



Using HighPoint NVMe RAID AICs with the Dell Precision 7960 Tower Workstation

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Table of Contents

- 1. Dell Precision 7960 Tower Workstation introduction..... 3
 - 1.1 Chipset..... 3
 - 1.2 Processor Types..... 3
 - 1.3 Memory..... 4
 - 1.4 PCIe slots 4
- 2. HighPoint NVMe RAID AIC compatibility with Dell Precision 7960 Tower Workstation..... 5
- 3. Installing HighPoint NVMe RAID AIC into Dell Precision 7960 Tower Workstation 6
 - 3.1 Install hardware..... 6
 - 3.2 System BIOS Setting 9
 - 3.2.1 Disable Secure Boot 10
 - 3.2.2 Disable PCIe Bifurcation 10
 - 3.2.3 Disable Kernel DMA support 11
 - 3.2.4 Disable Intel VMD Technology..... 12
 - 3.3 Install software 13
 - 3.3.1 Installing HighPoint NVMe RAID AICs into the Dell Precision 7960 Tower Workstation (Data RAID configurations) 13
 - 3.3.1.1 Installing the Windows Driver & Management Software..... 13
 - 3.3.1.2 Installing the Linux Driver & Management Software 13
 - 3.3.2 Installing HighPoint NVMe RAID AICs into the Dell Precision 7960 Tower Workstation (Boot RAID configurations)..... 13
 - 3.3.2.1 Installing a Windows OS to a bootable RAID configuration 13
 - 3.3.2.2 Installing Linux to a bootable RAID configuration 13
- 4. Test HighPoint NVMe RAID AIC 15
 - 4.1 Performance Testing..... 15
 - 4.1.1 Recommended Hardware Configuration..... 15
 - 4.1.2 Test tool 16
 - 4.1.3 Gen3 HighPoint NVMe RAID AIC test results 20
 - 4.1.4 Gen4 HighPoint NVMe RAID AIC test results 22
- 5. Uninstalling a HighPoint NVMe RAID AIC from the Dell Precision 7960 Tower Workstation 24
 - 5.1 Uninstall hardware 24
 - 5.1.1 Uninstall the HighPoint NVMe RAID AIC 24
 - 5.2 Uninstalling the HighPoint Software 27
 - 5.2.1 Uninstall the HighPoint NVMe RAID AIC for Windows..... 27
 - 5.2.1.1 Uninstall the driver 27
 - 5.2.1.2 Uninstall the RAID Management Software 28
 - 5.2.2 Uninstall the HighPoint NVMe RAID AIC for Linux 28
 - 5.2.2.1 Uninstall Driver..... 28
 - 5.2.2.2 Uninstall the RAID Management Software 29

1. Dell Precision 7960 Tower Workstation introduction

This document provides guidelines and procedures for installing HighPoint NVMe AICs into the Dell Precision 7960 Tower Workstation platform. The guide examines the performance capabilities of each PCIe slot, and provides recommended hardware configurations that can be used to optimize NVMe storage configurations for maximum throughput and capacity.

1.1 Chipset

Dell Precision 7960 Tower Workstation Chipset: Intel W790

1.2 Processor Types

Dell Precision 7960 Tower Workstation processor types:

Description	Option one	Option two	Option three	Option four	Option five	Option six	Option seven	Option eight	Option nine
Processor type	Intel Xeon W5-3423	Intel Xeon W5-3425	Intel Xeon W5-3433	Intel Xeon W5-3435X	Intel Xeon W7-3445	Intel Xeon W7-3455	Intel Xeon W7-3465X	Intel Xeon W9-3475X	Intel Xeon W9-3495X
Processor wattage	220 W	270 W	220 W	270 W	270 W	270 W	300 W	300 W	350 W
Processor core count	12	12	16	16	20	24	28	36	56
Processor thread count	24	24	32	32	40	48	56	72	112
Processor speed	2.10 GHz to 4.20 GHz	3.20 GHz to 4.60 GHz	2.0 GHz to 4.20 GHz	3.10 GHz to 4.70 GHz	2.60 GHz to 4.80 GHz	2.50 GHz to 4.80 GHz	2.50 GHz to 4.80 GHz	2.20 GHz to 4.80 GHz	1.90 GHz to 4.80 GHz
Processor cache	30 MB	30 MB	45 MB	45 MB	52.5 MB	67.5 MB	75 MB	82.5 MB	105 MB
Integrated graphics	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported

1.3 Memory

Memory type: DDR5
 Memory speed: 4800 MT/s
 Memory slot: 16 DIMM slots
 Maximum memory configuration: 1TB
 Minimum memory configuration: 16GB

1.4 PCIe slots

Dell Precision 7960 PCIe Expansion Slot Configuration:

Slot	Type	Volatile supported	Max Height (in,mm)	Max Length (in,mm)	Max Wattage
1	PCIe x16 Gen5	3.30V/12V	Full Height 4.612 in / 117.15mm	Full Length 12.28 in / 312mm	75W (300 W with additional power cable)
2	PCIe x8 (4) Gen4	3.30V/12V	Full Height 4.612 in / 117.15mm	Half Length 12.28 in / 312mm	25W
3	PCIe x8 (4) Gen4	3.30V/12V	Full Height 4.612 in / 117.15mm	Half Length 12.28 in / 312mm	25W
4	PCIe x16 Gen4	3.30V/12V	Full Height 4.612 in / 117.15mm	Full Length 12.28 in / 312mm	75W (300 W with additional power cable)
5	PCIe x16 Gen5	3.30V/12V	Full Height 4.612 in / 117.15mm	Full Length 12.28 in / 312mm	75W (300 W with additional power cable)
6	PCIe x8 Gen4	3.30V/12V	Full Height 4.612 in / 117.15mm	Full Length 12.28 in / 312mm	25W
7	PCIe x8 Gen4	3.30V/12V	Full Height 4.612 in / 117.15mm	Full Length 12.28 in / 312mm	25W
8	PCIe x16 Gen4	3.30V/12V	Full Height 4.612 in / 117.15mm	Full Length 12.28 in / 312mm	75W (300 W with additional power cable)

