



# **SSD7000 NVMe RAID AIC BootRAID Installation Guide**

**V1.02 - October 10, 2024**

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# 1. Overview

Boot-RAID: a RAID array that functions as a system disk (bootable drive or volume). In most cases, a Boot-RAID is configured as a redundant RAID array (RAID 1, 10), as it adds a layer of data security to the OS.

Boot-RAID volumes must be created before an OS can be installed; a bootable drive cannot be converted into a RAID array. Administrators can configure the array depending on the AIC using the AIC's UEFI tool and UEFI HII.

**Note:** Though a Boot-RAID array can be moved from one HighPoint solution to another within the same product class and remain recognized, it is unlikely to remain bootable. This isn't unique to HighPoint or RAID in general. Boot volumes (including bootable single disks) are generally "tied" to the computing platform in place at the original OS installation. The Boot-RAID volume would be recognized and readable but could not be used to boot another system.

The following is a table of Operating Systems and NVMe RAID AICs.

**Table 1: Supported Operating Systems and NVMe RAID AICs**

<b>Supported NVMe RAID AICs</b>	<ul style="list-style-type: none"> <li>• SSD7105</li> <li>• SSD7202</li> <li>• SSD7502</li> <li>• SSD7505</li> <li>• SSD7540</li> <li>• SSD7580A</li> <li>• SSD7580B</li> <li>• SSD7580C</li> <li>• SSD7749E</li> <li>• SSD7749M</li> <li>• SSD7749M2</li> <li>• SSD6780A</li> <li>• RS6542AW</li> <li>• RA6542AWW-S491T5-12</li> <li>• RocketAIC 7105HWSeries</li> <li>• RocketAIC 7502HWSeries</li> <li>• RocketAIC 7505HWSeries</li> <li>• RocketAIC 7540HWSeries</li> <li>• RocketAIC 7749EWSeries</li> <li>• RocketAIC 7749MW Series</li> <li>• RocketAIC 7749M2W Series</li> </ul>
<b>Supported Operating Systems</b>	<p><b>Microsoft Windows</b></p> <ul style="list-style-type: none"> <li>• Windows 11</li> <li>• Windows 10</li> </ul> <p><b>Microsoft Windows Server</b></p> <ul style="list-style-type: none"> <li>• Windows Server 2022</li> <li>• Windows Server 2019</li> <li>• Windows Server 2016</li> </ul>

	<b>Microsoft Windows Hyper-V Server</b> <ul style="list-style-type: none"><li>• Hyper-V 2019</li></ul> <b>Red Hat Enterprise Linux</b> <ul style="list-style-type: none"><li>• Red Hat Enterprise Linux 7.9</li><li>• Red Hat Enterprise Linux 8.3</li><li>• Red Hat Enterprise Linux 8.5</li><li>• Red Hat Enterprise Linux 8.6</li><li>• Red Hat Enterprise Linux 8.7</li><li>• Red Hat Enterprise Linux 8.10</li><li>• Red Hat Enterprise Linux 9.4</li></ul> <b>Rocky Linux</b> <ul style="list-style-type: none"><li>• Rocky Linux 8.6</li><li>• Rocky Linux 8.7</li><li>• Rocky Linux 8.9</li><li>• Rocky Linux 8.10</li><li>• Rocky Linux 9.0</li><li>• Rocky Linux 9.1</li><li>• Rocky Linux 9.4</li></ul> <b>Debian</b> <ul style="list-style-type: none"><li>• Debian 10.1</li><li>• Debian 10.2</li><li>• Debian 10.3</li><li>• Debian 10.4</li><li>• Debian 10.5</li><li>• Debian 10.6</li><li>• Debian 10.7</li><li>• Debian 10.8</li><li>• Debian 10.9</li><li>• Debian 11.3</li><li>• Debian 11.4</li><li>• Debian 11.5</li><li>• Debian 11.6</li><li>• Debian 12.5</li></ul> <b>Ubuntu</b> <ul style="list-style-type: none"><li>• Ubuntu 20.04</li><li>• Ubuntu 20.04.1</li><li>• Ubuntu 20.04.2</li><li>• Ubuntu 20.04.3</li><li>• Ubuntu 20.04.4</li><li>• Ubuntu 20.04.5</li><li>• Ubuntu 20.10</li><li>• Ubuntu 22.04</li><li>• Ubuntu 22.04.1</li><li>• Ubuntu 22.10</li></ul>
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	<ul style="list-style-type: none"><li>• Ubuntu 22.04.4</li><li>• Ubuntu 24.04</li></ul>
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## 2. Prerequisites

To configure a bootable NVMe RAID array, please perform the following operations.

### 2.1. Prepare Your Hardware for Installation

1. The NVMe RAID AIC needs to connect the disks for a bootable NVMe RAID array.  
[Note: The RocketAIC series NVMe drives already include pre-configured SSDs.](#)
2. The NVMe RAID AIC must be installed into a PCIe slot.
3. Remove all the NVMe SSDs not physically attached to the NVMe RAID AIC from your system.
4. Disconnect the system from the internet and any local network.

[Note: If connected to the Internet, the system will automatically update the latest kernel after the installation is complete without saving the initial version of the kernel, which will result in the system not booting correctly after the installation is complete.](#)

### 2.2. Prepare Two USB Flash Drives








1. Prepare two USB flash drives formatted as FAT32.
2. The first USB flash drive is used as a bootable USB flash drive. You can use third-party software to flash the operating system to a USB flash drive.
3. The second USB flash drive is used to save the files the operating system needs, such as the UEFI package, Linux open source driver, binary driver, and Windows driver.

You must extract HighPoint\_NVMe\_Linuxxx.xx\_x86\_64\_vx.x.x\_xx\_xx\_xx.tar.gz to a USB flash drive's top(/) directory. It will look like:

```
root@test-Super-Server:/home/test/Downloads# tar zxvf HighPoint_NVMe_ubuntu24.04_x86_64_v1.8.0.0_24_06_03.tar.gz
hptdd/
hptdd/60-persistent-storage-hptblock.rules
hptdd/boot/
hptdd/boot/hptnvme6.8.0-31-genericx86_64.ko.gz
hptdd/hptblock
hptdd/hptdrv
hptdd/postinst.sh
hptdd/postinst2.sh
hptdd/preinst.sh
hptdd/readme.txt
```

The UEFI package must be unzipped directly to the root directory of this flash drive. (Do not extract the contents in a new folder.) It will look like:

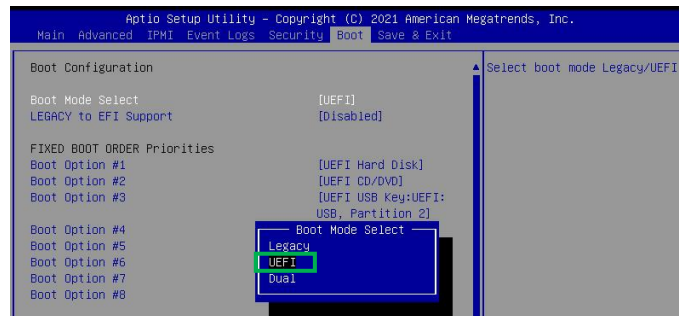
[Example screenshot](#)

	efi	1/27/2022 3:06 PM	File folder	
	7505uefi.rom	11/19/2021 9:42 AM	ROM File	65 KB
	ArrayCreate.efi	9/24/2021 10:51 AM	EFI File	74 KB
	go.nsh	9/24/2021 10:51 AM	NSH File	1 KB
	load.efi	9/24/2021 10:51 AM	EFI File	103 KB
	README	1/27/2022 4:11 PM	Text Document	4 KB
	startup.nsh	9/24/2021 10:51 AM	NSH File	1 KB

## 2.3. Adjust System EFI Settings

Adjust the UEFI settings. Allow the option ROM settings for third-party devices to load. Different motherboards will provide different UEFI-related BIOS settings. Please consult your motherboard's user manual for more information. This section provides examples of two different types of motherboard BIOS menus.

1. Set UEFI setting with SuperMicro X11DPI-NT motherboard as an example.
  - a. Boot the system and access the motherboard BIOS menu.
  - b. Select the **Boot** tab and set the **Boot Mode Select** to **UEFI**.

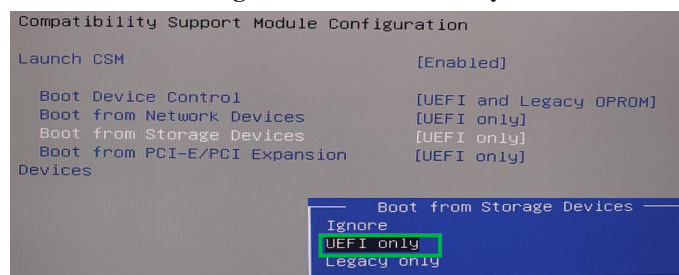


- c. Select **Advanced**→**PCIe/PCI/PnP Configuration**→**CPU Slot PCI-E OPRM** to **EFI**.  
 NVMe AIC is connected to motherboard CPU1 Slot 2 PCI-E X16; then you should set “CPU1 Slot 2 PCI-E X16 OPRM” to “EFI”.

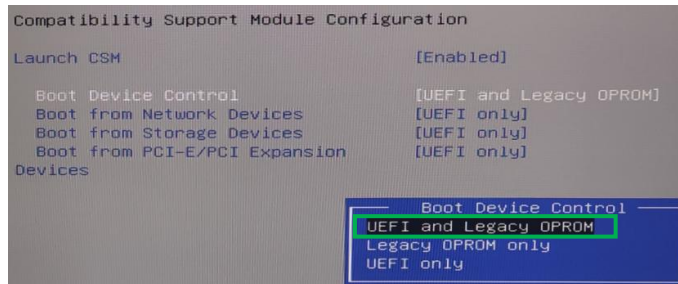


Note: If the OPRM is not configured correctly, the UEFI driver will not load correctly!

2. Set UEFI setting with ASUS Pro WS WRX90E-SAGE SE motherboard as an example.
  - a. Set **Boot from Storage Devices** to **UEFI only**.



- b. And **Boot Device Control** to **UEFI Only** or **UEFI and Legacy OPRM**.



Note: If the OPRM is not configured correctly, the UEFI driver will not load correctly!



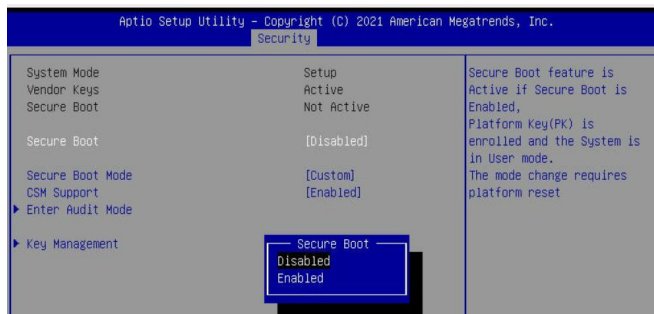
## 2.4. Adjust Secure Boot Setting

The Windows Boot-RAID supports Secure Boot enabled and disabled.

The Linux Boot-RAID supports Secure Boot disabled. If Secure Boot is enabled, the HighPoint driver can not work.

Set UEFI setting with SuperMicro X11DPi-NT motherboard as an example.

1. Boot the system and access the motherboard BIOS menu.
2. Set **Secure Boot** to **Disabled/ Enabled**.



## 2.5. Create a RAID Array

Note: RocketAIC series NVMe drives are already pre-configured with RAID0. You can skip those steps. If you want to use another type of RAID for Boot-RAID, follow the steps.

There are two ways to create a RAID.

### 2.5.1. Method 1: UEFI Command Line (RAID Tool)

1. Insert the bootable USB flash drive into the motherboard.
2. Power on the motherboard → the BIOS Setting → **Advanced**, and select the “**UEFI: flash drive**”.

```
Boot Override
SanDisk
BRCM MBA Slot 4500 v20.14.2
UEFI: SanDisk, Partition 1
UEFI: Built-in EFI Shell
Launch EFI Shell from filesystem device
```

3. At the prompt, enter the following command to change the resolution:

**mode 100 31**

```
FS0:\> mode
Available modes for console output device.
Col   80 Row   25  *
Col   80 Row   50
Col  100 Row   31
Col  240 Row   56
FS0:\> mode 100 31
```

Note: This command adjusts the screen resolution; please adjust it according to the actual situation of your motherboard.

