Revision Log				
Date	**Version**	**Owner**	**Approve**	**Remake**
5/14/2020	v1.00	QYT	/	Init version
5/15/2020	v1.01	ARM	/	Added in SSD7202 edits
5/28	V1.02	QYT		Update BootRAID screenshot information
5/28	V1.03	CB		Added page numbers (word format), update page 19 – refer customer to WebGUI installation

Contents

SSD7202 & SSD7103 Driver & Management Software Installation Guide

This guide includes important hardware/software requirements, installation & upgrade procedures, and troubleshooting tips for using SSD7202 or SSD7103 NVMe RAID controllers with a Windows operating system.

Prerequisites

This section describes the base hardware and software requirements for the SSD7202 and SSD7103 PCIe 3.0 NVMe RAID controllers.

UEFI BIOS settings

This section describes how to configure your motherboard UEFI settings for use with SSD7202 and SSD7103 NVMe RAID controllers.

Driver Installation

This section covers driver installation, driver upgrade and driver uninstallation procedures for SSD7202/SSD7103 NVMe RAID controllers.

Management Software Installation

This section explains how to download and install the SSD7202 /SSD7103 RAID Management Software Suite for Windows operating systems. The download includes both the Web RAID Management Interface (WebGUI), and the CLI (Command Line Interface).

Troubleshooting

Please consult this section if you encounter any difficulties installing or using the SSD7202 and SSD7103 NVMe RAID controller. It includes descriptions and solutions for commonly reported technical issues.

Appendix

A selection of useful information and web links for the SSD7202 and SSD7103 NVMe RAID controllers.

Prerequisites for a Bootable RAID Configuration

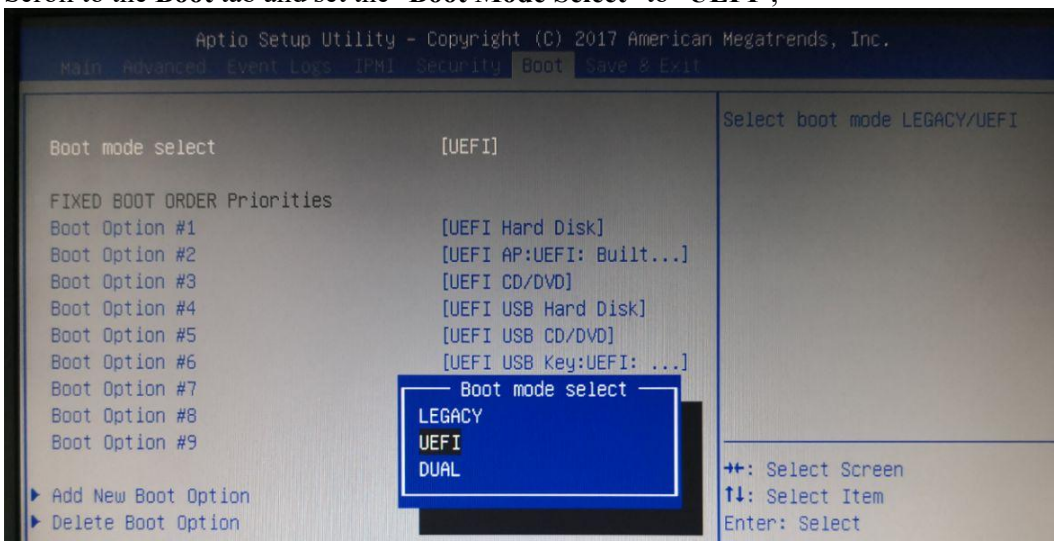
The SSD7202 and SSD7103 controllers can support bootable RAID arrays. After configuring an array using the UEFI RAID tool, you can install a Windows or Linux operating system to the NVMe SSD's. In order to configure a bootable NVMe RAID array, you will need the following:

1. **An NVMe SSD must be installed**. You must have at least one NVMe SSD installed into the SSD7202 or SSD7103 RAID controller.
2. **A PCIe 3.0 slot with x8 or x16 lanes.** The SSD7202 or SSD7103 must be installed into a PCIe 3.0 slot with x8 or x16 lanes.
3. **Your motherboard must have a UEFI BIOS with option ROM settings** for third party devices (such as the SSD7202/SSD7103, optical drives and USB flash drives). If this is not configured correctly, the system will fail to load the SSD7000 RAID controller. Please check the SSD7202 and SSD7103 compatibility lists for recommended motherboards.
4. **Secure Boot must be disabled.** The SSD7202/SSD7103 UEFI capability has not been signed and certified. If Secure Boot is enabled, the motherboard will not recognize the SSD7000 controller, and you will be unable to proceed with installation.
5. **Install an optical drive into the system** (such as a DVD-ROM, DVD-RW or Blu-Ray drive).
6. **Prepare the OS Installation disc (**Windows 10 & later / Windows server 2016 & later, or a Linux Distribution that corresponds with the binary diver you intend to install). Download and burn an official copy of the latest ISO image of your preferred operating system to a DVD. This should be inserted into the optical drive when booting the system.
7. **You will need a USB flash drive** – the UEFI package and driver should be extracted to the root directory of this flash drive.
8. **Remove all other drives during the OS installation process.** Make sure only the SSD7000 controller, 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 SSD's hosted by the SSD7000 series RAID controllers**. 3rd party software and manufacturer provided drivers may prevent the SSD7000 from functioning properly
10. **For Windows 10 users, make sure to Disable Fast Boot .**

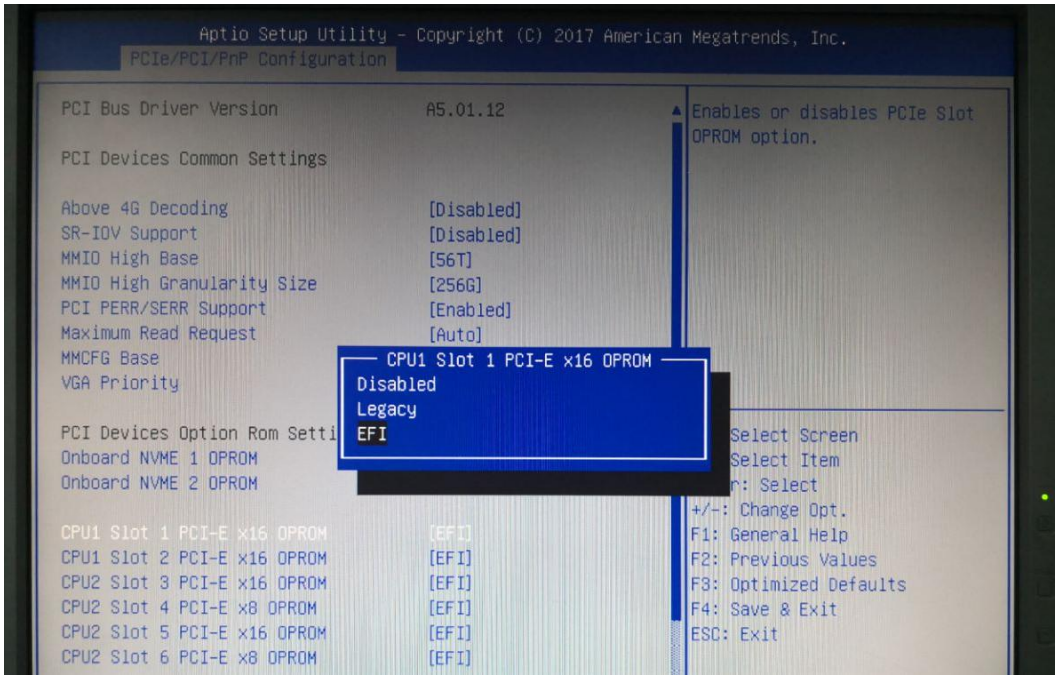
UEFI BIOS Settings

Different motherboards will provide different UEFI-related BIOS settings. Please consult your motherboard's user manual for more information. This section provides examples for two different types of motherboard BIOS menus.

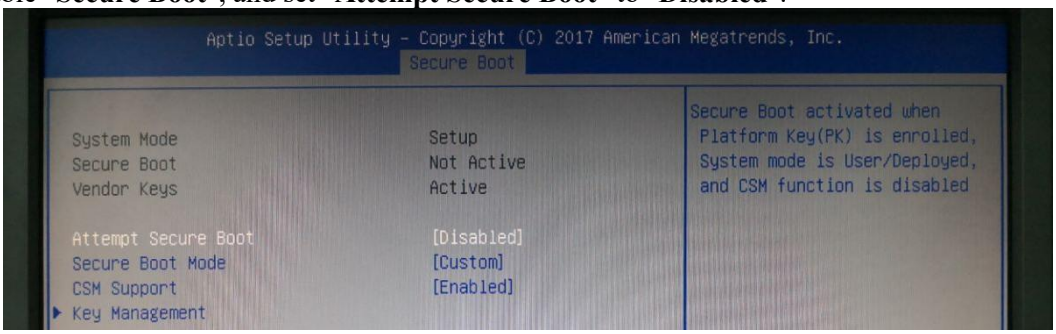
1. **Example 1:** Changing the UEFI setting (SuperMicro X11DAi-N motherboard).
    1. Boot the system and access the motherboard BIOS menu.
    2. Scroll to the **Boot** tab and set the "**Boot Mode Select**" to "**UEFI**";



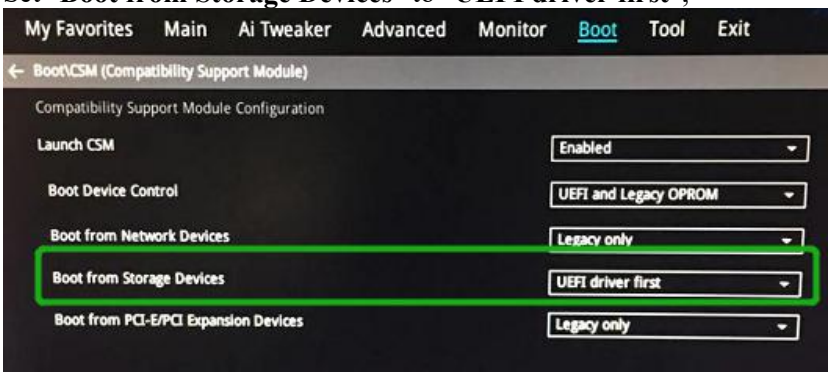
    3. Under "**Advanced->PCIe/PCI/PnP Configuration->**, change **"CPUx Slot x PCI-E OPROM**" to "**EFI**". "**x**" represents the PCIE slot assignment. For this example, the SSD7103 is installed into "CPU1 Slot 1".



