Emulex® Elxflash and LpCfg Utilities for LightPulse®Adapters

User Guide

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Chapter 1: Introduction

This document explains how to use the Emulex® Elxflash and LpCfg adapter management utility kits for Linux, Windows, and VMware pre-boot environments.

1.1 Elxflash Offline Kit

The Elxflash Offline kit allows you to configure Emulex adapters before you install or boot a server operating system. You can also use the Elxflash Standalone kit, which lets you update firmware on Emulex adapters without installing any tools. See Section 4.2, Running the LpCfg Utility Included with the Elxflash Standalone Kit, for more information.

The Elxflash Offline kit includes:

- linlpcfg and elxflash for Linux
- winlpcfg and elxflash for Windows

The winlpcfg and the linlpcfg are management utilities for adapter configuration and diagnostics for Windows and Linux, respectively. The LpCfg utility can also download firmware, but you must manually select the adapters to be updated.

Elxflash is a firmware download utility. When the `/auto` switch is used, Elxflash automatically chooses the best image to download. When the `fwmatrix.txt` file is used, you choose the images to apply to the adapters.

NOTE The Offline utility must be installed on your system before you can run it. While the standalone utility does not need to be installed before it is run, you must go to the directory into which the standalone utility was extracted and run it from the command prompt.

See Chapter 4, LpCfg Utility Command Line Interface, for further information about the offline utility.

1.2 Elxflash Utility

The Elxflash utility uses a command line interface allowing you to build scripts for automated and unattended firmware and boot code download solutions for Emulex LightPulse® Fibre Channel (FC) host bus adapters (HBAs), and Fibre Channel over Ethernet/network interface card (NIC+FCoE) in production systems. You can also download firmware and boot code on local and remote machines simultaneously.

The Elxflash Standalone kit, which allows you to update firmware on Emulex adapters without any tools, is also available. See Section 4.2, Running the LpCfg Utility Included with the Elxflash Standalone Kit, for more information.

The Elxflash utility uses auto-discovery (`/auto`), so you do not need to maintain the `fwmatrix.txt` configuration file. When auto-discovery is invoked, the utility automatically discovers local adapters and performs selected operations, such as: `/ff` (force firmware), `/fb` (force boot), `/update`, `/downgrade`, and `/rewrite`.

When using auto-discovery, you must populate the firmware and boot subdirectories with image files for specific adapter models. Auto-discovery uses Emulex-defined firmware and boot code file names in their respective directories.

If you do not want to use auto-discovery, the Elxflash utility can update the firmware or boot code of an adapter using the `fwmatrix.txt` configuration file. When using the `fwmatrix.txt` file, you must update each supported adapter's type, firmware, and boot code entries and place the corresponding firmware and boot code images into their respective directories. The `fwmatrix.txt` file enables all operations that are used with auto-discovery.

1.3 Command Syntax

In all cases, the commands are given with the prefix *os*. When you enter any command, you must replace *os* with either:

- **./lin** – for the Linux LpCfg utility commands, for use on Linux machines.
- **win** – for the WinPE LpCfg utility commands, for use on WinPE machines.

NOTE WinPE is supported on FC adapters only. It is not supported on LPe16202/OCe15100 adapters in NIC+FCoE mode.

The LpCfg utility commands are not case-sensitive, nor are their arguments. You can enter them in upper, lower, or mixed case. However, for Linux operating systems, use *linlpcfg* (all lowercase) for the utility commands; for example, `./linlpcfg listhba`.

The LpCfg utility commands use both:

- One space between the command name and the first argument.
- One space between additional arguments.

NOTE Do not put a space before or after the equal sign within an argument.

World wide name (WWN) values are reported and specified with two 4-byte hexadecimal words – WWN word 0 (w0) and WWN word 1 (w1). To make the full WWN, concatenate the w0 and w1 values.

For detailed information on the command line interface, see Chapter 3, Elxflash Utility Command Line Interface, and Chapter 4, LpCfg Utility Command Line Interface.

1.4 Supported Platforms

For information on supported adapters and supported versions of operating systems and platforms, see http://www.broadcom.com.

1.5 Abbreviations

BIOS	basic input/output system
EFI	Extensible Firmware Interface
EROM	erasable read-only memory
FC	Fibre Channel
FCoE	Fibre Channel over Ethernet
HBA	host bus adapter
HEX	hexadecimal
IEEE	Institute of Electrical and Electronics Engineers
GUI	graphical user interface
ISO	International Organization for Standards
LUN	logical unit number
MAC	media access control
MILI	management interface library
ms	milliseconds
NIC	network interface card
PCI	Peripheral Controller Interconnect
PCI_ID	PCI device identification number
POST	power-on self-test
ROM	read-only memory
SAN	storage area network
UCNA	universal converged network adapter
VPD	Vital Product Data
VWWNN	Virtual World Wide Node Name
VWWPN	Virtual World Wide Port Name
WWN	World Wide Name
WWNN	World Wide Node Name
WWPN	World Wide Port Name
XML	Extensible Markup Language

Chapter 2: Installation

This chapter details prerequisites and procedures for installing and uninstalling the Elxflash Offline and Standalone kits for Linux, VMware, and Windows systems. It also describes the update procedure for each operating system.

2.1 Platform Prerequisites

The utilities included in the Elxflash Offline and Standalone kits for Linux have prerequisites that must be installed prior to installing the utilities. There are no prerequisites for installing the Elxflash Offline and Standalone kits on the VMware and Windows operating systems.

2.1.1 Linux

The Linux platform uses additional software, such as libraries, to run the different versions of the utility. This section identifies the prerequisites.

NOTE The Linux driver must be installed on the system for the applications to work properly.

2.1.1.1 Elxflash Offline and Elxflash Standalone Kits

The following software must be installed to run the utility.

- libnl
- ethtool
- lspci
- libsysfs (optional)

2.2 Installing the Elxflash Offline Kit for Linux

The Elxflash Offline Kit for Linux uses an install script to install the elxflash and linlpcfg utilty RPM packages. The install script determines the correct architecture and distribution, and it updates the existing Elxflash Offline and Elxlinlpcfg RPM packages. If there are no existing Elxflash Offline or Elxlinlpcfg RPM packages, the install script installs the packaged Elxflash Offline and Elxlinlpcfg RPM packages.

To install the Elxflash Offline Kit for Linux:

1. Untar the installation tarball.
2. Run the install script located on the root of the installation kit.

Example:

```
$ tar zxvf elxflashOffline-linux-<version>-<rel>.tgz
$ cd elxflashOffline-linux-<version>-<rel>
$ ./install.sh
```

2.2.1 Updating

To update an existing Elxflash Offline Kit for a Linux installation, run the `install.sh` script to update the Elxflash Offline and Elxlinlpcfg RPM packages.

2.2.2 Uninstalling

The Elxflash Offline Kit for Linux uses an uninstall script to uninstall the utility. The uninstall script performs specific actions depending on the switches that are used.

- `./uninstall.sh` – Uninstalls the Elxflash Offline and Elxlinlpcfg RPM packages.
- `./uninstall.sh -h` – Displays a summary of all available switches

To uninstall the Elxflash Offline Kit for Linux, run the uninstall script located on the root of the installation kit.

Example:

```
$ cd elxflashOffline-linux-<version>-<rel>
$ ./uninstall.sh
```

2.3 Installing the Elxflash Offline Kit for Windows PE

To install the Elxflash Offline kit for Windows PE:

1. Unzip the `Offline-WinPE-<version>-<rel>.zip`.
2. Change the directory to the correct architecture subdirectory.
3. Run `setupElxAll-<arch>.exe`.

The following components are installed:

- Storport CNA driver
- Storport Fibre Channel (FC) driver
- winLpCfg – Elxflash Offline

NOTE The `setupElxAll-<arch>.exe` file is compatible only with WinPE. It does not function with any version of Windows Server.

2.3.1 Updating

To update an existing Elxflash Offline kit installation, run the same steps that you used for installing the Elxflash Offline kit for Windows PE above.

The installer uninstalls the existing version and then installs the updated version.

2.3.2 Uninstalling

To uninstall the Elxflash Offline kit for Windows PE, run the following commands:

```
cd \ProgramData\Tarma Installer\
setup.exe /remove
```

2.4 Extracting the Driver Files from the Elxflash Offline Kit for Windows

To extract the driver files from the Elxflash Offline kit, you can use the installer or the command line. When extracting these files, all files, both x64 and x86, are extracted to `<Drive>:\My Documents\Emulex\Drivers`. This location is hard-coded and cannot be changed.

NOTE Extracting all the drivers takes an additional 28 MB. By default, Windows PE allocates only 32 MB of writable memory. The size of the writable memory can be increased when building the WinPE ISO image.

You can extract the driver files using the GUI mode by running the installer, or you can use the command line in silent mode.

To extract the drivers from the Elxflash Offline kit for Windows, perform these steps:

1. In GUI Mode:
   a. Run the installer.
   b. From the Installation Options screen, select **Extract All Drivers**, and deselect **Install elxApp_Drivers (64-bit)**.
   c. Click **Install** to continue.
2. In Silent Mode, from the command line, type:

```
start/wait SetupElxAll-x64.exe/q2 extract=2
```

NOTE Values for the *extract* parameter are:

- 0 – Install the package; do not extract the drivers (default)
- 1 – Install the package; extract the drivers
- 2 – Do not install the package; extract the drivers

2.5 Extracting the Elxflash Standalone Kit for Linux, Windows, and VMware

The Elxflash Standalone kit is not installed; you must extract it from its zip file. After you extract the utility, the following directories are created. The Linux executable files are extracted to the `lx\` directory, the VMware executable files are extracted to the `esxi\` directory, and the Windows executable files are extracted to the `win\` directory.

- boot\
- firmware\
- lx\
- esxi\
- win\

In Windows, for example, three directories are visible in the kit's root directory after you extract the standalone utility. The top-level boot directory and firmware directory are the default directories in which Elxflash looks for boot code and firmware images. Ensure that firmware and boot code are located in these directories.

```
# dir

07/05/2012  07:02 PM    <DIR>          .
07/05/2012  07:02 PM    <DIR>          ..
07/02/2012  03:14 PM    <DIR>          boot
```

```
07/02/2012  03:14 PM    <DIR>          firmware
07/02/2012  03:15 PM    <DIR>          win
```

The Elxflash Standalone kit for Linux has the same dependencies as the Elxflash Offline kits for Linux. The Elxflash Standalone kits for Windows and VMware do not have any dependencies. See Section 2.1, Platform Prerequisites.

NOTE Update and uninstall procedures for the Elxflash Standalone kit are not needed. When a new version is available you extract it, replacing the older version.

NOTE To manage LightPulse adapters, you must install the operating system-specific FC drivers. To manage LPe16202/OCe15100 adapters, you must install the operating system-specific NIC drivers and the operating system-specific FC/FCoE or FCoE drivers.

2.6 Firmware and Boot Code

Firmware images are available on the Broadcom® support site at http://www.broadcom.com. For all adapters, firmware image files are expected to be in the sub-directory named *firmware;* for all LPe16000-series, LPe31000-series, and LPe32000-series adapters, the firmware includes boot code. For LPe12000-series adapters, all boot code image files are expected to be in the sub-directory named *boot*. The HBA types are always Emulex model names.

When the `fwmatrix.txt` file is used, the Elxflash model name must include the highest protocol being used on that model. An adapter's Elxflash model name can be seen by running the `/query` command.

NOTE On an LPe16202/LPe15100 adapter running in NIC+FCoE mode, the highest protocol is FCoE.

