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Release Notes

Emulex® Drivers for Linux

Release 12.8.340.11

Purpose and Contact Information

These release notes describe the new features, resolved issues, FC and NVMe driver known issues, and FC and NVMe technical tips associated with this release of the Emulex® drivers for Linux.

For the latest product documentation, go to www.broadcom.com. If you have questions or require additional information, contact an authorized Broadcom® Technical Support representative at ecd-tech.support@broadcom.com.

New Features

Release 12.8.340.11

1. Added support for the RHEL/CentOS/Oracle Linux (RHEL Equivalent) 8.3 operating system.

Release 12.8.340.9

1. Fabric Notifications are a new T11 standard. This release of Linux drivers introduces Emulex support for Fabric Notifications, which include FPINs and signaling. For additional information, refer to the Brocade® switch documentation.
2. Added support for FC-NVMe-2 specification in SLES15 SP2.
3. Added support for loop topology on LPe35000-series adapters.
4. Discontinued support for the following operating systems:
   - RHEL/CentOS/Oracle Linux (RHEL Equivalent) 7.6
   - RHEL/CentOS/Oracle Linux (RHEL Equivalent) 8.0
   - SLES 15 SP0
5. The default LUN queue depth value in the Emulex drivers for Linux has changed from 30 to 64 outstanding I/Os per LUN. You can override the default value using the `lpfc_lun_queue_depth` driver parameter. Refer to your storage array documentation or support contact for the recommended LUN queue depth settings for your array.

NOTE: The Emulex OneCommand® Manager application has been renamed as the Emulex HBA Manager application.

Resolved Issues

Release 12.8.340.11

There are no resolved issues in this release.

Release 12.8.340.9

1. The remote switched diagnostic test no longer fails with a Latency Err-Drop error if you run diagnostics on multiple HBAs simultaneously.
2. The issue of debugfs cpucheck not recording I/O statistics if CPU ID or number of CPUs is greater than128 is fixed.
3. NVMe no longer needs to be enabled manually for RHEL 7.8 if the inbox driver is used with Emulex HBA Manager application 12.8 or later.
4. The issue of the link going down when authentication is disabled in both the HBA and the switch is fixed.

FC Driver Known Issues

1. Revision A of the FOIT AFCT-57F3TMZ-ELX (16GFC longwave optic transceiver) does not support D_Port for MDS Diagnostic for Cisco switches.

   Workaround

   None.

2. Neither Revision A nor Revision B of the FOIT AFCT-57F3TMZ-ELX (16GFC longwave optic transceiver) supports D_Port for Brocade switches.

   Workaround

   None.

3. Brocade switches using Fabric OS® version 8.2.1B and earlier might encounter the following issues with DH-CHAP authentication:
   - You might not be able to configure the secret pair between the switch and the HBA.
   - When authentication is enabled on the switch, and authentication is disabled on the HBA, the switch disables the port, but it does not issue the expected status messages.
   - The Brocade switch authenticates the HBA port when authentication is disabled on the switch or when a frame is dropped.

   Workaround

   None.

4. On inbox drivers, the ExpressLane™ configuration is not persistent.

   Workaround

   Install the `elx-lpfc-extras` (`elx-lpfc-vector-map` in case of older distributions) RPM from the out-of-box `lpfc` driver package. The `lpfc_configure_oas.sh` script that is a part of this RPM will take care of making the ExpressLane configuration persistent.

5. An unrecoverable operating system fault might occur when unloading the RHEL 7.7 inbox `lpfc` driver version 12.0.0.10.

   Workaround

   Update the operating system to RHEL 7.8 or later, or use an out-of-box `lpfc` driver.

NVMe Driver Known Issues

1. If you are adding a subsystem dynamically on a target, you must issue a LIP on the initiator host port that is bound to the target. If you are adding new namespaces dynamically to existing subsystems, you must perform a manual scan on the initiator. See NVMe Driver Technical Tips for more information.
2. Configuring initiator ports as NVMe over FC is not supported on ports that are configured as Fabric Assigned Port World Wide Names (FA-PWWNs).
3. Unloading the FCP driver using the `modprobe -r` command might cause issues on the initiator before NVMe devices are disconnected.

   Workaround

   Unload the driver with `rmmod lpfc`, or if `modprobe –r lpfc` is required, wait for the device loss period of 60 seconds before unloading the driver.
4. During RHEL 7.8 and RHEL 8.1 installation, the operating system reports an error while attempting to add an UEFI boot entry. This is an operating system issue and has been reported to Red Hat.

   NOTE: This issue is specific to NVMe BFS.

   Workaround

   Ignore the warning prompt and continue the installation. On the first reboot, use the server UEFI menu to select the adapter port that is attached to the fabric to boot the operating system.
5. On SLES 12 SP5 and SLES 15 SP1, the `nvmefc-boot-connections` systemd unit is disabled after the operating system is installed using NVMe BFS. This leads to the operating system failing to discover all NVMe subsystems when a large number of NVMe subsystems exist.

   Workaround

   Manually enable the `nvmefc-boot-connections` systemd unit. See NVMe Driver Technical Tips, Item 8, for more information.
6. On RHEL 8.1, RHEL 7.8, and RHEL 7.7 inbox drivers with NVMe targets connected to the port, when the firmware is upgraded, the **No host reboot required to activate new firmware** feature might not work as intended.

