



HighPoint NVMe AIC Boot RAID Windows Installation Guide

V1.00-July 31st 2023

Copyright 2023 HighPoint Technologies, Inc.

All rights reserved

Content

Prerequisites for a Bootable RAID Configuration	3
BIOS Settings.....	5
How to install Windows to the NVMe NVMe RAID AIC.....	6
Method 1 UEFI Command Line (RAID Tool).....	6
Method 2 UEFI HII (UEFI Utility)	11
Disabling Hibernation.....	14
Trouble shooting.....	15
No supporting host adapter is found.....	15
No supported controller detected.....	15
Yellow warning before and after installation of the driver.....	16
Load driver error	16
This PC Can't run Windows11	17
Appendix	18

Prerequisites for a Bootable RAID Configuration

The following is a list of NVMe RAID AICs that can support bootable RAID arrays.

Supported NVMe RAID AICs	SSD7105 SSD7202 SSD7502 SSD7505 SSD7540
Supported system board	Dell Precision 7920 Tower Dell Precision 7960 Tower

After configuring an array using the UEFI RAID tool or UEFI HII, you can install a Windows operating system to the NVMe SSDs.

In order to configure a bootable NVMe RAID array, you will need the following:

Note: *Prior to system installation, please do not connect any NVMe to the system board M.2 SLOT to prevent any unexpected situation during the installation process.*

1. **An NVMe SSD must be installed.** You must have at least one NVMe SSD installed into the NVMe RAID AICs.
2. **A PCIe 3.0/ 4.0/ 5.0 slot with x8 or x16 lanes.** The NVMe RAID AICs must be installed into a PCIe 3.0/ 4.0/ 5.0 slot with x8 or x16 lanes.
3. **Secure Boot must be disabled.** The UEFI capability of the NVMe RAID AIC has not been signed and certified. If Secure Boot is enabled, the system board will not recognize the NVMe RAID AIC, and you will be unable to proceed with installation.
4. **Prepare the Windows OS Installation media.** You will need an official Windows installation DVD or flash drive, or access to an official downloadable copy (which will then have to be burned/transferred to a DVD or flash drive).
5. If you are installing the OS using a DVD/Blu-Ray disc, you will need to **Install an optical drive into the system** (such as a DVD-ROM, DVD-RW or Blu-Ray drive).
6. **You will need a USB flash drive** – the UEFI package and driver should be extracted to the root directory of this flash drive.

Note: *If you are using a USB flash drive as the Windows OS Installation media, then you will need to prepare another USB flash drive. Windows OS cannot be stored in a USB flash drive with UEFI package and driver.*

7. **Remove all other drives during the OS installation process.** Make sure only the NVMe RAID AIC, the USB flash drive, and the optical drive are installed into

- the system during this procedure. This includes any other USB hard drives, USB flash drives, memory sticks, or SAS/SATA drives. You can reattach these drives after the operating system has been successfully installed.
8. Make sure any non-HighPoint drivers are uninstalled for any SSDs hosted by the NVMe RAID AIC. 3rd party software and manufacturer provided drivers may prevent the NVMe RAID AIC from functioning properly.
 9. **For Windows 10/11 users, make sure to Disable Fast Boot.**
 10. **The following are the basic requirements for installing Windows 11 on your computer.** If your device does not meet these requirements, you may not be able to install Windows 11 on your device; If your device is already running Windows 10, you can use the [PC Health Check app](#) to evaluate compatibility.

Minimum system requirements

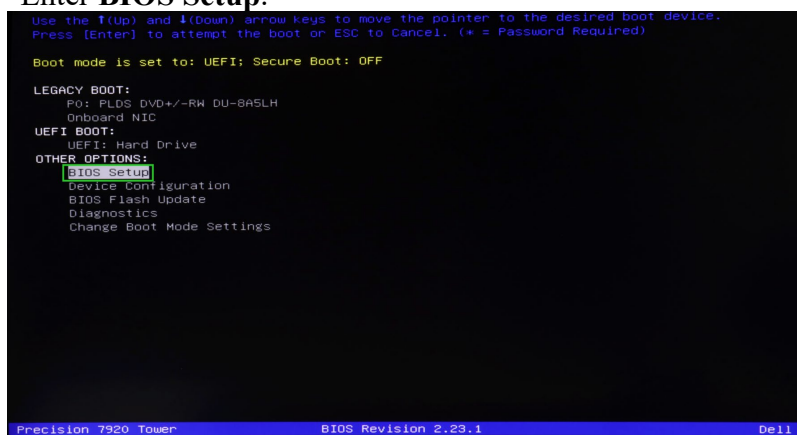
Read [here](#) for more information on system requirements and information on how some PCs might be able to update or change settings to meet the requirements.

