# Emulex® Brcmflash and LpCfg Management Utilities for OneConnect® Adapters

User Guide

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# Chapter 1: Introduction

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

## 1.1 Brcmflash Offline Kit

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

The Brcmflash Offline kit includes:

- brcmlinlpcfg and brcmflash for FreeBSD
- brcmlinlpcfg and brcmflash for Linux
- brcmwinlpcfg and brcmflash for Windows

The brcmwinlpcfg and the brcmlinlpcfg are management utilities for adapter configuration and diagnostics for Windows and Linux, respectively. brcmlinlpcfg is also used for the FreeBSD operating system. The LpCfg utility can also download firmware, but you must manually select the adapters to be updated.

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

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

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

## 1.2 Brcmflash Utility

The Brcmflash utility uses a command line interface allowing you to build scripts for automated and unattended firmware and boot code download solutions for Emulex OneConnect® CNAs in production systems. You can also download firmware and boot code on local and remote machines simultaneously.

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

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

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

If you do not want to use auto-discovery, the Brcmflash utility can update the firmware or boot code of an adapter using the `fwmatrix.txt` configuration file. When using the `fwmatrix.txt` file, you must update each supported

adapter's type, firmware, and boot code entries and place the corresponding firmware and boot code images into their respective directories. The `fwmatrix.txt` file enables all operations that are used with auto-discovery.

## 1.3 Command Syntax

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

- **./brcmlin** – for the Linux LpCfg utility commands, for use on Linux and FreeBSD machines.
- **brcmwin** – for the WinPE LpCfg utility commands, for use on WinPE machines.

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

The LpCfg utility commands use both:

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

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

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

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

## 1.4 Supported Platforms

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

## 1.5 Abbreviations

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

# Chapter 2: Installation

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

## 2.1 Platform Prerequisites

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

### 2.1.1 Linux

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

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

#### 2.1.1.1 Brcmflash Offline and Brcmflash Standalone Kits

The following software must be installed to run the utility.

- libnl
- ethtool
- lspci
- libsysfs (optional)

### 2.1.2 FreeBSD

The FreeBSD platform uses additional software, such as libraries, to run the Brcmflash utilities. These prerequisites are listed below and are provided by the operating system.

- libstdc++
- libm
- libc
- libgcc

**NOTE** BASH is required to run the install and uninstall scripts. If it is not installed, you must install the BASH package, which is part of the FreeBSD distribution.

## 2.2 Installing the Brcmflash Offline Kit for Linux

The Brcmflash Offline kit for Linux uses an install script to install the brcmflash and linlpcfg utilty RPM packages. The install script determines the correct architecture and distribution, and it updates the existing Brcmflash Offline and

Brcmlinlpcfg RPM packages. If there are no existing Brcmflash Offline or Brcmlinlpcfg RPM packages, the install script installs the packaged Brcmflash Offline and Brcmlinlpcfg RPM packages.

To install the Brcmflash Offline Kit for Linux:

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

Example:

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

### 2.2.1 Updating

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

### 2.2.2 Uninstalling

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

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

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

Example:

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

## 2.3 Installing the Brcmflash Offline Kit for Windows PE

To install the Brcmflash Offline kit for Windows PE:

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

The following components are installed:

- Storport CNA driver
- OneConnect iSCSI and NIC drivers
- brcmwinlpcfg – Brcmflash Offline

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

### 2.3.1 Updating

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

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

### 2.3.2 Uninstalling

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

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

## 2.4 Extracting the Driver Files from the Brcmflash Offline Kit for Windows

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

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

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

To extract the drivers from the Brcmflash Offline kit for Windows, perform the following steps:

1. In GUI Mode:
   a. Run the installer.
   b. From the Installation Options screen, select **Extract All Drivers**, and deselect **Install brcmApp_Drivers (64-bit)**.
   c. Click **Install** to continue.
2. In Silent Mode, from the command line, type:
   ```
   start/wait SetupBrcmAll-x64.exe/q2 extract=2
   ```

**NOTE** Values for the *extract* parameter are:

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

## 2.5 Extracting the Brcmflash Standalone Kit for Linux, Windows, and VMware

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

- boot\

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

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

```
# dir

07/05/2012  07:02 PM    <DIR>          .
07/05/2012  07:02 PM    <DIR>          ..
07/02/2012  03:14 PM    <DIR>          boot
07/02/2012  03:14 PM    <DIR>          firmware
07/02/2012  03:15 PM    <DIR>          win
```

The Brcmflash Standalone kits for Linux have the same dependencies as the Brcmflash Offline kits. See Section 2.1, Platform Prerequisites.

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

**NOTE** To manage OneConnect adapters, you must install the operating system-specific NIC, iSCSI, and FCoE drivers.

## 2.6 Installing the Brcmflash Offline Kit for FreeBSD

The Brcmflash Offline kit installation for FreeBSD uses an install script. The install script determines the correct architecture and distribution and performs the following operations:

- Installs the Brcmflash utility and linlpcfg
- Temporarily mounts `/proc`

**NOTE** For security reasons, `/proc` is not mounted by default; however, you must mount `/proc` to run Brcmflash and linlpcfg. Verify that `/proc` is mounted before running Brcmflash or linlpcfg.

To install the Brcmflash Offline kit for FreeBSD:

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

For example:

```
# tar xvf brcmflashOffline-FreeBSD-<version>-<rel>.tgz
# cd brcmflashOffline-FreeBSD-<version>-<rel>
# ./install.sh
```

### 2.6.1 Updating

To update the Brcmflash Offline kit for FreeBSD, uninstall the old version and then unzip the new version.