NOTE Ensure that there are no spaces in the `fwmatrix.txt` model name to avoid a firmware update failure.

For example:

```
# ./elxflash /q
HBA=LPe32000, Port Type=FC, WWN=10:00:00:90:FA:94:2E:CA, PCI ID=E300, VID=10DF,
SSID=E321, SVID=10DF, Firmware=11.2.50.48, Boot Code=11.2.50.35, Boot Enabled=1
HBA=LPe12002, Port Type=FC, WWN=10:00:00:00:C9:A1:80:00, PCI ID=F100, VID=10DF,
SSID=F100, SVID=10DF, Firmware=UD202A1, Boot Code=UU700A2, Boot Enabled=1
HBA=LPe12002, Port Type=FC, WWN=10:00:00:00:C9:A1:80:01, PCI ID=F100, VID=10DF,
SSID=F100, SVID=10DF, Firmware=UD202A1, Boot Code=UU700A2, Boot Enabled=1
```

Chapter 3: Elxflash Utility Command Line Interface

Two supported modes for each Elxflash utility switch are available. The first mode relies on the `fwmatrix.txt` file. In the first mode, you must update the firmware and boot code directories with the appropriate firmware and boot code images.

NOTE Verify that there are no spaces in the `fwmatrix.txt` model name to avoid a firmware update failure.

The second mode is auto-discovery mode. When the `/auto` switch is used with the following switches, the Elxflash utility automatically discovers adapters, and using the firmware and boot subdirectories, performs the specified operation on each adapter.

- /f
- /fb
- /ff
- /downgrade
- /rewrite
- /update

NOTE In this chapter, references to FCoE and NIC apply only to LPe16202/OCe15100 adapters in NIC+FCoE mode. References to FC apply to all other LightPulse adapters and to LPe16202 adapters in FC mode.

3.1 Auto-Discovery (/auto)

Usage: `/auto`

The `/auto` switch instructs the Elxflash utility to ignore the `fwmatrix.txt` file, automatically discover local adapters, and perform specified operations employing an additional switch using the firmware and boot directories.

The `/auto` switch must be used with an additional operational switch, such as:

- /f
- /ff
- /fb
- /downgrade
- /rewrite
- /update

Example usage:

`./elxflash /auto /update` – Updates the firmware and boot code using the `firmware` and `boot` directories.

- The `fwmatrix.txt` file is ignored. You must place the desired versions of firmware in the `firmware` directory.
- Using the `firmware` subdirectory, the Elxflash utility automatically discovers the best matching firmware for each installed and supported adapter.
- If multiple versions of firmware or boot code are found for an adapter, the Elxflash utility uses the most recent version when performing the firmware download.

3.2 Downgrade (/downgrade or /g)

Usage: `/downgrade or /g`

The `/downgrade` switch downgrades the firmware or boot code of each adapter if the currently installed versions are more recent than the downgrade versions. This switch cannot be used with the `/update` or `/rewrite` commands.

Example usage:

`./elxflash /downgrade /auto` – Downgrades the firmware or boot code using auto-discovery.

- The `fwmatrix.txt` file is ignored. You must place the desired downgrade versions of firmware or boot code in their respective directories.
- If the downgrade versions are older than the currently installed versions on the adapter, then the downgrade versions are downloaded to the adapter.
- If multiple downgrade versions of firmware or boot code are found for an adapter, the next-previous downgrade versions are downloaded to the adapter.
- When performing the boot code downgrade operation, the Elxflash utility first tries to match by adapter family and boot type. If a match is not found, the Elxflash utility then tries to match by boot type. If the utility matches by boot type and multiple versions of boot code are detected, the utility chooses the downgrade file in the following order:
  a. Universal (U)
  b. Pair (P)
  c. Open (O)
  d. EFI (E)
  e. x86 (B)

`./elxflash /downgrade` – Downgrades the firmware or boot code using the `fwmatrix.txt` file.

- For each installed and supported adapter, the current firmware or boot code versions are compared with the versions specified in `fwmatrix.txt`.
- If the downgrade version in `fwmatrix.txt` is older than the currently installed version, the downgrade version of firmware or boot code is downloaded to that adapter.

3.2.1 FC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=<Boot Code|Firmware>, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.2.2 FCoE Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.2.3 NIC Adapter Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, MAC=<mac_address>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
Return Code=<n>
```

where <*description*> is `Success` or `Error`, and <*n*> = `0` for completion with no errors or a non-zero error code for any error.

NOTE To activate new firmware on LPe16202/OCe15100 adapters in NIC+FCoE mode only, perform a system reboot.

If the preview switch is used, the `Status=`<*description*> field displays `Preview`.

3.3 Force Firmware and Boot Code (/f)

Usage: `/f`

The `/f` switch forces a firmware and boot code download to an adapter regardless of the current version on the adapter, and it is performed regardless of any additional operational switches given on the command line. Also, see Section 3.4, Force Boot Code (/fb), and Section 3.5, Force Firmware (/ff).

Example usage:

`./elxflash /f /auto` – Forces a firmware and boot code download using auto-discovery.

- The `fwmatrix.txt` file is ignored. You must place the desired versions of firmware and boot code in their respective directories.
- If multiple versions of firmware or boot code are found for an adapter, the Elxflash utility uses the most recent version when performing the firmware and boot code downloads.

`./elxflash /f` – Forces a firmware and boot code download using the `fwmatrix.txt` file.

- For each installed and supported adapter, forces a download of firmware and boot code using the versions specified in the `fwmatrix.txt` file.

3.3.1 FC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=<Boot Code|Firmware>, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.3.2 FCoE Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.3.3 NIC Adapter Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, MAC=<mac_address>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
Return Code=<n>
```

where <*description*> is `Success` or `Error`, and <*n*> = `0` for completion with no errors or a non-zero error code for any error.

NOTE To activate new firmware on LPe16202/OCe15100 adapters in NIC+FCoE mode, perform a system reboot.

If the preview switch is used, the `Status=<description>` field displays `Preview`.

3.4 Force Boot Code (/fb)

Usage: `/fb`

The `/fb` switch forces a boot code download to an adapter regardless of the boot code version installed on the adapter, and it is performed regardless of any additional operational switches given on the command line.

Example usage:

`./elxflash /fb /auto` – Forces a boot code download using auto-discovery.

- The `fwmatrix.txt` file is ignored. You must place the desired versions of boot code in the `boot` directory.
- If multiple versions of boot code are found for an adapter, the Elxflash utility uses the most recent version when performing the boot code download.

`./elxflash /fb` – Forces a boot code download using the `fwmatrix.txt` file.

- For each installed and supported adapter, forces a download of boot code using the boot code version specified in the `fwmatrix.txt` file.

3.4.1 FC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=Boot Code, Image=<image>, New=<version>, Old=<version>,
Status=<description>
Return Code=<n>
```

where <*description*> is `Success` or `Error`, and <*n*> = `0` for completion with no errors or a non-zero error code for any error.

NOTE If the preview switch is used, the `Status=<description>` field displays `Preview`.

The `/fb` switch applies only to LPe12000-series adapters.

3.5 Force Firmware (/ff)

Usage: `/ff`

The `/ff` switch forces a firmware download to an adapter regardless of the firmware version installed on the adapter or any additional operational switches given on the command line.

NOTE Because boot code is included in the firmware image for LPe16000-series, LPe31000-series, and LPe32000-series adapters, this command has the same result as the `/f` command, which forces a firmware and boot code download.

Example usage:

`./elxflash /ff /auto` – Forces a firmware download using auto-discovery.

- The `fwmatrix.txt` file is ignored. You must place the desired versions of firmware in the firmware directory.
- If multiple versions of firmware are found for an adapter, the Elxflash utility uses the most recent version when performing the firmware download.

`./elxflash /ff` – Forces a firmware download using the `fwmatrix.txt` file.

- For each installed and supported adapter, forces a download of firmware using the firmware version specified in the `fwmatrix.txt` file.

3.5.1 FC and FCoE Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.5.2 NIC Adapter Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, MAC=<mac_address>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
Return Code=<n>
```

where <*description*> is `Success` or `Error`, and <*n*> = `0` for completion with no errors or a non-zero error code for any error.

NOTE To activate new firmware on LPe16202/OCe15100 adapters in NIC+FCoE mode, perform a system reboot.

If the preview switch is used, the `Status=<description>` field displays `Preview`.

3.6 Firmware Matrix Directory Change (/fmd)

Usage: `/fmd=<directory>`

The `/fmd` switch changes the location of the base directory in which `fwmatrix.txt` is located.

3.7 Help (/h or /?)

Usage: `/h or /?`

The `/h` switch displays a help message detailing instructions on how to use the Elxflash utility.

3.8 Image Directory Change (/id)

Usage: `/id=<image_directory>`

The `/id` switch is used to specify the location of the `firmware` and `boot code` directories.

Example usage:

`./elxflash /f /auto /id=/tmp` – Forces a firmware and boot code download using auto-discovery.

- Elxflash looks for the `firmware` and `boot code` directories in the `/tmp` directory.
- The `fwmatrix.txt` file is ignored. The desired versions of firmware and boot code must be placed in their respective directories.
- In this example, firmware must be placed in the `/tmp/firmware` directory, and boot code must be placed in the `/tmp/boot` directory.
- If multiple versions of firmware or boot code are found for an adapter, Elxflash uses the most recent versions when performing the firmware and boot code downloads.

`./elxflash /f /id/tmp` – Forces a firmware and boot code download using the `fwmatrix.txt` file.

- Elxflash looks for the `firmware` and `boot code` directories in the `/tmp` directory.
- For each installed and supported adapter, a forced download of firmware and boot code occurs using the versions specified in the `fwmatrix.txt` file.
- In this example, firmware must be placed in the `/tmp/firmware` directory and boot code must be placed in the `/tmp/boot` directory.

NOTE This switch was `/i` in previous versions of the Elxflash utility.

3.9 Image Version Display (/iv)

Usage: `/iv=<image file>`

The `/iv` switch shows the firmware image file's version number. You must specify a path to the firmware image file for the command to decode the image file's version.

Example usage:

```
./elxflash /iv=firmware/A11460.grp
1.1.46.0
```

3.10 Log (/log)

Usage: `/log=<logfile.txt>`

The `/log` switch appends the output of the Elxflash utility to a text file. `Log` can be used with any switch.

3.11 Preview (/p)

Usage: `/p`

The `/p` switch provides a download preview of all adapters the Elxflash utility can update using either auto-discovery or the `fwmatrix.txt` file. The preview switch can be used with any of the operational switches, such as:

- /ff
- /fb
- /downgrade
- /rewrite
- /update

When the preview switch is used, the Elxflash utility displays a download summary, but it does not actually perform the download.

Each adapter's download preview displays the adapter's old and new image version. The old image version represents the image version that is currently on the adapter. The new image version represents the image version the Elxflash utility would use during a download.

Example usage:

`./elxflash /preview /auto /update` – Previews an upgrade of firmware or boot code using auto-discovery.

- The `fwmatrix.txt` file is ignored. You must place the desired update versions of firmware or boot code in their respective directories.
- If the update versions are later than the currently installed versions on the adapter, the Elxflash utility provides a download preview for each adapter that can be updated.
- If multiple update versions of firmware or boot code are found for an adapter, the Elxflash utility provides a download preview using the most recent versions.

`./elxflash /preview` – Previews an upgrade of firmware or boot code using the `fwmatrix.txt` file.

- For each installed and supported adapter, the current firmware and boot code versions are compared with the versions specified in `fwmatrix.txt` file.
- If the update versions in `fwmatrix.txt` file are more recent than the currently installed versions, the Elxflash utility provides a download preview of firmware or boot code for each adapter that can be updated.

