

## **Emulex® LPe35000-Series HBA Firmware and Boot Code**

**Releases 12.6.240.21, 12.6.240.40, 12.6.240.42, and 12.6.240.55**

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### **Purpose and Contact Information**

These release notes describe the new features, resolved issues, known issues, new firmware features or resolved issues that require a host reboot, technical tips, and license notices associated with this firmware and boot code release for Emulex® LPe35000-series HBAs.

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### **New Features**

#### **Release 12.6.240.55**

This release adds support for new flash devices.

**NOTE:** If you downgrade the firmware to a version earlier than 12.6.240.55 on an HBA that has a new flash device, the firmware is not installed and an error message is displayed.

#### **Release 12.6.240.42**

This release adds support for Boot from SAN on NVMe over FC on the VMware ESXi 7.0 U1 operating system. For implementation instructions, see [Technical Tips Item 10](#) in these release notes.

#### **Release 12.6.240.40**

No new features were added to this release.

#### **Release 12.6.240.21**

No new features were added to this release.

**NOTE:** In some cases, a firmware update requires either a firmware reset or a basic PCIe reset, depending on the features available in the new firmware. A firmware reset is performed automatically if it is needed, regardless of the operating system. In some cases, a full reboot is required to activate new firmware, to enable a new feature, or to take advantage of a resolved issue. In such a case, the application that updated the firmware produces a message indicating what is needed.

See the [New Firmware Features or Resolved Issues That Require a Host Reboot](#) section for a list of new features or resolved issues that require a host reboot after a firmware update.

## Resolved Issues

### Firmware (Release 12.6.240.55)

An issue was resolved that prevented a complete firmware debug capture under certain circumstances.

### Boot Code (Release 12.6.240.55)

No boot code issues were resolved in this release.

### Firmware (Release 12.6.240.42)

No firmware issues were resolved in this release.

### Boot Code (Release 12.6.240.42)

When you add or configure NVMe boot devices, the NVMe namespaces list in the **Add NVMe over FC Boot Device** menu is no longer empty.

### Firmware (Release 12.6.240.40)

No firmware issues were resolved in this release.

### Boot Code (Release 12.6.240.40)

1. Booting from SAN using NVMe no longer results in Windows Server 2019 going into repair mode.
2. The Emulex UEFI configuration utility now discovers an NVMe target on an IBM FlashSystem 900 array.

### Firmware (Release 12.6.240.21)

1. Running the Brocade® `dporttest` command with the `-time` parameter from a Brocade switch no longer results in the message `FAILED (Unable to start/restart the test)` when a port failure is encountered.
2. A condition that could result in memory loss has been resolved.

### Boot Code (Release 12.6.240.21)

In the Emulex x86 BIOS utility, selecting **Reset Adapter Defaults** correctly changes the link speed setting to **Auto Select**.

# Known Issues

## Firmware

1. In the Linux operating systems, setting the `enable-mds-diags` parameter to disabled does not disable the Cisco MDS switch diagnostics.

### Workaround

None

2. To perform a firmware dump on an LPe35000-series adapter with one of the following inbox Linux drivers installed, you cannot use the Emulex HBA Manager application or the Emulex HBA Capture utility. You must use the LPe35000-Series HBA Firmware Dump tool instead. Refer to the *Emulex Drivers for Linux Release Notes* for instructions on using the tool.
  - SLES 15
  - RHEL 7.6 (except the RHEL 7.6 errata kernel kernel-3.10.0-990.el7)
  - Ubuntu 18.0.4 (except the Ubuntu 18.04.3 HWE release)

**NOTE:** The OneCommand™ Manager application has been renamed the Emulex HBA Manager application.

**NOTE:** The OneCapture™ utility has been renamed the Emulex HBA Capture utility.

3. A host reboot is required after a firmware update on the following Linux inbox drivers:
  - SLES 15
  - RHEL 7.6
  - Ubuntu 18.04 (except the Ubuntu 18.04.3 HWE release)
4. Performing a firmware update using `sysfs` on certain inbox Linux operating systems might cause the misleading message `3199 Firmware write complete: Firmware write complete: Firmware reset required to instantiate to be displayed`.

The following Linux inbox drivers are affected:

- RHEL7.7
- RHEL 8.1
- SLES12SP5
- SLES15S1

### Workaround

Instead of performing a firmware reset, perform a PCI bus reset to activate newly downloaded firmware. For instructions on issuing a PCI bus reset, refer to the *Emulex Drivers for Linux User Guide*.

5. The scheduler is not able to drain outstanding work queue entries (WQEs) within the specified timeout period while running a heavy load of I/O.

### Workaround

None

6. The link fails to come up on some 16Gb/s arrays that are directly attached to an adapter when FEC is enabled at the array.