### 2.6.2 Uninstalling

To uninstall the Brcmflash Offline kit for FreeBSD:

Run the uninstall script located in the root directory of the installation kit.

For example:

```
# cd brcmflashOffline-FreeBSD-<version>-<rel>
# ./uninstall.sh
```

## 2.7 Firmware and Boot Code

**NOTE** If a secure version of firmware (version 11.0 or later) is installed on an OCe14000B-series adapter and you want to update to an earlier, unsecure version of firmware, you must remove the secure firmware jumper block before performing the update. See the installation manual for the adapter for more information.

Firmware images are available on the Broadcom® support site at http://www.broadcom.com. All firmware image files are expected to be in the sub-directory named *firmware*.

**NOTE** OneConnect models (FCoE, iSCSI, and NIC) might share the same Emulex model names, but they can run different protocols. For example, an OCe14000B-series adapter can be an FCoE, iSCSI, or NIC CNA.

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

**NOTE** On an FCoE/NIC adapter, the highest protocol is FCoE. On an iSCSI/NIC adapter, the highest protocol is iSCSI. Ensure that there are no spaces in the fwmatrix.txt model name to avoid a firmware update failure.

For example:

```
# ./brcmflash /q
HBA=OCe11100-iSCSI, Port Type=iSCSI, MAC=00:00:C9:AD:AD:21, PCI ID=712, VID=19A2,
SSID=E702, SVID=10DF, Firmware=4.0.493.0, Boot Code=2.0.21.768
HBA=OCe11100-iSCSI, Port Type=iSCSI, MAC=00:00:C9:AD:AD:25, PCI ID=712, VID=19A2,
SSID=E702, SVID=10DF, Firmware=4.0.493.0, Boot Code=2.0.21.768
HBA=OCe11100-iSCSI, Port Type=NIC, MAC=00:00:C9:AD:AD:20, PCI ID=710, VID=19A2,
SSID=E702, SVID=10DF, Firmware=4.0.493.0, Boot Code=2.0.21.768
HBA=OCe11100-iSCSI, Port Type=NIC, MAC=00:00:C9:AD:AD:24, PCI ID=710, VID=19A2,
SSID=E702, SVID=10DF, Firmware=4.0.493.0, Boot Code=2.0.21.768
brcmflash.exe: All required queries succeeded - Return Code=0
```

**NOTE** The OCe11100 CNA in the example above is an iSCSI adapter, which has the Brcmflash model name of OCe11100-iSCSI.

# Chapter 3: Brcmflash Utility Command Line Interface

Two supported modes for each Brcmflash utility switch are available. The first mode relies on the `fwmatrix.txt` file. It is your responsibility to update the firmware directories with the appropriate `firmware/boot` code images.

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

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

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

## 3.1 Auto-Discovery (/auto)

Usage: `/auto`

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

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

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

Example usage:

`./brcmflash /auto /update` – Updates the firmware/boot code using the `firmware` directory.

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

## 3.2 Downgrade (/downgrade or /g)

Usage: `/downgrade or /g`

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

**NOTE** If a secure version of firmware (version 11.0 or later) is installed on an OCe14000B-series adapter and you want to update to an earlier, unsecure version of firmware, you must remove the secure firmware jumper block before performing the update. Refer to the installation manual for the adapter for more information.

Example usage:

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

- The `fwmatrix.txt` file is ignored. You must place the desired downgrade version of firmware/boot code in the firmware directory.
- If the downgrade version is older than the currently installed version on the adapter, then the downgrade versions are downloaded to the adapter.
- If multiple downgrade versions of firmware/boot code are found for an adapter, the next-previous downgrade version is downloaded to the adapter.

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

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

### 3.2.1 FCoE Adapter Download Summary

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

### 3.2.2 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 or a non-zero error code for any error.

**NOTE** To activate new firmware, perform a system reboot.
If the preview switch is used, the `Status=`<*description*> field displays `Preview`.

## 3.3 Force Firmware and Boot Code (/f)

Usage: `/f`

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

**NOTE** If a secure version of firmware (version 11.0 or later) is installed on an OCe14000B-series adapter and you want to force an update to an earlier, unsecure version of firmware, you must remove the secure firmware jumper block before performing the update. See the installation manual for the adapter for more information.

Example usage:

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

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

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

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

### 3.3.1 FCoE Adapter Download Summary

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

### 3.3.2 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 or a non-zero error code for any error.

**NOTE** To activate new firmware, perform a system reboot.

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

## 3.4 Force Firmware (/ff)

Usage: `/ff`

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

**NOTE** If a secure version of firmware (version 11.0 or later) is installed on an OCe14000B-series adapter and you want to update to an earlier, unsecure version of firmware, you must remove the secure firmware jumper block before performing the update. See the installation manual for the adapter for more information.

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

Example usage:

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

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

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

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

### 3.4.1 FCoE Adapter Download Summary

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

### 3.4.2 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 or a non-zero error code for any error.

**NOTE** To activate new firmware, perform a system reboot.

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

## 3.5 Firmware Matrix Directory Change (/fmd)

Usage: `/fmd=<directory>`

The `/fmd` (firmware matrix directory change) switch changes the location of the base directory in which `fwmatrix.txt` is located.

## 3.6 Firmware Flash Override (/fo)

Usage: `/fo`

The `/fo` switch is used to run a firmware download using the flash executable file on supported CNAs.