4. Enter the following command to enter the RAID creation utility:

**ArrayCreate.efi**

```
FS0:\SSD7505-uefi\> ArrayCreate.efi
HighPoint RAID utility for UEFI (version: 20200306)
==== Controller information:
Vendor: HighPoint Technologies, Inc.
Product: SSD7505 (7505)

==== Physical device list(count 4):
1/1 Sabrent Rocket 4.0 1TB-7FE00707087104034542, 1000204MB(MaxFree 0MB), Normal
1/2 Sabrent Rocket 4.0 1TB-7F600707089D04033529, 1000204MB(MaxFree 0MB), Normal
1/3 Seagate FireCuda 520 SSD ZP2000GM30002-7QH002A2, 2000398MB(MaxFree 0MB), Normal
1/4 Seagate FireCuda 520 SSD ZP2000GM30002-7QH0025Q, 2000398MB(MaxFree 0MB), Normal

==== Logical device list(count 4):
1 1/1 Sabrent Rocket 4.0 1TB-7FE00707087104034542, 1000204MB(MaxFree 0MB), Normal
2 1/2 Sabrent Rocket 4.0 1TB-7F600707089D04033529, 1000204MB(MaxFree 0MB), Normal
3 1/3 Seagate FireCuda 520 SSD ZP2000GM30002-7QH002A2, 2000398MB(MaxFree 0MB), Normal
4 1/4 Seagate FireCuda 520 SSD ZP2000GM30002-7QH0025Q, 2000398MB(MaxFree 0MB), Normal

>>> Please specify command to execute:
<<<
```

5. Enter the following command to create the RAID:

**create RAID0**

```
<<< create RAID0
Creating array: RAID0_000041A7.
Array created successfully.

==== Physical device list(count 4):
1/1 Sabrent Rocket 4.0 1TB-7FE00707087104034542, 1000123MB(MaxFree 0MB), Normal
1/2 Sabrent Rocket 4.0 1TB-7F600707089D04033529, 1000123MB(MaxFree 0MB), Normal
1/3 Seagate FireCuda 520 SSD ZP2000GM30002-7QH002A2, 2000313MB(MaxFree 1000190MB), Normal
1/4 Seagate FireCuda 520 SSD ZP2000GM30002-7QH0025Q, 2000313MB(MaxFree 1000190MB), Normal

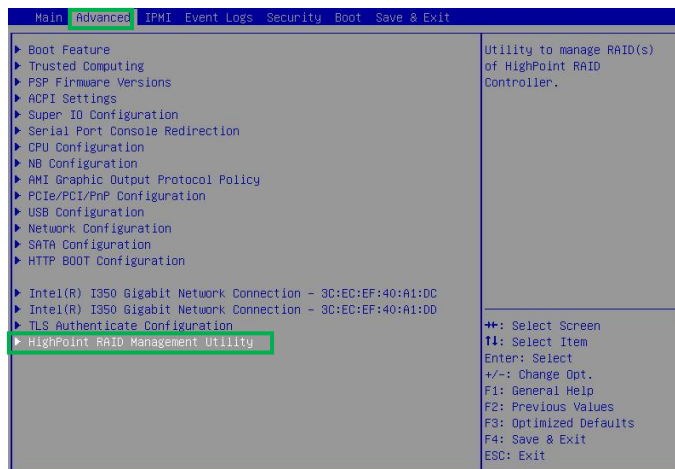
==== Logical device list(count 1):
1 [VD4] RAID0_000041A7 (RAID0), 4000493MB (Stripe 512KB), Normal
1/1 Sabrent Rocket 4.0 1TB
1/2 Sabrent Rocket 4.0 1TB
1/3 Seagate FireCuda 520 SSD ZP2000GM30002
1/4 Seagate FireCuda 520 SSD ZP2000GM30002
```

6. Enter the following command to exit the UEFI command line: **exit**

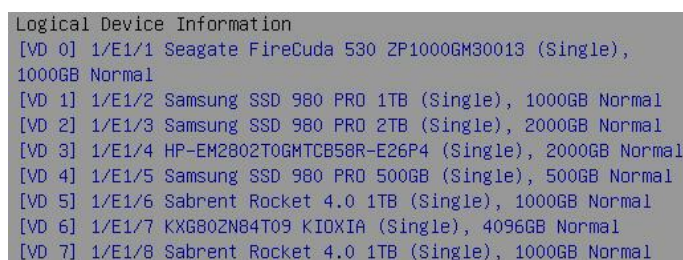
Note: For more additional commands, please refer to [Appendix](#) of this guide.

## 2.5.2.Method 2: UEFI HII (UEFI Utility)

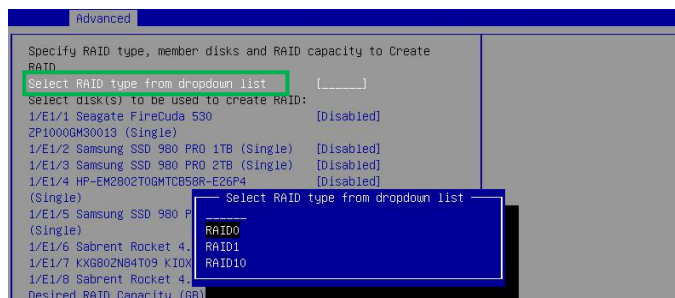
1. Power on the motherboard→the **BIOS Setting**→**Advanced, HighPoint RAID Management Utility** should appear.



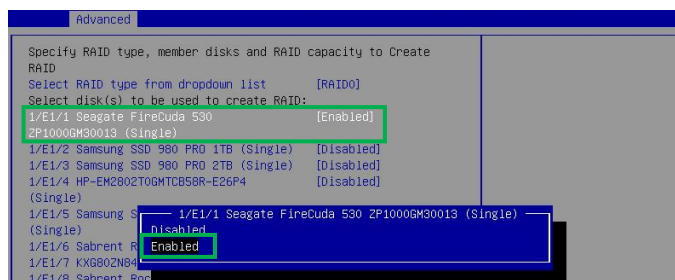
2. Enter **HighPoint RAID Management Utility** and select **Create RAID....**
3. A disk list will appear, displaying all available disks.



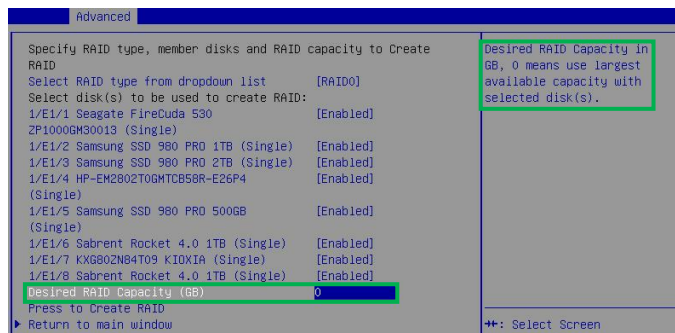
4. Select the **RAID type** from the dropdown list. Use the keyboard or mouse's up and down keys to select the RAID type and press **Enter**.



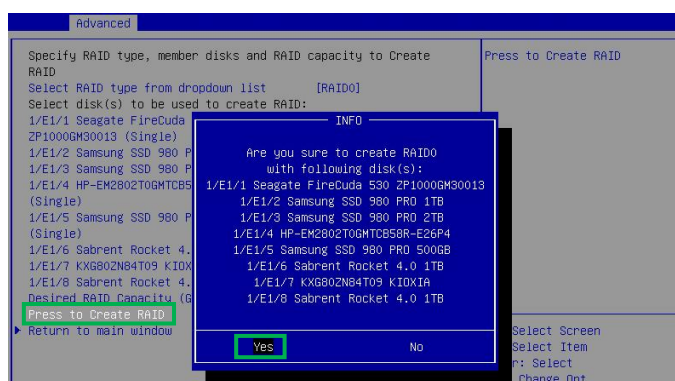
5. Select the disk that needs to create a RAID array and its status changes from **Disabled** to **Enabled**.



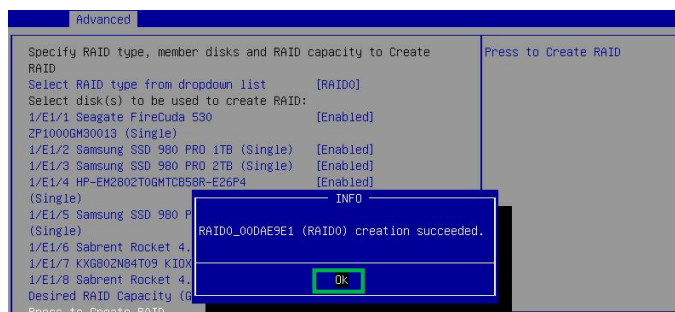
6. Use the keyboard to input the space (GB) you want to set aside for this array. You can decide how much storage capacity will be assigned to the array.



7. Select and **press to create RAID** to complete the RAID Array creation. A pop-up window prompt: **Are you sure to create RAID0 with following disk(s)**. Press the **Enter** key to confirm.



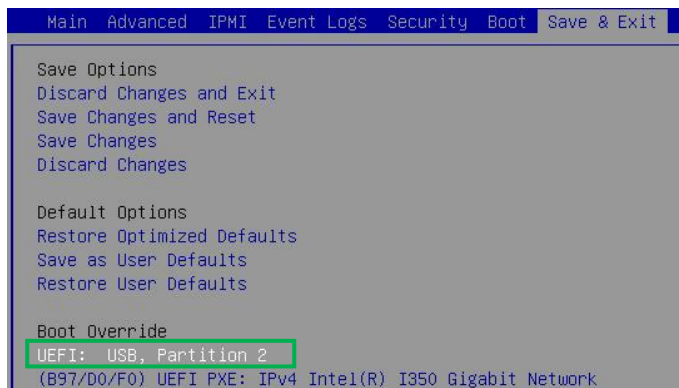
8. A pop-up window will state that **RAID\*\*\* creation succeeded**. Press the **Enter** key to confirm the operation again.



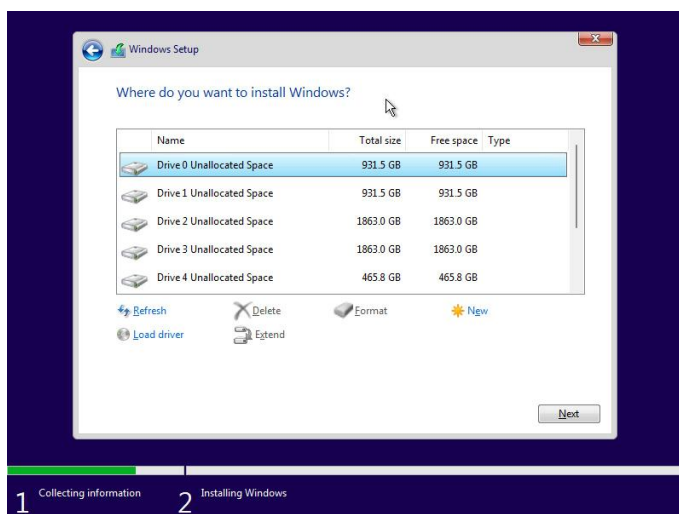
### 3. Install the Windows OS in a RAID array

Please install the Windows operating system in a RAID array following the following sections.

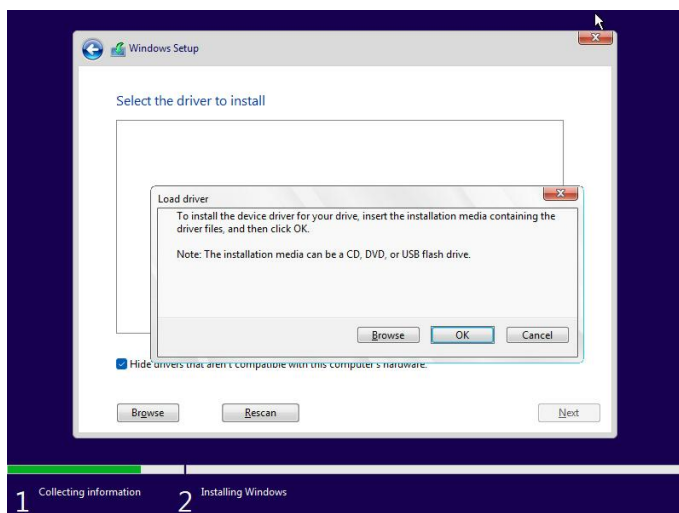
1. Insert a bootable USB flash drive into the target system.
2. Boot the system using a bootable USB flash drive.



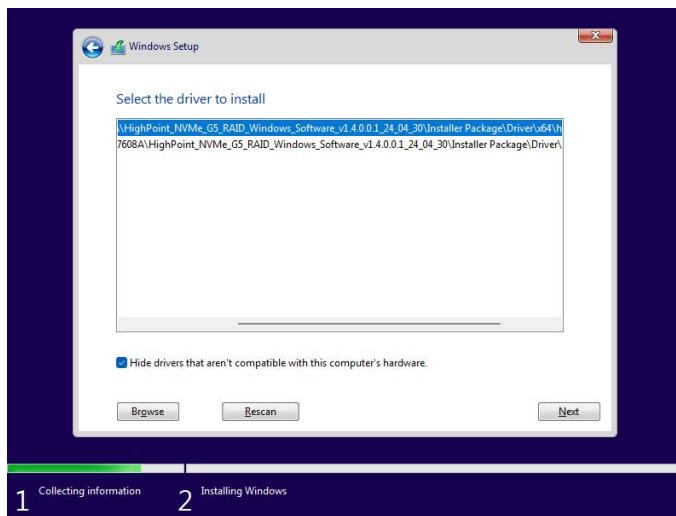
3. Windows setup begins; follow the on-screen prompts. When Windows asks, “**Where do you want to install Windows?**” you should see several legacy disks (one for each SSD installed into the NVMe RAID AIC).



