make sure that persistent binding is implemented correctly.

#### A Loaded File Is Not Executable (Solaris LPFC Driver)

**Situation:** After entering boot disk, a message states that the file that was loaded is not executable.

**Resolution:** The boot block may not be installed correctly to the FC drive. See *Configure Boot from SAN on Solaris LPFC (SPARC)* on page 9.

#### The System Hangs or Reboots After Displaying Driver Information (Solaris LPFC Driver)

**Situation:** The system hangs for a long time after displaying driver information, or it reboots after displaying driver information.

**Resolution:** Possible incorrect topology set in the /kernel/drv/lpfc.conf file on the target disk.

#### FC Disk Is Not Found (Solaris LPFC Driver)

**Situation:** You have performed the setup tasks and the FC disk is not found when you reboot the system.

**Resolution:** If the FC disk is not found when the system is rebooted, it may be necessary to do the following:

1. Type "cfgadm -a" to list the target.

2. Type "cfgadm -vc configure c1::c5t2200002037AE0091" to configure the FC target.

3. Type "cfgadm -c unconfigure c1" to remove the FC target.

It may also be necessary to add an entry for the boot drive to the sd.conf file.

#### The Displayed List of Emulex Adapters Ends with "fibre-channel" (Solaris LPFC Driver)

**Situation:** After all Emulex adapters have been enabled to boot from SAN, the system has been rebooted, and you show all system devices, the path to an Emulex adapter ends with "fibre-channel", for example:

/pci@1f,2000/fibre-channel

instead of "lpfc@#", for example:

/pci@1f,4000/lpfc@2

**Resolution:** The OpenBoot code is not loaded in the adapter's firmware. You must install OpenBoot before you can set up boot from SAN on the adapter. See "Install, Update, and Enable Boot Code" on page 14.

# **EFIBoot Diagnostic Utility**

The EFI Diagnostic Utility tests all adapters in your system.

### Conventions

- Press the up/down arrows on your keyboard to move through and highlight menu options or configuration fields. Menus with adapter listings and information display up to eight rows at a time. If applicable, press the up/down arrows to scroll to additional adapters.
- Press the left/right arrows on your keyboard to scroll through pages of information.
- Press **<Enter>** to select a menu option.
- Press **<Esc>** to return to the previous menu.
- Press the space bar to select or check a test data pattern. All patterns are selected by default.
- Press **<F1>** to view online help for a menu item.
- Press **<F2>** to clear the status (Passed, Failed, or Unsupported) of each test on a data test pattern menu. This clears the menu, but it does not clear the results log.
- Press **<F3>** to execute a selected test pattern.
- Press **<F4>** to reset the data patterns back to the default (all checked).
- When you view any of the Adapter Data information, press any key to return to the Diagnostic Main menu.

### Access the EFI Diagnostic Utility

Note: Before you can use the EFI utility for the first time, you must install it.

To access the main EFI utility:

1. To view Emulex driver image handle information, at the shell prompt type:

fs0:\> drivers

A list of drivers is displayed (Figure 23 on page 38.)

2. Enter this command, followed by the driver image handle for the SCSI Pass Thru driver. For example, C2 (your driver image handle may be different):

drvdiag-s c2

3. Press **<Enter>**. Information similar to Figure 93 is displayed (listing all adapters in the system):

	Emulex FC EFI-Bios Utility, Ver: 4.00A0			
Eni	lex Adapters in th	is System: 001 thru 006		
001: LP11002 002: LP11002 003: LP1150-F4 004: LP10000DC-S 005: LP10000DC-S 006: LP10000-H2	PCI-X 133MHz PCI-X 133HHz PCI-X 66HHz PCI-X 66HHz PCI-X 66HHz PCI-X 66HHz	Seg#: 00 Bus#: 80 Dev#: 01 Func#: Seg#: 00 Bus#: 80 Dev#: 01 Func#: Seg#: 00 Bus#: 80 Dev#: 02 Func#: Seg#: 00 Bus#: E0 Dev#: 01 Func#: Seg#: 00 Bus#: E0 Dev#: 01 Func#: Seg#: 00 Bus#: E0 Dev#: 02 Func#:	01 00 00 01 00	

Figure 93: Adapter Listing screen

4. Use the up/down arrows and to select (highlight) an adapter and press **<Enter>**. The Diagnostic Main menu is displayed.