2. HighPoint NVMe RAID AIC compatibility with Dell Precision

7960 Tower Workstation

HighPoint NVMe RAID AICs	Slot1 PCIe x16 Gen5	Slot2 PCIe x8 (x4 electric al) Gen4	Slot3 PCIe x8 (x4 electric al) Gen4	Slot4 PCIe x16 Gen4	Slot5 PCIe x16 Gen5	Slot7 PCIe x8 Gen4	Slot7 PCIe x8 Gen4	Slot8 PCIe x16 Gen4
Gen3 AICs								
SSD6202	✓	N/A	N/A	✓	✓	✓	✓	✓
SSD6202A	✓	N/A	N/A	✓	✓	✓	✓	✓
SSD6204	✓	N/A	N/A	✓	✓	✓	✓	✓
SSD6204A	✓	N/A	N/A	✓	✓	✓	✓	✓
SSD7101A-1	✓	N/A	N/A	✓	✓	N/A	N/A	✓
SSD7104	✓	N/A	N/A	✓	✓	N/A	N/A	✓
SSD7105	✓	N/A	N/A	✓	✓	N/A	N/A	✓
SSD7140A	✓	N/A	N/A	✓	✓	N/A	N/A	✓
SSD7202	✓	N/A	N/A	✓	✓	✓	✓	✓
SSD7204	✓	N/A	N/A	✓	✓	✓	✓	✓
RocketAIC 7105HW	✓	N/A	N/A	✓	✓	N/A	N/A	✓
RocketAIC 7140AW	✓	N/A	N/A	✓	✓	N/A	N/A	✓
Gen4 AICs								
SSD7502	✓	N/A	N/A	✓	✓	N/A	N/A	✓
SSD7505	✓	N/A	N/A	✓	✓	N/A	N/A	✓
SSD7540	✓	N/A	N/A	✓	✓	N/A	N/A	✓
SSD7580B	✓	N/A	N/A	✓	✓	N/A	N/A	✓
RocketAIC 7502HW	✓	N/A	N/A	✓	✓	N/A	N/A	✓
RocketAIC 7505HW	✓	N/A	N/A	✓	✓	N/A	N/A	✓
RocketAIC 7540HW	✓	N/A	N/A	✓	✓	N/A	N/A	✓
RocketAIC 7749EW	N/A	N/A	N/A	✓	✓	N/A	N/A	N/A

Note1: ✓ means that the HighPoint NVMe RAID AIC can be used normally in this slot.

Note2: N/A means that it is an untested slot and HighPoint NVMe RAID AIC using this slot will not optimal performance.

3. Installing HighPoint NVMe RAID AIC into Dell Precision 7960 Tower Workstation

3.1 Install hardware

- a. Unlock the left-side cover by inserting the key from the left-side cover and turning the key counterclockwise.



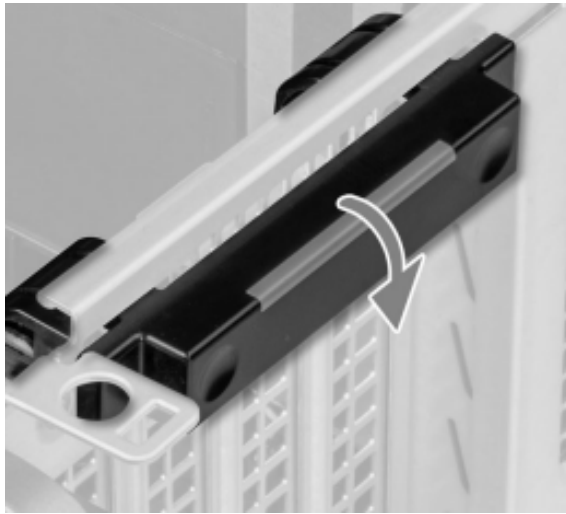
- b. Gently push the latch to release the left-side cover from the computer.



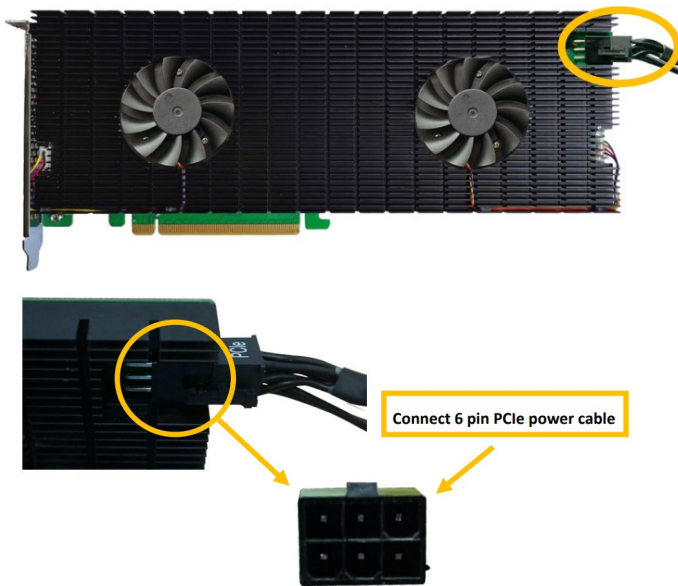
- c. Then lift the left-side cover out of the chassis.



- d. Push the PCIe latch to open the PCIe door.

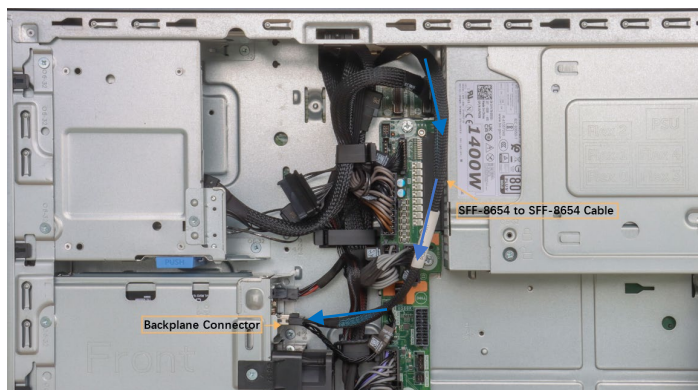
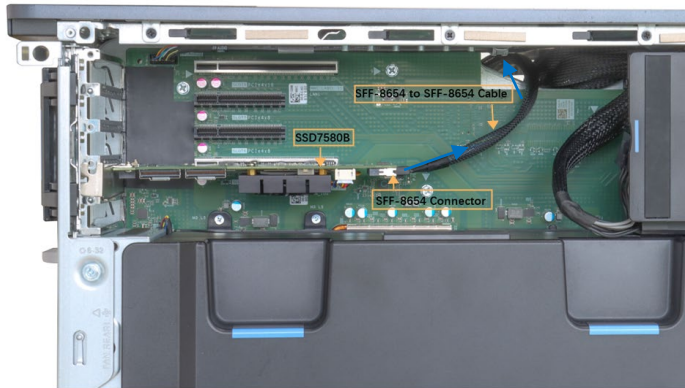


- e. Install the HighPoint NVMe RAID AIC into the appropriate PCIe slot.
- f. Connect the power cable to the 6-pin power supply of HighPoint NVMe RAID AICs (Required for the SSD7140A/ SSD7540/ RA7749EW).

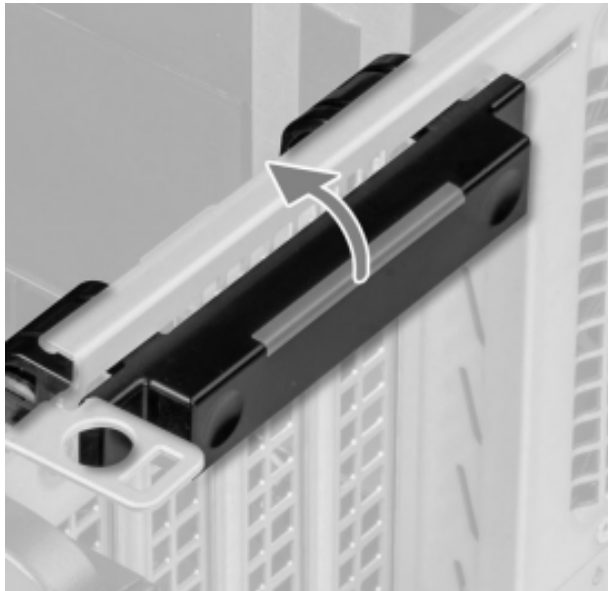


Using HighPoint NVMe RAID AICs with the Dell Precision 7960 Tower Workstation

- g. If you are installing the SSD7580B, connect each SFF-8654 to SFF-8654 cable to the AIC and the appropriate backplane connector.