4. Insert a file USB flash drive with the Windows open source driver into the target system.
5. Click “**Load driver**” in the pop-up window, and click “**Cancel**”.

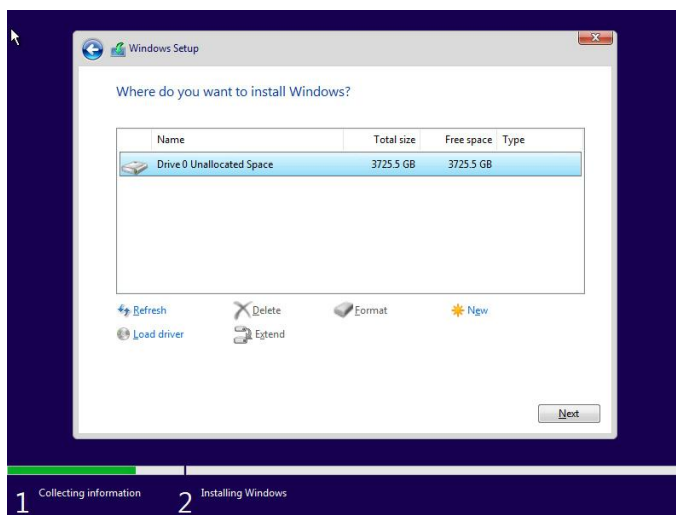


6. Insert a USB flash drive that contains the Windows driver into the motherboard USB slot and click **“Browse”**. Select the driver file as shown:



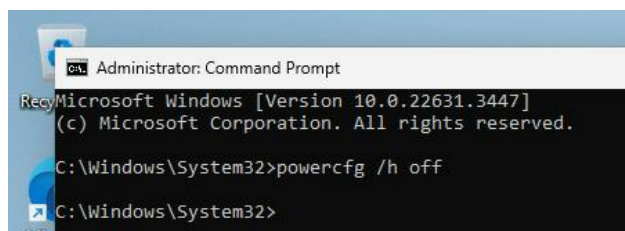
**Note:** The driver revision shown in the screenshots may not correspond with current software releases. Please download the latest driver from the AIC’s Software Updates page.

7. After loading the driver, return to the **“Where do you want to install Windows?”** interface. The previous legacy disks will now be recognized as a RAID array:



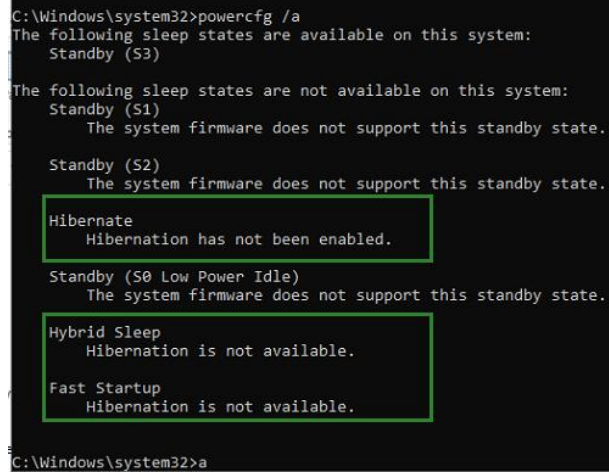
8. Continue and complete the Windows installation procedure.
9. Boot into the Windows and disable Hibernation.
  - a. Enter the command to turn off hibernation.

**#powercfg /h off**



- b. Enter the command to check that the quick shutdown is turned off.

**#powercfg /a**



```
C:\Windows\system32>powercfg /a
The following sleep states are available on this system:
  Standby (S3)

The following sleep states are not available on this system:
  Standby (S1)
    The system firmware does not support this standby state.

  Standby (S2)
    The system firmware does not support this standby state.

  Hibernation
    Hibernation has not been enabled.

  Standby (S0 Low Power Idle)
    The system firmware does not support this standby state.

  Hybrid Sleep
    Hibernation is not available.

  Fast Startup
    Hibernation is not available.

C:\Windows\system32>a
```

Note: If you do not turn the hibernation functionality off, you may experience the following problems:

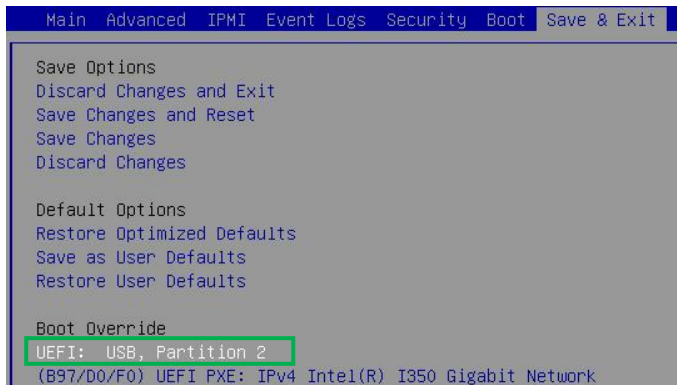
- Shutdown time is extended by an additional 3-5 minutes.
- You cannot shut down properly; you need to manually press the power switch button of the motherboard to power off the system.



## 4. Install the Ubuntu OS in a RAID array

Please disconnect from the network and follow these steps to install the Ubuntu operating system in a RAID array.

1. Insert a bootable USB flash drive into the target system.
2. Boot the system using a bootable USB flash drive.



3. Block the system kernel module so that NVMe SSD is not occupied by the system driver.
  - a. When the Installation screen appears, press the **e** key to edit the boot command line option.



- b. On the edit command window, move the cursor to the end of the line "**linux /casper/vmlinuz...**", and append "**modprobe.blacklist=nvme,mpt3sas**".

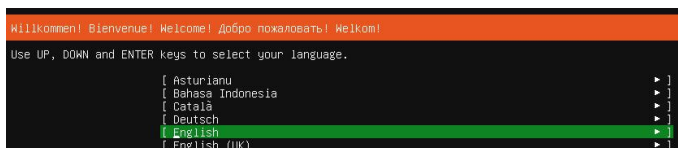


- c. Press **CTRL+X** or **F10** to start the system.
4. Install the binary driver in a RAID array.

- **For Ubuntu Server:**

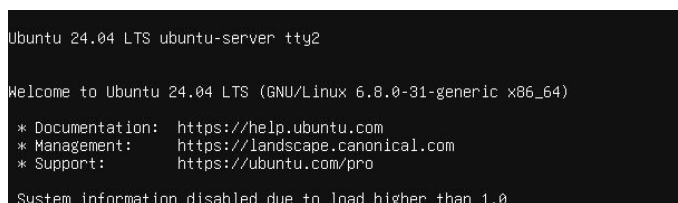
### Example: Ubuntu Server 24.04

- a. When the following window appears during installation. Press **ALT+F2** to switch to the shell on console 2.



**Note:** The shortcut to switch to the shell may differ for different Ubuntu versions.

- b. Press **Enter** to activate this console.





- c. Switch to root privileges.

```
ubuntu-server@ubuntu-server:~$ sudo su
root@ubuntu-server:/home/ubuntu-server#
```

- d. Execute the following command to create a mount point for the USB flash drive.

```
#mkdir /hptdd
```

- e. Execute the following command to mount the USB flash drive to /hptdd.

```
#mount /dev/sda1 /hptdd/
```

- f. Execute the following command to copy the binary driver installation file to the system's temporary directory.

```
#cp -a /hptdd/hptdd /tmp/
```

- g. Execute the following command to unmount the USB flash drive.

```
#umount /hptdd
```

```
root@ubuntu-server:/home/ubuntu-server# mkdir /hptdd
root@ubuntu-server:/home/ubuntu-server# mount /dev/sda1 /hptdd/
root@ubuntu-server:/home/ubuntu-server# cp -a /hptdd/hptdd/ /tmp/
root@ubuntu-server:/home/ubuntu-server# umount /dev/sda1
```

- h. When the USB flash drive is unmounted, please unplug it from the system.

- i. Execute the following command to load the NVMe AIC binary driver.

```
#sh /tmp/hptdd/preinst.sh
```

```
root@ubuntu-server:/home/ubuntu-server# sh /tmp/hptdd/preinst.sh
This step succeeded!
```

- j. Press **ALT+F1** to switch back to the installation screen and continue the installation.

- k. Select the previously created RAID.

```
Guided storage configuration
Configure a guided storage layout, or create a custom one:
(X) Use an entire disk
    /dev/hptblock12n0p local disk 1.746T
[X] Set up this disk as an LVM group
    [ ] Encrypt the LVM group with LUKS
```

- l. When the screen shows **Install complete!** Press **ALT+F2** to the shell and type the following command to install the NVMe AIC binary driver.

```
#sh /tmp/hptdd/postinst.sh
```

```
root@ubuntu-server:/home/ubuntu-server# sh /tmp/hptdd/postinst.sh
Running in chroot, ignoring request.
Running in chroot, ignoring request.
Sourcing file /etc/default/grub
Sourcing file /etc/default/grub.d/90_lommuoff.cfg
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-6.8.0-31-generic
Found initrd image: /boot/initrd.img-6.8.0-31-generic
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
setdefaultkernel:No change.
umount: /target/sys: target is busy.
We have completed the driver installation.
```

A message will be displayed that the driver has been installed successfully.

- m. Press **ALT+F1** to switch back to the installation screen and finish the installation.

```

updating initramfs configuration
configuring target system bootloader
installing grub to target devices
copying metadata from /cdrom

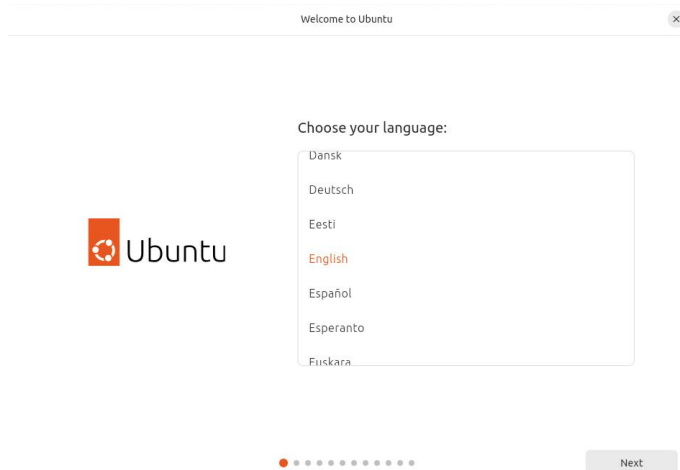
final system configuration
calculating extra packages to install
installing openssh-server
retrieving openssh-server
curtin command system-install
unpacking openssh-server
curtin command system-install
configuring cloud-init
restoring apt configuration
subiquity/late/run:
[ View full log ]
[ Reboot Now ]

```

● **Ubuntu Desktop:**

**Example: Ubuntu Desktop 24.04**

- a. When the following window appears during installation. Open the **Terminal**.



- b. Switch to root privileges.

```

root@ubuntu: /home/ubuntu
ubuntu@ubuntu: ~$ sudo su

```

- c. Execute the following command to create a mount point for the USB flash drive.

```
#mkdir /hptdd
```

- d. Execute the following command to mount the USB flash drive to **/hptdd**.

```
#mount /dev/sdb1 /hptdd/
```

- e. Execute the following command to copy the binary driver installation file to the system's temporary directory.

```
#cp -a /hptdd/hptdd /tmp/
```

- f. Execute the following command to unmount the USB flash drive.

```
#umount /hptdd
```

```

root@ubuntu:/home/ubuntu# mkdir /hptdd
root@ubuntu:/home/ubuntu# mount /dev/sda1 /hptdd/
root@ubuntu:/home/ubuntu# cp -a /hptdd/hptdd/ /tmp/
root@ubuntu:/home/ubuntu# umount /hptdd/

```

- g. When the USB flash drive is unmounted, please unplug the USB flash drive from the system.

- h. Execute the following command to load the NVMe AIC binary driver.