Processor:	1 gigahertz (GHz) or faster with 2 or more cores on a compatible 64-bit processor or System on a Chip (SoC).	Graphics card:	Compatible with DirectX 12 or later with WDDM 2.0 driver.
Memory:	4 GB RAM.	Display Resolution:	High definition (720p) display that is greater than 9" diagonally, 8 bits per color channel.
Storage:	64 GB or larger storage device.	Internet connection:	Microsoft account and internet connectivity required for setup for Windows 11 Home.
System firmware:	UEFI, Secure Boot capable. Check here for information on how your PC might be able to meet this requirement.	Your device must be running Windows 10 , version 2004 or later, to upgrade. Free updates are available through Windows Update in Settings>Update and Security.	
TPM:	Trusted Platform Module (TPM) version 2.0. Check here for instructions on how your PC might be enabled to meet this requirement.	Certain features require specific hardware . ² System requirements to run some apps will exceed the Windows 11 minimum device specifications. Check device compatibility information specific to the apps you want to install. Available storage on your device will vary based on installed apps and updates. Performance will scale with higher end, more capable PCs. Additional requirements may apply over time and for updates.	

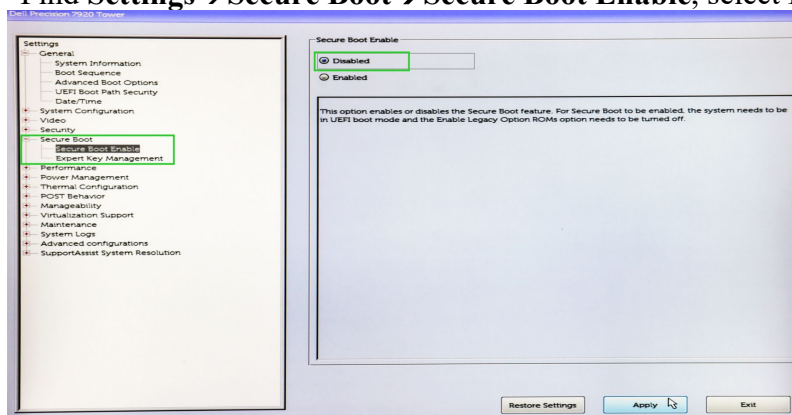
Please refer to the following link for detailed requirements:
[Windows 11 Specs and System Requirements | Microsoft](#)

BIOS Settings

1. Boot the system and press **F12** to enter BIOS menus.
2. Enter **BIOS Setup**.



3. Find **Settings** → **Secure Boot** → **Secure Boot Enable**, select **Disabled**.



4. Save configuration and restart the system.

How to install Windows to the NVMe AID AIC

Method 1 UEFI Command Line (RAID Tool)

Step 1 - Preparing the USB Flash Drive

When preparing the USB flash drive, make sure to format the USB partition as FAT32. If another file system is used, the USB drive may not be properly recognized, and will not appear as an option under the system board's BIOS menus.

Step 2 - Preparing the UEFI Package

The package must be unzipped directly to the root of the bootable USB flash drive (do not extract the contents to a new folder). All of the following items must be present in the root of the USB flash drive.

Example screenshot

> SSD7505_UEFI_v2.3.5_2023_07_12 >

名称	修改日期
efi	2023/7/28 14:33
7505uefi.blf	2023/7/12 17:05
ArrayCreate.efi	2023/7/12 17:05
go.nsh	2023/7/12 17:05
load.efi	2023/7/12 17:05
LogShow.efi	2023/7/12 17:05
README.txt	2023/7/12 17:05
rsnvme-x86_64.efi	2023/7/12 17:05
startup.nsh	2023/7/12 17:05

Note1: The screenshot above is only for reference.