- h. Close the PCIe latch to secure the NVMe RAID AIC's bracket.



- i. Align the left-side cover with the Dell Precision 7960 Tower Workstation.
- j. Insert the key from the left-side cover and turn the key clockwise to complete the left-side cover installation.

3.2 System BIOS Setting

The following is a list of system BIOS settings required on the Dell Precision 7960 Tower Workstation for each NVMe RAID AIC.

Please refer to the following sections for system BIOS settings setup procedures.

[Section 3.2.1, Disable Secure Boot](#)

[Section 3.2.2, Disable PCIe Bifurcation](#)

[Section 3.2.3, Disable Kernel DMA support](#)

[Section 3.2.4, Disable Intel VMD Technology](#)

HighPoint NVMe RAID AICs	System BIOS Settings			
	Secure Boot	PCIe Bifurcation	Kernel DMA support	Intel VMD Technology
SSD6202	✓	✗	✓	✗
SSD6202A	✓	✗	✓	✗
SSD6204	✓	✗	✓	✗
SSD6204A	✓	✗	✓	✗
SSD7101A-1	✓ ¹	✗	✓	✗
SSD7104	✓ ¹	✗	✓	✗
SSD7105	✓ ¹	✗	✗	✗
SSD7140A	✓ ¹	✗	✓	✗
SSD7202	✓ ¹	✗	✗	✗
SSD7204	✓ ¹	✗	✓	✗
SSD7502	✓ ¹	✗	✗	✗
SSD7505	✓ ¹	✗	✗	✗
SSD7540	✓ ¹	✗	✗	✗
SSD7580B	✓ ¹	✗	✗	✗
RocketAIC 7105HW	✓ ¹	✗	✗	✗
RocketAIC 7140AW	✓ ¹	✗	✓	✗
RocketAIC 7502HW	✓ ¹	✗	✗	✗
RocketAIC 7505HW	✓ ¹	✗	✗	✗
RocketAIC 7540HW	✓ ¹	✗	✗	✗
RocketAIC 7749EW	✓ ¹	✗	✗	✗

Note1: ✓ means that the HighPoint NVMe RAID AIC support this BIOS setting.

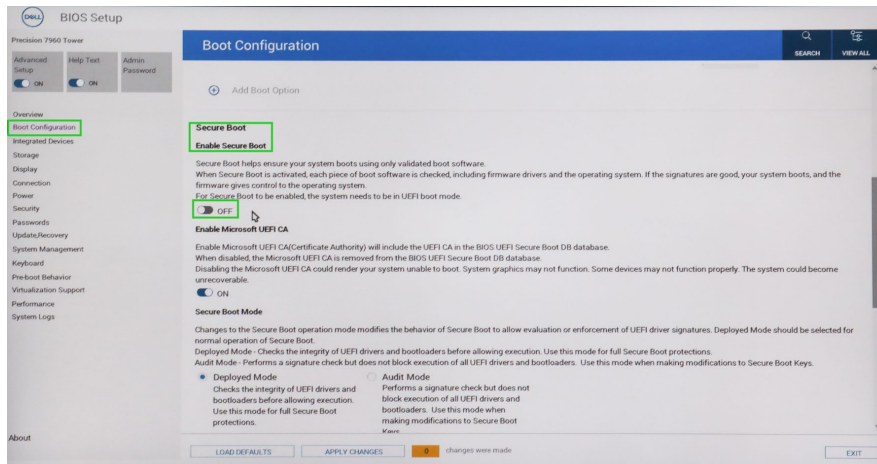
Note2: ✗ means that the HighPoint NVMe RAID AIC do not support this BIOS setting.

Note3: ✓¹ If you are using the Linux or the unsigned UEFI utility, Secure Boot must be disabled.

3.2.1 Disable Secure Boot

Note: If you are using the SSD7000/7500 series NVMe RAID AICs in Linux or the unsigned UEFI utility, Secure Boot must be disabled. If you are using an SSD6200 series NVMe RAID AICs, Secure Boot can be enabled.

- Power up the system.
- Press **F2** to enter **BIOS**.
- Find **Boot Configuration** → **Secure Boot** → **Enable Secure Boot**, select **OFF**.

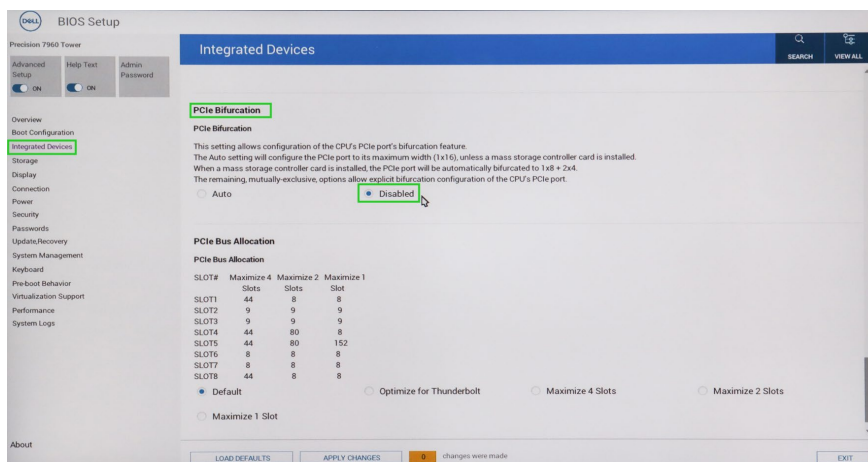


- Save configuration and restart system.

3.2.2 Disable PCIe Bifurcation

Note: HighPoint NVMe RAID AICs do not support PCIe Bifurcation. This setting must be disabled in order to use these products.

- Power up the system.
- Press **F2** to enter **BIOS**.
- Find **Integrated Devices** → **PCIe Bifurcation**, select **Disabled**.



- Save configuration and restart system.

3.2.3 Disable Kernel DMA support

Note: Kernel DMA support is different for different NVMe RAID AICs

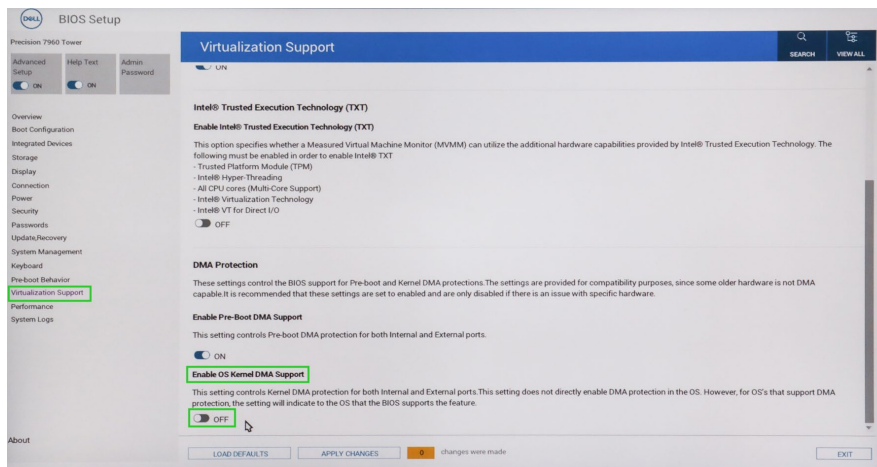
The following is a list of NVMe RAID AICs that support Kernel DMA.

