Using HighPoint NVMe RAID AICs with the Supermicro H11DSi

V1.00-Jan 3,2024

Table of Contents

1. Supermicro H11DSi Introduction

This document provides guidelines and procedures for installing HighPoint NVMe AICs into the Supermicro H11DSi. 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 Chassis

Supermicro H11DSi Chassis list:

Chassis	Model
2U	SuperChassis 213AC-R1K23LPB
	SuperChassis 216BE1C4-R1K23LPB
	SuperChassis 825TQC-R802LPB
	SuperChassis 826BE1C4-R1K23LPB
	SuperChassis 829HE1C4-R1K62LPB
3U	SuperChassis 836BE1C-R1K23B
4U	SuperChassis 745BAC-R1K28B2
	SuperChassis 846BE1C-R1K23B

1.2 Chipset

Supermicro H11DSi Chipset: System on Chip

1.3 Processor Types

Supermicro H11DSi processor type: Dual EPYC 7001/7002* Series Processors, in Socket SP3. (*AMD EPYC 7002 series drop-in support requires board revision 2.x)

1.4 Memory

Memory Capacity: 16 DIMM slots
Supports up to 2TB Registered ECC DDR4 2666MHz SDRAM in 16 DIMMs
Supports up to 4TB Registered ECC DDR4 3200MHz SDRAM (Board revision 2.x required)
8-channel memory bus

Memory type: DDR4 2666 MHz Registered ECC, 288-pin gold-plated DIMMs
DDR4 3200 MHz Registered ECC, 288-pin gold-plated DIMMs (Board revision 2.x required)

DIMM Sizes: 8GB, 16GB, 32GB, 64GB, 128GB, 256GB

Memory Voltage: 1.2V

1.5 PCIe slots

Supermicro H11DSi PCIe Expansion Slot Configuration:

Slot	CPU	Height	Length	Width	Link width	Slot width
1	2	Full Height	Half Length	Single Width	x8	x8
2	1	Full Height	Full Length	Single Width	x16	x16
3	1	Full Height	Half Length	Single Width	x8	x8
4	1	Full Height	Full Length	Single Width	x16	x16
5	1	Full Height	Half Length	Single Width	x8	x8

Note: *Supermicro 2U chassis are only available in Half Height.*

1.6 GPU

Supermicro H11DSi Graphic:

GPU Type	Slot priority
ASPEED AST2500 BMC	N/A

Notes:

The ASPEED AST2500 BMC is an integrated graphics card and will not take up a PCIe slot.

1.7 Other PCIe devices

The Supermicro H11DSi is available with optional PCIe devices.

The following table provides a list of PCIe device accessories available for the Supermicro H11DSi and which slot they are typically associated with.

PCIe devices type	Slot priority
Intel i350 on LAN Controller	1, 3, 5

Note: *Supermicro platforms are typically shipped with an array of pre-installed PCIe devices. Please note, one or more PCIe slots may be unavailable for use with HighPoint NVMe AICs.*

2. HighPoint NVMe RAID AIC compatibility with the Supermicro H11DSi

HighPoint NVMe RAID AICs	Slot1 PCIe 3.0 x8	Slot2 PCIe 3.0 x16	Slot3 PCIe 3.0 x8	Slot4 PCIe 3.0 x16	Slot5 PCIe 3.0 x8
Gen3 AICs					
SSD6202	√[1]	√[1]	√[1]	√[1]	√[1]
SSD6202A	√[1]	√[1]	√[1]	√[1]	√[1]
SSD6204A	√[1, 2]	√[1, 2]	√[1, 2]	√[1, 2]	√[1, 2]
SSD7101A-1	X	√[1, 2]	X	√[1, 2]	X
SSD7104	X	√[1, 2]	X	√[1, 2]	X
SSD7105	X	√[1, 2]	X	√[1, 2]	X
SSD7140A	X	√[1, 2]	X	√[1, 2]	X
SSD7202	√[1]	√[1]	√[1]	√[1]	√[1]
SSD7204	√[1, 2]	√[1, 2]	√[1, 2]	√[1, 2]	√[1, 2]
RocketAIC 7105HW	X	√[1, 2]	X	√[1, 2]	X
RocketAIC 7140AW	X	√[1, 2]	X	√[1, 2]	X
Gen4 AICs					
SSD7502	X	√[1]	X	√[1]	X
SSD7505	X	√[1, 2]	X	√[1, 2]	X
SSD7540	X	√[1, 2]	X	√[1, 2]	X
RocketAIC 7502HW	X	√[1]	X	√[1]	X
RocketAIC 7505HW	X	√[1, 2]	X	√[1, 2]	X
RocketAIC 7540HW	X	√[1, 2]	X	√[1, 2]	X

Notes:

√[1] *means that the HighPoint NVMe RAID AIC can be used normally in this slot if you do not have other PCIe devices installed in this slot.*

√[2] *means that the HighPoint NVMe RAID AIC can be used normally in this slot if you use the Full Height chassis.*

X *means that the HighPoint NVMe RAID AIC is not compatible with this slot.*

3. Installing HighPoint NVMe RAID AICs into the Supermicro H11DSi

3.1 Install hardware

3.1.1 Recommended tools

a. Screwdriver (system cover require a screwdriver to open)
b. Wired ESD wrist strap (to prevent electrostatic accidents)

3.1.2 Installing the Hardware into 2U and 4U Chassis: SuperChassis 213AC-R1K23LPB/ SuperChassis 216BE1C4-R1K23LPB/ SuperChassis 846BE1C-R1K23B

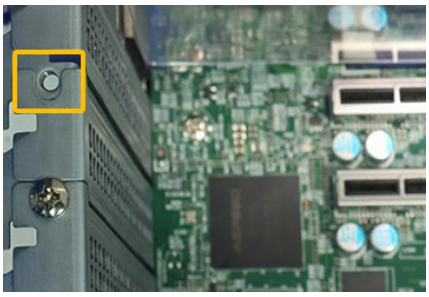
For PCIe slot recommendations, please refer to this table.
The following installation procedure applies to these chassis:

Chassis	Model
2U	SuperChassis 213AC-R1K23LPB
	SuperChassis 216BE1C4-R1K23LPB
4U	SuperChassis 846BE1C-R1K23B

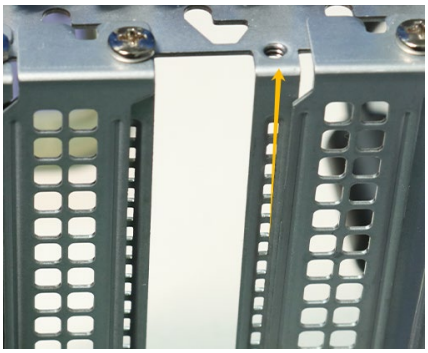
a. Use a wired ESD wrist strap that is properly grounded.
b. Shut down the system.
c. Press both release tabs simultaneously to release the cover from the locked position.

d. Lift the cover up and off the chassis.

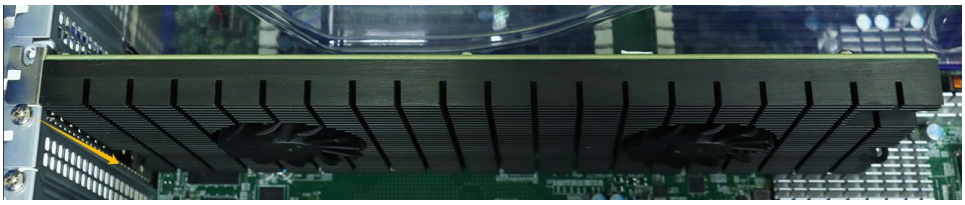
e. Remove the screw securing the PCI shield.