**NOTE** The flash override switch applies to Linux Brcmflash Offline and Brcmflash Standalone utilities only.

Example usage:

`./brcmflash /f /auto /fo` – Forces a firmware/boot code download using auto-discovery, and downloads the firmware to supported CNAs using the flash executable file.

- The `fwmatrix.txt` file is ignored. The desired version of firmware/boot code must be placed in the `firmware` directory.
- If multiple versions of firmware/boot code are found for an adapter, Brcmflash uses the most recent versions when performing the firmware/boot code downloads.
- The flash executable file is used to download firmware to supported CNAs.

`./brcmflash /f /fo` – Forces a firmware/boot code download using the `fwmatrix.txt` file, and downloads the firmware to supported CNAs using the flash executable file.

- For each installed and supported adapter, a forced download of firmware/boot code occurs using the versions specified in the `fwmatrix.txt` file.
- The flash executable file is used to download firmware to supported CNAs.

## 3.7 Help (/h or /?)

Usage: `/h or /?`

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

## 3.8 Image Directory Change (/id)

Usage: `/id=<image_directory>`

The `/id` switch is used to specify the location of the `firmware` directory.

Example usage:

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

- Brcmflash looks for the `firmware` directory in the `/tmp` directory.
- The `fwmatrix.txt` file is ignored. The desired version of firmware/boot code must be placed in the `firmware` directory.
- If multiple versions of firmware/boot code are found for an adapter, Brcmflash uses the most recent version when performing the firmware/boot code downloads.

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

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

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

## 3.9 Image Version Display (/iv)

Usage: `/iv=<image file>`

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

Example usage:

```
./brcmflash /iv=firmware/oc14-

11.2.123.45.ufi
11.2.123.45
```

### 3.9.1 Log(/log)

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

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

## 3.10 Preview (/p)

Usage: `/p`

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

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

When the /p switch is used, the Brcmflash utility displays a download summary, but it does not actually perform the download.

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

Example usage:

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

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

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

- For each installed and supported adapter, the current firmware/boot code version is compared to the version specified in `fwmatrix.txt`.
- If the update version in `fwmatrix.txt` is more recent than the currently installed version, the Brcmflash utility provides a download preview of firmware/boot code for each adapter that can be updated.

### 3.10.1 FCoE Adapter Download Summary

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

### 3.10.2 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
```

## 3.11 Query (/q)

Usage: `/q`

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

Example usage:

```
C:\brcmflashStandalone-windows-10.0.567.22-1\win>brcmflash.bat /q
```

### 3.11.1 FCoE Adapter Status Summary

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

### 3.11.2 iSCSI and NIC Adapter Status Summary

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

**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`.

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

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

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

## 3.13 Rewrite (/rewrite or /e)

Usage: `/rewrite -or- /e`

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

Example usage:

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

- The `fwmatrix.txt` file is ignored. You must place the desired rewrite versions of firmware/boot code in the `/tmp/firmware` directory.
- If the rewrite version is more recent than, or the same as, the versions installed on the adapter, the rewrite version is downloaded to the adapter.
- If multiple rewrite versions of firmware/boot code are found for an adapter, the most recent version is downloaded to the adapter.

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

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

### 3.13.1 FCoE Adapter Download Summary

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

### 3.13.2 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 or a non-zero error code for any error.

**NOTE** To activate new firmware, perform a system reboot.
If the preview switch is also used, the `Status =<description>` field displays `Preview`.

## 3.14 Silent (/s)

Usage: `/s`

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

Example usage:

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

- The `fwmatrix.txt` file is ignored. The desired versions of firmware/boot code must be placed in the firmware directory.
- If multiple versions of firmware/boot code are found for an adapter, Brcmflash uses the most recent version when performing the firmware/boot code downloads.
- No output is printed to stdout.

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

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

## 3.15 Discover Adapters Using SysFS (/sysfs)

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

Usage: `/sysfs + operational switch`

`/sysfs` is an operational switch that discovers CNA functions using the SysFS tool and runs firmware downloads by using the ethtool utility or SysFS interface. The `/sysfs` switch is used with any switch that displays adapter information; for example, `/q`, or any combination of switches that performs a download.

The following switches can be used:

- /f – force firmware and boot code
- /ff – force firmware

- /downgrade or /g
- /query or /q
- /rewrite or /e
- /update

For example, `./brcmflash /sysfs /auto /f` discovers CNA NIC functions using SysFS and forces a firmware download on CNA adapters using ethtool or SysFS.

**NOTE** Only CNA NIC functions are displayed. Displaying iSCSI and FCoE functions is not supported.

When `/sysfs` is used, the VPD model name is not available.

The `/sysfs` switch is available on Brcmflash Standalone on RHEL 6, RHEL 7, SLES 11 SP1+, and SLES 12.

Example usage:

```
/brcmflash /sysfs /q
```

## 3.16 Update (/update)

Usage: `/update`

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

Example usage:

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

- The `fwmatrix.txt` file is ignored. You must place the desired update versions of firmware/ boot code in the `firmware` directory.
- If the update version is newer than the currently installed version on the adapter, the update version is downloaded to the adapter.
- If multiple update versions of firmware/ boot code are found for an adapter, the most recent version is downloaded to the adapter.

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

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

### 3.16.1 FCoE Adapter Download Summary

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

### 3.16.2 iSCSI and NIC Adapter Download Summary

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

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

**NOTE** To activate new firmware, perform a system reboot.

## 3.17 Verbose (/v)

Usage: `/v`

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

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

### 3.17.1 FCoE Adapter Download Summary

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

### 3.17.2 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 or a non-zero error code for any error.

## 3.18 VPD (/vpd)

Usage: `/vpd`

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

- /f – force firmware and boot

- /ff – force firmware
- /xml – XML output
- /downgrade or /g
- /query or /q
- /rewrite or /e
- /update

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

If the `/vpd` command is used in conjunction with the `fwmatrix.txt` file, the model name in the `fwmatrix.txt` file must match the VPD model name reported by Brcmflash.

## 3.19 XML Output (/xml)

Usage: `/xml`

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

# Chapter 4: LpCfg Utility Command Line Interface

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

The LpCfg utility includes:

- brcmwinlpcfg
- brcmlinlpcfg

**NOTE** Usage code and examples show *brcmos*lpcfg. Note that the *brcmos* designation changes to *brcmwin* if you are using LpCfg for Windows and to *brcmlin* if you are using LpCfg for Linux.

You can use the LpCfg utility to do the following:

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

## 4.1 Running the LpCfg Utility from the Command Prompt

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

To run the LpCfg utility from the command prompt:

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

     *brcmos*lpcfg <*valid command*>

     (replace *os* with ./brcmlin or brcmwin as appropriate)
     - For example, starting the Windows LpCfg utility with a reset command:

       ```
       brcmwinlpcfg reset n=2
       ```
     - For example, starting the Linux LpCfg utility with a reset command:

       ```
       ./brcmlinlpcfg reset n=2
       ```

— To start the LpCfg utility with a script file name, move to the directory where the LpCfg utility resides and type:

`brcmoslpcfg @<script file name>`

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

  `brcmoslpcfg @C:\test\script1.txt`

**NOTE** To redirect screen output to a file, add `<filename>` at the end of each command.
For example:
`brcmoslpcfg listboot n=1 >result.out`
For more information on script files, see Section 4.3.9, Using Script Files.

## 4.2 Running the LpCfg Utility Included with the Brcmflash Standalone Kit

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

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

- **Windows** – `brcmwinlpcfg.bat` and `brcmflash.bat`
- **Linux** – `brcmlinplcfg.sh` and `brcmflash.sh`

### 4.2.1 Windows

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

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

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

If OneCommand® CNA Manager is installed, the OneCommand CNA Manager libraries and OneCommand CNA Manager MILI service are used by the Brcmflash and brcmwinlpcfg utilities.

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

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

5. To update firmware/boot code on an adapter in Windows, type:

```
# brcmflash.bat /auto /up
```

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

```
# brcmwinlpcfg.bat  listhba
```

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

```
C:\clu\log\brcmflash.log
C:\clu\log\brcmwinlpcfg.log
```

### 4.2.2 Linux and VMware

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

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

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

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

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

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

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

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

**NOTE**

The MILI service is temporarily installed. The service is removed after the script execution is completed.

If OneCommand CNA Manager is installed, the OneCommand CNA Manager libraries and OneCommand CNA Manager `brcmmilid` daemon are used by the `brcmflash` and `brcmlinlpcfg` utilities.

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

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

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

```
# ./brcmflash.sh /auto up
```

To display a list of adapters, type:

```
# ./brcmlinlpcfg.sh  listhba
```

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

```
/var/log/clu/brcmflash.log
/var/log/clu/brcmlinlpcfg.log
```

## 4.3 Supported Commands

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

- ✓ indicates commands that are supported on both `brcmwinlpcfg` and `brcmlinlpcfg`.
- *FCoE only* indicates commands that are supported only by FCoE adapters.

**Table 1 Supported Commands for LpCfg**

| COMMANDS | FCoE, NIC, and iSCSI Adapters | |
|---|---|---|
| | x86 | x64 |
| Operating Systems | RHEL 6.5+ | RHEL 6.5+<br>RHEL 7.0+ |
| | SLES 11.3+ | SLES 11.3+<br>SLES 12 |
| | WinPE 3.1+ | WinPE 3.1+ |
| | Debian 8.x[a] | Debian 8.x[a] |
| | Ubuntu 14.x[b]<br>Ubuntu 16.x[b] | Ubuntu 14.x[b]<br>Ubuntu 16.x[b] |
| config | FCoE only | FCoE only |
| changemac[c] | RHEL 7.3 | RHEL 7.3 |
| disablebootdevice | FCoE | FCoE |
| dmatest | ✓ | ✓ |
| download | ✓ | ✓ |
| enablebootdevice | FCoE | FCoE |
| extloopback | ✓ | ✓ |

**Table 1 Supported Commands for LpCfg (Continued)**

| COMMANDS | FCoE, NIC, and iSCSI Adapters | |
|---|---|---|
| | x86 | x64 |
| factorydefaults<br>Supported on OCe14000-series adapters only. | ✓ | ✓ |
| hbaattr | ✓ | ✓ |
| h or ? (Help) | ✓ | ✓ |
| intloopback | ✓ | ✓ |
| listhba | ✓ | ✓ |
| listrev | FCoE only | FCoE only |
| listmac | NIC, iSCSI | NIC, iSCSI |
| listwwn | FCoE only | FCoE only |
| logfile | ✓ | ✓ |
| networkboot | ✓ | ✓ |
| pciloopback | FCoE only | FCoE only |
| personalityinfo<br>Supported on OCe11000-series adapters only. | ✓ | ✓ |
| changepersonality<br>Supported on OCe11000-series adapters only. | ✓ | ✓ |
| readaltboot | FCoE only | FCoE only |
| readbootdevice | FCoE only | FCoE only |
| readconfig | FCoE only | FCoE only |
| readmac | ✓ | ✓ |
| readvlanprops | ✓ | ✓ |
| reset | FCoE only | FCoE only |
| restoredefsvmac[c] | ✓ | ✓ |
| restoredefwwn | FCoE only | FCoE only |
| restorenwwn | FCoE only | FCoE only |
| restorevlanprops | ✓ | ✓ |
| restorewwn | FCoE only | FCoE only |
| savewwn | FCoE only | FCoE only |
| screendisplay | FCoE only | FCoE only |
| scriptvwwnn | FCoE only | FCoE only |
| scriptvwwpn | FCoE only | FCoE only |
| scriptwwnn | FCoE only | FCoE only |
| scriptwwpn | FCoE only | FCoE only |
| setaltboot | FCoE only | FCoE only |
| setbootdevice | FCoE only | FCoE only |

**Table 1 Supported Commands for LpCfg (Continued)**

| COMMANDS | FCoE, NIC, and iSCSI Adapters | |
|---|---|---|
| | x86 | x64 |
| version | ✓ | ✓ |
| vpd | ✓ | ✓ |
| writesvmac[c] | ✓ | ✓ |
| writevlanprops | ✓ | ✓ |
| writewwn | FCoE only | FCoE only |

a. Debian operating systems support NIC only.
b. Ubuntu operating systems support NIC only.
c. This command is supported only on certain OEM-specific adapters.

## 4.3.1 Help Command and General Adapter Management Commands

Use the following commands to view the online help, reset the adapter, or reset the adapter to factory defaults.

### 4.3.1.1 Viewing the Syntax for Commands (help or ?)

To view the syntax for all available commands, type:

```
brcmoslpcfg help
```

or

```
brcmoslpcfg ?
```

To view the syntax for a specific command, type:

```
brcmoslpcfg help <command>
```

or

```
brcmoslpcfg ? <command>
```

For example, either:

```
brcmoslpcfg help download
```

or

```
brcmoslpcfg ? download
```

returns a response similar to the following:

- For Windows

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

- For Linux, VMware, and FreeBSD:

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

#### 4.3.1.2 Resetting an Adapter (reset)

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

**ATTENTION** Executing a reset on an adapter that is being used to boot from SAN is not recommended. The reset might cause a loss of connectivity to the SAN and possible loss of data. To reset an adapter, make sure the adapter is not currently being used to boot from SAN. There are two ways to do this:

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

To reset one adapter, type:

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

To reset all adapters in the system, type

```
brcmoslpcfg reset n=all
```

#### 4.3.1.3 Resetting an Adapter to the Factory Defaults (factorydefaults)

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

**NOTE** The factory defaults command is supported on OCe14000-series adapters only.

After a successful factory reset on an OCe14000-series adapter, the adapter is offline. Perform an immediate reboot to complete the reset and return the adapter to full functionality.

To return an adapter to its default settings, type

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

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

```
brcmoslpcfg factorydefaults 1
```

### 4.3.2 Viewing Adapter Information

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

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

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

- listhba
- config
- download

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

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

```
brcmoslpcfg listhba -/c
```

The output from this command includes the Broadcom Emulex conventional model name – OCe14401-UX, rather than the VPD model name – Emulex OneConnect OCe14401-UX 40GbE 1-Port QSFP+PCIe 3.0 Universal CNA, NIC PF.

#### 4.3.2.2 Viewing the LpCfg Utility Version Information (version)

This command shows the LpCfg utility version information.

To view this information, type:

```
brcmoslpcfg version
```

#### 4.3.2.3 Viewing VPD

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

To display VPD, type:

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

#### 4.3.2.4 Viewing Boot Device Information (readbootdevice)

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

To show this information, type:

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

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

```
brcmoslpcfg readbootdevice n=1
```

#### 4.3.2.5 Viewing Adapter Attributes (hbaattr)

This command displays adapter information.

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

```
brcmoslpcfg hbaattr
```

To list the adapter attributes for one adapter, type

```
brcmoslpcfg hbaattr n=<adapter_number>
```

#### 4.3.2.6 Viewing All Adapters in the System (listhba)

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

To list all adapters in the system, type:

```
brcmoslpcfg listhba
```

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

#### 4.3.2.7 Viewing the WWN of All Adapters in the System (listwwn)

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

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

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

To show the WWN information, type:

```
brcmoslpcfg listwwn
```

#### 4.3.2.8 Viewing the MAC Address (listmac)

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

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

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

#### 4.3.2.9 Reading the MAC Address (readmac)

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

To view the MAC address of the adapter number specified, type:

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

The following example lists information for adapter number 1:

```
>brcmoslpcfg.exe readmac n=1
Command: readmac n=1
adapter 1:
Current MAC Address : 00-90-FA-30-43-AA
Factory MAC Address : 00-90-FA-30-43-30
Semi-Volatile MAC Address: 00-90-FA-30-43-AA
Command completed, NO Error
```

#### 4.3.2.10 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:

```
brcmoslpcfg listrev n=<adapter number>
```

The following example lists information for adapter number 3:

```
brcmoslpcfg listrev n=3
```

#### 4.3.2.11 Viewing Selected Configuration Regions (readconfig)

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

**NOTE** The `readconfig` command only supports reading configuration regions 0, 8, and 32 on OneConnect FCoE adapters.

To read a configuration, type:

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

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

*brcmos*`lpcfg readconfig n=1 r=0 l=20`

## 4.3.3 Firmware and Boot Code Download Commands

The following firmware/boot code download command downloads a firmware/boot code file.

### 4.3.3.1 Downloading a File (download)

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

The adapter name is the name that appears when you run the `listhba` command. For more information on the `listhba` command, see Section 4.3.2.6, Viewing All Adapters in the System (listhba).

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

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

The following example downloads the `oc14-11.2.123.45.ufi` firmware file to adapter number 6; in this example, the firmware file is for an OCe14000-series adapter:

*brcmos*`lpcfg download n=6 i=oc14-11.2.123.45.ufi`

**NOTE** Boot code on OneConnect adapters is updated by downloading firmware. LpCfg does not support updating boot code separately for these adapters.

## 4.3.4 World Wide Name Commands

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

### 4.3.4.1 Writing WWN and Updating NVPARMS (writewwn)

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

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

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

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

```
3xxxxxxx
5xxxxxxx
```

To modify the WWPN and WWNN, type:

```
brcmoslpcfg writewwn n=<adapter number>
```

The offline utility prompts you to enter new data:

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

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

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

Enter a value.

```
10000000
```

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

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

#### 4.3.4.2 Saving WWN Data to a File (savewwn)

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

To save the WWN data to a file, type:

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

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

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

#### 4.3.4.3 Restoring WWN and Updating NVPARMS (restorewwn)

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

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

- Move the adapter on which you want to use the `restorewwn` command to a non-boot from SAN host, and run `restorewwn` command from there.
- If the host with the `restorewwn` command target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now restore the WWN and update the NVPARMS on the intended

target adapter, because it is not being actively used for boot from SAN.

To restore the WWN, type:

*brcmos*`lpcfg restorewwn n=<`*`adapter number`*`> c=<`*`wwn filename`*`>`

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

*brcmos*`lpcfg restorewwn n=4 c=ctwwn.sav`

#### 4.3.4.4 Restoring NVPARMS (restorenvwwn)

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

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

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

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

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

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

To restore the non-volatile WWN, type:

*brcmos*`lpcfg restorenvwwn n=<`*`adapter number`*`>`

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

*brcmos*`lpcfg restorenvwwn n=2`

#### 4.3.4.5 Restoring the IEEE Address (restoredefwwn)

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

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

- Move the adapter on which you want to use the `restoredefwwn` command to a non-boot from SAN host and run restoredefwwn from there.
- If the host with the `restoredefwwn` target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. You can now

restore the IEEE address on the intended target adapter, because it is not being actively used for boot from SAN.

To restore the IEEE address, type:

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

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

```
brcmoslpcfg restoredefwwn n=2
```

## 4.3.5 Boot Code Commands

To set the boot device with the offline utility, do the following:

1. Use the `setbootdevice` command to set the boot device. See Section 4.3.5.1, Selecting a Boot Device (setbootdevice), for more information.
2. Configure the system BIOS so the adapter boot device is the highest in the boot order.

### 4.3.5.1 Selecting a Boot Device (setbootdevice)

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

The selected device boots when the system reboots.

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

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

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

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

**NOTE** Enter the LUN in decimal format.

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

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

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

### 4.3.5.2 Enabling or Disabling Boot Devices (enablebootdevice or disablebootdevice)

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

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

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

To enable the boot device, type:

`brcmoslpcfg enablebootdevice n=<adapter number>`

To disable the boot device, type:

`brcmoslpcfg disablebootdevice n=<adapter number>`

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

#### 4.3.5.3 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):

`brcmoslpcfg readaltboot n=1`

#### 4.3.5.4 Selecting One or More Alternate Boot Devices (setaltboot)

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

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

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

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

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

#### 4.3.5.5 Enable or Disable PXE Boot on NIC Devices (networkboot)

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

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

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

The following example enables PXE boot on adapter 1:

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

The following example disables PXE boot on adapter 1

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

## 4.3.6 Configuration Commands

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

### 4.3.6.1 Updating Configuration Regions (config)

Two forms of configuration are available:

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

Valid region numbers range from 0 to 32.

#### 4.3.6.1.1 Update by Name

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

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

**NOTE** The adapter name is the name that appears when you run the `listHBA` command. For more information on the `listHBA` command, see Section 4.3.2.6, Viewing All Adapters in the System (listhba).

The following example updates region 6 of all OCe14000 adapters with `ctplus1.cfl`:

```
brcmoslpcfg config a=oce14000 r=6 c=ctplus1.cfl
```

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

#### 4.3.6.1.2 Update by Number

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

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

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

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

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

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

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

**NOTE** This command is supported only on OEM-specific adapters.

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

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

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

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

#### 4.3.6.3 Writing a Non-Volatile MAC Address on a NIC Device (changemac)

**NOTE** This command is supported only on OEM-specific adapters.

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

`brcmoslpcfg changemac n=<adapter_number> m=<mac_address>`

The following example writes the non-volatile MAC address 0090FA112233 to adapter 1:

`brcmoslpcfg changemac n=1 m=0090FA112233`

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

**NOTE** This command is supported only on OEM-specific adapters.

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

`brcmoslpcfg restoredefsvmac n=<adapter_number>`

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

`brcmoslpcfg restoredefsvmac n=1`

### 4.3.7 Personality Commands

The following commands allow you to manage the personality of the adapter.

**NOTE** Personality commands are supported on OCe11100-series adapters only.

#### 4.3.7.1 Viewing Personality Information (personalityInfo)

This command displays the current personality running on the adapter and other available personalities.

To view personality information, type:

`brcmoslpcfg personalityInfo n=<adapter index>`

where <*adapter index*> is obtained from the `listhba` command.

The following example lists the `personalityInfo` on adapter number 3:

`brcmoslpcfg personalityInfo n=3`

#### 4.3.7.2 Changing Personality Information (changePersonality)

This command changes the personality of the adapter to the selected personality. You must reboot the system to activate the personality change.

To change personality, type:

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

The following example changes the personality information on adapter number 3:

`brcmoslpcfg changePersonality n=3 p=iSCSI`

## 4.3.8 Diagnostic Tests

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

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

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

### 4.3.8.1 Running the External Loopback Test (extloopback)

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

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

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

The option on error choices are:

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

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

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

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

where:

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

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

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

#### 4.3.8.2 Running the Internal Loopback Test (intloopback)

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

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

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

The option on error choices are:

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

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

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

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

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

where:

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

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

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

#### 4.3.8.3 Running the PCI Loopback Test (pciloopback)

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

- Move the adapter on which you want to perform the PCI loopback test onto a non-boot from SAN host and perform the test from there.

- If the host with the test target adapter is also hosting other boot from SAN adapters, carry out a boot from SAN using one of the other boot from SAN adapters. The `pciloopback` command can now be run on the intended target adapter, because it is not being actively used for boot from SAN.

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

The option on error choices are:

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

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

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

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

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

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

#### 4.3.8.4 Running the DMATest

This command runs the DMA test, which is a test of the memory on the adapter. You can run the test on a specific adapter in the system and specify the number of times you want the test to repeat.

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

Do not use the DMA test on Emulex blade adapters.

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

```
brcmoslpcfg dmatest n=<adapter> p=<pattern> c=<byte-count> r=<repeat-count>
```

The following example runs the DMA test two times on adapter number 1:

```
brcmoslpcfg dmatest n=1 p=abcde c=1500 r=2
```

### 4.3.9 Using Script Files

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

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

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

To run a script file type:

*brcmos*`lpcfg @<`*`scriptname.txt`*`>`

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

*brcmos*`lpcfg @script1.txt`

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

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

```
version
screendisplay o=0
;download a=oce14000 i=c:\temp\oc14-11.2.123.45.ufi
;reset n=1 s=0
;reset n=2 s=0
reset n=all s=0
; pciloopback n=1 r=10 o=1
; pciloopback n=2 r=10 o=2
; pciloopback n=all r=50 o=3
intloopback n=1 r=10 o=1
intloopback n=2 r=10 o=1
extloopback n=1 r=40 o=3
extloopback n=2 r=40 o=3
;repeat r=10
```

#### 4.3.9.1 Repeating a Series of Commands (repeat)

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

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

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

`repeat r=<`*`repeat count`*`>`

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

```
repeat r=10
```

#### 4.3.9.2 Enabling or Disabling Test Messages on the Screen (screendisplay)

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

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

**NOTE** This command is supported only in script files.

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

`screendisplay o=<`*`display option`*`>`

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