**Workaround**

Disable FEC using one of the following applications:

- Emulex HBA Manager application
- Emulex HBA Manager for VMware vCenter application
- Emulex x86 BIOS utility
- Emulex UEFI configuration utility

Refer to the appropriate drivers user guide and the *Emulex HBA Manager Application User Guide*, the *Emulex HBA Manager Application CLI User Guide*, or the *Emulex HBA Manager for VMware vCenter User Guide* for information about changing parameters. Refer to the *Emulex Boot for the Fibre Channel Protocol User Guide* for information about changing the FEC setting in the Emulex x86 BIOS utility or in the Emulex UEFI configuration utility.

7. Using the Brocade `portdporttest` command with the `stop` option causes the HBA to stop responding when running D\_Port tests from the switch. Disabling a port while running D\_Port tests from the switch can cause the switch port to get stuck in D\_Port mode.)

**Workaround**

Do not stop D\_Port tests while they are running from the switch. Do not disable a port while D\_Port tests are running from the switch.

If the HBA stops responding, remove the D\_Port configuration from the switch port (`portdisable p#;` `portcfgdport --disable p#;` `portenable p#`). Refer to the Brocade switch documentation for more information.

If the switch port is stuck in D\_Port mode, use the `Portdporttest --exit` command to clear the configuration.

## Boot Code

1. When configured for NVMe boot support, the Emulex UEFI environment does not understand the various levels of Asymmetric Namespace Access (ANA), also called I/O multipathing. It assumes all boot devices are fully accessible and active. If a boot device that is in an ANA un-optimized or inaccessible state is configured, or if the boot device transitions to such a state over time, the UEFI boot environment might significantly slow or stop its boot sequence. Messages such as `Option ROM POST Error: 2110... Controller I/O timeout failure...` might appear.

**Workaround**

When you configure UEFI boot devices with storage that supports NVMe ANA, attempt to have optimized paths configured ahead of non-optimized or inaccessible device paths. If the storage array state changes for boot devices, reconfigure the boot device list to order optimized paths ahead of non-optimized or inaccessible storage. Refer to Knowledge Base article #1211251400308 for further information.

2. In the Emulex UEFI configuration utility, if FEC is disabled and either a cold boot or a system reboot is performed, the setting reverts to enabled.

**Workaround**

Use the Emulex UEFI configuration utility to reset FEC to disabled, and perform a warm boot.

3. A value for FA-PWWN that was configured in the Emulex HBA Manager application is not reflected in the Emulex UEFI configuration utility.

4. Updating the NVMe BFS installation from RHEL 8.1 to a later RHEL 8.x release requires a special procedure.

You must use the `rhel8u1_upgrade.sh` script to update an NVMe BFS installation from RHEL 8.1 to RHEL 8.2 or later. The script ensures that the NVMe BFS setup is maintained through the update process.

The `rhel8u1_upgrade.sh` script is packaged in the `nvme-fc-dm-<build>.rhel8.tar.gz` kit inside the `elx-nvme-fc-dm-<build>-n.tar.gz` preinstallation kit, which is used to configure BFS for NVMe over FC on Linux. For more information about the pre-installation kit, refer to the *Emulex Boot for the Fibre Channel Protocol User Guide*.

Before you run the script, you must configure the `yum` repository for the new operating system. The script uses this new repository to update the `nvme-cli` utility.

The `rhel8u1_upgrade.sh` update script performs the following actions:

- Backs up the `hostnqn` file
- Removes the RHEL8u1 `nvme-fc-dm` package
- Upgrades the `nvme-cli` utility to the RHEL 8.2 or later package
- Restores the `hostnqn` file
- Installs a new version of the `nvme-fc-dm` package

You can update the operating system any time after you have run the script.

## New Firmware Features or Resolved Issues That Require a Host Reboot

This section lists the new firmware features or resolved issues that require a host reboot to be activated after they are installed through a firmware update.

### Firmware Version 12.6.240.55

Support was added for new flash devices.

### Firmware Version 12.6.240.42

No firmware features in this release require a host reboot after a firmware update.

### Firmware Version 12.6.240.40

No firmware features in this release require a host reboot after a firmware update.

### Firmware Version 12.6.240.21

No firmware features in this release require a host reboot after a firmware update.

### Firmware Version 12.6.182.8

1. The PCIe firmware component was updated to support new PCIe Gen4 processor functionality and to improve the overall operating margin.
2. Error messages are no longer encountered if an Emulex HBA Manager CLI `Reset` command is issued while I/O is running.
3. Changes were made to support the suite of tests performed at the PCI-SIG industry workshop.
4. PCIe error messaging was enhanced.

## Firmware Version 12.4.243.23

No firmware features in this release require a host reboot after a firmware update.

## Firmware Version 12.4.243.22

No firmware features in this release require a host reboot after a firmware update.

## Firmware Version 12.4.243.16

1. An issue with function level reset (FLR) error handling and recovery was resolved.
2. To improve consistency across Emulex HBAs, the PCI Rev\_ID value was changed from 1 to 0.

## Firmware Version 12.2.299.32

No firmware features in this release require a host reboot after a firmware update.

## Firmware Version 12.2.299.23

No firmware features in this release require a host reboot after a firmware update.

## Firmware Version 12.2.299.14

No firmware features in this release require a host reboot after a firmware update.