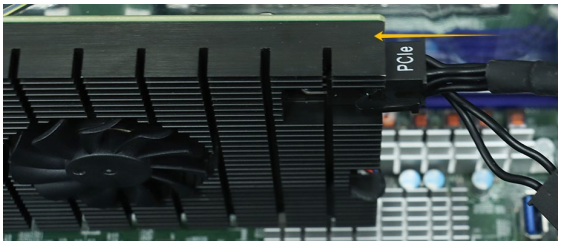
f. Remove the PCI shield pre-installed in the expansion slot.

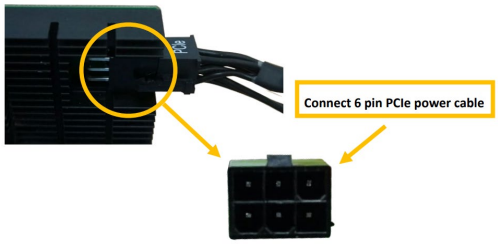


g. Holding the edge of the HighPoint NVMe RAID AIC, align the HighPoint NVMe RAID AIC connector with the expansion slot and insert it downward.



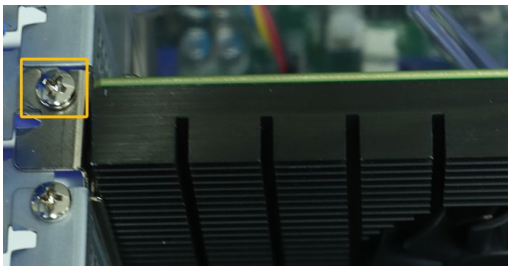
h. If you are using the SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you will need to connect the power cable to the 6-pin power connector on the side of the HighPoint NVMe RAID AICs.





Note: *If you are not using SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you can safely move to the next step.*

i. Install the screw securing the HighPoint NVMe RAID AIC bracket.



j. Align the cover with the chassis in the locked position.

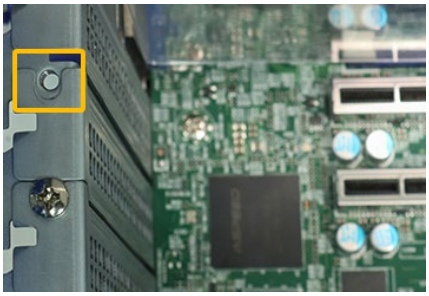
3.1.3 Installing the Hardware into 2U and 3U Chassis: SuperChassis 825TQC-R802LPB/ SuperChassis 826BE1C4-R1K23LPB/ SuperChassis 829HE1C4-R1K62LPB/ SuperChassis 836BE1C-R1K23B

For PCIe slot recommendations, please refer to this table.
The following installation procedure applies to these chassis:

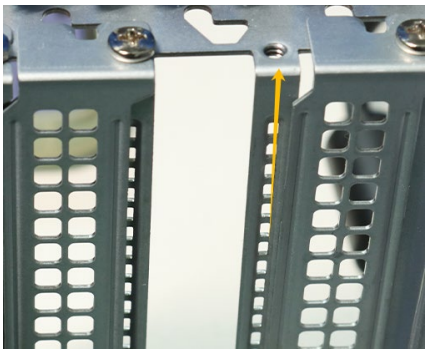
Chassis	Model
2U	SuperChassis 825TQC-R802LPB
	SuperChassis 826BE1C4-R1K23LPB
	SuperChassis 829HE1C4-R1K62LPB
3U	SuperChassis 836BE1C-R1K23B

a. Use a wired ESD wrist strap that is properly grounded.
b. Shut down the system.
c. Insert a screwdriver to remove the screws and on the sides of the chassis.
d. Press both release tabs simultaneously to release the cover from the locked position.

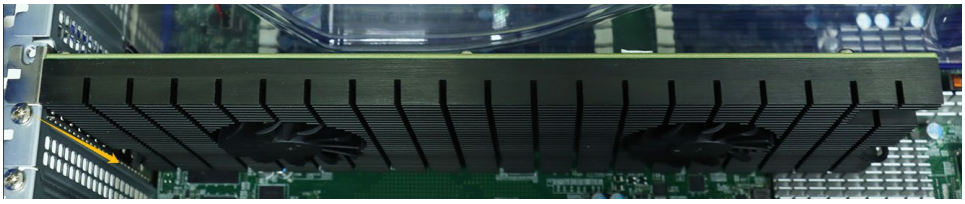
e. Lift the cover up and off the chassis.
f. Remove the screw securing the PCI shield.



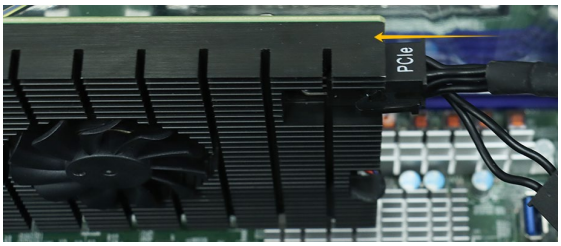
g. Remove the PCI shield pre-installed in the expansion slot.

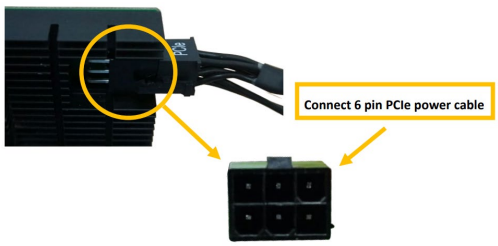


h. Holding the edge of the HighPoint NVMe RAID AIC, align the HighPoint NVMe RAID AIC connector with the expansion slot and insert it downward.



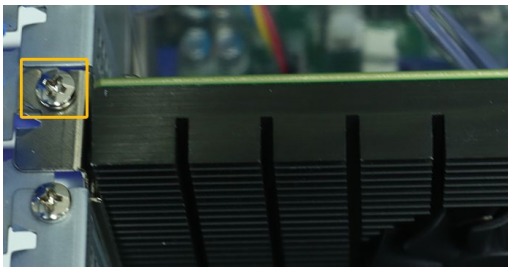
i. If you are using the SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you will need to connect the power cable to the 6-pin power connector on the side of the HighPoint NVMe RAID AICs.





Note: *If you are not using SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you can safely move to the next step.*

j. Install the screw securing the HighPoint NVMe RAID AIC bracket.



k. Align the cover with the chassis in the locked position.

l. Insert a screwdriver and install the screws removed in step c to secure the chassis and cover.

3.1.4 Installing the Hardware into the SuperChassis 745BAC-R1K28B2

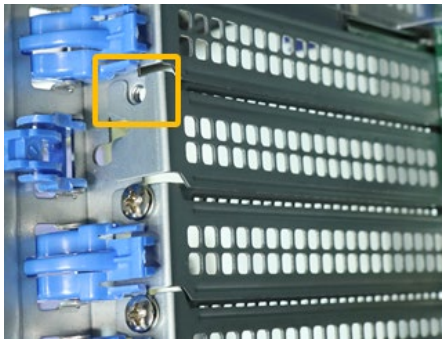
For PCIe slot recommendations, please refer to this table.
The following installation procedure applies to these chassis:

Chassis	Model
4U	SuperChassis 745BAC-R1K28B2

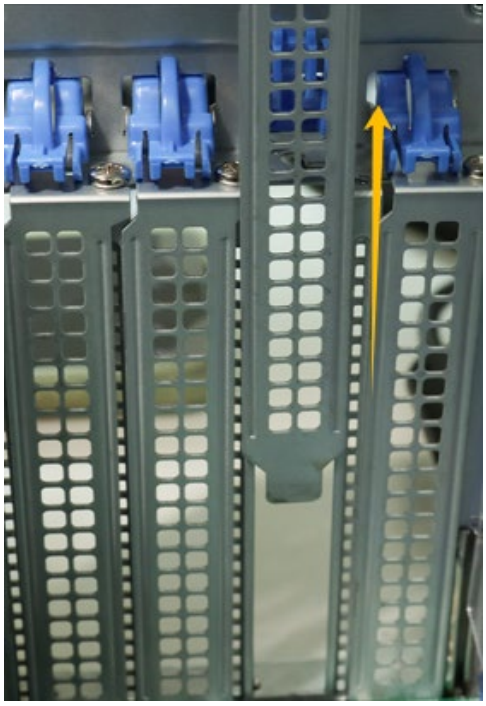
a. Use a wired ESD wrist strap that is properly grounded.
b. Shut down the system.
c. Locate the latch on the cover, press where it says "Push" and lift the latch to release the cover.

d. In the rear of the chassis, push on the PCI shield lock, then lift up on the lock.