Note2: If the above content is not present in the root directory, the UEFI boot device will not be properly recognized, and or you will be unable to create an array for OS installation.

Step 3 – Creating the RAID Array

Note: Picture for reference only.

1. This procedure assumes you have already installed NVMe SSDs into the NVMe RAID AIC.
2. Insert the bootable USB flash drive into the system board and boot the system.
3. Press **F12** to enter the system board's BIOS menus, and select the **"UEFI: USB"** from the **UEFI BOOT**.



4. 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_
```

5. Next, 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:
<<< _
```

6. Next, create the array using the following command:
create RAID0

This will create a RAID0 array using all of the SSDs, and configured for maximum capacity.

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

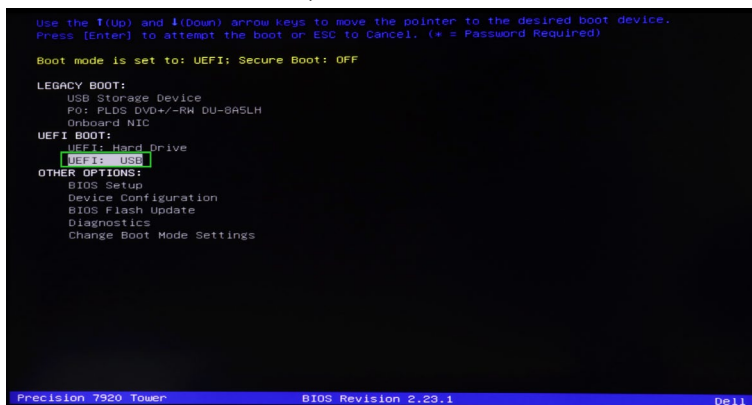
==== Physical device list(count 4):
1/1 Sabrent Rocket 4.0 1TB-7FE00707087104034542, 1000123MB(MaxFree 0MB), Normal
1/2 Sabrent Rocket 4.0 1TB-7F600707089D04033529, 1000123MB(MaxFree 0MB), Normal
1/3 Seagate FireCuda 520 SSD ZP2000GM30002-7QH002A2, 2000313MB(MaxFree 1000190MB), Normal
1/4 Seagate FireCuda 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
