



SRD7104FDC/SRD7204DC/SRD7505DC/BRD7505DC/ BRD7103DC/CRD7505DC/CRD7104FDC Data RAID Installation Guide (Linux)

Version v1.01

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Contents

Overview.....	1
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Prerequisites for a Data-RAID Configuration	2
Driver Installation	3
Installing the Driver.....	3
Updating the Driver.....	7
Uninstalling the Driver	9
FnL Management (FnL Monitor) Installation / Driver Installation Verification	10
Installing the FnL Monitor	10
Uninstalling the FnL Monitor.....	12
Troubleshooting	13
FnL Monitor	13
1. The FnL Monitor fails to install	13
2. The FnL Monitor cannot connect to the Drives	13
3. Fail to compile gcc, make and other driver files.	14
4. If you experience any other FnL Monitor or CLI related problems.....	15
Controller and Drive Detection Issues	15
Appendix	16
How to collect Log information in WEBGUI	16
How to collect Log information in CLI.....	17

Overview

This guide includes important hardware/software requirements, installation & upgrade procedures, and troubleshooting tips for using SRD7104FDC/SRD7204DC/SRD7505DC/BRD7505DC/BRD7103DC/CRD7505DC/CRD7104FDC NVMe AIC RAID Drives with a Linux operating system.

Prerequisites

This section describes the base hardware and software requirements for FnL series NVMe AIC RAID Drives.

Driver Installation

This section covers driver installation, driver upgrade and driver uninstallation procedures for FnL series NVMe AIC RAID Drives in a Linux environment.

Management Software Installation

This section explains how to download and install the HighPoint FnL Management Software Suite for Linux distributions. The download includes both the Web FnL Management Interface (FnL Monitor), and the CLI (Command Line Interface).

Troubleshooting

Please consult this section if you encounter any difficulties installing or using FnL series NVMe AIC RAID Drives. It includes descriptions and solutions for commonly reported technical issues.

Appendix

This section describes how to collect trouble shooting information for support cases you have submitted via our Online Support Portal.

Prerequisites for a Data-RAID Configuration

The FnL series SRD7104FDC/SRD7204DC/SRD7505DC/BRD7505DC/BRD7103DC/CRD7505DC/CRD7104FDC were designed to support data-only NVMe storage configurations. In order to configure a NVMe RAID array, you will need the following:

1. **A PCIe 3.0/4.0 slot with x8 or x16 lanes.** The SRD7104FDC/SRD7505DC/BRD7103DC/BRD7505DC/CRD7104FDC/CRD7505DC device must be installed into a PCIe 3.0 or 4.0 slot with x16 dedicated lanes. The SRD7204DC can be installed into a PCIe 3.0 x8 or x16 slot.
2. **Make sure any non-HighPoint drivers are uninstalled for any SSD's hosted by the FnL series RAID controllers.** 3rd party software and manufacturer provided drivers may prevent the FnL AIC Drives from functioning properly.

Warnings:

- 1) **Failing to remove the AIC Drive and SSD's when uninstalling the driver may result in data loss.**
- 2) **Always make sure the FnL driver is installed before moving a FnL series NVMe AIC RAID Drives to another Linux system.**

Linux distributions will always load the default NVMe support after the FnL driver has been uninstalled, or if it detects the presence of a card when no driver has been loaded – this driver will only recognize the NVMe SSD's as separate disks.

If the SSDs are recognized separately, any data they contain may be lost – this includes RAID configuration data.

Driver Installation

Installing the Driver

1. Power on the system and boot the Linux distribution.
2. Open a system terminal with root privileges, and verify that the FnL series NVMe AIC RAID Drives is detected by using the following command:

lspci

Example screenshot (SRD7104FDC/CRD7104FDC):

```
[root@localhost test]# lspci
00:00.0 Host bridge: Intel Corporation 8th Gen Core Processor Host Bridge/DRAM Registers (rev 0a)
00:01.0 PCI bridge: Intel Corporation Xeon E3-1200 v5/E3-1500 v5/6th Gen Core Processor PCIe Controller (x16) (rev 0a)
00:02.0 VGA compatible controller: Intel Corporation UHD Graphics 630 (Desktop 9 Series)
00:12.0 Signal processing controller: Intel Corporation Cannon Lake PCH Thermal Controller (rev 10)
00:14.0 USB controller: Intel Corporation Cannon Lake PCH USB 3.1 xHCI Host Controller (rev 10)
00:14.2 RAM memory: Intel Corporation Cannon Lake PCH Shared SRAM (rev 10)
00:14.3 Network controller: Intel Corporation Wireless-AC 9560 [Jefferson Peak] (rev 10)
00:16.0 Communication controller: Intel Corporation Cannon Lake PCH HECI Controller (rev 10)
00:17.0 SATA controller: Intel Corporation Cannon Lake SATA AHCI Controller (rev 10)
00:1b.0 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #17 (rev f0)
00:1c.0 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #1 (rev f0)
00:1c.4 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #5 (rev f0)
00:1c.6 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #7 (rev f0)
00:1d.0 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #9 (rev f0)
00:1f.0 ISA bridge: Intel Corporation Z390 Chipset LPC/eSPI Controller (rev 10)
00:1f.3 Audio device: Intel Corporation Cannon Lake PCH cAVS (rev 10)
00:1f.5 SMBus: Intel Corporation Cannon Lake PCH SMBus Controller (rev 10)
00:1f.5 Serial bus controller (0c80): Intel Corporation Cannon Lake PCH SPI Controller (rev 10)
00:1f.6 Ethernet controller: Intel Corporation Ethernet Connection (7) I219-V (rev 10)
01:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
02:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
02:09.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
02:10.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
02:11.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
03:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM991
04:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM991
05:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM991
06:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM991
75:00.0 Ethernet controller: Aquantia Corp. AC107 10GbE 7/10E 802.3bz Ethernet Controller (ADT1) (rev 02)
74:00.0 PCI bridge: ASMedia Technology Inc. ASM1184e PCIe Switch Port
75:01.0 PCI bridge: ASMedia Technology Inc. ASM1184e PCIe Switch Port
75:03.0 PCI bridge: ASMedia Technology Inc. ASM1184e PCIe Switch Port
75:05.0 PCI bridge: ASMedia Technology Inc. ASM1184e PCIe Switch Port
75:07.0 PCI bridge: ASMedia Technology Inc. ASM1184e PCIe Switch Port
```

SRD7204DC:

```
18:1e.0 System peripheral: Intel Corporation Sky Lake-E PCH Registers (rev 04)
17:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
18:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
18:10.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
1a:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
1b:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
1b:09.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
1b:10.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
1b:11.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
1c:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM991
1e:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM991
1f:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM991
64:00.0 PCI bridge: Intel Corporation Sky Lake-E PCI Express Root Port A (rev 04)
64:05.0 System peripheral: Intel Corporation Sky Lake-E VT-d (rev 04)
64:05.2 System peripheral: Intel Corporation Sky Lake-E BAS Configuration Registers (rev 04)
64:05.4 PIC: Intel Corporation Sky Lake-E IDMAPIC Configuration Registers (rev 04)
64:06.0 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:09.0 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0a.0 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0a.1 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0a.2 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0a.3 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0a.4 System peripheral: Intel Corporation Sky Lake-E LMS Channel 1 (rev 04)
64:0a.5 System peripheral: Intel Corporation Sky Lake-E LMS Channel 1 (rev 04)
64:0a.6 System peripheral: Intel Corporation Sky Lake-E LMS Channel 1 (rev 04)
64:0a.7 System peripheral: Intel Corporation Sky Lake-E LMPD Channel 1 (rev 04)
64:0b.0 System peripheral: Intel Corporation Sky Lake-E DECS Channel 2 (rev 04)
64:0b.1 System peripheral: Intel Corporation Sky Lake-E LMS Channel 2 (rev 04)
64:0b.2 System peripheral: Intel Corporation Sky Lake-E LMS Channel 2 (rev 04)
64:0b.3 System peripheral: Intel Corporation Sky Lake-E LMPD Channel 2 (rev 04)
64:0c.0 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0c.1 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0c.2 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0c.3 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0c.4 System peripheral: Intel Corporation Sky Lake-E Integrated Memory Controller (rev 04)
64:0c.5 System peripheral: Intel Corporation Sky Lake-E LMS Channel 1 (rev 04)
64:0c.6 System peripheral: Intel Corporation Sky Lake-E LMS Channel 1 (rev 04)
64:0c.7 System peripheral: Intel Corporation Sky Lake-E LMPD Channel 1 (rev 04)
64:0d.0 System peripheral: Intel Corporation Sky Lake-E DECS Channel 2 (rev 04)
64:0d.1 System peripheral: Intel Corporation Sky Lake-E LMS Channel 2 (rev 04)
64:0d.2 System peripheral: Intel Corporation Sky Lake-E LMS Channel 2 (rev 04)
64:0d.3 System peripheral: Intel Corporation Sky Lake-E LMPD Channel 2 (rev 04)
65:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
66:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
66:10.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
68:00.0 VGA compatible controller: NVIDIA Corporation GK208B [GeForce 710] (rev a1)
68:01.0 Audio device: NVIDIA Corporation GK208 HDMI/DP Audio Controller (rev a1)
b2:05.0 System peripheral: Intel Corporation Sky Lake-E VT-d (rev 04)
```

SRD7103DC:

```
00:18.3 Host bridge: Advanced Micro Devices, Inc. [AMD] Starship Device 24; Function 3
00:18.4 Host bridge: Advanced Micro Devices, Inc. [AMD] Starship Device 24; Function 4
00:18.5 Host bridge: Advanced Micro Devices, Inc. [AMD] Starship Device 24; Function 5
00:18.6 Host bridge: Advanced Micro Devices, Inc. [AMD] Starship Device 24; Function 6
00:18.7 Host bridge: Advanced Micro Devices, Inc. [AMD] Starship Device 24; Function 7
01:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
02:08.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
02:09.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
02:10.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
02:11.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
03:00.0 Non-Volatile memory controller: Sandisk Corp WD Black 2018/PC SN520 NVMe SSD (rev 01)
04:00.0 Non-Volatile memory controller: Sandisk Corp WD Black 2018/PC SN520 NVMe SSD (rev 01)
05:00.0 Non-Volatile memory controller: Sandisk Corp WD Black 2018/PC SN520 NVMe SSD (rev 01)
06:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
07:08.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
07:09.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
07:10.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
07:11.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
08:00.0 Non-Volatile memory controller: Sandisk Corp WD Black 2018/PC SN520 NVMe SSD (rev 01)
09:00.0 RAID bus controller: HighPoint Technologies, Inc. Device 7103 (rev 01)
0c:00.0 Non-Essential Instrumentation [1300]: Advanced Micro Devices, Inc. [AMD] Starship/Matisse PCIe Dummy Function
0d:00.0 Non-Essential Instrumentation [1300]: Advanced Micro Devices, Inc. [AMD] Starship/Matisse Reserved SPP
0d:00.3 USB controller: Advanced Micro Devices, Inc. [AMD] Starship USB 3.0 Host Controller
```

SRD7505DC/BRD7505DC/CRD7505DC:

```
07:00.3 USB controller: Advanced Micro Devices, Inc. [AMD] Matisse USB 3.0 Host Controller
08:00.0 SATA controller: Advanced Micro Devices, Inc. [AMD] FCH SATA Controller [AHCI mode] (rev 51)
09:00.0 SATA controller: Advanced Micro Devices, Inc. [AMD] FCH SATA Controller [AHCI mode] (rev 51)
0a:00.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0b:00.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0b:0c.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0b:1c.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0c:00.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0d:10.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0d:14.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0d:18.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0d:1c.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
0e:00.0 Non-Volatile memory controller: Seagate Technology PLC Device 5016 (rev 01)
0f:00.0 Non-Volatile memory controller: Seagate Technology PLC Device 5016 (rev 01)
10:00.0 Non-Volatile memory controller: Seagate Technology PLC Device 5016 (rev 01)
11:00.0 Non-Volatile memory controller: Seagate Technology PLC Device 5016 (rev 01)
12:00.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
13:14.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
13:15.0 PCI bridge: Broadcom / LSI Device c010 (rev b0)
14:00.0 RAID bus controller: HighPoint Technologies, Inc. Device 7505 (rev 01)
16:00.0 Mass storage controller: Broadcom / LSI Device c010 (rev b0)
```

Additionally, you can verify that the NVMe SSD's are detected by using the following command:

fdisk -l

Example screenshot (SRD7104FDC):

```
[root@localhost test]# fdisk -l
WARNING: fdisk GPT support is currently new, and therefore in an experimental phase. Use at your own discretion.

Disk /dev/sda: 120.0 GB, 120034123776 bytes, 234441648 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: gpt
Disk identifier: 4F8C489F-66B4-422E-9902-B27FC59829B6

#           Start          End          Size      Type           Name
#-----
 1             34           32767       16M       Microsoft reser Microsoft reserved partition
 2          32768          442367      200M       EFI System      EFI System Partition
 3          442368          2539519       1G       Microsoft basic
 4         2539520         234440703    110.6G      Linux LVM

Disk /dev/mapper/rhel-root: 53.7 GB, 53687091200 bytes, 104857600 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mapper/rhel-swap: 12.0 GB, 12004098048 bytes, 23445504 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/nvme0n1: 500.1 GB, 500107862016 bytes, 976773168 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

3. Download the appropriate driver from Software Downloads webpage:

SRD7104FDC:

<https://www.fnlnvme.com/srd7104fdc-overview>

SRD7204DC:

<https://www.fnlnvme.com/srd7204dc-overview>

SRD7505DC:

<https://www.fnlnvme.com/srd7505dc-overview>

BRD7505DC:

<https://www.fnlnvme.com/brd7505dc-overview>

BRD7103DC:

<https://www.fnlnvme.com/brd7103dc-overview>

CRD7505DC:

<https://www.fnlnvme.com/crd7505dc-overview>

CRD7104FDC:

<https://www.fnlnvme.com/crd7104fdc-overview>

4. Using the system terminal with root privileges, browse to the directory where the driver downloads, and enter the following commands to extract the Linux Open Source Driver software package:

**SRD7104FDC/SRD7204DC/SRD7505DC, BRD7505DC/BRD7103DC,
CRD7505DC/CRD7104FDC:**

tar xzvf HighPoint_NVMe_G5_Linux_Src_vx.x.xx_xx_xx_xx.tar.gz

```
[root@localhost Downloads]# tar xzvf HighPoint_NVMe_G5_Linux_Src_v1.2.13_20_03_17.tar.gz
hptnvme_g5_linux_src_v1.2.13_20_03_17.bin
README
```

Note: The driver revision shown in the screenshots may not correspond with current software releases. Please make sure to download the latest driver updates from the product's Software Updates page.

5. Install the Opensource Driver using the following command:

sh hptnvme_g5_linux_src_vx.x.xx_xx_xx_xx.bin
(or ./hptnvme_g5_linux_src_vx.x.xx_xx_xx_xx.bin)

```
[root@localhost Downloads]# sh hptnvme_g5_linux_src_v1.2.13_20_03_17.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
Checking and installing required toolchain and utility ...
Found program make (/usr/bin/make)
Found program gcc (/usr/bin/gcc)
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
Created symlink from /etc/systemd/system/default.target.wants/hptdrv-monitor.service to /usr/lib/systemd/system/hptdrv-monitor.service.

Please run hptuninhptnvme to uninstall the driver files.

Please restart the system for the driver to take effect.
[root@localhost Downloads]#
```

6. After the driver installation is complete, the system will prompt you to restart to make the driver take effect. **Manually restart the system.**
7. After the distribution as rebooted, open the system terminal with root privileges and check the driver status using the following command:

dmesg | grep nvme

The following screenshot shows driver version v1.2.13.

```
[root@localhost Downloads]# dmesg | grep hptnvme
[ 4.431322] hptnvme: loading out-of-tree module taints kernel.
[ 4.431325] hptnvme: module license 'Proprietary' taints kernel.
[ 4.431786] hptnvme: module verification failed: signature and/or required key missing - tainting kernel
[ 5.381222] hptnvme: HighPoint NVMe RAID controller driver (65) v1.2.13 block major fc
[ 5.382480] scsi host6: hptnvme
[ 5.382617] hptnvme 0000:03:00.0: irq 145 for MSI/MSI-X
[ 5.382622] hptnvme 0000:03:00.0: irq 146 for MSI/MSI-X
[ 5.382625] hptnvme 0000:03:00.0: irq 147 for MSI/MSI-X
[ 5.382630] hptnvme 0000:03:00.0: irq 148 for MSI/MSI-X
[ 5.382633] hptnvme 0000:03:00.0: irq 149 for MSI/MSI-X
[ 5.382637] hptnvme 0000:03:00.0: irq 150 for MSI/MSI-X
```

Additionally, you can check the NVMe driver using the following command:

fdisk -l


```
Device Boot      Start          End      Blocks   Id  System
/dev/sdb1   *        1654784      11925039   58800128   c   W95 FAT32 (LBA)
/dev/sdb2        11925040      120172542   458751+    1b   Hidden W95 FAT32
WARNING: fdisk GPT support is currently new, and therefore in an experimental phase. Use at your own discretion.

Disk /dev/hptblock15n0p: 2000.1 GB, 2000112502656 bytes, 3906460888 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: gpt
Disk identifier: 4B74167E-E9DA-4BD2-A20F-44ED3EC04D33

#           Start          End      Size Type          Name
# 1         40            409639   200M  EFI System    EFI System Partition
# 2        409640       3906469847  1.8T  unknown

Disk /dev/mapper/rhel-home: 53.0 GB, 53041168384 bytes, 103596032 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

[root@localhost test]#
```

Updating the Driver

1. Prerequisites

- a. Ensure that the FnL series NVMe AIC RAID Drives is attached to the motherboard.
- b. Open the system terminal with root privileges to check the current driver version by using the following command:

**SRD7104FDC/SRD7204DC/SRD7505DC, BRD7505DC/BRD7103DC,
CRD7505DC/CRD7104FDC:**

dmesg | grep nvme

The following screenshot shows driver version v1.2.13.

```
[root@localhost Downloads]# dmesg | grep hptnvme
[ 4.431322] hptnvme: loading out-of-tree module taints kernel.
[ 4.431325] hptnvme: module license 'Proprietary' taints kernel.
[ 4.431786] hptnvme: module verification failed: signature and/or required key missing - tainting kernel
[ 5.381222] hptnvme: HighPoint NVMe RAID controller driver (G5) v1.2.13 block major fc
[ 5.382480] scsi host6: hptnvme
[ 5.382617] hptnvme 0000:03:00.0: irq 145 for MSI/MSI-X
[ 5.382622] hptnvme 0000:03:00.0: irq 146 for MSI/MSI-X
[ 5.382625] hptnvme 0000:03:00.0: irq 147 for MSI/MSI-X
[ 5.382630] hptnvme 0000:03:00.0: irq 148 for MSI/MSI-X
[ 5.382633] hptnvme 0000:03:00.0: irq 149 for MSI/MSI-X
[ 5.382637] hptnvme 0000:03:00.0: irq 150 for MSI/MSI-X
```

8. Download the appropriate driver from Software Downloads webpage:

SRD7104FDC:

<https://www.fnlnvme.com/srd7104fdc-overview>

SRD7204DC:

<https://www.fnlnvme.com/srd7204dc-overview>

SRD7505DC:

<https://www.fnlnvme.com/srd7505dc-overview>

BRD7505DC:

<https://www.fnlnvme.com/brd7505dc-overview>

BRD7103DC:

<https://www.fnlnvme.com/brd7103dc-overview>

CRD7505DC:

<https://www.fnlnvme.com/crd7505dc-overview>

CRD7104FDC:

<https://www.fnlnvme.com/crd7104fdc-overview>

- c. Open the directory where the latest driver version is located and open the system terminal with root privileges. Extract the Linux Opensource Driver software package.

SRD7104/7204/7505, BRD7505/7103, CRD7505/7104:

tar zxvf HighPoint_NVMe_G5_Linux_Src_vx.x.xx_xx_xx_xx.tar.gz

```
[root@localhost Downloads]# tar zxvf HighPoint_NVMe_G5_Linux_Src_v1.2.14_20_04_10.tar.gz
hptnvme_g5_linux_src_v1.2.14_20_04_10.bin
README
```

- d. Make sure the system has an active internet connection. To install the latest Opensource Driver, open the system terminal with root privileges and enter the following command:

./hptnvme_g5_linux_src_vx.x.xx_xx_xx_xx.bin

```
[root@localhost Downloads]# ./hptnvme_g5_linux_src_v1.2.14_20_04_10.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
Checking and installing required toolchain and utility ...
Found program make (/usr/bin/make)
Found program gcc (/usr/bin/gcc)
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
old crashkernel=auto rd.lvm.lv=centos/root rd.lvm.lv=centos/swap rhgb quiet intel_iommu=off and_iommu=off
new crashkernel=auto
rd.lvm.lv=centos/root
rd.lvm.lv=centos/swap
rhgb
quiet intel_iommu=off amd_iommu=off
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-3.10.0-1062.18.1.el7.x86_64
Found initrd image: /boot/initramfs-3.10.0-1062.18.1.el7.x86_64.img
Found linux image: /boot/vmlinuz-3.10.0-1062.el7.x86_64
Found initrd image: /boot/initramfs-3.10.0-1062.el7.x86_64.img
Found linux image: /boot/vmlinuz-0-rescue-cd0401dc0d1649da9932eac9f5546670
Found initrd image: /boot/initramfs-0-rescue-cd0401dc0d1649da9932eac9f5546670.img
done

Please run hptunihptnvme to uninstall the driver files.
Please restart the system for the driver to take effect.
[root@localhost Downloads]#
```

- e. After the driver installation is complete, the system will prompt you to restart to allow the new driver to take effect. Manually restart the system
- f. Once the distribution has rebooted, open the system terminal with root privileges and check the current driver version using the following command:

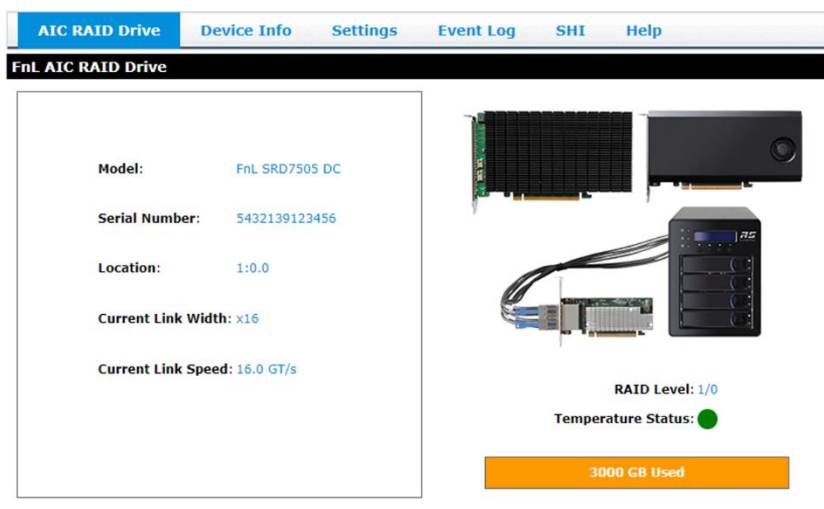
dmesg | grep nvme.

The screenshot below shows driver v1.2.14 is installed:

```
[root@localhost test]# dmesg | grep hptnvme
[ 4.267125] hptnvme: loading out-of-tree module taints kernel.
[ 4.267128] hptnvme: module license 'Proprietary' taints kernel.
[ 4.267485] hptnvme: module verification failed: signature and/or required key missing - tainting kernel
[ 5.216390] hptnvme: HighPoint NVMe RAID controller driver (G5) v1.2.14 block major fc
[ 5.217073] scsi host0: hptnvme
[ 5.217813] hptnvme 0000:03:00.0: irq 145 for MSI/MSI-X
[ 5.217817] hptnvme 0000:03:00.0: irq 146 for MSI/MSI-X
[ 5.217820] hptnvme 0000:03:00.0: irq 147 for MSI/MSI-X
[ 5.217823] hptnvme 0000:03:00.0: irq 148 for MSI/MSI-X
[ 5.217827] hptnvme 0000:03:00.0: irq 149 for MSI/MSI-X
```

- g. Open the FnL Monitor ([refer to FnL Monitor install](#)) to make sure it can connect to the controller and recognize the NVMe SSD's RAID array.
- h. As shown below, the new driver has been successfully installed and loaded at bootup – the FnL Monitor can connect to the controller and recognize the SSDs and RAID array:

For Example: SRD7505DC



Uninstalling the Driver

1. Prerequisites

- a. Power off the system and remove the FnL device from the motherboard.

Note: failing to remove the controller and SSD's when uninstalling the driver may result in data loss. The Linux distribution will load the default NVMe support after the FnL driver has been uninstalled – this driver will only recognize the NVMe SSD's as separate disks.

2. To uninstall the driver:

- a. Open the system terminal with root privileges. Enter the following commands to uninstall the driver:

SRD7104FDC/SRD7204DC/SRD7505DC, BRD7505DC/BRD7103DC, CRD7505DC/CRD7104FDC:

hptuninhptnvme

- b. Press 'Y' to confirm.