3.11.1 FC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=<Boot Code|Firmware>, Image=<image>, New=<version>, Old=<version>,
Status=Preview
```

3.11.2 FCoE Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>, Status=Preview
```

3.11.3 NIC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, MAC=<mac_address>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>, Status=Preview
```

3.12 Process FC HBAs Only (/fc)

Usage: `/fc`

The `/fc` switch causes Elxflash to act only on FC HBAs, including LPe16202/OCe15100 adapters in FC mode. It does not act on LPe16202/OCe15100 adapters in NIC+FCoE mode.

Example usage:

`./elxflash /q /fc` - Only FC HBAs are displayed for a query.

`./elxflash /auto /up /fc` - Applies auto update only to FC HBAs.

When a firmware or boot code update is performed and the `/fc` switch is used, only FC adapters are updated; LPe16202/OCe15100 adapters in NIC+FCoE mode are not displayed.

3.13 Process UCNAs (/ucna)

Usage: `/ucna`

The `/ucna` switch causes Elxflash to act only on LPe16202/OCe15100 adapters in NIC+FCoE mode.

Example usage:

`./elxflash /q /ucna` - Only LPe16202/OCe15100 adapters in NIC+ FCoE mode are displayed for a query.

`./elxflash /auto /up /ucna` - Apply auto update only to LPe16202/OCe15100 adapters in NIC+FCoE mode.

When a firmware/boot code update is performed and the `/ucna` switch is used, only LPe16202/OCe15100 adapters in NIC+FCoE mode are updated; FC HBAs are not displayed.

3.14 Query (/q)

Usage: `/q`

The `/q` switch displays an adapter's model, WWN or MAC address, PCI_ID, firmware version, and boot code version. Query can be used with any switch.

Example usage:

```
C:\elxflashStandalone-windows-10.0.567.22-1\win>elxflash.bat /q
```

3.14.1 FC Adapter Status Summary

HBA=<*model*>, Port Type=<*port_type*>, WWN =<*wwn*>, Firmware=<*version*>, Boot Code=<*version*>, Boot Code enable=<*status*>

3.14.2 FCoE Adapter Status Summary

HBA=<*model*>, Port Type=<*port_type*>, WWN =<*wwn*>, Firmware=<*version*>, Boot Code=<*version*>

3.14.3 NIC Adapter Status Summary

HBA=<*model*>, Port Type=<*port_type*>, MAC =<*mac_address*>, Firmware=<*version*>, Boot Code=<*version*>

NOTE On FC adapters, the query switch displays boot code version information only if the adapter has boot code installed.

When the query switch is used with an operational switch, the query also includes an additional field called `Supported Firmware` or `Supported Boot Code`.

3.15 Ramdrive (/ramdrive) - (Windows Offline Adapter Management Utility Only)

Usage: `/ramdrive=<drive letter>[:]`

The `/ramdrive` switch specifies the drive on which to create temporary files and log files. The default is drive X; the default drive in Windows PE.

3.16 Rewrite (/rewrite or /e)

Usage: `/rewrite -or- /e`

The `/rewrite` switch updates the firmware or boot code of each adapter if the installed versions are earlier than, or the same as, the rewrite versions. This switch cannot be used with `/update` or `/downgrade`.

Example usage:

`./elxflash /rewrite /auto` – Rewrites the firmware or boot code using auto-discovery.

- The `fwmatrix.txt` file is ignored. You must place the desired rewrite versions of firmware or boot code in their respective directories.
- If the rewrite versions are more recent than, or the same as, the versions installed on the adapter, the rewrite versions are downloaded to the adapter.
- If multiple rewrite versions of firmware or boot code are found for an adapter, the most recent versions are downloaded to the adapter.
- When performing the boot code rewrite operation, Elxflash first tries to match by adapter family and boot type. If a match is not found, Elxflash then tries to match by boot type. If the utility matches by boot type, and multiple versions of boot code are detected, rewrite always chooses the boot code in the following order:
  a. Universal (U)
  b. Pair (P)
  c. Open (O)
  d. EFI (E)
  e. x86 (B)

`./elxflash /rewrite` – Rewrites the firmware or boot code using the fwmatrix.txt file.

- For each installed and supported adapter, the current firmware or boot code versions are compared with the versions in `fwmatrix.txt` file.
- If the currently installed versions are less than or equal to the rewrite versions in `fwmatrix.txt` file, the rewrite versions of firmware or boot code are downloaded to the adapter.

3.16.1 FC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=<Boot Code|Firmware>, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.16.2 FCoE Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.16.3 NIC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, MAC=<mac_address>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
Return Code=<n>
```

where <*description*> is `Success` or `Error`, and <*n*> = `0` for completion with no errors or a non-zero error code for any error.

NOTE To activate new firmware on an LPe16202/OCe15100 adapter in NIC+FCoE mode, perform a system reboot.
If the preview switch is also used, the `Status =<description>` field displays `Preview`.

3.17 Silent (/s)

Usage: `/s`

The `/s` switch prevents all output from being displayed.

Example usage:

`./elxflash /f /auto /s` – Forces a firmware and boot code download using auto-discovery and mutes all output to stdout.

- The `fwmatrix.txt` file is ignored. The desired versions of firmware and boot code must be placed in their respective directories.
- If multiple versions of firmware or boot code are found for an adapter, Elxflash uses the most recent versions when performing the firmware and boot code downloads.
- No output is printed to stdout.

`./elxflash /f /s` – Forces a firmware and boot code download using the `fwmatrix.txt` file and mutes all output to stdout.

- For each installed and supported adapter, a download of firmware and boot code is forced using the versions specified in the `fwmatrix.txt` file.
- No output is printed to stdout.

3.18 Discover CFAs Using SysFS (/sysfs) (LPe16202/OCe15100 Adapters Only)

NOTE The libsysfs library must be installed. If the libsysfs library is not found, the sysfs switch is not available.

Usage: `/sysfs + operational switch`

`/sysfs` is an operational switch that discovers CFA (NIC) functions using the SysFS tool, and it discovers FC functions using the LpCfg tool. It also runs firmware downloads on CFAs using the ethtool utility or SysFS interface, and on FC adapters using the LpCfg utility.The `/sysfs` switch is used with any switch that displays adapter information; for example, `/q`, or any combination of switches that performs a download.

The following switches can be used:

- /f - force firmware and boot code
- /fb - force boot code
- /ff - force firmware
- /downgrade or /g
- /query or /q
- /rewrite or /e
- /update

For example, `./elxflash /sysfs /auto /f` discovers CFA NIC functions using SysFS and discovers legacy FC functions using LpCfg. It forces a firmware download on CFA adapters using ethtool or SysFS and forces a firmware and boot code download on legacy FC adapters using LpCfg.

NOTE Only CFA NIC functions are displayed. Displaying FCoE functions is not supported.
When `/sysfs` is used, the VPD model name is not available.
The `/sysfs` switch is not supported by the Elxflash standalone kit for VMware.

Example usage:

```
/elxflash /sysfs /q
```

3.19 Update (/update)

Usage: `/update`

The `/update` switch updates the firmware or boot code of each adapter if the currently installed versions are older than the update versions. This switch cannot be used with `/downgrade` or `/rewrite`.

Example usage:

`./elxflash /update /auto` – Upgrades the firmware or boot code using auto-discovery.

- The `fwmatrix.txt` file is ignored. You must place the desired update versions of firmware or boot code in their respective directories.
- If the update versions are newer than the currently installed versions on the adapter, the update versions are downloaded to the adapter.
- If multiple update versions of firmware or boot code are found for an adapter, the most recent versions are downloaded to the adapter.
- When performing the boot code update operation, the Elxflash utility uses the most recent boot code version found. Since multiple compatible versions of boot code can exist, the most recent version is selected in the following order:
  a. Universal (U)
  b. Pair (P)
  c. Open (O)
  d. EFI (E)
  e. x86 (B)

NOTE The most recent boot code version is downloaded regardless of the installed boot code. This allows upgrading from one type of boot code to another type.

`./elxflash /update` – Upgrades the firmware or boot code using the `fwmatrix.txt` file.

- For each installed and supported adapter, the current firmware and boot code versions are compared with the versions specified in `fwmatrix.txt`.
- If the update versions in `fwmatrix.txt` are more recent than the currently installed versions, the update versions of firmware or boot code are downloaded to that adapter.

3.19.1 FC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=<Boot Code|Firmware>, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.19.2 FCoE Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.19.3 NIC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, MAC=<mac_address>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
Return Code=<n>
```

where <*description*> is `Success` or `Error`, and <*n*> = `0` for completion with no errors or a non-zero error code for any error.

NOTE To activate new firmware on LPe16202/OCe15100 adapters in NIC+FCoE mode, perform a system reboot.

3.20 Verbose (/v)

Usage: `/v`

The `/v` switch displays progress messages, and it can be used with any switch. When this switch is used, the following information is displayed:

- A download summary for all adapters that had successful or failed downloads
- A summary of unsupported adapters, if applicable
- A per-adapter message for each adapter the Elxflash utility did not update

3.20.1 FC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=<Boot Code|Firmware>, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.20.2 FCoE Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, WWN=<wwn>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
```

3.20.3 NIC Adapter Download Summary

```
<date><time>
HBA=<model>, Port Type=<port_type>, MAC=<mac_address>,
Update=Firmware, Image=<image>, New=<version>, Old=<version>,
Status=<description>
Return Code=<n>
```

where <*description*> is `Success` or `Error`, and <*n*> = `0` for completion with no errors or a non-zero error code for any error.

3.21 VPD (/vpd)

Usage: `/vpd`

The `/vpd` command displays the VPD model name for supported adapters. You must use the `vpd` command with one of the following switches:

- /f - force firmware and boot
- /fb - force boot code
- /ff - force firmware
- /xml - XML output
- /downgrade or /g
- /query or /q
- /rewrite or /e
- /update

NOTE The `/vpd` command does not display any information if used without the switches listed above. If you attempt to use the `/vpd` command without the switches listed above, an error message is displayed.

If the `/vpd` command is used in conjunction with the `fwmatrix.txt` file, the model name in the `fwmatrix.txt` file must match the VPD model name reported by Elxflash. Supported adapters include legacy FC adapters that support VPD.

3.22 XML Output (/xml)

Usage: `/xml`

The `/xml` switch displays utility output in XML format.

Chapter 4: LpCfg Utility Command Line Interface

The LpCfg utility allows you to configure Emulex adapters before you install or boot a server operating system.

The LpCfg utility includes:

- winlpcfg
- linlpcfg

NOTE Usage code and examples show *os*`lpcfg`. Note that the *os* designation changes to *win* if you are using LpCfg for Windows and to *lin* if you are using LpCfg for Linux or VMware.

You can use the LpCfg utility to do the following:

- View information about an Emulex adapter
- Reset the adapter
- Return the adapter to its factory default settings
- Download firmware and boot code files
- Select a boot device
- Read and update WWNs
- Read MAC addresses
- Enable boot code
- Update configuration regions
- Set the adapter to use soft jumpers
- Run diagnostic tests
- Read and process script files
- Read, write, and reset VLAN IDs and VLAN Priorities

4.1 Running the LpCfg Utility from the Command Prompt

NOTE The LpCfg utility is a command line utility and does not include a graphical user interface.

