



HighPoint NVMe Boot RAID Windows Installation Guide

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Prerequisites for a Bootable RAID Configuration

The NVMe products can support bootable RAID arrays. After configuring an array using the UEFI RAID tool, you can install a Windows operating system to the NVMe SSDs.

The following is a list of NVMe AICs supporting bootable RAID arrays.

Supported AIC	SSD7105
	SSD7202
	SSD7502
	SSD7505
	SSD7540
	SSD7580A
	SSD7580B
	SSD7580C
	SSD7749E
	SSD7749M
	SSD6780A
	RocketAIC 7105HW Series
	RocketAIC 7502HW Series
	RocketAIC 7505HW Series
	RocketAIC 7540HW Series
	RocketAIC 7749EW Series
	RocketAIC 7749MW Series

To configure a bootable NVMe RAID array, you will need the following:

1. **An NVMe SSD must be installed.** You must have at least one NVMe SSD installed into the NVMe products.
Note: The RocketAIC series NVMe drives already include pre-configured SSDs.
2. **A PCIe 3.0/4.0/5.0 slot with x8 or x16 lanes.** The NVMe products must be installed into a PCIe 3.0/4.0/5.0 slot with x8 or x16 lanes.
3. **Your motherboard must have a UEFI BIOS with option ROM settings** for third-party devices (such as NVMe products, optical drives, and USB flash drives). If this is not configured correctly, the system will fail to load the NVMe products. Please check the compatibility lists for recommended motherboards/platforms – these are available from the Documentation sections of the product category web pages.
4. **Secure Boot must be disabled.** The UEFI capability of the NVMe product has not been signed and certified. If Secure Boot is enabled, the motherboard will not recognize the NVMe product, and you will be unable to proceed with installation.

5. **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).
6. 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).
7. **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 use a USB flash drive as the Windows OS installation media, you must prepare another USB flash drive. Windows OS cannot be stored in a USB flash drive with a UEFI package and driver.
8. **Remove all other drives during the OS installation process.** Ensure only the NVMe product, 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.
9. Make sure any non-HighPoint drivers are uninstalled for any SSDs hosted by the NVMe product. 3rd party software and manufacturer-provided drivers may prevent the NVMe product from functioning properly.
10. **For Windows 10/11 users, make sure to Disable Fast Boot.**
11. **The following are the basic requirements for installing Windows 11 on your computer.** If your device does not meet these requirements, you may be unable to install Windows 11. 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.

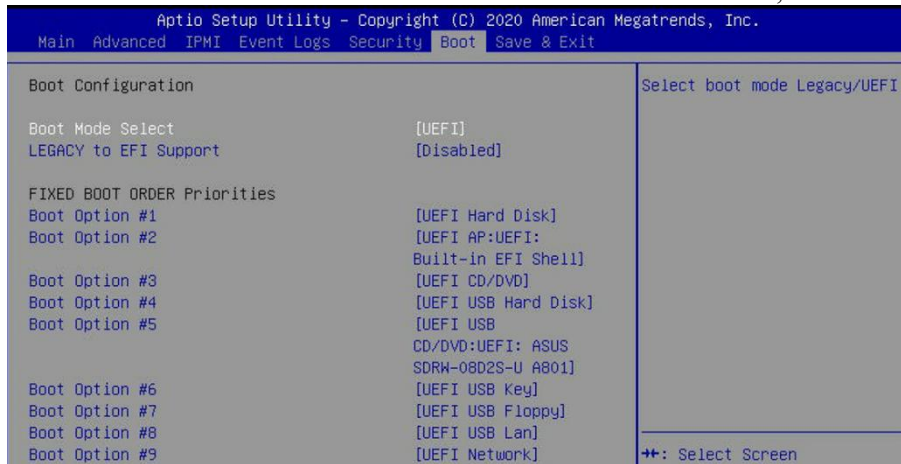
Processor:	1 gigahertz (GHz) or faster with 2 or more cores on a compatible 64-bit processor or System on a Chip (SoC).	Graphics card:	Compatible with DirectX 12 or later with WDDM 2.0 driver.
Memory:	4 GB RAM.	Display Resolution:	High definition (720p) display that is greater than 9" diagonally, 8 bits 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](#)