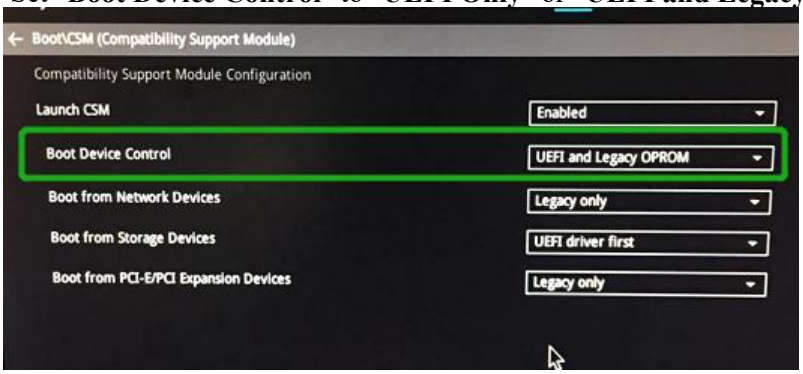
4. Disable "**Secure Boot**", and set "**Attempt Secure Boot**" to "**Disabled**".



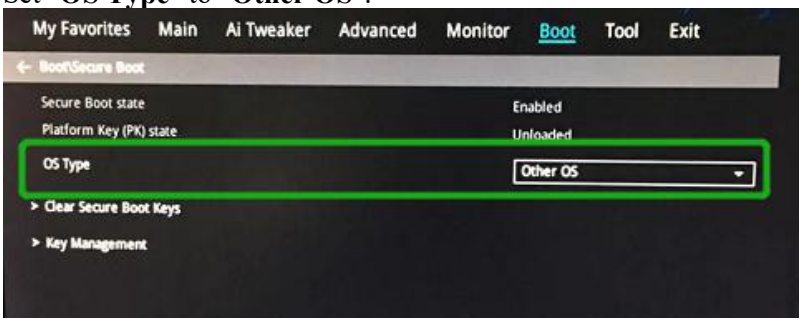
2. **Example 2:** Changing the UEFI setting (ASUS PRIME X299 –DELUXE):
   a. Boot the system and access the motherboard's BIOS menu.
   b. Set "**Boot from Storage Devices**" to "**UEFI driver first**";



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



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



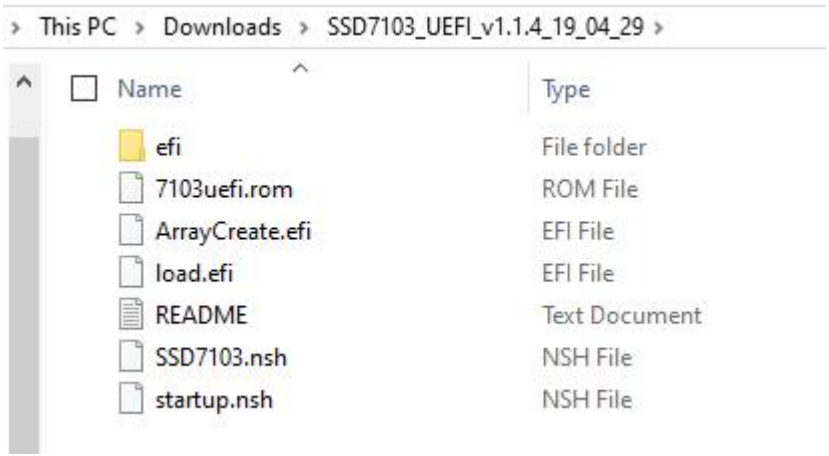
How to install Windows to the SSD7202/SSD7103 RAID Controller

Step 1 - Preparing the USB Flash Drive:

When preparing the USB flash dive, make sure to format the USB partition as NTFS or 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:



Note: *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.*

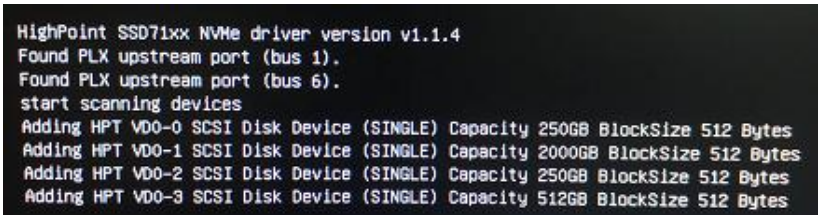
Step 3 - Creating the RAID Array

a. This procedure assumes you have already installed NVMe SSD's into the SSD7103 controller (please see Step 1- Prerequisites).

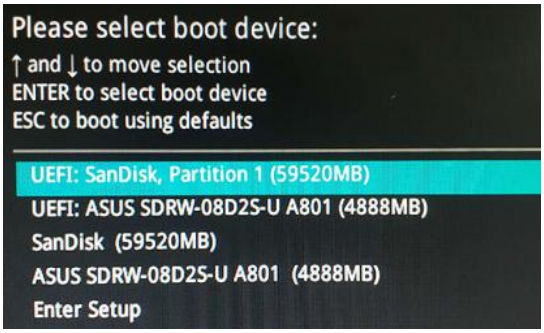
Note: Make sure your USB flash drive has been formatted using the NTFS or FAT32 file systems.

b. Insert the bootable USB flash drive into the motherboard and boot the system.

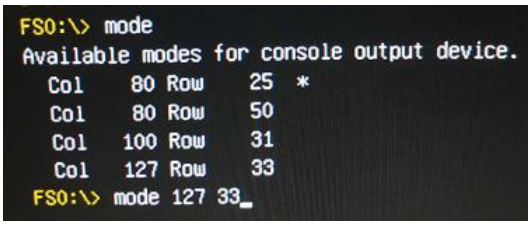
c. The motherboard's BIOS post screen should display information about the NVMe SSD's:



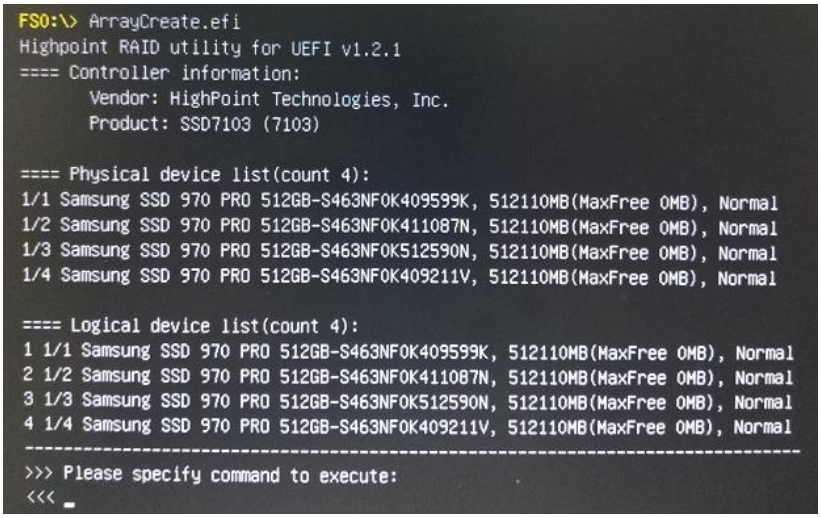
d. Enter the motherboard's BIOS settings, and select the **UEFI: "flash drive"** from the menu:



e. At the prompt, enter the following command to change the resolution:
mode 160 53

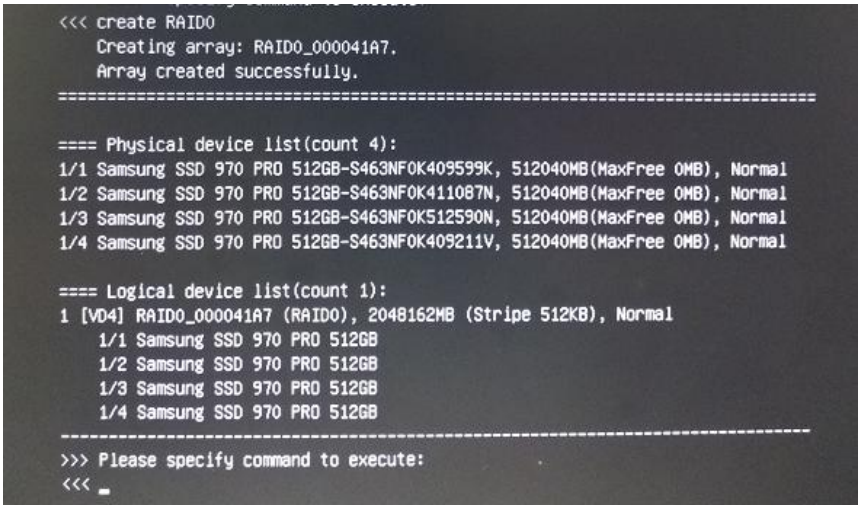


f. Next, enter the following command to enter the RAID creation utility:
ArrayCreate.efi



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

This will create a RAID0 array using all of the SSD's, and configured for maximum capacity:



h. You can now exit the utility. Enter the following command:
Exit

Note: For more additional commands, please refer to Appendix A of this user guide.