Supported NVMe RAID AICs	SSD6202
	SSD6202A
	SSD6204
	SSD6204A
	SSD7101A-1
	SSD7104
	SSD7140A
	SSD7204
	RocketAIC 7140AW

The following is a list of NVMe RAID AICs that do not support Kernel DMA.

Supported NVMe RAID AICs	SSD7105
	SSD7202
	SSD7502
	SSD7505
	SSD7540
	SSD7580B
	RocketAIC 7105HW
	RocketAIC 7502HW
	RocketAIC 7505HW
	RocketAIC 7540HW
RocketAIC 7749EW	

- Power up the system.
- Press **F2** to enter **BIOS**.
- Find **Virtualization support** → **Enable OS Kernel DMA Support**, select **OFF**.

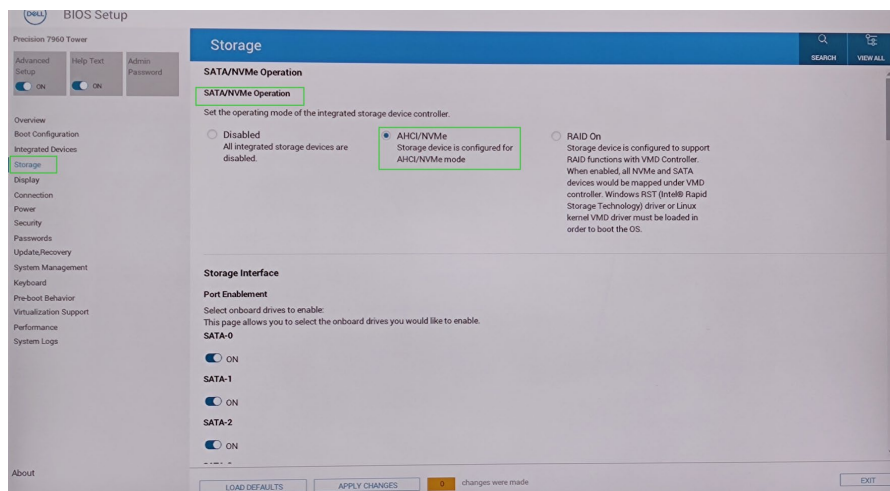


- Save configuration and restart system.

3.2.4 Disable Intel VMD Technology

Note: HighPoint NVMe RAID AICs don't support Intel VMD Technology, need to turn off Intel VMD Technology.

- a. Power up the system.
- b. Press **F2** to enter **BIOS**.
- c. Find **Storage**→**SATA/NVMe Operation**, select **AHCI/NVMe**.



- d. Save configuration and restart system.

3.3 Install software

3.3.1 Installing HighPoint NVMe RAID AICs into the Dell Precision 7960

Tower Workstation (Data RAID configurations)

The following section discusses HighPoint NVMe RAID AIC driver installation for a non-bootable NVMe configuration.

3.3.1.1 Installing the Windows Driver & Management Software

Please refer to the [Data RAID Installation Guide \(Windows\)](#) to install the Windows Device Driver and Management Software.

3.3.1.2 Installing the Linux Driver & Management Software

Please refer to the [Data RAID Installation Guide \(Linux\)](#) to install the Linux Device Driver and Management Software.

3.3.2 Installing HighPoint NVMe RAID AICs into the Dell Precision 7960

Tower Workstation (Boot RAID configurations)

The following section discusses HighPoint NVMe RAID AIC driver installation for a bootable NVMe configuration.

3.3.2.1 Installing a Windows OS to a bootable RAID configuration

Windows BootRAID:

Please refer to [HighPoint Windows Boot RAID Windows installation Guide](#).

3.3.2.2 Installing Linux to a bootable RAID configuration

Debian BootRAID:

Please refer to [Linux Debian On HighPoint NVMe RAID Controller Installation Guide](#).

Using HighPoint NVMe RAID AICs with the Dell Precision 7960 Tower Workstation

RHEL BootRAID:

Please refer to [Linux RHEL On HighPoint NVMe RAID Controller Installation Guide](#).

Ubuntu BootRAID:

Please refer to [Linux Ubuntu On HighPoint NVMe RAID Controller Installation Guide](#).

Rocky Linux BootRAID:

Please refer to [Linux Rocky Linux On HighPoint NVMe RAID Controller Installation Guide](#).

4. Test HighPoint NVMe RAID AIC

4.1 Performance Testing

4.1.1 Recommended Hardware Configuration

- **Dell Precision 7960 Tower Workstation:**

CPU: Intel(R) Xeon(R) W5-3423

Memory: 32GB

PCIe slot: slot 4

- **HighPoint NVMe RAID AICs:**

Gen3 HighPoint NVMe RAID AICs	SSD6202
	SSD6202A
	SSD6204
	SSD6204A
	SSD7101A-1
	SSD7104
	SSD7105
	SSD7140A
	SSD7202
	SSD7204
Gen4 HighPoint NVMe RAID AICs	SSD7502
	SSD7505
	SSD7540

- **Disk:**

Samsung 980 Pro 2TB

Note: Samsung 980 Pro 2TB Disk spec.

Performance	Sequential Read	Sequential Write
	Up to 7,000 MB/s * Performance may vary based on system hardware & configuration	Up to 5,100 MB/s * Performance may vary based on system hardware & configuration
	Random Read (4KB, QD32) Up to 1,000,000 IOPS * Performance may vary based on system hardware & configuration	Random Write (4KB, QD32) Up to 1,000,000 IOPS * Performance may vary based on system hardware & configuration
	Random Read (4KB, QD1) Up to 22,000 IOPS * Performance may vary based on system hardware & configuration	Random Write (4KB, QD1) Up to 60,000 IOPS * Performance may vary based on system hardware & configuration

4.1.2 Test tool

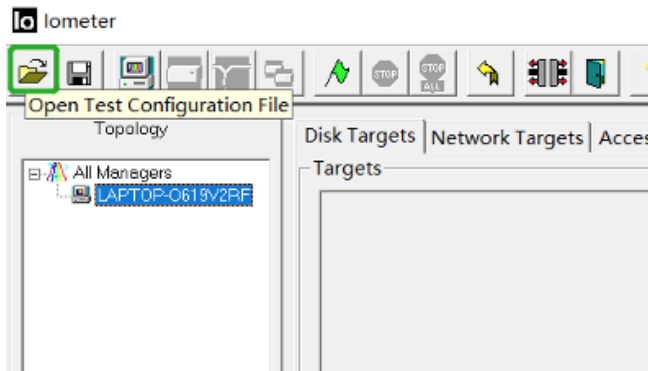
Benchmark Tool: Iometer/ CrystalDiskMark

- **Iometer script setting:**

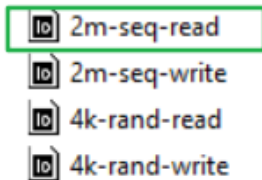
We will upload the [Iometer script](#) to a web page where you can download it.