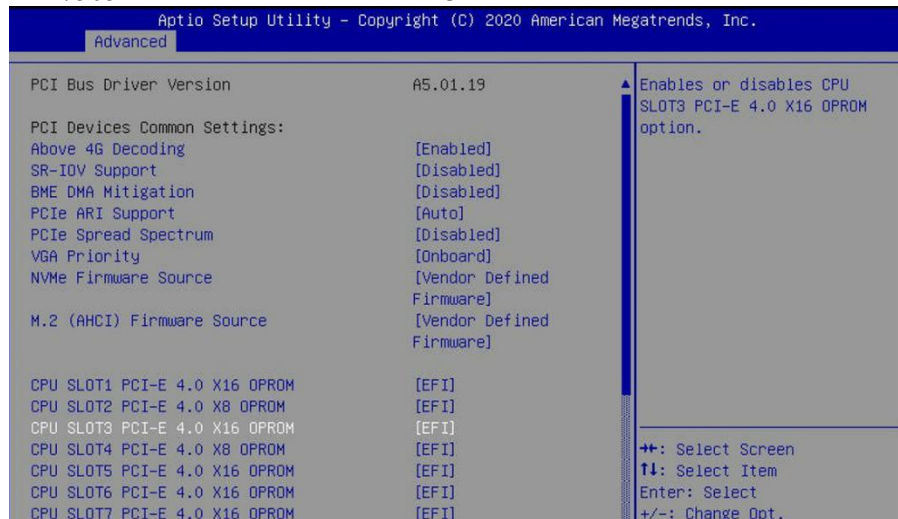
UEFI BIOS Settings

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. **Example 1:** Changing the UEFI setting (SuperMicro H12SSL-i motherboard).
 - a. Boot the system and access the motherboard BIOS menu.
 - b. Scroll to the **Boot** tab and set the **"Boot Mode Select"** to **"UEFI"**;



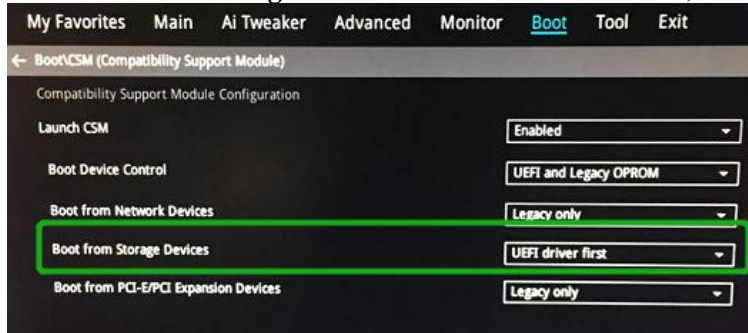
- c. Under **"Advanced->PCIe/PCI/PnP Configuration->**, change **"CPU Slot x PCI-E OPROM"** to **"EFI"**. "x" represents the PCIE slot assignment. For this example, the **SSD7505** is installed into **"CPU Slot 3"**.



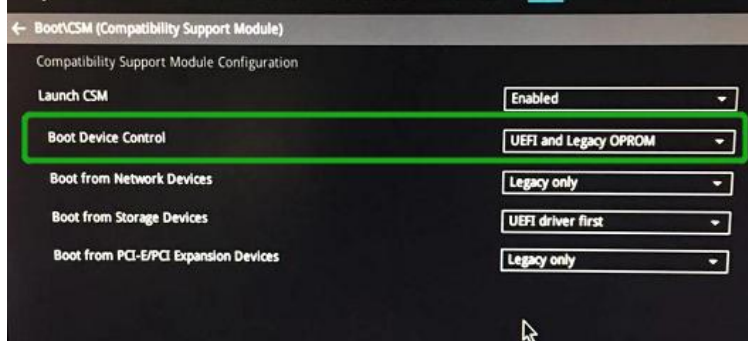
- d. Disable **"Secure Boot"**, and set **"Attempt Secure Boot"** to **"Disabled"**.



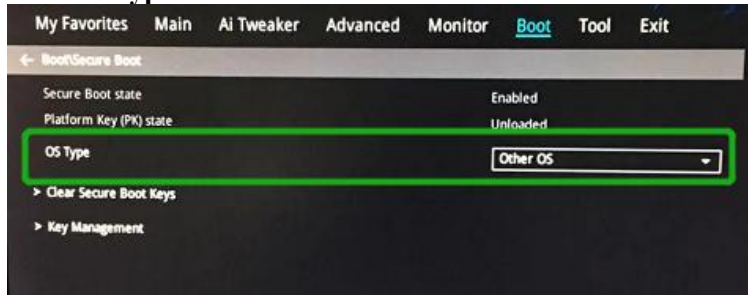
2. **Example 2:** Changing the UEFI setting (ASUS PRIME X299 –DELUXE):
 - a. Boot the system and access the motherboard's BIOS menu.
 - b. Set **"Boot from Storage Devices"** to **"UEFI driver first"**;



- c. Set **"Boot Device Control"** to **"UEFI Only"** or **"UEFI and Legacy OPROM"**;



- d. Set **"OS Type"** to **"Other OS"**.



How to install Windows to the NVMe product

Method 1 UEFI Command Line (RAID Tool)

Step 1 - Preparing the USB Flash Drive

When preparing the USB flash drive, 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 motherboard's UEFI 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

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

Note: the picture is only for reference.

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

Step 3 – Creating the RAID Array

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

- This procedure assumes you have already installed NVMe SSDs into the NVMe product. (please see Step 1- Prerequisites).
- Insert the bootable USB flash drive into the motherboard and boot the system.
- Enter the motherboard's BIOS settings, and select the UEFI: "flash drive" from the menu.

```

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

- 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_
    
```


- e. 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:
<<< _
```

- f. Next, create the array using the following command:

create RAID0

This will create an RAID0 array using all the SSDs and configure it 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:
<<< _
```

- g. You can now exit the utility. Enter the following command: **exit**

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

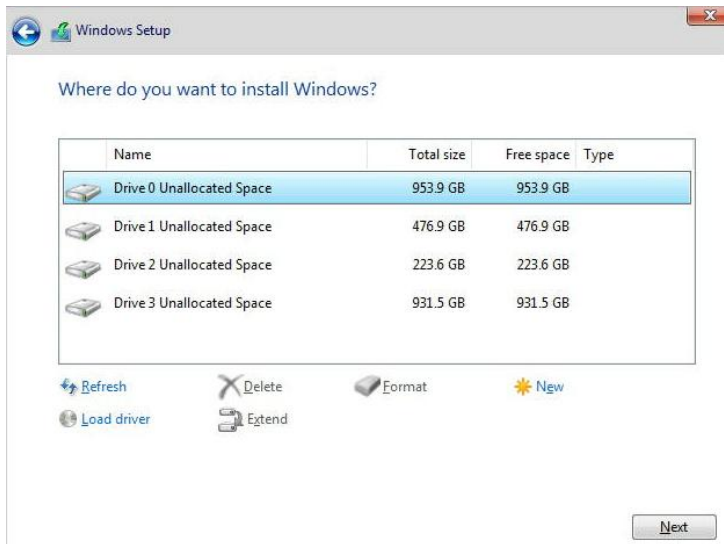
Step 4 - Install Windows

- a. Insert the Windows installation media (USB flash drive or DVD), then reboot the system.
- b. Enter the Boot list, and select the appropriate boot path to the Windows installation media (the example below shows how the system’s optical drive was selected for a Windows installation USB):

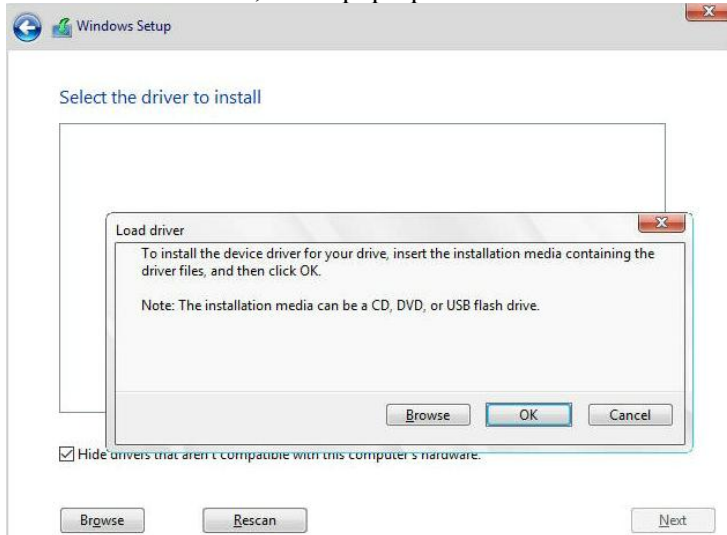
```
UEFI: USB, Partition 2
UEFI: Built-in EFI Shell
(B97/D0/F0) UEFI: PXE IPv4 Intel(R) I350 Gigabit Network
Connection(MAC:3cecef40a1dc)
(B97/D0/F1) UEFI: PXE IPv4 Intel(R) I350 Gigabit Network
```

- c. 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 product).