To run the LpCfg utility from the command prompt:

1. Boot the system with a supported operating system.
2. Start the LpCfg utility with a valid command or a valid script file name.
   - — To start the LpCfg utility from the command line, move to the directory where the executable file resides and type:
     os`lpcfg <valid command>`
     Replace *os* with `./lin` or `win` as appropriate.
     - For example, starting the Windows LpCfg utility with a reset command:
       ```
       winlpcfg reset n=2
       ```
     - For example, starting the Linux or VMware LpCfg utility with a reset command:
       ```
       ./linlpcfg reset n=2
       ```
   - — To start the LpCfg utility with a script file name, move to the directory where the LpCfg utility resides and type:
     os`lpcfg @<script file name>`

- For example, starting the Windows LpCfg utility with `script1.txt` in the `c:\test` directory:
  os`lpcfg @C:\test\script1.txt`

NOTE To redirect screen output to a file, add <*filename*> at the end of each command.
For example:
`oslpcfg listboot n=1 >result.out`
For more information on script files, see Section 4.3.8, Using Script Files.

4.2 Running the LpCfg Utility Included with the Elxflash Standalone Kit

The Elxflash Standalone kit allows you to run elxflash and lpcfg without installing the utilities. No drivers are included in the Standalone kit. No applications are installed, because the utility runs from inside the kit.

The Elxflash Standalone Kit has the same capability as the Elxflash Offline Kit, except you use the following scripts to run the utility:

- **Windows** – `winlpcfg.bat` and `elxflash.bat`
- **Linux** and **VMware** – `linplcfg.sh` and `elxflash.sh`

4.2.1 Windows

1. Extract the kit contents.
2. Change directory (`cd`) to `Elxflash Standalone-windows-<version>`.
   The following directories must be present:
   — boot\
   — firmware\
   — win\
3. For Elxflash, copy the firmware images to the `firmware` directory. Copy the boot images to the `boot` directory.

   NOTE For Elxflash, each operating system architecture directory includes a `fwmatrix.txt` file. You must use the `fwmatrix.txt` directory that matches the current operating system architecture.
4. Change directory (`cd`) to the win directory.
   The following files and directories must be present:
   — win32\
   — x64\
   — elxflash.bat
   — winlpcfg.bat
   The `elxflash.bat` script is used to configure the environment. Run Elxflash, and revert any changes before exiting. This script installs the MILI service if it is not already installed.
   The `winlpcfg.bat` script is used to configure the environment. Run `winlpcfg`, and revert any changes before exiting. This script installs the MILI service if it is not already installed.

   NOTE The MILI service is temporarily installed. The service is removed after the script runs.

If OneCommand® Manager is installed, the OneCommand Manager libraries and OneCommand Manager MILI service are used by the Elxflash and winlpcfg utilities.

The `winlpcfg.bat` and `elxflash.bat` scripts call the native versions of `elxflash.exe` and `winlpcfg.exe`. For example, on Windows x64, the 64-bit utilities are called.

The adapter being managed by the utilities included in the Elxflash Standalone kit must not be managed simultaneously by other Emulex utilities, including OneCommand Manager.

5. To update firmware and bootcode on an adapter in Windows, type:

```
# elxflash.bat /auto /up
```

To display a list of HBAs in Windows, type from the `Win` directory:

```
# winlpcfg.bat  listhba
```

Each time Elxflash or lpcfg is run, a log file is created. On Windows these files are called:

```
C:\clu\log\elxflash.log
C:\clu\log\winlpcfg.log
```

4.2.2 Linux and VMware

NOTE Running 32-bit applications on Linux x86_64 is not supported. The `sh` scripts run only native executable files.

1. Extract the kit contents.
2. Change directory (`cd`) to `ElxflashStandalone-linux-<version>`.

   The following directories must be present:
   - `boot\`
   - `firmware\`
   - `lx\`
3. For Elxflash, copy the firmware images to the firmware directory. Copy the boot images to the boot directory.

NOTE For Elxflash, each operating system architecture directory includes a `fwmatrix.txt` file. You must use the `fwmatrix.txt` directory that matches the current operating system architecture.

4. Change directory (`cd`) to the `lx` directory.

   The following files and directories must be present:
   - `i386\`
   - `x86_64\`
   - `ppc64\`
   - `elxflash.sh`
   - `linlpcfg.sh`

   The `elxflash.sh` script is used to configure the environment. Run Elxflash, and revert any changes before exiting. This script installs the MILI daemons if they are not already installed.

   The `linlpcfg.sh` script is used to configure the environment. Run linlpcfg, and revert any changes before exiting. This script installs the MILI daemons if they are not already installed.

NOTE If OneCommand Manager is installed, the OneCommand Manager libraries are used by the Elxflash and linlpcfg utilities.

The `linlpcfg.sh` and `elxflash.sh` scripts call the native versions of Elxflash and linlpcfg. For example, on Linux x86_64, the 64-bit utilities are called.

The adapter being managed by the utilities included in the Elxflash Standalone kit must not be managed simultaneously by other Emulex utilities, including OneCommand Manager.

5. To update firmware and boot code on an adapter, type:

```
# ./elxflash.sh /auto up
```

To display a list of HBAs, type:

```
# ./linlpcfg.sh  listhba
```

Each time Elxflash or lpcfg is run, a log file is created. On Linux these files are called:

```
/var/log/clu/elxflash.log
/var/log/clu/linlpcfg.log
```

4.3 Supported Commands

Table 1 lists all of the LpCfg commands that are supported on Emulex adapters on various platforms.

- ✓ indicates commands that are supported on both winlpcfg and linlpcfg.
- L indicates commands that are supported only on linlpcfg.
- *FCoE only* indicates commands that are supported only by LPe16202/OCe15100 adapters in FCoE mode.
- *NIC only* indicates commands that are supported by LPe16202/OCe15100 adapters in NIC mode.

Table 1 Supported Commands for LpCfg

Commands	FC Adapters			LPe16202/OCe15100 Adapters in NIC+FCoE Mode	
	x86	x64	PPC	x86	x64
Operating Systems	RHEL 6.5+	RHEL 6.5+ RHEL 7.0+	RHEL 6.5+ RHEL 7.0+	RHEL 6.5+	RHEL 6.5+ RHEL 7.0+
	SLES 11.3+	SLES 11.3+ SLES 12	SLES 11.3+	SLES 11.3+	SLES 11.3+ SLES 12
	WinPE 3.1+	WinPE 3.1+		N/A	N/A
config	✓	✓	L	FCoE only	FCoE only
directDownload Supported on LPe12000-series adapters only.	L	L	L	N/A	N/A
disableboot	✓	✓	L	N/A	N/A
disablebootdevice	✓	✓	L	FCoE	FCoE
download a=<*adapter name*> is supported on LPe12000-series adapters only.	✓	✓	L	✓	✓
enableboot	✓	✓	L	N/A	N/A
enablebootdevice	✓	✓	L	FCoE	FCoE
extloopback	✓	✓	L	✓	✓

Table 1 Supported Commands for LpCfg

Commands	FC Adapters			LPe16202/OCe15100 Adapters in NIC+FCoE Mode	
	x86	x64	PPC	x86	x64
factorydefaults Not supported on LPe16202/OCe15100 adapters in NIC+FCoE mode.	✓	✓	✓	N/A	N/A
hbaattr	✓	✓	✓	✓	✓
h or ? (Help)	✓	✓	L	✓	✓
intloopback	✓	✓	L	✓	✓
listboot	✓	✓	L	N/A	N/A
listhba	✓	✓	L	✓	✓
listrev	✓	✓	L	FCoE only	FCoE only
listmac	N/A	N/A	N/A	NIC only	NIConly
listwwn	✓	✓	L	FCoE only	FCoE only
logfile	✓	✓	L	✓	✓
networkboot	N/A	N/A	N/A	✓	✓
pciloopback	✓	✓	L	FCoE only	FCoE only
posttest Supported on LPe12000-series adapters only.	✓	✓	L	N/A	N/A
readaltboot	✓	✓	L	FCoE only	FCoE only
readbootdevice	✓	✓	L	FCoE only	FCoE only
readconfig	✓	✓	L	FCoE only	FCoE only
readmac	N/A	N/A	N/A	✓	✓
readvlanprops	N/A	N/A	N/A	✓	✓
reset	✓	✓	L	FCoE only	FCoE only
restoredefsvmac[a]	N/A	N/A	N/A	✓	✓
restoredefwwn	✓	✓	L	FCoE only	FCoE only
restorenwwn	✓	✓	L	FCoE only	FCoE only
restorevlanprops	N/A	N/A	N/A	✓	✓
restorewwn	✓	✓	L	FCoE only	FCoE only
savewwn	✓	✓	L	FCoE only	FCoE only
screendisplay	✓	✓	L	FCoE only	FCoE only
scriptvwwnn	✓	✓	L	FCoE only	FCoE only
scriptvwwpn	✓	✓	L	FCoE only	FCoE only
scriptwwnn	✓	✓	L	FCoE only	FCoE only
scriptwwpn	✓	✓	L	FCoE only	FCoE only
setaltboot	✓	✓	L	FCoE only	FCoE only
setbootdevice	✓	✓	L	FCoE only	FCoE only
version	✓	✓	L	✓	✓
vpd	✓	✓	L	✓	✓

Table 1 Supported Commands for LpCfg

Commands	FC Adapters			LPe16202/OCe15100 Adapters in NIC+FCoE Mode	
	x86	x64	PPC	x86	x64
writesvmac[a]	N/A	N/A	N/A	✓	✓
writevlanprops	N/A	N/A	N/A	✓	✓
writewwn	✓	✓	L	FCoE only	FCoE only

a. This command is supported only on certain OEM-specific adapters.

4.3.1 Help Command and General Adapter Management Commands

Use the following commands to view the online help, reset the adapter, or reset the adapter to factory defaults. You can also run a POST.

4.3.1.1 Viewing the Syntax for Commands (help or ?)

To view the syntax for all available commands, type:

```
oslpcfg help
```

or

```
oslpcfg ?
```

To view the syntax for a specific command, type:

```
oslpcfg help <command>
```

or

```
oslpcfg ? <command>
```

For example, either:

```
oslpcfg help download
```

or

```
oslpcfg ? download
```

returns a response similar to the following:

- For Windows:

```
download <n=adapter> <i=path\image_filename>
or
download <a=adaptertype> <i=path\image_filename>
```

- For Linux and VMware:

```
download <n=adapter> <i=path/image_filename>
or
download <a=adaptertype> <i=path/image_filename>
```

4.3.1.2 Resetting an Adapter (reset)

This command resets a specific adapter or all adapters in the system.

ATTENTION Executing a reset on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The reset might cause a loss of connectivity to the SAN and possible loss of data. To reset an

LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter you want to reset to a non-boot from SAN host and reset it from there.
- If the host with the reset target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The intended target adapter can now be reset, because it is not being actively used for boot from SAN.

To reset one adapter, type:

```
oslpcfg reset n=<adapter number>
```

To reset all adapters in the system, type

```
oslpcfg reset n=all
```

4.3.1.3 Resetting an Adapter to the Factory Defaults (factorydefaults)

This command returns the adapter to the factory default profile and configuration. A reboot is required for the changes to take effect.

NOTE The factory defaults command is not supported on LPe16202/OCe15100 adapters in NIC+FCoE mode.

After a successful factory reset on LPe32000-series, LPe31000-series, or LPe16000-series adapters, the adapter is offline. Perform an immediate reboot to complete the reset and return the adapter to full functionality. An LPe12000-series adapter is online after the reset is complete and does not require a reboot.

ATTENTION Restoring the factory defaults on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The restore command might cause a loss of connectivity to the SAN and possible loss of data. To restore the factory defaults on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to restore the defaults to a non-boot from SAN host and perform the restore defaults command from there.
- If the host with the restore defaults target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The factory defaults can now be restored on the intended target adapter, because it is not being actively used for boot from SAN.