Note: If you use the SSD6200 series NVMe RAID AICs, you will need to download another [Iometer script](#).

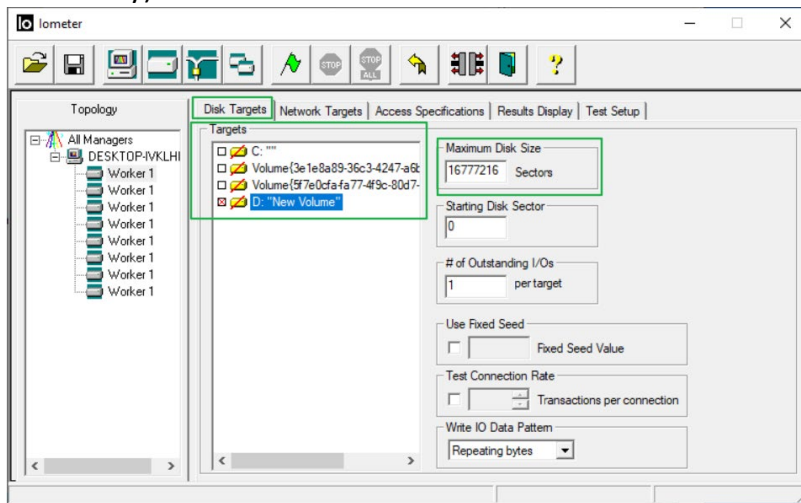
- The “**2m-seq-read.icf**” script tests the Sequential read performance of 2M large data blocks.
 - The “**2m-seq-write.icf**” script tests the Sequential write performance of 2M large data blocks.
 - The “**4k-rand-read.icf**” script tests the Random read performance of 4k small data blocks.
 - The “**4k-rand-write.icf**” script tests the Random write performance of 4k small data blocks.
- a. Open Iometer with administrator rights.
 - b. Click the folder icon to open the script, then select the script to be configured.



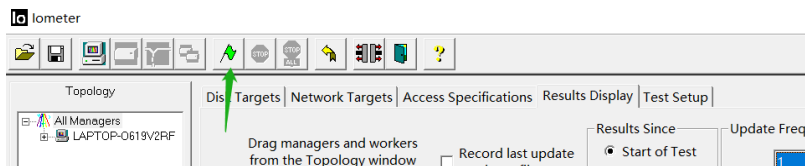
- c. Select **2M-seq-read**.



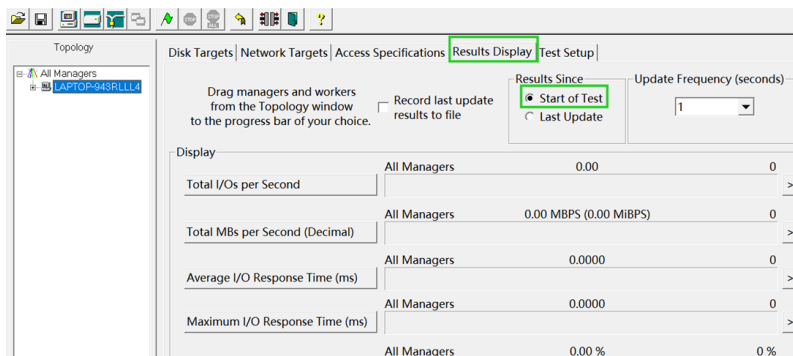
- d. The **Disk Targets** page will change, the **Target** should be the test disk (the RAID array). The **Maximum Disk Size** should be set to **16777216** Sectors.



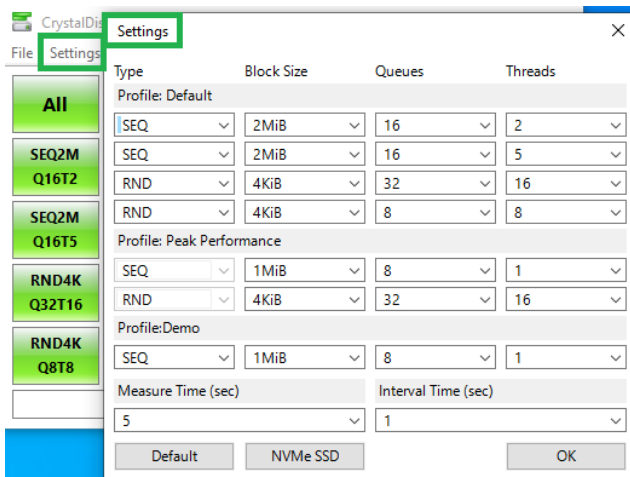
- e. After confirming the settings, click the green mark to start the performance test.



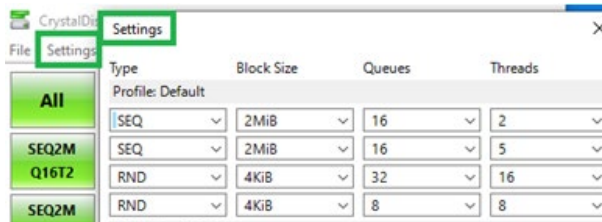
- f. **Result Display** will be automatically configured as **Start of Test**.



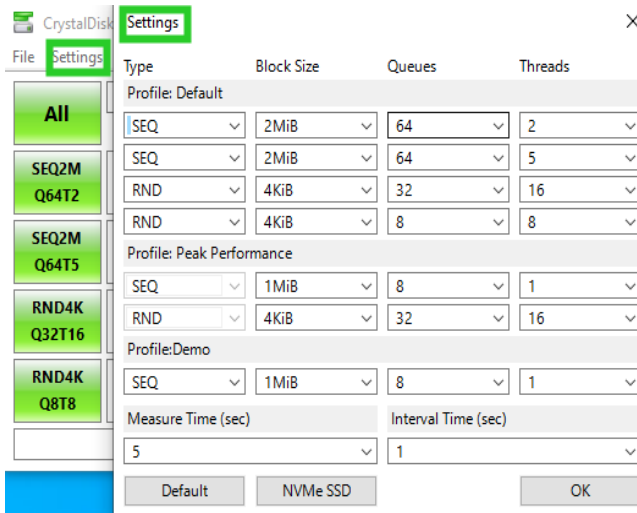
● **CrystalDiskMark script setting:**



- a. Open CrystalDiskMark with administrator rights.
- b. Click **Settings**.

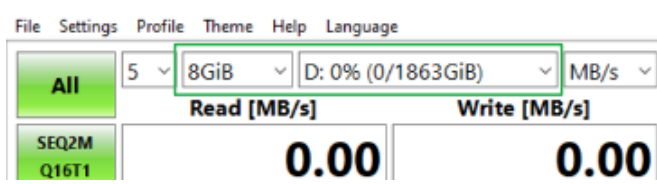


Note1: Please refer to the following Screenshot for recommended settings.

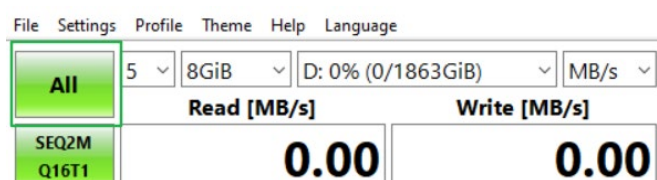


Note2: The above recommended setting will meet the needs of most NVMe RAID AICs and achieve optimal performance in testing. In testing, you can also choose to adjust the settings in the script yourself for optimal performance.

- c. **Test Size:** set to 8GiB; **Test Drive:** set to the RAID Volume.



- d. After confirming the settings, click **ALL** to start the performance test.



4.1.3 Gen3 HighPoint NVMe RAID AIC test results

- **Iometer**

(script setting)	Gen3 RAID AIC	Legacy	RAID0	RAID1	RAID10
2m-Seq-Read (MiB/s)	SSD6202	3,512	7,981	6,934	/
	SSD6202A	3,525	6,977	7,003	/
	SSD6204	1,784	7,134	3,565	/
	SSD6204A	1,784	7,125	3,559	/
	SSD7101A-1	3,570	14,153	7,032	14,201
	SSD7104	3,569	14,188	7,038	14,302
	SSD7105	3,545	14,243	7,150	13,367
	SSD7140A	3,570	14,290	7,034	14,295
	SSD7202	3,569	7,152	7,146	/
	SSD7204	3,596	7,151	7,032	7,159
2m-Seq-Write (MiB/s)	SSD6202	3,133	6,113	3,056	/
	SSD6202A	3,522	5,968	3,052	/
	SSD6204	1,723	6,332	1,704	/
	SSD6204A	1,731	6,220	1,723	/
	SSD7101A-1	3,515	13,891	3,516	6,954
	SSD7104	3,507	13,888	3,517	6,956
	SSD7105	3,514	13,891	3,514	6,953
	SSD7140A	3,509	14,077	3,532	7,039
	SSD7202	3,514	6,970	3,482	/
	SSD7204	3,509	7,066	3,485	3,436
4k-Rand-Read (IOPS)	SSD6202	653,803	944,790	940,819	/
	SSD6202A	723,809	920,233	939,554	/
	SSD6204	397,999	662,716	846,706	/
	SSD6204A	397,951	952,062	847,623	/
	SSD7101A-1	852,917	113,616	114,572	128,283
	SSD7104	852,291	114,640	116,343	127,612
	SSD7105	687,511	775,312	751,348	764,812
	SSD7140A	852,940	137,258	115,019	125,262
	SSD7202	690,855	750,938	745,913	/
	SSD7204	846,294	114,172	115,468	125,672
4k-Rand-Write (IOPS)	SSD6202	689,949	728,635	648,814	/
	SSD6202A	709,519	688,784	652,103	/
	SSD6204	401,449	569,087	297,135	/
	SSD6204A	406,226	725,689	306,816	/
	SSD7101A-1	806,819	113,160	72,474	76,998
	SSD7104	807,697	114,510	72,810	77,370

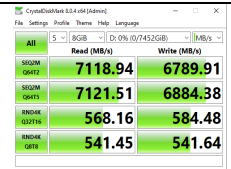
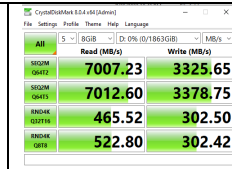
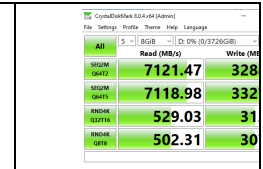
Using HighPoint NVMe RAID AICs with the Dell Precision 7960 Tower Workstation

	SSD7105	635,884	661,490	469,428	499,838
	SSD7140A	801,050	138,544	71,956	74,810
	SSD7202	645,272	661,815	457,716	/
	SSD7204	801,278	111,905	72,445	77,246

● **CrystalDiskMark**

(script setting)	Gen3 RAID AIC	RAID0	RAID1	RAID10
2m-Seq (MB/s)	SSD6202			/
	SSD6202A			/
	SSD6204			/
	SSD6204A			/
	SSD7101A-1			
	SSD7104			
	SSD7105			
	SSD7140A			
	SSD7202			/

Using HighPoint NVMe RAID AICs with the Dell Precision 7960 Tower Workstation

SSD7204			
---------	---	--	---

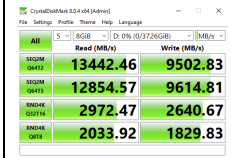
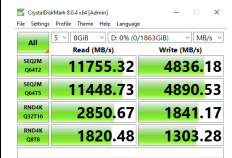
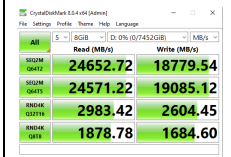
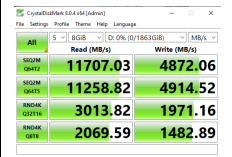
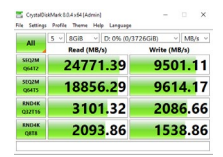
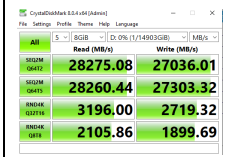
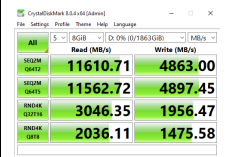
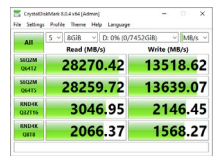
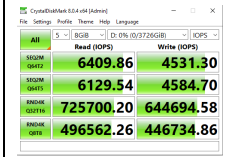
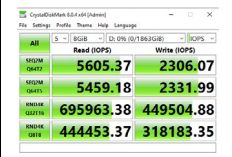
Note: / means that this AIC does not support the creation of RAID10.

4.1.4 Gen4 HighPoint NVMe RAID AIC test results

- Iometer**

(script setting)	Gen4 RAID AIC	Legacy	RAID0	RAID1	RAID10
2m-Seq-Read (MiB/s)	SSD7502	6,990	12,442	11,880	/
	SSD7505	7,013	24,363	11,868	23,975
	SSD7540	7,026	28,506	11,693	28,525
2m-Seq-Write (MiB/s)	SSD7502	5,179	9,948	5,053	/
	SSD7505	5,157	24,363	5,058	10,006
	SSD7540	5,106	28,164	5,050	14,082
4k-Rand-Read (IOPS)	SSD7502	609,432	744,123	740,548	/
	SSD7505	686,606	777,230	747,409	774,975
	SSD7540	684,320	794,352	748,335	787,138
4k-Rand-Write (IOPS)	SSD7502	551,362	645,161	464,110	/
	SSD7505	637,328	671,830	466,545	502,493
	SSD7540	633,019	695,314	476,263	522,571

- CrystalDiskMark**

(script setting)	Gen4 RAID AIC	RAID0	RAID1	RAID10
2m-Seq (MB/s)	SSD7502			/
	SSD7505			
	SSD7540			
4k-Rand (IOPS)	SSD7502			/