Step 4 - Install Windows

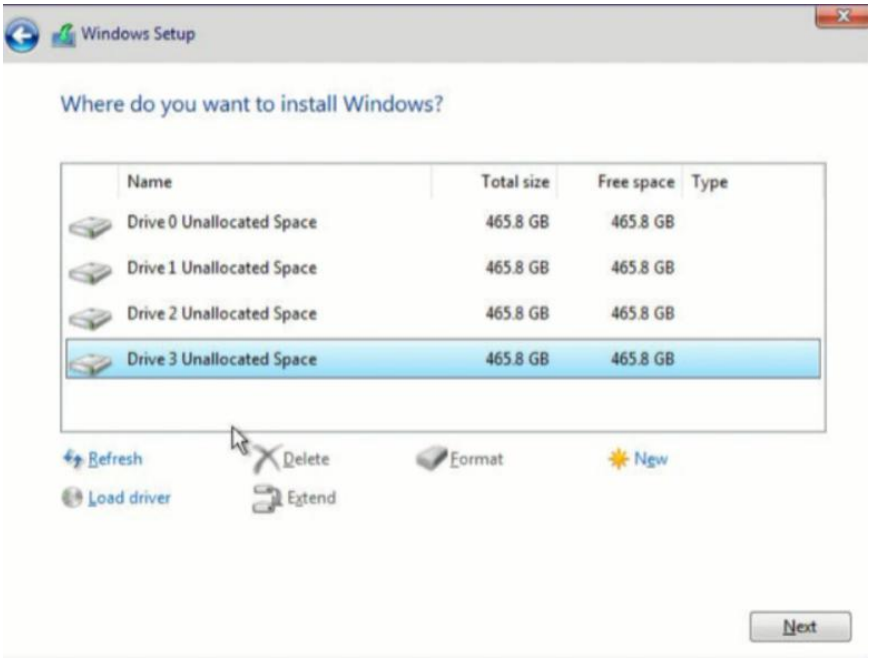
a. Insert the Windows install DVD in your optical drive (DVD/Blu-ray, etc.) and then reboot your system.

b. The following RAID information should be displayed by the motherboard BIOS post screen:

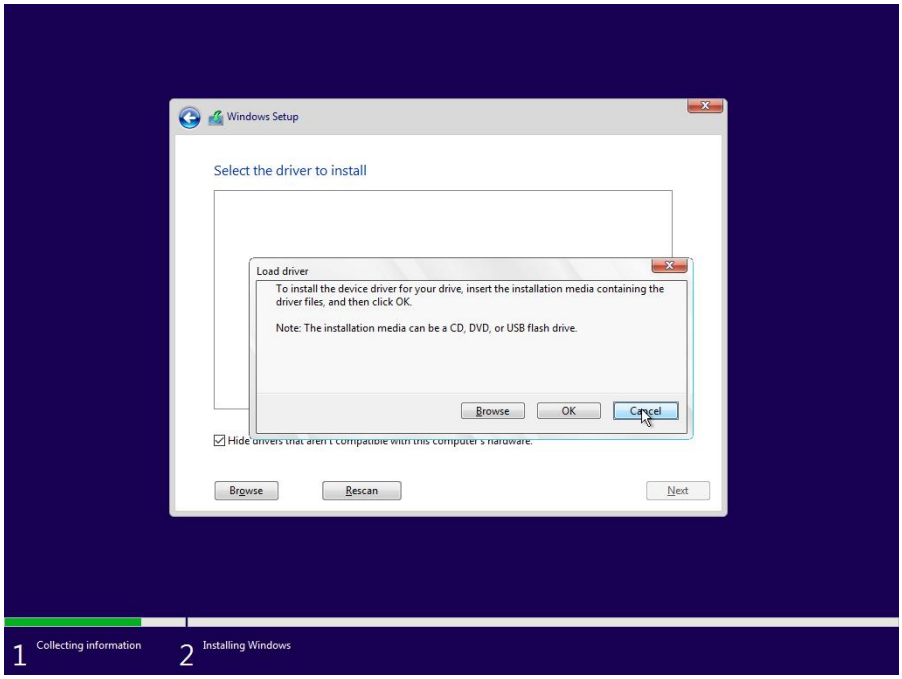
c. Enter the Boot list, and select start from **UEFI DVD:**

d. Install Windows, to "**Where do you want to install Windows?**", you should see several Legacy disks available (one for each SSD you have installed into the SSD7202/SSD7103 controller).

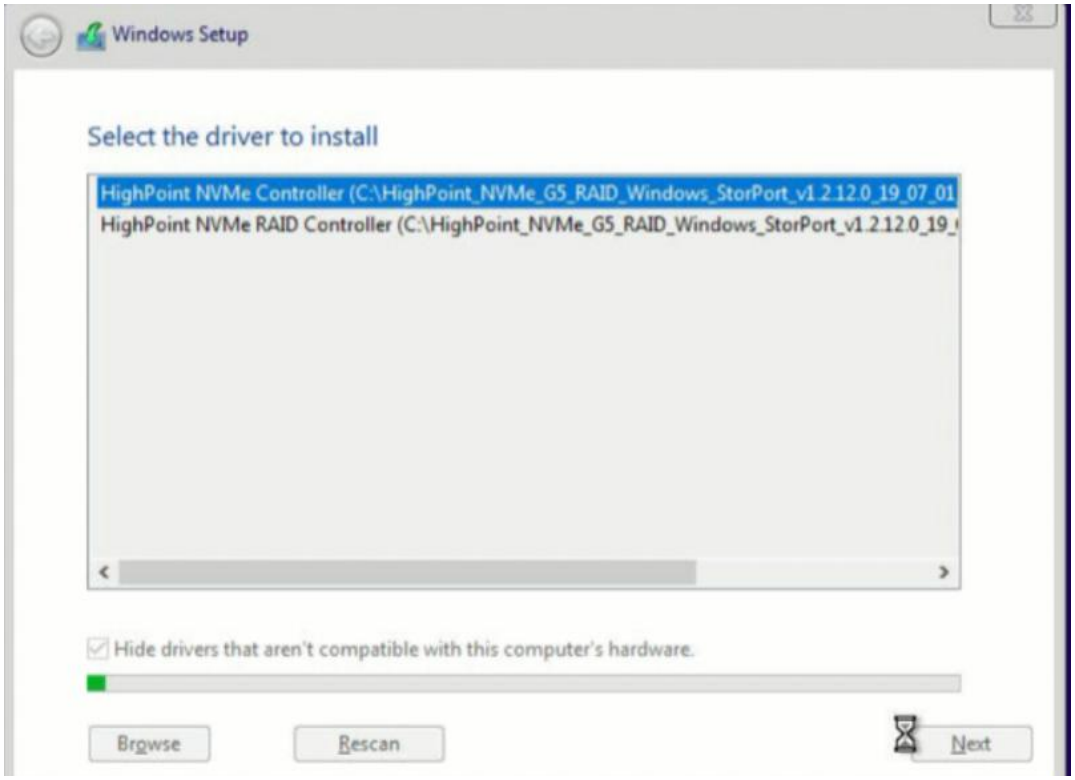
Note: The screenshot below shows 4 SSD's that have been installed into a SSD7103 controller:



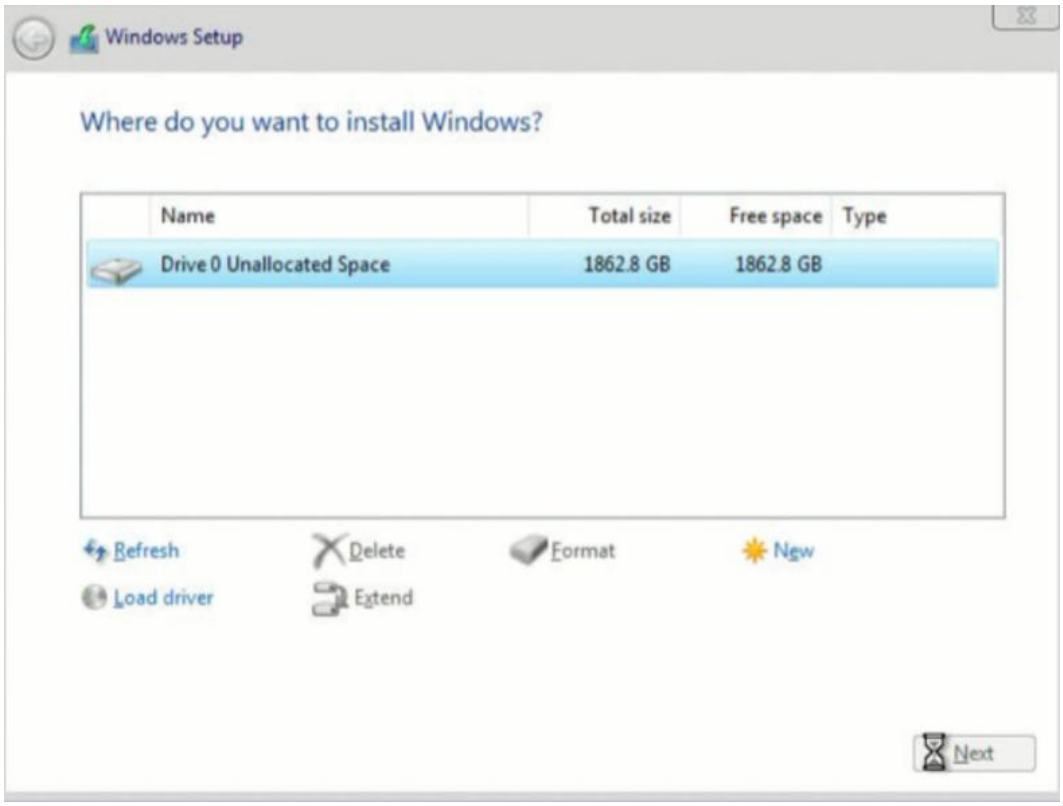
e. Click "**Load driver**"，in the pop-up window and click "**Cancel**":



f. Next, insert the USB flash that contains the SSD7202/SSD7103 driver into the motherboard USB slot and click "**Browse**". Select the driver file as shown:



g. 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:



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

Disabling Hibernation

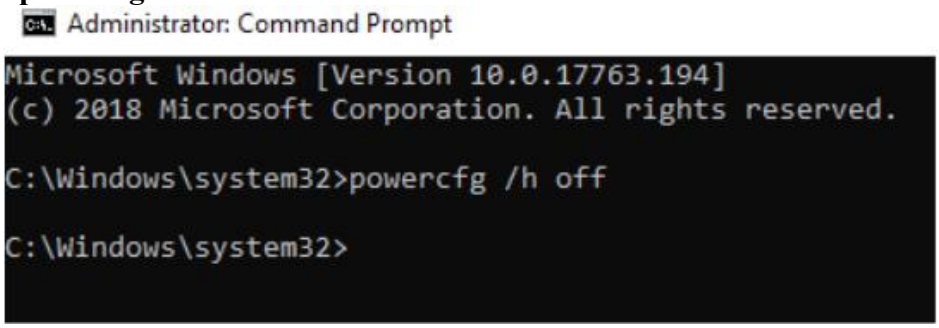
a. After Windows is installed, boot into the operating system and disable Hibernation. Hibernation fails when the system is installed on an NVMe RAID array; this bug will slow down or prevent startup and disable sleep mode.