	Emulex FC EFI-B	lios Diagnosti	c Utility, Ve	: 4.00A0	
001: LP1100	HBA Status: Not EFI Boot : BE3	33MHz S Ready .20A0	eg#: 00 Bus#: Boot Bios : Firmware :	02 Dev#: 0 Enabled BS2.11A7	9 Func#: 00
		<ol> <li>Diagnostic</li> <li>Adapter</li> <li>Device</li> <li>View Resul</li> </ol>	Tests Data Data ts Log		

Figure 94: Diagnostic Main menu

### **Run Loopback Tests**

Test patterns for the PCI Loopback, Internal Loopback, and External Loopback tests may be selected to be run individually. Test indicators are Passed, Failed, or Unsupported. Unsupported is displayed if the test is not supported. For example, if an unsupported link speed is selected, a test is not performed at the unsupported speed, and a status of Unsupported is displayed in front of the link speed on the link speed menu.

To run a single test:

1. Access the Diagnostic Main menu (Figure 94) and select <1>. Diagnostic Tests. Press <Enter>. The Diagnostic Tests menu is displayed.

Enul	lex FC EFI-Bios Diag	mostic Utility, Ver: 4.00A0
001: LP11000-M4	PCI-X 133HHz	Seg#: 00 Bus#: 02 Dev#: 09 Func#: 00
	Select Dia <b>I 1. PCI L</b> [] 2. Inter [] 3. Exter [] 4. Adapt	agnostic Tests: copback Test nal Loopback Test nal Loopback Test ter Diagnostic Tests

Figure 95: Diagnostic Tests menu

- 2. Use the up/down arrow keys to highlight a test and press the space bar. That test is checked.
- 3. Press **<F3>**. The selected test runs.

To run multiple tests from the Diagnostic Tests menu:

- 1. On the Diagnostic Main menu (Figure 94), select **<1>. Diagnostic Tests**. Press **<Enter>**. The Diagnostic Tests menu is displayed (Figure 95).
- 2. Use the up/down arrow keys to highlight tests and press the space bar to select or deselect.
- 3. Highlight **<5>. Execute Selected Diagnostics**. Press **<Enter>**. The selected tests run.

To run individual Loopback test patterns:

- 1. Access the Diagnostic Main menu (Figure 94) and select **<1>. Diagnostic Tests**. Press **<Enter>**. The Diagnostic Tests menu is displayed (Figure 95).
- 2. Use the up/down arrow keys to highlight a test. Press < Enter>.
- 3. Another menu is displayed. Select one or more individual patterns for the diagnostic test. For example:



Figure 96: PCI Loopback Test Data Patterns menu

- 4. Press **<Esc>** one or more times as necessary to display the Diagnostic Tests menu.
- Use the up/down arrow keys to highlight <5>. Execute Selected Diagnostic and press <Enter>. The selected tests run. After tests are performed, the status of each selected pattern is displayed. For example:

301: LP11080-M4	PCI-X	133MHz	Seg#:	00	Bus#:	02	Devil:	09	Func#:	00
	Select PCI	Bus Loopba	ick Test O	lata	Patte	irns	÷			
	Passed		lking One	s I	est Test					
			1 Zeros 1 1 Ones Te	lest est						
		1 6. 8	AR lest							
		IXI 8: 8	AS Test							

Figure 97: PCI Loopback Test Data Pattern Status menu

**Diagnostic Test Specifics** 

#### PCI Loopback Test

The PCI loopback test executes the RunBuiDiag64 mailbox command once for each test pattern. The data length for each test is 128 bytes. A loopback connector is required for this test.