```
[root@localhost test]# hptuninhptnvme
Are you sure to uninstall the driver hptnvme from system? (Y/n): y
depmod: WARNING: could not open /lib/modules/3.10.0-1133.el7.x86_64/modules.order: No such file or directory
depmod: WARNING: could not open /lib/modules/3.10.0-1133.el7.x86_64/modules.builtins: No such file or directory
Removed symlink /etc/systemd/system/default.target.wants/hptdrv-monitor.service.
Removed symlink /etc/systemd/system/sysinit.target.wants/systemd-hptdrv.service.
All files installed have been deleted from the system.
[root@localhost test]#
```

- c. After uninstalling the driver, manually reboot the system.
- d. After the distribution has rebooted, open the system terminal with root privileges. And enter the following command to check the driver status:

lsmod | grep hptnvme

Before uninstalling:

```
[root@localhost test]# lsmod |grep hptnvme
hptnvme                235777  0
[root@localhost test]#
```

After uninstalling:

```
[root@localhost test]# lsmod |grep hptnvme
[root@localhost test]#
```

- e. If the system does not display information about “**nvme or hptnvme**”, the driver has been successfully uninstalled.

FnL Management (FnL Monitor) Installation / Driver Installation Verification

Installing the FnL Monitor

The FnL Management software is used to monitor SSD's and arrays hosted by the FnL series NVMe AIC RAID Drives.

Download the FnL Management software package.

1. Using the system terminal with root privileges, browse to the directory where the driver download, and enter the following commands to extract the management software package:

Example screenshot:

tar zxvf FnL_7000_Monitor_Linux_vx.x.xx_xx_xx_xx.tgz

```
root@test:/home/test# tar zxvf FnL_7000_Monitor_Linux_v2.1.1_21_06_10.tgz
README.txt
FnL_Monitor_Linux_v2.1.1_21_06_10.bin
root@test:/home/test# _
```

2. Install the HighPoint FnL management software (FnL Monitor & CLI) using the following command:

sh FnL_Monitor_Linux_vx.x.xx_xx_xx_xx.bin
(or ./FnL_Monitor_Linux_vx.x.xx_xx_xx_xx.bin)

```
root@test:/home/test# sh FnL_Monitor_Linux_v2.1.1_21_06_10.bin
-----
Install .....
FnL_Monitor_Linux_v2.1.1_21_06_10.bin: 91: [: /lib/x86_64-linux-gnu/libreadline.so.8: unexpected operator
removing previous hptsvr...
waiting for hptsvr to be terminated...
removed.
Package readline lib is already installed!
readline/hptsvr_2.1.1_amd64.deb will be installed!
Selecting previously unselected package hptsvr.
(Reading database ... 115854 files and directories currently installed.)
Preparing to unpack ../hptsvr_2.1.1_amd64.deb ...
Unpacking hptsvr (2.1.1) ...
Setting up hptsvr (2.1.1) ...
Starting hptsvr daemon.
Clean .....
Finish .....
root@test:/home/test# █
```

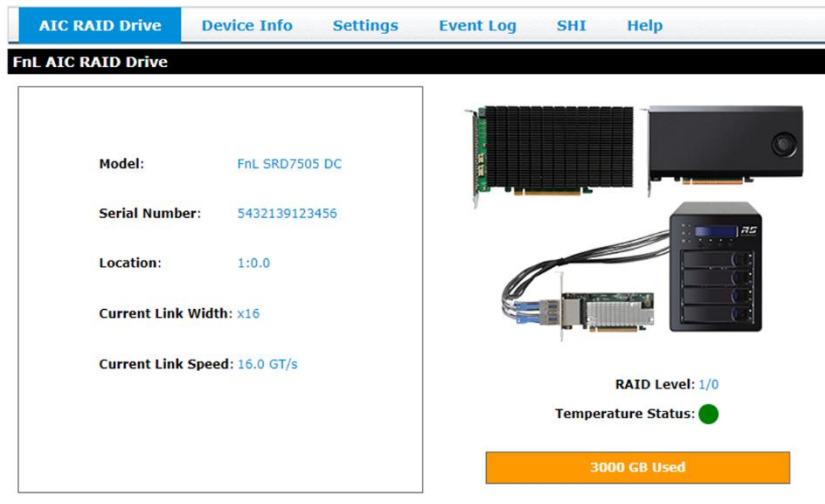
3. After the software is installed, open the FnL Monitor to make sure it can connect to the FnL series NVMe AIC RAID Drives.
4. You can also check the controller using the CLI (command line interface). Using the system terminal, enter the following command:

hptraidconf

For more information about the CLI, please download the guide: [Link](#).