To return an adapter to its default settings, type:

```
oslpcfg factorydefaults n=<adapter#|all>
```

The following example returns adapter number 1 to its default settings.

```
oslpcfg factorydefaults 1
```

4.3.1.4 Running a Power-on Self-Test (posttest)

This command runs a POST on the selected adapter.

ATTENTION Running a POST on an older FC adapter (for example a LPe12000) that is being used to boot from SAN is not recommended. The posttest command might cause a loss of connectivity to the SAN and possible loss of data. To run a POST on an older Fibre Channel adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to run POST to a non-boot from SAN host and run POST from there.
- If the host with the posttest target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The POST can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

To run the adapter POST, type:

```
oslpcfg posttest n=<all|adapter number>
```

The following example runs a POST on adapter number 1.

```
oslpcfg posttest n=1
```

4.3.2 Viewing Adapter Information

Use the following commands to view different kinds of adapter information, such as VPD, boot device information, and adapter attributes.

4.3.2.1 Viewing Emulex Conventional Names Instead of VPD (-/c)

Adding /c to any command that uses the a= parameter to return adapter data causes the command to return an Emulex conventional model for the adapter rather than the model name of the adapter. /c can be used for any command that uses the model name. For instance, the following commands use the a= parameter and show this behavior.

- listhba
- config
- download
- directdownload

NOTE The offline utility does not always display the model name of the adapter being tested.

In the following example, the VPD model name is reported for each adapter:

```
# ./linlpcfg listhba
Command: listhba
HBA 1: 10000090 FA942ECA Functional FW: 11.2.50.48 devID:E300 Bus:8 Dev:0 Func:0
LPe32000-M2-D
HBA 2: 10000000 C9A18000 Functional FW: US2.02A1  devID:F100 Bus:E Dev:0 Func:0
LPe12002-M8
HBA 3: 10000000 C9A18001 Functional FW: US2.02A1  devID:F100 Bus:E Dev:0 Func:1
LPe12002-M8
```

To list adapter information using the conventional name rather than the VPD, type

```
# ./linlpcfg listhba /c
```

The following information is returned:

```
Command: listhba /c
HBA 1: 10000090 FA942ECA Functional FW: 11.2.50.48 devID:E300 Bus:8 Dev:0 Func:0
LPe32000
HBA 2: 10000000 C9A18000 Functional FW: US2.02A1  devID:F100 Bus:E Dev:0 Func:0
LPe12002
HBA 3: 10000000 C9A18001 Functional FW: US2.02A1  devID:F100 Bus:E Dev:0 Func:1
LPe12002
```

The output from this command includes the Emulex conventional model name – LPe12002, rather than the VPD model name– LPe12002-M8.

4.3.2.2 Viewing the LpCfg Utility Version Information (version)

This command shows the LpCfg utility version information.

To view this information, type:

```
oslpcfg version
```

4.3.2.3 Viewing VPD

This command shows the VPD of the adapter specified by its number.

To display VPD, type:

```
oslpcfg vpd n=<adapter number>
```

4.3.2.4 Viewing Boot Device Information (readbootdevice)

This command shows the WWN, the LUN (in decimal format), and the topology in use for the currently selected boot device.

To show this information, type:

```
oslpcfg readbootdevice n=<adapter number>
```

The following example reads WWN and LUN for adapter number 1:

```
oslpcfg readbootdevice n=1
```

4.3.2.5 Viewing BootBIOS Versions (listboot)

This command lists all the BootBIOS versions, with indices (base 1) and code names, that are loaded in the flash of the adapter and specified by its number. If the selected adapter does not have a BootBIOS loaded, it returns error code 39.

NOTE Because this application uses base 1 indices, if you had three ports in the application they would be port 1, port 2, and port 3.

To list BootBIOS versions, type:

```
oslpcfg listboot n=<adapter number>
```

The following example lists BootBIOS versions that are loaded on adapter number 3:

```
oslpcfg listboot n=3
```

4.3.2.6 Viewing Adapter Attributes (hbaattr)

This command displays adapter information.

To list the adapter attributes for all installed adapters, type:

```
oslpcfg hbaattr
```

To list the adapter attributes for one adapter, type

```
oslpcfg hbaattr n=<adapter_number>
```

4.3.2.7 Viewing All Adapters in the System (listhba)

This command lists all installed adapters in the system. Information includes the adapter number (base 1), the IEEE address assigned by the manufacturer, the functional firmware, the adapter type, and possible mailbox errors.

To list all adapters in the system, type:

```
oslpcfg listhba
```

NOTE `listHBA` with option `-/c` displays the conventional model names instead of the model names contained in the VPD.

4.3.2.8 Viewing the WWN of All Adapters in the System (listwwn)

This command lists all adapters installed in the system and shows the factory-assigned WWN, the non-volatile WWPN, and the WWNN used to identify an adapter in the SAN.

The factory-assigned WWN is an IEEE address that cannot be changed in the field. The non-volatile WWN can be modified in the field and persists after a restart of the operating system. The full factory-assigned WWN and non-volatile WWN are a concatenation of the two 8-character values (word 0 and word 1) that are shown for each. You can modify the non-volatile WWPN and WWNN using either the `writewwn` command or the `scriptwwpn` and `scriptwwnn` commands. For more information on the `writewwn` command, see Section 4.3.4.1, Writing WWN and Updating NVPARMS (writewwn).

If the system does not have any Emulex adapters installed, it returns error code 45.

To show the WWN information, type:

```
oslpcfg listwwn
```

4.3.2.9 Viewing the MAC Address (listmac)

This command shows the MAC address of a NIC port on an LPe16202/OCe15100 adapter in NIC+FCoE mode.

To view the MAC address of a NIC port, type:

```
oslpcfg listmac n=<adapter number>
```

4.3.2.10 Reading the MAC Address (readmac)

This command shows the current, factory and semi-volatile MAC addresses for the adapter number specified.

The readmac command is supported only on LPe16202/OCe15100 adapters in NIC+FCoE mode.To view the MAC address of the adapter number specified, type:

```
oslpcfg.exe readmac n=<adapter number>
```

The following example lists information for adapter number 1:

```
>oslpcfg.exe readmac n=1
Command: readmac n=1
adapter 1:
Current MAC Address : 00-90-FA-30-43-AA
```

```
Factory MAC Address : 00-90-FA-30-43-30
Semi-Volatile MAC Address: 00-90-FA-30-43-AA
Command completed, NO Error
```

4.3.2.11 Viewing Firmware Program Revisions (listrev)

This command shows the firmware versions in the adapter's flash memory, specified by their numbers.

To show revisions, type:

os`lpcfg listrev n=<`*adapter number*`>`

The following example lists information for adapter number 3:

os`lpcfg listrev n=3`

4.3.2.12 Viewing Selected Configuration Regions (readconfig)

This command shows the contents of the selected configuration region up to the initialized length or the specified byte count (if the initialized length is less than the specified byte count). Valid region numbers are 0 to 32. You must initialize the configuration region first by writing data to it.

NOTE The `readconfig` command only supports reading configuration regions 0, 8, and 32 on the following adapters:

- LPe16000-series adapters
- LPe31000-series adapters
- LPe32000-series adapters

To read a configuration, type:

os`lpcfg readconfig n=<`*adapter number*`> r=<`*region number*`> l=<`*byte count*`>`

The following example reads the configuration for adapter number 1, region 0, byte count 20:

os`lpcfg readconfig n=1 r=0 l=20`

4.3.3 Firmware and Boot Code Download Commands

The following firmware and boot code download commands include a command to download a firmware or boot code file and a command to access the flash device directly.

4.3.3.1 Downloading a File (download)

This command downloads a firmware or boot code file to a specific adapter.

ATTENTION Downloading a firmware or boot code file to an LPe12000-series adapter that is being used to boot from SAN is not recommended. The download command might cause a loss of connectivity to the SAN and possible loss of data. To download a firmware or boot code file to LPe12000-series adapter , make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to download the file onto a non-boot from SAN host and perform the download command from there.
- If the host with the download target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The firmware or boot code file

can now be downloaded onto the intended target adapter, because it is not being actively used for boot from SAN.

The adapter name is the name that appears when you run the `listhba` command. For more information on the `listhba` command, see Section 4.3.2.7, Viewing All Adapters in the System (listhba).

To download a firmware image file to an adapter specified by its number, type

os`lpcfg download n=<`*adapter number*`> i=<`*firmware image filename*`>`

The following example downloads the `uu513a10.prg` BootBIOS file to adapter number 6; in this example, the BootBIOS file is for an LPe12000 adapter:

os`lpcfg download n=6 i=uu513a10.prg`

NOTE Boot code on LPe16000-series, LPe31000-series, and LPe32000-series adapters is updated by downloading firmware. LpCfg does not support updating boot code separately for these adapters.

4.3.3.2 Accessing the Flash Device Directly (directdownload)

This command accesses the flash device on the adapter directly without using the adapter firmware. This feature is useful in downloading a ROM file image if the firmware has been corrupted. The adapter name is the name that appears when you run the `listhba` command. You can also use `default` for the adapter name if only one single-port adapter or one dual-port adapter is in the system. For more information on the `listhba` command, see Section 4.3.2.7, Viewing All Adapters in the System (listhba).

NOTE You cannot use `directdownload` in a script file.

This command is supported only on LPe12000-series adapters.

ATTENTION Accessing the flash device directly on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The directdownload command might cause a loss of connectivity to the SAN and possible loss of data. To run the directdownload command on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to run the `directdownload` command to a non-boot from SAN host and run the command from there.
- If the host with the directdownload target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The directdownload command can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

To access the flash device on the adapter directly, type (all on one line):

os`lpcfg directdownload a=<`*adapter name/default*`> i=<`*path*`\`*image_filename*`>(Windows) <`*path/image_filename*`>(Linux) s=<`*selection 0 or 1*`>`

where `s=1` saves the existing VPD.

The following example accesses the flash device on an LPe12000 HBA:

os`lpcfg directdownload a=lpe12000 i=C:\image\ud100a8.rom s=1`

The following example accesses the flash device if the offline utility cannot detect the adapter type and only one single-port adapter or one dual-port adapter is in the system:

os`lpcfg directdownload a=default i=C:\image\ud100a8.rom s=1`

ATTENTION If `s=0`, the ROM images used with the `directdownload` command might not contain certain VPD information; for example, serial number, adapter model, or manufacturer. Direct download of a ROM image that has not been confirmed to contain the correct VPD image updates the board's firmware, but it also clears the VPD. The board will function. If you use calls for VPD in your applications, the information might be changed or missing.

4.3.4 World Wide Name Commands

The following commands allow you to use the WWN to update NVPARAMS, save WWN data to a file, and restore WWN data while updating NVPARAMS. You can also restore the NVPARAMS and the IEEE address.

4.3.4.1 Writing WWN and Updating NVPARMS (writewwn)

This command allows you to enter word 0 and word 1 of the WWPN or WWNN from the keyboard or from a barcode scanner to update a specified adapter's NVPARMS with a new WWPN or WWNN. The new WWPN and WWNN are used the next time the adapter is discovered. The adapter stores the original WWPN and WWNN in another region of the memory so it can be used to identify the adapter as it was manufactured. The WWN can also be read with a barcode scanner.

ATTENTION Running `writewwn` on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `writewwn` command might cause a loss of connectivity to the SAN and possible loss of data. To write to the WWN and Update NVPARMS on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to use the `writewwn` command to a non-boot from SAN host and run `writewwn` from there.
- If the host with the `writewwn` target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now write the WWN or update the NVPARMS on the intended target adapter, because it is not being actively used for boot from SAN.