   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 motherboard to power off the system.

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

   #**powercfg /h off**



Driver Installation

Installing the Device Driver

The following section discusses driver installation for a non-bootable NVMe configuration. Note, you will not need to install the driver for a bootable NVMe RAID array – bootable configurations require that the driver be installed during the OS installation procedure.

1. Verify that Windows recognizes the controller

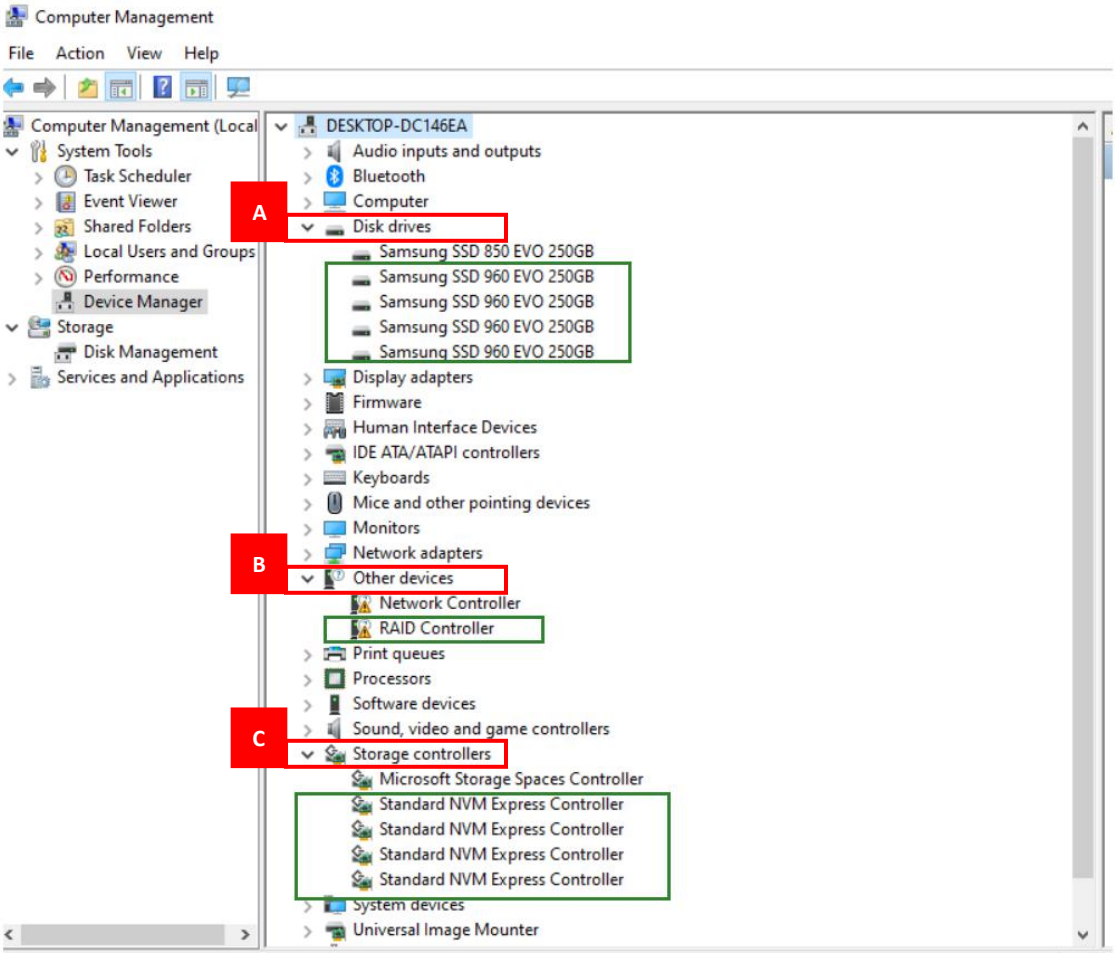
After installing the SSD7000 controller into the motherboard, power on the computer, boot the Windows operating system, and open **Device Manager**.

A. Expand the **Disk drives** tab. Each NVMe SSD's installed into the SSD7202/SSD7103 controller should be displayed here.

B. Expand the **Other Devices** tab. You should see a single **"RAID Controller"** entry. The  icon indicates that the driver has not been installed.

C. Expand the **Storage Controllers** tab. You should see a "**Standard NVM Express Controller**" entry for each NVMe SSD that is installed into the SSD7202/SSD7103 controller.

Example screenshot (SSD7103):



2. Download the Device Driver

Download the appropriate SSSD7000 driver from the controller's Software Downloads webpage.

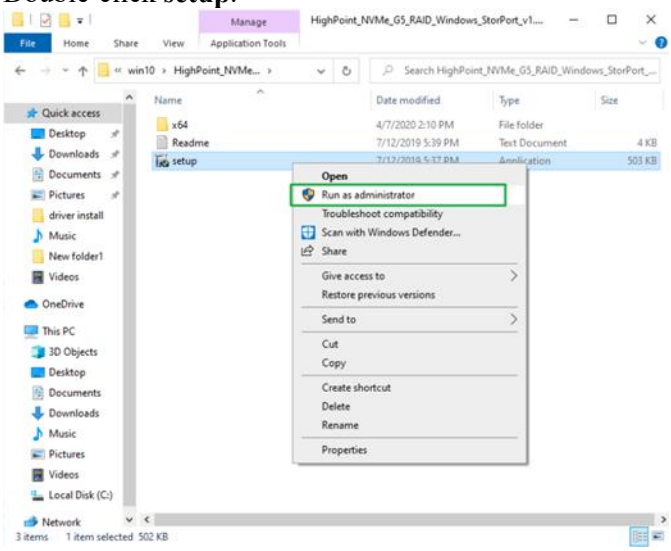
SSD7202: https://highpoint-tech.com/USA_new/series-ssd7202-download.htm

SSD7103: https://highpoint-tech.com/USA_new/series-ssd7103-download.htm

3. Install the Device Driver

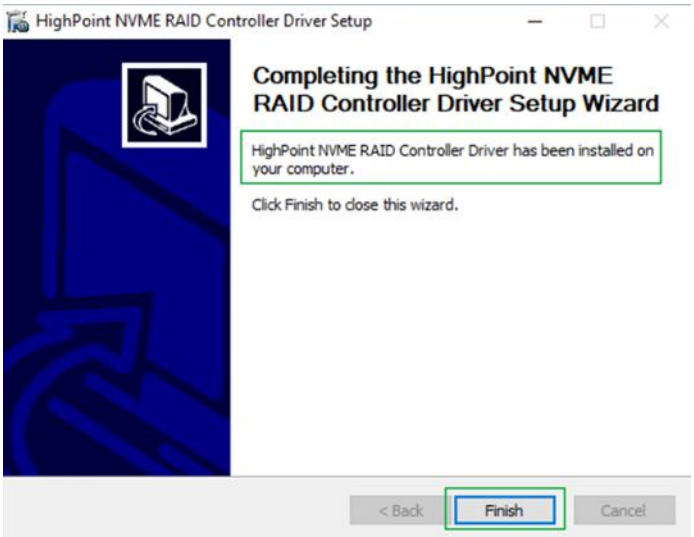
A. Locate the driver download and open the file.

B. Double-click **setup**.



Note: if installation does not start, you may have to manually start setup using Administrator Privileges. Right-click **setup**, select **Run as Administrator** from the menu, and confirm the pop-up window to proceed.

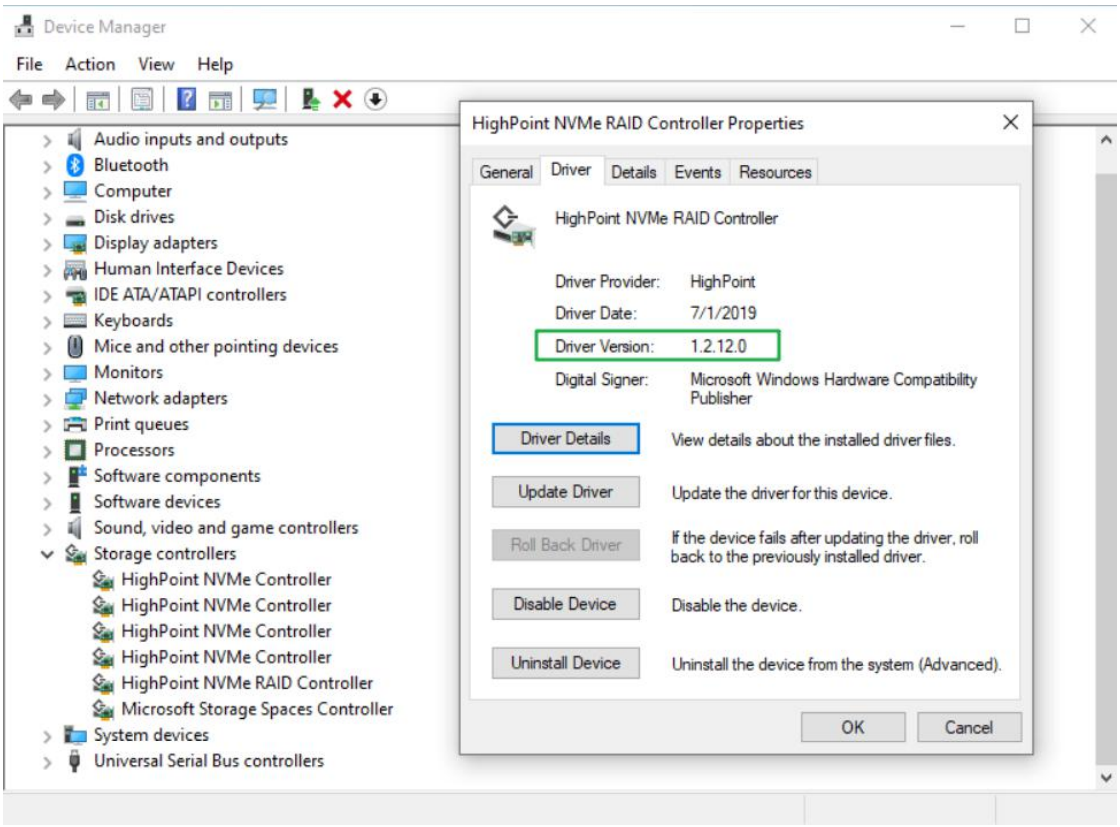
C. After driver installation is complete, click **Finish** to proceed.



