SSD7101 A&SSD7204 Data RAID Linux 安装指南

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概述

本指南包含重要的硬件/软件要求、安装和升级过程,以及有关在 Linux 操作系统上使用 SSD7101A-1, SSD7120 和 SSD7204 NVMe RAID 控制器以及 SSD6540 / 6540M RAID 外机的故障排除提示

要求

这部分介绍 SSD7000 系列 NVMe RAID 控制器和机箱的基本硬件和软件要求

驱动安装

这部分介绍了 Linux 环境中 SSD7000 系列 NVMe RAID 控制器和机箱的驱动程序安装,驱动程序升级和驱动程序卸载过程

管理软件安装

这部分说明了如何下载和安装适用于 Linux 发行版的 HighPoint RAID 管理软件套件,下载内容包括 Web RAID 管理界面(WebGUI)和 CLI(命令行界面)

故障排除

如果在安装或使用 SSD7000 系列 NVMe RAID 控制器或机箱时遇到任何困难,请查阅 这部分,它包括对常见报告的技术问题的描述和解决方案

附录

这部分介绍了如何收集通过我们的在线支持门户网站提交的支持案例的故障排除信息

数据 RAID 配置的先决条件

HighPoint SSD7101A-1、SSD7120、SSD7204、SSD6540M 和 SSD6540 旨在 支持纯数据 NVMe 存储配置,为了配置不可引导的 NVMe RAID 阵列,您将 需要以下内容:

- 1. **必须安装一个 NVMe SSD** 您必须在 SSD7000 系列 RAID 控制器或机 箱中至少安装一个 NVMe SSD
- 一个具有 x8 或 x16 通道的 PCIe 3.0 插槽 SSD7200 系列 RAID 控制器(例如 SSD7204)可与具有 x8 或 x16 通道的 PCIe 3.0 插槽一起使用,其他 SSD7000 系列 NVMe 解决方案都需要 x16 通道以实现最佳性能
- 3. 确保为 SSD7000 系列 RAID 控制器托管的任何 SSD 卸载了所有非 HighPoint 驱动程序 第三方软件和制造商提供的驱动程序可能会阻止 SSD7000 控制器或机箱正常运行

警告:

- 1) 卸载驱动程序时未能删除控制器和 SSD 可能会导致数据丢失
- 2) 在将 SSD7000 系列 NVMe RAID 控制器和 RAID 阵列移至另一个 Linux 系统 之前,请始终确保已安装 SSD7000 驱动程序

卸载 SSD7000 驱动程序后,Linux 发行版将始终加载默认的 NVMe 支持,或者在未加载驱动程序时检测到卡的存在,Linux 驱动程序仅将 NVMe SSD 识别为单独磁盘

如果单独识别 SSD,则其中包含的所有数据都可能会丢失,包括 RAID 配置数据

驱动安装

安装驱动程序

- 1. 打开系统电源并启动 Linux 发行版
- 2. 使用 root 用户特权打开系统终端,并使用以下命令验证是否检测到 SSD7000 系列控制器或机箱:

lspci

屏幕截图示例 (SSD7101A):