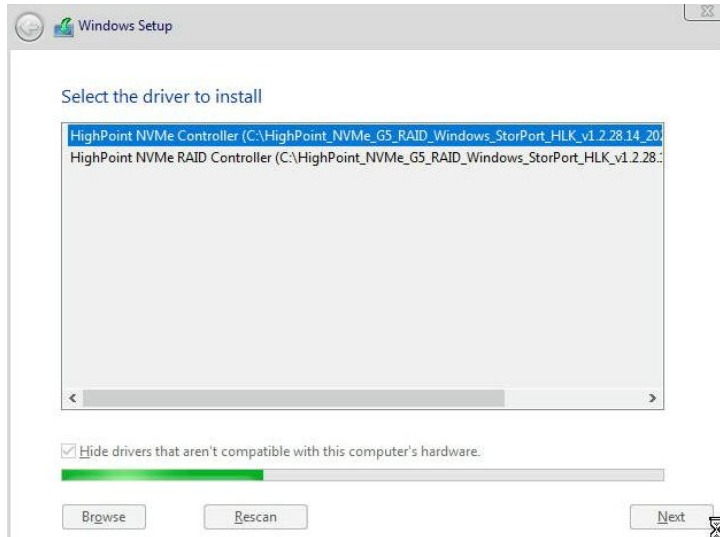
Note: The screenshot below shows 4 SSDs installed into an SSD7505 AIC.



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

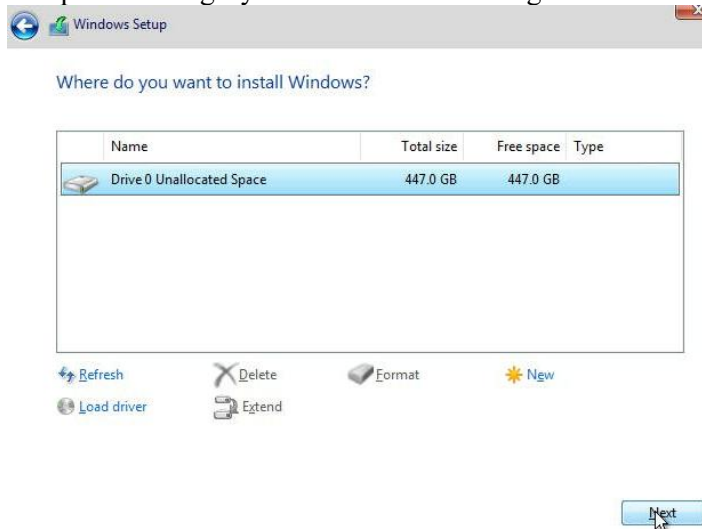


- e. Next, insert a USB flash drive that contains the NVMe product driver into the motherboard USB slot and click “**Browse**”. Select the driver file as shown:



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

- f. 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:



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

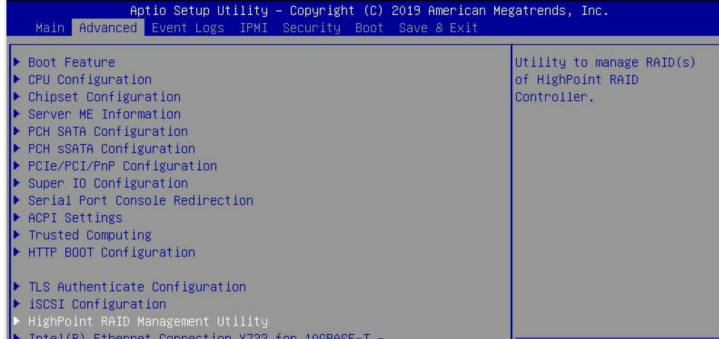
Method 2 UEFI HII (UEFI Utility)

Note: The following installation process uses the SSD7505 and SuperMicro H12SSL-i motherboard as an example.

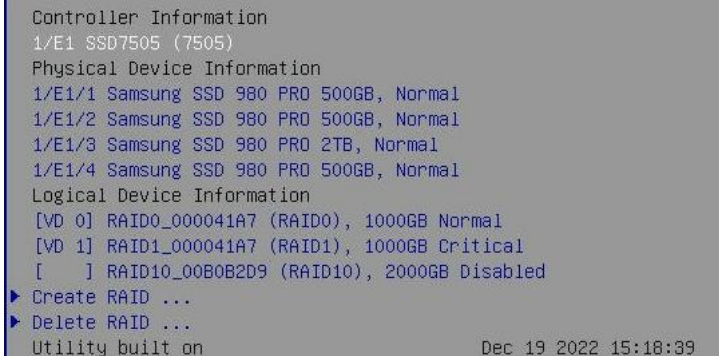
Step 1 – Create RAID

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

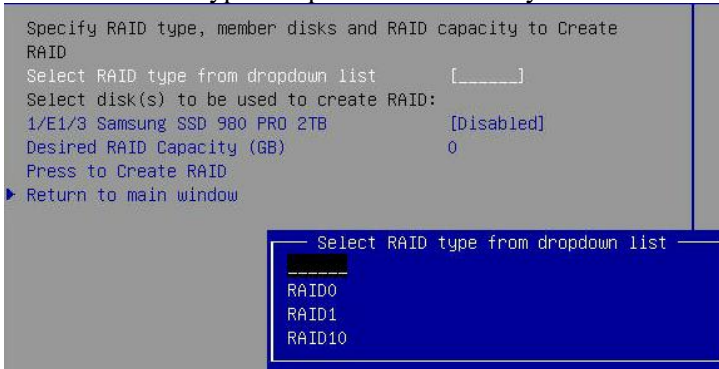
- a. Power on the motherboard→the motherboard BIOS→Advanced, "**HighPoint RAID Management Utility**" should appear under Advanced options.



- b. Enter "**HighPoint RAID Management Utility**", Select **Create RAID...**



- c. A device list will appear in the Create menu, displaying all available hard disk drives. 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 the **Enter** key.



- d. Insert the Windows install media (such as a Bootable USB drive) and reboot the system.

Step 2 - Install Windows

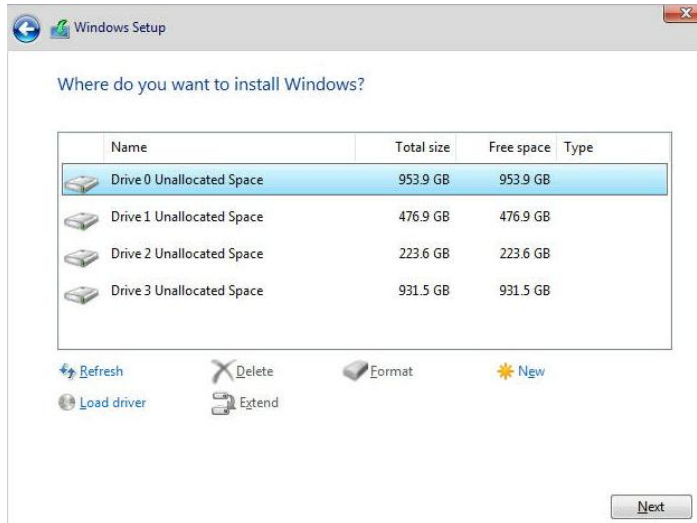
- a. Enter the Boot list, and select start from UEFI BOOT:

```

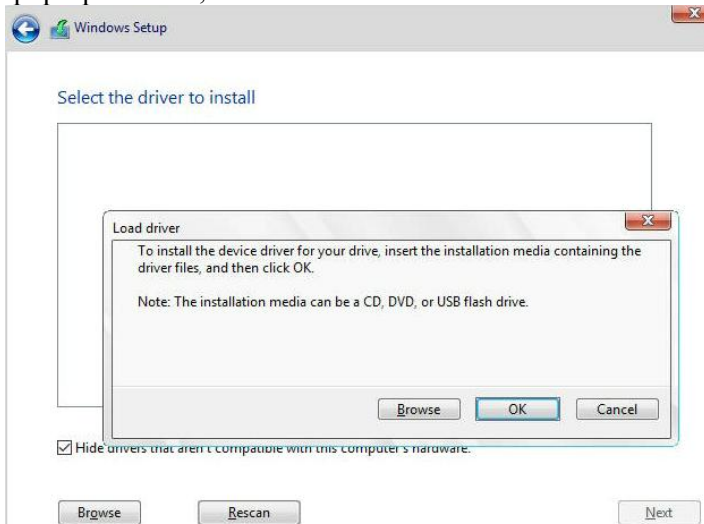
UEFI: USB, Partition 2
UEFI: Built-in EFI Shell
(B97/D0/F0) UEFI: PXE IPv4 Intel(R) I350 Gigabit Network
Connection(MAC:3cecef40a1dc)
(B97/D0/F1) UEFI: PXE IPv4 Intel(R) I350 Gigabit Network
    
```

- b. 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 product).

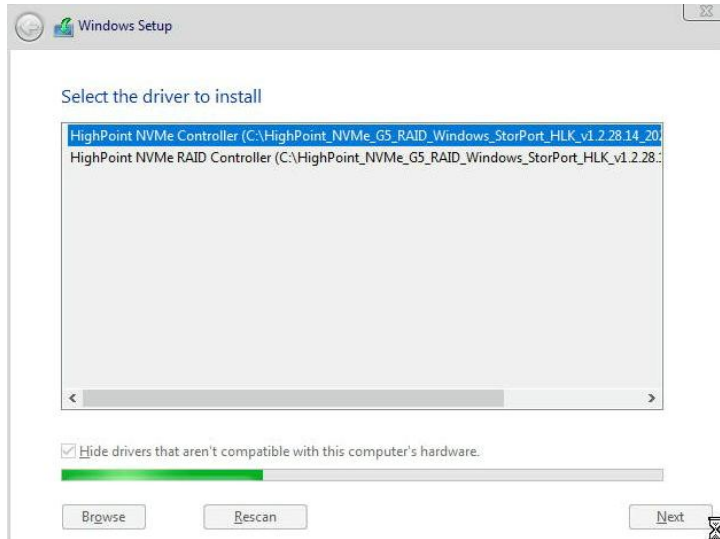
Note: The screenshot below shows 4 SSDs that have been installed into an SSD7505 AIC:



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

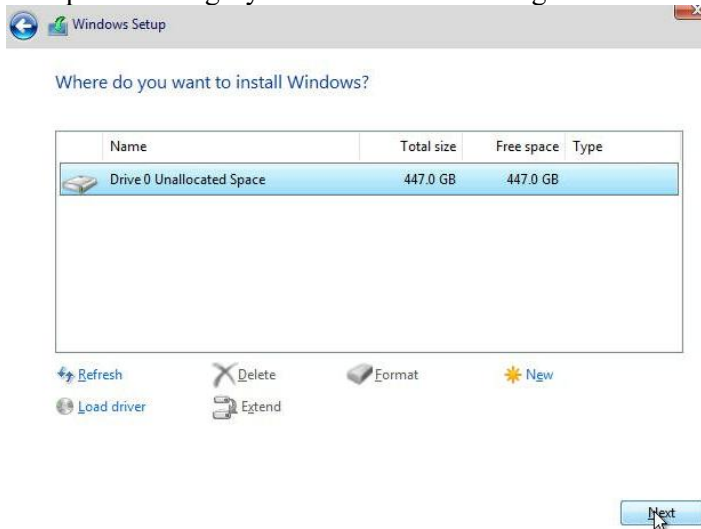


- d. Next, insert a USB flash drive that contains the NVMe product driver into the motherboard USB slot and click **“Browse”**. Select the driver file as shown:



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

- e. 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:



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

Disabling Hibernation

- a. After installing Windows, boot into the operating system and disable Hibernation. Hibernation fails when 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 motherboard 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.
  Hibernate
    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 Read me 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,