D. Reboot Windows.

E. Once Windows has rebooted, open **Device Manager** to check the status of the driver. Expand **Storage controllers** and click on the **HighPoint NVMe RAID Controller entry.** View the properties and click the **Driver** tab:

Example screenshot (SSD7103)



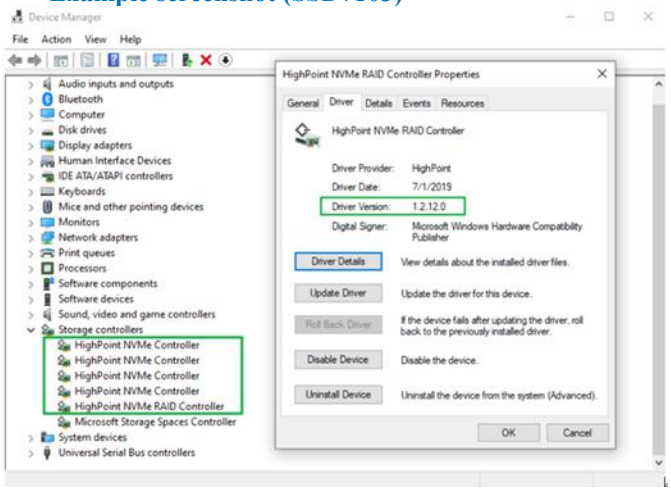
Note: Please refer to Appendix A to verify that your Device Manager entries correspond with the driver version you have installed.

Updating the Device Driver

Note: before attempting to update the driver entry, ensure that the SSD7202/SSD7103 is installed into the motherboard.

1. Open Device Manager to check the current driver version. Expand **Storage controllers** and click on the **HighPoint NVMe RAID Controller entry.** View the properties and click the **Driver** tab:

Example screenshot (SSD7103)



2. Download the Device Driver

Download the latest driver from the controller's Software Downloads webpage.

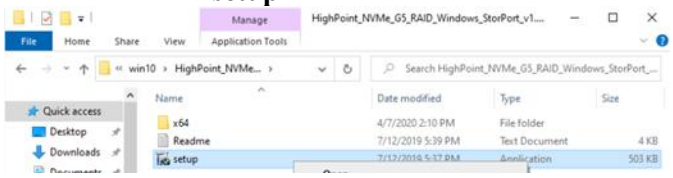
SSD7202: https://highpoint-tech.com/USA_new/series-ssd7202-download.htm

SSD7103: https://highpoint-tech.com/USA_new/series-ssd7103-download.htm

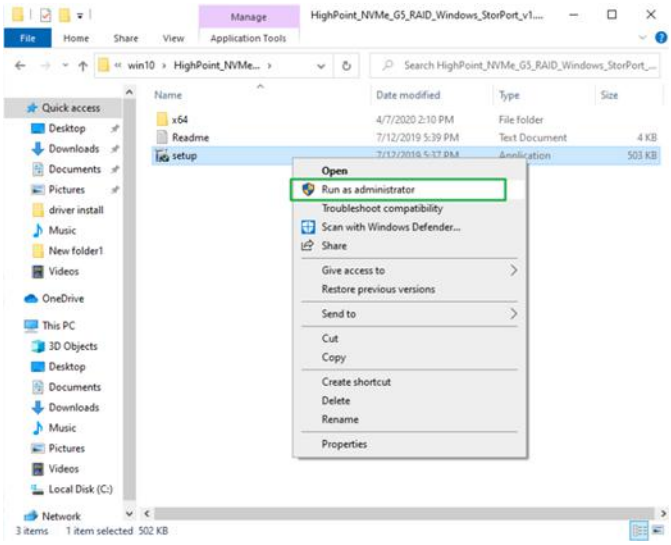
3. Update the Device Driver

A. Locate the driver download and open the file.

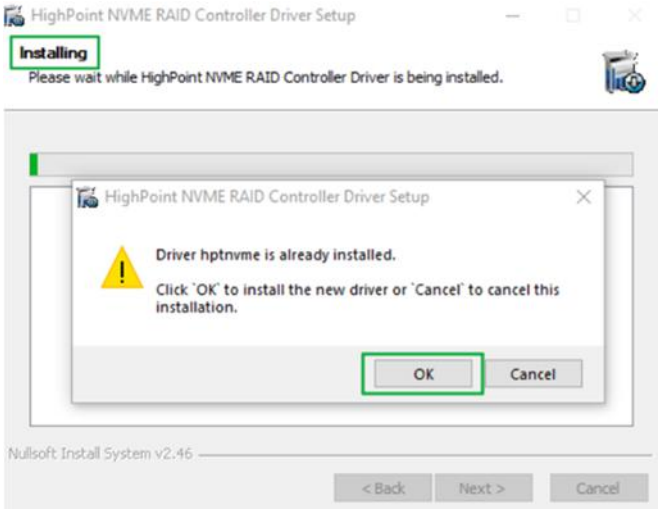
B. Double-click **setup**.



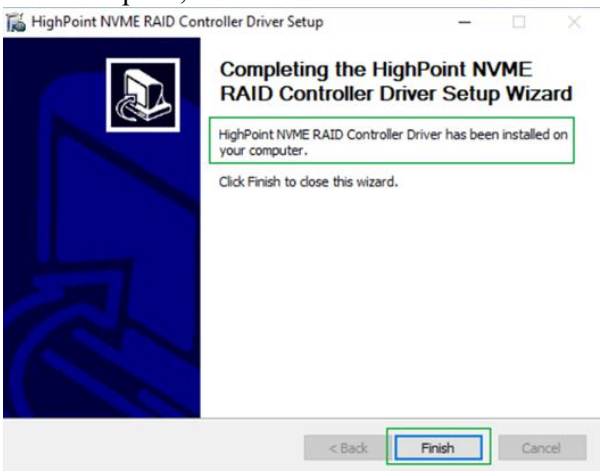
Note: if the update does not start, you may have to manually start setup using Administrator Privileges. Right-click **setup**, select **Run as Administrator** from the menu, and confirm the pop-up window to proceed.



C. Windows will notify you that the driver is already installed. Click **OK** to install the new driver:



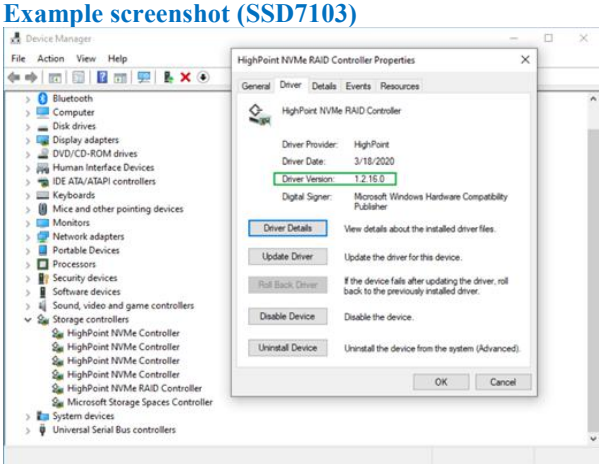
D. Once complete, click **Finish**.



E. Reboot Windows.

F. Once Windows has rebooted, open **Device Manager** to check the status of the driver. Expand **Storage controllers** and click on the **HighPoint NVMe RAID Controller entry.** View the properties and click the **Driver** tab:

Example screenshot (SSD7103)



G. First, make sure the WebGUI has been installed (see page 22). Open the WebGUI and make sure the SSD.'s / arrays are properly recognized.

Uninstalling the Device Driver

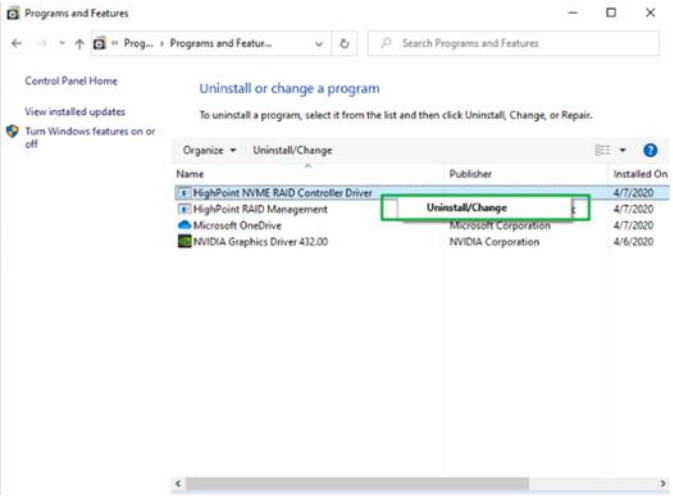
1. Power down the system and remove the SSD7202/SSD7103 RAID controller from the motherboard.

   Note: Failing to remove the SSD7000 controller from the motherboard during the uninstall process may result in data loss. Whenever the driver is uninstalled, Windows will attempt to install the default NVMe support, which may corrupt the RAID configurations and any data stored on SSD's hosted by the SSD7000 controller.

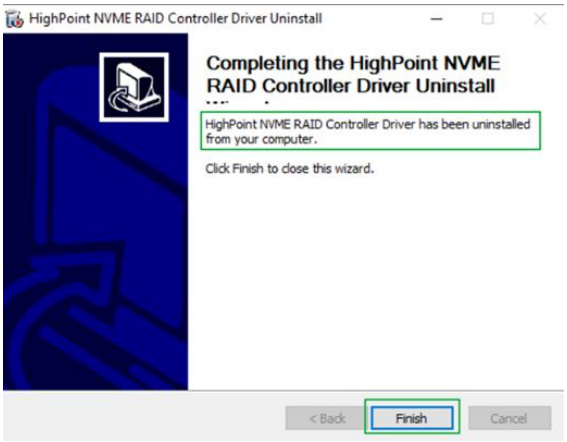
2. Power on the system and boot Windows.