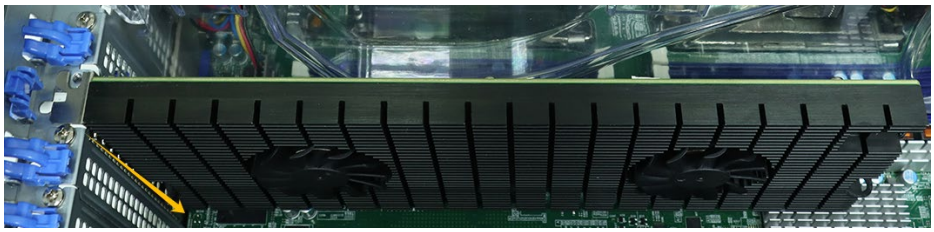
e. Remove the screw securing the PCI shield.



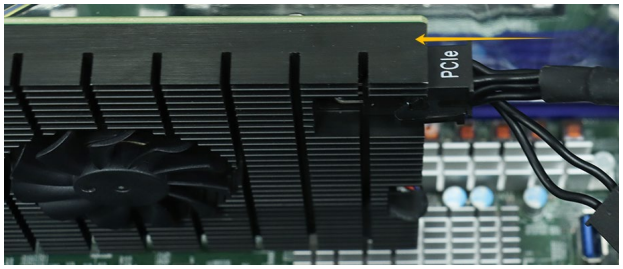
f. Remove the PCI shield.

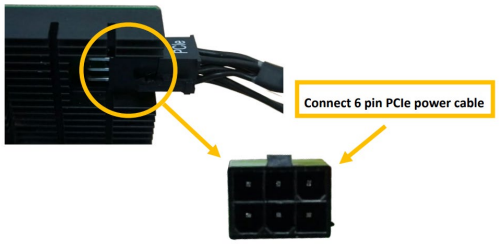


g. Holding the edge of the HighPoint NVMe RAID AIC, align the HighPoint NVMe RAID AIC connector with the expansion slot and insert it downward.



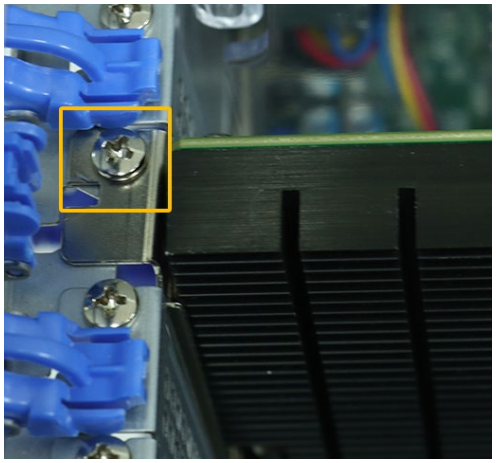
h. If you are using the SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you will need to connect the power cable to the 6-pin power connector on the side of the HighPoint NVMe RAID AICs.





Note: *If you are not using SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you can safely move to the next step.*

i. Install the screw securing the HighPoint NVMe RAID AIC bracket.



j. Secure the HighPoint NVMe RAID AIC bracket onto the rear of the chassis with the PCI shield lock.

k. Align the cover with the chassis in the locked position.

3.2 System BIOS Setting

The following is a list of Supermicro H11DSi system BIOS settings required for each NVMe RAID AIC.
Please refer to the following sections for system BIOS settings setup procedures.
3.2.1 Disable Secure boot
3.2.2 Boot mode to UEFI

HighPoint NVMe RAID AICs	System BIOS Settings (Boot RAID configurations)	
	Secure Boot	Boot mode
SSD6202	√	√
SSD6202A	√	√
SSD6204A	√	√
SSD7105	√[1]	√
SSD7202	√[1]	√
SSD7502	√[1]	√
SSD7505	√[1]	√
SSD7540	√[1]	√
RocketAIC 7105HW	√[1]	√
RocketAIC 7502HW	√[1]	√
RocketAIC 7505HW	√[1]	√
RocketAIC 7540HW	√[1]	√

HighPoint NVMe RAID AICs	System BIOS Settings (Data RAID configurations)
	Secure Boot
SSD6202	√
SSD6202A	√
SSD6204A	√
SSD7101A-1	√[1]
SSD7104	√[1]
SSD7105	√[1]
SSD7140A	√[1]
SSD7202	√[1]
SSD7204	√[1]
SSD7502	√[1]
SSD7505	√[1]
SSD7540	√[1]
RocketAIC 7105HW	√[1]
RocketAIC 7140AW	√[1]
RocketAIC 7502HW	√[1]

RocketAIC 7505HW	√[1]
RocketAIC 7540HW	√[1]

Notes:

√ means that the HighPoint NVMe RAID AIC support this BIOS setting.

√[1] means that the HighPoint NVMe RAID AIC support this BIOS setting if you are not using the Linux.

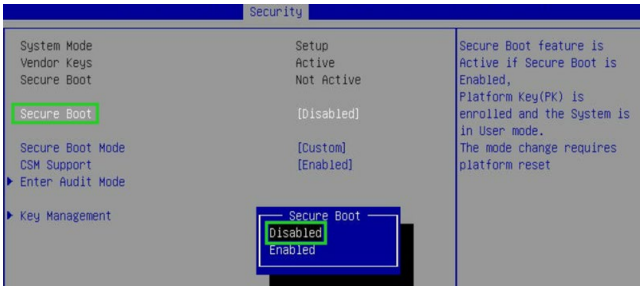
3.2.1 Disable Secure boot

***Note**: If you are using the SSD7000/7500 series NVMe RAID AICs or RocketAIC series NVMe Drives in Linux, Secure Boot must be disabled. If you are using the SSD6200 series NVMe RAID AICs, Secure Boot can be enabled.*

a. Power up the system.

b. Press **<Delete>** to enter BIOS.

c. Find **Security→Secure Boot**, select **Disabled**.



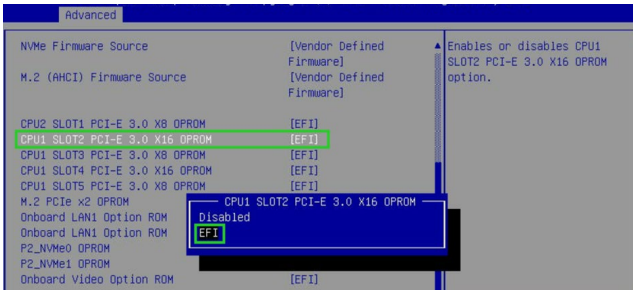
d. Save configuration and restart system.