The `writewwn` command prompts you for the WWPN and WWNN data words, so it cannot be used in a script file. The `scriptwwnn` and `scriptwwpn` commands use values entered with the command, so they can be used in a script file.

ATTENTION Use the `writewwn` command with caution. If you use the same WWPN or WWNN on more than one adapter in a fabric, unpredictable results might occur.

NOTE Word 0 of WWNN and WWPN names must follow one of the following formats:
1 0 0 0 0 x x x
2 x x x x x x x
3 x x x x x x x
5 x x x x x x x

To modify the WWPN and WWNN, type:

`oslpcfg writewwn n=<adapter number>`

The offline utility prompts you to enter new data:

- WWPN word 0
- WWPN word 1
- WWNN word 0
- WWNN word 1

The following example writes the WWPN and WWNN for adapter number 1.

```
oslpcfg writewwn n=1
Enter or Scan value for WWPN word 0 now
```

Enter a value.

```
10000000
```

The system echoes what you entered, followed by the next prompt:

```
10000000
Enter or Scan value for WWPN word 1 now
```

4.3.4.2 Saving WWN Data to a File (savewwn)

This command reads the original words 0 and 1 of the IEEE address, installed by manufacturing, from configuration regions 16 (or 32) of the adapter (specified by its number), and it saves the configuration region information in the selected WWN file.

To save the WWN data to a file, type:

```
oslpcfg savewwn n=<adapter number> c=<wwn filename>
```

The following example reads the configuration region information on adapter number 4 and saves it to the contents of the `ctwwn.sav` file:

```
oslpcfg savewwn n=4 c=ctwwn.sav
```

4.3.4.3 Restoring WWN and Updating NVPARMS (restorewwn)

This command restores words 0 and 1 of the IEEE address from a specified file created with the `savewwn` command and uses them to update the NVPARMS port name with this IEEE address.

ATTENTION Running a `restorewwn` on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `restorewwn` command might cause a loss of connectivity to the SAN and possible loss of data. To restore the WWN and Update NVPARMS on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to use the `restorewwn` command to a non-boot from SAN host and run `restorewwn` from there.
- If the host with the `restorewwn` target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now restore the WWN and update the NVPARMS on the intended target adapter, because it is not being actively used for boot from SAN.

To restore the WWN, type:

```
oslpcfg restorewwn n=<adapter number> c=<wwn filename>
```

The following example updates the NVPARMS on adapter number 4 with the `ctwwn.sav` file.

```
oslpcfg restorewwn n=4 c=ctwwn.sav
```

4.3.4.4 Restoring NVPARMS (restorenvwwn)

ATTENTION Running a `restorenvwwn` on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The restorenvwwn command might cause a loss of connectivity to the SAN and possible loss of data. To restore the NVPARMS on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to use the `restorenvwwn` command to a non-boot from SAN host and run the command from there.
- If the host with the `restorenvwwn` target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now restore the NVPARMS on the intended target adapter, because it is not being actively used for boot from SAN.

This command restores the non-volatile WWPN and WWNN to the adapter, replacing any volatile WWPN and WWNN data, without powering off the adapter.

If the adapter does not have firmware that supports the volatile WWN, the following error message appears:

```
Write Volatile Parms Error. Reported Error 48
```

If this occurs, install firmware that supports the volatile WWN.

To restore the non-volatile WWN, type:

```
oslpcfg restorenvwwn n=<adapter number>
```

The following example restores the non-volatile WWN on adapter number 2.

```
oslpcfg restorenvwwn n=2
```

4.3.4.5 Restoring the IEEE Address (restoredefwwn)

This command reads the IEEE address (assigned by the manufacturer) and writes it to the non-volatile WWPN and WWNN.

ATTENTION Running `restoredefwwn` on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The restoredefwwn command might cause a loss of connectivity to the SAN and possible loss of data. To restore the IEEE address on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to use the `restoredefwwn` command to a non-boot from SAN host and run `restoredefwwn` from there.
- If the host with the `restoredefwwn` target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now restore the IEEE address on the intended target adapter, because it is not being actively used for boot from SAN.

To restore the IEEE address, type:

```
oslpcfg restoredefwwn n=<adapter number>
```

The following example restores the IEEE address on adapter number 2.

```
oslpcfg restoredefwwn n=2
```

4.3.5 Boot Code Commands

You must enable BootBIOS before you can issue `setBootDevice` and `setAltBoot` commands. If necessary, use the `enableboot` command to enable the BootBIOS. See Section 4.3.5.1, Enabling or Disabling BootBIOS or Boot Code (enableboot or disableboot), for more information.

To set the boot device with the offline utility, run the following commands in this order:

1. Use the `listboot` command to verify that the BootBIOS is present. See Section 4.3.2.5, Viewing BootBIOS Versions (listboot), for more information.

   Example:

   ```
   oslpcfg listboot n=1
   ```

   Sample return:

   ```
   bootBIOS 1 (enabled): ZB2.01A2
   bootBIOS 2 (disabled): ZB2.01A1
   ```

2. Use the `setbootdevice` command to set the boot device. See Section 4.3.5.2, Selecting a Boot Device (setbootdevice), for more information.
3. Configure the system BIOS so the adapter boot device is the highest in the boot order.

4.3.5.1 Enabling or Disabling BootBIOS or Boot Code (enableboot or disableboot)

This command enables or disables the BootBIOS (boot code) (selected by its index) for the specified adapter number. Index i is one of the indices (base 1) shown when you run the `listboot` command.

ATTENTION Enabling or disabling the BootBIOS or boot code on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `enableboot` or `disableboot` command might cause a loss of connectivity to the SAN and possible loss of data. To run either of these commands on LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to enable or disable the BootBIOS or boot code to a non-boot from SAN host and run the command from there.
- If the host with the target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The `enableboot` or `disableboot` command can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

To enable BootBIOS, type:

```
oslpcfg enableboot n=<adapter number> i=<index>
```

The following example enables BootBIOS on adapter number 6:

```
oslpcfg enableboot n=6 i=1
```

To disable BootBIOS, type:

```
oslpcfg disableboot n=<adapter number>
```

The following example disables BootBIOS on adapter number 6:

```
oslpcfg disableboot n=6
```

4.3.5.2 Selecting a Boot Device (setbootdevice)

This command sets the boot device specified by its WWN, LUN, and desired topology.

- Set `t=0` for arbitrated loop.
- Set `t=1` for point-to-point.

The selected device boots when the system reboots.

ATTENTION Selecting a boot device on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `setbootdevice` command might cause a loss of connectivity to the SAN and possible loss of data. To run the `setbootdevice` command on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to run the `setbootdevice` command to a non-boot from SAN host and run the command from there.
- If the host with the `setbootdevice` target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The setbootdevice command can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

The boot code must be enabled before issuing the `setbootdevice` command.

To set the boot device, type (all on one line):

```
oslpcfg setbootdevice n=<adapter number> w0=<wwpn word 0> w1=<wwpn word 1>
l=<Decimal ID of LUN> t=<topology>
```

NOTE Enter the LUN in decimal format.

The following example sets the boot device on adapter number 1, LUN number 46, with a desired topology of arbitrated loop:

```
oslpcfg setbootdevice n=1 w0=a1b2c3d4 w1=b946a4e8 l=46 t=0
```

NOTE If port login fails after 50 ms, the command is retried once.

4.3.5.3 Enabling or Disabling Boot Devices (enablebootdevice or disablebootdevice)

After using the `setbootdevice` command, you can enable or disable the boot device by using the `enablebootdevice` or `disablebootdevice` command.

ATTENTION Enabling or disabling the boot device on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `enablebootdevice` or `disablebootdevice` command might cause a loss of connectivity to the SAN and possible loss of data. To run either command on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to enable or disable the boot device to a non-boot from SAN host and run the command from there.
- If the host with the target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. Either command can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

To enable the boot device, type:

```
oslpcfg enablebootdevice n=<adapter number>
```

To disable the boot device, type:

```
oslpcfg disablebootdevice n=<adapter number>
```

NOTE For the change to take effect, perform a system reboot.

4.3.5.4 Read All Alternative Boot Devices (readaltboot)

This command shows the WWN and LUN numbers in decimal format of all possible alternate boot devices. You can have up to seven alternate boot devices.

To read all alternate boot devices, type (all on one line):

```
oslpcfg readaltboot n=1
```

4.3.5.5 Selecting One or More Alternate Boot Devices (setaltboot)

This command sets alternate boot devices. You can set up to seven alternate boot devices; that is, *index* `i` can be from one to seven.

NOTE The boot code must be enabled before you issue the `setAltBoot` command.

To set up one or more alternate boot devices, type (all on one line):

```
oslpcfg setaltboot n=<adapter number> i=<index> w0=<wwpn word 0> w1=<wwpn word 1>
l=<Decimal ID of LUN>
```

The following example sets the alternate boot device on adapter number 1, LUN number 3:

```
oslpcfg setaltboot n=1 i=1 w0=12345678 w1=a842b6ed l=3.
```

4.3.5.6 Enable or Disable PXE Boot on NIC Devices (networkboot)

NOTE This command is supported only on LPe16202/OCe15100 adapters in NIC mode.

This command allows you to enable or disable PXE boot on NIC devices.

To enable or disable PXE boot on a NIC device, type:

```
oslpcfg networkboot n=<adapter_number> <t=type> <s=status>
```

The following example enables PXE boot on adapter 1:

```
oslpcfg networkboot n=1 t=pxe s=1
```

The following example disables PXE boot on adapter 1

```
oslpcfg networkboot n=1 t=pxe s=0
```

4.3.6 Configuration Commands

Configuration commands allow you to update the configuration region of an adapter by name or by number.

4.3.6.1 Updating Configuration Regions (config)

Two forms of configuration are available:

- Configure all adapters of a given adapter name at once
- Configure a single adapter by its number

Valid region numbers range from 0 to 32.

4.3.6.1.1 Update by Name

To update a specified configuration region on all adapters of the same selected name, type (all on one line)

```
oslpcfg config a=<adapter name> r=<region number> c=<configuration filename>
```

NOTE The adapter name is the name that appears when you run the `listHBA` command. For more information on the `listHBA` command, see Section 4.3.2.7, Viewing All Adapters in the System (listhba).

The following example updates region 6 of all LP12000 adapters with `ctplus1.cfl`:

```
oslpcfg config a=lpe12000 r=6 c=ctplus1.cfl
```

The following example updates region 17 of all ABC24-FC56 adapters with `d:\dfplus1.cfl`:

```
oslpcfg config a=ABC24-FC56 r=17 c=d:\dfplus1.cfl
```

NOTE The size of the `.cfl` file for configuration region update can be up to 2028 bytes.

4.3.6.1.2 Update by Number

To update a specified configuration region for one adapter, type (all on one line):

```
oslpcfg config n=<adapter number> r=<region number>  c=<configuration filename>
```

The following example updates region 17 of adapter number 4 with `heplus1.cf1`:

```
oslpcfg config n=4 r=17 c=heplus1.cfl
```

The following example updates region 6 of adapter number 2 with `d:\dfplus1.cf1`:

```
oslpcfg config n=2 r=6 c=d:\dfplus1.cfl
```

4.3.6.2 Writing a Semi-Volatile MAC Address on a NIC Device (writesvmac)

NOTE This command is supported only on OEM-specific LPe16202/OCe15100 adapters in NIC mode.