#### Internal and External Loopback Tests

Internal and external loopback tests execute the ElsEcho FCP command to send 124 bytes from the transmit to the receive side of an FC port. A loopback connector is required for the external loopback test.

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Internal and external loopback test menus have two configurations (data patterns and link speeds). The data test patterns are the same as the PCI Loopback patterns (Figure 96).



Figure 98: Internal Loopback Test Configuration menu

Internal and external loopback link speeds have the same three options. Link speed defaults to 1 Gb for both internal and external tests.

Enu	lex FC EFI	-Bios Di	agnostic U	tili	ty, Ve	r: I	1.00A0			
001: LP11000-M4	PCI-X	133MHz	Seg#	: 00	Bus#:	82	Dev#:	09	Func#:	00
	Select	Internal	Loopback	.ink	Speed	s:				
		[ <b>X] 1</b> . [ ] 2. [ ] 3.	One Gb/s Two Gb/s Four Gb/s	Lin Lin	<ul> <li>Speed</li> <li>Speed</li> <li>Speed</li> </ul>	8				

Figure 99: Internal Loopback Link Speeds menu

As tests are performed a screen similar to the following is displayed:

001	1.011000	DOT U	10000-	0	00	D	00	0	00	Course He	00
001:	CP11000-M4	PC1-8	133MHZ	Seg#:	00	BUSH:	θZ	Uev#;	09	Funce:	00
	Perfor Testir Testir Testir Testir Testir Testir	ming Fib ng Link S ng Data P ng Data P ng Data P ng Data P ng Data P ng Data P	re Channel peed: One ( attern: Wa attern: Wa attern: Al attern: Al attern: Au	Internal Gb/s Iking Ones Iking Zero I Zeros Te Ones Test 55 Test	Lor s Tr os est st	opback est fest	Te	sts: Passed Passed Passed Passed Passed			
	Ţestir	g Data P	attern: 0x	A Test		10	1	assed			

Figure 100: Internal Loopback Test progress screen

Emulex FC EFI-Bios Diagnostic Utility, Ver: 4.00A0 001: LP11000-M4 PCI-X 133NHz Seg#: 00 Bus#: 02 Dev#: 09 Func#: 00 Select Internal Loopback Test Data Patterns: Walking Ones Test Walking Zeros Test All Zeros Test All Ones Test 3 ALL lassed insted 5 0x55 lest es \_

Test results are displayed on the Test Data Pattern menu and saved to results log.

Figure 101: Internal Loopback Test Data Pattern results screen

### **Run Adapter Diagnostic Tests**

The Adapter Diagnostic Tests include adapter restart, display of some configuration parameters, results of linkup and target login. These actions cannot be selected individually. If any one of these tests fail, Failed is displayed on the Diagnostic Test menu (Figure 95).

When you run adapter diagnostic tests, a screen similar to the following is displayed:



Figure 102: Running Adapter Diagnostic Tests In progress screen

If all tests pass, "Passed" is displayed on the Diagnostic Utility menu. For example:

881: LFe11088	PCIe	2.5Gb/s,	×4	Seg#:	88	Bus#:	<b>8</b> B	Deu#:	88	Func#:	88
	Ge	leet Diag	noat	tie Tea	ta I						
	Passed D	] 81. РСІ ] 82. Іпт ] 83. Ект [] 84. Ада 85. Ект	Loc erna crna pten cute	al Loop al Loop	les bac bac bac bac bac bac	t k Test k Test ic Tes Diagn	ts ost:	ics			
Fi - Help F3 - Execu	te Higlight	ed Piagne	s <b>t</b> 10	12 14	- C	lear te	est iagi	resul nostic	ts Vel	aults	
<td>lect Options</td> <td>. (Enter)</td> <td>¢0</td> <td>Select</td> <td>Qp.</td> <td>tion.</td> <td>(ES)</td> <td>C&gt; to  </td> <td>Pres</td> <td>Henu.</td> <td></td>	lect Options	. (Enter)	¢0	Select	Qp.	tion.	(ES)	C> to	Pres	Henu.	