   Workaround

   If the new firmware is not activated, reload the driver or reboot the system.
7. If you are updating from RHEL 8.1 to RHEL 8.2 or later in an NVMe BFS environment, refer the known issue in the *Emulex LPe31000-Series and LPe32000-Series HBA Firmware and Boot Code Release Notes* or to the *Emulex LPe35000-Series HBA Firmware and Boot Code Release Notes* regarding a script that must be run as part of the operating system update.
8. On the Oracle Linux 7.7 unbreakable enterprise kernel (UEK) R6 operating system, unloading a Linux FCP driver with NVMe connections might fail.

   Workaround

   Disconnect the NVMe connections before unloading the Linux FCP driver.
9. When performing a clean operating system installation of RHEL 8.2 and loading the `nvme-cli` RPM from the ISO, the default hostid and hostnqn values are the same on multiple servers.

   Workaround

   Update the `nvme-cli` utility to version `1.10.1-1.el8` or later.

10. 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 unoptimized 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 nonoptimized or inaccessible storage. Refer to Knowledge Base article #1211251400308 for further information.

FC Driver Technical Tips

1. For secure boot of the RHEL operating system, download the public key file for the RHEL operating system from www.broadcom.com and place it in the system's key ring before installing the signed `lpfc` driver for the RHEL operating system. Refer to the Red Hat documentation for instructions on adding a kernel module to the system.
2. Dynamic D_Port is enabled by default and cannot be simultaneously enabled with FA-PWWN or DH-CHAP.

    Workaround

    Disable Dynamic D_Port before enabling FA-PWWN or DH-CHAP.
3. On Red Hat operating systems, the installer automatically searches for a driver update disk (DUD) on a storage volume labeled `OEMDRV`. For details, refer to Red Hat documentation.

NVMe Driver Technical Tips

1. Creation of N_Port ID Virtualization (NPIV) connections on initiator ports that are configured for NVMe over FC is not supported. However, initiator ports can connect to Fibre Channel Protocol (FCP) and NVMe targets simultaneously.
2. NVMe disks might not reconnect after a device timeout greater than 60 seconds has occurred.

    Workaround

    You must perform a manual scan or connect via the `nvme connect-all` CLI command.
3. To manually scan for targets or dynamically added subsystems, type the following command (all on one line):

    `nvme connect-all --transport=fc --host-traddr=nn-<initiator_WWNN>:pn-<initiator_WWPN> --traddr=nn-<target_WWNN>:pn-<target_WWPN>`

    where:

    – `<initiator_WWNN>` is the WWNN of the initiator, in hexadecimal.
    – `<initiator_WWPN>` is the WWPN of the initiator, in hexadecimal.
    – `<target_WWNN>` is the WWNN of the target, in hexadecimal.
    – `<target_WWPN>` is the WWPN of the target, in hexadecimal.

    For example:

    ```
    # nvme connect-all --transport=fc --host-traddr=nn-0x20000090fa942779:pn-0x10000090fa942779
    --traddr=nn-0x20000090fae39706:pn-0x10000090fae39706
    ```

4. To enable autoconnect on the following operating systems, install `nvme-cli` from the operating system distribution media:
   - RHEL 8.3
   - RHEL 8.2
   - SLES 15 SP2
   - SLES 15 SP1
   - SLES 12 SP5
5. This release supports FC-NVMe specification version 1.19.
6. If the following files are present on the system after the operating system is installed, the operating system has already installed NVMe over FC autoconnect facilities. Do not install the Emulex autoconnect script file for inbox NVMe over FC drivers.
   - `/usr/lib/systemd/system/nvmefc-boot-connections.service`
   - `/usr/lib/systemd/system/nvmefc-connect@.service`
   - `/usr/lib/udev/rules.d/70-nvmefc-autoconnect.rules`
7. Back up the initial ramdisk before upgrading the operating system.

   During an operating system upgrade, the kernel or `nvme-cli` might be upgraded. You must back up the initial ramdisk before upgrading the operating system. This will ensure that the operating system is still bootable in the event that NVMe BFS fails due to a change in either the kernel or `nvme-cli`.

   Change directory to `/boot` and make a copy of the initial ramdisk.

   Example for SUSE operating systems:
   ```
   # cd /boot
   # cp initrd-$(uname -r) initrd-$(uname -r).bak
   ```
   Example for Red Hat operating systems:
   ```
   # cd /boot
   # cp initramfs-$(uname -r).img initramfs-$(uname -r).img.orig
   ```
8. Enable `nvmefc-boot-connections` to start during boot.

   Use `systemctl enable` to enable the `nvmefc-boot-connections` systemd unit to start during boot.
   ```
   # systemctl enable nvmefc-boot-connections
   Created symlink /etc/systemd/system/default.target.wants/nvmefc-boot-connections.service ? /usr/
   lib/systemd/system/nvmefc-boot-connections.service.
   ```
9. BFS is supported on NVMe over FC. Refer to the *Emulex Boot for the Fibre Channel and NVMe over FC Protocols* for detailed instructions.

   NOTE: Special procedures are required for upgrading an NVMe BFS installation from RHEL 8.1 to a later RHEL 8.x release. Refer to the HBA firmware and boot code release notes for specific information.