## Firmware Version 12.2.212.14

This was the initial factory release of firmware for LPe35000-series adapters.

**NOTE:** If you downgrade the firmware to a version that did not require a host reboot after a firmware update, from a newer version that required a host reboot after a firmware update (such as version 12.4.243.16), you must perform a host reboot after installing the older, downgraded version.

## Technical Tips

1. If a firmware update requires a system reboot, you cannot perform a firmware dump until the reboot has occurred.

### Workaround

None.

2. When D\_Port tests are run from the switch, the switch port can get stuck in D\_Port mode if the tests are interrupted.

### Workaround

Do not stop D\_Port tests while they are running. Instead, use the `Portdporttest --exit` command to clear the configuration.

If the switch port is stuck in D\_Port mode, reset the ports at both ends of the connection.

3. Trunking is not supported at 8Gb/s speeds.
4. Dynamic D\_Port cannot coexist with the trunking feature. If trunking is enabled, the LPe35000 firmware automatically disables Dynamic D\_Port.

5. If you reset an adapter to its default values while trunking is configured, trunking is disabled after reboot, and all boot parameters are set to default.
6. If trunking is configured, the trunk port link speed displayed by the Emulex x86 BIOS utility or the Emulex UEFI configuration utility is always shown as the aggregate speed. If a physical port is inactive, the displayed speed does not change from the aggregate speed.
7. To configure BFS for NVMe over FC on a Linux operating system, you must use the `elx-nvmefc-dm-<build>-n.tar.gz` pre-installation kit for both inbox and out-of-box drivers. Refer to the *Emulex Boot for the Fibre Channel Protocol User Guide* for more information.
8. D\_Port and FA-PWWN cannot be enabled simultaneously.

**Workaround**

If D\_Port is enabled and you want to enable FA-PWWN, you must first disable D\_Port. If FA-PWWN is enabled and you want to enable D\_Port, you must first disable FA-PWWN.

**NOTE:** You must disable D\_Port using an Emulex application that allows you to do so, such as the Emulex HBA Manager application.

9. BFS is not supported if DH-CHAP authentication is enabled.
10. To configure Boot from SAN for NVMe over FC on the VMware ESXi 7.0 U1 operating system, perform the following steps:
  - a. Refer to the *NVMe over FC Boot Settings* section in the *Emulex Boot for the Fibre Channel Protocol User Guide* to configure NVMe over FC boot and to add an NVMe boot device using the UEFI utility.

**NOTE:** Before starting the installation, zone the target WWN appropriately to the initiator WWNs. Create the Namespace of an appropriate size in the NVMe target, and map it to the initiator NQNs as described in the *Emulex Boot for the Fibre Channel Protocol User Guide*.

- b. Attach the operating system installation media to the server, and reboot or power on the server using the **UEFI Boot Menu**.

**NOTE:** Use a custom ESXi 7.0 U1 ISO image with version 12.8.x.x FC driver and NVMe transport driver for ESXi 7.0 U1 for NVMe over FC BFS on VMware.

- c. When the installation GUI appears, wait for the **Welcome to the VMware ESXi 7.0.1 Installation** window to appear.
- d. Press **Alt+F1** to switch to the ESXi console window.
- e. Enter `root` as the login credential and press **Enter**. Leave the password blank, and press **Enter** to continue.
- f. Since `hostd` is not available, use `localcli` instead of `esxcli` to perform operations in this shell.
- g. At the command prompt, run the `localcli nvme info get` command to obtain the host NVMe qualified name (NQN).
- h. Make a note of the NQN string, and provide it to the storage administrator to configure the boot namespace in the NVMe target.
- i. Issue the `localcli storage core adapter list` command to obtain a list of available FC adapters.

- j. After the host NQN is configured on the target, trigger a discovery at the host to discover the newly configured namespace for `BOOT`. This discovery can be started using one of the following methods:
  - Perform a Loop Initialization Primitive (LIP) reset to a given FC adapter by typing the following command:
 

```
#localcli storage core adapter list localcli storage san fc reset -A <vmhba#>
```
  - Use the following native `nvme fabrics` VMware command to discover an NVMe controller on the specified target port through the specified NVMe adapter:
 

```
#localcli nvme fabrics discover -a<vmhba#> -W=<Target WWNN> -w=<Target WWPn>
```

For example:

```
localcli nvme fabrics discover -a vmhba66 -W=20:2c:00:a0:98:c1:fe:52
-w=20:6d:00:a0:98:c1:fe:52
```
- k. Verify whether the new subsystem and namespace are discovered using the following commands in the shell:
 

```
#localcli nvme controller list
#localcli nvme namespace list
```
- l. After the new namespace is discovered, press **ALT+F2** to return to the installation GUI and continue the installation process.
- m. The newly assigned namespace for `BOOT` will appear in the **Select a Disk to install or Upgrade** menu under the **Remote:** section.
- n. Select the displayed namespace and continue the operating system installation following the on-screen prompts.
- o. After successful operating system installation, ensure that the Emulex adapter is configured as the first boot device in the BIOS and proceed with boot.

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