3. Access **Control Panel** and select **Programs→ Programs and Features, and click on the HighPoint NVMe RAID Controller Driver** entry**.**

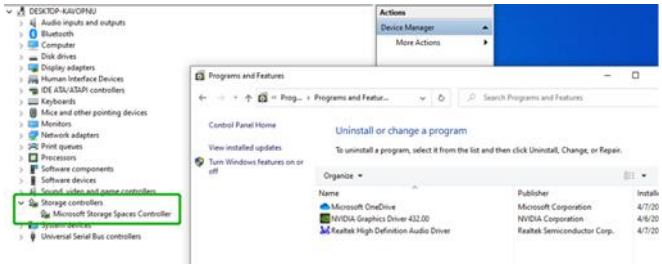
4. Click **Uninstall/Change**



5. After uninstalling the driver, click **Finish**.



6. Reboot Windows to complete the uninstall procedure.
7. After Windows has rebooted, access **Device Manager – Storage Controllers** and **Control Panel** to make sure the driver has been uninstalled. If there are no HighPoint entries present, the driver has been successfully uninstalled



Installing the HighPoint RAID Management Software (WebGUI & CLI)

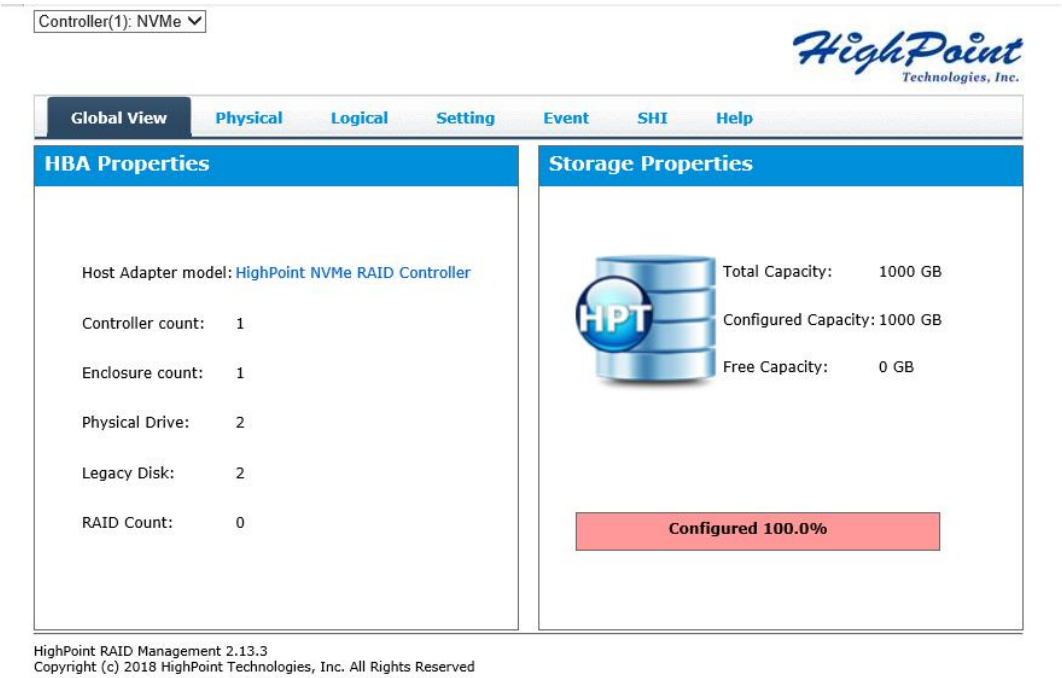
The HighPoint RAID Management Software (WebGUI and CLI utilities) are used to configure and monitor NVMe SSD's hosted by the SSD7202/SSD7103 RAID controller. Download the latest software package from the HighPoint website:

SSD7103:
http://highpoint-tech.com/USA_new/series-ssd7103-download.htm

SSD7202:
https://highpoint-tech.com/USA_new/series-ssd7202-download.htm

1. Extract the package and double-click the HighPoint RAID Management program to install the software.
2. Once installed, locate the Management icon on the desktop and double-click to start the WebGUI interface.

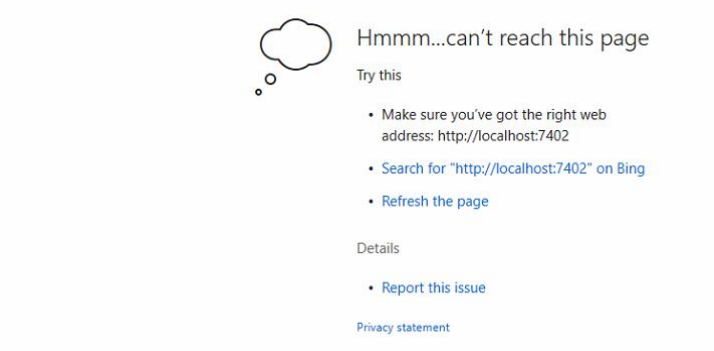
Example screenshot (SSD7202)



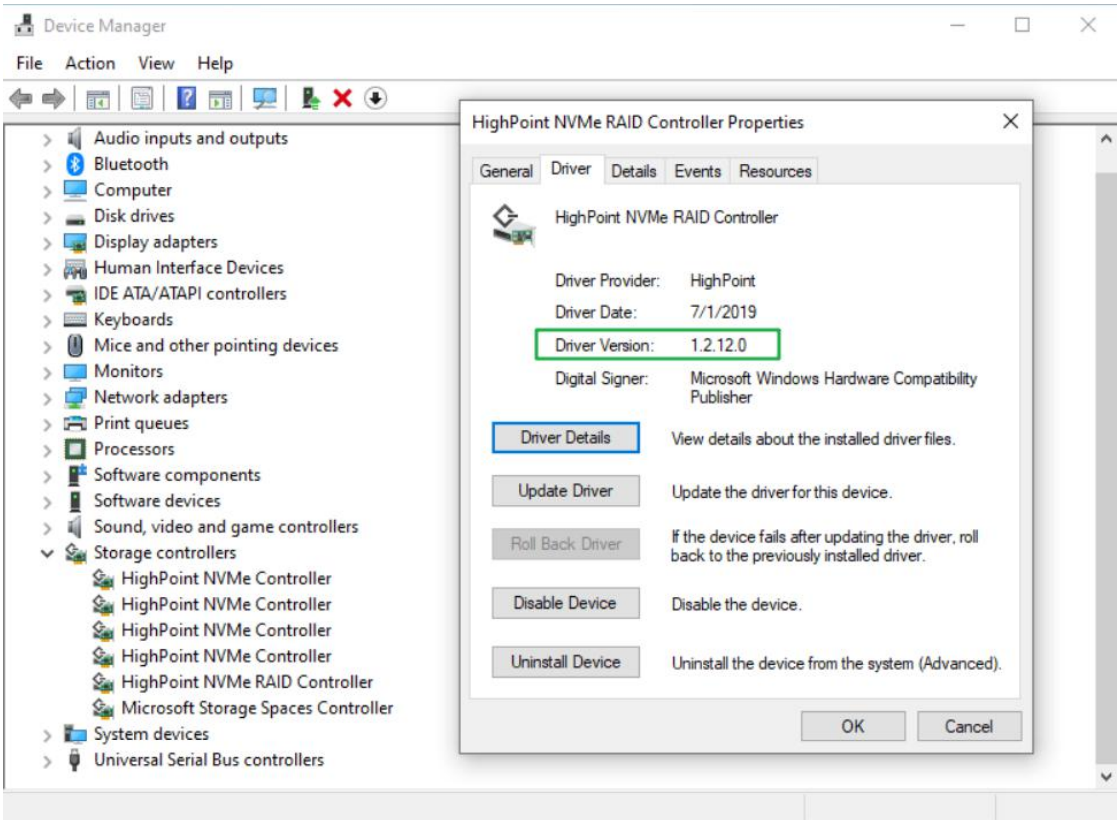
Troubleshooting

Note: When troubleshooting your SSD7202/SSD7103 NVMe RAID controller, make sure all of the Prerequisites have been met before proceeding.

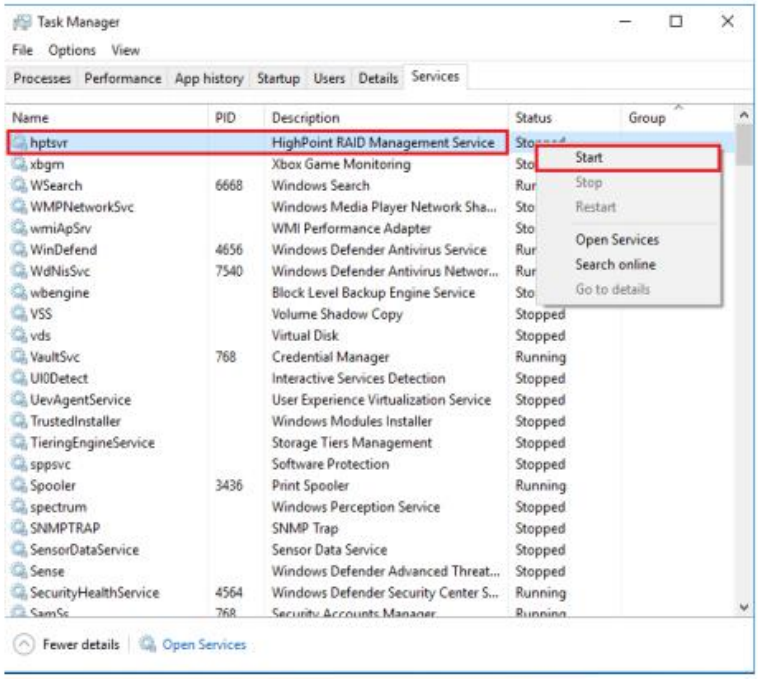
The WebGUI will not start after double-clicking the desktop icon.



