Offline and Online Adapter Management Utilities

Version 6.0

User Manual

P007621-01A Rev. A

Emulex Connects™
Servers, Storage and People.

Emulex, 3333 Susan Street
Costa Mesa, CA 92626

Introduction

This document explains how to prepare the adapter management utility kits for Linux and Windows pre-boot environments.

Offline Adapter Management Utilities

The Offline Adapter Management Utility kits allow you to configure Emulex® adapters before you install or boot a server operating system.

Caution: The adapter must not be connected to any device or fabric while the Linux offline utilities are in use.

The offline utilities include:

- winlpcfg - for use with 32-bit and 64-bit, versions of the Microsoft WinPE operating system.
- linlpcfg - for use with Linux RHEL 5.6 and above, SLES 10 SP3 and above, and SLES 11 SP1 and above operating systems.
-

See Table 1 on page 5 for information on supported platforms.
See *Offline Adapter Management Utilities Command Line Interface* on page 32 for further information on the offline utilities.

Online Adapter Management Utilities

The Online Adapter Management Utilities use a command line interface allowing you to build scripts for automated and unattended firmware and boot code download solutions for Emulex LightPulse® (LP) Host Bus Adapters (HBAs) and OneConnect™ Universal Converged Network Adapters (UCNAs). For simplicity, this document refers to HBAs and UCNAs as adapters.

You can download firmware and boot code on local and remote machines simultaneously.

The Online Adapter Management Utilities use uses auto-discovery (/auto) which relieves you from having 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), /upgrade, /downgrade, and /rewrite.

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

If you do not want to use the auto-discovery approach, the Online Adapter Management Utilities have retained the ability to update the firmware and/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/or boot code entries in addition to placing the corresponding firmware and boot code images into their respective directories. The fwmatrix.txt file enables all operations that are used with auto-discovery.

New Features

New features for this release include:

- Support for 16 Gb/s Fibre Channel adapters.

Key Features

Key features include:

- /auto - Auto-discovers adapters and does not use the fwmatrix.txt configuration file.
- /downgrade - Downgrades firmware and/or boot code if the downgrade version is less than the version that is currently installed on an adapter.
- /fb - Forces a boot code download on an adapter.
- /ff - Forces a firmware download on an adapter.
- /p - Previews a download of firmware and/or boot code.
- /rewrite - Explicitly re-flashes the firmware and/or boot code on an adapter if the rewrite version is equal to or higher than the version currently installed on the adapter.
- /update - Upgrades firmware and/or boot code if the update version is greater than the version currently installed on an adapter.

Supported Platforms

Legend for Table 1 and Table 2:

X - LightPulse and OneConnect adapters

L - LightPulse adapters only

Table 1: Supported Platforms for Offline Adapter Management Utilities

Operating System	X86	X64	PPC64	IA64
WinPE 2.x+	X	X	N/A	N/A
RHEL 5.6+	X	X	L	L
RHEL 6.0+	X	X	L	N/A
SLES 10.3+	X	X	L	L
SLES 11.1+	X	X	L	L
Citrix XenServer 5.6.0	X	N/A	N/A	N/A
Citrix XenServer 5.6 SP2	X	N/A	N/A	N/A
Citrix XenServer 6.0	X	N/A	N/A	N/A

Note: On RHEL 5.6 the elxlinlpcfg RPM file requires the libnl library. This library is not installed by default, but can be obtained from the OS distribution media.
- For i386 RHEL 5.6+, use the 32bit libnl library.
- For x86_64 RHEL 5.6+, use the 64bit libnl library.
- For ia64 RHEL 5.6+, use the 64bit libnl library.
- For PPC RHEL 5.6, use the 32bit libnl library.

Table 2: Supported Platforms for Online Adapter Management Utilities

Operating System	X86	X64	PPC64	IA64
W2K3 SP2+	X	X	N/A	N/A
W2K8 SP1+	X	X	N/A	N/A

Table 2: Supported Platforms for Online Adapter Management Utilities (Continued)

Operating System	X86	X64	PPC64	IA64
RHEL 5.6+	X	X	L	L
RHEL 6.0+	X	X	L	N/A
SLES 10.3+	X	X	L	L
SLES 11.1+	X	X	L	L
ESX 4.0	N/A	X	N/A	N/A
Citrix XenServer 5.6.0	X	N/A	N/A	N/A
Citrix XenServer 5.6 SP2	X	N/A	N/A	N/A
Citrix XenServer 6.0	X	N/A	N/A	N/A

Offline Adapter Management Utility - Linux Kit

Package Contents

Kit Name:

- elxflashOffline-<platforms>-<version>-<rel>.tgz

Dependencies:

- libnl

Root directory:

- iscsi_drivers/
- lpfc_drivers/
- nic_drivers/
- ia64/
- i386/
- x86_64/
- ppc64/
- install.sh
- uninstall.sh

iscsi_drivers/ directory:

- elx-be2iscsi-dd-<version>-<rel>.tar.gz

nic_drivers/ directory:

- elx-be2net-dd-<version>-<rel>.tar.gz

lpfc_drivers/ directory:

- Rev8.2.0.X/
- Rev8.3.5.X/

Arch/ directories:

- rhel-5/
- rhel-6/
- sles-10/
- sles-11/

Arch/os/ directories:

- elxflashOffline-<version>-<rel>.<arch>.rpm
- elxlinlpcfg-<version>-<rel>.<arch>.rpm

Application installation directory:

- /usr/sbin/linlpcfg

Elxlinlpcfg RPM contents:

- /etc/init.d/elxmilid
- /usr/lib/libdfc.a
- /usr/lib/libdfc.so
- /usr/lib/libdfc.so.X
- /usr/lib/libdfc.so.X.X.X
- /usr/lib/libmili2.so
- /usr/sbin/linlpcfg/linlpcfg
- /usr/sbin/linlpcfg/mili2d

ElxflashOffline RPM contents:

- /usr/sbin/linlpcfg/boot/ - the boot code subdirectory
- /usr/sbin/linlpcfg/firmware/ - the firmware subdirectory
- /usr/sbin/linlpcfg/elxflash - the Offline Adapter Management Utility executable
- /usr/sbin/linlpcfg/fwmatrix.txt - a sample configuration file
- /usr/sbin/linlpcfg/lcreflsh.sh - a sample scripting file
- /usr/sbin/linlpcfg/readme.txt - a readme with usage instructions
- /usr/sbin/linlpcfg/flash - used by the Offline Adapter Management Utility for NCSI firmware download on supported UCNAs

Installing

To install an Offline Adapter Management Utility - Linux Kit:

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

The install script determines the correct architecture and distribution, and performs the following operations:

1. Installs the packaged LPFC driver only if an LPFC driver RPM is not currently installed.
2. Installs the packaged NIC driver only if a NIC driver RPM is not currently installed.
3. Installs the packaged iSCSI driver only if a iSCSI driver RPM is not currently installed.
4. Attempts to upgrade the existing ElxflashOffline and Elxlinlpcfg RPMs. If there are no existing ElxflashOffline or Elxlinlpcfg RPMs, the install script installs the packaged ElxflashOffline and Elxlinlpcfg RPMs.

Example:

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

Upgrading

With an existing Offline Adapter Management Utility - Linux Kit installation, run the install.sh script to upgrade the ElxflashOffline and Elxlinlpcfg RPMs.

Note: During an upgrade, only the ElxflashOffline and Elxlinlpcfg RPMs are upgraded. Existing lpfc, NIC, and iSCSI driver RPMs are not upgraded.

Uninstalling

To uninstall an Offline Adapter Management Utilities - Linux Kit, run the uninstall script located on the root of the installation kit.

The uninstall script executes specific actions depending on what switches are used.

1. ./uninstall.sh - Uninstall ElxflashOffline and Elxlinlpcfg.
2. ./uninstall.sh -f - Uninstall ElxflashOffline, Elxlinlpcfg and LPFC driver.
3. ./uninstall.sh -n - Uninstall ElxflashOffline, Elxlinlpcfg, and NIC drivers.
4. ./uninstall.sh -s - Uninstall ElxflashOffline, Elxlinlpcfg, and iSCSI drivers.
5. ./uninstall.sh -u - Uninstall ElxflashOffline, Elxlinlpcfg, NIC, iSCSI and LPFC drivers.
6. ./uninstall.sh -h - Display a summary of all available switches.

Example:

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

Online Adapter Management Utility - Linux Kit

Package Contents

Kit Name:

- elxflashOnline-tgz-<platforms>-<version>-<rel>.tgz

Dependencies:

- OneCommand Core or Enterprise Kit

Root directory:

- ia64/
- i386/
- x86_64/
- ppc64/

Arch/ directories:

- rhel-5/
- rhel-6/
- sles-10/
- sles-11/

Arch/os/ directories:

- elxflashOnline -<version>

ElxflashOnline-<version> directory contents:

- boot/ - the boot code subdirectory
- firmware/ - the firmware subdirectory
- elxflash - the Online Adapter Management Utility executable
- fwmatrix.txt - a sample configuration file
- lcreflsh.sh - a sample scripting file
- readme.txt - a readme with usage instructions

Installing

To install an Online Adapter Management Utility - Linux Kit:

1. Untar the elxflashOnline tar ball that matches the target architecture and operating system.
2. Copy the elxflashOnline-<version>-<rel> directory to the directory you choose.