- a. The error message reminds the user that the card cannot be found in UEFI. Ensure the NVMe product is installed into a PCIe slot with x8 or x16 lanes.
- b. To avoid this slot being broken, 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\> _
```

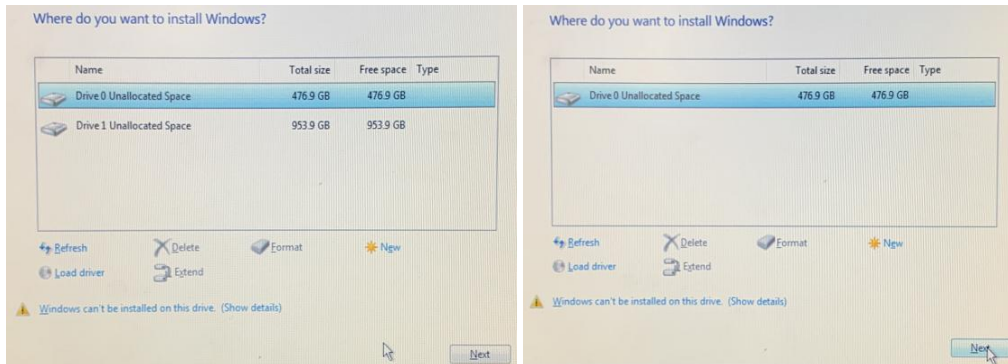
Solutions: If you get the message, "No supported controller detected." Try the following,

- a. Check whether the Storage option ROM is Enabled in the motherboard BIOS.
- b. Check whether NVMe is connected to the product.
- c. Replace the motherboard slot, enter the UEFI environment, 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 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.

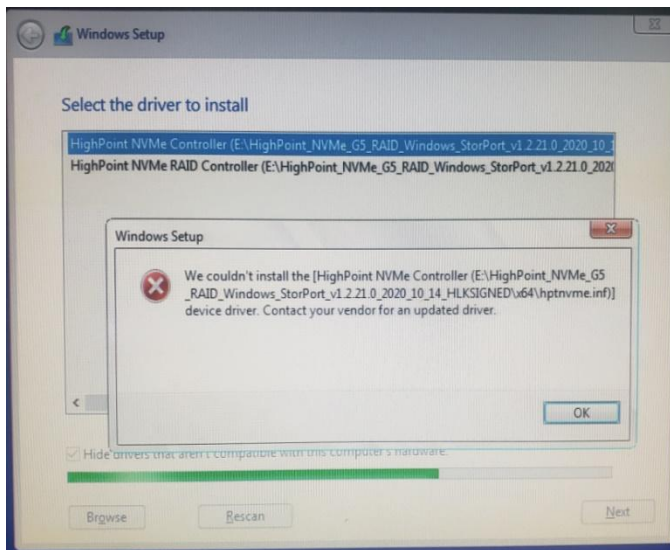


Solution:

- Please confirm "Boot from Storage Devices" is set to "UEFI driver first";
- Confirm whether UEFI DVD is selected to enter the system installation interface.

Load driver error

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



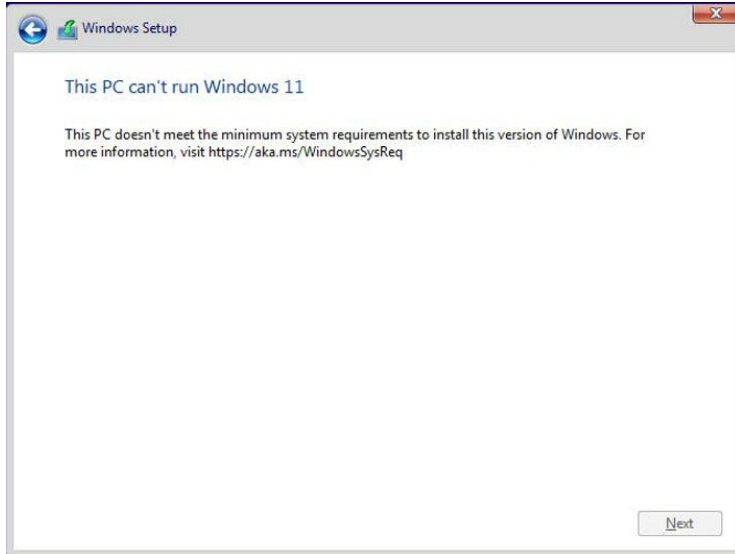
Solution: The appearance of the error message indicates that other NVMe Drives are connected to your applicable motherboard. Try the following:

- Remove all NVMe drives installed on the motherboard 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](#), and include a description of the problem in as much detail as possible.

This PC Can't run Windows 11

If it prompts 'This PC Can't run Windows 11' during the installation process, please check whether the computing platform you are using complies with "[Minimum system requirements for windows 11](https://aka.ms/WindowsSysReq)"



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 a RAID0 array with all disks and with maximum capacity.

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

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

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

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

- **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.

- **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