Using HighPoint NVMe RAID AICs with the Dell Precision 7960 Tower Workstation

	SSD7505	<table border="1"> <thead> <tr> <th></th> <th>Read (IOPS)</th> <th>Write (IOPS)</th> </tr> </thead> <tbody> <tr> <td>All</td> <td>11755.33</td> <td>8954.78</td> </tr> <tr> <td>SSD0M Qd4T2</td> <td>11716.47</td> <td>9100.50</td> </tr> <tr> <td>SSD0M Qd4T3</td> <td>728374.27</td> <td>635852.78</td> </tr> <tr> <td>SSD0M Qd4T4</td> <td>458686.28</td> <td>411278.56</td> </tr> </tbody> </table>		Read (IOPS)	Write (IOPS)	All	11755.33	8954.78	SSD0M Qd4T2	11716.47	9100.50	SSD0M Qd4T3	728374.27	635852.78	SSD0M Qd4T4	458686.28	411278.56	<table border="1"> <thead> <tr> <th></th> <th>Read (IOPS)</th> <th>Write (IOPS)</th> </tr> </thead> <tbody> <tr> <td>All</td> <td>5582.35</td> <td>2323.18</td> </tr> <tr> <td>SSD0M Qd4T2</td> <td>5368.62</td> <td>2343.43</td> </tr> <tr> <td>SSD0M Qd4T3</td> <td>735796.63</td> <td>481240.97</td> </tr> <tr> <td>SSD0M Qd4T4</td> <td>505271.73</td> <td>362034.42</td> </tr> </tbody> </table>		Read (IOPS)	Write (IOPS)	All	5582.35	2323.18	SSD0M Qd4T2	5368.62	2343.43	SSD0M Qd4T3	735796.63	481240.97	SSD0M Qd4T4	505271.73	362034.42	<table border="1"> <thead> <tr> <th></th> <th>Read (IOPS)</th> <th>Write (IOPS)</th> </tr> </thead> <tbody> <tr> <td>All</td> <td>11811.92</td> <td>4530.48</td> </tr> <tr> <td>SSD0M Qd4T2</td> <td>8991.38</td> <td>4584.39</td> </tr> <tr> <td>SSD0M Qd4T3</td> <td>757157.71</td> <td>509438.48</td> </tr> <tr> <td>SSD0M Qd4T4</td> <td>511195.80</td> <td>375697.02</td> </tr> </tbody> </table>		Read (IOPS)	Write (IOPS)	All	11811.92	4530.48	SSD0M Qd4T2	8991.38	4584.39	SSD0M Qd4T3	757157.71	509438.48	SSD0M Qd4T4	511195.80	375697.02
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Note: / means that this AIC does not support the creation of RAID10.

5. Uninstalling a HighPoint NVMe RAID AIC from the Dell Precision 7960 Tower Workstation

5.1 Uninstall hardware

5.1.1 Uninstall the HighPoint NVMe RAID AIC

- a. Unlock the left-side cover by inserting the key from the left-side cover and turning the key counterclockwise.



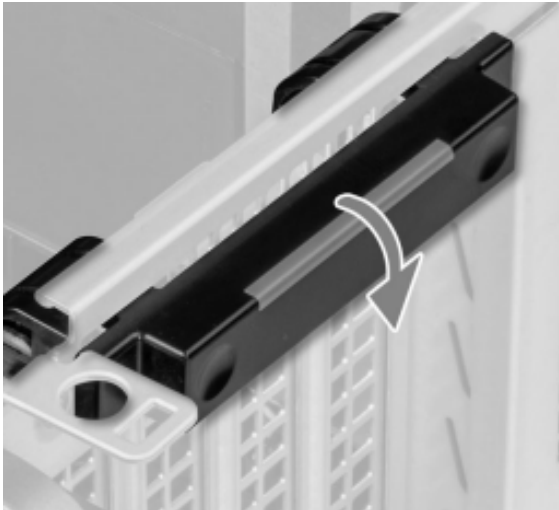
- b. Gently push the latch to release the left-side cover from the computer.



- c. Then lift the left-side cover out of the chassis.

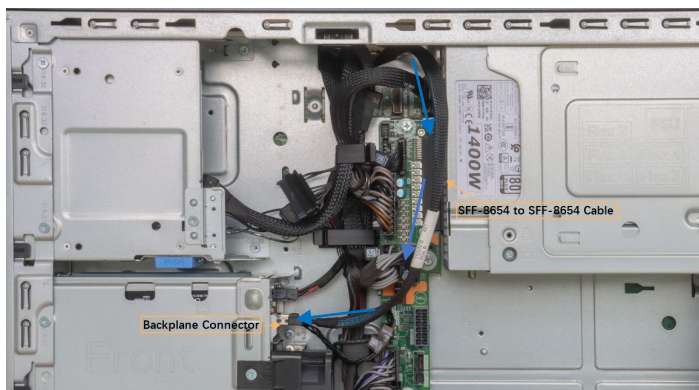
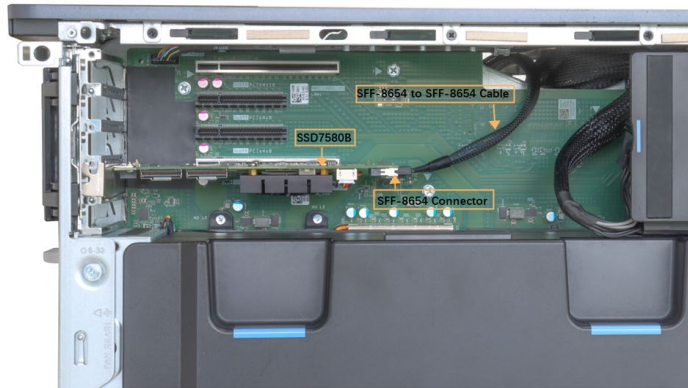


- d. Push the PCIe latch to open the PCIe door.

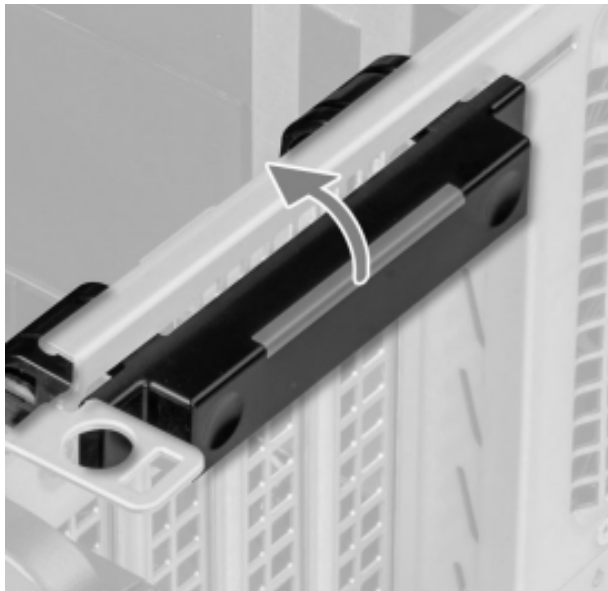


- e. Disconnect the power cable from the 6-pin power supply of the HighPoint NVMe RAID AIC (only applies to the SSD7140A/7540).

- f. If you are uninstalling the SSD7580B, disconnect each SFF-8654 to SFF-8654 cable to the AIC and the appropriate backplane connector.