Figure 103: Select Diagnostic Tests - Adapter Diagnostic Tests Passed screen

If any one of these tests fail, Failed is displayed on the Select Diagnostic Tests screen.

## **View Adapter Data**

To view data for a specific adapter:

1. Access the Diagnostic Main menu (Figure 94) and select **<2>. Adapter Data**. Press **<Enter>**. The **Adapter Data** menu is displayed:

Emulex FC EFI-	Bios Diagnosti	c Utility, Ver	: 4.0080		
001: LP11000-M4 PCI-X HBA Status: Re EFI Boot : BE	133MHz S ady 3.20A0	eg∥: 00 Bus∥: Boot Bios : Firmware :	02 Dev∥: Enabled BS2.11A7	09 Func∥:	00
	1. Config 2. Firmware 3. Vpd 4. Ctrl 5. Slim 6. PCI	Info Info Info Info Info Info			



#### Examples

	Enulex	FC EFI-Bic	s Configuration	Information, Veri 4	. NISAN (
881:	LPe11000	PCIe	2.5Gb/s, x4 Se	g#: 00 Bus#: 88 Dev	#: 00 Func#: 00
	EFI Bios Luns/Target Topology	= Enabled = 0256 = H = Auto Loc	Parameter lard ALPA - 0x80 op First	Device Path Boot Scan PLOGI Retry Timer	= Fibre = All = Disabled
		No ProtiD 01 000000 02 000000 03 000000 04 000000 05 000000 06 000000 07 000000 08 000000	Bot Devic UJPN 21080011C6810A0F 8008008080808080 8009009090909090 8009009090909	CS LUN 0000000000000000000 000000000000000	

Figure 105: Configuration Information screen

1	Enulex FC	EFI	-Bios Firm	uare	Inform	ati	ion, U	or i	5.00AB			
001: LPe11000	PC	le	2.5Gb/s,	x4 -	Seg#=	88	Bus#:	8B	Dev#:	88	Func#:	00
	Universal Firmware Port Name		ZU5.02A1 ZS2.70A5 100000000000	69877	SLI SLI 3 Ker	ne]	2 :	Z2 Z3 1.:	02.70A5 02.70A5 20A2			

Figure 106: Firmware Information screen

	Enules	FC E	PI-Bios UP	D In	format	ion.	. ller:	4 1	0.00			
001 :	LPe11000	PCIe	2.5Gb/s,	x4	Seg#=	80	Bus#=	8B	Dev#:	88	Func#=	80
	Product ID Product Name Part Number Eng Date Cod Serial Numbe Misc Info Mfg Date CheckSun EFI Version Asset Iag Firnware Ver UNN SUID SSID Total Checks	e de er	FE00 NA NA 1000000000 PCIe 2.5G NA 38 ZU5.02A1 NA ZS2.70A5 100000000C 10DF FE00 EF	969E b/8, 969E	1773 ×4							

Figure 107: Vendor Product Data (VPD) screen

	E	mulex FC EFI-B	ios Con	trolle	r Info	rnatio	n. Ver	: 4.89	68		
001:	LPe11000	FCIe	2.5Gb/	s, x4	Seg#:	88 Bu	s#: 8B	Dev#:	88	Func # :	88
		UNPN UNNN Fv minor Fv sub mino Fv Chip Rev Pci Bus Spe Self Topole SV PVWN SV NVWN Port Id Loop Id Max Frame S Link Speed	ize	109809 209909 27 15 E8 80 Syseed Loop F 800809 909909 809909 809909 809909 809909 809909 80 80 80 2 Gb/s	00C969 00C969 2.5Gb/ rivate 000000 000000	8773 8773 s, Wid 8000	th x4	(neg) /	⁄ ×4	(nax)	
		Press any )	(ey to	Return	to Pr	evious	Henu				