3.2.2 Boot mode to UEFI

a. Power up the system.

b. Press **<Delete>** to enter BIOS.

c. Find **Advanced→PCIe/PCI/PnP Configuration→CPU SLOT PCI-E OPROM,** select **EFI**.



d. Save configuration and restart system.

3.3 Install software

3.3.1 Installing HighPoint NVMe RAID AICs into the Supermicro H11DSi (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 Supermicro H11DSi (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.

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. Benchmarking HighPoint NVMe RAID AICs

4.1 Performance Testing

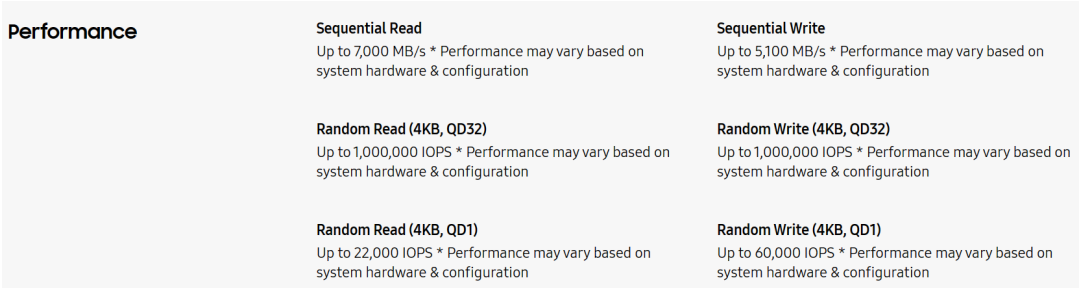
4.1.1 Recommended Hardware Configuration

- **Supermicro H11DSi:**
  CPU: AMD EPYC 7282 16-Core Processor
  Memory: 32 GB
  PCIe Slot: CPU1 SLOT3 PCI-E 3.0 X8/ CPU1 SLOT2 PCI-E 3.0 X16

- **HighPoint NVMe RAID AICs:**

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

- **Disk:**
  Samsung 980 Pro 2TB
  Note: *Samsung 980 Pro 2TB Disk spec.*



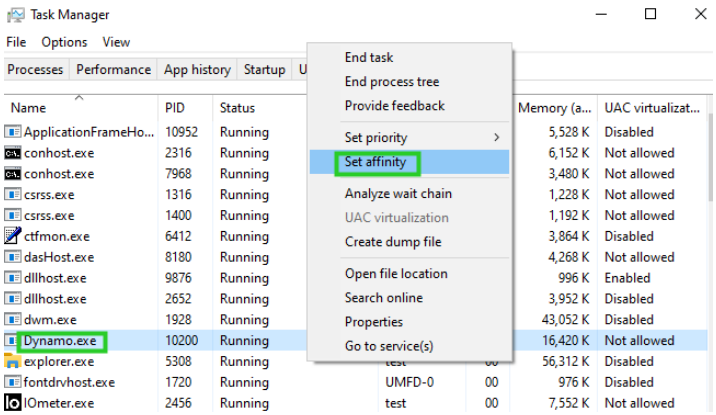
4.1.2 Test tool

Benchmark Tool: Iometer/ CrystalDiskMark

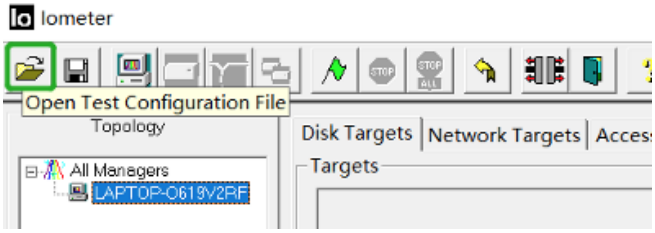
- **Iometer script setting:**
  The Iometer script can be downloaded here.
  Note: *If you use the SSD6200 series NVMe RAID AICs, you will need to download another iometer script.*

  - 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.

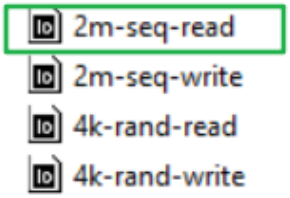
a. Open Iometer with administrator rights.
b. The system has two CPUs, so you need to specify the CPU node for performance testing.
   a) open **Task Manager** and find **Dynamo.exe** in Details.
   b) Right-click and select **Set affinity** to specify the CPU node (the CPU corresponding to the SLOT inserted in the HighPoint NVMe RAID AICs).



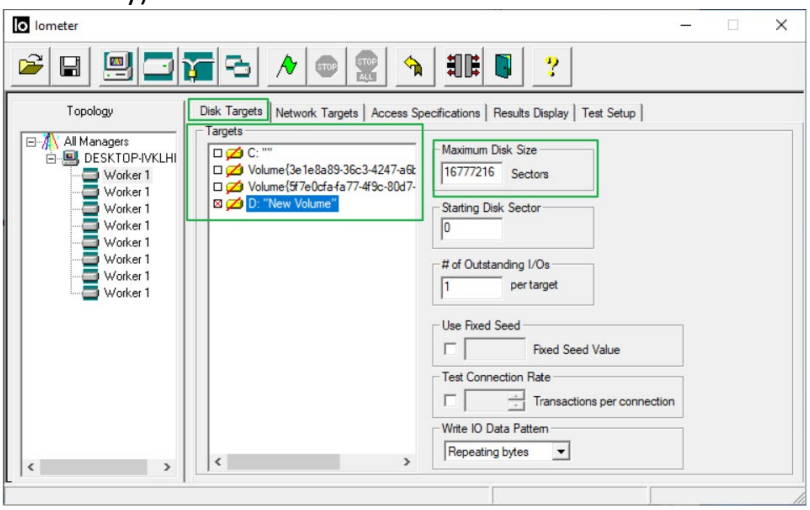
c. Click the folder icon to open the script, then select the script to be configured.



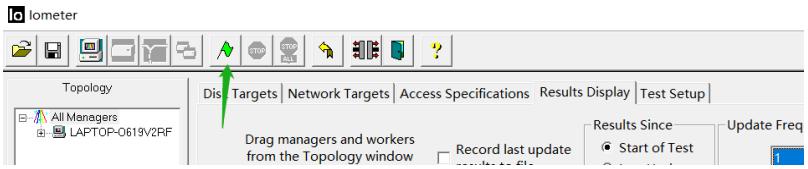
d. Select **2M-seq-read**.



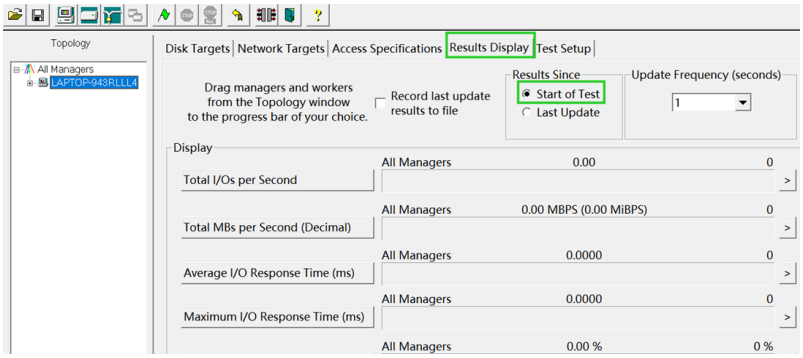
e. The **Disk Targets** page will change, the **Target** should be the test disk (the RAID array). The **Maximum Disk Size** should be set to **16777216** Sectors.



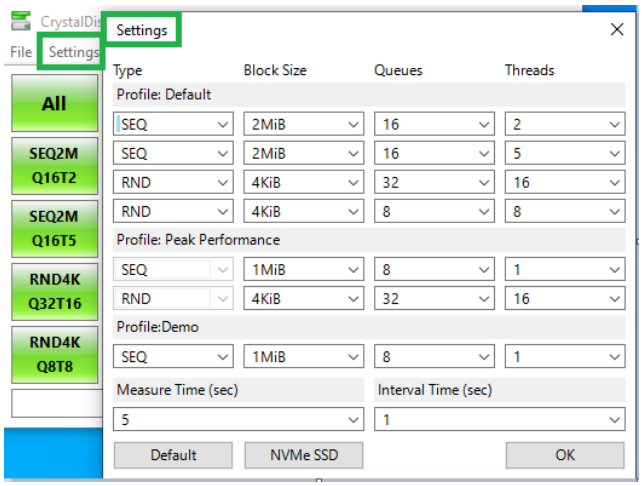
f. After confirming the settings, click the green mark to start the performance test.



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

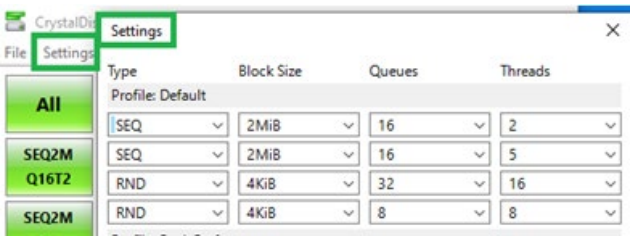


- **CrystalDiskMark script setting:**

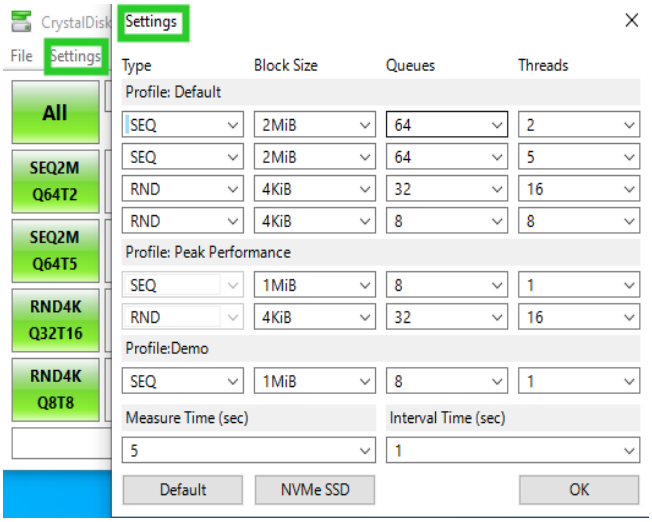


a. Open CrystalDiskMark with administrator rights.

b. Click **Settings.**

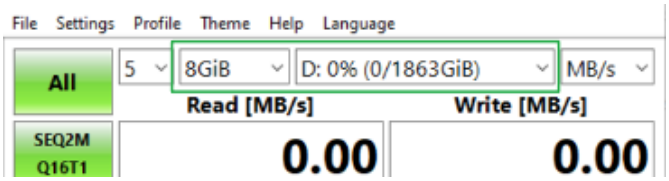


***Note1:** Please refer to the following Screenshot for recommended settings.*

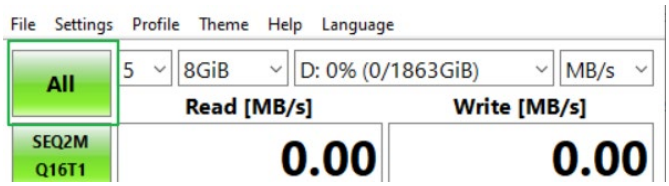


***Note2:** The above recommended setting will meet the needs of most NVMe RAID AICs and achieve optimal performance in testing. In testing, you can also choose to adjust the settings in the script yourself for optimal performance.*

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	7,084	7,047	/
	SSD6202A	3,504	6,744	6,981	/
	SSD6204A	1,759	6,940	3,551	/
	SSD7101A-1	3,580	14,207	7,038	14,205
	SSD7104	3,478	14,201	6,946	14,163
	SSD7105	3,499	14,501	7,108	14,022
	SSD7202	3,550	7,082	6,991	/
	SSD7204	3,512	7,104	6,849	7,039
2m-Seq-Write (MiB/s)	SSD6202	3,541	6,048	3,435	/
	SSD6202A	3,487	6,082	3,068	/
	SSD6204A	1,798	6,105	1,766	/
	SSD7101A-1	3,518	12,167	3,518	7,030
	SSD7104	3,398	11,882	3,409	7,018
	SSD7105	3,450	12,003	3,487	6,827
	SSD7202	3,489	6,921	3,503	/
	SSD7204	3,523	6,941	3,392	3,488
4k-Rand-Read (IOPS)	SSD6202	792,401	740,214	692,304	/
	SSD6202A	802,304	859,794	871,488	/
	SSD6204A	505,139	710,251	692,304	/
	SSD7101A-1	830,996	112,222	110,075	114,074
	SSD7104	835,390	111,044	105,802	113,602
	SSD7105	550,134	685,187	663,248	680,916
	SSD7202	720,064	125,028	119,943	/
	SSD7204	854,424	120,418	118,013	110,104
4k-Rand-Write (IOPS)	SSD6202	640,324	602,401	610,410	/
	SSD6202A	630,103	697,440	655,622	/
	SSD6204A	401,230	646,801	390,412	/
	SSD7101A-1	640,705	100,269	67,775	70,149
	SSD7104	659,117	99,344	69,771	70,260
	SSD7105	512,401	581,660	391,969	449,213
	SSD7202	600,413	102,019	67,308	/
	SSD7204	691,716	110,411	70,214	84,410

- **CrystalDiskMark**

(script setting)	Gen3 RAID AIC	RAID0	RAID1	RAID10
2m-Seq (MB/s)	SSD6202	Read (MB/s) / Write (MB/s): 7091.97 / 6094.81; 7089.09 / 5990.38; 7091.33 / 6196.43 Read (IOPS) / Write (IOPS): 17399.90 / 34367.68; 751978.76 / 622340.33	Read (MB/s) / Write (MB/s): 3501.71 / 3076.82; 3518.82 / 2826.95; 3385.01 / 2826.32 Read (IOPS) / Write (IOPS): 4260.99 / 4517.58; 64720.46 / 60543.70	/
	SSD6202A	Read (MB/s) / Write (MB/s): 7090.12 / 6068.45; 7080.56 / 5963.35; 7089.55 / 6185.47 Read (IOPS) / Write (IOPS): 17425.29 / 34111.82; 753682.86 / 612148.44	Read (MB/s) / Write (MB/s): 3365.71 / 2852.91; 6531.09 / 3072.44; 7090.46 / 3097.30 Read (IOPS) / Write (IOPS): 17660.64 / 33466.80; 759752.69 / 612403.32	/
	SSD6204A	Read (MB/s) / Write (MB/s): 7167.46 / 6293.31; 7110.21 / 6120.37; 7149.06 / 6329.13 Read (IOPS) / Write (IOPS): 17058.59 / 32642.33; 759351.07 / 630235.35	Read (MB/s) / Write (MB/s): 3555.28 / 1746.74; 3574.27 / 1751.60; 3568.01 / 1744.22 Read (IOPS) / Write (IOPS): 17143.07 / 32351.56; 755278.56 / 309083.74	/
	SSD7101A-1	Read (MB/s) / Write (MB/s): 8519.79 / 6973.30; 14203.42 / 13622.58; 13938.63 / 13672.41 Read (IOPS) / Write (IOPS): 14625.49 / 25269.53; 120545.41 / 101606.45	Read (MB/s) / Write (MB/s): 7113.39 / 3479.07; 7019.14 / 3423.78; 7105.31 / 3513.17 Read (IOPS) / Write (IOPS): 14116.21 / 16669.43; 124646.97 / 66862.30	Read (MB/s) / Write (MB/s): 9537.62 / 6498.91; 14219.71 / 6821.12; 14262.82 / 7003.29 Read (IOPS) / Write (IOPS): 12900.15 / 15700.44; 118853.76 / 67914.31
	SSD7104	Read (MB/s) / Write (MB/s): 8570.74 / 7132.65; 14222.08 / 13650.43; 14254.46 / 13890.52 Read (IOPS) / Write (IOPS): 12848.14 / 20532.47; 120481.20 / 101422.61	Read (MB/s) / Write (MB/s): 7120.12 / 3478.20; 7035.08 / 3424.40; 7110.23 / 3513.26 Read (IOPS) / Write (IOPS): 12512.94 / 16110.84; 122422.85 / 67673.58	Read (MB/s) / Write (MB/s): 8944.67 / 6444.33; 14205.08 / 6826.28; 14253.31 / 7007.99 Read (IOPS) / Write (IOPS): 12368.65 / 14904.79; 119739.99 / 68412.84
	SSD7105	Read (MB/s) / Write (MB/s): 10065.30 / 9034.93; 14381.82 / 13669.17; 14368.93 / 13972.07 Read (IOPS) / Write (IOPS): 19283.94 / 45782.96; 683653.81 / 557442.63	Read (MB/s) / Write (MB/s): 6726.47 / 3489.82; 7153.48 / 3432.70; 7159.77 / 3516.81 Read (IOPS) / Write (IOPS): 19337.16 / 43494.87; 679922.61 / 436710.69	Read (MB/s) / Write (MB/s): 8146.26 / 6678.06; 14059.65 / 6813.24; 14152.33 / 7006.53 Read (IOPS) / Write (IOPS): 19251.71 / 43307.62; 672479.25 / 456711.18
	SSD7202	Read (MB/s) / Write (MB/s): 7120.96 / 6895.42; 7113.55 / 6838.88; 7140.26 / 7027.57 Read (IOPS) / Write (IOPS): 14260.74 / 23640.38; 127708.25 / 103927.98	Read (MB/s) / Write (MB/s): 7114.38 / 3488.72; 7034.39 / 3426.80; 7118.04 / 3514.55 Read (IOPS) / Write (IOPS): 14658.94 / 15319.82; 125192.63 / 66577.88	/
	SSD7204	Read (MB/s) / Write (MB/s): 7118.29 / 7040.32; 7148.21 / 6990.52; 7148.31 / 7172.84 Read (IOPS) / Write (IOPS): 12920.17 / 19447.51; 120475.10 / 102032.23	Read (MB/s) / Write (MB/s): 7127.90 / 3454.66; 7138.44 / 3421.68; 7148.05 / 3499.72 Read (IOPS) / Write (IOPS): 12845.46 / 15947.02; 126938.48 / 67617.19	Read (MB/s) / Write (MB/s): 7126.10 / 3501.66; 7052.72 / 3426.26; 7107.23 / 3516.89 Read (IOPS) / Write (IOPS): 12603.76 / 15519.78; 124370.36 / 68022.71

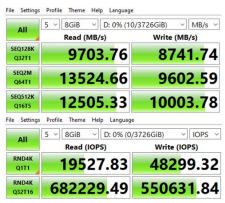
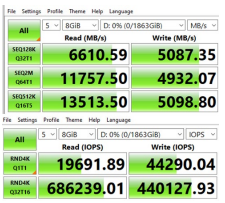
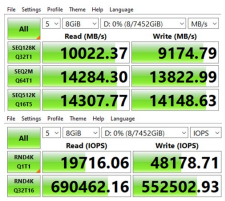
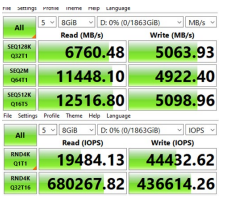
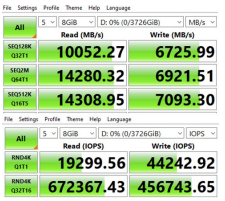
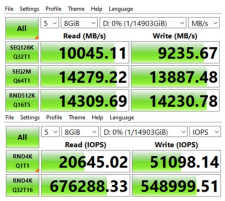
Note: */ means that this AIC does not support the creation of RAID10.*

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	6,941	13,840	12,104	/
	SSD7505	6,724	14,313	11,431	14,314
	SSD7540	6,811	14,314	N/A	N/A
2m-Seq-Write (MiB/s)	SSD7502	5,029	7,041	5,120	/
	SSD7505	4,942	10,900	5,057	7,127
	SSD7540	5,041	11,065	N/A	N/A
4k-Rand-Read (IOPS)	SSD7502	641,404	658,771	675,705	/
	SSD7505	658,964	705,962	657,870	672,632
	SSD7540	659,715	706,431	N/A	N/A
4k-Rand-Write (IOPS)	SSD7502	509,823	570,443	420,014	/
	SSD7505	512,004	577,474	389,852	449,421
	SSD7540	517,931	573,880	N/A	N/A

- **CrystalDiskMark**

(script setting)	Gen4 RAID AIC	RAID0	RAID1	RAID10
2m-Seq (MB/s)	SSD7502			/
	SSD7505			
	SSD7540		N/A	N/A

Notes:

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

***N/A** means that this AIC did not test this item.*

5. Uninstalling HighPoint NVMe RAID AICs from the Supermicro H11DSi

5.1 Uninstall hardware

5.1.1 Recommended tools

a. Screwdriver (system cover require a screwdriver to open)
b. Wired ESD wrist strap (to prevent electrostatic accidents)

5.1.2 Uninstalling the Hardware from 2U and 4U Chassis: SuperChassis 213AC-R1K23LPB/ SuperChassis 216BE1C4-R1K23LPB/ SuperChassis 846BE1C-R1K23B

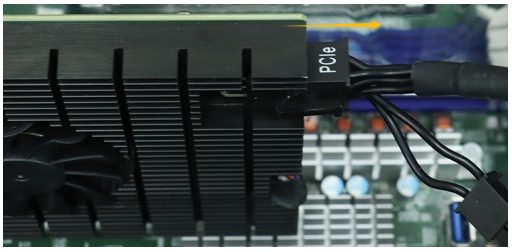
The following installation procedure applies to these chassis:

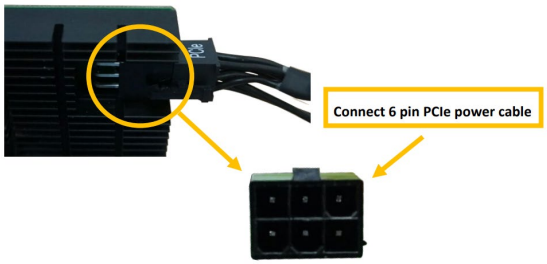
Chassis	Model
2U	SuperChassis 213AC-R1K23LPB
	SuperChassis 216BE1C4-R1K23LPB
4U	SuperChassis 846BE1C-R1K23B

a. Use a wired ESD wrist strap that is properly grounded.
b. Shut down the system.
c. Press both release tabs simultaneously to release the cover from the locked position.
d. Lift the cover up and off the chassis.

e. Remove the screw securing the HighPoint NVMe RAID AIC bracket.