1. This is often the result of a missing driver or improperly installed driver. Open **Device Manager** and check under **Storage Controllers**.
   If the Driver is properly installed, you should see a **HighPoint NVMe Controller** entry for each NVMe SSD's installed into the SSD7202/SSD7103 controller, followed by single **HighPoint NVMe RAID Controller** entry:



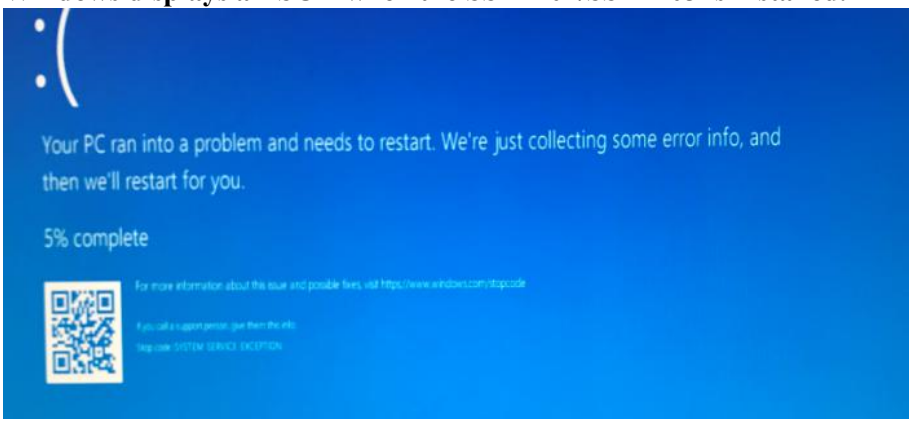
2. You should also check to make sure **hptsvr** is running under **Task Management → Services**. If the status of **hptsvr** process is **Stopped**, right-click on this entry and select Start from the menu:



BSOD (Blue Screen of Death)

There are three scenarios in which a BSOD may occur with SSD7202/SSD7103:

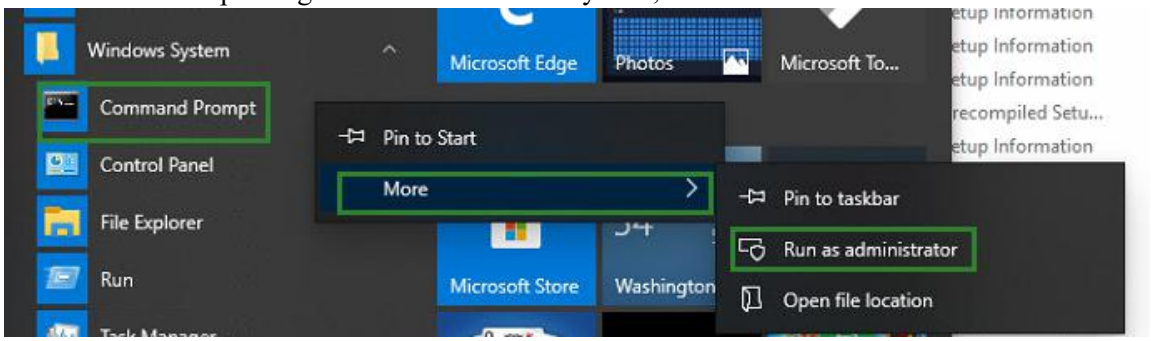
1. **Windows displays a BSOD when the SSD7202/SSD7103 is installed.**



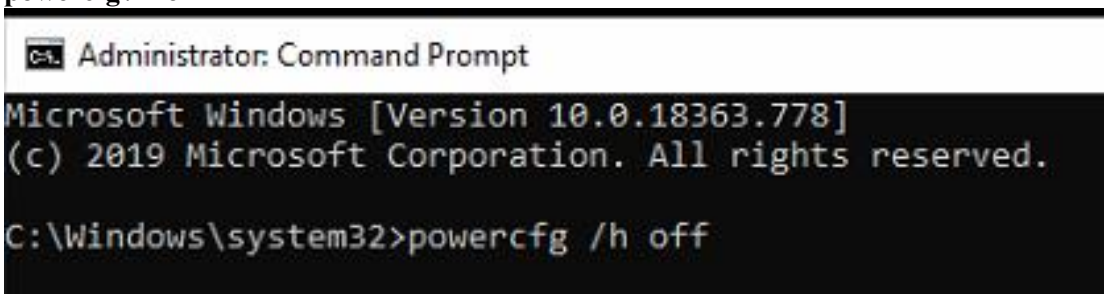
If you are running Windows 10, please make sure that any **Quick Shutdown** are disabled – these features can cause a BSOD when the SSD7202/SSD7103 is installed into or removed from your motherboard. BSODs can be avoided by **completely powering off** your system.

How to Turn off Quick Shutdown for Windows

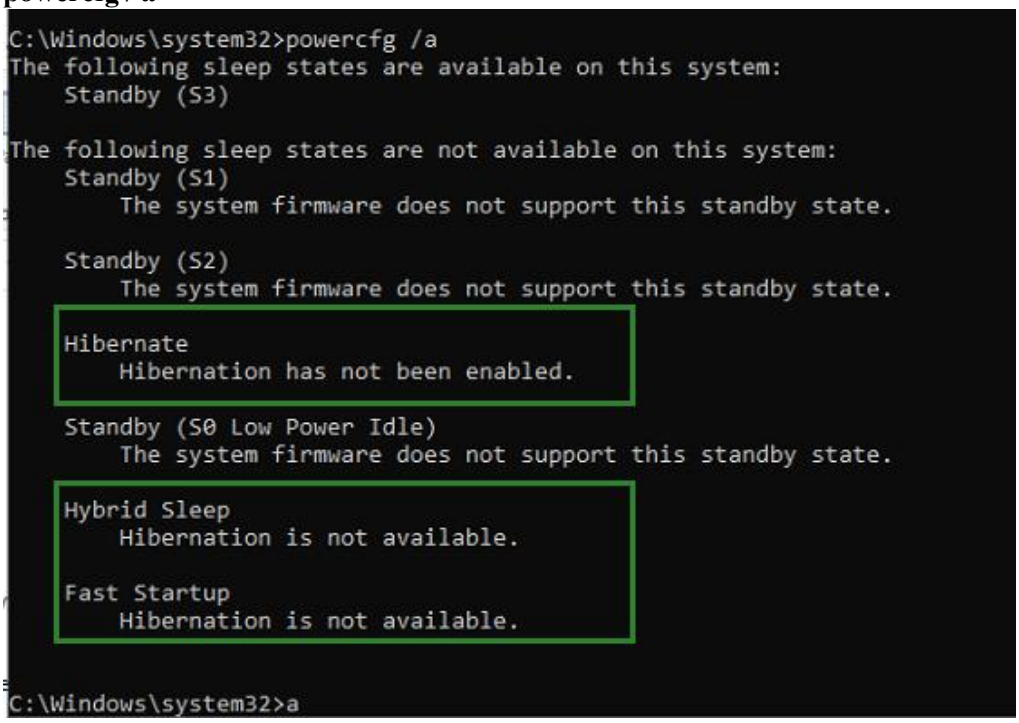
a. Use administrator privileges to enter cmd in the system;



b. Enter the command in cmd to close the quick shutdown;
powercfg / h off



c. Enter the command to check that the quick shutdown is turned off;
powercfg / a



d. Shut down the computer and remove the SSD7202/SSD7103 from the motherboard;
e. **Restart the system** and open the SSD7202/SSD7103 driver download.

f. Double-click **Setup** to reinstall the driver; if you are prompted to uninstall the driver, you will need to follow the prompts and restart; after rebooting, double-click Setup once more to install the driver.
g. After the driver installation is complete, shut down the computer. Connect the NVMe SSD's to the SSD7202/SSD7103 and insert it into the motherboard PCIe slot.
h. Power on; boot Windows and access the WebGUI; if the WebGUI can't connect, you need to restart again
i. If it fails to start the second time, please access our Online Support portal and submit a support ticket.

Note: If you are running a Server version of windows, and encounter a BSOD at bootup, please collect the following information: Windows version & build numbers, Memory Dump and System event Log

2. **A BSOD is encountered when installing the driver:**
If you experience a BSOD during driver installation, please collect the following information: Memory Dump, INF log, Debug Log, System Event log, and submit a new support ticket via our Online Support Portal.

3. **If Windows reports that driver installation has failed:**
a) Please collect these debugging information: INF log, Debug Log, Device Manager/Storage Controller screen shot, System Event log

Note: If you experience a BSOD or error when installing the driver, please ensure that any **Quick Shutdown** options are **not enabled** – Quick shutdown can cause a BSOD when removing the SSD7202/SSD7103 from your motherboard, and plugging it back in. BSODs can be avoided by **completely powering off** your system:

Controller and Drive Detection Issues

- If your motherboard or Windows is unable to detect the SSD7202/7103 RAID controller or NVMe SSD's, please shutdown the system and try moving the SSD7202/7103 to another PCIe slot.
- Make sure any unrelated NVMe devices are removed from the motherboard while troubleshooting the SSD7202/SSD7103 controller.