To write a semi-volatile MAC address to an adapter, type:

```
oslpcfg writesvmac n=<adapter_number> <m=mac_address>
```

The following example writes the MAC address `0090FA112233` to adapter 1:

```
oslpcfg writesvmac n=1 m=0090FA112233
```

4.3.6.3 Restoring the Default Semi-Volatile MAC Address on a NIC Device (restoredefsvmac)

NOTE This command is supported only on OEM-specific LPe16202/OCe15100 adapters in NIC mode.

To restore the default semi-volatile MAC address to an adapter, type:

```
oslpcfg restoredefsvmac n=<adapter_number>
```

The following example restores the default MAC address to adapter 1:

```
oslpcfg restoredefsvmac n=1
```

4.3.7 Diagnostic Tests

The following commands let you run diagnostic tests on your adapter.

NOTE Because the `extloopback`, `intloopback`, and `pciloopback` commands do not support testing on all installed adapters, the `o=3` option applies to running `linlpcfg` with the script command. The `o=3` option instructs LpCfg to ignore errors and continue script execution.

When the `o=2` option is used, LpCfg ignores up to 3 errors during an adapter test before continuing to the next adapter.

4.3.7.1 Running the External Loopback Test (extloopback)

NOTE `Extloopback` is supported only on LPe12000-series FC adapters.

ATTENTION Performing an `extloopback` test on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The extloopback command might cause a loss of connectivity to the SAN and possible loss of data. To perform an `extloopback` command on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to perform the external loopback test onto a non-boot from SAN host and perform the test from there.
- If the host with the test target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The extloopback command can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

This command runs the external loopback test. You must put a loopback plug in each adapter port to be tested. You can test a specific adapter in the system. Specify the number of times you want the test to repeat, and direct the test response if an error is found.

The option on error choices are:

- `o=1` stops the test on the first error
- `o=2` ignores three errors and stops the test on the fourth error
- `o=3` ignores errors and continues the test

NOTE The `extloopback` command does not support testing all installed adapters using `n=all`.

To run the external loopback test, type (all on one line):

`oslpcfg extloopback n=<adapter number> r=<repeat count> o=<option on error>`

where:

- *p* = 3 to 8-HEX byte pattern
- *c* = 1500 to 8192
- *r* = 1 to 4096

The following example runs the external loopback test 50 times on adapter number 1 and stops the test if an error occurs:

```
oslpcfg extloopback n=1 r=50 o=1
```

4.3.7.2 Running the Internal Loopback Test (intloopback)

ATTENTION Performing an internal loopback test on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `intloopback` command might cause a loss of connectivity to the SAN and possible loss of data. To perform an `intloopback` command on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to perform the internal loopback test onto a non-boot from SAN host and perform the test from there.
- If the host with the test target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The `intloopback` command can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

This command runs the internal loopback test. You can run the test on a specific adapter in the system. Specify the number of times you want the test to repeat, and direct the test response if an error occurs.

The option on error choices are:

- `o=1` stops the test on the first error
- `o=2` ignores three errors and stops the test on the fourth error
- `o=3` ignores errors and continues the test

NOTE `intloopback` does not support testing all installed adapters using `n=all`.

Do not use the internal loopback test on Emulex blade adapters.

To run the internal loopback test, type (all on one line):

`oslpcfg intloopback n=<adapter number> r=<repeat count> o=<option on error>`

where:

- *p* = 3 to 8-HEX byte pattern
- *c* = 1500 to 8192
- *r* = 1 to 4096
- *t* = 2

The following example runs the internal loopback test 100 times on adapter number 1 and stops the test if an error occurs:

```
oslpcfg intloopback n=1 r=100 o=1
```

4.3.7.3 Running the PCI Loopback Test (pciloopback)

ATTENTION Performing a PCI loopback test on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `pciloopback` command might cause a loss of connectivity to the SAN and possible loss of data. To perform a `pciloopback` command on LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to perform the PCI loopback test onto a non-boot from SAN host and perform the test from there.
- If the host with the test target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The `pciloopback` command can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

This command runs the PCI loopback test. You can run the test on a specific adapter or on all adapters in the system. Specify the number of times you want the test to repeat, and direct the test response if an error occurs.

The option on error choices are:

- `o=1` stops the test on the first error
- `o=2` ignores three errors and stops the test on the fourth error
- `o=3` ignores errors and continues the test

NOTE `pciloopback` does not support testing all installed adapters using `n=all`.

To run the PCI loopback test, type (all on one line):

```
oslpcfg pciloopback n=<all|adapter number> r=<repeat count> o=<option on error>
```

The following example runs the PCI loopback test 100 times on all adapters in the system and stops the testing if any errors occur.

```
oslpcfg pciloopback n=all r=100 o=1
```

4.3.8 Using Script Files

Use script files to efficiently perform tasks. Script files are common sequences of commands you use when performing tasks.

You can group commands together and run them using a script file. You can also enter comment lines, which begin with a semicolon. Each line follows the same command syntax as those documented in this manual. Using the offline utility, you can:

- Run commands entered in a script file. Use the @ command to run the script file.
- Run commands multiple times. Add the `repeat` command as the last line of the script file.
- Create a log of test results. Add the `logfile` command as the first line of the script file.

To run a script file type:

*os*lpcfg @<*scriptname.txt*>

The following example runs the script `script1.txt`, which resides in the current directory and runs all the commands in that script file.

*os*lpcfg @script1.txt

NOTE To interrupt and stop any script, press <S> on the keyboard.

The following is a sample script file. Each command follows the syntax covered above. The comment lines begin with a semicolon (;):

```
version
screendisplay o=0
;download a=lpe12000 i=c:\temp\ud201a12.all
;reset n=1 s=0
;reset n=2 s=0
reset n=all s=0
listboot n=1
enableboot n=1 i=2
; pciloopback n=1 r=10 o=1
; pciloopback n=2 r=10 o=2
; pciloopback n=all r=50 o=3
intloopback n=1 r=10 o=1
intloopback n=2 r=10 o=1
extloopback n=1 r=40 o=3
extloopback n=2 r=40 o=3
;repeat r=10
```

4.3.8.1 Repeating a Series of Commands (repeat)

Enter this command at the end of a script file to repeat a series of commands from the beginning of the script file a specific number of times.

NOTE To interrupt and stop the repeat command, press <S> on the keyboard.

To repeat the series of commands in the script file, add the following as the last line of the file:

repeat r=<*repeat count*>

The following example repeats the series of commands in the script file ten times.

```
repeat r=10
```

4.3.8.2 Enabling or Disabling Test Messages on the Screen (screendisplay)

This command enables or disables test message displays on the screen.

- o=0 – Prevents messages from appearing
- o=1 – Enables messages

NOTE This command is supported only in script files.

To enable or disable test message displays on the screen, add the following line to the script:

screendisplay o=<*display option*>

In the following script file example, messages from the `version` and `listhba` commands are output to the log file and to the screen. After the `screendisplay` command is set to `0`, the result messages for all successive commands (`download`, `listboot`, and `enableboot`) are output only to the log file, not to the screen.

```
version
listhba
screendisplay o=0
download a=lpe12000 i=c:\temp\ud201a12.all
listboot n=2
enableboot n=2 i=1
```

4.3.8.3 Updating Non-volatile WWNN (scriptwwnn)

ATTENTION Running `scriptwwnn` on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `scriptwwnn` command might cause a loss of connectivity to the SAN and possible loss of data. To update the non-volatile WWNN on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to use the `scriptwwnn` command to a non-boot from SAN host and run the script from there.
- If the host with the target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now run the script to update the non-volatile WWNN on the intended target adapter, because it is not being actively used for boot from SAN.

This command reads the WWNN words 0 and 1 from the command line to update the non-volatile WWNN. You can also include this command in a script file. When the adapter is discovered, the new WWNN value is used. The adapter retains the original WWNN in another region of the firmware.

ATTENTION Use the `scriptwwnn` command with caution. If you use the same WWNN on more than one adapter in a fabric, unpredictable results might occur.

To change WWNN words 0 and 1 from the command line, type (all in one line):

os`lpcfg scriptwwnn n=<`*`adapter number`*`> w0=<`*`wwnn word 0`*`> w1=<`*`wwnn word 1`*`>`

The following example updates non-volatile WWNN word 0 and word 1 for adapter number 1:

os`lpcfg scriptwwnn n=1 w0=10000345 w1=B620A1B2`

NOTE Word 0 of WWNN and WWPN names must follow one of the following formats:
1 0 0 0 0 x x x
2 x x x x x x x
3 x x x x x x x
5 x x x x x x x
If the `scriptvwwnn` command has been used previously, the adapter continues to use that WWNN until you change the WWNN with the `restorenvwwn` command.

4.3.8.4 Updating Non-volatile WWPN (scriptwwpn)

ATTENTION Running `scriptwwpn` on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `scriptwwpn` command might cause a loss of connectivity to the SAN and possible loss of data. To update the non-volatile WWPN on LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to use the `scriptwwpn` command to a non-boot from SAN host and run the script from there.
- If the host with the target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now run the script to update the non-volatile WWPN on the intended target adapter, because it is not being actively used for boot from SAN.

This command reads WWPN words 0 and 1 from the command line to update the non-volatile WWPN. You can also include this command in a script file. When it is discovered, the adapter uses the new WWNN value. It does not use the original IEEE address assigned by manufacturing (located in Configuration Region 16 or 32).

ATTENTION Use the `scriptwwpn` command with caution. If you use the same WWPN on more than one adapter in a fabric, unpredictable results might occur.

NOTE If the `scriptvwwnn` command has been used previously, the adapter continues to use that WWPN until you change the WWPN with the `restorenvwwn` command.

To change WWPN words 0 and 1 from the command line, type (all in one line):

`oslpcfg scriptwwpn n=<adapter number> w0=<wwpn word 0> w1=<wwpn word 1>`

The following example updates the non-volatile WWPN word 0 word 1 for adapter number 1:

`oslpcfg scriptwwpn n=1 w0=20A2D6B8 w1=C920A1B2`

4.3.8.5 Updating Volatile WWNN (scriptvwwnn)

ATTENTION Running `scriptvwwnn` on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `scriptvwwnn` command might cause a loss of connectivity to the SAN and possible loss of data. To update the volatile WWNN on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to use the `scriptvwwnn` command to a non-boot from SAN host and run the script from there.
- If the host with the target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now run the script to update the volatile WWNN on the intended target adapter, because it is not being actively used for boot from SAN.

This command reads the WWNN words 0 and 1 from the command line to update the volatile WWNN. The next time the adapter is discovered, it uses this new WWNN. It does not use the original IEEE address assigned by manufacturing

(located in Configuration Region 16 or 32), nor does it use the value entered by the `writewwn` or `scriptwwnn` commands.

If the adapter does not have firmware that supports the volatile WWN, the following error message appears:

```
Write Volatile Parms Error. Reported Error 48
```

If this occurs, install firmware that supports the volatile WWN.

NOTE Word 0 of WWNN and WWPN names must follow one of the following formats:
1 0 0 0 0 x x x
2 x x x x x x x
3 x x x x x x x
5 x x x x x x x
After you issue this command, the volatile WWNN is used by the adapter until the `restorenvwwn` command is issued or the system is restarted.

ATTENTION Use the `scriptvwwnn` command with caution. If you use the same volatile WWNN on more than one adapter in a fabric, unpredictable results might occur.

To change volatile WWNN words 0 and 1 from the command line, type (all in one line):

```
oslpcfg scriptvwwnn n=<adapter number> w0=<wwnn word 0> w1=<wwnn word 1>
```

The following example updates the volatile WWNN word 0 word 1 for adapter number 1:

```
oslpcfg scriptvwwnn n=1 w0=20A2D6B8 w1=C920A1B2
```

4.3.8.6 Updating Volatile WWPN (scriptvwwpn)

ATTENTION Running `scriptvwwpn` on an LPe12000-series adapter that is being used to boot from SAN is not recommended. The `scriptvwwpn` command might cause a loss of connectivity to the SAN and possible loss of data. To update the volatile WWPN on an LPe12000-series adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

- Move the adapter on which you want to use the scriptvwwpn command to a non-boot from SAN host and run the script from there.
- If the host with the target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now run the script to update the volatile WWPN on the intended target adapter, because it is not being actively used for boot from SAN.

This command reads the WWPN words 0 and 1 from the command line to update the volatile WWPN. The next time the adapter is discovered, it uses this new WWPN. It does not use the original IEEE address assigned by manufacturing (located in Configuration Region 16 or 32), nor does it use the value entered by the `writewwn` or `scriptwwpn` commands.

If the adapter does not have firmware that supports the volatile WWN, the following error message appears:

```
Write Volatile Parms Error. Reported Error 48
```

If this occurs, install firmware that supports the volatile WWN.

NOTE Word 0 of WWNN and WWPN names must follow one of the following formats:
1 0 0 0 0 x x x
2 x x x x x x x
3 x x x x x x x
5 x x x x x x x
After you issue this command, the volatile WWNN is used by the adapter until the `restorenvwwn` command is issued or the system is restarted.

ATTENTION Use the `scriptvwwnn` command with caution. If you use the same VWWNN on more than one adapter in a fabric, unpredictable results might occur.

To change VWWPN words 0 and 1 from the command line, type (all in one line):

`oslpcfg scriptvwwpn n=<adapter number> w0=<wwpn word 0> w1=<wwpn word 1>`

The following example updates the volatile WWPN word 0 word 1 for adapter number 1:

`oslpcfg scriptvwwpn n=1 w0=20A2D6B8 w1=C920A1B2`

4.3.8.7 Creating a Log (logfile)

This command creates a log file with a specified directory and file name. The default log file is `lpcfglog.txt` and is created in the system's current directory.

NOTE This command is supported only in script files. Make it the first command in the script.

To create a log file, type the following command in the script file:

`logfile l=<filename>`

The following example creates a file called `lplog.txt` in the `d:\` directory:

```
logfile l=d:\log\lplog.txt
```

Results of all commands are recorded in a log file. Unless otherwise specified by the `logfile` command, the default log file is `lpcfglog.txt` in the current directory.

4.3.9 VLAN Commands

Using the following commands, you can manage the VLAN ID and VLAN priorities on specified adapters.

4.3.9.1 Reading VLAN Priorities (readvlanprops)

This command shows the NIC function on an adapter's VLAN ID and VLAN Priority for the adapter number specified.

NOTE `Readvlanprops` is supported only on LPe16202/OCe15100 adapters in NIC+FCoE mode.

To read the VLAN priorities for the adapter specified, type:

`>oslpcfg.exe readmac n=<adapter number>`

The following example lists information for adapter number 1:

```
>oslpcfg.exe readvlanprops n=1
Command: readvlanprops n=1
adapter 1:
VLANId          : 1024
VLANPriority: 1
Command completed, NO Error
```

4.3.9.2 Restoring the Default Values for the VLAN ID and VLAN Priorities (restorevlanprops)

This command restores the adapter's default VLAN ID and VLAN Priority values, which are both set to zero, on the adapter number specified.

NOTE `Restoredefvlanprops` is supported only on LPe16202/OCe15100 adapters in NIC+FCoE mode..

To restore the VLAN ID and VLAN priorities for the adapter specified, type:

```
>oslpcfg.exe restorevlanprops n=<adapter number>
```

4.3.9.3 Changing the VLAN ID and VLAN Priority on a Specified Adapter's NIC Function (writevlanprops)

This command lets you change the VLAN ID and VLAN Priority on the specified adapter's NIC function. You can specify the VLAN ID and the VLAN Priority with the following values:

- `vlan_id` – 0 to 4095. A value of 0 disables the VLAN ID.
- `vlan_priority` – 0 to 7.

NOTE `Writevlanprops` is supported only on LPe16202/OCe15100 adapters in NIC+FCoE mode..

To change the VLAN ID and the VLAN Priority on a specified adapter's NIC function, type:

```
WinLpCfg.exe writevlanprops n=<adapter number> i=<vlan_id> p=<vlan_priority>
```

The following example changes the VLAN ID and VLAN Priority for adapter number 1:

```
>oslpcfg.exe writevlanprops n=1 i=1024 p=1
Command: writevlanprops n=1 i=1024 p=1
adapter 1:
Command completed, NO Error
```

Chapter 5: Status Messages and Error Codes

5.1 Elxflash Utility Status Messages

The Elxflash utility takes a less stringent approach to reporting status messages when used with auto-discovery. An error message is returned only when the Elxflash utility reports a failure during a download or if the firmware and boot directories cannot be located.

Table 2 lists the Elxflash utility status messages that are supported.

Table 2 Elxflash Status Messages

Message Number	Message Title	Message Details
0	GOOD_ALL_UPGRADES_OK	Returned if any of the discovered adapters had a successful download performed.
1	GOOD_NO_UPDATES_NEEDED	Returned if any of the discovered adapters did not need an update, downgrade, or rewrite operation. This message is never returned during a force firmware or force boot code download operation.
2	ERROR_ALL_UPGRADES_FAILED	Returned if all attempted downloads failed.
3	ERROR_SOME_UPGRADES_FAILED	Returned if some of the attempted downloads failed.
4	ERROR_EMULEX_APPS_COMMAND	Returned if Elxflash cannot run an external executable such as: ■ *os*lpcfg (elxflashOffline)
5	ERROR_NO_SUPORTED_HBA_FOUND	Returned if no supported adapters are found.
6	ERROR_DIRECTORY_NOT_FOUND	Returned if the firmware or boot directories are missing. Depending on the operation, auto-discovery expects the firmware or boot directories to exist as subdirectories in the root of the package directory.
7	GOOD_NO_UPGRADES_AVAILABLE	Returned if none of the discovered adapters had a matching image in the firmware or boot directories. In this case only, a matching image is an image that the adapter accepts regardless of the download operation being performed.
8	ERROR_NOT_ADMIN_USER	Returned when you attempt to run the executable file and do not have administrator (Windows) or root (Linux) privileges.
9	ERROR_UNSUPPORTED_OS	Used by the Exlflash Standalone execution scripts. Returned when the scripts are run on an unsupported operating system.
10	ERROR_UNSUPPORTED_ARCH	Used by the Exlflash Standalone execution scripts. Returned when the scripts are run on an unsupported architecture.
19	ERROR_IMAGE_VERSION	An error occurred when decoding the image version. The image file has an invalid extension, or Elxflash was unable to decode the image file's version. **NOTE** This is returned only when using the /iv=<image_version> switch.
20	ERROR_MISSING_DEP	Returned when a missing dependency is detected.

5.2 LpCfg Error Codes

Table 3 lists the LpCfg error codes that are supported.

Table 3 LpCfg Error Codes

Error Code	Description
0	No error
1	Invalid adapter number
2	Mailbox command error
3	No valid boot (BIOS) code found
4	Open file error
5	Invalid configuration region
6	Invalid adapter name
7	Download error
8	Invalid boot (BIOS) code index
9	Link not up for external loopback test
10	Link not up for internal loopback test
11	Invalid jumper selection (in jumper command)
12	Invalid alternate configuration region (in jumper command)
13	PCI loopback test fails
14	Adapter reset error
15	Read configuration region error
16	No VPD information available
17	No command in command line
18	Open log file error
19	Read wakeup parameters error
20	Update wakeup parameters error
21	Incorrect test parameters
22	Stopped by user
23	Internal loopback test fails
24	External loopback test fails
25	Error exists after four retries
26	Invalid command
27	Incorrect syntax
28	Command supported only in script files
29	Read_rev error
30	Dump configuration region error
31	Read file error
32	Short file error
33	Read NVPARMS error
34	Write NVPARMS error
35	Command does not support all adapters
36	Invalid LUN

Table 3 LpCfg Error Codes (Continued)

Error Code	Description
37	No boot (BIOS) code enabled
38	Update configuration region error
39	No boot (BIOS) found
40	Dump memory error
41	Update EROM error
42	Delete load entry error
43	Write WWN error
44	Not supported in script files
45	No Emulex adapter found
46	Invalid Alternate Boot Device Index
47	Cannot restart adapter
48	Write volatile parameters error
49	POST test error
50	Incorrect symbols
51	Invalid length
52	Invalid topology
53	No event log
54	Read event log
55	Invalid input value
56	No libdfc library
57	Non-numeric input
58	No valid WWN
59	Region cleanup
60	Region initialization
62	Unable to allocate memory
63	DFC_InitDiagEnv error
64	DFC_ReadPciCfg error
65	No driver installed
66	No valid driver
67	Not valid adapter type
68	Not valid image
69	Long file error
70	Incompatible image
71	Not supported
72	MILI service not started
73	Script not supported
74	MILI not started
75	No NIC adapter
76	Personality information
77	Personality change

Table 3 LpCfg Error Codes (Continued)

Error Code	Description
78	Administrator rights error
79	SLI-4 management error
80	Reboot required
83	Application is missing one or more dependencies.
87	The system must be rebooted to activate the new firmware image and the image must be downloaded again.
88	Duplicate MAC address
89	Download failed due to missing digital signature. Please contact customer support for additional help. Download failed on adapter <adapter number> Stat 89.
90	Download failed due to invalid firmware digital signature. Please contact customer support for additional help. Download failed on adapter <adapter number> Stat 90.
141	General error from MILI
200	General error

Chapter 6: Troubleshooting

When using Elxflash, some commands take precedence over others. For instance, the force firmware (`/ff`), force boot (`/fb`), and force firmware and boot code (`/f`) switches take precedence over the `/downgrade`, `/update`, and `/rewrite` switches. If `/ff`, `/fb`, or `/f` are used, the `/downgrade`, `/update`, and `/rewrite` switches are ignored.

The following examples illustrate this behavior:

1. `./elxflash /ff /update`
   a. `/update` is ignored.
   b. Performs a force firmware operation on all installed and supported adapters.
2. `./elxflash /fb /update`
   a. `/update` is ignored.
   b. Performs a force boot code operation on all installed and supported adapters.
3. `./elxflash /ff /downgrade`
   a. `/downgrade` is ignored
   b. Performs a force firmware operation on all installed and supported adapters.
4. `/elxflash /fb / downgrade`
   a. `/downgrade` is ignored.
   b. Performs a force boot code operation on all installed and supported adapters.
5. `./elxflash /ff /rewrite`
   a. `/rewrite` is ignored
   b. Performs a force firmware operation on all installed and supported adapters.
6. `./elxflash /fb / rewrite`
   a. `/rewrite` is ignored.
   b. Performs a force boot code operation on all installed and supported adapters.

6.1 Unsupported Driver

The Elxflash utility reports an error similar to the following if an unsupported driver is installed on the system:

```
elxflash: no supported Emulex HBA's found - Return Code=1
```

If an error similar to the above occurs, verify that the correct version of the driver is installed. For supported adapters, and supported versions of operating systems and platforms, go to http://www.broadcom.com.

6.2 Updating Adapters without Boot Code

The Elxflash utility reports an adapter's boot code version as `NONE` when the adapter does not have boot code installed. The utility does not update, downgrade, or rewrite the boot area if boot code is not present, but firmware will still be updated or downgraded without boot code. You can force a boot code download using auto-discovery or the `fwmatrix.txt` file.


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