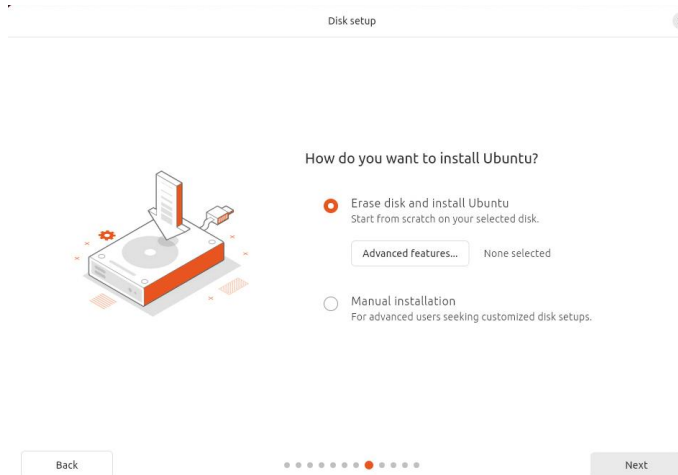
```

# sh /tmp/hptdd/preinst.sh
root@ubuntu:/home/ubuntu# sh /tmp/hptdd/preinst.sh
This step succeeded!

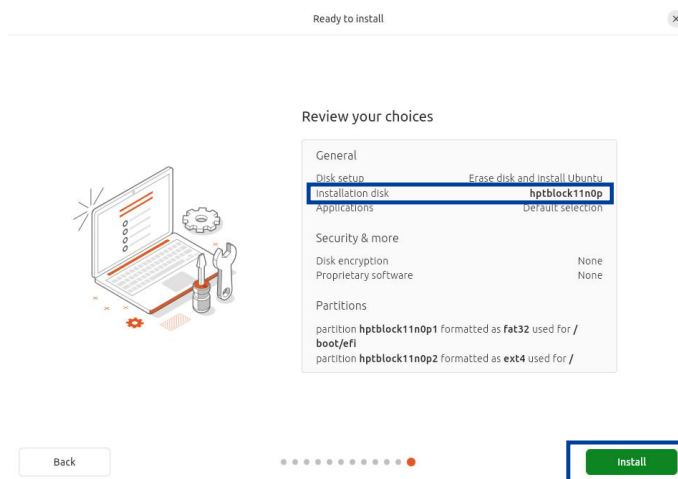
```

- i. Close the **Terminal** and continue the installation.

- j. Select the previously created RAID.



- k. Verify information and start the installation.



- l. When the screen shows **Install complete!** Open the **Terminal** and enter the following command to install the NVMe AIC binary driver.

**#sh /tmp/hptdd/postinst.sh**

```

root@ubuntu: /home/ubuntu
ubuntu@ubuntu:~$ sudo su
root@ubuntu:/home/ubuntu# sh /tmp/hptdd/postinst.sh
Running in chroot, ignoring request.
Running in chroot, ignoring request.
Sourcing file '/etc/default/grub'
Sourcing file '/etc/default/grub.d/90_iommuoff.cfg'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-6.8.0-31-generic
Found initrd image: /boot/initrd.img-6.8.0-31-generic
Found memtest86+ 64bit EFI image: /boot/memtest86+x64.efi
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
setdefaultkernel:No change.
We have completed the driver installation.
root@ubuntu:/home/ubuntu#

```

- m. Close the **Terminal** and finish the installation.

5. If you want to boot from another kernel, please install the NVMe AIC open source driver after entering the system.
  - a. Boot the system.

```

Aprio Setup Utility - Copyright (C) 2021 American
Main Advanced IPMI Event Logs Security Boot Save & Exit

Save Options
Discard Changes and Exit
Save Changes and Reset
Save Changes
Discard Changes

Default Options
Restore Optimized Defaults
Save as User Defaults
Restore User Defaults

Boot Override
Ubuntu (HPT VDO-0 SCSI Disk Device)
(B97/D0/F0) UEFI PXE: IPv4 Intel(R) I350 Gigabit Network

```

- b. Enter the following command to extract the open source driver:

```
#tar zxvf HighPoint_NVMe_G5_Linux_Src_vx.x.xx_xx_xx.xx.tar.gz
```

```

root@test-Super-Server:/home/test/Documents# tar zxvf HighPoint_NVMe_G5_Linux_Src_v1.6.17.0_2024_07_01.tar.gz
hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.bl
README

```

- c. Enter the following command to install the open source driver.

```
#sh hptnvme_g5_linux_src_vxx.x.x_xx_xx.xx.bin or
```

```
#./hptnvme_g5_linux_src_vxx.x.x_xx_xx.xx.bin
```

```

root@test-Super-Server:/home/test/Documents# ./hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
.....
Checking and installing required toolchain and utility ...
Installing program gcc ... done
Installing program make ... done
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
Found program gcc-13 (/usr/bin/gcc-13)
Sourcing file '/etc/default/grub'
Sourcing file '/etc/default/grub.d/90_lionmuoff.cfg'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-6.8.0-31-generic
Found initrd image: /boot/initrd.img-6.8.0-31-generic
Found memtest86+ 64bit EFI image: /boot/memtest86+64.efi
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
Synchronizing state of hptdrv-monitor.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable hptdrv-monitor
update-rc.d: warning: enable action will have no effect on runlevel 1
Created symlink /etc/systemd/system/default.target.wants/hptdrv-monitor.service → /usr/lib/systemd/system/hptdrv-monitor.service.

SUCCESS: Driver hptnvme is installed successfully for kernel 6.8.0-31-generic.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from the computer, please run hptuninhptnvme to uninstall the driver files.
root@test-Super-Server:/home/test/Documents#

```

- d. Manually restart the system.
  - e. Execute the following command to download package information from all configured sources. (please connect to the internet) to install available upgrades of all packages currently installed on the system.

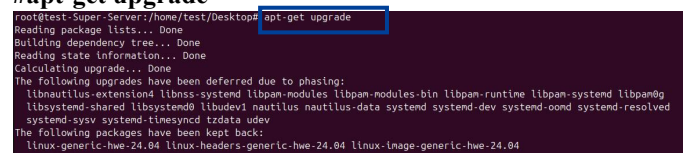
```
#apt-get update
```

```

root@test-Super-Server:/home/test/Desktop# apt-get update
Get:1 http://archive.ubuntu.com/ubuntu noble InRelease [256 kB]
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:3 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [106 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [29.8 kB]
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [6,876 B]

```

- f. Execute the following command to install available upgrades of all packages currently installed on the system.

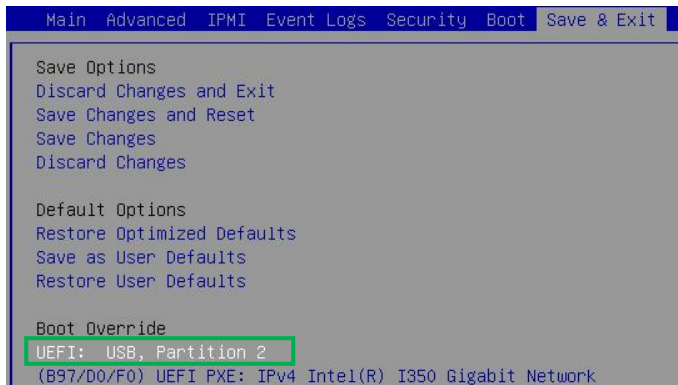
**#apt-get upgrade**

```
root@test-Super-Server: ~/home/test/Desktop # apt-get upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following upgrades have been deferred due to phasing:
libnautilus-extension4 libnss-systemd libpan-modules libpan-modules-bin libpan-runtime libpan-system libpan@
libsystemd-shared libsystemd@ libudev1 nautilus-data systemd systemd-dev systemd-oomd systemd-resolved
systemd-sysv systemd-timesyncd tzdata udev
The following packages have been kept back:
linux-generic-hwe-24.04 linux-headers-generic-hwe-24.04 linux-image-generic-hwe-24.04
```

## 5. Install the RHEL OS in a RAID array

Please disconnect from the network and follow these steps to install the Red Hat Enterprise Linux operating system in a RAID array.

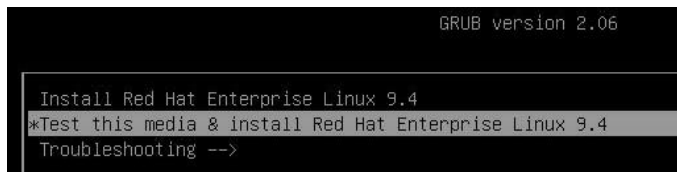
1. Insert a bootable USB flash drive into the target system.
2. Boot the system using a bootable USB flash drive.



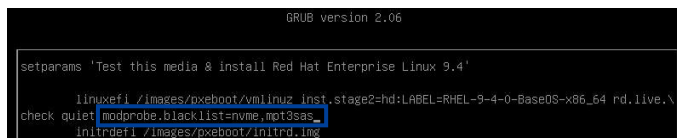
3. Block the system kernel module so that NVMe SSD is not occupied by the system driver.

### Example: Red Hat Enterprise Linux 9.4

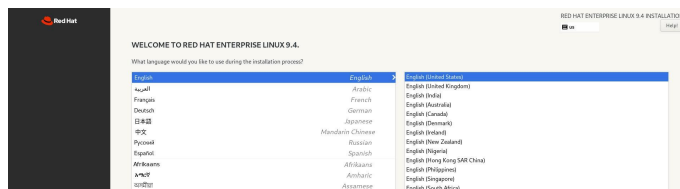
- a. When the Installation screen appears, press the **e** key to edit the boot command line option.



- b. On the edit command window, move the cursor to the end of the line “**linux efi/images/pxeboot/vmlinuz...**”, and append “**modprobe.blacklist=nvme,mpt3sas**”.



- c. Press **CTRL+X** or **F10** to start the system.
4. Install the binary driver in a RAID array.
    - a. When the following window appears during installation. Press **CTRL+ALT+F2** to switch to the shell on console 2.



**Note:** The shortcut to switch to the shell may differ for different Red Hat Enterprise Linux versions.

- b. Execute the following command to create a mount point for the USB flash drive.  
**#mkdir /hptdd**
- c. Execute the following command to mount the USB flash drive to **/hptdd**.  
**#mount /dev/sda1 /hptdd/**

- d. Execute the following command to copy the binary driver installation file to the system's temporary directory.

```
#cp -a /hptdd/hptdd /tmp/
```

- e. Execute the following command to unmount the USB flash drive.

```
#umount /hptdd
```

```
Red Hat Enterprise Linux 9.4 (Plow)
Kernel 5.14.0-427.13.1.el9_4.x86_64 on an x86_64

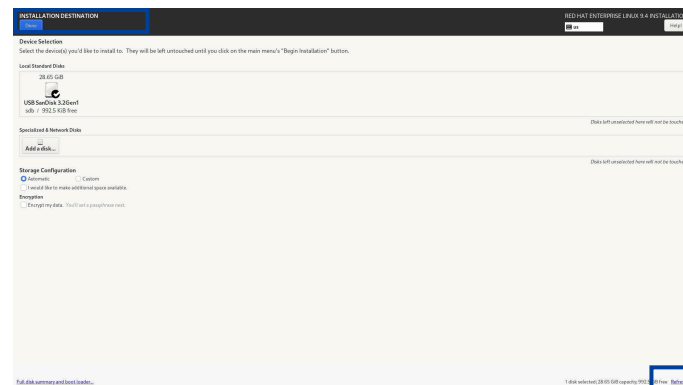
[anaconda root@localhost ~]# mkdir /hptdd/
[anaconda root@localhost ~]# mount /dev/sdb1 /hptdd/
[anaconda root@localhost ~]# cp -a /hptdd/hptdd/ /tmp/
[anaconda root@localhost ~]# umount /hptdd/
```

- f. When the USB flash drive is unmounted, please unplug the USB flash drive from the system.
- g. Execute the following command to load the NVMe AIC binary driver.

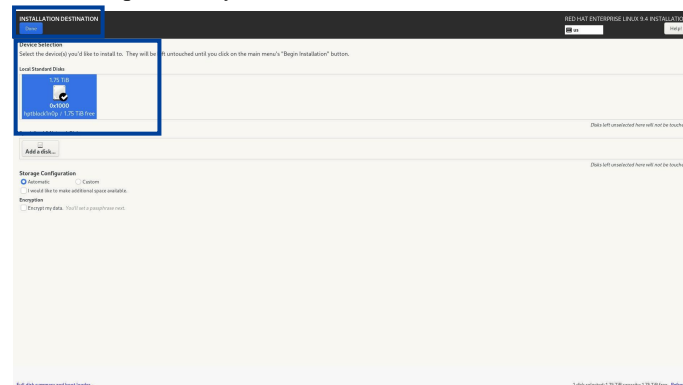
```
#sh /tmp/hptdd/rhel-install-step1.sh
```

```
[anaconda root@localhost ~]# sh /tmp/hptdd/rhel-install-step1.sh
Driver Installation
Driver installation step 1 completed.
```

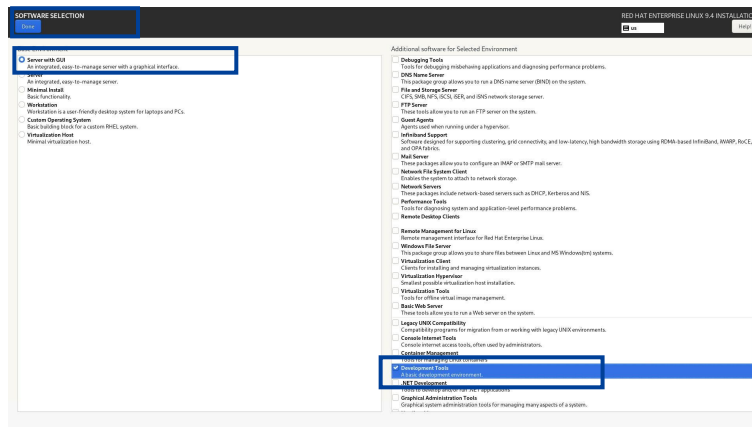
- h. Press **ALT+F6** to switch back to the installation screen and continue the installation.
- i. Select **Installation Destination** and click **Refresh**.