```
[root@localhost test]# hptraidconf
HPT CLI>query devices
-----
ID          Capacity  MaxFree  Flag  Status  ModelNumber
-----
1/E1/1     250.06    0        SINGLE LEGACY  Samsung SSD
1/E1/2     250.06    0        SINGLE LEGACY  Samsung SSD
1/E1/3     250.06    0        SINGLE LEGACY  Samsung SSD
1/E1/4     250.06    0        SINGLE LEGACY  Samsung SSD
-----
HPT CLI>□
```

5. If the FnL Monitor/CLI can connect to the controller and recognized the NVMe SSD's, the driver has been installed and is functioning normally:



Note: The FnL Monitor revision shown in the screenshots may not correspond with current software releases. Please make sure to download the latest driver updates from the product's Software Updates page.

Uninstalling the FnL Monitor

Open the system terminal with root privileges. Enter the following commands to uninstall the driver:

**SRD7104FDC/SRD7204DC/SRD7505DC, BRD7505DC/BRD7103DC,
CRD7505DC/CRD7104FDC:**

dpkg -r hptsvr (or rpm -e hptsvr-https)

```
root@test-X299-UD4-Pro:/home/test/Desktop# dpkg -r hptsvr
(Reading database ... 192976 files and directories currently installed.)
Removing hptsvr (2.1.1) ...
root@test-X299-UD4-Pro:/home/test/Desktop#
```

After removing the FnL Monitor, enter the following command to check if the FnL Monitor has been removed successfully:

hptraidconf

after uninstall:

```
root@test-X299-UD4-Pro:/home/test/Desktop# hptraidconf
hptraidconf: command not found
root@test-X299-UD4-Pro:/home/test/Desktop#
```

Troubleshooting

FnL Monitor

1. The FnL Monitor fails to install

If you use a ubuntu system, the system may prompt you about the lack of a **readline7** package when installing the FnL Monitor – this will interrupt the installation process.

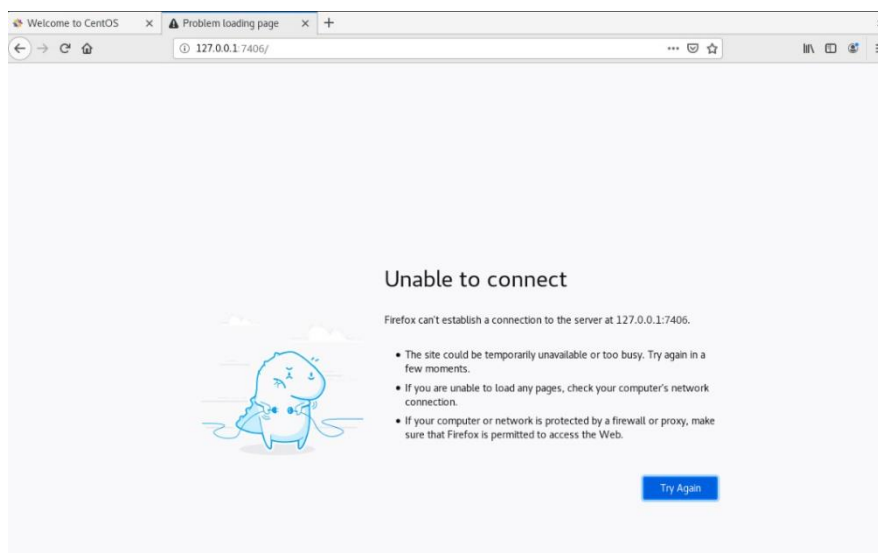
```
root@test-PRIME-Z390-A:/home/test/Downloads# sh RAID_Manage_Linux_v2.3.14_17_07_26.bin
-----
Install .....
Package readline lib not found! will be installed!
Install param error!
Clean .....
Finish .....
```

Solution:

- a. With root permissions enabled, you can use the following command to load readline5 at using a terminal, and will be allowed to install the FnL Monitor:
apt-get install libreadline7
- b. Once complete, restart the FnL Monitor installation procedure.

2. The FnL Monitor cannot connect to the Drives

If you are unable to access the FnL series NVMe AIC RAID Drives using the FnL Monitor:



- a. **FnL Monitor service did not start successfully.**

Solution:

Start the FnL Monitor by opening the system terminal with root privileges and entering the following command:

hptsvr

b. The driver cannot be compiled.

```
[root@localhost test]# hptsvr
proc file invalid, dwControllerId=0
Driver is not loaded.
[root@localhost test]# █
```

Solution:

1. Make sure motherboard can recognize the FnL device and display NVMe information during the BIOS post.
2. If you use a CentOS system, open the system terminal with root privileges and entering the following command to install “elfutils-libelf-devel”:

yum install elfutils-libelf-devel

Once complete, install the FnL driver once more.

3. If you use an Ubuntu/Debian system, open the system terminal with root privileges and entering the following command to install “libelf-dev”:

#yum install libelf-dev

Once complete, install the FnL driver once more.

3. Fail to compile gcc, make and other driver files.

When installing the driver, due to various factors, driver files such as **gcc** and **make** cannot be compiled, thus interrupting the driver installation process:

```
root@test:/home/test# ./rsnvme_linux_src_v1.2.18.1_2020_03_18.bin
Verifying archive integrity... All good.
Uncompressing RocketNVMe RAID Controller Linux Open Source package installer....
Checking and installing required toolchain and utility ...
Installing program make ... (failed)
Installing program gcc ... (failed)
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
```

This problem can be caused by:

a. The system is not connected to a network (internet connection)

Solution:

- a. Double check the system’s internet connection
- b. Once confirmed, reinstall the driver.

b. System process is occupied/busy

Solution:

Open the system terminal with root privileges and enter the following command:

apt-get update

This will prompt the system to release the process and update the download source. Install the driver again after the system process has been released.

- 4. If you experience any other FnL Monitor or CLI related problems,** please submit a support ticket using our [Online Support Portal](#), include a description of the problem in as much detail as possible, and upload the following:

Collect the following Log files: pci.log, drivermod.log, hptdrv.log, kernel.log

Please click the following [link](#) for more information about locating and collecting these logs. More information is also available in the Appendix section.

Controller and Drive Detection Issues

If the system is unable to detect the controller or SSD's, make sure to remove any NVMe devices from the system that is not related to the FnL series Drives during the troubleshooting process. The presence of other NVMe devices may interfere with the detection of the FnL device.

If you experience any other controller related problems, please submit a support ticket using our [Online Support Portal](#), include a description of the problem in as much detail as possible.

Please check the **Appendix**, starting on page 20— providing system logs, screenshots and other information about your system will enable our Support Department resolve you support issue as quickly and efficiently as possible.

Appendix

When submitting a support ticket via our Online Support Portal, the following information will help our Support Department diagnose and resolve your issue as quickly and efficiently as possible.

How to collect Log information in WEBGUI

01. Start the WEBGUI, Diagnostic view will appear when Driver or HPT card does not effect, you can see the system information and HPT Product information in this view;

Click '**Save Logs**', your log information will be collected. '**Logs Location**' will display the location of the saving path.

System	Product
OS: Ubuntu 21.04 x86_64	Controller: HighPoint NVMe RAID Controller
Kernel: 5.11.0-36-generic	Driver Name: hptnvme
CPU: AMD Ryzen Threadripper 3960X 24-Core Processor	Driver Version: v1.3.1
MotherBoard: ASUSTeK COMPUTER INC. PRIME TRX40-PRO Rev 1.xx	
BIOS: American Megatrends Inc. 1303 11/11/2020 13.3	
Disk: Samsung SSD 860	
Chipset: Advanced Micro Devices, Inc. [AMD] Starship/Matisse Root Complex	

Logs Location: Logs have not been saved Save Logs

02. You can also click '**Help**'→'**Diagnostic**' to enter the diagnostic view.

System	Product
OS: Ubuntu 21.04 x86_64	Controller: HighPoint NVMe RAID Controller
Kernel: 5.11.0-36-generic	Driver Name: hptnvme
CPU: AMD Ryzen Threadripper 3960X 24-Core Processor	Driver Version: v1.3.1
MotherBoard: ASUSTeK COMPUTER INC. PRIME TRX40-PRO Rev 1.xx	
BIOS: American Megatrends Inc. 1303 11/11/2020 13.3	
Disk: Samsung SSD 860	
Chipset: Advanced Micro Devices, Inc. [AMD] Starship/Matisse Root Complex	

Logs Location: Logs have not been saved Save Logs

Enter the Diagnostic view, click '**Save Logs**', your log information will be collected.
'**Logs Location**' will display the location of the saving path.

The screenshot shows a web-based diagnostic interface. At the top, there is a navigation bar with tabs: AIC RAID Drive, Device Info, Settings, Event Log, SHI, and Help. Below this is a header for 'Diagnostic View'. The main content is divided into two columns: 'System' and 'Product'. The 'System' column lists various hardware and software details, while the 'Product' column lists controller and driver information. At the bottom, there is a 'Logs Location' field showing 'Logs have not been saved' and a 'Save Logs' button.

System	Product
OS: Ubuntu 21.04 x86_64	Controller: HighPoint NVMe RAID Controller
Kernel: 5.11.0-36-generic	Driver Name: hptnvme
CPU: AMD Ryzen Threadripper 3960X 24-Core Processor	Driver Version: v1.3.1
MotherBoard: ASUSTeK COMPUTER INC. PRIME TRX40-PRO Rev 1.xx	
BIOS: American Megatrends Inc. 1303 11/11/2020 13.3	
Disk: Samsung SSD 860	
Chipset: Advanced Micro Devices, Inc. [AMD] Starship/Matisse Root Complex	

Logs Location: Logs have not been saved Save Logs

How to collect Log information in CLI

01. Execute the command '**hptraidconf**' to enter the CLI;
02. Execute the command '**diag**' in CLI, your log information will be collected.

```
FnL CLI>diag
The diagnostic information has been saved in /usr/share/hpt/HighPoint_hptnvme_v1.3.2_2021.11.01.tar.gz
FnL CLI>
```

If you have problems in use, please submit the log to our online service
(<https://www.highpoint-tech.com/websupport/>).