```
version
listhba
screendisplay o=0
download n=2 i=oc14-11.2.123.45.ufi
enablebootdevice n=2
```

#### 4.3.9.3 Updating Non-volatile WWNN (scriptwwnn)

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

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

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

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

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

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

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

*brcmos*`lpcfg scriptwwnn n=1 w0=10000345 w1=B620A1B2`

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

#### 4.3.9.4 Updating Non-volatile WWPN (scriptwwpn)

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

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

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

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

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

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

*brcmos*`lpcfg scriptwwpn n=<`*adapter number*`> w0=<`*wwpn word 0*`> w1=<`*wwpn word 1*`>`

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

*brcmos*`lpcfg scriptwwpn n=1 w0=20A2D6B8 w1=C920A1B2`

#### 4.3.9.5 Updating Volatile WWNN (scriptvwwnn)

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

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

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

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

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

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

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

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

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

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

*brcmos*`lpcfg scriptvwwnn n=<`*adapter number*`> w0=<`*wwnn word 0*`> w1=<`*wwnn word 1*`>`

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

*brcmos*`lpcfg scriptvwwnn n=1 w0=20A2D6B8 w1=C920A1B2`

#### 4.3.9.6 Updating Volatile WWPN (scriptvwwpn)

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

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

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

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

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

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

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

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

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

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

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

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

#### 4.3.9.7 Creating a Log (logfile)

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

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

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

`logfile l=<filename>`

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

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

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

### 4.3.10 VLAN Commands

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

#### 4.3.10.1 Reading VLAN Priorities (readvlanprops)

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

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

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

The following example lists information for adapter number 1:

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

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

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

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

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

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

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

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

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

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

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

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

# Chapter 5: Status Messages and Error Codes

## 5.1 Brcmflash Utility Status Messages

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

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

**Table 2 Brcmflash Status Messages**

| Message Number | Message Title | Message Details |
|---|---|---|
| 0 | GOOD_ALL_UPGRADES_OK | Returned if any of the discovered adapters had a successful download performed. |
| 1 | GOOD_NO_UPDATES_NEEDED | Returned if any of the discovered adapters did not need an update, downgrade, or rewrite operation.<br>This message is never returned during a force firmware or force boot code download operation. |
| 2 | ERROR_ALL_UPGRADES_FAILED | Returned if all attempted downloads failed. |
| 3 | ERROR_SOME_UPGRADES_FAILED | Returned if some of the attempted downloads failed. |
| 4 | ERROR_EMULEX_APPS_COMMAND | Returned if Brcmflash cannot run an external executable such as:<br>■ *brcmos*lpcfg (brcmflashOffline) |
| 5 | ERROR_NO_SUPORTED_HBA_FOUND | Returned if no supported adapters are found. |
| 6 | ERROR_DIRECTORY_NOT_FOUND | Returned if the `firmware` directory is missing. Depending on the operation, auto-discovery expects the `firmware` directory to exist as a subdirectory 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 directory. In this case only, a matching image is an image that the adapter accepts regardless of the download operation being performed. |
| 8 | ERROR_NOT_ADMIN_USER | Returned when you attempt to run the executable file and do not have administrator (Windows) or root (Linux) privileges. |
| 9 | ERROR_UNSUPPORTED_OS | Used by the Exlflash Standalone execution scripts. Returned when the scripts are run on an unsupported operating system. |
| 10 | ERROR_UNSUPPORTED_ARCH | Used by the Exlflash Standalone execution scripts. Returned when the scripts are run on an unsupported architecture. |
| 19 | ERROR_IMAGE_VERSION | An error occurred when decoding the image version. The image file has an invalid extension, or Brcmflash is unable to decode the image file's version.<br>**NOTE** This message is returned only when using the /iv=<image_version> switch. |
| 20 | ERROR_MISSING_DEP | Returned when a missing dependency is detected. |

## 5.2 LpCfg Error Codes

Table 3 lists the LpCfg error codes that are supported.

**Table 3 LpCfg Error Codes**

| Error Code | Description |
|---|---|
| 0 | No error |
| 1 | Invalid adapter number |
| 2 | Mailbox command error |
| 4 | Open file error |
| 5 | Invalid configuration region |
| 6 | Invalid adapter name |
| 7 | Download error |
| 9 | Link not up for external loopback test |
| 10 | Link not up for internal loopback test |
| 11 | Invalid jumper selection (in jumper command) |
| 12 | Invalid alternate configuration region (in jumper command) |
| 13 | PCI loopback test fails |
| 14 | Adapter reset error |
| 15 | Read configuration region error |
| 16 | No VPD information available |
| 17 | No command in command line |
| 18 | Open log file error |
| 19 | Read wakeup parameters error |
| 20 | Update wakeup parameters error |
| 21 | Incorrect test parameters |
| 22 | Stopped by user |
| 23 | Internal loopback test fails |
| 24 | External loopback test fails |
| 25 | Error exists after four retries |
| 26 | Invalid command |
| 27 | Incorrect syntax |
| 28 | Command supported only in script files |
| 29 | Read_rev error |
| 30 | Dump configuration region error |
| 31 | Read file error |
| 32 | Short file error |
| 33 | Read NVPARMS error |
| 34 | Write NVPARMS error |
| 35 | Command does not support all adapters |
| 36 | Invalid LUN |
| 38 | Update configuration region error |
| 40 | Dump memory error |

**Table 3 LpCfg Error Codes (Continued)**

| Error Code | Description |
|---|---|
| 41 | Update EROM error |
| 42 | Delete load entry error |
| 43 | Write WWN error |
| 44 | Not supported in script files |
| 45 | No Broadcom Emulex adapter found |
| 46 | Invalid Alternate Boot Device Index |
| 47 | Cannot restart adapter |
| 48 | Write volatile parameters error |
| 50 | Incorrect symbols |
| 51 | Invalid length |
| 52 | Invalid topology |
| 53 | No event log |
| 54 | Read event log |
| 55 | Invalid input value |
| 56 | No libdfc library |
| 57 | Non-numeric input |
| 58 | No valid WWN |
| 59 | Region cleanup |
| 60 | Region initialization |
| 62 | Unable to allocate memory |
| 63 | DFC_InitDiagEnv error |
| 64 | DFC_ReadPciCfg error |
| 65 | No driver installed |
| 66 | No valid driver |
| 67 | Not valid adapter type |
| 68 | Not valid image |
| 69 | Long file error |
| 70 | Incompatible image |
| 71 | Not supported |
| 72 | MILI service not started |
| 73 | Script not supported |
| 74 | MILI not started |
| 75 | No NIC adapter |
| 76 | Personality information |
| 77 | Personality change |
| 78 | Administrator rights error |
| 79 | SLI-4 management error |
| 80 | Reboot required |
| 83 | Application is missing one or more dependencies. |
| 87 | The system must be rebooted to activate the new firmware image and the image must be downloaded again. |

**Table 3 LpCfg Error Codes (Continued)**

| Error Code | Description |
|---|---|
| 88 | Duplicate MAC address |
| 89 | Download failed due to missing digital signature. Please contact customer support for additional help. Download failed on adapter <adapter number> Stat 89. |
| 90 | Download failed due to invalid firmware digital signature. Please contact customer support for additional help. Download failed on adapter <adapter number> Stat 90. |
| 141 | General error from MILI |
| 200 | General error |

# Chapter 6: Troubleshooting

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

The following examples illustrate this behavior:

1. `./brcmflash /ff /update`
   a. `/update` is ignored.
   b. Performs a force firmware operation on all installed and supported adapters.
2. `./brcmflash /ff /downgrade`
   a. `/downgrade` is ignored
   b. Performs a force firmware operation on all installed and supported adapters.
3. `./brcmflash /ff /rewrite`
   a. `/rewrite` is ignored
   b. Performs a force firmware operation on all installed and supported adapters.

## 6.1 Unsupported Driver

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

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

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


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