Example:

```
$ tar zxvf elxflashOnline-tgz-<platforms>-<version>-<rel>.tgz
$ cd elxflashOnline-tgz-<platforms>-<version>-<rel>/<arch>/<os>
```

Note: To run the Online Adapter Management Utility, you must install the OneCommand Manager application and the adapter drivers. These components are **not** included in the Online Adapter Management Utility - Linux Kit.

Upgrading

To upgrade an Online Adapter Management Utility - Linux Kit, untar the new version and delete the old version.

Uninstalling

To uninstall an Online Adapter Management Utility - Linux Kit, remove the elxflashOnline-<platforms>-<version>-<rel> directory that was created during installation.

Example:

```
$ rm -rf elxflashOnline-<platforms>-<version>-<rel>
```

Offline Adapter Management Utility - Linux Inbox NIC Kit

Package Contents

Kit Name:

- Kit Name: elxflashOffline_inbox_NIC-<platforms>-<version>-<rel>.tgz

RHEL 5.6 Dependencies:

- inbox NIC driver
- pciutils
- pciutils-devel
- ethtool

RHEL 5.7 Dependencies:

- inbox NIC driver
- pciutils
- pciutils-devel
- ethtool

RHEL 6 Dependencies:

- inbox NIC driver
- pciutils
- pciutils-libs
- ethtool

RHEL 6.1 Dependencies:

- inbox NICdriver
- pciutils
- pciutils-libs
- ethtool

SLES 10 SP4 Dependencies:

- inbox NIC driver or DUD (Driver Update Disk) NIC driver 4.0.359.0s or later
- pciutils
- ethtool

SLES 11 SP1 Dependencies:

- inbox NIC driver
- pciutils
- ethtool

SLES 11 SP2 Dependencies:

- inbox NIC driver
- pciutils
- ethtool

Root directory:

- i386/
- x86_64/

Arch/ directories:

- rhel-5/
- rhel-6/
- sles-10/
- sles-11/

Arch/os/ directories:

- elxflashOffline-<version>-<rel>.<arch>.rpm

ElxflashOffline RPM contents:

- firmware/ - the firmware subdirectory
- elxflash - the Offline Adapter Management Utility executable
- fwmatrix.txt - a sample configuration file
- lcreflsh.sh - a sample scripting file
- readme.txt - a readme with usage instructions

Installing

To install an Offline Adapter Management Utility - Linux Inbox NIC Kit:

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

The install script determines the correct architecture and distribution, and attempts to upgrade the existing ElxflashOffline and Elxlinlpcfg RPMs. If there are no existing ElxflashOffline or Elxlinlpcfg RPMs, the install script installs the packaged ElxflashOffline and Elxlinlpcfg RPMs.

Example:

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

Upgrading

To upgrade an Offline Adapter Management Utility - Linux Inbox NIC Kit installation, run the install.sh script to upgrade the ElxflashOffline RPM.

Note: During an upgrade, only the ElxflashOffline RPM is upgraded.

Uninstalling

To uninstall an Offline Adapter Management Utility - Linux Inbox NIC Kit, run the uninstall script located on the root of the installation kit.

The uninstall script executes specific actions depending on what switches are used.

Note: The following uninstall scripts should not be used on the Citrix operating system.

1. ./uninstall.sh - Uninstall ElxflashOffline and Elxlinlpcfg.
2. ./uninstall.sh -f, --uninstall_lpfc - Uninstall ElxflashOffline, Elxlinlpcfg and LPFC driver.
3. ./uninstall.sh -n, --uninstall_nic - Uninstall ElxflashOffline, Elxlinlpcfg, and NIC drivers.
4. ./uninstall.sh -s, --uninstall_iscsi - Uninstall ElxflashOffline, Elxlinlpcfg, and iSCSI drivers.
5. ./uninstall.sh -u, --uninstall_all - Uninstall ElxflashOffline, Elxlinlpcfg, NIC, iSCSI, and LPFC drivers.
6. ./uninstall.sh -h - Display a summary of all available switches.

Example:

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

Online Adapter Management Utility - VMware Kit

Package Contents

Kit Name:

- elxflashOnline-esx-<version>-<rel>.tgz

Root directory:

- esx4/

os/ directory:

- elxflashOnline -esxN-<version>-<rel>.tgz

ElxflashOnline tgz contents:

- boot/ - the boot code subdirectory
- firmware/ - the firmware subdirectory
- elxflash - the Online Adapter Management Utility executable
- fwmatrix.txt - a sample configuration file
- lcreflsh.sh - a sample scripting file
- readme.txt - a readme with usage instructions

Installing

To install an Online Adapter Management Utility - VMware Kit, untar the elxflashOnline tar ball that matches the target operating system.

Example:

```
$ tar zxvf elxflashOnline-esx-<version>-<rel>.tgz
$ cd elxflashOnline-esx-<version>-<rel>/<os>/
$ tar zxvf elxflashOnline-esx4-<version>-<rel>.tgz
```

```
$ cd elxflashOnline-esx4-<version>-<rel>
```

Note: To run the Online Adapter Management Utility, you must install the OneCommand Manager application Core Kit for ESX 4.0 and the adapter drivers. These components are **not** included in the Online Adapter Management Utility - VMware Kit.

Uninstalling

To uninstall an Online Adapter Management Utility - VMware Kit, delete the installation directory.

Example:

```
$ rm -rf elxflashOnline-esx-<version>-<rel>
```

Offline Adapter Management Utility - Windows Kit

Package Contents

Kit Name:

- Offline-WinPE-<version>-<rel>.zip

Root directory:

- setupElxAll-x64.exe
- setupElxAll-x86.exe

Contents:

- X:\Program Files\Emulex\Util\elxApp\libdfc.dll
- X:\Program Files\Emulex\Util\elxApp\MILI2DLL.dll
- X:\Program Files\Emulex\Util\elxApp\MILI2Service.exe
- X:\Program Files\Emulex\Util\elxApp\WinLpCfg.exe
- X:\Program Files\Emulex\Util\elxApp\boot\ - the boot code subdirectory
- X:\Program Files\Emulex\Util\elxApp\firmware\ - the firmware subdirectory
- X:\Program Files\Emulex\Util\elxApp\WorkDir\ - the FCoE, iSCSI, and NIC drivers
- X:\Program Files\Emulex\Util\elxApp\elxflash.exe - the Offline Adapter Management Utility executable
- X:\Program Files\Emulex\Util\elxApp\fwmatrix.txt - a sample configuration file
- X:\Program Files\Emulex\Util\elxApp\lcreflsh.bat - a sample batch file
- X:\Program Files\Emulex\Util\elxApp\readme.txt - a readme with usage instructions

Installing

To install an Offline Adapter Management Utility - Windows Kit:

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

   The following components are installed:

- The Storport converged network adapter (CNA) driver
- The Storport Fibre Channel (FC) driver
- The OneConnect iSCSI and NIC drivers
- WinLpCfg
- The Offline Adapter Management Utility

Upgrading

With an existing Offline Adapter Management Utility - Windows Kit installation, run the Offline-WinPE-<arch>-<version>-<rel>.exe. The installer uninstalls the existing version and then installs the updated version.

Uninstalling

To uninstall the Offline Adapter Management Utility - Windows Kit, run the following commands:

```
X:\>cd "X:\ProgramData\Tarma Installer\{AE1F1CA1-B626-4447-9208-
14607187EC3D}"
X:\>setup.exe /remove
```

Online Adapter Management Utility - Window Kit

Package Contents

Kit Name:

- ElxflashOnline-windows-<version>-<rel>.zip

Root directory:

- x64
- win32

Online Adapter Management Utility - Window Kit directory contents:

- boot\ - the boot code subdirectory
- firmware\ - the firmware subdirectory
- elxflash.exe - the Online Adapter Management Utility executable
- fwmatrix.txt - a sample configuration file
- lcreflsh.bat - a sample batch file
- readme.txt - a readme with usage instructions

Installing

To install an Online Adapter Management Utility - Windows Kit:

1. Unzip the ElxflashOnline-windows-<version>-<rel>.zip file.

2. Copy the win32 or x64 directory to the directory you choose.

Note: To run the Online Adapter Management Utility, you must install the OneCommand Manager application and the adapter drivers. These components are **not** included in the Online Adapter Management Utility - Windows Kit.

Upgrading

To upgrade the Online Adapter Management Utility - Windows Kit, unzip the new version and delete the old version.

Uninstalling

To uninstall the Online Adapter Management Utility- Windows Kit, remove the win32 or x64 directory that was created during installation.

