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Release Notes

Emulex® Drivers for SLES 12 SP5

Release 12.4.243.23

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 SLES 12 SP5.

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

SLES 12 SP5 is supported on the following series of Emulex adapters:

- LPe12000
- LPe16000
- LPe31000
- LPe32000
- LPe35000

Resolved Issues

This is the initial release of Emulex drivers for SLES 12 SP5.

FC Driver Known Issues

1. PCI Hot Plug might cause applications, such as the Emulex OneCommand® Manager application or third-party applications that use the Emulex libraries (for example, an HBA API), to malfunction.

   Workaround

   a. Stop all applications that are accessing the FC HBA API interface (Emulex OneCommand Manager application or third-party applications) before performing PCI Hot Plug of an FC adapter.

   b. Use the following command to stop the Emulex OneCommand Manager application:
   `#/usr/sbin/ocmanager/stop_ocmanager`

   c. After performing PCI Hot Plug of the adapter, restart the applications.

2. SCSI errors might occur on deletion of vPorts or PCI Hot Unplug.

   On occasion, the kernel might report SCSI errors when deleting vPorts through the `sysfs` interface or performing a PCI Hot Unplug of an Emulex adapter:

   ```
   kernel: Synchronizing SCSI cache for disk
   kernel: FAILED
   ```

   Or:

   ```
   SCSI error: return code = 0x00010000
   ```

   Workaround

   None. Ignore these messages; they do not indicate a functional failure.

3. An issue exists while deleting vPorts when devices are in use.

   Emulex provides management utilities that allow you to delete vPorts. However, no mechanism exists for the FC driver to detect whether devices accessed through that vPort are in use. This situation means that you can delete a vPort when devices accessible through the vPort are mounted or when I/O is outstanding to the device. When file systems are mounted on vPorts and vPorts are deleted, the file systems still appear to be mounted; however, they are inaccessible.

   Workaround

   Before deleting vPorts, you must prepare the system affected by the vPort deletion accordingly, by unmounting all the devices accessible through the vPorts and ensuring there is no outstanding I/O.

4. Devloss timeout occurs after swapping ports.

   The driver might not finish discovery when two initiator ports are swapped. This situation causes all devices accessible through one or both of these initiator ports to time out and all I/O to fail.

   Workaround

   Do one of the following:

   – When swapping cables, replace each cable, one at a time, and allow discovery to finish before replacing the next cable. To determine if discovery is finished, read the `state sysfs` parameter.
   – When swapping cables, allow the devloss timeout to occur before replacing the cables (this action fails all outstanding I/O).

5. Enabling the ExpressLane™ feature on a LUN, when maximum LUNs are already enabled for ExpressLane, might result in an error.

   Workaround

   Use the `/usr/sbin/lpfc/lpfc_clean_xlane_conf.sh` script to clear any unwanted entries and retry enabling ExpressLane.

6. The error message `Failed to issue SLI_CONFIG ext-buffer` might be displayed when multiple queue operations are performed.

   Workaround

   During firmware update operations, do not perform queue operations, such as resetting the adapter, the bus, the target, or the host.

7. Revision A of the FOIT AFCT-57F3TMZ-ELX (16GFC longwave optic transceiver) does not support D_Port (also called ClearLink) for Brocade switches and MDS Diagnostic for Cisco switches.

   Workaround

   None.

8. Neither Revision A nor Revision B of the FOIT AFCT-57F3TMZ-ELX (16GFC longwave optic transceiver) or AFCT-57G5MZ-ELX (32GFC longwave optic transceiver) supports D_Port for Brocade® switches.

   Workaround

   None.

9. The driver might not unload due to BTRFS.

   If a discovered SCSI device has a BTRFS partition on it, the upper layers maintain a reference count on the driver that will cause it not to be unloaded. After the SCSI layer discovers an FC device and you see the following BTRFS message:

   ```
   [    5.502273] sd 0:0:0:1: [sdd] Attached SCSI disk
   [   5.552774] BTRFS: device fsid 69ca50b4-c061-4f66-9ada-0287d76269a0 devid 1 transid 274 /dev/sdd2
   ```

   The BTRFS subsystem takes a reference count on the `lpfc` driver when this occurs. This extra reference count might stop the administrator from unloading the `lpfc` driver. To unload the driver, the reference count for it must be 0:

   ```
   # cat /sys/module/lpfc/refcnt
   0
   #
   ```

10. Boot from SAN is not supported if FC-SP-2 authentication (DHCHAP) is enabled.

    Workaround

    None.

11. Due to limitations in the FC-LS-3 RDP (Read Diagnostic Parameters) ELS (Extended Link Service) definition, FC switches do not issue RDP commands on trunked links.

    Workaround

    None.

12. The remote switched diagnostic test will fail with a Latency Err-Drop error, if you run diagnostics on multiple HBAs simultaneously.

    Workaround

    Run diagnostics on only one port at a time.

13. Brocade switches using Fabric OS® version 8.2.1B and earlier might encounter the following issues with DHCHAP 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.

14. Loading a Broadcom ECD-signed driver on a system using legacy BIOS might result in an error message similar to the following:

    ```
    Request for unknown module key 'Broadcom Inc.: Emulex Connectivity Division:
    d17ecabc92cd490989959b37f05f0eda48c53895' err -11
    ```

    or

    ```
    PKCS#7 signature not signed with a trusted key
    ```

    Workaround

    None. This is a benign error message and can be ignored.

15. On some inbox Linux distributions, the `lpfc_enable_mds_diags` driver parameter cannot be enabled dynamically.

    Workaround

    Enable the `lpfc_enable_mds_diags` parameter temporarily by issuing the following commands:

    ```
    rmmod lpfc
    modprobe lpfc lpfc_enable_mds_diags=1
    ```

    After the diagnostics are complete, reload the driver without the `lpfc_enable_mds_diags` parameter.

16. Do not leave the `enable-mds-diags` driver parameter set to 1. It can cause switch diagnostic failures and OCM D_Port failures, when connected to a Brocade switch.

    Workaround

    Set the `enable-mds-diags` driver parameter to 1, only when running diagnostic tests while connected to supported Cisco switches. Disable the `enable-mds-diags` driver parameter when not running diagnostic tests.

17. In the latest inbox SLES operating system releases, SCSI multi-queue might be enabled by default, which could dramatically increase the amount of preallocated I/O buffers. Depending on your system configuration, out-of-memory errors might occur on boot.

    Workaround

    If the system cannot boot because of memory issues, perform the following steps:

    a. Temporarily change the FC driver parameters by adding the following command to the kernel boot command line:
       `lpfc.lpfc_hdw_queue=1 lpfc.lpfc_fcp_io_sched=0`

       Refer to the operating system documentation for details.

    b. Install the latest release 12.4 out-of-box FC driver.

18. While installing the driver kit, if an instance of `elx-lpfc-vector-map` RPM exists, the driver kit `elx-lpfc-extras` RPM fails to install and might result in an RPM conflict error.

    Workaround

    Uninstall the `elx-lpfc-vector-map` RPM using the following commands:

    ```
    # rpm -e --allmatches elx-lpfc-vector-map --noscripts
    # rm -f /usr/lib/dracut/modules.d/89lpfc-vectormap
    # dracut -f
    ```

    Install the driver kit, after you have successfully uninstalled the `elx-lpfc-vector-map` RPM.

NVMe Driver Known Issues

1. The deliberate faulting of NVMe discovery commands (also called jamming) is not supported. If a discovery command is faulted during initial linkup or during the LIP linkup recovery time, NVMe discovery fails on the affected controller.

   Workaround

   Perform a LIP on the initiator link, and remove the condition that is faulting discovery.

2. If you are adding a subsystem dynamically on a target, you must issue a LIP on the initiator host port 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.

3. Configuring Initiator ports as NVMe over FC is not supported on ports configured as Fabric Assigned Port World Wide Names (FA-PWWN).

4. 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.

5. An I/O error can occur while resetting an NVMe controller. Error messages similar to the following might be shown, and the I/O request could fail.

   ```
   nvme nvme0: NVME-FC{0}: controller reset complete
   print_req_error: I/O error, dev nvme0c2n3, sector 11715.
   ```

   Workaround

   Upgrade to the latest operating system kernel version.

   The minimum supported kernel versions are:

   – SLES12 SP3 4.4.155-94.50.1 and later
   – SLES12 SP4 GA kernel and later
   – SLES15 maintenance update kernel 4.12.14-25.16.1 and later

6. On systems with version 1.7 of the `nvme-cli` installed, connection attempts might fail, and you might not see NVMe-FC storage. Console log messages and Systemd log messages indicate the failure to connect.

   Workaround

   Do one of the following:

   – Contact the operating system vendor to obtain a newer version of the `nvme-cli` utility.
   – Download and use the latest `nvme-cli` utility at https://github.com/linux-nvme/nvme-cli.

7. On SLES 12 SP5, an unrecoverable operating system fault occurs when unloading the lpfc inbox driver.

   Workaround

   Do not unload the lpfc driver using the `rmmod` or `modprode -r` command. After you update the lpfc driver perform a reboot.

8. On LPe35000-series adapters with a SLES 12 SP5 inbox driver, performing a firmware update through sysfs (`lpfc_req_fw_upgrade`) might result in an error message similar to the following:

   ```
   3199 Firmware write complete: Firmware write complete: Firmware reset required to instantiate
   ```

   Workaround

   Instead of a firmware reset, perform a PCI bus reset to activate the newly downloaded firmware.

FC Driver Technical Tips

1. Locked optics are supported on Emulex LPe31000-series and LPe32000-series adapters.

   The adapters perform the following operations:

   – Detect and enable both Broadcom or Emulex certified SFP optics.
   – For firmware revision 11.*x* and later, unqualified optics are disabled, the link is down, and an error message is written to the log file.
   – The `lpfc` out-of-box driver revision 11.*x* and later shows this message, and the link will not come up.
   `"3176 Port Name [wwpn] Unqualified optics - Replace with Avago optics for Warranty and Technical support"`

   When a 32 Gb/s optic is installed in an Emulex LPe31000-series, LPe32000-series, or LPe35000-series adapter, the link supports 32 Gb/s, 16 Gb/s, and 8 Gb/s speeds.

When a 16 Gb/s optic is installed in an Emulex LPe31000-series or LPe32000-series adapter, the link supports 16 Gb/s, 8 Gb/s, and 4 Gb/s speeds.

2. Dynamic D_Port is enabled by default and cannot be simultaneously enabled with FA-PWWN or DHCHAP.

   Workaround

3. To enable FA-PWWN or DHCHAP, you must first disable Dynamic D_Port.

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 reboot the initiator, or perform a manual scan, or connect using 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-0x10000090fae397
   ```
4. This release supports FC-NVMe specification version 1.19.
5. 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`

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