-----
>>> Please specify command to execute:
<<< _
```

7. You can now exit the utility. Enter the following command: **exit**
Note: For more additional commands, please refer to [Appendix](#) of this user guide.

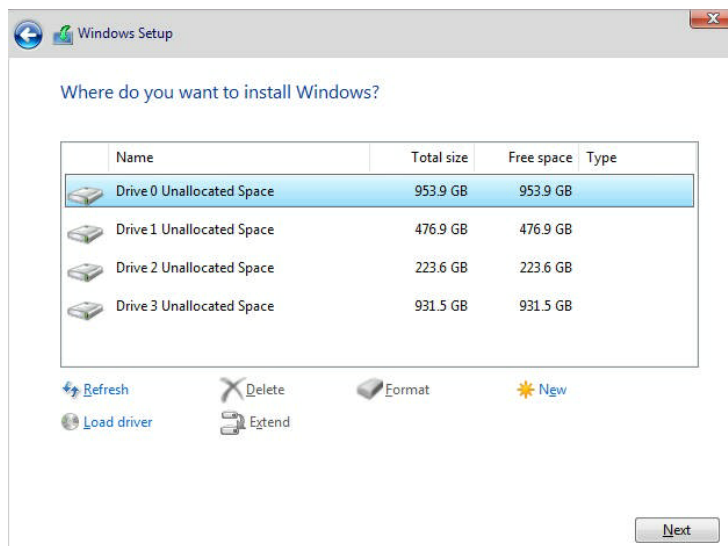
Step 4 - Install Windows

1. Insert the Windows installation media (USB flash drive or DVD), then reboot the system.
2. Enter the **UEFI BOOT**, and select the **“UEFI: USB”**.

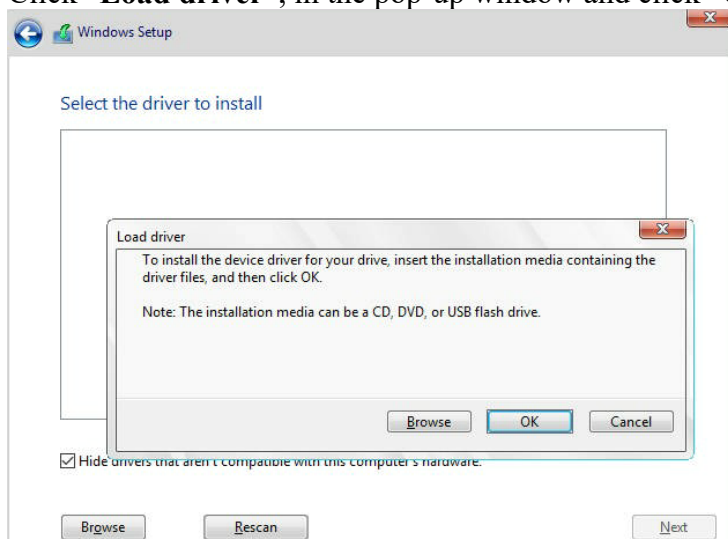


3. After Windows setup begins, follow the on-screen prompts. When Windows asks **“Where do you want to install Windows?”**, you should see several Legacy disks a available (one for each SSD you have installed into the NVMe RAID AIC).

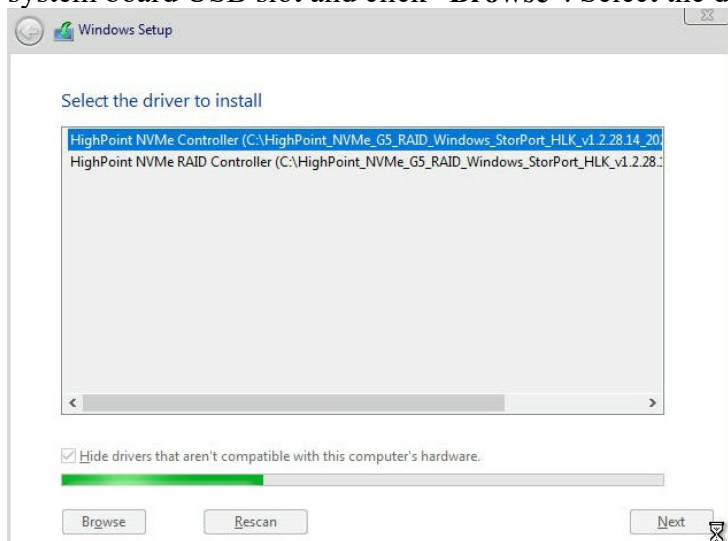
Note: The screenshot below shows 4 SSD's that have been installed into a SSD7505.



4. Click **“Load driver”**, in the pop-up window and click **“Cancel”**:

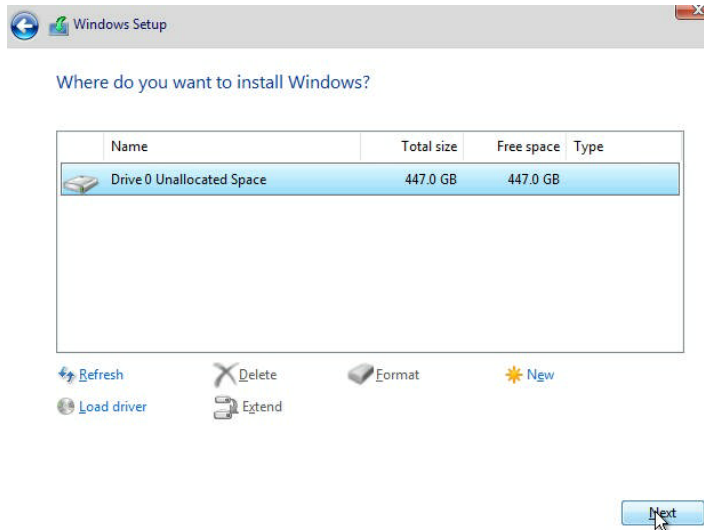


5. Next, insert a USB flash drive that contains the NVMe RAID AIC driver into the system board USB slot and click **“Browse”**. Select the driver file as shown:



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

6. 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:



7. After partitioning, continue and complete the Windows installation procedure.

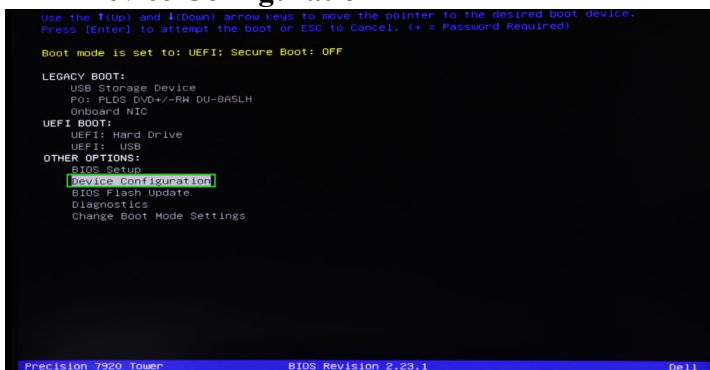
Method 2 UEFI HII (UEFI Utility)

Note1: The following installation process uses the SSD7505 as an example.

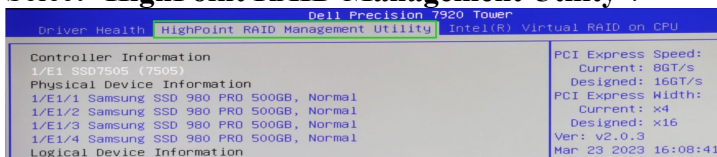
Note2: The screenshot above is only for reference.

Step 1 – Creating the RAID Array

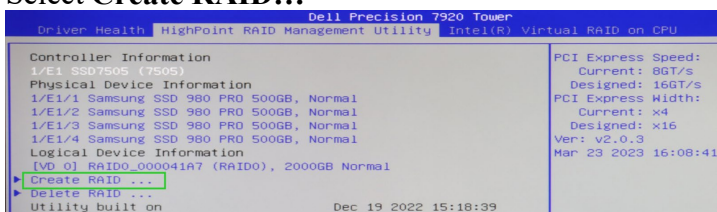
1. Boot the system and press **F12** to enter BIOS menus.
2. Enter **Device Configuration**.



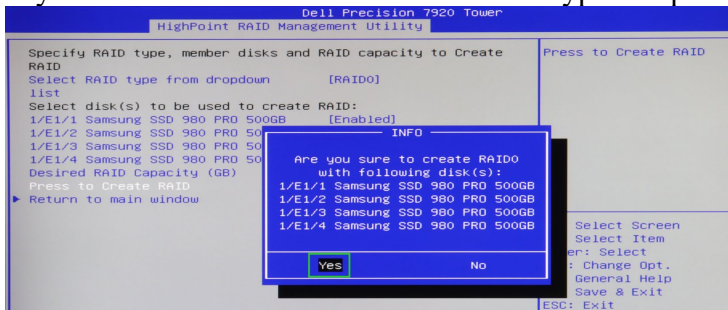
3. Select "**HighPoint RAID Management Utility**".



4. Select **Create RAID...**

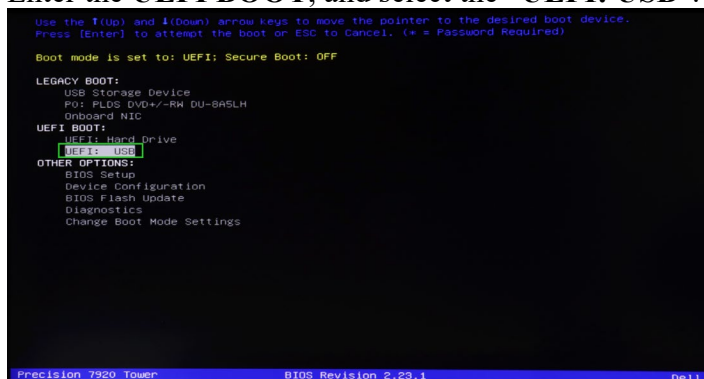


5. In **Create** menu, a device list will appear, and display all available hard disk drives. Select the RAID type from dropdown list. Use the **up** and **down** keys of the keyboard or the mouse to select the RAID type and press the **Enter** key.



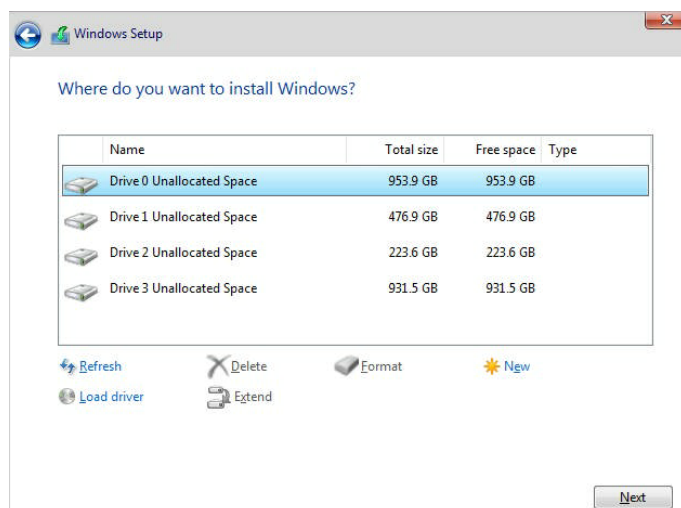
Step 2 - Install Windows

1. Enter the **UEFI BOOT**, and select the **“UEFI: USB”**.

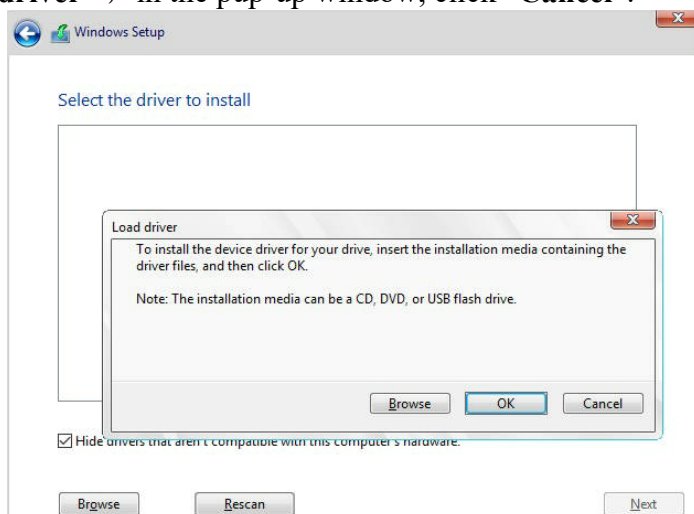


2. After Windows setup begins, follow the on-screen prompts. When Windows asks **“Where do you want to install Windows?”**, you should see several Legacy disks available (one for each SSD you have installed into the NVMe RAID AIC).

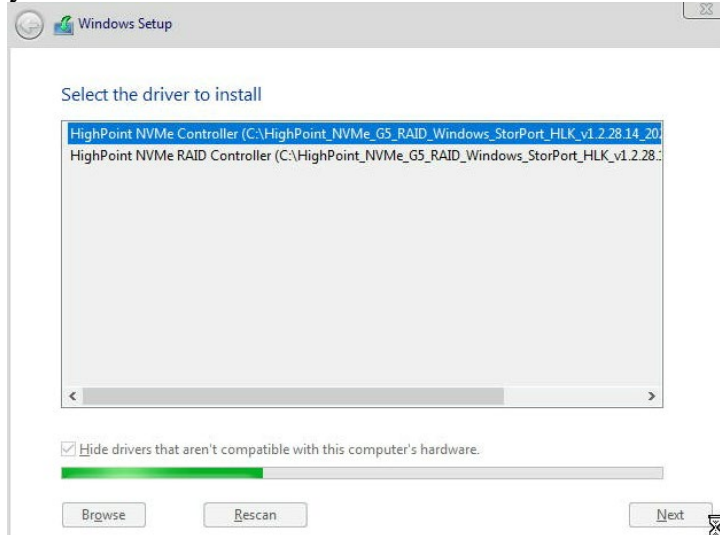
Note: The screenshot below shows 4 SSD's that have been installed into a SSD7505:



3. Install Windows, to **“Where do you want to install Windows?”**; Click **“Load driver”**, in the pop-up window, click **“Cancel”**.

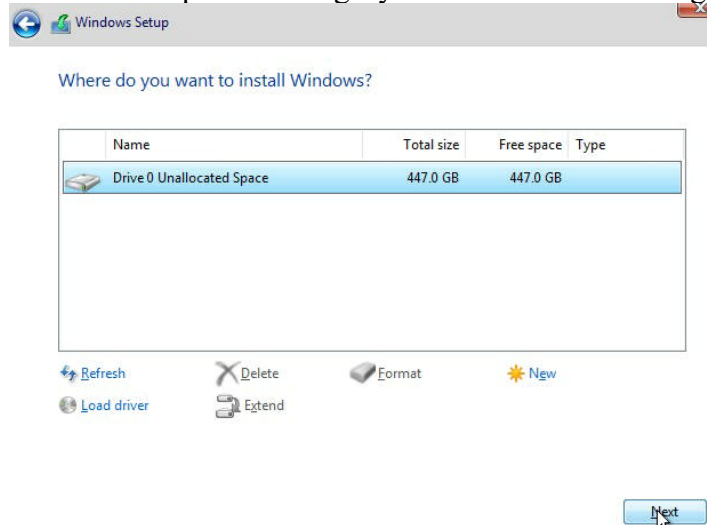


- Next, insert a USB flash drive that contains the NVMe RAID AIC driver into the system board USB slot and click **“Browse”**. Select the driver file as shown:



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

- 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:



- After partitioning, continue and complete the Windows installation procedure.

Disabling Hibernation

1. After Windows is installed, boot into the operating system and disable Hibernation. Hibernation fails when the system is installed on an NVMe RAID array; this bug will slow down or prevent startup and disable sleep mode.

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

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

Please use **administrator privileges** to turn off hibernation using the following command (Command Prompt utility):

#powercfg /h off

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.194]
(c) 2018 Microsoft Corporation. All rights reserved.
C:\Windows\system32>powercfg /h off
C:\Windows\system32>
```