Offline Adapter Management Utility - Citrix Kit

Package Contents

Kit Name:

- elxflashOffline-<platforms>-<version>-<rel>.tgz

Dependencies:

- libnl

Root directory:

- i386/
- install.sh
- uninstall.sh

Arch/ directories:

- xenserver-6.0/
- xenserver-5.6.0/
- xenserver-5.6-SP2/

Arch/os/ directories:

- elxflashOffline-<version>-<rel>.<arch>.rpm
- elxlinlpcfg-<version>-<rel>.<arch>.rpm

Application installation directory:

- /usr/sbin/linlpcfg

Elxlinlpcfg RPM contents:

- /etc/init.d/elxmilid
- /usr/lib/libdfc.a
- /usr/lib/libdfc.so
- /usr/lib/libdfc.so.X

- /usr/lib/libdfc.so.X.X.X
- /usr/lib/libmili2.so
- /usr/sbin/linlpcfg/linlpcfg
- /usr/sbin/linlpcfg/mili2d

ElxflashOffline RPM contents:

- /usr/sbin/linlpcfg/boot/ - the boot code subdirectory
- /usr/sbin/linlpcfg/firmware/ - the firmware subdirectory
- /usr/sbin/linlpcfg/elxflash - the Offline Adapter Management Utility executable
- /usr/sbin/linlpcfg/fwmatrix.txt - a sample configuration file
- /usr/sbin/linlpcfg/lcreflsh.sh - a sample scripting file
- /usr/sbin/linlpcfg/readme.txt - a readme with usage instructions
- /usr/sbin/linlpcfg/flash - used by the Offline Adapter Management Utility for NCSI firmware download on supported UCNAs

Installing

To install an Offline Adapter Management Utility - Citrix Kit:

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

Example:

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

Upgrading

With an existing Offline Adapter Management Utility - Citrix Kit installation, run the install.sh script to upgrade the ElxflashOffline and Elxlinlpcfg RPMs.

Note: During an upgrade, only the ElxflashOffline and Elxlinlpcfg RPMs are upgraded.

Uninstalling

To uninstall an Offline Adapter Management Utility - Citrix Kit, run the uninstall script located on the root of the installation kit.

Example:

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

Online Adapter Management Utility - Citrix Kit

Package Contents

Kit Name:

- elxflashOnline-tgz-<platforms>-<version>-<rel>.tgz

Dependencies:

- OneCommand Core or Enterprise Kit

Root directory:

- i386/

Arch/ directories:

- xenserver-6.0/
- xenserver-5.6.0/
- xenserver-5.6-SP2/

Arch/os/ directories:

- elxflashOnline -<version>

ElxflashOnline-<version> directory contents:

- boot/ - the boot code subdirectory
- firmware/ - the firmware subdirectory
- elxflash - the Online Adapter Management Utility executable
- fwmatrix.txt - a sample configuration file
- lcreflsh.sh - a sample scripting file
- readme.txt - a readme with usage instructions

Installing

To install an Online Adapter Management Utility - Citrix Kit:

1. Untar the elxflashOnline tar ball that matches the target architecture and operating system.
2. Copy the elxflashOnline-<*version*>-<*rel*> directory to the directory you choose.

   Example:

   ```
   $ tar zxvf elxflashOnline-tgz-<platforms>-<version>-<rel>.tgz
   $ cd elxflashOnline-tgz-<platforms>-<version>-<rel>/<arch>/<os>
   ```

Note: To run the Online Adapter Management Utility, you must install the OneCommand Manager application and the adapter drivers. These components are **not** included in the Online Adapter Management Utility - Citrix Kit.

Upgrading

To upgrade the Online Adapter Management Utility - Citrix Kit, untar the new version and delete the old version.

Uninstalling

To uninstall an Online Adapter Management Utility - Citrix Kit, remove the elxflashOnline-<*platforms*>-<*version*>-<*rel*> directory that was created during installation.

Example:

```
$ rm -rf elxflashOnline-<platforms>-<version>-<rel>
```

Firmware and Boot Code Prefixes

Table 3 provides the Emulex model names, corresponding firmware, and corresponding boot code filename prefixes. Use the Elxflash Model name with the highest protocol as the '*hbatype*' name argument in the string in the fwmatrix.txt file (see Table 4 on page 21).

- The F/W File Prefix column lists the 2 letters that begin the name of the appropriate firmware filename.
- The Boot File Prefix column lists the 2 letters that begin the name of the boot code filename images (xU=Universal boot, xB=x86Boot, xO=OpenBoot, xP=Pair Boot (x86+EFI), xE=EFIBoot).

Table 3: Firmware and Boot Code Prefixes

Emulex Adapter Model	Port Type	F/W File Prefix	Boot File Prefix
LP9802	FC	HD	HU
LP9802DC	FC	HD	HU
LP982	FC	LF	LP
LP1050	FC	MF	MB, MP, ME
LP1050DC	FC	MF	MB, MP, ME
LP10000	FC	TD	TU,TB,TO,TE
LP10000DC	FC	TD	TU,TB,TO,TE
LP11000	FC	BD	BU, BB, BO, BE
LP11002	FC	BF	BU, BB, BO, BE
LP1105	FC	BF	BU, BB, BO, BE
LPe1105	FC	ZF	BU, BB, BO, BE
LP1150	FC	JF	JB, JP, JE
LPe11000	FC	ZD	ZU, ZB, ZO, ZE
LPe11002	FC	ZF	ZU, ZB, ZO, ZE
LPem11002	FC	ZF	ZU, ZB, ZO, ZE
LPe11004	FC	ZF	ZU, ZB, ZO, ZE
LPem11004	FC	ZF	ZU, ZB, ZO, ZE
LPe1150	FC	WF	WB, WP, WE
LPe12000	FC	UD	UU, UB, UO, UE

Table 3: Firmware and Boot Code Prefixes (Continued)

Emulex Adapter Model	Port Type	F/W File Prefix	Boot File Prefix
LPSe12000	FC	FD	FU
LPe12002	FC	UD	UU, UB, UO, UE
LPSe12002	FC	FD	FU
LPem12002	FC	UD	UU, UB, UO, UE
LPe12004	FC	UD	UU, UB, UO, UE
LPe1250	FC	OF	OB, OP, OE
LPe1252	FC	OF	OB, OP, OE
LPe1205	FC	UF	UU,UB, UO, UE
LPe16000	FC	A	N/A
LPe16002	FC	A	N/A
OCe10100	FCoE	oc	N/A
OCe10102	FCoE	oc	N/A
OCe10102	iSCSI	oc	N/A
OCe10102	NIC	oc	N/A
OCe11100	FCoE	oc	N/A
OCe11102	FCoE	oc	N/A
OCe11102	iSCSI	oc	N/A
OCe11102	NIC	oc	N/A

Sample Configuration File

```
// Example FWMATRIX.TXT
//
// This is a tab delimited file forming a table of firmware and boot code
// image file names associated with each HBA type.
//
// Note: All firmware image files are expected to be in the
//       sub-directory named "firmware".
//
// Note: All boot code image files are expected to be in the
//       sub-directory named "boot".
//
// These entries and the actual image filenames are case sensitive.
//
// Note: The HBA types are always Emulex model names.
//
```

// hbatype	firmware	bootcode
LP9802	HD192A1.ALL	HU512A2.PRG
LP9802DC	HF192A1.ALL	HU512A2.PRG
LP982	LF192A1.ALL	LP512A2.PRG
LP1050	MF192A1.ALL	MP512A2.PRG
LP1050DC	MF192A1.ALL	MP512A2.PRG
LP10000	TD192A1.ALL	TU512A2PRG
LP10000DC	TD192A1.ALL	TU512A2.PRG
LP11000	BD282A4.ALL	BU512A2.PRG
LP11002	BF282A4.ALL	BU512A2.PRG
LP1105	BF282A4.ALL	BU512A2.PRG
LP1150	JF282A4.ALL	JP512A2.PRG
LPe11000	ZD282A4.ALL	ZU512A2.PRG
LPe11002	ZF282A4.ALL	ZU512A2.PRG
LPe11004	ZF282A4.ALL	ZU512A2.PRG
LPem11002	ZF282A4.ALL	ZU512A2.PRG
LPem11104	ZF282A4.ALL	ZU512A2.PRG
LPe1105	ZF282A4.ALL	ZU512A2.PRG
LPe1150	WF282A4.ALL	WP512A2.PRG
LPSe12000	FD110A6.ALL	FU512A3.PRG
LPSe12002	FD110A6.ALL	FU512A3.PRG

LPe12000	UD201A2.ALL	UU512A2.PRG
LPe12002	UD201A2.ALL	UU512A2.PRG
LPe12004	UD201A2.ALL	UU512A2.PRG
LPe12202	UD201A2.ALL	UU512A2.PRG
LPe12204	UD201A2.ALL	UU512A2.PRG
LPem12002	UD201A2.ALL	UU512A2.PRG
LPe1205	UF201A2.ALL	UU512A2.PRG
LPe1250	OF200A4.ALL	OP512A2.PRG
LPe1252	OF200A4.ALL	OP512A2.PRG
OCe10100-FCoE	oc10-4.0.253.0.ufi	
OCe10100-iSCSI	oc10-4.0.253.0.ufi	
OCe10100-NIC	oc10-4.0.253.0.ufi	
OCe10100-FCoE	oc10-4.0.253.0.ufi	
OCe11100-iSCSI	oc10-4.0.253.0.ufi	
OCe11100-NIC	oc10-4.0.253.0.ufi	
LPe16000	A1033.GRP	
LPe16002	A1033.GRP	

Emulex Adapter Model Name Equivalents

Table 4: Emulex Adapter Model Name Equivalents

Emulex Model	Elxflash 'hbatype'	Port Type
LP10000	LP10000	FC
LP10000DC	LP10000DC	FC
LP1050	LP1050	FC
LP1050DC	LP1050DC	FC
LP1050EX	LP1050	FC
LPe1150	LPe1150	FC
LPe11002	LPe11002	FC
LPe11004	LPe11004	FC
LP1150	LP1150	FC
LP11002	LP11002	FC
LP1105-HP (Mezzanine)	LP1105	FC
LP1050DC (Mezzanine)	LP1050DC	FC
LPe12000	LPe12000	FC

Table 4: Emulex Adapter Model Name Equivalents (Continued)

Emulex Model	Elxflash 'hbatype'	Port Type
LPe12002	LPe12002	FC
LPe12004	LPe12004	FC
LPe1250	LPe1250	FC
LPe1205 (Mezzanine)	LPe1205	FC
LPe16000	LPe16000	FC
LPe16002	LPe16002	FC
OCe10102	OCe10100-FCoE	FCoE
OCe10102	OCe10100-iSCSI	iSCSI
OCe10102	OCe10100-NIC	NIC
OCe11102	OCe11100-FCoE	FCoE
OCe11102	OCe11100-iSCSI	iSCSI
OCe11102	OCe11100-NIC	NIC

Firmware images are available on the Emulex support site at: http://www.emulex.com.

Note: OneConnect models (FCoE, iSCSI, and NIC) may share the same Emulex model name, but may run different protocols. For example, an Emulex model OCe10102 can be an FCoE, iSCSI, or NIC board.

When the fwmatrix.txt file is used, the Elxflash '*hbatype*' must include the highest protocol being used on that model. An adapter's 'hbatype' can be seen by running the /Query command. For example:

```
# ./elxflash /q
HBA=OCe10100-iSCSI, Port Type=iSCSI, MAC=00-00-c9-5b-3b-99, PCI ID=702,
Firmware=4.0.180.2
HBA=OCe10100-iSCSI, Port Type=iSCSI, MAC=00-00-c9-5b-3b-9b, PCI ID=702,
Firmware=4.0.180.2
HBA=OCe10100-iSCSI, Port Type=NIC, MAC=00-00-c9-5b-3b-98, PCI ID=700,
Firmware=4.0.180.2
HBA=OCe10100-iSCSI, Port Type=NIC, MAC=00-00-c9-5b-3b-9a, PCI ID=700,
Firmware=4.0.180.2
elxflash: Operation complete - Return Code=0
```

The OCe10100 UCNA in the example above is an iSCSI adapter.

Online Adapter Management Utilities Command Line Interface

There are two supported modes for each Adapter Management Utility switch. The first mode relies on the fwmatrix.txt file. It is your responsibility to update the fwmatrix.txt file, firmware and boot code directories with the appropriate firmware and boot code images.

The second mode is auto-discovery. When the /auto switch is used with /ff, /fb, /downgrade, /rewrite or /update, the Adapter Management Utility auto discovers adapters and using the firmware and boot subdirectories, performs the specified operation on each adapter.

Auto-Discovery (/auto)

The auto-discovery switch instructs the Adapter Management Utility to ignore the fwmatrix.txt file, automatically discover local adapters, and perform specified operations (/f, /ff, /fb, /downgrade, /rewrite, or /update) using the firmware and boot directories.

The /auto switch must be used with an additional operational switch, i.e., /f, /ff, /fb, /downgrade, /rewrite, or /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 Adapter Management Utility automatically discovers the best matching firmware for each installed and supported adapter.
- If multiple versions of firmware and/or boot code are found for an adapter, the Adapter Management Utility uses the highest version when performing the firmware download.

Downgrade (/downgrade or /g)

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

Example usage:

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

- The fwmatrix.txt file is ignored. You must place the desired downgrade versions of firmware and/or boot code in their respective directories.
- If the downgrade versions are lower than the currently installed versions on the adapter then the downgrade versions are downloaded to the adapter.
- If multiple downgrade versions of firmware and/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 Adapter Management Utility first tries to match by adapter family and boot type. If a match is not found, the Adapter Management Utility then tries to match by boot type. If matching by boot type and multiple versions of boot code are detected, downgrade always chooses in the following order: Universal (U), Pair (P), Open (O), EFI (E) and x86 (B).

./elxflash /downgrade - Downgrades the firmware and/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 downgrade versions in fwmatrix.txt are lower than the currently installed versions, the downgrade versions of firmware and/or boot code are downloaded to that adapter.

LightPulse 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>
```

FCoE Adapter Download Summary:

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

iSCSI and NIC-only 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 and a non-zero error code for any error.

Note: FCoE, iSCSI, and NIC-only adapters require a system reboot to activate new firmware.

Note: If the preview switch is also used, the Status=<*description*> field is not displayed.

Force Firmware and Boot Code (/f or /ff /fb)

The Force Firmware and Boot Code switch forces a firmware and boot code download to an adapter regardless of the current version on the adapter. When this switch is used, a Force Firmware and Boot Code operation is performed regardless of any additional switches given on the command line.

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 and/or boot code are found for an adapter, the Adapter Management Utility uses the highest versions 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.

LightPulse 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>
```

FCoE Adapter Download Summary:

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

iSCSI and NIC-only 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 and a non-zero error code for any error.

Note: FCoE, iSCSI, and NIC-only adapters require a system reboot to activate new firmware.

Note: If the preview switch is also used, the Status=<description> field is not displayed.

Force Boot Code (/fb)

The Force Boot Code switch forces a boot code download to an adapter regardless of what boot code the adapter currently has installed. When this switch is used, a Force Boot Code operation is performed regardless of any additional 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 Adapter Management Utility uses the highest version when performing the boot code download.

./elxflash /fb - Forces boot code using the fwmatrix.txt file

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

LightPulse 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 and a non-zero error code for any error.

Note: If the preview switch is also used, the Status=<description> field is not displayed.

Force Firmware (/ff)

The Force Firmware switch forces a firmware download to an adapter regardless of what firmware the adapter currently has installed. When this switch is used, a Force Firmware operation is performed regardless of any additional switches given on the command line.

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 Adapter Management Utility uses the highest version when performing the firmware download.

./elxflash /ff - Forces firmware 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.

LightPulse 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>
```

iSCSI and NIC-only 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 and a non-zero error code for any error.

Note: FCoE, iSCSI, and NIC-only adapters require a system reboot to activate new firmware.

Note: If the preview switch is also used, the Status=<description> field is not displayed.

Help (/h or /?)

Usage: /h or /?

The help switch displays a help message detailing instructions on how to use the Adapter Management Utility.

Log (/log)

Usage: /log=<logfile.txt>

The log switch appends the output of the Adapter Management Utility to a text file. Log can be used with any switch.

Preview (/p)

The preview switch provides you with a download preview of all adapters that the Adapter Management 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: force firmware, force boot, downgrade, rewrite, and update. When the preview switch is used, the Adapter Management Utility displays a download summary, but 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 that the Adapter Management Utility would use during an actual download.

Example usage:

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

- The fwmatrix.txt file is ignored. You must place the desired update versions of firmware and/or boot code in their respective directories.
- If the update versions are higher than the currently installed versions on the adapter, the Adapter Management Utility provides a download preview for each adapter that can be updated.
- If multiple update versions of firmware and/or boot code are found for an adapter, the Adapter Management Utility provides a download preview using the highest versions.

./elxflash /preview - Previews an upgrade of firmware and/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 higher than the currently installed versions, the Adapter Management Utility provides a download preview of firmware and/or boot code for each adapter that can be updated.

LightPulse 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
```

FCoE Adapter Download Summary:

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

iSCSI and NIC-only Adapter Download Summary:

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

Query (/q)

Usage: /q

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

LightPulse Adapter Status Summary:

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

FCoE Adapter Status Summary:

```
HBA=<model>, Port Type=<port_type>, WWN =<wwn>, Firmware=<version>,
```

iSCSI and NIC-only Adapter Status Summary:

```
HBA=<model>, Port Type=<port_type>, MAC =<mac_address>, Firmware=<version>,
```

Note: On LightPulse adapters, the query switch only displays boot code version information if the adapter has boot code installed.

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

Ramdrive (/ramdrive) - (Windows Offline Adapter Management Utilities only)

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

The ramdrive switch specifies the drive for creating temporary and log files. The default is drive X.

Remote (/remote) - (Online Adapter Management Utilities only)

Usage: /remote

The remote switch enables updates on remote in-band adapters.

Rewrite (/rewrite or /e)

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

Example usage:

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

- The fwmatrix.txt file is ignored. You must place the desired rewrite versions of firmware and/or boot code in their respective directories.
- If the rewrite versions are higher than or equal to the versions installed on the adapter then the rewrite versions are downloaded to the adapter.
- If multiple rewrite versions of firmware and/or boot code are found for an adapter, the highest versions are downloaded to the adapter.
- When performing the boot code rewrite operation the Adapter Management Utility first tries to match by adapter family and boot type. If a match is not found, the Adapter Management Utility then tries to match by boot type. If matching by boot type and multiple versions of boot code are detected, rewrite always chooses in the following order: Universal (U), Pair (P), Open (O), EFI (E) and x86 (B).

./elxflash /rewrite - Rewrites the firmware and/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 in fwmatrix.txt.
- If the currently installed versions are less than or equal to the rewrite versions in fwmatrix.txt then the rewrite versions of firmware and/or boot code are downloaded to the adapter.

LightPulse 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>
```

FCoE Adapter Download Summary:

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

iSCSI and NIC-only 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 and a non-zero error code for any error.

Note: FCoE, iSCSI, and NIC-only adapters require a system reboot to activate new firmware.

Note: If the preview switch is also used, the Status =<*description*> field is not displayed.

Update (/update)

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

Example usage:

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

- The fwmatrix.txt file is ignored. You must place the desired update versions of firmware and/or boot code in their respective directories.
- If the update versions are higher than the currently installed versions on the adapter then the update versions are downloaded to the adapter.
- If multiple update versions of firmware and/or boot code are found for an adapter, the highest versions are downloaded to the adapter.
- When performing the boot code update operation, the Adapter Management Utility uses the highest boot code version found. Since multiple compatible versions of boot code may exist, the highest version is selected in the following order: Universal (U), Pair (P), Open (O), EFI (E), and x86 (B).

  Note: The highest 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 and/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 higher than the currently installed versions then the update versions of firmware and/or boot code are downloaded to that adapter.

LightPulse 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>
```

FCoE Adapter Download Summary:

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

iSCSI and NIC-only 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 and a non-zero error code for any error.

Note: FCoE, iSCSI, and NIC-only adapters require a system reboot to activate new firmware.

Verbose (/v)

Usage: /v

The verbose switch displays progress messages and can be used with any switch. When this switch is used the following information is displayed:

1. A download summary for all adapters that had successful or failed downloads.
2. A summary of unsupported adapters, if applicable.
3. A per adapter message for each adapter that the Adapter Management Utility did not update.

LightPulse 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>
```

FCoE Adapter Download Summary:

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

iSCSI and NIC-only 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 and a non-zero error code for any error.

Offline Adapter Management Utilities Command Line Interface

The Offline Adapter Management Utilities allow you to configure Emulex adapters before you install or boot a server operating system.

Caution: Under Linux, the Offline Adapter Management Utility is for offline use only. The adapter must not be connected to any device or fabric while the Linux Offline Adapter Management Utility is in use.

The Offline Adapter Management Utilities include:

- winlpcfg - for use with 32-bit and 64-bit, versions of the Microsoft WinPE operating system.
- linlpcfg - for use with Linux RHEL5.5 and above, SLES 10 SP3 and above, and SLES 11 SP1 and above operating systems.

You can use the Offline Adapter Management Utilities to do the following:

- View information on an Emulex adapter
- Reset the adapter
- Download firmware and boot code files
- Select a boot device
- Read and update world wide names (WWNs)
- Enable boot code
- Update configuration regions
- Set the adapter to use soft jumpers
- Run diagnostic tests
- Read and process script files

Command Syntax

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

- *win* for the WinPE Offline Adapter Management Utility commands for use on WinPE machines.
- *./lin* for the Linux Offline Adapter Management Utility commands for use on Linux machines.

The Offline Adapter Management 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, Emulex recommends using linlpcfg (all lowercase) for the Offline Adapter Management Utility commands (for example, ./linlpcfg listhba).

The Offline Adapter Management Utility commands require both:

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

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

  WWN values are reported and specified with two 4-byte hexadecimal words – WWN word 0 (w0) and WWN word 1 (w1). Concatenate the w0 and w1 values to make the full WWN.

Running the Offline Adapter Management Utilities from the Command Prompt

Note: You must start the WinPE and Linux Offline Adapter Management Utilities at the command prompt.

1. Boot the system with a supported operating system.
2. Start the Offline Adapter Management Utility with a valid command or a valid script file name.
   - To start an Offline Adapter Management Utility from the command line, move to the directory where the executable file resides and type:

     `os`lpcfg <*valid command*> (replace *os* with dos, ./lin or win as appropriate)

     - Example, starting the WinPE Offline Adapter Management Utility with a reset command:

       `winlpcfg reset n=2`

     - Example, starting the Linux Offline Adapter Management Utility with a reset command:

       `./linlpcfg reset n=2`

   - To start an Offline Adapter Management Utility with a script file name, from the directory where the `os`lpcfg.exe file resides, type:

     `os`lpcfg @<*script file name*>

     - Example, starting an Offline Adapter Management 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.

Example:
`os`lpcfg listboot n=1 >result.out

Note: For more information on script files, See “Creating Script Files” on page 51 and *Script File Commands* on page 51.

Supported Commands

Table 5 lists all Offline Adapter Management Utility commands supported/not-supported with Emulex traditional LightPulse HBAs and with OneConnect adapters on various platforms.

X indicates commands are supported on both WinLpCfg and LinLpCfg.

L indicates commands are supported only on LinLpCfg.

FCoE only indicates commands are supported only by FCoE CNAs.

Table 5: Supported Commands

	FC Adapters				FCoE, NIC, and iSCSI Adapters			
COMMANDS	**X86**	**X64**	**IA64**	**PPC**	**X86**	**X64**	**IA64**	**PPC**
Operating Systems	RH 5.5+	RH 5.5+	RH 5.5+	RH 5.5+	RH 5.5+	RH 5.5+	RH 5.5+	RH 5.5+
	RH6.0+	RH6.0+		RH6.0+	RH6.0+	RH6.0+		RH6.0+

Table 5: Supported Commands (Continued)

	FC Adapters				FCoE, NIC, and iSCSI Adapters			
COMMANDS	**X86**	**X64**	**IA64**	**PPC**	**X86**	**X64**	**IA64**	**PPC**
	SLES 11.1+	SLES 11.1+	SLES 11.1+	SLES 11.1+	SLES 11.1+	SLES 11.1+	SLES 11.1+	SLES 11.1+
	WinPE 2.x	WinPE 2.x			WinPE 2.x	WinPE 2.x		
Config See Note 7 page 36	x	x	x	L	FCoE only	FCoE only		
DirectDownload See Note 7 page 36	L	L	L	L	N/A	N/A		
DisableBoot	x	x	x	L	N/A	N/A		
disableBootDevice	x	x	x	L	FCoE	FCoE		
DmaTest See Note 1 page 35 See Note 7 page 36	N/A	N/A	N/A	N/A	x	x		
Download See Note 5 page 36	x	x	x	L	x	x		
EnableBoot	x	x	x	L	FCoE	FCoE		
enableBootDevice	x	x	x	L	FCoE	FCoE		
extLoopback See Note 2 page 36	x	x	x	L	x	x		
Help	x	x	x	L	x	x		
intLoopback See Note 3 page 36	x	x	x	L	x	x		
ListBoot	x	x	x	L	N/A	N/A		
listHBA See Note 4 page 36	x	x	x	L	x	x		
listRev	x	x	x	L	FCoE only	FCoE only		
listMAC	N/A	N/A	N/A	N/A	NIC	NIC		
listWWN	x	x	x	L	FCoE only	FCoE only		
logFile	x	x	x	L	x	x		
pciLoopback	x	x	x	L	FCoE only	FCoE only		
postTest See Note 7 page 36	x	x	x	L	N/A	N/A		
personalityInfo	N/A	N/A	N/A	N/A	x	x		
changePersonality	N/A	N/A	N/A	N/A	x	x		
readAltBoot	x	x	x	L	FCoE only	FCoE only		

Table 5: Supported Commands (Continued)

	FC Adapters				FCoE, NIC, and iSCSI Adapters			
COMMANDS	**X86**	**X64**	**IA64**	**PPC**	**X86**	**X64**	**IA64**	**PPC**
readBootDevice	x	x	x	L	FCoE only	FCoE only		
readConfigc	x	x	x	L	FCoE only	FCoE only		
reset	x	x	x	L	FCoE only	FCoE only		
restoreDefWWN	x	x	x	L	FCoE only	FCoE only		
restoreNVWWN	x	x	x	L	FCoE only	FCoE only		
restoreWWN	x	x	x	L	FCoE only	FCoE only		
saveWWN	x	x	x	L	FCoE only	FCoE only		
screenDisplay	x	x	x	L	FCoE only	FCoE only		
scriptVWWNN	x	x	x	L	FCoE only	FCoE only		
scriptVWWPN	x	x	x	L	FCoE only	FCoE only		
scriptWWNN	x	x	x	L	FCoE only	FCoE only		
scriptWWPN	x	x	x	L	FCoE only	FCoE only		
setAltBoot	x	x	x	L	FCoE only	FCoE only		
setBootDevice	x	x	x	L	FCoE only	FCoE only		
Version	x	x	x	L	x	x		
VPD See Note 6 on page 36	x	x	x	L	x	x		
writeWWN	x	x	x	L	FCoE only	FCoE only		

Note: 1

DmaTest is supported on OneConnect adapters only.
Syntax:
DmaTest n=<adapter index> p=<pattern> c=<byte count> r=<repeat count>
p: 3 to 8-HEX byte pattern
c: 64 to 4096
r: 1 to 4096

Note: 2

An external loopback plug is required.
Syntax for OneConnect adapters:
extLoopback n=<adapter index> p=<pattern> c=<byte count> r=<repeat count>
p: 3 to 8-HEX byte pattern
c: 1500 to 8192
r: 1 to 4096

Note: 3

Syntax for OneConnect adapters:
intLoopback n=<adapter index> p=<pattern> c=<byte count> r=<repeat count> t=<type>
p: 3 to 8-HEX byte pattern
c: 1500 to 8192
r: 1 to 4096
t: 2

Note: 4

The listHBA command displays all HBAs installed in the systems, OneConnect adapters included with all basic properties: Serial number, Physical number, Universal CNA type, NIC-Only/iSCSI/FCoE type.

Note: 5

The download command does not support a= <adapter name> with OneConnect adapters.

Note: 6

VPD is supported for the following UCNA functions:
OCe10102, FCoE functions only
OCe11102, FCoE functions, NIC and iSCSI functions

VPD is supported for all Fibre Channel devices.

Note: 7

The Config, DirectDownload, DmaTest and postTest commands are not supported by the LPe16000 or LPe16002 adapters.

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:

download <n=adapter> <i=imagepath>

or

download <a=adaptertype> <i=imagepath>

Resetting an Adapter (reset)

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

Syntax:

- To reset one adapter:
  *os*lpcfg reset n=<*adapter number*>
- To reset all adapters in the system:
  *os*lpcfg reset n=all

Running the Power-On Self-Test (posttest)

This command runs the power-on self-test (POST) on the selected adapter.

- To run the adapter POST test, type:
  *os*lpcfg posttest n=<all/*adapter number*>
- The following example runs the POST test on adapter #1.
  *os*lpcfg posttest n=1

Viewing Adapter Information

Viewing Emulex Conventional Names Instead of Vital Product Data (VPD) (- /c)

Adding a - /c to any command that uses the parameter a= to return adapter data causes the command to return an Emulex conventional model for the adapter rather than the model name in the adapter. The following commands use the -/c operator:

- config
- download
- directdownload

Examples of Emulex conventional model names:

- LPe12000
- LPe11002
- LP10000DC

Example of model names in (usually OEM) VDP data:

- LPe1104-M4

Viewing the Offline Adapter Management Utilities' Version Information (version)

This command shows the Offline Adapter Management Utility's version information.

- To view this information, type:

```
oslpcfg version
```

Viewing Vital Product Data (vpd)

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

- To display VPD, type:

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

- The following examples show VPD output:

  ```
  oslpcfg vpd n=2
  ```

- Sample OCe1110x UCNA with NIC driver response:

  ```
  PN (Part Number):                P2T4M
  SN (Serial Number):              VA14000086
  V1:                              Dell OneConnect P2T4M 1-port PCIe 10GbE NIC
  V2:                              P2T4M
  V4:                              0
  V5:                              OCe11101-NX-D
  ```

- Sample LP adapter response:

  ```
  SN (Serial Number):              VM74941526
  V1:                              Emulex LP11000-M4 4Gb 1port FC: PCI-X2 SFF HBA
  V2:                              LP11000-M4
  V3:                              T2:C3,C8,T3:C1,C2,C3,C5,C6,C7,T6:C3,T7:C3,TB:C3
  V4:
  Command completed, NO Error
  ```

Viewing Boot Device Information, WWN, LUN and Topology (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 #1:

  ```
  oslpcfg readbootdevice n=1
  ```

- Sample response:

  ```
  Boot Device WWN:          104AC6D2  C920A4D6
  Boot Device LUN:          43
  Topology                  Point-to-Point
  Current State:            Enabled
  ```

Note: The readbootdevice command does not read boot device settings for EFI (IA64) adapter boot. This command is supported only for x86 and x86_64 adapter boot configurations. You can modify or show EFI boot settings using hbacmd or from the EFI shell.

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, specified by its number. If the selected adapter does not have any BootBIOS loaded, it returns error code 39.

- To list BootBIOS versions, type:

  *os*lpcfg listboot n=<*adapter number*>

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

  *os*lpcfg listboot n=3

Viewing all Adapters in the System (listhba)

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

- To list all adapters in the system, type:

  *os*lpcfg listhba

- Sample response:

```
HBA 1: FCoE 10000000 C95B3C99 Functional FW: 2.701.126.5 OCe10102-F
HBA 2: FCoE 10000000 C95B3C9B Functional FW: 2.701.126.5 OCe10102-F
HBA 3: 10000000 C95B38CA Functional FW: US1.10N1  LPe12002
HBA 4: 10000000 C95B38CB Functional FW: US1.10N1  LPe12002
HBA 5: 10000000 C951AC67 Functional FW: WS2.50A4  LPe1150-F4
HBA 6: iSCSI  MAC:00.00.c9.5b.3f.f5 devID:702 Port:1 Func:2 Univ:YES
OCe10102-I
HBA 7: iSCSI  MAC:00.00.c9.5b.3f.f7 devID:702 Port:0 Func:3 Univ:YES
OCe10102-I
HBA 8: NIC    MAC:00.00.c9.5b.3f.f4 devID:700 Port:1 Func:0 Univ:YES
OCe10102-I
HBA 9: NIC    MAC:00.00.c9.5b.3f.f6 devID:700 Port:0 Func:1 Univ:YES
OCe10102-I
HBA 10: NIC    MAC:00.00.c9.5b.3c.98 devID:700 Port:1 Func:0 Univ:YES
OCe10102-F
HBA 11: NIC    MAC:00.00.c9.5b.3c.9a devID:700 Port:0 Func:1 Univ:YES
OCe10102-F
Command completed, NO Error!
```

Note: In this example:
HBAs 1,2,10, and 11 are FCoE OneConnect board HBAs.
HBAs 6-9 are iSCSI OneConnect board HBAs.
HBAs 3-5 are LPe boards.

Note: listHBA with option -/c displays the LightPulse HBA conventional model names instead of the model names contained in the VPD.

Viewing 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 scriptwwnn and scriptwwnn commands. For more information on the writewwn command, see *Writing WWN and Updating NVPARMS (writewwn)* on page 43.

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

- To show the WWN information, type:

  `oslpcfg listwwn`

- Sample response:

```
adapter 1:  LPe11002
            Factory IEEE:     10000000     C92774AF
            Non-Volatile WWPN: 10A2A2A2 C92774AF,     WWNN: 20A2A2A2 C92774AF
adapter 2:  LPe11002
            Factory IEEE:     10000000     C92774AE
            Volatile WWPN: 10FFFFFF C92774AE,         WWNN: 20FFFFFF 00000000
adapter 3:  LPe11004-M4
            Factory IEEE:     10000000     C93CCE08
            Non-Volatile WWPN: 10A3A3A3 C93CCE08,     WWNN: 20A3A3A3 C93CCE08
adapter 4:  LPe11004-M4
            Factory IEEE:     10000000     C93CCE09
            Volatile WWPN: 10000000 C93CCE09,         WWNN: 20000000 C93CCE09
```

Viewing MAC Address (listmac)

This command shows the MAC address of a NIC HBA port.

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

  `oslpcfg listmac n=<adapter number>`

- Sample response:

```
adapter 2: NIC Permanent MAC 00-00-c9-5b-3a-f4 MAC 00-00-c9-5b-3a-d2
```

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:

  `oslpcfg listrev n=<adapter number>`

- The following example lists information for adapter #3:

  `oslpcfg listrev n=3`

- Sample response:

```
Chipset Rev:
BIU:                                    1001206D
SM FW:                                  0BC12792
FW Rev:
Current FW:                             SLI-3 Overlay
Kernel Rev:                             FFC01213
Kernel          LP110021.20a3
Init FW:        LP11002Init Load 2.72a2 (BS2.72A2)
SLI-2:          LP11002Overlay 2.72a2 (B2F2.72A2)
SLI-3:          LP11002Overlay 2.72a2 (B3F2.72A2)
FC-PH Version Supported:
Highest FC-PH Version Supported = 4.3
Lowest FC-PH Version Supported = 4.3
Feature Availability = 0000 00ef
```

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.

- To read a configuration, type:

  `oslpcfg readconfig n=<adapter number> r=<region number> l=<byte count>`

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

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

- Sample Response:

```
00000000:  10000000  c93ccce08
00000008:  20000000  c93ccce08
00000010:  00000000
```

Firmware and Boot Code Download Commands

Downloading a File (download)

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

Note: This download command is not supported with CEE firmware (used with LP21002 and LP21000 CNAs).

The adapter name is the name that appears when you run the listHBA command. For more information on the listHBA command, see *Viewing all Adapters in the System (listhba)* on page 39.

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

```
oslpcfg download n=<adapter number> i=<firmware image filename>
```

- The following example downloads the Zb200a1.prg (x86) BootBIOS file to adapter # 6; in this example, the x86 BootBIOS file is for an LPe11000 adapter:

  ```
  oslpcfg download n=6 i=zb200a1.prg
  ```

Accessing the Flash Device Directly (directdownload)

Note: You cannot use directdownload in a script file.

Note: This command does not support a CEE firmware directdownload.

This command directly accesses the flash device on the adapter without using the adapter firmware. This feature is useful in downloading a read-only memory (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 there is only one single-channel adapter or one dual-channel adapter in the system. For more information on the listHBA command, see *Viewing all Adapters in the System (listhba)* on page 39.

You can use this feature on the following Emulex adapters:

- LP21000 and LP21002
- LPe12000, LPe12002 and LPe1250
- LPe11000, LPe11002, LPe1150 and LPe11004
- LP11002, LP11000 and LP1150
- LP10000ExDC and LP1050Ex
- LP10000DC and LP10000
- LP1005DC-CM2
- LP1050 and LP1050DC
- To access the flash device on the adapter directly, type, all on one line:

  ```
  oslpcfg directdownload a=<adapter name/default> i=<firmware image file-
  name> s=<selection 0 or 1>
  ```

  where s=1 saves the existing VPD.
- The following example accesses the flash device on an LPe12000 HBA:

  ```
  oslpcfg directdownload a=lpe12000 i=C:\image\ud100a8.rom s=1
  ```
- The following example accesses the flash device if the offline utilities cannot detect the adapter type and there is only one single-channel adapter or one dual-channel adapter in the system:

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

Caution: In versions prior to 5.1 or with option s=0 in version 5.1: The ROM images used with the directdownload command may 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 may be changed or missing.

Dual-channel adapters include:

- LP21002

- LPe12002
- LPe11002
- LP11002
- LP10000ExDC
- LP10000DC
- LP1050DC
- LP9002DC

Four-channel adapters include:

- LPe11004
- LPe12004

World Wide Name Commands

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 a barcode scanner to update a specified adapter's non-volatile parameters (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.

Write WWN prompts for the WWPN and WWNN cannot be used in a script file. The scriptwwnn and scriptwwpn commands use values entered with the command and can be used in a script file.

Caution: Use the writewwn command with caution. If you use the same WWPN or WWNN on more than one adapter in a fabric, unpredictable results may 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:

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

  The offline utility prompts you to enter a new data:

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

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

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

- (User enters a value)

  ```
  10000000
  ```

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

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

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 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 #4 and saves it to the contents of the ctwwn.sav file:

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

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.

- To restore the WWN, type:

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

- The following example updates the NVPARMS on adapter #4 with the ctwwn.sav file.

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

Restoring NVPARMS (restorenvwwn)

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, an error message appears:

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

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

- To restore the NVWWN, type:

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

- The following example restores the NVWWN on adapter #2.

```
oslpcfg restorenvwwn n=2
```

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.

- To restore the defwwn, type:

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

- The following example restores the defwwn on adapter #2.

```
oslpcfg restoredefwwn n=2
```

Boot Code Commands

You must enable BootBIOS before you can issue setBootDevice and setAltBoot commands. If necessary, use the enableboot command to enable BootBIOS. (See “Configure the system BIOS so the adapter boot device is the highest in the boot order.” on page 45 for more information.)

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

1. Use the listboot command to verify that the BootBIOS is present. (See “Viewing BootBIOS Versions (listboot)” on page 39 for more information.)
2. Use the setbootdevice command to set the boot device. (See “Selecting a Boot Device (setbootdevice)” on page 45 for more information.)

- Example:

  ```
  oslpcfg listboot n=1
  ```

- Sample return:

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

Configure the system BIOS so the adapter boot device is the highest in the boot order.

Enabling or Disabling BootBIOS or boot code (enableboot/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.

- To enable BootBIOS, type:

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

- The following example enables BootBIOS on adapter #6:

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

- To disable BootBIOS, type:

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

- The following example disables BootBIOS on adapter #6:

  ```
  oslpcfg disableboot n=6
  ```

Selecting a Boot Device (setbootdevice)

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

- Set t to 0 for Arbitrated Loop.
- Set t to 1 for Point-to-Point.

The selected device boots when the system reboots.

Note: 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 number in decimal format.

- The following example sets the boot device on adapter #1, LUN #46 with a desired topology of Arbitrated Loop:

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

Note: If port login PLOGI) fails after 50 msecs, the command is retried once.

Note: The setbootdevice command does not configure boot device settings for EFI (IA64) adapter boot. This command is supported only for the x86 and x86_64 adapter boot configuration. You can modify or display EFI boot settings using the EFI shell.

Enabling or Disabling Boot Devices (enablebootdevice/disablebootdevice)

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

- To enable the boot device, type:

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

- To disable the boot device, type:

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

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
  ```

Sample response:

```
Alt Boot 1-
Boot Device WWN:      10000000     C920A4D6
Boot Device LUN:         1

Alt Boot 2-
Boot Device WWN:      10000000     C920A4D8
Boot Device LUN:         4

Alt Boot 3-
Boot Device WWN:      10000000     C920A4DA
Boot Device LUN:         3

Alt Boot 4-
Boot Device WWN:      10000000     C920A4DC
Boot Device LUN:         2

Alt Boot 5-
Boot Device WWN:      10000000     C920A4DE
Boot Device LUN:         1
```

```
Alt Boot 6-
Boot Device WWN:      10000000     C920A4F2
Boot Device LUN:        14

Alt Boot 7-
Boot Device WWN:      00000000     00000000
Boot Device LUN:         0
```

Note: The readaltboot command does not read boot device settings for EFI (IA64) adapter boot. This command is supported only for x86 and x86_64 adapter boot configuration. EFI boot settings can be modified or displayed using hbacmd or from the EFI shell.

Selecting One or More Alternate Boot Devices (setaltboot)

This command sets up alternate boot devices. You can set up to seven alternate boot devices, that is, index i can be from 1 to 7.

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):

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

- The following example set the alternate boot device on adapter #1, LUN #3:

  *os*lpcfg setaltboot n=1 i=1 w0=12345678 w1=a842b6 l=3.

Note: The setaltboot command does not configure boot device settings for EFI (IA64) adapter boot. This command is supported only for x86 and x86_64 adapter boot configuration. EFI boot settings can be modified or displayed using hbacmd or from the EFI shell.

Configuration Commands

Setting the Adapter to Use Soft Jumpers or Hardware Default (jumper)

With this command you can select the default PCI configuration or other configurations. Selections are:

- 0 for none
- 1 for hardware default
- 2 for soft jumpering
  - Alternate regions are 6 or 7 (used only for selection 2, soft jumper).
- To set soft jumpers or the hardware default, type (all on one line):

  *os*lpcfg jumper n=*<adapter number>* s=*<selection>* r=*<alternate region>*.

Note: Parameter r is used only in soft jumpering, that is, when s=2

- The following example sets up adapter #5 to use soft jumpers in region 7:

  *os*lpcfg jumper n=5 s=2 r=7

- The following example selects the default PCI configuration for adapter #4:

  *os*lpcfg jumper n=4 s=1

Updating Configuration Regions (config)

There are two forms of configuration:

- 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.

Update by name

- To update a specified configuration region of 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 *Viewing all Adapters in the System (listhba)* on page 39.

- The following example updates region 6 of all LP11000 adapters with ctplus1.cfl:

  ```
  oslpcfg config a=lp11000 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.

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
  ```

Viewing Personality Information (personalityInfo)

This command displays the current personality and the available personalities.

- To view personality information, type:

  ```
  personalityInfo n=<adapter index>
  ```

  where *adapter index* is obtained from the listHBA command.

- The following example lists the personalityInfo on adapter #3:

  ```
  personalityInfo n=3
  ```

- Sample response:

  ```
  Current Personality: FCoE
  ```

```
Configured Personality: FCoE
Available Personalities:
NIC
iSCSI
FCoE
Command completed, NO Error
```

Changing Personality Information (changePersonality)

This command changes the personality of the adapter to the selected one.

- To change personality, type:

  `changePersonality n=<adapter index> p=<personality string>`

- The following example changes the personality information on adapter #3:

  `changePersonality n=3 p=iSCSI`

- Sample response:

```
Please REBOOT the system now to activate the Personality change
Command completed, NO Error
```

Running Tests

Running the External Loopback Test (extloopback)

This command runs the external loopback test. You must put a loopback plug in each adapter channel 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 for stop
- o=2 for repeat
- o=3 for ignore
- To run the external loopback test on LightPulse adapters, type (all on one line):

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

Note: You must put a loopback plug in each port tested for extloopback.

- To run external loopback test on OneConnect adapters, type (all on one line):

  `extLoopback n=<adapter index> p=<pattern> c=<byte count> r=<repeat count>`

  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 #1 and stops the test if an error occurs:

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

Running the Internal Loopback Test (intloopback)

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 for stop
- o=2 for repeat
- o=3 for ignore

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

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

  *os*lpcfg intloopback n=<adapter number> r=<*repeat count*> o=<*option on error*>

- To run internal loopback test on OneConnect adapters, type (all on one line):

  intLoopback n=<adapter index> p=<pattern> c=<byte count> r=<repeat count> t=<type>

  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 #1 and stops the test if an error occurs:

  *os*lpcfg intloopback n=1 r=100 o=1

Running the PCI Loopback Test (pciloopback)

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 for stop
- o=2 for repeat
- o=3 for ignore
- To run the PCI loopback test, type (all on one line):

  *os*lpcfg 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 occurs.

  *os*lpcfg pciloopback n=all r=100 o=1

Using Script Files

Creating Script Files

You can group commands together and execute 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. The offline utilities allow you to:

- Execute commands entered in a script file. Use the @ command to execute the script file.
- Execute 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” that resides in the current directory and executes all the commands in that script file.

  ```
  oslpcfg @script1.txt
  ```

Note: To interrupt and stop any script, press **<S>** on the keyboard.

Script File Commands

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=lpe11000 i=c:\temp\zd272a2.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=all r=10 o=1
extloopback n=all r=40 o=3
;repeat r=10
```

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 10 times.

```
repeat r=10
```

Enabling or Disabling Test Messages on the Screen (screendisplay)

This command enables or disables test message display 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, 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, all successive commands (download, listboot and enableboot) result messages are output only to the log file, not to the screen.

```
version
listhba
screendisplay o=0
download a=lpe11000 i=c:\temp\zd272a2.all
listboot n=2
enableboot n=2 i=1
```

Updating Non-volatile WWNN (scriptwwnn)

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.

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

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

  `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 #1:

```
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
```

Note: If the scriptvwwnn command has been used previously, the adapter continues to use that WWNN until you change the WWNN with the restorenvwwn command.

Updating Non-volatile WWPN (scriptwwpn)

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).

Caution: Use the scriptwwnn command with caution. If you use the same WWNN on more than one adapter in a fabric, unpredictable results may 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):

  `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 #1:

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

Updating Volatile WWNN (scriptvwwnn)

This command reads the WWNN words 0 and 1 from the command line to update the volatile WWNN. When next discovered, the adapter 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 scriptwwnn commands.

If the adapter does not have firmware that supports the volatile WWN, an 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
```

Note: Once you issue this command, the volatile WWNN is used by the adapter until the restorenvwwn command is issued or the system is restarted.

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

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

  `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 #1:

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

Updating Volatile WWPN (scriptvwwpn)

This command reads the WWPN words 0 and 1 from the command line to update the volatile WWPN. When next discovered, the adapter 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, an 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
```

Note: Once you issue this command, the volatile WWPN is used by the adapter until the restorenvwwn command is issued or the system is restarted.

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

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

  `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 #1:

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

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 use the following command as the first command in your script file, type:

  `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.
- Sample log file:

```
>>>>>>>> Test Script starts on Tue Jul 31 14:52:36 2007>>>>>>>>
listhba
adapter 1:    C96C146D          Functional FW:   WS2.70A5        LPe1150-F4
adapter 2:    C94B0718          Functional FW:   ZS2.72A2        LPe11002-F4

extloopback n=all r=500 o=1
```

```
**Start tests on Adapter 1
Run EXT Loopback
 Pass 500 test(s)
*Complete tests on Adapter 1, NO error

**Start tests on Adapter 2
Run EXT Loopback
 Pass 500 test(s)
*Complete tests on Adapter 2, NO error

intloopback n=all r=500 o=1

**Start tests on Adapter 1
Run INT Loopback
 Pass 500 test(s)
*Complete tests on Adapter 1, NO error

**Start tests on Adapter 2
Run INT Loopback
 Pass 500 test(s)
*Complete tests on Adapter 2, NO error

pciloopback n=all r=500 o=1

**Start tests on Adapter 1
Run PCI Loopback
 Pass 500 test(s)
*Complete tests on Adapter 1, NO error

**Start tests on Adapter 2
Run PCI Loopback
 Pass 500 test(s)
*Complete tests on Adapter 2, NO error

extloopback n=all r=500 o=1

**Start tests on Adapter 1
EXTLB: Error - Link is not UP
Encounter Error, stop all tests
>>>>>>> Test Script stops on Tue Jul 31 14:53:45 2007
```

Offline and Online Adapter Management Utilities Status Messages

```
0 - GOOD_ALL_UPGRADES_OK
1 - GOOD_NO_UPDATES_NEEDED
2 - ERROR_ALL_UPGRADES_FAILED
3 - ERROR_SOME_UPGRADES_FAILED
5 - ERROR_NO_SUPPORTED_HBA_FOUND
6 - ERROR_DIRECTORY_NOT_FOUND
7 - GOOD_NO_UPGRADES_AVAILABLE
```

The Offline Adapter Management Utilities use two methods to compute the return status of a command. The Offline Adapter Management Utilities take a very strict approach when an operation is performed using the fwmatrix.txt file. When an operation is performed using auto-discovery, the Offline Adapter Management Utilities are less stringent.

Status Messages When Using the fwmatrix.txt File

If a supported adapter entry is found in the fwmatrix.txt file, an operation is conducted using the specified firmware and boot code versions. A supported adapter is defined as an adapter with an entry in the fwmatrix.txt file that is recognized by the Offline Adapter Management Utilities. The entry in fwmatrix.txt must match the Offline Adapter Management Utilities internal identification.

0 - GOOD_ALL_UPGRADES_OK. Returned if and only if all the supported adapters had a successful download performed.

1 - GOOD_NO_UPDATES_NEEDED. Returned if and only if the supported adapters did not need an upgrade, downgrade, or rewrite operation.

2 - ERROR_ALL_UPGRADES_FAILED. Returned if all of the supported adapters failed to complete the requested download.

3 - ERROR_SOME_UPGRADES_FAILED. Returned if some of the supported adapters failed to complete the requested download.

4 - ERROR_EMULEX_APPS_NOT_INSTALLED. Returned if the Offline Adapter Management Utilities cannot find HBACMD. This return code applies only to ElxFlashOnline.

5 - ERROR_NO_SUPPORTED_HBA_FOUND. Returned if the installed adapter has no entry in fwmatrix.txt or if the entry in the fwmatrix.txt does not match the Offline Adapter Management Utilities internal identification of the adapter.

Status Messages When Using Auto-Discovery

The Offline Adapter Management Utilities take a less stringent approach to reporting status messages when used with auto-discovery. An error message is returned only when the Offline Adapter Management Utilities report a failure during a download or if the firmware and boot directories cannot be located.

0 - GOOD_ALL_UPGRADES_OK. Returned if one, some or all of the discovered adapters had a successful download performed.

1 - GOOD_NO_UPDATES_NEEDED

a. Returned if one, some or all of the discovered adapters did not need an upgrade, downgrade, or rewrite operation.

b. This should never be returned during a force firmware or force boot code download operation.

2 - ERROR_ALL_UPGRADES_FAILED. Returned if all of the discovered adapters that had a download attempted failed during the operation.

3 - ERROR_SOME_UPGRADES_FAILED. Returned if some of the discovered adapters that had a download attempted failed during the operation.

4 - ERROR_EMULEX_APPS_NOT_INSTALLED. Returned if the Offline Adapter Management Utilities cannot find HBACMD. This return code applies only to ElxFlashOnline.

6 - ERROR_DIRECTORY_NOT_FOUND. Returned if the firmware and/or boot directories are missing. Depending on the operation, auto-discovery expects the firmware and/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 and/or boot directories. In this case only, a matching image is an image that the adapter accepts regardless of the download operation being performed.

Offline Adapter Management Utilities Error Codes

Table 6: Offline Adapter Management Utilities 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

Table 6: Offline Adapter Management Utilities Error Codes (Continued)

Error Code	Description
30	Dump configuration region error
31	Read file error
32	Short file error
33	Read NVPARMS error
34	Write NVPAMRMS error
35	Command does not support all adapters
36	Invalid LUN number
37	No boot (BIOS) code enabled
38	Update configuration region error
39	No boot (BIOS) found
40	Dump memory error
41	Update erasable read-only memory (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 Initialize
62	Unable to allocate memory

Table 6: Offline Adapter Management Utilities Error Codes (Continued)

Error Code	Description
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	Milliservice not started
73	Script not supported
74	Mili not started
75	No NIC adapter
76	Personality information
77	Personality change
78	Administrator rights error
79	SLI4 management error
80	Reboot required
141	General error from Mili
200	General error

Troubleshooting

The Force Firmware (/ff), Force Boot (/fb), and the Force Firmware and Boot Code (/f) switches take precedence over the /downgrade, /upgrade, and /rewrite switches. If /ff, /fb, or /f are used, the /downgrade, /upgrade, 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.

Unsupported Driver

The Offline Adapter Management Utilities output an error similar to the following if an unsupported driver is installed on the system:

```
sh: line 1: 9810 Segmentation fault linlpcfg listhba >./temp.txt
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. The supported drivers and Linux distributions are listed in this document.

Updating Adapters without Boot Code

The Offline Adapter Management Utilities report an adapter's Boot Code version as "NONE" when the adapter does not have boot code installed. The Offline Adapter Management Utilities do not update, downgrade, or rewrite the boot area if boot code is not present, but firmware will still upgrade or downgrade without boot code. You can force a boot code download using auto-discovery or the fwmatrx.txt file.