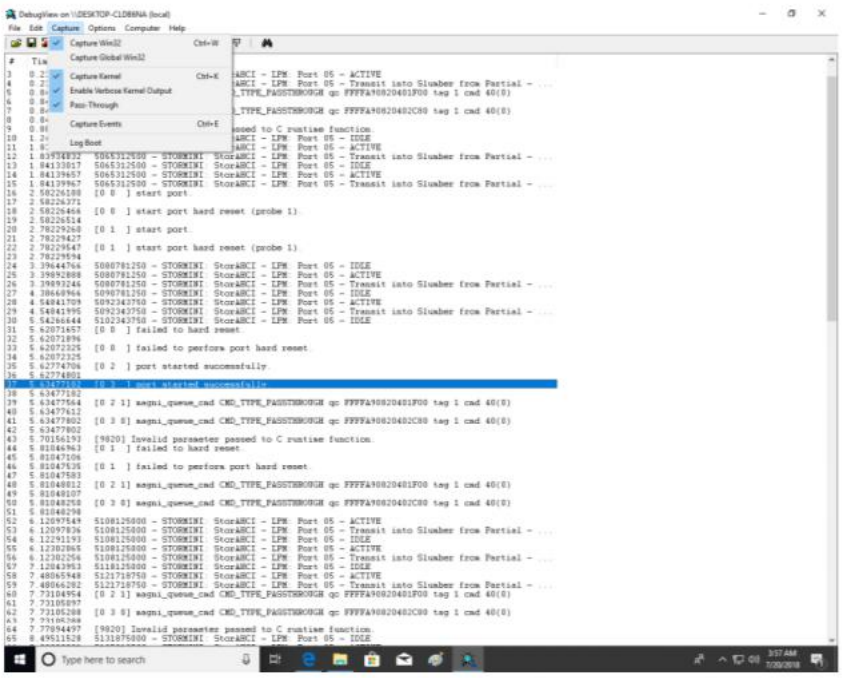
Appendix

How to Collect Debug View Logs

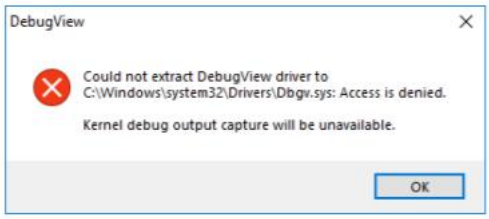
If other troubleshooting steps fail to solve the problem, we suspect that the driver and management software cannot establish a connection with the SSD7202/SSD7103 controller. We will provide you with a Debug version of the driver to collect information about the problem you are experiencing.

To install the Debug driver, follow the standard driver installation procedure (please refer to the SSD7202/SSD7103 RAID controller User Guide). After installing the driver, follow the steps below:

1. Download the DebugView utility from https://download.sysinternals.com/files/DebugView.zip.
2. Unzip, right-click on the icon, and run DebugView with administrator privileges. Select Capture Win32, Capture Kernel, Enable Verbose Kernel Output, and Pass in the Capture toolbar.



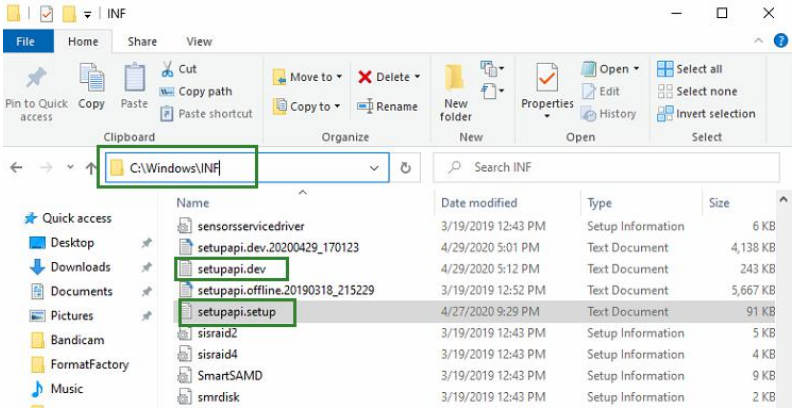
3. If the utility displays an “access denied” message, rename the following file: C:\Windows\System32\drivers\Dbgv.sys For example, rename it to “Dbgv.sys1”, ie change the file type



4. Save the information printed by DebugView and send this to our support department.
5. If required, we will provide management software information collection tools for the NVMe RAID Manager interface.

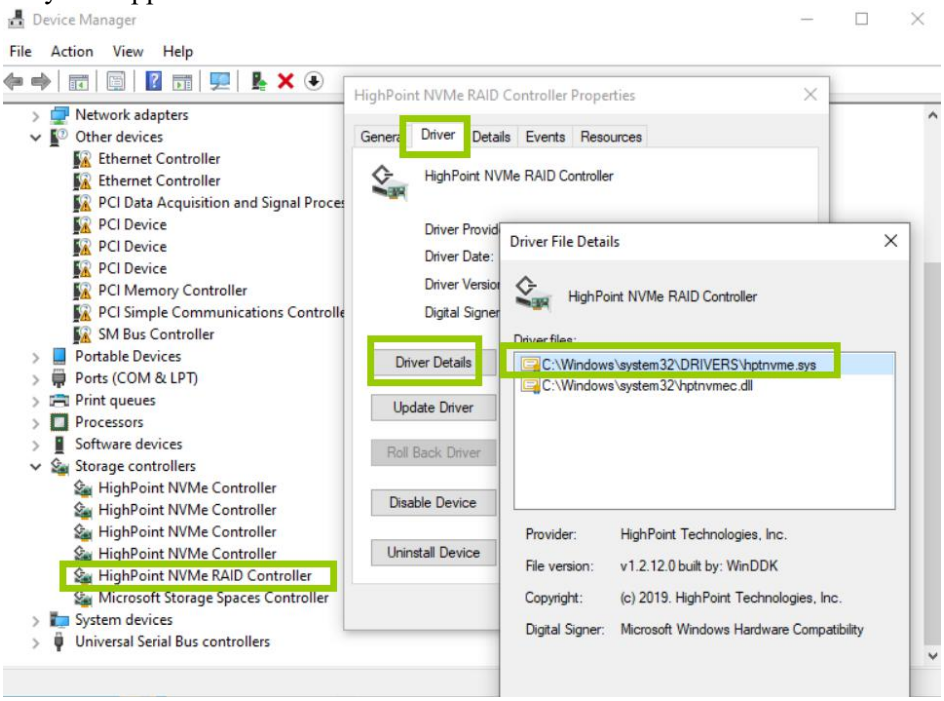
How to Collect INF Logs:

1. Go to drive C→ Windows→ INF, and locate the **setuppapi.dev** and **setupapi.setup** logs:



INF logs can be used to check what kind of software has been installed into the Windows systems.

2. Please access Device Manager, Storage Controllers, and check the properties for the HighPoint entry. Click on Driver Details and take a screenshot – include this with the log files you submit for your support case.

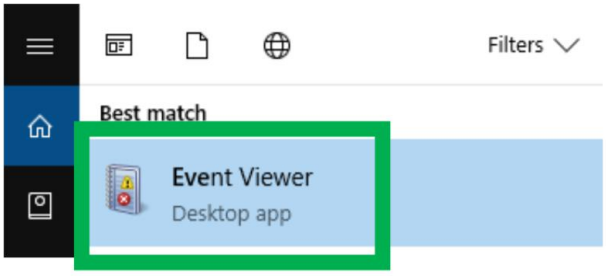


How to Collect System Logs:

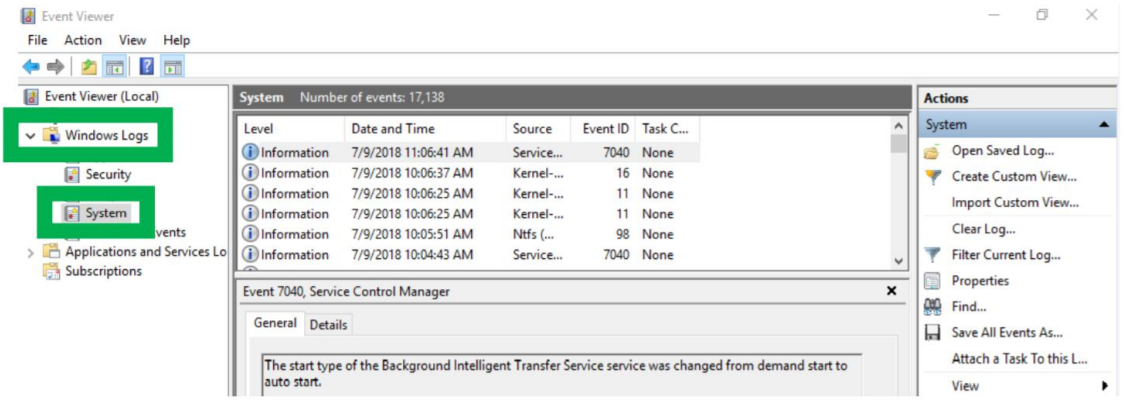
In addition to DebugView logs, System Logs can aid our Support department diagnose and resolve the support issues you have submitted. The System Log typically records errors, device failures, and software or driver related incidents. This information can help our engineers narrow down or even identify the source of the problem you are experiencing.

System Log

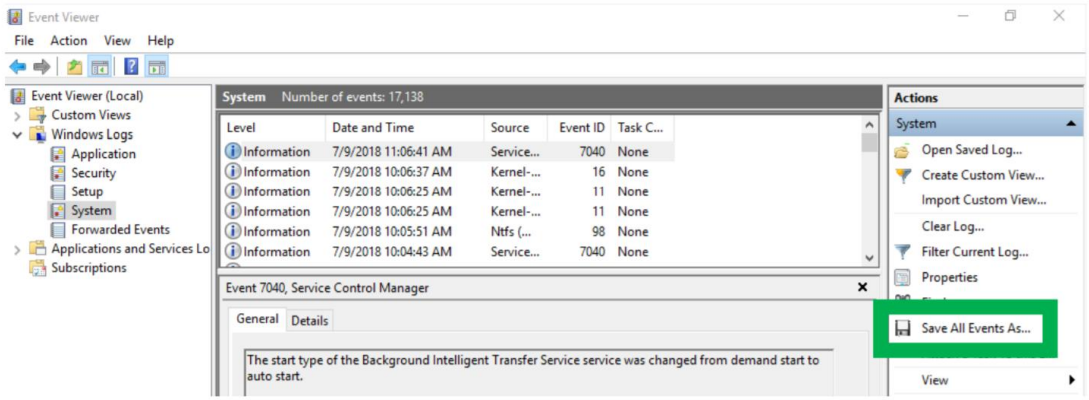
1. Click the **Windows** button towards the bottom left-hand corner of your desktop, and click on the Search field.
2. Type **Event Viewer** and click the icon as shown below:



3. Expand the Windows Log folder and select **System**:



4. Select **Save All Events as…** and save the **.evtx** file in an easy to find location.



Collecting Windows Dump Files

Windows Dump files are snap shots that show which processes were running at the time of the event or failure. If possible, locate and upload the following files to your support case:

- Memory.dmp
- Minidump.dmp

To locate the dump files, check the C:\Windows directory and search for Memory.dmp and Minidump.dmp: