EMULEX®

Elxflash

Version 5.1

User Manual

Introduction

This document explains how to prepare Elxflash kits for Linux and Windows pre-boot environments.

Elxflash uses a command line interface allowing you to build scripts for automated and unattended firmware and boot code download solutions for Emulex LightPulse™ Host Bus Adapters (HBAs) and OneConnect™ Universal Converged Network Adapters (UCNAs). You can download firmware and boot code on local and remote machines simultaneously.

Elxflash version 5.1 uses auto-discovery (/auto) which relieves you from having to maintain the fwmatrix.txt configuration file. When auto-discovery is invoked, Elxflash 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, Elxflash has 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.

For simplicity, this document refers to HBAs and UCNAs as adapters.

Key Features

Elxflash version 5.1 key features include:

- /auto - Auto-discover adapters and do not use the fwmatrix.txt configuration file.
- /downgrade - Downgrade firmware and/or boot code if the downgrade version is less than the version that is currently installed on an adapter.
- /fb - Force a boot code download on an adapter.
- /ff - Force a firmware download on an adapter.
- /p - Preview a download of firmware and/or boot code.
- /rewrite - Explicitly re-flash 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 - Upgrade firmware and/or boot code if the update version is greater than the version currently installed on an adapter.

Supported Platforms

Table 1: ElxflashOffline

Operating System	X86	X64	PPC64	IA64
WinPE 2.x+	X	X	N/A	N/A
RHEL 5.4+	X	X	L	L
RHEL 6	X	X	L	L
SLES 10.2+	X	X	L	L
SLES 11.0+	X	X	L	L

Table 2: ElxflashOnline

Operating System	X86	X64	PPC64	IA64
W2K3 SP2+	X	X	N/A	N/A
W2K8 SP1+	X	X	N/A	N/A
RHEL 5.4+	X	X	L	L
RHEL 6	X	X	L	L
SLES 10.2+	X	X	L	L
SLES 11.0+	X	X	L	L
ESX 4.0	N/A	X	N/A	N/A

Legend:

X - LightPulse and OneConnect Adapters

L - LightPulse Adapters only

Linux ElxflashOffline 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:

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

iscsi_drivers/arch/ directories:

- rhel-5.4/
- rhel-5.5/
- rhel-5.6/
- sles-10.2/
- sles-10.3/
- sles-11.0/

iscsi_drivers/arch/os/ directories (supported architectures and operating systems only):

- be2iscsi-<version>-<rel>.<arch>.rpm

nic_drivers/ directory:

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

nic_drivers/arch/ directories:

- rhel-5.4/
- rhel-5.5/
- rhel-6.0/
- sles-10.2/
- sles-10.3/
- sles-11.0/
- sles-11.1/

nic_drivers/arch/os/ directories (supported architectures and operating systems only):

- be2net-<version>-<rel>.<arch>.rpm

lpfc_drivers/ directory:

- Rev8.2.0.X/
- Rev8.2.8.X/
- Rev8.3.5.X/

Arch/ directories:

- rhel-5/
- rhel-6/
- sles-10/
- sles-11/
- sles-11-sp1

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/mili2dcontrol
- /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 - used by Elxflash to communicate with the driver
- /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 Elxflash 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 Elxflash for HP UCNA firmware downloads

Installing

To install an ElxflashOffline 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 be2net driver only if a be2net driver RPM is not currently installed.
3. Installs the packaged be2iscsi driver only if a be2iscsi 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 ElxflashOffline 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, be2net, and be2iscsi driver RPMs are not upgraded.

Uninstalling

To uninstall an ElxflashOffline 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 be2net drivers.
4. ./uninstall.sh -s - Uninstall ElxflashOffline, Elxlinlpcfg, and be2iscsi drivers.
5. ./uninstall.sh -u - Uninstall ElxflashOffline, Elxlinlpcfg, be2net, be2iscsi, and lpfc drivers.
6. ./uninstall.sh -h - Display a summary of all available switches.