- g. Uninstall the HighPoint NVMe RAID AIC from the PCIe slot.
- h. Close the PCIe latch.



- i. Align the left-side cover with the Dell Precision 7960 Tower Workstation.
- j. Insert the key from the left-side cover and turn the key clockwise to complete the left-side cover installation.

5.2 Uninstalling the HighPoint Software

5.2.1 Uninstall the HighPoint NVMe RAID AIC for Windows

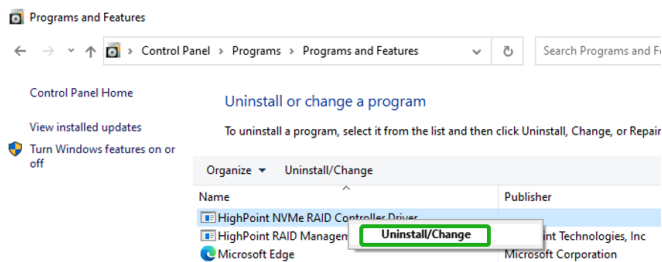
5.2.1.1 Uninstall the driver

- a. Power down the system and remove the HighPoint NVMe RAID AIC from the motherboard.

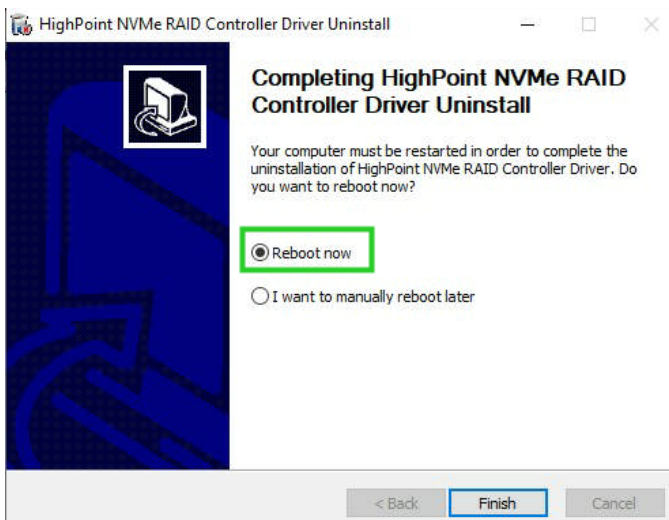
Note1: Failing to remove the HighPoint NVMe RAID AIC from the motherboard during the uninstall process may result in data loss.

Note2: 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 HighPoint NVMe RAID AIC.

- b. Power on the system and boot Windows.
- c. Access **Control Panel** and select **Programs**→ **Programs and Features**, and click on the **HighPoint NVMe RAID Controller Driver** entry.
- d. Click **Uninstall/Change**.

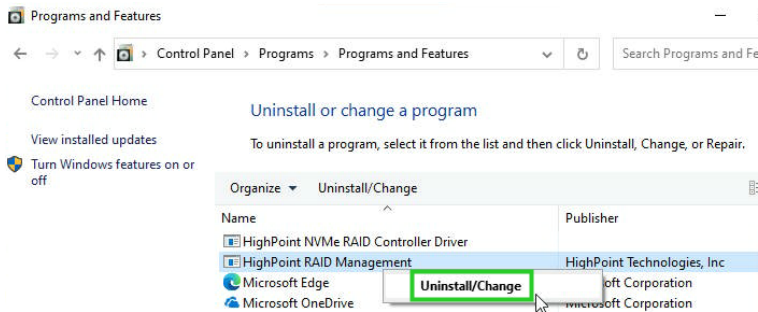


- e. After uninstalling the driver, click Finish.

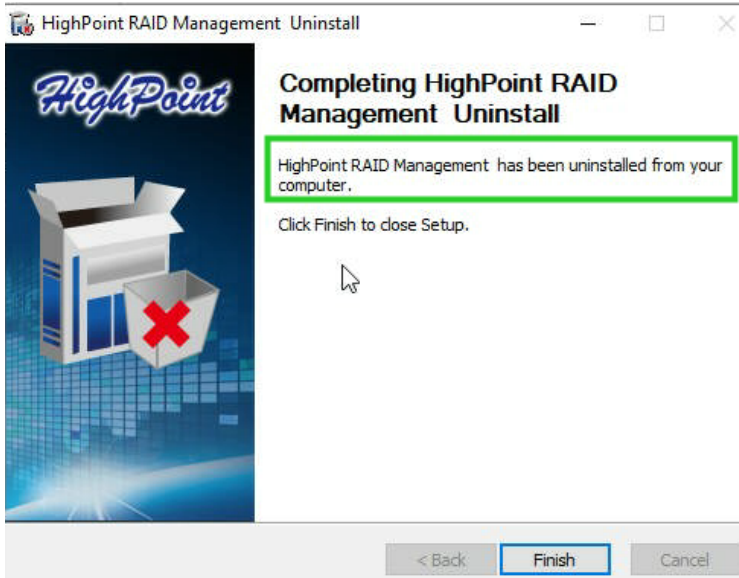


5.2.1.2 Uninstall the RAID Management Software

- Access **Control Panel** and select **Programs**→ **Programs and Features**.
- Click on the **HighPoint RAID Management** entry.
- Click **Uninstall/Change**.



- After uninstalling the HighPoint RAID Management, click **Finish**.



5.2.2 Uninstall the HighPoint NVMe RAID AIC for Linux

5.2.2.1 Uninstall Driver

- Open the system terminal with root privileges.
- Enter the following commands to uninstall the driver: **hptuninhptnvm**.
- Press **'Y'** to confirm.

```
[root@localhost Downloads]# hptuninhptnvm
Are you sure to uninstall the driver hptnvm from system? (Y/n): y
Removed symlink /etc/systemd/system/default.target.wants/hptdrv-monitor.service.
Removed symlink /etc/systemd/system/sysinit.target.wants/systemd-hptdrv.service.
All files installed have been deleted from the system.
[root@localhost Downloads]#
```

- After uninstalling the driver, manually reboot the system.

- e. After the system has rebooted, open the system terminal with root privileges. And enter the following command to check the driver status:
lsmod |grep hptnvme

Before uninstalling:

```
[root@localhost test]# lsmod | grep hptnvme
hptnvme                235401  0
```

After uninstalling:

```
[root@localhost test]# lsmod | grep hptnvme
[root@localhost test]#
```

- f. If the system does not display information about “hptnvme”, the driver has been successfully uninstalled.

5.2.2.2 Uninstall the RAID Management Software

- a. Open the system terminal with root privileges.
- b. Enter the following commands to uninstall the RAID Management.

dpkg -r hptsvr (or rpm -e hptsvr-https)

```
root@testlu-Super-Server:/home/testlu/Desktop# dpkg -r hptsvr
(Reading database ... 183888 files and directories currently installed.)
Removing hptsvr (3.1.12) ...
```

- c. Enter the following command to check if the RAID Management has been removed successfully.

#hptraidconf

After uninstall:

```
root@testlu-Super-Server:/home/testlu/Desktop# hptraidconf
bash: /usr/bin/hptraidconf: No such file or directory
```