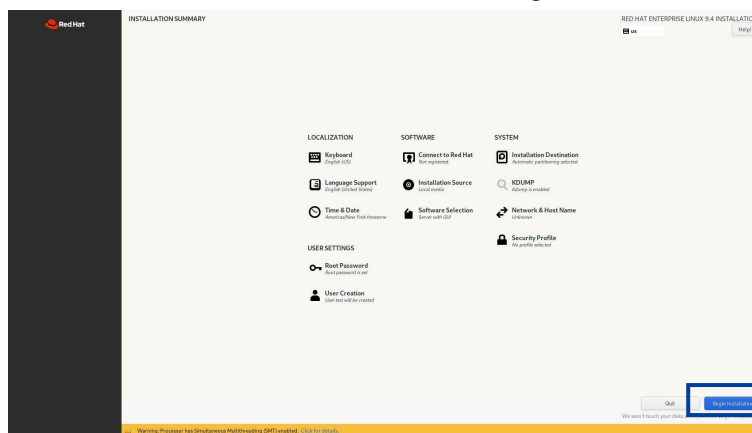
- j. Select the previously created RAID.



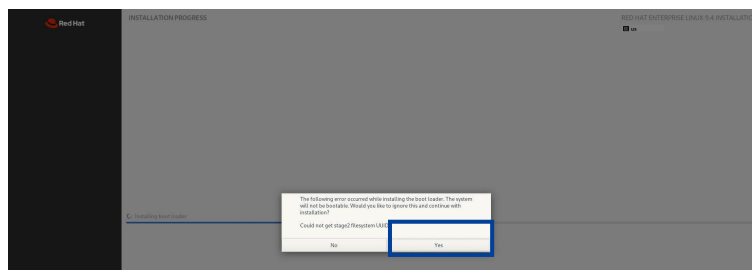
k. Set **Software Selection** and choose **Server with GUI and Development Tools**.



l. Set the **Root Password** and create the User to begin the installation.



If the following information is displayed during the installation, select **Yes**.



- m. When the screen shows **Install complete!** Press **CTRL+ALT+F2** to the shell.
- n. Execute the following command to copy the binary driver installation file to the system.  

```
#cp -r /tmp/hptdd /mnt/sysimage/tmp/hptdd
```
- o. Execute the following command to switch to the top(/) directory.  

```
#chroot /mnt/sysimage/
```
- p. Execute the following command to install the NVMe AIC binary driver.  

```
#sh /tmp/hptdd/rhel-install-step2.sh
```

A message will be displayed that the driver has been installed successfully.
- q. Execute the following command to delete the NVMe AIC binary driver file.  

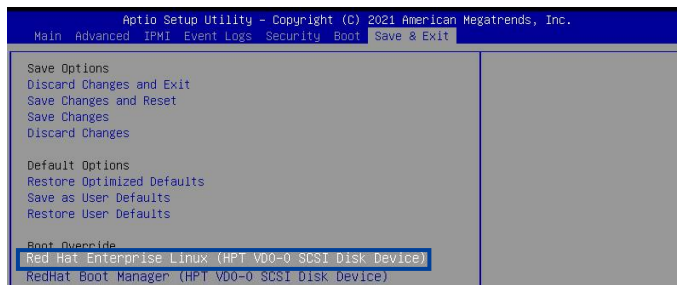
```
#rm -rf /tmp/hptdd
```



- r. Execute the following command to exit the top(/) directory.

```
#exit
anaconda root@localhost /l# cp -r /tmp/hptdd /mnt/sysimage/tmp/hptdd
anaconda root@localhost /l# chroot /mnt/sysimage/
anaconda root@localhost /l# sh /tmp/hptdd/rhel-install-step2.sh
Driver Installation
Updating 5.14.0-427.13.1.el9_4.x86_64...
Driver installation step 2 completed.
anaconda root@localhost /l# rm -rf /tmp/hptdd/
anaconda root@localhost /l# exit
exit
```

- s. Press **ALT+F6** to switch back to the installation screen and finish the installation.
5. If you want to boot from another kernel, please install the NVMe AIC open source driver after entering the system.
- a. Boot the system.



- b. Enter the following command to extract the open source driver:

```
#tar zxvf HighPoint NVMe G5 Linux Src vxx.x.xx xx xx xx.tar.gz
[test@localhost Documents]# tar zxvf HighPoint_NVMe_G5_Linux_Src_v1.6.17.0_2024_07_01.tar.gz
hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.01n
README
```

- c. Enter the following command to install the open source driver.

```
#sh hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin or
#./ hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin
[test@localhost Documents]# ./hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.bin
Verifying archive integrity.....
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
Please supply root's password to install this package.
Password:
Checking and installing required toolchain and utility ...
Found program gcc (/usr/bin/gcc)
Found program make (/usr/bin/make)
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
Created symlink /etc/systemd/system/default.target.wants/hptdrv-monitor.service → /usr/lib/systemd/system/hptdrv-monitor.service.
SUCCESS: Driver hptnvme is installed successfully for kernel 5.14.0-427.13.1.el9_4.x86_64.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from this computer, please run hptuninstall to uninstall the driver files.
```

- d. Manually restart the system.
- e. Execute the following command to download package information from all configured sources. (please connect to the internet) to install available upgrades of all packages currently installed on the system.

```
#yum update
[root@localhost test]# yum update
Updating Subscription Management repositories.
Last metadata expiration check: 0:01:38 ago on Tue 11 Jun 2024 01:04:51 PM CST.
Dependencies resolved.
=====
Package Architecture
=====
Installing:
kernel x86_64
```

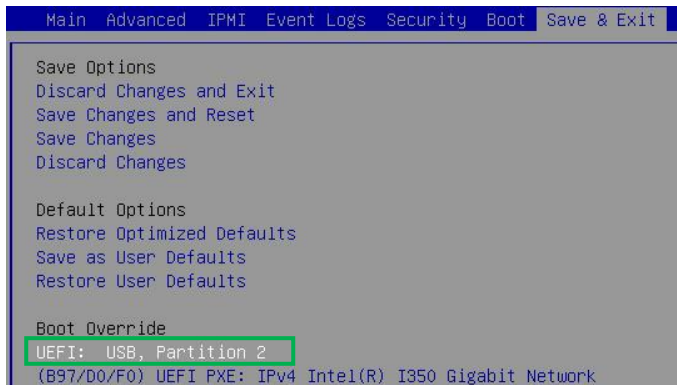
- f. Execute the following command to install available upgrades of all packages currently installed on the system.

```
#yum upgrade
[root@localhost test]# yum upgrade
Updating Subscription Management repositories.
Last metadata expiration check: 0:25:59 ago on Tue 11 Jun 2024 01:09:38 PM CST.
Dependencies resolved.
```

## 6. Install the Rocky Linux OS in a RAID array

Please disconnect from the network and follow these steps to install the Rocky Linux operating system in a RAID array.

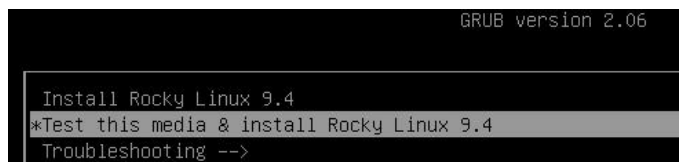
1. Insert a bootable USB flash drive into the target system.
2. Boot the system using a bootable USB flash drive.



3. Block the system kernel module so that NVMe SSD is not occupied by the system driver.

### Example: Rocky Linux 9.4

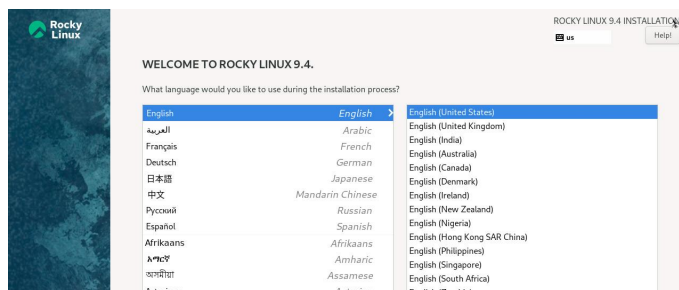
- a. When the Installation screen appears, press **e** key to edit boot command line option.



- b. On the edit command window, move the cursor to the end of the line “**linux** **efi/images/pxeboot/vmlinuz...**”, and append “**modprobe.blacklist=nvme,mpt3sas**”.



- c. Press **CTRL+X** or **F10** to start the system.
4. Install the binary driver in a RAID array.
    - a. When the following window appears during installation. Press **CTRL+ALT+F2** to switch to the shell on console 2.



**Note:** The shortcut to switch to the shell may be different for different Rocky Linux versions.

- b. Execute the following command to create a mount point for the USB flash drive.  
**#mkdir /hptdd**
- c. Execute the following command to mount the USB flash drive to **/hptdd**.  
**#mount /dev/sda1 /hptdd/**

- d. Execute the following command to copy the binary driver installation file to the system's temporary directory.

```
#cp -a /hptdd/hptdd /tmp/
```

- e. Execute the following command to unmount the USB flash drive.

```
#umount /hptdd
```

```
Rocky Linux 9.4 (Blue Onyx)
Kernel 5.14.0-427.13.1.el9_4.x86_64 on an x86_64

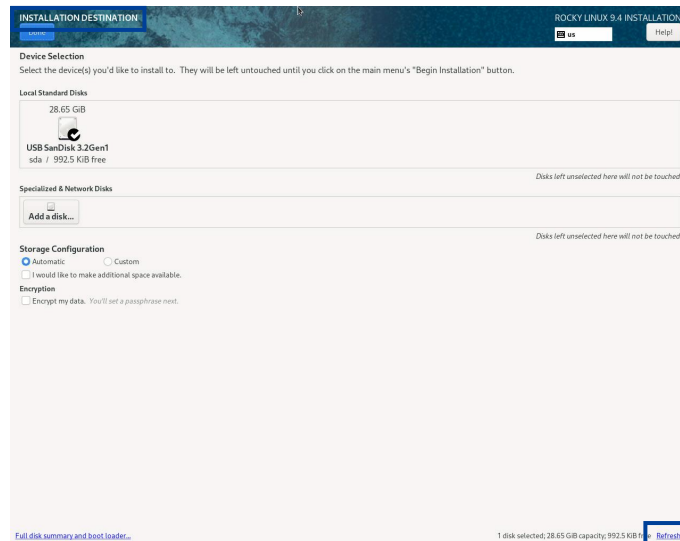
[anaconda root@localhost ~]# mkdir /hptdd
[anaconda root@localhost ~]# mount /dev/sda1 /hptdd/
[anaconda root@localhost ~]# cp -a /hptdd/hptdd /tmp/
[anaconda root@localhost ~]# umount /hptdd/
```

- f. When the USB flash drive is unmounted, please unplug the USB flash drive from the system.
- g. Execute the following command to load the NVMe AIC binary driver.

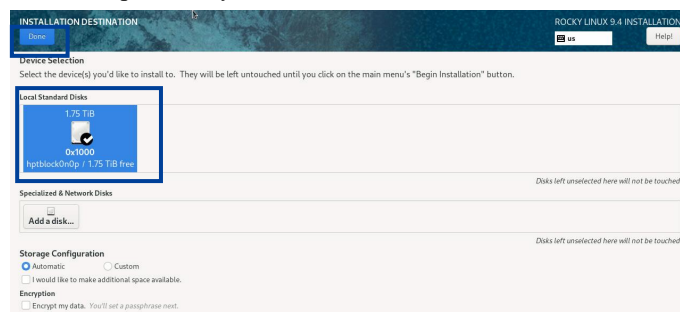
```
#sh /tmp/hptdd/rhel-install-step1.sh
```

```
[anaconda root@localhost ~]# sh /tmp/hptdd/rhel-install-step1.sh
Driver Installation
Driver installation step 1 completed.
```

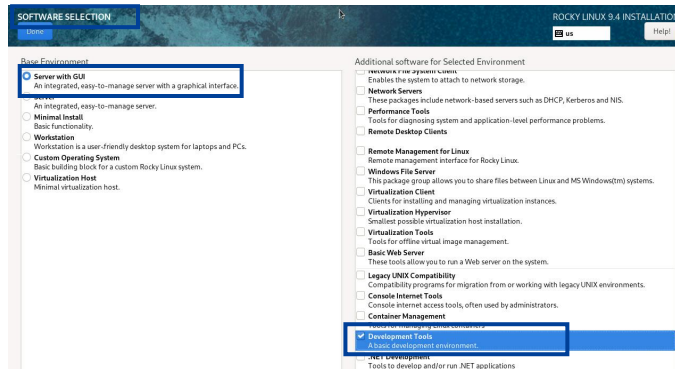
- h. Press **ALT+F6** to switch back to the installation screen and continue the installation.
- i. Select **Installation Destination** and click **Refresh**.



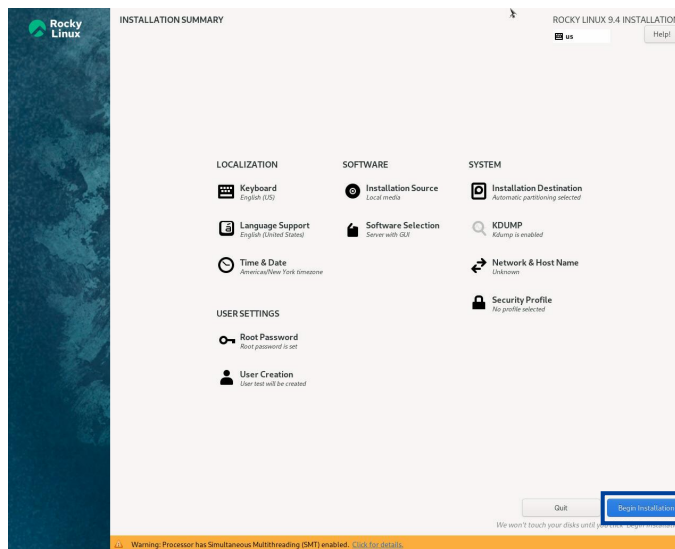
- j. Select the previously created RAID.



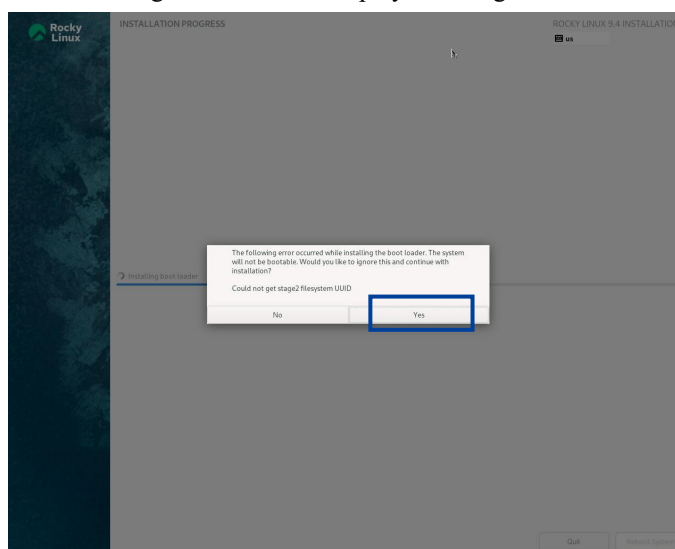
k. Set **Software Selection** and choose **Server with GUI** and **Development Tools**.



l. Set the **Root Password** and create the User to begin the installation.



If the following information is displayed during the installation, select **Yes**.



- m. When the screen shows **Install complete!** Press **CTRL+ALT+F2** to the shell.
- n. Execute the following command to copy the binary driver installation file to the system.  
**#cp -r /tmp/hptdd /mnt/sysimage/tmp/hptdd**
- o. Execute the following command to switch to the top(/) directory.  
**#chroot /mnt/sysimage/**

- p. Execute the following command to install the NVMe AIC binary driver.

```
#sh /tmp/hptdd/rhel-install-step2.sh
```

A message will be displayed that the driver has been installed successfully.

- q. Execute the following command to delete the NVMe AIC binary driver file.

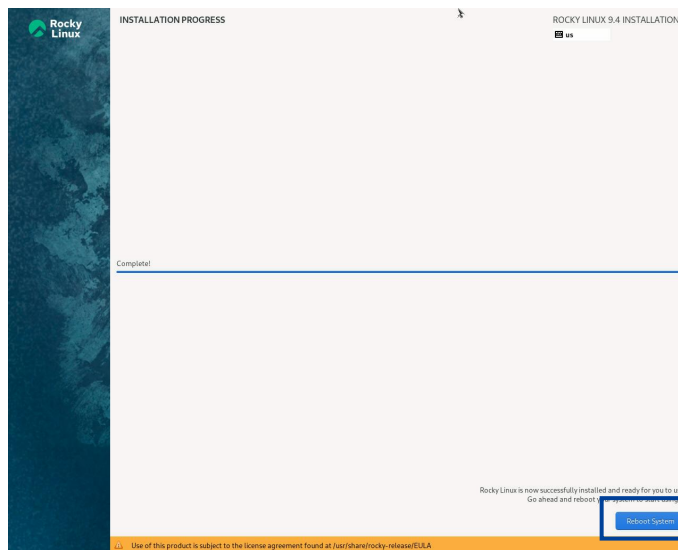
```
#rm -rf /tmp/hptdd
```

- r. Execute the following command to exit the top(/) directory.

```
#exit
```

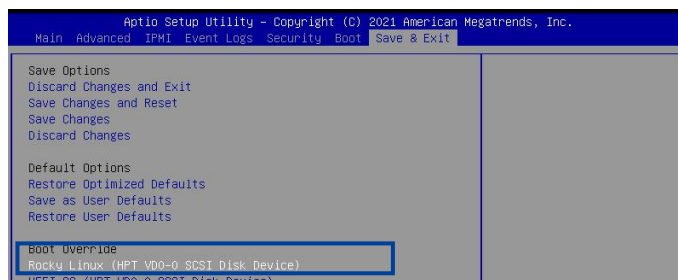
```
anaconda root@localhost /l# cp -r /tmp/hptdd /mnt/sysimage/tmp/hptdd
anaconda root@localhost /l# chroot /mnt/sysimage/
anaconda root@localhost /l# sh /tmp/hptdd/rhel-install-step2.sh
Driver Installation
Updating 5.14.0-427.13.1.el9_4.x86_64...
Driver installation step 2 completed.
anaconda root@localhost /l# rm -rf /tmp/hptdd/
anaconda root@localhost /l# exit
exit
```

- s. Press **ALT+F6** to switch back to the installation screen and finish the installation.



5. If you want to boot from another kernel, please install the NVMe AIC open source driver after entering the system.

- a. Boot the system.



- b. Enter the following command to extract the open source driver:

```
#tar xzvf HighPoint NVMe G5 Linux Src vx.x.xx xx xx xx.tar.gz
```

```
[test@localhost Documents]: tar xzvf HighPoint_NVMe_G5_Linux_Src.v1.6.17.0_2024_07_01.tar.gz
hptnvm_g5_linux_src_v1.6.17.0_2024_07_01.bin
README
```

- c. Enter the following command to install the open source driver.

```
#sh hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin or
#./ hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin
```

```
[test@localhost Documents]$ ./hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.bin
Verifying archive integrity... xix good
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
Please supply root's password to install this package.
Password:
Checking and installing required toolchain and utility ...
Found program gcc (/usr/bin/gcc)
Found program make (/usr/bin/make)
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
Created symlink /etc/systemd/system/default.target.wants/hptdrv-monitor.service → /usr/lib/systemd/system/hptdrv-monitor.service.
SUCCESS: Driver hptnvme is installed successfully for kernel 5.14.0-427.13.1.el9_4.x86_64.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from the computer, please run hptuninstallnvme to uninstall the driver files.
```

- d. Manually restart the system.
- e. Execute the following command to download package information from all configured sources. (please connect to the internet) to install available upgrades of all packages currently installed on the system.

```
#yum update
```

```
[root@localhost Downloads]# yum update
Last metadata expiration check: 0:02:20 ago on Wed 12 Jun 2024 09:21:59 PM EDT.
Dependencies resolved.
=====
=
Package                                Architecture      Version
=====
=
Installing:
kernel                                x86_64            5.14.0-427.20.1.el9_4
```

- f. Execute the following command to install available upgrades of all packages currently installed on the system.

```
#yum upgrade
```

```
[root@localhost Downloads]# yum upgrade
Last metadata expiration check: 0:07:58 ago on Wed 12 Jun 2024 09:21:59 PM EDT.
Dependencies resolved.
```

## 7. Install the Debian OS in a RAID array

Please disconnect from the network and follow these steps to install the Debian operating system in a RAID array.

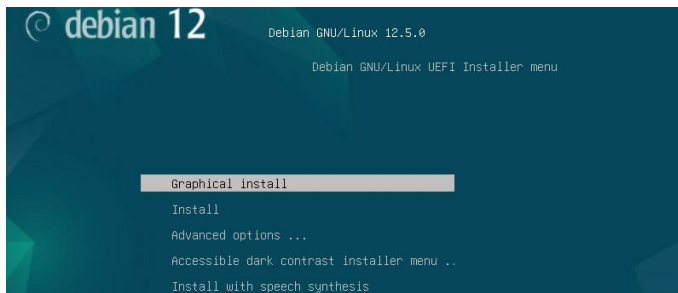
1. Insert a bootable USB flash drive into the target system.
2. Boot the system using a bootable USB flash drive.



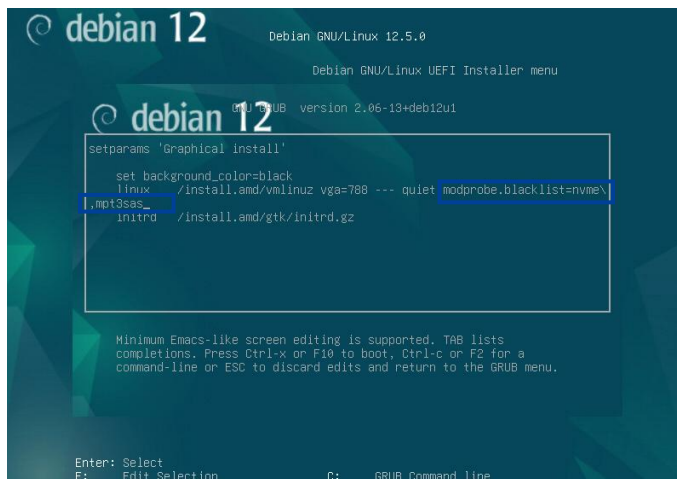
3. Block the system kernel module so that NVMe SSD is not occupied by the system driver.

### Example: Debian 12.5

- a. When the Installation screen appears, press the **e** key to edit the boot command line option.



- b. On the edit command window, move the cursor to the end of the line “**linux** /install.amd/vmlinuz...”, and append “**modprobe.blacklist=nvme,mpt3sas**”.

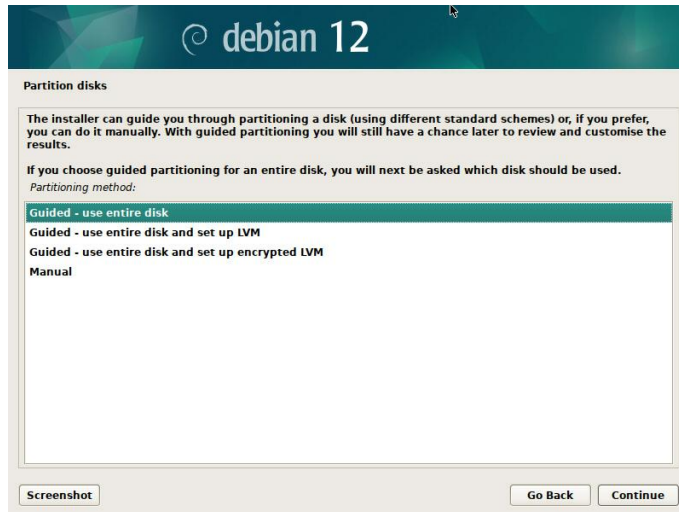


- c. Press **CTRL+X** or **F10** to start the system.



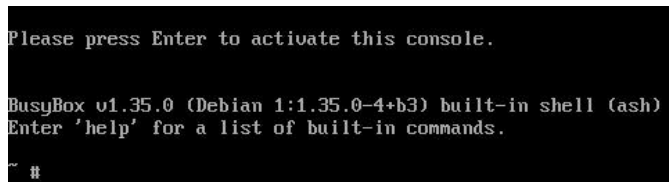
## 4. Install the binary driver in a RAID array.

- a. When the following window appears during installation. Press **Ctrl+ALT+F2** to switch to the shell on console 2.

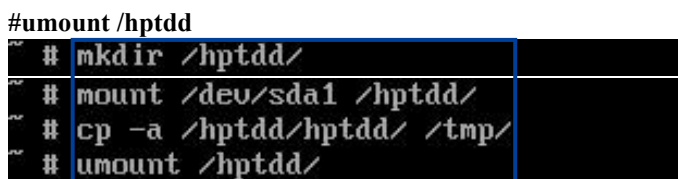


Note: The shortcut to switch to the shell may differ for different Ubuntu versions.

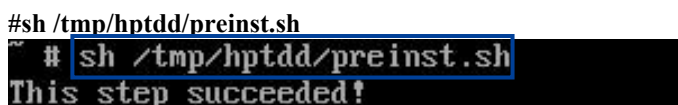
- b. Press **Enter** to activate this console.



- c. Execute the following command to create a mount point for the USB flash drive.  
**#mkdir /hptdd**
- d. Execute the following command to mount the USB flash drive to **/hptdd**.  
**#mount /dev/sda1 /hptdd/**
- e. Execute the following command to copy the binary driver installation file to the system's temporary directory.  
**#cp -a /hptdd/hptdd /tmp/**
- f. Execute the following command to unmount the USB flash drive.  
**#umount /hptdd**



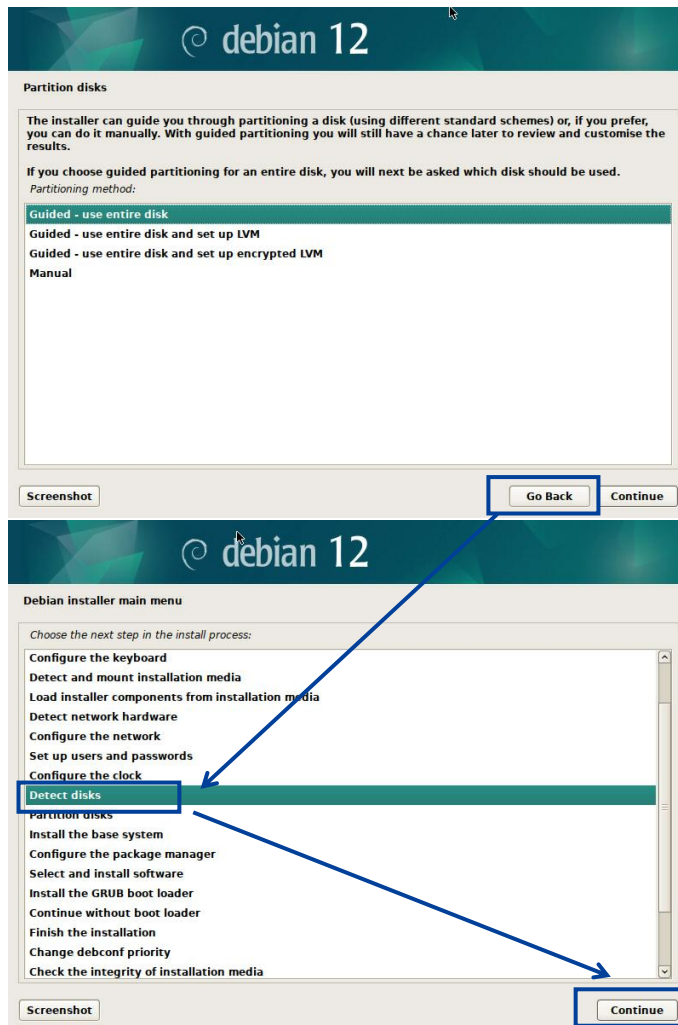
- g. When the USB flash drive is unmounted, please unplug the USB flash drive from the system.
- h. Execute the following command to load the NVMe AIC binary driver.



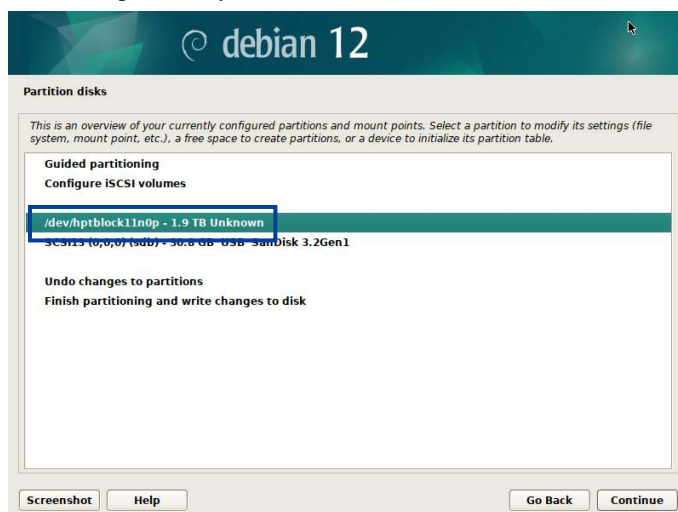
- i. Press **Ctrl+ALT+F5** to switch back to the installation screen and continue the installation.



- j. Click the **Go Back** first, then click **Detect disks** and **Continue** to detect the hptnvme disk.



- k. Select the previously created RAID.



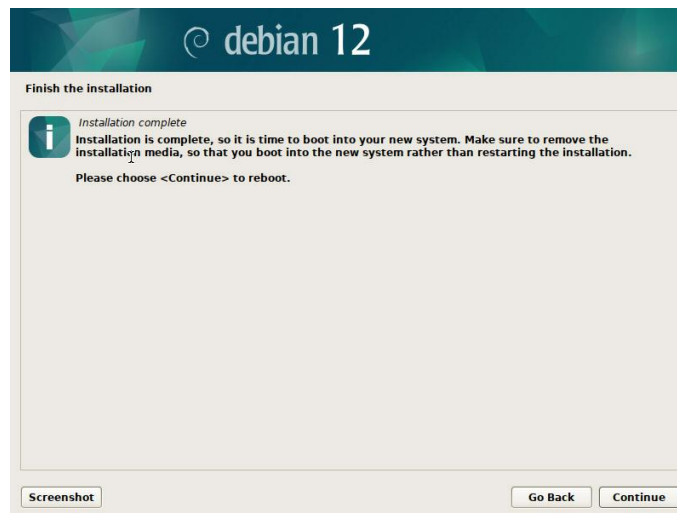
- l. When the screen shows **Install complete!** Press **Ctrl+ALT+F2** to the shell and type the following command to install the NVMe AIC binary driver.

```
#sh /tmp/hptdd/postinst.sh
```

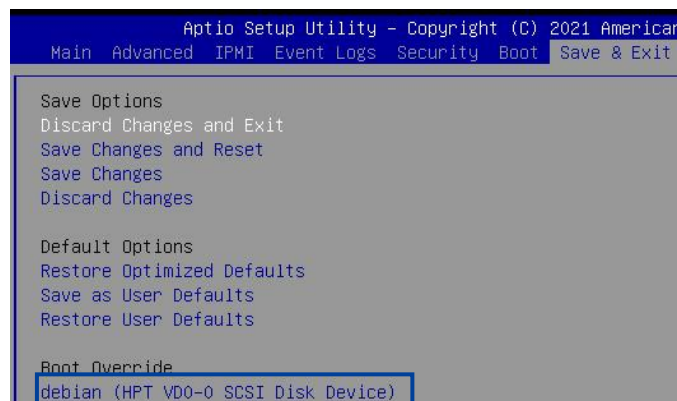
```
# sh /tmp/hptdd/postinst.sh
Running in chroot, ignoring request.
Running in chroot, ignoring request.
Generating grub configuration file ...
Found background image: /usr/share/images/desktop-base/desktop-grub.png
Found linux image: /boot/vmlinuz-6.1.0-18-amd64
Found initrd image: /boot/initrd.img-6.1.0-18-amd64
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
done
We have completed the driver installation.
#
```

A message will be displayed that the driver has been installed successfully.

- m. Press **Ctrl+ALT+F5** to switch back to the installation screen and finish the installation.



5. If you want to boot from another kernel, please install the NVMe AIC open source driver after entering the system.
  - a. Boot the system.



- g. Enter the following command to extract the open source driver:

```
#tar zxvf HighPoint NVMe G5 Linux Src vx.x.xx xx xx xx.tar.gz
root@debian:/home# tar zxvf HighPoint_NVMe_G5_RAID_Linux_Software_v1.8.1.0.1_24_06_22.tgz
setup.bin
README.txt
```

- h. Enter the following command to install the open source driver.

```
#sh hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin or
#./ hptnvme_g5_linux_src_vxx.x.x_xx_xx_xx.bin
root@debian:/home/test/Documents: ./hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
Checking and installing required toolchain and utility ...
Installing program gcc ... done
Installing program make ... done
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
Generating grub configuration file ...
Found background image: /usr/share/images/desktop-base/desktop-grub.png
Found linux image: /boot/vmlinuz-6.1.0-18-amd64
Found initrd image: /boot/initrd.img-6.1.0-18-amd64
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
Synchronizing state of hptdrv-monitor.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable hptdrv-monitor
update-rc.d: warning: enable action will have no effect on runlevel 1

SUCCESS: Driver hptnvme is installed successfully for kernel 6.1.0-18-amd64.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from the computer, please run hptuninhptnvme to uninstall the driver files.
```

- i. Manually restart the system.
- b. Execute the following command to download package information from all configured sources. (please connect to the internet) to install available upgrades of all packages currently installed on the system.

```
#apt-get update
root@debian:/home# apt-get update
-bash: apt-get: command not found
root@debian:/home# apt-get update
Hit:1 https://security.debian.org/debian-security bookworm-security InRelease
Hit:2 https://mirrors.tuna.tsinghua.edu.cn/debian bookworm InRelease
Get:3 https://mirrors.tuna.tsinghua.edu.cn/debian bookworm-updates InRelease [55.4 kB]
Get:4 https://mirrors.tuna.tsinghua.edu.cn/debian bookworm-backports InRelease [56.5 kB]
```

- c. Execute the following command to install available upgrades of all packages currently installed on the system.

```
#apt-get upgrade
root@debian:/home# apt-get upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  libwpe-1.0-1 libwpebackend-fdo-1.0-1
Use 'apt autoremove' to remove them.
The following packages have been kept back:
  linux-image-amd64
The following packages will be upgraded:
  apache2-bin bind9-dnsutils bind9-host bind9-libs bsdxrtautils bsdtails eject fdisk
  gir1.2-javascriptcoregtk-4.0 gir1.2-javascriptcoregtk-4.1 gir1.2-webkit2-4.0 gir1.2-
  gstreamer1.0-gi gstreamer1.0-plugins-base gstreamer1.0-x imagemagick-6-common less
  libgl1.0-bin libgl1.0-data libgs-common libgs10 libgs10-common libgstreamer-glib
  libjavascriptcoregtk-4.1-0 libjavascriptcoregtk-6.0-1 libmagickcore-6.q16-6 libmagi
  libreoffice-base-core libreoffice-calc libreoffice-common libreoffice-core libreoff
  libreoffice-help-en-us libreoffice-impress libreoffice-math libreoffice-style-colib
  libuno-cppu3 libuno-cppuhelpergcc3-3 libuno-purpnhelpergcc3-3 libuno-sal3 libuno-
  libwebkitgtk-6.0-4 mount python3-uno uno-libs-private ure util-linux util-linux-ext
  xserver-xorg-legacy
80 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
Need to get 279 MB/286 MB of archives.
After this operation, 10.8 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

## 8. Trouble shooting

### 8.1. Fail to compile gcc, make and other driver files

#### 8.1.1. For Debian

##### 1. Description of the Problem

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@debian:/home/test/Documents# ./hptnvm_g5_linux_src_v1.4.4_2022_06_13.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe 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)
old pcie.aspm=off iommu=off intel_iommu=off amd_iommu=off
new pcie.aspm=off iommu=off intel_iommu=off amd_iommu=off
Synchronizing state of hptdrv-monitor.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable hptdrv-monitor
update-rc.d: warning: enable action will have no effect on runlevel 1
Toolchain to build the driver is incomplete, please install the missing package to build the driver.
Exit.
```

##### 2. Cause of the Problem

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

##### 3. Solution

- a. Ensure that the network is properly connected.
- b. Reinstall the HighPoint software.

**If the following occurs after the network connection and reinstall driver:**

```
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe G5 RAID Linux Software package installer.....
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
Checking and installing required toolchain and utility ...
Installing program gcc ...
Media change: please insert the disc labeled
'Debian GNU/Linux 12.5.0 Bookworm - Official amd64 DVD Binary-1 with firmware 20240210-11:28'
in the drive '/media/cdrom/' and press [Enter]
```

**A lack of dependency packages can cause this problem:**

##### Solution:

- a. To install using the CD-ROM: insert the CD-ROM back and press **Enter**.
- b. To install using the USB flash drive:
  - a) The system needs to be resourced. For details, please refer to the official website file: <https://www.debian.org/doc/manuals/debian-faq/uptodate.en.html>
  - b) Open the system terminal with root privileges and enter the following command:  
**#nano /etc/apt/sources.list**
  - c) Replace the contents of the file with the following illustration  

```
deb https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm main contrib non-free non-free-firmware
# deb-src https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm main contrib non-free non-free-firmware
deb https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm-updates main contrib non-free non-free-firmware
# deb-src https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm-updates main contrib non-free non-free-firmware
deb https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm-backports main contrib non-free non-free-firmware
# deb-src https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm-backports main contrib non-free non-free-firmware
```

Note: See the mirror list at <https://www.debian.org/mirror/list> for more information.

d) apt-get update

```
root@test:/home/test/Documents# nano /etc/apt/sources.list
root@test:/home/test/Documents# apt-get update
Get:1 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye InRelease [116 kB]
Get:2 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-updates InRelease [44.1 kB]
Get:3 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports InRelease [49.0 kB]
Get:4 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security InRelease [48.4 kB]
Get:5 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free Sources [81.2 kB]
Get:6 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main Sources [8,633 kB]
Get:7 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib Sources [43.2 kB]
Get:8 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main amd64 Packages [8,184 kB]
Get:9 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main Translation-en [6,239 kB]
Get:10 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main amd64 DEP-11 Metadata [4,049 kB]
Get:11 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main DEP-11 48x48 Icons [3,478 kB]
Get:12 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main DEP-11 64x64 Icons [7,315 kB]
Get:13 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib amd64 Packages [50.6 kB]
Get:14 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib Translation-en [46.9 kB]
Get:15 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib amd64 DEP-11 Metadata [13.6 kB]
Get:16 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib DEP-11 48x48 Icons [47.2 kB]
Get:17 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib DEP-11 64x64 Icons [93.3 kB]
Get:18 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free amd64 Packages [97.7 kB]
Get:19 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free Translation-en [92.4 kB]
Get:20 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free amd64 DEP-11 Metadata [17.9 kB]
Get:21 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free DEP-11 48x48 Icons [74.1 B]
Get:22 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free DEP-11 64x64 Icons [27.7 kB]
Get:23 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-updates/main Sources [3,588 B]
Get:24 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-updates/main amd64 Packages [6,344 B]
Get:25 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-updates/main Translation-en [5,890 B]
Get:26 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/main Sources [314 kB]
Get:27 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/non-free Sources [3,996 B]
Get:28 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/contrib Sources [2,712 B]
Get:29 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/main amd64 Packages [341 kB]
Get:30 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/main Translation-en [281 kB]
Get:31 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/contrib amd64 Packages [4,400 B]
Get:32 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/contrib Translation-en [4,320 B]
Get:33 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/non-free amd64 Packages [11.5 kB]
Get:34 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/non-free Translation-en [8,960 B]
Get:35 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/main Sources [160 kB]
Get:36 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/non-free Sources [632 B]
Get:37 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/main amd64 Packages [189 kB]
Get:38 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/main Translation-en [119 kB]
Get:39 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/non-free amd64 Packages [528 B]
Get:40 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/non-free Translation-en [344 B]
Fetched 40.2 MB in 3min 13s (208 kB/s)
Reading package lists... Done
root@test:/home/test/Documents#
```

e) Reinstall the HighPoint software.

## 8.1.2. For RHEL

### 1. Description of the Problem

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@localhost Documents]# ./hptnvme_g5_linux_src_v1.4.1_2022_03_04.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
Checking and installing required toolchain and utility ...
Installing program make ... (failed)
Installing program gcc ... (failed)
```

Or a prompt with **subscription-manager** repos:

```
compile:default boot kernel: /boot/vmlinuz-...x86_64
dumpkernels:kernel installed
kernel-...x86_64
dumpkernels:kernel-devel installed
kernel-devel-...x86_64
dumpkernels:repo list kernel-devel

dumpkernels:end
installlib_centos elfutils-libelf-devel
There are no enabled repos.
Run "yum repolist all" to see the repos you have.
To enable Red Hat Subscription Management repositories:
subscription-manager repos --enable <repo>
To enable custom repositories:
yum-config-manager --enable <repo>
compile:some build tools are missing.
```

### 2. Cause of the Problem

The system is not connected to a network (internet connection), or this is not registered.

### 3. Solution

- Ensure that the network is properly connected.
- Go to the Red Hat website and register an account: [Register for | Red Hat IDP](#)
- Open the system terminal with root privileges.
- Enter the following command to log in:



```
#subscription-manager register --username=*** --password=*** --auto-attach
```

```
[root@localhost Documents]# subscription-manager register --username=*** --password=*** --auto-attach
Registering to: subscription.rhsm.redhat.com:443/subscription
The system has been registered with ID: 96
The registered system name is: localhost.localdomain
```

- e. Reinstall the HighPoint software.

```
[root@localhost Documents]# ./hptnvme_g5_linux_src_v1.4.1_2022_03_04.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....
.....
Checking and installing required toolchain and utility ...
Installing program make ... done
Installing program gcc ... done
```

### 8.1.3. For Ubuntu

#### 1. Description of the Problem

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@testlu-Super-Server:/home/testlu/Desktop# ./hptnvme_g5_linux_src_v1.6.2.0_2023_06_21.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe 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)
Sourcing file '/etc/default/grub'
```

#### 2. Cause of the Problem & Solution

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

##### Solution:

- a. Ensure that the network is properly connected.
- b. Reinstall the HighPoint driver.

- The system process is occupied/ busy.

```
Found linux image: /boot/vmlinuz-6.5.0-10-generic
Found initrd image: /boot/initrd.img-6.5.0-10-generic
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
Synchronizing state of hptdrv-monitor.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable hptdrv-monitor
update-rc.d: warning: enable action will have no effect on runlevel 1
ERROR: Toolchain to build the driver is incomplete, please install the missing package to build the driver.
Make sure your machine is properly connected to the network and can install software packages from the appropriate software repository.
Exit.
```

##### Solution:

- a. Open the system terminal with root privileges and enter the following commands:
 

```
#apt-get update
```
- b. Release the process and update the download source.
- c. Reinstall the HighPoint driver.

## 8.2. Fail to install the Ubuntu 22.04.4 Server

### 1. Description of the Problem

When executing command `sh /tmp/hptdd/preinst.sh` to load the NVMe AIC binary driver reports error **Error! This step failed!**

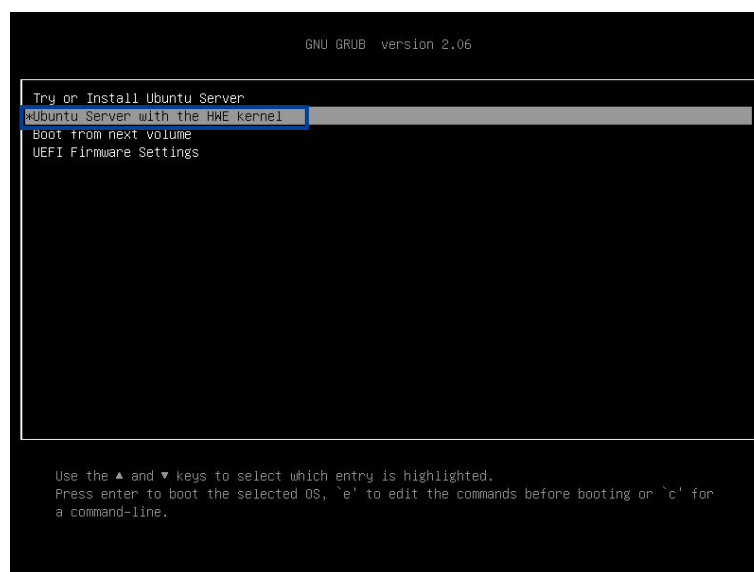
```
root@ubuntu-server:/# sh /tmp/hptdd/preinst.sh
szin: /tmp/hptdd/boot/hptovmeS.15.0-94-genericx86_64.ko.gz: No such file or directory
Error! This step failed!
root@ubuntu-server:/# _
```

### 2. Cause of the Problem

The currently installed kernel version does not match the kernel version supported by the NVMe AIC binary driver, causing the installation to fail to load the NVMe AIC binary driver.

### 3. Solution

- Boot the system using a bootable USB flash drive.
- Select the **Ubuntu Server with the HWE kernel**.



- Press the **e** key to edit the boot command line option.
- Follow the installation steps for subsequent operations.

## 8.3. No supported controller detected

### 1. Description of the Problem

Run the command “ArrayCreate.efi” in the UEFI command line.

```
FS0:\SSD7505-uefi\> ArrayCreate.efi
Highpoint RAID utility for UEFI (version: 20200306)
No supported controller detected.
FS0:\SSD7505-uefi\> _
```

### 2. Cause of the Problem

The OPRM is not configured correctly, which prevents the UEFI driver from loading correctly.

### 3. Solution

- a. Check whether the [Storage option ROM](#) is Enabled in the system EFI setting.
- b. Check whether NVMe is connected to the NVMe RAID AIC.
- c. Replace the motherboard slot and re-enter the command.

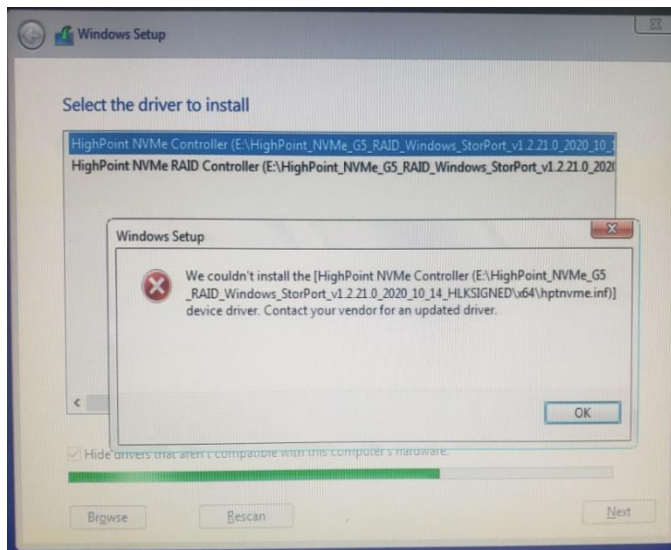
If none of the above methods work, please provide a [UEFI log](#). You can submit a support ticket using our [Online Support Portal](#) and include a problem description in as much detail as possible.



## 8.4. Load driver error

### 1. Description of the Problem

When installing the driver, it prompts the driver to be updated.



### 2. Cause of the Problem

The appearance of the error message indicates that other NVMe Drives are connected to your applicable motherboard.

### 3. Solution

- a. Remove all NVMe drives installed on the motherboard.
- b. Reinstall OS.

If none of the above methods work, please provide a [UEFI log](#). You can submit a support ticket using our [Online Support Portal](#) and include a problem description in as much detail as possible.

## 9. Appendix

UEFI Command Line supports command: help/info/quit/exit/create/delete

### 9.1. Create Command

#### Syntax

create {Array Type (RAID0/RAID1)} {Member Disk list (1/1, 1/2|\*)} {Capacity (100|\*)}

#### Examples

```
<<<<create RAID0
```

```
<<<<create RAID0 *
```

```
<<<<create RAID0 * *
```

Create a RAID0 array with all disks and with maximum capacity.

```
<<<<create RAID1 1/1, 1/3 10
```

Create an RAID1 array with disks 1/1 and 1/3 and 10GB capacity.

```
<<<<create RAID10 * 10
```

Create an RAID1 array with all disks and 10GB capacity.

### 9.2. Delete Command

#### Syntax

delete {array ID}

#### Examples

```
<<<<delete 1
```

Delete the first array from the Logical device list.

```
<<<<delete 2
```

Delete the second array from the Logical device list.

### 9.3. Info Command

#### Syntax

```
<<<<info
```

Display physical device list and logical list.

## 9.4. Exit Command

### Syntax

<<<Q/q/quit/exit

Quit the application.

## 9.5. Help Command

### Syntax

<<<H/h/help

This is a help message.

## 10. Revision History

### 10.1. Version 1.00, July 15, 2024

Initial version.

### 10.2. Version 1.01, August 13, 2024

Add RocketAIC 7749M2W Series support.

### 10.3. Version 1.02, October 10, 2024

1. Add RA6542AWW-S491T5-12 support.
2. Add [8.4 Load driver error](#)