Example:

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

Linux ElxflashOnline Kit

Package Contents

Kit Name:

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

Dependencies:

- Libnl

Root directory:

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

Arch/ directories:

- rhel-5/
- rhel-6/
- sles-10/
- sles-11/
- sles-11-sp1/

Arch/os/ directories:

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

ElxflashOnline tgz contents:

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

Installing

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

Note: To run Elxflash, you must install the OneCommand Manager application and the adapter drivers. These components are not included in the ElxflashOnline Kit.

Upgrading

With an existing ElxflashOnline installation, run the install.sh script to upgrade the ElxflashOnline RPM.

Note: During an upgrade, only the ElxflashOnline RPM is upgraded. Existing lpfc, be2net, be2iscsi, and OCManager RPMs are not upgraded.

Uninstalling

To uninstall an ElxflashOnline Kit, remove the elxflashOnline-<platforms>-<version>-<rel> directory that was created during installation.

Example:

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

Linux ElxflashOffline Inbox NIC Kit

Package Contents

Kit Name:

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

RHEL 5.4 Dependencies:

- DUP (Driver Update Package) 2.101.377r be2net driver
- pciutils
- pciutils-devel
- ethtool

RHEL 5.5 Dependencies:

- inbox be2net driver
- pciutils
- pciutils-devel
- ethtool

RHEL 6 Dependencies:

- inbox be2net driver
- pciutils
- pciutils-libs
- ethtool

SLES 11 SP1 Dependencies:

- inbox be2net driver
- pciutils
- ethtool

Root directory:

- i386/
- x86_64/
- ppc64/

Arch/ directories:

- rhel-5/
- rhel-6
- sles-11-sp1/

Arch/os/ directories:

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

ElxflashOffline RPM contents:

- firmware/ - the firmware subdirectory
- elxflash - the Elxflash executable

- fwmatrix.txt - a sample configuration file
- lcreflsh.sh - a sample scripting file
- readme.txt - a readme with usage instructions

Installing

To install an ElxflashOffline Kit:

1. Untar the ElxflashOffline tar ball.
2. Execute an RPM install of the RPM that matches the target architecture and operating system.

Example:

```
$ tar zxvf elxflashOffline_inbox_NIC-<platforms>-<version>-<rel>.tgz
$ cd elxflashOffline-<platforms>-<version>-<rel>/<arch>/<os>
$ rpm -iv elxflashOffline-<version>-<rel>.<arch>.rpm
```

Upgrading

To upgrade an ElxflashOffline Kit:

1. Untar the ElxflashOffline tar ball.
2. Execute an RPM upgrade of the RPM that matches the target architecture and operating system.

Example:

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

Uninstalling

To uninstall an ElxflashOffline Kit, uninstall the RPM.

Example:

```
$ rpm -ev elxflashOffline-<version>-<rel>
```

VMware ElxflashOnline 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 Elxflash executable
- fwmatrix.txt - a sample configuration file
- lcreflsh.sh - a sample scripting file
- readme.txt - a readme with usage instructions

Installing

To install an ElxflashOnline 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 Elxflash, you must install the OneCommand Manager application Core Kit for ESX 4.0 and the adapter drivers. These components are not included in the ElxflashOnline Kit.

Uninstalling

To uninstall an ElxflashOnline Kit, delete the installation directory.

Example:

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

Windows ElxflashOffline Kit

Package Contents

Kit Name:

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

Root directory:

- setupElxAll-x64
- setupElxAll-x86

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\ - Contains the FCoE, iSCSI, and NIC drivers
- X:\Program Files\Emulex\Util\elxApp\elxflash.exe - the Elxflash 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 ElxflashOffline Kit:

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

The following components will be installed:

- The LightPulse drivers
- The OneConnect FCoE, iSCSI and NIC drivers
- WinLpCfg
- Elxflash

Upgrading

With an existing ElxflashOffline installation, run the Offline-WinPE-<arch>-<version>-<rel>.exe. The installer will uninstall the existing version and then install the updated version.

Uninstalling

Run the Uninstall.exe located in: X:\Program Files\Emulex\Util\elxApp

Windows ElxflashOnline Kit

Package Contents

Kit Name:

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

Root directory:

- elxflashOnline-windows-x64/
- elxflashOnline-windows-x86/

ElxflashOnline directory contents:

- boot\ - the boot code subdirectory
- firmware\ - the firmware subdirectory
- elxflash.exe - the elxflash executable

- fwmatrix.txt - a sample configuration file
- lcreflsh.bat - a sample batch file
- readme.txt - a readme with usage instructions

Installing

To install an ElxflashOnline Kit:

1. Unzip the elxflashOnline-windows-<version>-<rel>.zip file.
2. Copy the elxflashOnline-windows-<arch>-<version> directory to the directory you choose.

Note: To run Elxflash, you must install the OneCommand Manager application and the adapter drivers. These components are not included in the ElxflashOnline Kit.

Upgrading

With an existing ElxflashOnline installation, run the elxocmcore-windows-<version>-<rel>.exe. The installer uninstalls the existing version and then installs the updated version. Replace the previous ElxflashOnline directory with the new version.

Uninstalling

To uninstall an ElxflashOnline Kit, remove the elxflashOnline-windows-<arch>-<version>-<rel> directory that was created during installation.

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 as the 'hbatype' name argument in the string in the fwmatrix.txt file. 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
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
LP1150	FC	JF	JB, JP, JE
LPe11000	FC	ZD	ZU, ZB, ZO, ZE
LPe11002	FC	ZF	ZU, ZB, ZO, ZE

Table 3: Firmware and Boot Code Prefixes (Continued)

Emulex Adapter Model	Port Type	F/W File Prefix	Boot File Prefix
LPe1150	FC	WF	WB, WP, WE
LPe12000	FC	UD	UU, UB, UO, UE
LPe12002	FC	UD	UU, UB, UO, UE
LPe1250	FC	OF	OB, OP, OE
LPe1205	FC	UF	UU,UB, UO, UE
OCE10102	FCoE	S	N/A
OCE10102	iSCSI	S	N/A
OCE10102	NIC	S	N/A
OCE11102	FCoE	T	N/A
OCE11102	iSCSI	T	N/A
OCE11102	NIC	T	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".
//
// Note: The firmware and boot code file names must follow the Emulex
//       naming convention:
// <2 letter type code><major version digit><2 digit minor version>
// <1 letter release code><optional sub-version>.<extension>
//
//
// 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	HU503A2.PRG
LP9802DC	HF192A1.ALL	HU503A2.PRG
LP982	LF192A1.ALL	LP503A2.PRG
LP1050	MF192A1.ALL	MP503A4.PRG
LP1050DC	MF192A1.ALL	MP503A4.PRG
LP10000	TD192A1.ALL	TU503A4.PRG
LP10000DC	TD192A1.ALL	TU503A4.PRG
LP11000	BD282A3.ALL	BU503A4.PRG
LP11002	BF282A3.ALL	BU503A4.PRG
LP1150	JF282A3.ALL	JP503A4.PRG
LPe11000	ZD282A3.ALL	ZU503A4.PRG
LPe11002	ZF282A3.ALL	ZU503A4.PRG
LPe1150	WF282A3.ALL	WP503A2.PRG
LPe12000	UD111A5.ALL	UU503A4.PRG
LPe12002	UD111A5.ALL	UU503A4.PRG

LPe1250	OF111A5.ALL	OP503A4.PRG
LPe1205	UF111A5.ALL	UU503A4.PRG
OCE10102-FCoE	S1298000.UFI	
OCE10102-iSCSI	S1298000.UFI	
OCE10102-NIC	S1298000.UFI	
OCE11102-FCoE	T2298000.UFI	
OCE11102-iSCSI	T2298000.UFI	
OCE11102-NIC	T298000.UFI	