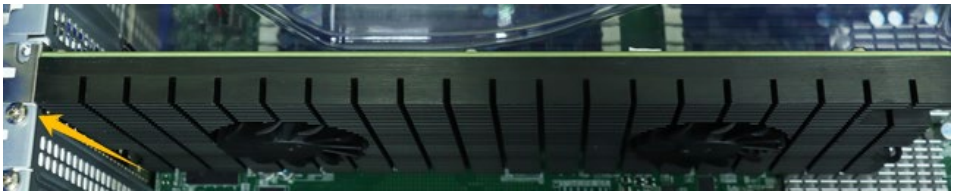
f. If you are using the SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you will need to disconnect the power cable to the 6-pin power connector on the HighPoint NVMe RAID AICs.



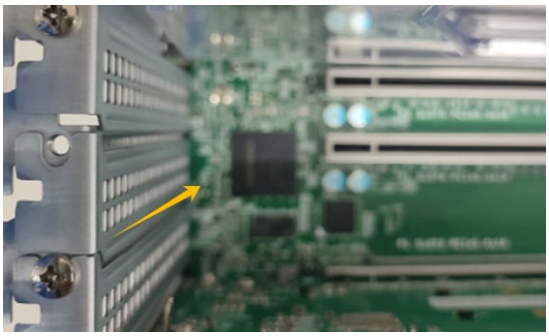


Note: *If you are not using SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you can safely move to the next step.*

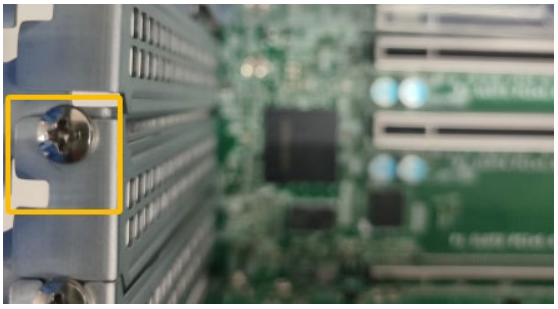
g. Holding the edge of the HighPoint NVMe RAID AIC, lift up to remove the HighPoint NVMe RAID AIC connector from the expansion slot.



h. Install the PCI shield into the expansion slot.



i. Install the screw securing the PCI shield.



j. Align the cover with the chassis.

5.1.3 Uninstalling the Hardware from 2U and 3U Chassis: SuperChassis 825TQC-R802LPB/ SuperChassis 826BE1C4-R1K23LPB/ SuperChassis 829HE1C4-R1K62LPB/ SuperChassis 836BE1C-R1K23B

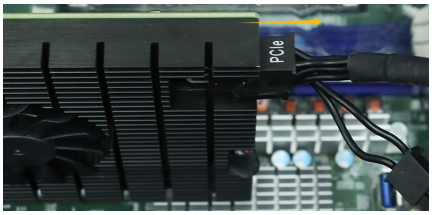
For PCIe slot recommendations, please refer to this table.
The following installation procedure applies to these chassis:

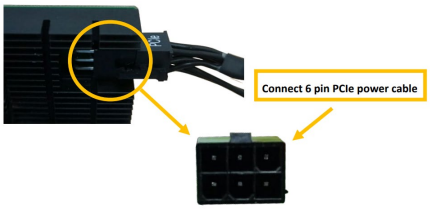
Chassis	Model
2U	SuperChassis 825TQC-R802LPB
	SuperChassis 826BE1C4-R1K23LPB
	SuperChassis 829HE1C4-R1K62LPB
3U	SuperChassis 836BE1C-R1K23B

a. Use a wired ESD wrist strap that is properly grounded.
b. Shut down the system.
c. Insert a screwdriver to remove the screws at the rear of the chassis and on the sides of the cover.
d. Lift the cover up and off the chassis.

e. Remove the screw securing the the HighPoint NVMe RAID AIC bracket.

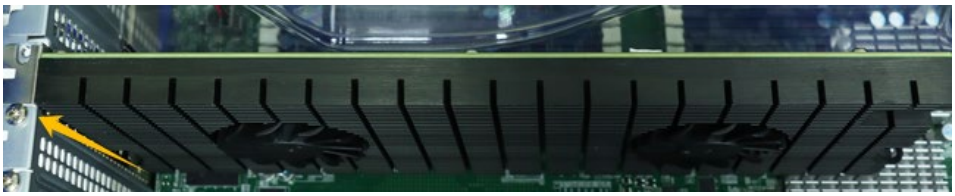
f. If you are using the SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you will need to disconnect the power cable to the 6-pin power connector on the HighPoint NVMe RAID AICs.



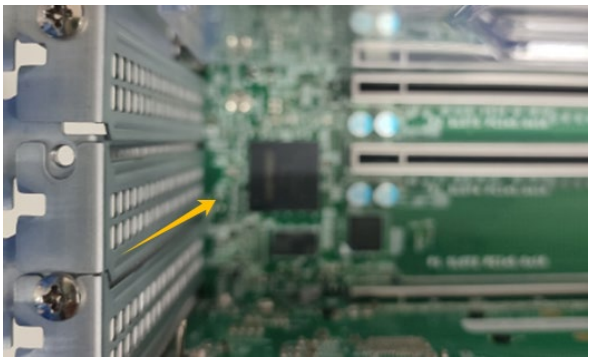


Note: *If you are not using SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you can safely move to the next step.*

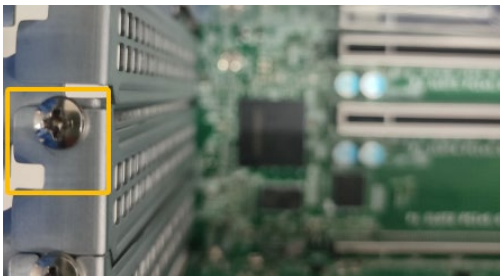
g. Holding the edge of the HighPoint NVMe RAID AIC, lift up to remove the HighPoint NVMe RAID AIC connector from the expansion slot.



h. Install the PCI slot cover into the expansion slot.



i. Install the screw securing the PCI slot cover.



j. Align the cover with the chassis.

k. Insert a screwdriver and install the screws removed in step c to secure the chassis and cover.

5.1.4 Uninstalling the Hardware from the SuperChassis 745BAC-R1K28B2

For PCIe slot recommendations, please refer to this table.
The following installation procedure applies to these chassis:

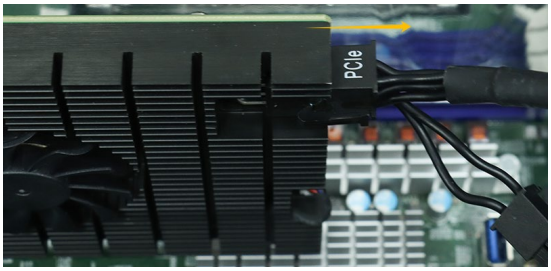
Chassis	Model
4U	SuperChassis 745BAC-R1K28B2

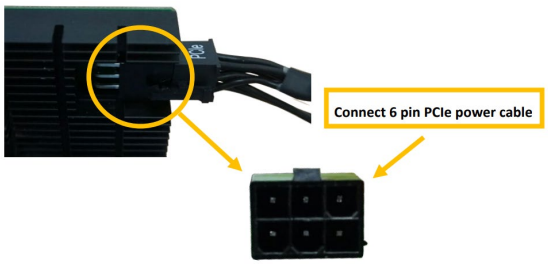
a. Use a wired ESD wrist strap that is properly grounded.
b. Shut down the system.
c. Locate the latch on the cover, press where it says "Push" and lift the latch to release the cover.

d. In the rear of the chassis, push on the PCI shield lock, then lift up on the lock.

e. Remove the screw securing the HighPoint NVMe RAID AIC bracket.