Figure 108: Controller Information screen

Er	nulex FC EFI-Bios Slim Information, Ver: 4.0000
001: LPe11000	PCIe 2.5Gb/s, x4 Seg#: 00 Bus#: 88 Dev#: 00 Func#: 00
00         42         49         4           10         11         00         0         0           20         11         00         0         0           30         11         00         0         0           40         11         00         0         0           50         00         00         00         0           60         00         00         00         0           70         00         00         00         0	Signature : BIOS       Topology : Loop         IF 53 04 0F 0F 0F 00 00 00 00 00 00 00 00 00 00
1. UWN:21000011 3. UWN:21000011	C6810A0F LUN:0000 2. WUN:21000011C681090A LUN:0000 C681098F LUN:0000 4. WUN:21000011C6810994 LUN:0000
	Press any Key to Return to Previous Menu

Figure 109: Service Level Interface Memory (SLIM) Information screen

Enulex FC	EFI-Bios PCI Configuratio	on Viewer, Wer: 4.0909		
901: LPe11000	PCIe 2.5Gb/s, x4 Seg#:	: 80 Bus#: 8B Dev#: 80 Func#: 00		
PCI	Configuration Space Offset	s: 0x00 to 0x7F		
×8 ×1	x2 x3 x4 x5 x6 x7 x8 x9 x 80 FF 47 81 10 80 82 80 6	ch xB xC xD xE xF		
0×1× 04 10 0×2× 01 C0	84 E0 00 00 00 00 00 04 00 0 00 00 00 00 00 00 00 00 00 00	4 E0 00 00 00 00 00 00 00 00 00 00 00 00		
8×3× 88 88 8×4× 88 88	00 E0 58 00 00 00 00 00 00 00 00 00 00 00 00 00	30 00 FF 01 00 00 30 00 10 28 00 00		
0x6x 05 44 0x7x 03 44	86 00 00 00 00 00 00 00 00 00 00 00 00 00	22 00 00 00 00 00 00 30 00 00 00 00 00		
<pre>&lt;&lt;-/&gt; to Display Prev/Next Page. F2 To Change Data Size.</pre>				

Figure 110: Peripheral Component Interconnect (PCI) Information screen

Note: View up to 256 bytes of PCI configuration space using paging. 128 bytes are displayed at a time. Use the **<F2>** key to select byte, word, or dword display.

#### View Device Data

The device data is stored in the results log and is displayed on the console in ASCII and hexadecimal format.

To view data for attached block devices:

1. Access the Diagnostic Main menu (Figure 94) and select **<3>. Device Data**. Press **<Enter>**. The Device Data Target Selection menu is displayed.

		nulex FC EFI-I	lios Device Da	ata Utility, Ver	: <u>6.00AD</u>	
001 <b>:</b>	LPe11000	PCIe	2.5Gb/s, x4	Seg#: 00 Bus#:	8B Dev#: 00	Func#: 00
		Here ar	e targets num	bers 001 thru 00	14:	
	001: DISK 002: DISK 003: DISK 004: DISK	DEU:SEAGATE DEU:SEAGATE DEU:SEAGATE DEU:SEAGATE DEV:SEAGATE	ST336854FC ST336854FC ST336854FC ST336854FC	Enulex SCSI Enulex SCSI Enulex SCSI Enulex SCSI	Pass Thru Pass Thru Pass Thru Pass Thru	Driver Driver Driver Driver

**Note:** Up to eight devices are displayed per page. If there are more than eight devices, use the left/right arrow keys to scroll to the previous/next page.

Figure 111: Device Data Target Selection menu

Use the up/down arrow keys to highlight an attached block I/O device and press < Enter>. A screen similar to Figure 112 is displayed.

	8	mules FC EFI-D	Ries Bevie	e Da	ta Uti	llit	, lee	: 4	BEIAE			
00 <b>1</b> :	LPc11000	FCIe	2.5Gb/s.	×4	Seg#:	88	Bus # :	8B	Dev <b>a</b> :	80	Func#:	09
		Device Name Logical Unit	Nunber		SEAG 0000	ATE 0000	\$1336	5854	FC		0004	
		Fibre (WWN210 World Wide N Device Block Number of Bl Device Capac Enter Startin	00011C6810 ode Number Size ocks (LBA) ity ng LBA (HI	EX >	Lun 00 2100 512 0000 0034	00)/ 0011 Byte 0445 Gig	SEAGAI C6810f DCCC abyte:	IE S NOF	13368	54F(	;	0004



Figure 112: Device Data screen

 To read the individual block from the media, specify the logical block address (LBA) and press **Enter>**. 256 bytes of sector data display per screen. Use the left/right arrow keys to scroll through the data. Information similar to the following is displayed:

Emulex FC EFI-Bios Device Data Utility, Ver: 4 00A0
Device Data LDA 808808888888 Offsets: 0x808 to 0x8FF
X0 X1 X2 X3 X4 X5 X6 X7 - X8 X9 X8 X6 X0 XE XF 9x09x 45 46 49 29 59 41 52 54 - 00 00 01 00 5C 00 09 09 EFI.PART
8×81× BF 26 DB 22 00 00 00 00 - 01 00 00 00 00 00 00 00 8×82× CB DC 45 04 00 00 00 00 - 22 00 00 00 00 00 00 00
8x03x AA DC 45 04 00 00 00 00 - E8 7C F4 91 88 B9 EB 46EF
8X04X 8F 34 CB 93 1F 7C C7 7E - 62 66 66 66 66 66 66 66 74
<mark>8×86×</mark> 80 80 80 80 80 80 80 80 - 80 80 80 80 80 80 80 80 8×82× 80 80 80 80 80 80 80 80 80 - 80 80 80 80 80 80 80 80 80
8x88x 80 80 80 80 80 80 80 80 80 - 80 80 80 80 80 80 80 80
0x07x 80 80 80 80 80 80 80 80 80 80 - 80 80 80 80 80 80 80 80 80 80 80 80 80
9×96× 90 90 99 99 99 99 99 90 90 90 90 90 90
0x00x 00 00 00 00 00 00 00 00 - 00 00 00 00 0
0x0Fx 80 80 80 80 80 88 88 80 - 88 88 80 80 80 80 80 80 80 80
<>>> to Display Prev/Next PagePress Esc to Exit

Figure 113: LBA Data screen

### View the Results Log

The results log stores diagnostic test results, adapter diagnostics and device data. The results log stores up to 8k of data (about 1,600 rows). Once the buffer is full, no more data is logged.

**Note:** There is no reminder when the buffer is full.

To view the results log:

1. Access the Diagnostic Main menu (Figure 94) and select **<4>. View Results Log**. Press **<Enter>**. A screen similar to the following is displayed:

Emulex FC	EFI-Bios Diagnostic	Utility, Ver:	4.00R0
( EHUL	EX DIAGNOSTIC UTILI	IV RESULTS LOG	]
Copyright (c) 2003-200	7 Emulex, All rights	s reserved.	
Emulex Efi Driver Diag	nostic - Standard:		
Date: 02/15/2007 Start Time: 13:02:01			
Performing Diagnostics 001: LP11000-M4 PCI-X	on Adapter: 133MHz SegW: 00 H	Bus∥: 02 Dev∥:	09 Func#: 00
			¥

Figure 114: Results Log screen

To scroll through the results log:

• Use the up/down arrow keys to scroll one row at a time.

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• Use the Home/End keys to scroll one page at a time.

Note: The Page Up and Page Dn keys do not navigate the results log.

To view help on the results log screen.

- 1. Press **<F1>**. Help text is displayed.
- 2. Press **<Esc>**. Log results are displayed.

To save results log information:

- 1. View the results log.
- 2. Press <F3>. The Log to File screen is displayed.



Figure 115: Log to File screen

- 3. Enter the directory path and press **<Enter>**. The Filename field is displayed.
- 4. Enter the filename and press <Enter>.

Note: The filename must be unique.

Once the file is successfully saved, a screen similar to the following is displayed:



Figure 116: Successful Log to File screen

To clear the log result, press **<F2>**. The results on the diagnostic tests are erased, and a new time and date is written to the log.