Emulex Adapter Model Name Equivalence

Table 4: Emulex Adapter Model Name Equivalence

Emulex Model	Elxflash 'hbatype'	Port Type
LP10000	LP10000	FC
LP10000DC	LP10000	FC
LP1050	LP1050	FC
LP1050DC	LP1050	FC
LP1050EX	LP1050	FC
LPe1150	LPe1150	FC
LPe11002	LPe11002	FC
LPe11004	LPe11004	FC
LP1150	LP1150	FC
LP11002	LP11002	FC
LP1105-HP	LPe12000	FC
LP1050DC (Mezzanine)	LP1050	FC
LPe12000	LPe12000	FC
LPe12002	LPe12002	FC
LPe12004	LPe12004	FC
LPe1250	LPe1250	FC
LPe1205 (Mezzanine)	LPe1205	FC
OCE10102	OCE10102-FCoE	FCoE
OCE10102	OCE10102-iSCSI	iSCSI
OCE10102	OCE10102-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=OCE10102-iSCSI, Port Type=iSCSI, MAC=00-00-c9-5b-3b-99, PCI ID=702,
Firmware=193011
HBA=OCE10102-iSCSI, Port Type=iSCSI, MAC=00-00-c9-5b-3b-9b, PCI ID=702,
Firmware=193011
HBA=OCE10102-iSCSI, Port Type=NIC, MAC=00-00-c9-5b-3b-98, PCI ID=700,
Firmware=193011
HBA=OCE10102-iSCSI, Port Type=NIC, MAC=00-00-c9-5b-3b-9a, PCI ID=700,
Firmware=193011
elxflash: Operation complete - Return Code=0
```

The OCE10102 shown above is an iSCSI adapter.

Elxflash Command Line Interface

There are two supported modes for each Elxflash switch. The first method 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 method is auto-discovery. When the /auto switch is used with /ff, /fb, /downgrade, /rewrite or /update, Elxflash 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 Elxflash 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 - Update the firmware and boot code using the firmware and boot directories.

1. The fwmatrix.txt file is ignored. You must place the desired versions of firmware in the firmware directory.
2. Using the firmware subdirectory, Elxflash automatically discovers the best matching firmware for each installed and supported adapter.
3. If multiple versions of firmware and/or boot code are found for an adapter, Elxflash 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 /update or /rewrite.

Example usage:

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

1. The fwmatrix.txt file is ignored. You must place the desired downgrade versions of firmware and/ or boot code in their respective directories.
2. If the downgrade versions are lower than the currently installed versions on the adapter then the downgrade versions are downloaded to the adapter.
3. If multiple downgrade versions of firmware and/or boot code are found for an adapter, the next-previous downgrade versions will be downloaded to the adapter.
4. When performing the boot code downgrade operation Elxflash first tries to match by adapter family and boot type. If a match is not found Elxflash then tries to match by boot type. If 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 - Downgrade the firmware and/or boot code using the fwmatrix.txt file.

1. For each installed and supported adapter, the current firmware and boot code versions are compared with the versions specified in fwmatrix.txt.
2. If the downgrade versions in fwmatrix.txt are lower than the currently installed versions then 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 - Force a firmware and boot code download using auto-discovery.

1. The fwmatrix.txt file is ignored. You must place the desired versions of firmware and boot code in their respective directories.

2. If multiple versions of firmware and/or boot code are found for an adapter, Elxflash uses the highest versions when performing the firmware and boot code downloads.

./elxflash /f - Force a firmware and boot code download using the fwmatrix.txt file.

1. For each installed and supported adapter, force 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 will be performed regardless of any additional switches given on the command line.

Example usage:

./elxflash /fb /auto - Force a boot code download using auto-discovery.

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

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

1. For each installed and supported adapter, force 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 - Force a firmware download using auto-discovery.

1. The fwmatrix.txt file is ignored. You must place the desired versions of firmware in the firmware directory.
2. If multiple versions of firmware are found for an adapter, Elxflash uses the highest version when performing the firmware download.

./elxflash /ff - Force firmware using the fwmatrix.txt file.

1. For each installed and supported adapter, force 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 Elxflash.

Log (/log)

Usage: /log=<logfile.txt>

The log switch appends the output of Elxflash 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 Elxflash 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, Elxflash displays a download summary, but it will not actually perform the download.

Each adapter's download preview will display 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 Elxflash would use during an actual download.

Example usage:

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

1. The fwmatrix.txt file is ignored. You must place the desired update versions of firmware and/or boot code in their respective directories.
2. If the update versions are higher than the currently installed versions on the adapter, Elxflash provides a download preview for each adapter that can be updated.

3. If multiple update versions of firmware and/or boot code are found for an adapter, Elxflash provides a download preview using the highest versions.

./elxflash /preview - Preview an upgrade of firmware and/or boot code using the fwmatrix.txt file.

1. For each installed and supported adapter, the current firmware and boot code versions are compared with the versions specified in fwmatrix.txt.

2. If the update versions in fwmatrix.txt are higher than the currently installed versions, Elxflash 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 ElxflashOffline only)

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

The ramdrive switch is used to specify the drive for creating temporary and log files. The default is drive X.

Remote (/remote) - (ElxflashOnline only)

Usage: /remote

The remote switch is used to enable 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 - Rewrite the firmware and/or boot code using auto-discovery.

1. The fwmatrix.txt file is ignored. You must place the desired rewrite versions of firmware and/or boot code in their respective directories.
2. 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.
3. If multiple rewrite versions of firmware and/or boot code are found for an adapter, the highest versions are downloaded to the adapter.
4. When performing the boot code rewrite operation Elxflash first tries to match by adapter family and boot type. If a match is not found, Elxflash then tries to match by boot type. If 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 - Rewrite the firmware and/or boot code using the fwmatrix.txt file.

1. For each installed and supported adapter, the current firmware and boot code versions are compared with the versions in fwmatrix.txt.
2. 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 - Upgrade the firmware and/or boot code using auto-discovery.

1. The fwmatrix.txt file is ignored. You must place the desired update versions of firmware and/or boot code in their respective directories.

2. If the update versions are higher than the currently installed versions on the adapter then the update versions are downloaded to the adapter.

3. If multiple update versions of firmware and/or boot code are found for an adapter, the highest versions are downloaded to the adapter.

4. When performing the boot code update operation Elxflash first ties to match by adapter family and boot type. If a match is not found Elxflash 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 /update - Upgrade the firmware and/or boot code using the fwmatrix.txt file.

1. For each installed and supported adapter, the current firmware and boot code versions are compared with the versions specified in fwmatrix.txt.

2. 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 status message for each adapter that Elxflash 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.

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
```

Elxflash uses two methods to compute the return status of a command. Elxflash will take a very strict approach when an operation is performed using the fwmatrix.txt file. When an operation is performed using auto-discovery, Elxflash is 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 Elxflash. The entry in fwmatrix.txt must match Elxflash's 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 Elxflash 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 Elxflash's internal identification of the adapter.

Status Messages When Using Auto-Discovery

Elxflash takes a less stringent approach to reporting status messages when used with auto-discovery. An error message is returned only when Elxflash reports 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, down-grade, 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 Elxflash 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 will accept regardless of the download operation being performed.

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. Perform a Force Firmware operation on all installed and supported adapters.

2. ./elxflash /fb /update

    a. /update is ignored.

    b. Perform a Force Boot Code operation on all installed and supported adapters.

3. ./elxflash /ff /downgrade

    a. /downgrade is ignored

    b. Perform a Force Firmware operation on all installed and supported adapters.

4. /elxflash /fb / downgrade

    a. /downgrade is ignored.

    b. Perform a Force Boot Code operation on all installed and supported adapters.

5. ./elxflash /ff /rewrite

    a. /rewrite is ignored

    b. Perform a Force Firmware operation on all installed and supported adapters.

6. ./elxflash /fb / rewrite

    a. /rewrite is ignored.

    b. Perform a Force Boot Code operation on all installed and supported adapters.

Unsupported Driver

Elxflash will 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

Elxflash reports an adapter's Boot Code version as "NONE" when the adapter does not have boot code installed. Elxflash will 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.