[root@localhost test]# lspc1
00:00.0 Host bridge: Intel Corporation 8th Gen Core Processor Host Bridge/DRAM Registers (rev Da)
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 16)
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)
A0:14 3 Network controller: Intel Corporation Wireless-AC 9568 [lefferson Peak] (rev 18)
A0.16 & Computing controller: Intel Corporation Cannon Lake BCH HECT Controller (rev 10)
00.13.0 CATA controller. Inter composation campo Lake PCH APET Controller (rev 10)
00.17.0 SALA CONTOLLET: Intel Corporation Camon Lake PCH BGT Experses Dect Dect Art (6)
00:16:0 PCT bridge: Intel Comporation Camon Lake PCH PCI Express Root Port #17 (rev 10)
00:1c.0 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #1 (rev 10)
delic.4 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #5 (rev 10)
00:12.0 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #/ (rev 10)
00:10.0 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #9 (rev T0)
00:11.0 ISA bridge: Intel Corporation 2390 Chipset LPC/eSPI Controller (rev 10)
00:11.3 Audio device: Intel Corporation Cannon Lake PCH CAVS (rev 18)
00:11.4 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)
100:1f.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)
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)
01:00.0 PCL bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:08.0 PCL bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:09.0 PCL bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
01:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:09.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca)
01:00.0 PCL bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCL Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:08.0 PCL bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCL Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:09.0 PCL bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCL Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:10.0 PCL bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCL Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:10.0 PCL bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCL Express Gen 3 (8.0 GT/s) Switch (rev ca)
01:00.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:09.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 03:00.0 Non-Volatile memory controller: Samsung Electronics Go Ltd NWe S50 Controller SM98L/PM981
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) 02:10.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 03:10.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NWE S5D Controller SM08LPM981 04:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NWE S5D Controller SM08LPM981
01:00.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:09.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 03:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM081/PM981 04:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM081/PM981
01:00.0 PCI pridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:09.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 04:10.0 Non-Volatile Remory controller: Samsung Electronics Co Ltd NWE 53D Controller 5498L/PM981 05:00.0 Non-Volatile Remory controller: Samsung Electronics Co Ltd NWE 53D Controller 5498L/PM981
01:00.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:09.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 03:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 04:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S5D Controller SM08L/PM981 06:00.8 Non-Volatile memory controller: Aguantia Corp. ACICAT NBase-T/IEEE 802.33b Ethermet Controller [A0tion] (rev 62)
01:00.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca) 04:00.0 Non-Volatile memory controller: Samurg Electronics G Ltd NWe SS Controller 5402/PM031 05:00.0 Non-Volatile memory controller: Samurg Electronics G Ltd NWe SS Controller 5402/PM031 06:00.0 Non-Volatile memory controller: Samurg Electronics G Ltd NWe SS Controller 5402/PM031 73:00.0 Ethernet controller: Aquantia Corp. ACI07 NBase-7/IEEE 802.3bz Ethernet Controller [ACI00] 73:00.0 Ethernet controller: Aquantia Corp. ACI07 NBase-7/IEEE 802.3bz Ethernet Controller [ACI00] 73:00.0 Ethernet controller: Aquantia Corp. ACI07 NBase-7/IEEE 802.3bz Ethernet Controller [ACI00] 74:00.0 Ethernet controller: Aquantia Corp. ACI07 NBase-7/IEEE 802.3bz Ethernet Controller [ACI00] 74:00.0 Ethernet controller: Aquantia Corp. ACI07 NBase-7/IEEE 802.3bz Ethernet Controller [ACI00] 74:00.0 Ethernet Controller: Aquantia Corp. ACI07 NBase-7/IEEE 802.3bz Ethernet Controller [ACI00] 74:00.0 Ethernet Controller: AQUANTIA ECHICA PLE SWIGH Port
01:00.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:09.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 03:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S50 Controller SM08L/PM981 04:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe S50 Controller SM08L/PM981 73:00.8 Ethernet controller: Aquantia Corp. AGCIOT N08ser-17IEEE 802.3bz Ethernet Controller [A0CII0n] (rev 02) 74:00.8 PCI bridge: ASMedia Technology Inc. ASM1184e PCIE Switch Port
01:00.0 PCI pridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 G7/s) Switch (rev ca) 02:08.0 PCI pridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 G7/s) Switch (rev ca) 02:09.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 G7/s) Switch (rev ca) 02:01.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 G7/s) Switch (rev ca) 02:01.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 G7/s) Switch (rev ca) 03:00 0 Non-Volatile memory controller: Samsung Electronics Go Ltd NWe SSD Controller 5M98L/PM981 04:00 0 Non-Volatile memory controller: Samsung Electronics Go Ltd NWe SSD Controller 5M98L/PM981 04:00 0 Non-Volatile memory controller: Samsung Electronics Go Ltd NWe SSD Controller 5M98L/PM981 06:00 0 Non-Volatile memory controller: Samsung Electronics Go Ltd NWe SSD Controller 5M98L/PM981 06:00 0 Non-Volatile memory controller: Samsung Electronics Go Ltd NWe SSD Controller 5M98L/PM981 06:00 0 Non-Volatile memory controller: Samsung Electronics Go Ltd NWe SSD Controller 5M98L/PM981 07:00 0 PCI tridge: ASMedia Technology Inc. ASM1346 PCIE Switch Port 73:00.0 PCI bridge: ASMedia Technology Inc. ASM1346 PCIE Switch Port 73:00.0 PCI bridge: ASMedia Technology Inc. ASM1346 PCIE Switch Port
01:00.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:08.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:09.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 02:10.0 PCI bridge: PLX Technology. Inc. PEX 874 748-Lane, 5-Port PCI Express Gen 3 (8.0 Gr/s) Switch (rev ca) 03:00.0 Non-Volatile memory controller: Samsung Electronics G Ltd NVMe S50 Controller SM08L/PM981 04:00.0 Non-Volatile memory controller: Samsung Electronics G Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics G Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics G Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics G Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics G Ltd NVMe S50 Controller SM08L/PM981 05:00.8 Non-Volatile memory controller: Samsung Electronics G Ltd NVMe S50 Controller SM08L/PM981 73:00.8 Ethernet controlled Technology Inc. ANIL& PCIE Switch Port 73:00.8 PCI bridge: ASMedia Technology Inc. ASMIL& PCIE Switch Port 73:01.9 PCI bridge: ASMedia Technology Inc. ASMIL& PCIE Switch Port 73:05.0 PCI bridge: ASMedia Technology Inc. ASMIL& PCIE Switch Port 73:05.0 PCI bridge: ASMedia Technology Inc. ASMIL& PCIE Switch Port

SSD7204:

10:10:0 System peripherat: Intel corporation Sky Lake-E PLU Registers (rev 84)
17:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 40-Lane, 5-Port PCI Express Gen 3 (8.0 G/S) Switch (rev ca)
18:08.0 PCI bridge: PLX Technology, Inc. PEX 8/4/ 48 Lane, 5-Port PCI Express Gen 3 (8.0 G/S) Switch (FeV ca)
16:10.0 PCT bridge: PLX Technology, Inc. PEX 0747 40-Lane, 5-Port PCT Express Gen 3 (0.0 GT/s) Switch (rev ca)
13:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, S-Port PCI Express Gen 3 (8.0 GT/S) Switch (rev ca)
10:00.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/s) Switch (rev ca)
ID:09.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/S) Switch (rev ca)
10:10.0 PCI bridge: PLX Technology, Inc. PEX 8/47 48-Lane, 5-Port PCI express Gen 3 (8.0 GT/S) Switch (rev ca)
ID:11.0 PCI bridge: PLX Technology, Inc. PEX 8747 48-Lane, 5-Port PCI Express Gen 3 (8.0 GT/S) Switch (rev ca)
C:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM961
10:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM961
Le:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM961
LT:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM961/PM961
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 RAS Configuration Registers (rev 04)
64:05.4 PIC: Intel Corporation Sky Lake-E IOxAPIC Configuration Registers (rev 04)
64:08.0 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 Integrated Memory Controller (rev 04)
64:0a.5 System peripheral: Intel Corporation Sky Lake-E LM 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 LMDP 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 LM 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 LMDP 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 LM 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 LMDP 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 LM 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 LMDP 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)
66:08.0 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 GK2088 [GeForce GT 710] (rev al)
68:00.1 Audio device: NVIDIA Corporation GK208 HDMI/DP Audio Controller (rev al)
b2:05.0 System peripheral: Intel Corporation Sky Lake-E VT-d (rev 04)

此外,您可以使用以下命令来验证是否检测到 NVMe SSD:

fdisk -l

屏幕截图示例(SSD7101A-1):

Dis	<pre>k /dev/nvme3nl: 512.1 GB,</pre>	122110190592 bytes, 1000215216 sectors
Uni	= sectors of 1 * 512 =	12 bytes
Sec	tor size (logical/physical	1 512 bytes / 512 bytes
I/O	ize (minimum/optimal): 5	2 bytes / 512 bytes
Dis	k /dev/nvme2nl: 512.1 GB,	512110190592 bytes, 1000215216 sectors
Uni	t = sectors of 1 * 512 =	512 bytes
Sec	ter size (logical/physical	1: 512 bytes / 512 bytes
I/O	size (minimum/optimal): 5	12 bytes / 512 bytes
Dis	k /dev/nvme0n1: 512.1 GB,	512110190592 bytes, 1000215216 sectors
Uni	t = sectors of 1 * 512 =	512 bytes
Sec	tor size (logical/physical): 512 bytes / 512 bytes
I/O	:ize (minimum/optimal): 5	12 bytes / 512 bytes
Dis	k /dev/nvmelnl: 2000.4 GB,	2000398934016 bytes, 3907029168 sectors
Uni	t = sectors of 1 * 512 =	512 bytes
Sec	tor size (logical/physical): 512 bytes / 512 bytes
I/O	:ize (minimum/optimal): 5	12 bytes / 512 bytes

3. 从软件下载网页下载适当的驱动程序:

SSD7101A-1: http://highpoint-tech.cn/product-detail7101a.html SSD7120: http://highpoint-tech.cn/product-detail7120.html SSD7204: http://highpoint-tech.cn/product-detail7204.html SSD6540M: http://highpoint-tech.cn/product-detail6540m.html SSD6540: http://highpoint-tech.cn/product-detail6540.html

4. 使用具有 root 用户特权的系统终端,浏览到驱动程序下载的目录,然后输入以下 命令以提取 Linux Open Source Driver 软件包:

tar zxvf RocketNVMe_Linux_Src_vx.x.xx_xx_xx_xx.tar.gz

[root@localhost Documents]# tar zxvf RocketNVMe_Linux_Src_v1.2.18_19_12_11.tar.gz README rsnvme_linux_src_v1.2.18_19_12_11.bin 5. 使用以下命令安装开源驱动程序:

sh rsnvme_linux_src_vx.x.xx_xx_xx_sx.bin



- 6. 驱动程序安装完成后,系统将提示您重新启动以使驱动程序生效,手动重启系统
- 重新启动发行版后,使用 root 特权打开系统终端,并使用以下命令检查驱动 程序状态:

dmesg | grep rsnvme

下面的屏幕截图显示驱动器版本为 v1.2.18. 5.766371] rsnvme: loading out-of-tree module taints kernel. 5.766371] rsnvme: module License 'Proprietary' taints kernel. 5.766374] rsnvme: module License 'Proprietary' taints kernel. 5.767385] rsnvme:RoudPWE RAID controller driver v1.2.18 block major fc 5.767385] rsnvme:RoudPWE RAID controller driver v1.2.18 block major fc 5.767526] rsnvme:RoudPWE RAID controller driver v1.2.18 block major fc 5.767526] rsnvme:RoudPWE RAID controller driver v1.2.18 block major fc 6.626578] rsnvme:RegValue 60400ca sub_bri_dev 10 (bus_num+1) 2 6.626594] rsnvme:PLX[0].vcces1(0]. 6.626595] rsnvme:PLX[0].bridge_addr[0] bus 3,device 0 func 0 6.626595] rsnvme:PLX[0].bridge_addr[0] bus 2,device 10 func 0

此外,您可以使用下面的命令检查 NVMe 驱动器: fdisk - l



Dlsk /dev/mapper/centos-home: 192.9 GB, 192904429568 bytes, 376766464 sectors Units = sectors of 1 * 512 = 512 bytes Sector size (logicat/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes

更新驱动

- 1. 要求
- a. 确保 SSD7000 系列控制器或机箱已连接至主板
- b. 使用下方命令以 root 权限打开系统终端以检查当前驱动程序版本:

dmesg | grep rsnvme

示例的驱动程序版本为 v1.2.18

	5.706371] rsnvme: loading out-of-tree module taints kernel.
1	5.7063/4] rshvme: module license 'Proprietary' taints kernet.
C.	5.707385] rsnyme: RocketNVMe RAID controller driver v1.2.18 block major fc
T	5.707497] rsnvme:Found PLX upstream port (bus 1) (cmd 100407).
1	5.707520] rsnvme:Mapped Va ffffaf560197c000 size 690 874710b5
Î.	6.626578] rsnyme:Verify success(0).
Ĩ.	6.626582] rsnyme:RegValue 60400ca sub bri dev 10 (bus num+1) 2
Ē.	6.626590] rsnyme:[5] vdid a808144d
Ē.	6.626594] rsnvme:PLX[0].nvme addr[0] bus 5.device 0 func 0
Î	6.626595] rsnyme:PLX[0].bridge addr[0] bus 2.device 10 func 0
	。 开放供工业网页上工业县实的驱动租户
	C. 从扒什下私网贝上下私取却的犯列性庁:

SSD7101A-1: http://highpoint-tech.cn/product-detail7101a.html

SSD7120: http://highpoint-tech.cn/product-detail7120.html

SSD7204: http://highpoint-tech.cn/product-detail7204.html

SSD6540M: http://highpoint-tech.cn/product-detail6540m.html

SSD6540: http://highpoint-tech.cn/product-detail6540.html

e. 打开最新驱动程序版本所在的目录,并以 root 权限打开系统终端,解 压缩 Linux 开源程序软件包

tar zxvf RocketNVMe_Linux_Src_vx.x.xx_xx_xx_tar.gz

[root@localhost Downloads]# tar zxvf RocketNVMe_Linux_Src_v1.2.18.1_2020_03_18.1.tar.gz rsnvme_linux_src_v1.2.18.1_2020_03_18.bin README f. 确保系统具有活动的网络连接,要安装最新的开源驱动程序请以 root 权限打开系统终端,然后输入以下命令:

sh rsnvme_linux_src_vx.x.xx_xx_xx_xx.bin

- g. 安装完成后系统将提示您重新启动以使新驱动程序生效,手动重启系统
- h. 发行版重新启动后以 root 权限打开系统终端,并使用以下命令检查当前驱 动程序版本:

dmesg | grep rsnvme.

下面的屏幕快照显示已安装驱动程序 v1.2.18:

[4.	678942] <mark>rsnvme</mark> : loading out-of-tree module taints kernel. 678945] <mark>rsnvme</mark> : module license 'Proprietary' taints kernel.	
	.678945] rsnvme: module license 'Proprietary' taints kernel.	
[4.		
4.	.679268] rsnvme: module verification failed: signature and/or required key missing - tainting kernel	
[4.	.679851] rsnvme:RocketNVMe RAID controller driver v1.2.18.1 block major fc	
1 4.	.679962] rsnvme:Found PLX upstream port (bus 1) (cmd 100407).	
[4.	.679985] rsnvme:Mapped Va ffffc0140197c000 size 690 874710b5	
[5	598968] rsnvme:Verify success(0).	
[5	.598973] rsnvme:RegValue 60400ca sub_bri_dev 10 (bus_num+1) 2	
[5.	598981] rsnvme: [5] vdid a808144d	
[5.	.598985] rsnvme:PLX[0].nvme_addr[0] bus 5,device 0 func 0	
[5.	598986] rsnvme:PLX[0].bridge_addr[0] bus 2,device 10 func 0	
[5.	.598987] rsnvme:ChipInfoTable[0].count 1 PLX[0].count 1	

- i. 打开 WebGUI,确保可以连接到控制器并识别 NVMe SSD 的 RAID 阵列
- j. 如下所示,新驱动程序已在启动时成功安装并加载,WebGUI可以连接 到控制器并识别 SSD 和 RAID 阵列:

lobal View	Physical	Logical	Setting	Event	SHI	Help	
A Propertie	:5			Storag	je Prop	erties	
				_			
st Adapter mo	del: HighPoin	t NVMe RAID	Controller	6	1	Total Capacity:	1000 GB
closure count:	1			U	J-	Configured Capacity	1000 GB
						Free Capacity:	0 GB
ysical Drive:	4						
gacy Disk:	4						
ID Count:	0						
					Co	nfigured 100.0%	

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卸载驱动

- 1. 要求
 - a. 关闭系统电源,然后从主板上卸下 SSD7000 设备

注释:Note: 卸载驱动程序时未能删除控制器和 SSD 可能会导致数据丢失 卸载 SSD7000 驱动程序后,Linux 发行版将加载默认的 NVMe 支持——该驱动程

声载 SSD 7000 驱动程序后,Linux 反行版将加载默认的 NVMe 文持——该驱动程序仅将 NVMe SSD 识别为单独的磁盘

2. 卸载驱动程序:

a. 使用 root 特权打开系统终端。 输入以下命令以卸载驱动程序:

hptuninrsnvme

b. 按'Y'以确定

```
[root@localhost test]# hptuninrsnvme
Are you sure to uninstall the driver rsnvme from system? (Y/n): y
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.
```

- c. 卸载驱动程序后, 手动重新启动系统
- d. 重新启动发行版后,请以 root 权限打开系统终端。并输入以下命令以检查 驱动程序状态:

lsmod | grep rsnvme

```
Before uninstalling:

[root@localhost test]# lsmod | grep rsnvme

234860 0

After uninstalling:

[root@localhost test]# lsmod | grep rsnvme

[root@localhost test]# []
```

b. 关闭系统电源,然后从主板上卸下 SSD7000 设备

注释: Note: 卸载驱动程序时未能删除控制器和 SSD 可能会导致数据丢失 卸载 SSD7000 驱动程序后, Linux 发行版将加载默认的 NVMe 支持——该驱 动程序仅将 NVMe SSD 识别为单独的磁盘

e. 如果系统未显示"rsnvme"信息,则说明驱动程序已成功卸载

HighPoint RAID 管理器 (WebGUI) 安装 / 驱动程序 验证

HighPoint RAID 管理软件用于配置与监视 SSD7000 系列 RAID 控制器和机箱托管的 SSD 及阵列

从 HighPoint 网站下载 RAID 管理软件包:

SSD7101A-1: http://highpoint-tech.cn/product-detail7101a.html

SSD7120: http://highpoint-tech.cn/product-detail7120.html

SSD7204: http://highpoint-tech.cn/product-detail7204.html

SSD6540M: http://highpoint-tech.cn/product-detail6540m.html

SSD6540: http://highpoint-tech.cn/product-detail6540.html

 使用具有 root 用户特权的系统终端,浏览到驱动程序下载的目录,然后输入以下 命令以提取管理软件包:

使用以下命令安装 HighPoint RAID 管理软件(Web GUI 和 CLI):
 ./RAID_Manage_Linux_v2.x.x_x_x_s.bin

```
[root@localhost Downloads]# ./RAID_Manage_Linux_v2.3.14_17_07_26.bin
Install .....
Package readline6/hptsvr-https-2.3.14-17.0718.x86_64.rpm will be installed!
Starting hptdaemon (via systemctl): [ OK ]
Clean .....
```

3. 安装软件后,打开 WebGUI,确保它可以连接到 SSD7000 系列 RAID 控制器 或机箱

4. 您也可以使用 CLI (命令行界面)检查控制器在系统终端上输入以下命令:

hptraidconf

有关 CLI 的更多信息,请下载指南: 链接

[root@localhost test]# hptraidconf

HPT CLI>query devices

ED	Capacity	MaxFree	Flag	Status	ModelNur	nber				
L/E1/1	250.06	0	SINGLE	LEGACY	Samsung	SSD	960	EVO	250GB	2
L/E1/2	250.06	Θ	SINGLE	LEGACY	Samsung	SSD	960	EVO	250GB	
L/E1/3	250.06	Ø	SINGLE	LEGACY	Samsung	SSD	960	EVO	250GB	
L/E1/4	250.06	0	SINGLE	LEGACY	Samsung	SSD	960	EVO	250GB	

HPT CLI>

5. 如果 WebGUI / CLI 可以连接到控制器并识别出 NVMe SSD,则表明驱动程序已 安装并且可以正常运行:

ontroller(1): HighPoint V	HighPol
Global View Physical Logical Settin	g Event SHI Help
BA Properties	Storage Properties
Host Adapter model: HighPoint NVMe RAID Controll Enclosure count: 1	r Total Capacity: 1000 GB Configured Capacity: 1000 GB Free Capacity: 0 GB
Physical Drive: 4	
RAID Count: 0	Configured 100.0%

HighPoint RAID Management 2.3.14 Copyright (c) 2017 HighPoint Technologies, Inc. All Rights Reserved

故障排除

WebGUI

1. WebGUI 安装失败

如果您使用 Ubuntu 系统,则在安装 WebGUI 时,系统可能会提示您缺少 readline5 软件包——这会中断安装过程



解决方法:

a. 启用 root 权限后,您可以使用以下命令在终端上加载 readline5,WebGUI 将被允许安装:

apt-get install libreadline5

b. 完成后,重新启动 WebGUI 安装过程

2. WebGUI 无法连接到控制器

如果无法使用 WebGUI 访问 SSD7000 系列 RAID 控制器或机箱:



a. WebGUI服务未成功启动

解决方法: 通过使用 root 权限打开系统终端并输入以下命令来启动 WebGUI: hptsvr

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b. 驱动程序无法编译



解决方法:

- 1. 确保在 SSD7000 系列 RAID 控制器或机箱中至少安装了一个 NVMe SSD
- 2. 确保主板可以在 BIOS 发布期间识别 SSD7000 设备并显示 NVMe 信息
- 如果您使用的是 CentOS 系统,请以 root 特权打开系统终端,然后输入 以下命令来安装"elfutils-libelf-deve"l:

yum install elfutils-libelf-devel

完成后,再次安装 SSD7000 驱动程序

4. 如果您使用 Ubuntu / Debian 系统,请以 root 权限打开系统终端, 然后输入以下命令来安装"libelf-dev":

#yum install libelf-dev

完成后,再次安装 SSD7000 驱动程序

3. 无法编译 gcc, make 和其他驱动程序文件

安装驱动程序时,由于各种因素无法编译 gcc 和 make 等驱动程序文件,从 而中断了驱动程序的安装过程:



此问题可能是由于:

a. 系统未连接到网络(互联网连接) 解决方法:

- a. 仔细检查系统的互联网连接
- b. 确认后,重新安装驱动程序
- b. 系统进程忙/忙

解决方法:

以 root 用户特权打开系统终端, 然后输入以下命令:

apt-get update

这将提示系统释放该过程并更新下载源,释放系统进程后重新安装驱动 程序

4. **如果您遇到任何其他与 WebGUI 或 CLI 相关的问题**,请使用我们的在 线支持门户提交申请,尽可能详细地描述问题,并上传以下内容:

收集以下日志文件: pci.log, drivermod.log, hptdrv.log, kernel.log

请单击以下链接以获取有关查找和收集这些日志的更多信息 第16页开始的附录部分中也提供了更多信息

控制器和驱动检测问题

如果系统无法检测到控制器或 SSD,请在故障排除过程中确保从系统中删除与 SSD7000 系列 RAID 控制器或机箱无关的所有 NVMe 设备,因为其他 NVMe 设备的存 在可能会干扰 SSD7000 设备的检测

如果您遇到其他与控制器有关的问题,请使用我们的在线支持门户网站提交 申请,并尽可能详细地描述问题

请检查从第16页开始的**附录**——提供有关系统的系统日志、屏幕截图和其他 信息,将使我们的支持部门能够尽快有效地解决您的问题

附录

通过我们的在线支持门户网站提交申请时,以下信息将帮助支持部门尽快并高效地 诊断和解决您的问题:

A. 如何收集 WebGUI 信息

请拍摄每个选项卡的屏幕截图 (例如"物理"、"逻辑"、"事件"等)并将 其上传到您的支持案例。此外,检查"事件日志"选项卡并保存当前日志的副 本,并将此文件上传到支持案例

B. 如何收集日志文件

a. 提供已安装驱动程序的屏幕截图:

```
      [rootBlocalhost Downloads]# //ptrume.g5_linux.src_vl.2.14_20_04_10.bin

      Verifying archive integrily...All good.

      Uncompressing HighPoint WWME RAID Controller Linux Open Source package Installer......

      Found program make (/usr/bin/get)

      Found program get( /usr/bin/get)

      Found program get( /usr/bin/get)

      Oid crashKernel=auto fd.lvm.lvecentos/root rd.lvm.lvecentos/swap rhgb quiet intel_iommu=off and_lon red.tvm.lvecentos/swap

      rd.lvm.lvecentos/soup

 rhgb
quiet intel iommunoff and iommunoff
Generating grub configuration file ...
Found linux image: /bootvinitura-31.06-1062.18.1.el7.x86_64
Found innity image: /bootvinitramfs-3.10.0-1062.18.1.el7.x86_64.img
Found linux image: /bootvinitramfs-3.10.0-1062.el7.x86_64.img
Found linux image: /bootvinitramfs-3.10.0-1062.el7.x86_64.img
Found linux image: /bootvinitramfs-0-rescue-cd040idc040f405932eac9f5546670
Found initrd image: /bootvinitramfs-0-rescue-cd040idc041649d9932eac9f5546670.img
done
Please run hptuninhptnyme to uninstall the driver files.
Please restart the system for the driver to take effect. [root@localhost Downloads]# []
```

1. 打开系统终端,输入以下命令: lspci >pci.log

下面的屏幕快照显示已确定硬件:

[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)
AB-14 & USB controller: Intel Corporation Cannon Lake PCH USB 3.1 xHCT Host Controller (rev. 18)
00:14 2 DAM menory. Total Carneration Cannon Lake DFU Chared SPAM (rev 10)
00:14.2 Nation memory. Inter comportation campon wirelass. A 0550 [laffarcap Bask] (ray 10)
00:14.3 Network controller: intel corporation wireless AL 5000 [Jenerson Peak] (rev 10)
de 18.6 communication controller intel corporation campon take per neci controller (rev 18)
80:17.0 SATA controller: Intel Corporation Cannon Lake PCH SATA AHCI Controller (rev 10)
00:10.0 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #17 (rev T0)
00:1c.0 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #1 (rev 10)
00:1c.4 PCI bridge: Intel Corporation Cannon Lake PCH PCI Express Root Port #5 (rev 10)
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.4 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)
02:08.0 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: Samsung Electronics Co Ltd NVMe SSD Controller SM981/PM981
04:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM981/PM981
05:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM981/PM981
06:00.0 Non-Volatile memory controller: Samsung Electronics Co Ltd NVMe SSD Controller SM981/PM981
73:00.0 Ethernet controller: Aquantia Corp. AQC107 NBase-T/IEEE 802.3bz Ethernet Controller [AQtion] (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

2. 使用系统终端,输入以下命令访问 drivermod.log:

lsmod >drivermod.log

下面的屏幕截图显示已安装驱动程序

rfkill	22391	7 cfg80211,bluetooth
nvme	32382	0
nvme core	63547	1 nvme
pinctrl cannonlake	31687	0
pinctrl intel	23466	1 pinctrl cannonlake
wmi	21636	2 mxm wmi,intel wmi thunderbolt
acpi pad	116316	0
rsnvme	234860	0
ip tables	27126	5 iptable security, iptable filter, iptable mangle, iptable nat, iptable raw
xfs	997681	3
libcrc32c	12644	3 xfs,nf_nat,nf_conntrack
sd mod	46281	3
crc t10dif	12912	1 sd mod
crct10dif generic	12647	0
1915	1859232	11
i2c_algo_bit	13413	1 1915
iosf_mbi	15582	2 i915, intel_rapl
drm kms helper	186531	1 1915
syscopyarea	12529	1 drm_kms_helper
sysfillrect	12701	1 drm kms helper
sysimgblt	12648	1 drm kms helper
ahci	34056	2

3. 在系统终端上,输入以下命令以查看驱动程序日志:

vi /var/log/hptdrv.log

4. 要查看内核日志,请打开系统终端并输入以下命令:

dmesg >kernel.log.