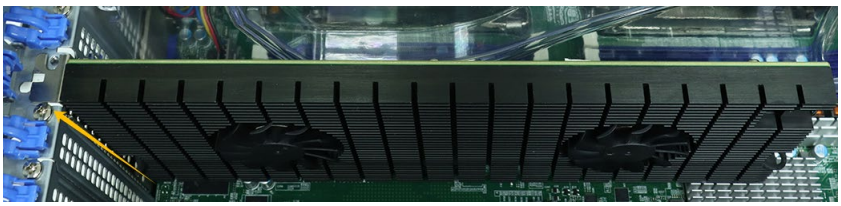
f. If you are using the SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you will need to disconnect the power cable to the 6-pin power connector on the HighPoint NVMe RAID AICs.





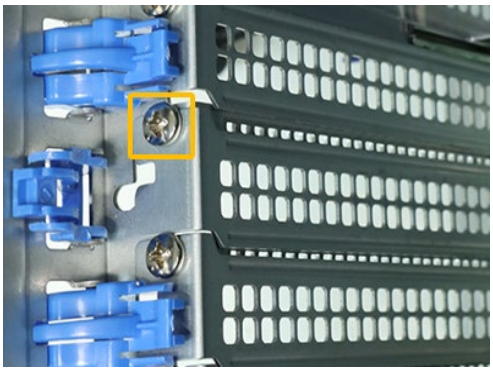
Note: *If you are not using SSD7140A, SSD7540, RocketAIC 7140AW or RocketAIC 7540HW, you can safely move to the next step.*

g. Holding the edge of the HighPoint NVMe RAID AIC, lift up to remove the HighPoint NVMe RAID AIC connector from the expansion slot.

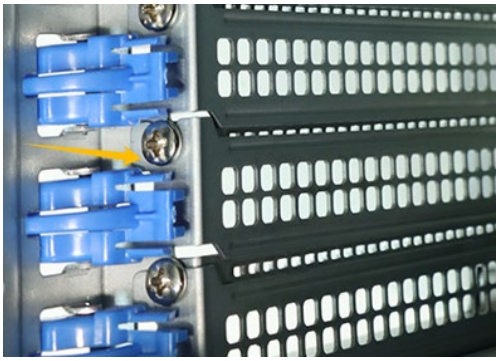


h. Install the PCI shield into the expansion slot.

i. Install the screw securing the PCI shield.



j. Secure the PCI shield onto the rear of the chassis with the PCI shield lock.



k. Align the cover with the chassis in the locked position.

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 system.

Notes:

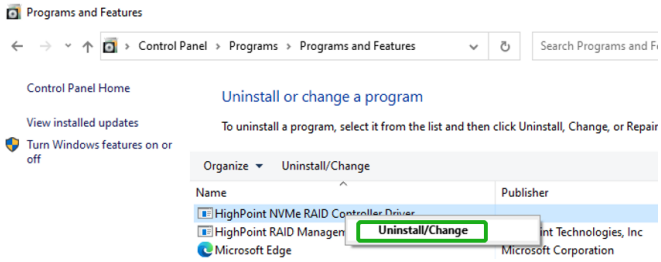
Failing to remove the HighPoint NVMe RAID AIC from the system during the uninstall process may result in data loss.

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 SSDs hosted by the HighPoint NVMe RAID AIC.

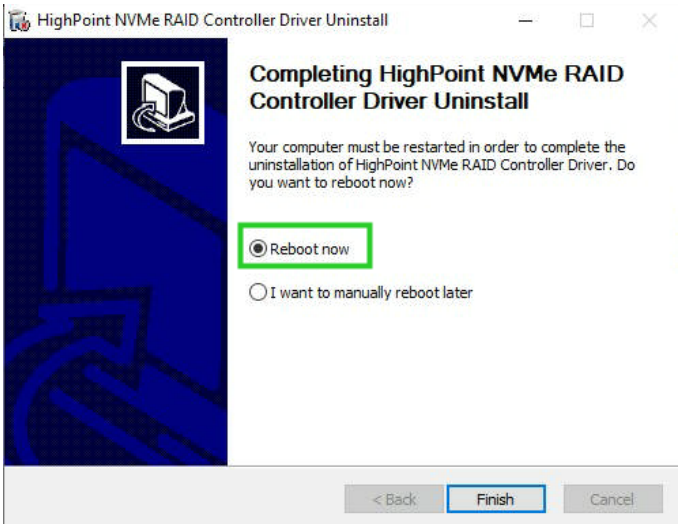
b. Power on the system and boot Windows.

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

d. Click **Uninstall/Change.**



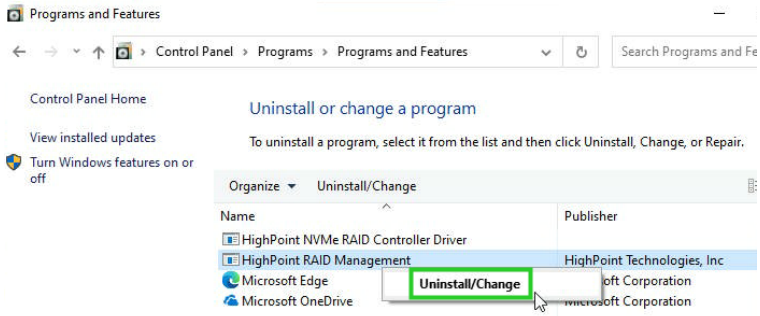
e. After uninstalling the driver, click Finish.



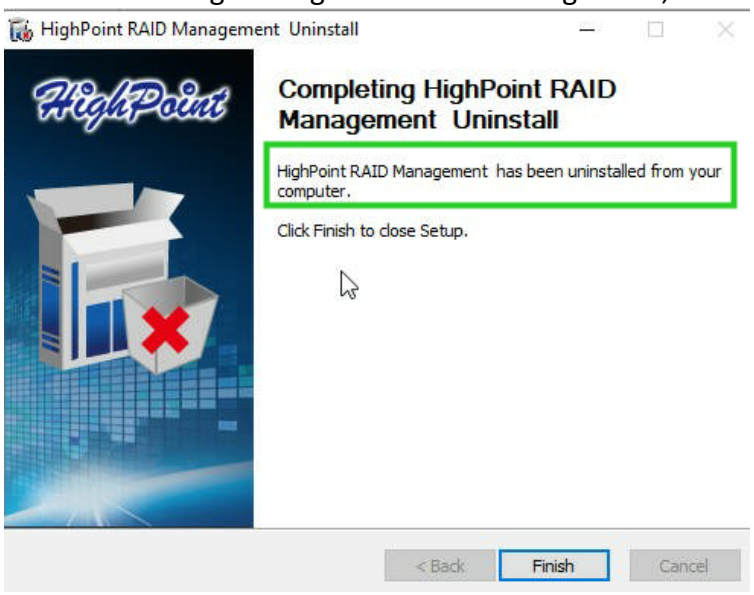
f. Reboot Windows to complete the uninstall procedure.

5.2.1.2 Uninstall the RAID Management Software

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



d. After uninstalling the HighPoint RAID Management, click Finish.



5.2.2 Uninstall the HighPoint NVMe RAID AIC for Linux

5.2.2.1 Uninstall the Driver

a. Open the system terminal with root privileges.
b. Enter the following commands to uninstall the driver: **hptuninhptnvme.**
c. Press **'Y'** to confirm.

```
[root@localhost Downloads]# hptuninhptnvme
Are you sure to uninstall the driver hptnvme 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]#
```

d. 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
```