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
```

Trouble shooting

No supporting host adapter is found

In the UEFI environment, run the command, " go.nsh (Please see UEFI README for specific input content.)".

```
FS0:\SSD7505-uefi\> go.nsh
FS0:\SSD7505-uefi\> load.efi 7505uefi.rom
Load Utility for Flash EPROM v1.1.0
(built at Jan 5 2021 13:30:42)

Set flash size to 65K
No supporting host adapter is found.
FS0:\SSD7505-uefi\> _
```

Solutions: If you get the message, "No supporting host adapter is found. "Try the following,

1. The error message is to remind the user that when the card cannot be found in UEFI. Make sure the NVMe RAID AIC is installed into a PCIe slot with x8 or x16 lane.
2. In order to avoid this slot is broken, so replace the slot and test again.

No supported controller detected

In the UEFI environment, run the command, "ArrayCreate.efi".

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

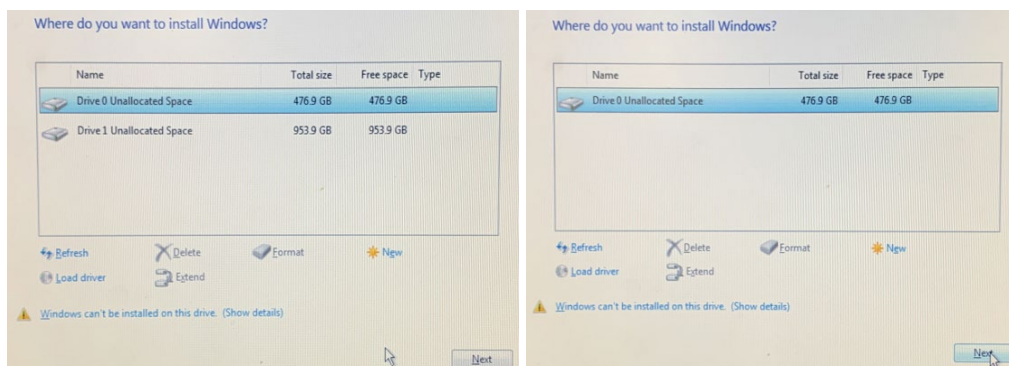
Solutions: If you get the message, "No supported controller detected." Try the following:

1. Check whether NVMe is connected to the NVMe RAID AIC.
2. Replace the system board slot, enter the UEFI environment and re-enter the command.

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

Yellow warning before and after installation of the driver.

Before and after installing the driver, a yellow exclamation point warning appears in the lower left corner of the installation interface.

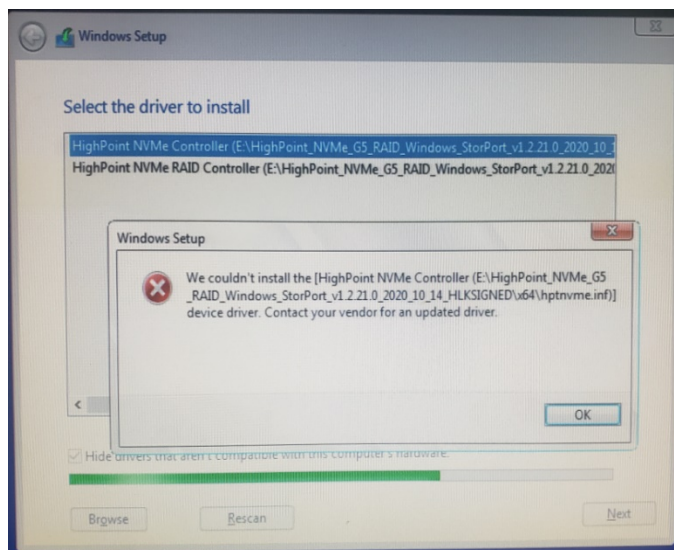


Solution:

Confirm whether UEFI DVD is selected to enter the system installation interface.

Load driver error

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



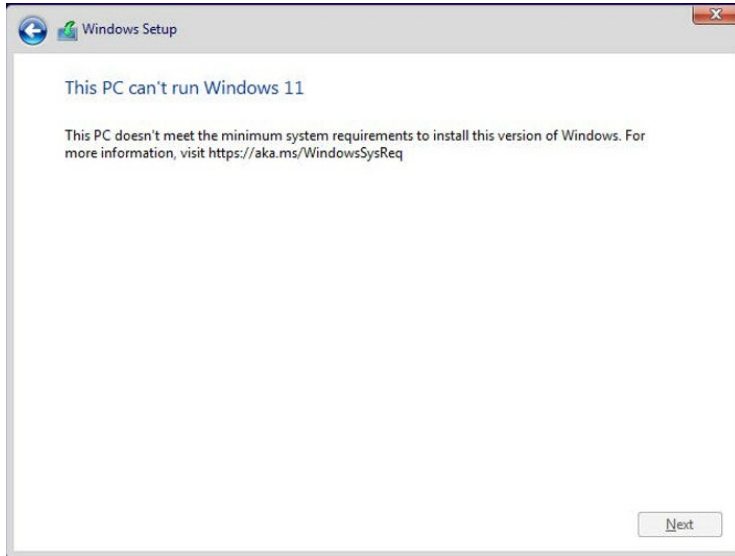
Solution: The appearance of the error message indicates that other NVMe Drives are connected to your applicable system board. Try the following:

1. Remove all NVMe Drive installed on the system board and reinstall OS.

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

This PC Can't run Windows11

If it prompts 'This PC Can't run Windows11' during the installation process, please check whether the computing platform you are using complies with "[Minimum system requirements for windows11](#)"



Appendix

Support command: help/info/quit/exit/create/delete.

- **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 RAID0 array with all disks and with maximum capacity.

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

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

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

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

- **Delete Command**

Syntax

```
delete {array ID}
```

Examples

```
<<< delete 1
```

Delete the first array from Logical device list.

```
<<< delete 2
```

Delete the second array from Logical device list.

- **Info Command**

- **Syntax**

- info

- Display physical device list and logical list

- **Exit Command**

- **Syntax**

- Q/q/quit/exit

- Quit the application

- **Help Command**

- **Syntax**

- H/h/help

- This is help message