
# SSD7000 Software Guide

## V1.03- October 10, 2024

# Table of Contents

# 1. Overview

This document is the primary reference and user guide for the HighPoint NVMe RAID AIC. This document contains the complete using the HighPoint Web RAID Management Interface (WebGUI), CLI (command line interface) utility, UEFI utility, and SafeStorage SED Solution.

## 1.1. General Features of the NVMe RAID AIC

- RAID levels: 0, 1, 10, Single
- Single-RAID or multi-RAID arrays per AIC
- Cross-Sync RAID solution across AICs
- Multiple RAID partitions supported
- TRIM RAID support
- Data RAID support
- WebGUI (Browser-Based management tool)
- CLI (Command Line Interface- scriptable configuration tool)
- API package
- Fast initialization for quick array setup
- Check Consistency for background data integrity
- Automatic and configurable RAID Rebuilding Priority
- Auto resume incomplete rebuilding after power on or reboot system
- Self-monitoring, Analysis, and Reporting Technology (S.M.A.R.T) support
- Storage Health Inspector
- SMTP Email Alert Notification
- Online Array Roaming
- Global Hot Spare Disk support

# 1.2. Advanced Features of the NVMe RAID AIC

The following table lists the advanced features and the NVMe RAID AICs that support them.

**Table 1: Features and support NVMe RAID AICs**

| Advanced Features | Support NVMe RAID AICs |
|---|---|
| **SSD HotPlug Support** | SSD6780A/ SSD7580B/ SSD7580C/RS6542AW /RA6542AWW-S491T5-12 |
| **LED Indicators** | SSD6444/ SSD6444M/ SSD6540/ SSD6540M/ SSD6780A/ SSD7749M/ RS6542AW/ RocketAIC7749MWSeries/ RA6542AWW-S491T5-12 |
| **Fan Control** | SSD7101A-1/ SSD7104/ SSD7104F/ SSD7105/ SSD7140A/ SSD7180/ SSD7184/ SSD7202/ SSD7502/ SSD7505/ SSD7540/ SSD7580A/ SSD7580B/ SSD7580C/ SSD6444/ SSD6444M/ SSD6540/ SSD6540M/ SSD6780A/ RS6542AW/ RocketAIC7105HWSeries/ RocketAIC7140AWSeries/ RocketAIC7502HWSeries/ RocketAIC7505HWSeries/ RocketAIC7540HWSeries/ RA6542AWW-S491T5-12 |
| **SafeStorage Encryption** | SSD7580C/ SSD7749M/ SSD7749M2/ SSD7749E/ SSD6780A/ RS6542AW/ RA7105HW-A04T0-03/ RA7502HW-A02T0-03/ RA7502HW-A04T0-00/ RA7502HW-A08T0-09/ RA7505HW-A04T0-03/ RA7505HW-A08T0-00/ RA7505HW-A04T0-0D/ RA7505HW-A08T0-0E/ RA7505HW-A16T0-0F/ RA7540HW-A16T0-00/ RA7540HW-A16T0-0E/ RA7540HW-A32T0-0F/ RA7749EW-K15T3-0A/ RA7749EW-K30T7-0B/ RA7749EW-K61T4-0C/ RA7749MW-A32T0-0F/RA6542AWW-S491T5-12 |
| **Boot RAID Support** | SSD7105/ SSD7202/ SSD7502/ SSD7505/ SSD7540/ SSD7580A/ SSD7580B/ SSD7580C/ SSD7749E/ SSD7749M/ SSD7749M2/ SSD6780A/ RS6542AW<br>RocketAIC 7105HWSeries/ RocketAIC 7502HWSeries<br>RocketAIC 7505HWSeries/ RocketAIC 7540HWSeries<br>RocketAIC 7749EWSeries/ RocketAIC 7749MW Series<br>RocketAIC7749M2WSeries/RA6542AWW-S491T5-12 |
| **UEFI HII Utility** | SSD7105/ SSD7202/ SSD7502/ SSD7505/ SSD7540/ SSD7580A/ SSD7580B/ SSD7580C/ SSD7749E/ SSD7749M/ SSD7749M2/ SSD6780A/ RS6542AW<br>RocketAIC 7105HWSeries/ RocketAIC 7502HWSeries<br>RocketAIC 7505HWSeries/ RocketAIC 7540HWSeries<br>RocketAIC 7749EWSeries/ RocketAIC 7749MW Series<br>RocketAIC7749M2WSeries/RA6542AWW-S491T5-12 |
| **Flash ROM for Upgradeable UEFI** | SSD7105/ SSD7202/ SSD7502/ SSD7505/ SSD7540/ SSD7580A/ SSD7580B/ SSD7580C/ SSD7749E/ SSD7749M/ SSD7749M2/ SSD6780A/ RS6542AW |

| | |
|---|---|
| | RocketAIC 7105HWSeries/ RocketAIC 7502HWSeries<br>RocketAIC 7505HWSeries/ RocketAIC 7540HWSeries<br>RocketAIC 7749EWSeries/ RocketAIC 7749MW Series<br>RocketAIC7749M2WSeries/RA6542AWW-S491T5-12 |

# 1.3. Technical Support

For assistance with using your HighPoint NVMe RAID AIC, please contact our Technical Support Department.

## 1.3.1. One-Click Diagnostic Feature

One-Click Diagnostic is a unique feature of our HighPoint RAID Management. One-Click Diagnostic provides an information collection system for troubleshooting. It will gather all necessary hardware, software, and storage configuration data and compile it into a single file, which can be transmitted directly to our FAE Team via our Online Support Portal.

# 2. SafeStorage Encryption

**Overview**

The SafeStorage Encryption (SED) service uses a secured key to encrypt data stored on SED-capable disks. Without the corresponding security key, the encrypted data becomes inaccessible. This approach ensures the confidentiality of data in the event of disk theft, loss, or removal.

The SafeStorage solution, developed by HighPoint, seamlessly integrates with industry-standard Self-Encrypted Drive (SED) technology and complies with OPAL v2.0. It supports M.2 and U.2/U.3 NVMe media, adhering to the specifications outlined by the OPAL SSC TCG (Trusted Computing Group). The objective is safeguarding data assets by preventing unauthorized access to stored information when physical drives are misplaced or stolen.

The SafeStorage solution applies to both single-disk and RAID configurations. Activation is facilitated through Disk Security, which can be easily managed via our HighPoint RAID Management.

**Benefits**

Numerous customers are actively seeking a comprehensive and efficient storage encryption solution to ensure the security of their data. To fulfill this urgent need, we recommend SafeStorage Encryption. By simply setting a security key, you can significantly reduce the risk of data loss and provide solid protection for valuable information assets.

In addition, SafeStorage Encryption also supports Cryptographic erase, which further enhances effective data erasure and disk reuse. We are confident that by adopting SafeStorage Encryption, you will be able to better meet the increasingly complex data security challenges and support your organization’s robust development.

# 2.1. Workflow

**Overview**

The SafeStorage can be operated in WEBGUI. The specific operation process is as follows:

1. Use the disk that has SED (self-encrypting disk) capability.
2. Enable AIC security and create a security key that conforms to the security requirements.
3. Enable disk security. The key used to secure the disk is the same as the key generated when the board is secured.
4. Enable RAID security when creating RAID with disks that have SED (self-encrypting disk) capability.

Please refer to the sections for the steps in the above process.

## 2.1.1. Enable Security

You can enable security on the AIC. To enable AIC security, you need to generate and configure a security key on the AIC. The security key is a unique identifier used to authenticate the AIC and protect from unauthorized access. The AIC security key you create will also serve as the disk security key, written to the disk or array.

After you enable AIC security, you can enable disk security using a security key.

**Enable AIC Security**

If you want to use SafeStorage, you must first enable AIC security option using the HighPoint RAID Management utility (WebGUI or CLI) and create a security Key.

Warning: Be sure to make a record of your AIC security key. If the security key is lost or forgotten, you will lose access to any encrypted data stored on the disk or RAID array.

**Enable Disk Security**

SafeStorage can only be used with storage media that has SED (self-encrypting disk) capability.

As mentioned previously, the disk security key is automatically generated when the AIC security key is created and will be written to the disk. These keys are identical. You only need to enable disk security.

There are two situations in which Disk Security can be enabled.

- Situation 1: Enabling Disk Security for disks with the Legacy status
- Situation 2: Enabling Disk Security when creating a RAID array

## 2.1.2. Change Security

You can change the security key on the AIC, and you can change the disk security key.

**Change AIC Security**

If you want to change the AIC security key, you must provide the old AIC security key.

When the AIC security key is changed to the new key, the disk security key is automatically changed to the same new key and written to the secured disk.

**Change Disk Security**

If the AIC and disk security keys do not match, you cannot access data stored on the disk or array. To resolve the password inconsistency, you need to change the disk security key to one that matches the current AIC so that you can access the data stored on the disk or RAID array.

To explain, there are two situations in which the AIC security key and disk security key will not match:

- Situation 1: The disk is from another AIC.
- Situation 2: The disk or array was not present when the AIC security key was changed.

## 2.1.3. Create a Secured RAID

Select the secured or unsecured disks to create a secure RAID and check the **secure** function.

## 2.1.4. Disable Security

If you disable security, there are two steps you need to follow.

1. Disable disk security using the Cryptographic Erase option.
2. Disable AIC security using the Disable Security option.

**Disable Disk Security**

If you want to disable disk security, use Cryptographic Erase.

Warning: Cryptographic erase will delete the Security (Encryption) key from the target disk/ array members. Data stored on these SSDs will no longer be accessible.

**Disable AIC Security**

We offer the “Disable Security” option to disable AIC security. The AIC security can only be disabled if the target AIC does not host any secured disks with the “legacy” status or secured arrays.

Warning: After disable AIC security, data stored on these secured disks will no longer be accessible.

## 2.1.5. Import SafeStorage Encryption

One of the features of all HighPoint RAID AIC is Online Array Roaming. Information about the RAID configuration is stored on the physical drives. So, if the AIC fails, you wish to use another AIC, or the drives to be moved to a different AIC, the RAID configuration data can still be read by another HighPoint RAID AIC. There are three situations:

- Situation 1: If the disks and HighPoint RAID AIC are not secured. You can do Online Array Roaming directly.
- Situation 2: If the disk security key and the HighPoint RAID AIC security key are the same. You can do Online Array Roaming directly.
- Situation 3: If the disks and HighPoint RAID AIC are secured and their security key does not match. You modify the AIC security key to match the disk security key or back up the data in the RAID, delete the RAID, and then create a new RAID on the AIC.

Note: The prerequisite for using this feature is that both AICs use the same AIC type. You can contact our FAE Team via our Online Support Portal for assistance.

# 3. UEFI Command Line Utility

## Overview

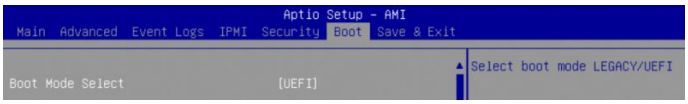
The UEFI (Unified Extensible Firmware Interface) command line utility is provided in a binary format, and no separate installation is required.

## Prerequisites

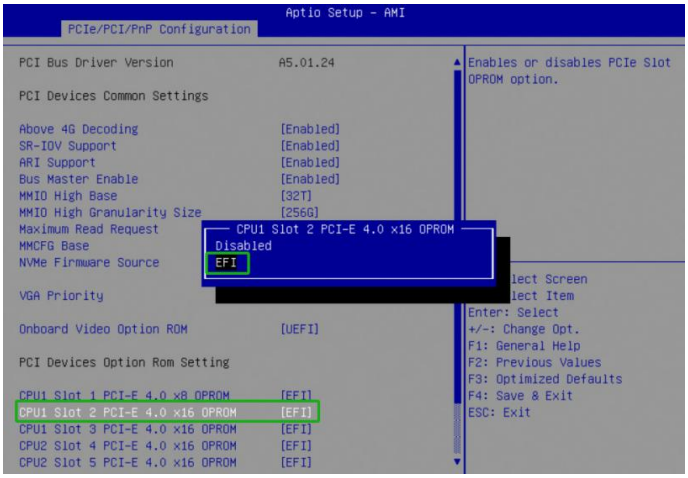
1. The AIC must be installed into a PCIe slot.
2. The motherboard needs to be booted into UEFI mode. Confirm that the motherboard boots in UEFI mode.

   Example: SuperMicro X12DPi-N6 motherboard

   1) Set **Boot Mode Select** to **UEFI.**



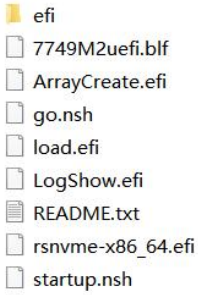

   2) Set the **Slot** where the AIC is located to **EFI**.




   3) Save changes and reboot.

3. A USB flash drive in FAT32 format. The UEFI package must be unzipped directly to the root directory of this flash drive. (Do not extract the contents in a new folder.)

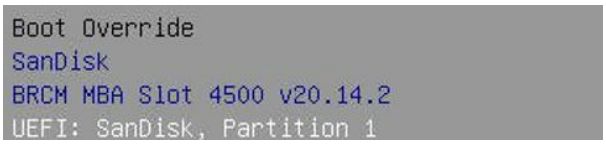
Example: SSD7749M2




- **7749M2uefi.blf** -- UEFI BLF file for SSD7749M2.
- **ArrayCreate.efi** -- EFI utility.
- **go.nsh** -- Batch file for flash loader.
- **load.efi** -- Flash utility for EFI environment.
- **LogShow**.efi -- EFI file for log.
- **README.txt** -- Includes an introduction to the UEFI, basic usage, etc.
- **rsnvme-x86_64.efi** -- EFI file for debug.
- **startup.nsh** -- Find USB driver.

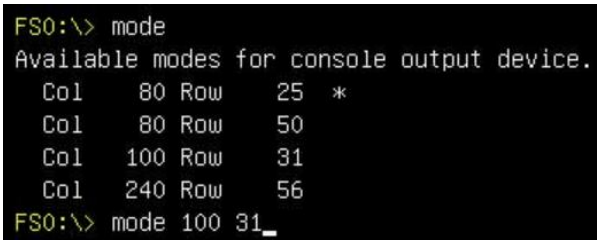
# 3.1. Start the UFEI Command Line Utility

1. Insert the USB flash drive and NVMe RAID AIC into the motherboard and boot the system.
2. Enter the motherboard's BIOS and select the **UEFI: USB flash drive** in the BIOS startup item.




3. At the prompt, enter the following command to change the resolution:

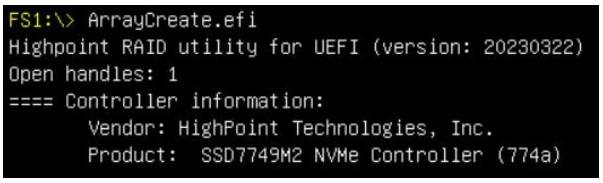
   **mode 100 31**




   Note: This command is used to adjust the screen resolution, please adjust it according to the actual situation of your motherboard.

4. Enter the following command to enter the UEFI command line:

   **ArrayCreate.efi**



# 3.2. Help Command


If you input an unknown or error command, you will be told that the command is unknown; you can use help commands to find the correct commands.

The following table lists and describes the properties of the help command.

**Table 2: Properties for help Commands**

| cmd | Property Name | Description |
|---|---|---|
| **H** | N/A | This command shows generic help about this utility. |
| **h** | | |
| **help** | | |

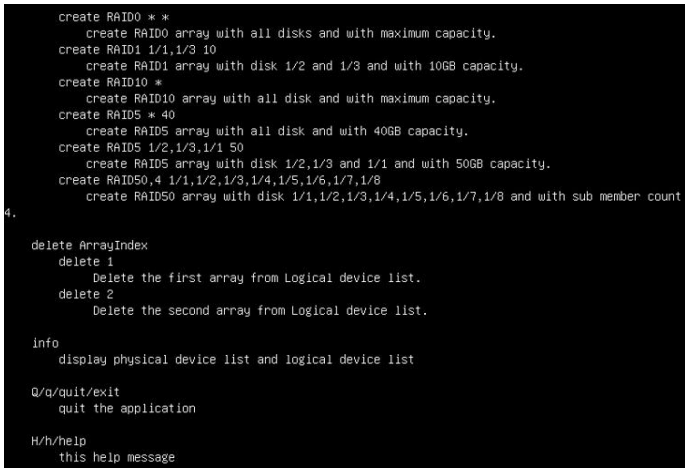
## 3.2.1. Show the Generic Help Command

**<<<H/ h/ help**

This command shows generic help about this utility.

**Input example:**

<<<help



# 3.3. Info Command

```
>>> Please specify command to execute:
<<< info
```

You can use the info command to view the NVMe RAID AIC status and disks information.

The following table lists and describes the properties of the info command.

**Table 3: Properties for info Commands**

| cmd | Property Name | Description |
|---|---|---|
| **info** | N/A | This command shows the NVMe RAID AIC status and disks information. |

## 3.3.1. Show the Physical Device Information

**<<<info**

Disks hosted by the AIC will appear here

**Input example:**

<<<info

```
<<< info
================================================================================

==== Physical device list(count 4):
1/1 Samsung SSD 980 PRO 1TB-S5GXNX1W506237F, 1000204MB(MaxFree 0MB), Normal
1/2 KXG80ZN84T09 KIOXIA-4122X2BFA00WFU26, 4096805MB(MaxFree 0MB), Normal
1/3 HP-EM2802T0GMTCB58R-E264-2311270010002, 2000398MB(MaxFree 0MB), Normal
1/4 KXG60ZNV1T02 TOSHIBA-694S100MTVDQ, 1024209MB(MaxFree 0MB), Normal
```

- **Location** – The physical disk location (e.g., 1/2 represents the disk on AIC 1 port2)
- **Model** – The model number of the physical disk.
- **Capacity** – The total capacity of the physical disk.
- **Max Free** – The space on the physical disk is not configured in an array.
- **Status** – The status of the physical disk.

# 3.3.2. Show the Logical Device Information

**<<<info**

Disks and arrays you create and the properties associated with them will appear here.

**Input example:**

<<<info

```
==== Logical device list(count 1):
 1 [VD24-4] RAID0_000041A7 (RAID0), 4000493MB (Stripe 512KB), Normal
    1/1 Samsung SSD 980 PRO 1TB
    1/2 KXG80ZN84T09 KIOXIA
    1/3 HP-EM2802T0GMTCB58R-E264
    1/4 KXG60ZNV1T02 TOSHIBA
```

- **Name** – The name of the arrays you created.
- **Type –** The RAID level of the arrays you created.
- **Capacity** – The total capacity of the array.
- **Stripe** – The block size of the arrays you created.
- **Status** – The status of the array.
- **Member disk** – The member disk of the array.

# 3.4. Quit Command


Quit the UEFI Command Line Utility.

The following table lists and describes the properties of the quit command.

**Table 4: Properties for quit Commands**

| cmd | Property Name | Description |
|---|---|---|
| **Q** | N/A | This command allows you to quit the UEFI Command Line Utility. |
| **q** | | |
| **quit** | | |

## 3.4.1. Quit the UEFI Command Line Utility

**<<<Q/ q/ quit**

This command allows you to quit the UEFI Command Line Utility.

**Input example:**

<<<quit

# 3.5. Exit Command


Exit the UEFI Command Line Utility.

The following table lists and describes the properties of the exit command.

**Table 5: Properties for exit Commands**

| cmd | Property Name | Description |
|---|---|---|
| **exit** | N/A | This command allows you to exit the UEFI Command Line Utility. |

## 3.5.1. Exit the UEFI Command Line Utility

**<<<exit**

This command allows you to exit the UEFI Command Line Utility.

**Input example:**

<<<exit

# 3.6. Create Command


You can use create commands to create a new RAID array.

Note: RocketAIC series NVMe AIC SSDs are already pre-configured with RAID0. You can skip those steps. You can follow the steps if you want to use another type of RAID.

The following table lists and describes the properties of the create command.

**Table 6: Properties for create Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **create** | ArrayType | RAID0<br>RAID1<br>RAID10 | Specify the RAID level to be created.<br>The AIC supports RAID levels 0, 1, and 10. |
| | disks | MemberDiskList | Specifies member disks that will compose a new array.<br>disks=1/2,1/3...or disks=*<br>* Indicates creation of RAID array using all member disks. |
| | capacity | capacity | Specify the capacity of the target array.<br>capacity=10MB/1000MB...or capacity=*<br>* Indicates creation of RAID array using all disk capacities. |

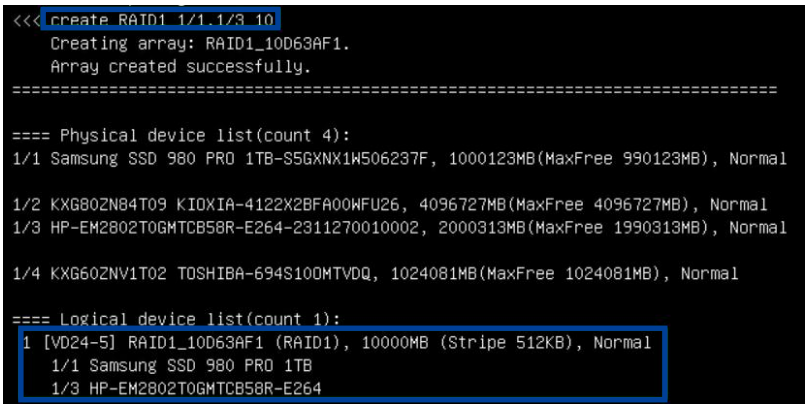
# 3.6.1. Create a RAID Array

**<<<create ArrayType (RAID0/RAID1/RAID10) MemberDiskList (1/1,1/2|*) Capacity(100|*)**

This command allows you to create a new RAID array.

**Input example:**

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



# 3.7. Delete Command

```
>>> Please specify command to execute:
<<< delete_
```

You can use delete command to delete an existing RAID array.

After deletion, the original array and all data will be lost. All the member disks will be listed as available single disks.

The following table lists and describes the properties of the delete command.

**Table 7: Properties for delete Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **delete** | {array_id} | The created RAID array | This command instructs the system to delete the array. |

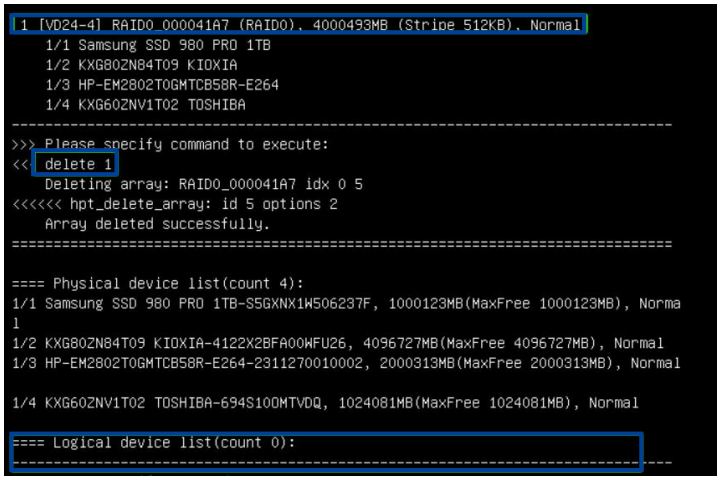
## 3.7.1. Delete a RAID Array

**<<<delete {array_id}**

This command allows you to delete an existing RAID array.

**Input example:**

<<<delete 1



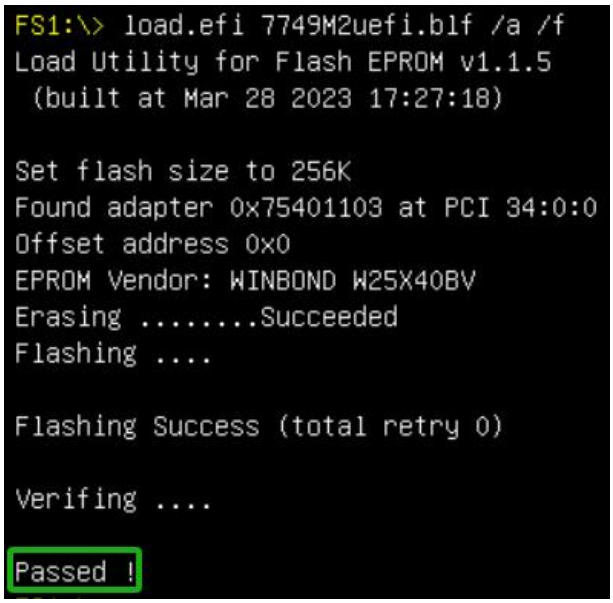
# 3.8. Flashing the UEFI

You can flash the UEFI in the UEFI interface. This usually involves loading the latest UEFI package onto the motherboard to get the latest feature updates.

1. Enter the motherboard's BIOS and select the UEFI: USB flash drive in the BIOS startup item.


2. Enter the following command to flash the NVMe RAID AIC UEFI: **go.nsh.**


3. When the message **Passed** appears, the flash is successful.




4. Reboot to complete the update process.

# 4. UEFI HII Utility

**Overview**

The UEFI HII Utility is a powerful tool. It provides the most flexible and intuitive interface options available to the user and performs other configuration tasks in a BIOS environment. It provides rich functions to help users easily and conveniently query AIC and disk information and configure AIC.

**Prerequisites**

1. The AIC must be installed into a PCIe slot.
2. The motherboard needs to be booted into UEFI mode. Confirm that the motherboard boots in UEFI mode.

## 4.1. Start the UEFI HII Utility

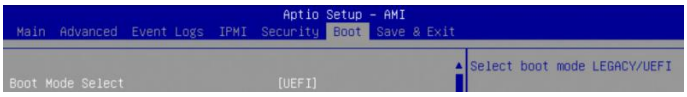
Follow these steps to start the UEFI HII Utility.

**Step 1 Adjust System EFI Settings**

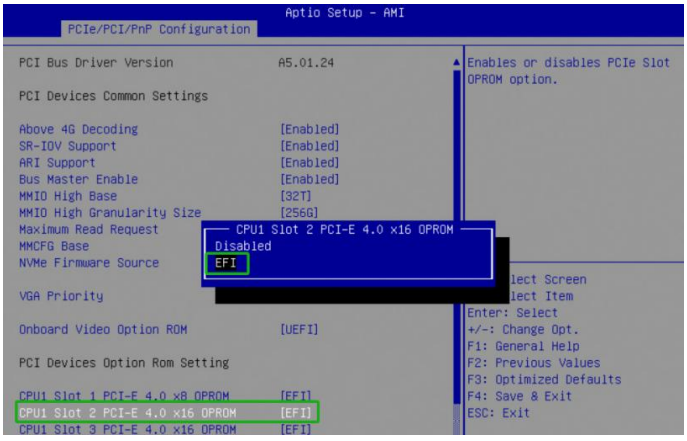
1. Insert the AIC into the motherboard, power on the system, and enter the BIOS.
2. Adjust the UEFI settings. Allow the option ROM settings for third-party devices to load.

   Example: SuperMicro X12DPi-N6 motherboard

   1) Set **Boot Mode Select** to **UEFI.**



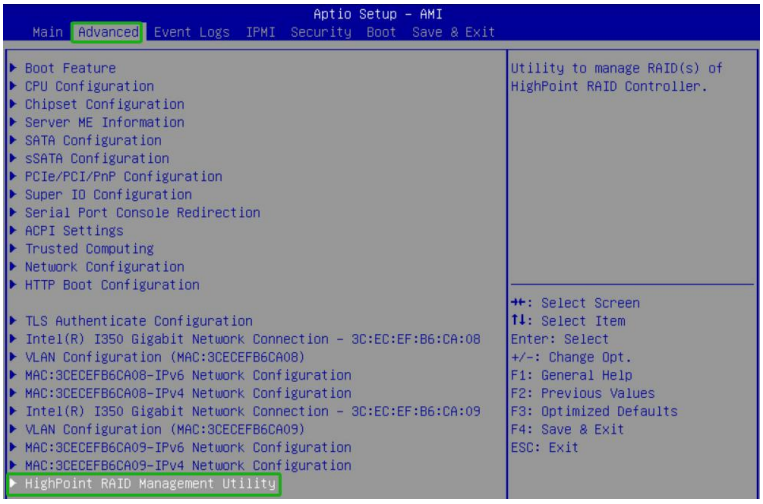

   2) Set the **Slot** where the AIC is located to **EFI**.




3. Save changes and reboot.

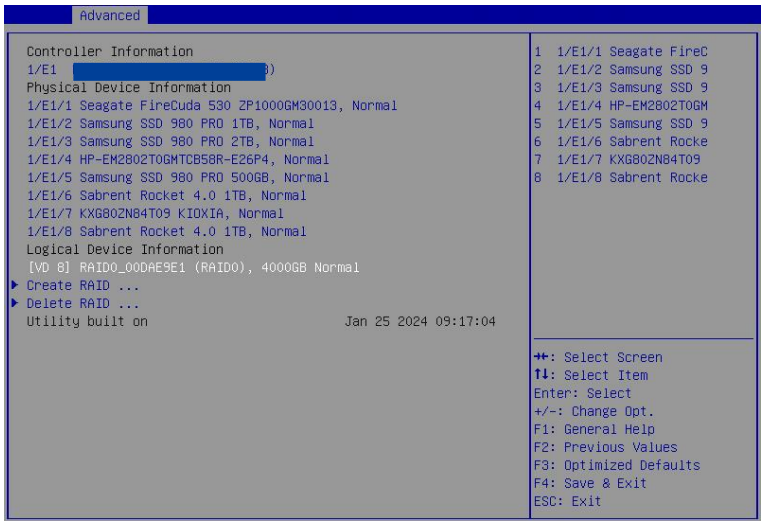
**Step 2 Enter the UEFI HII Utility**

1. Power up the system.
2. Press **Delete** to enter BIOS.
3. Find **Advanced→HighPoint RAID Management Utility** should appear under **Advanced** options.




4. Select **HighPoint RAID Management Utility** and enter it.

# 4.2. UEFI HII Utility Menu View



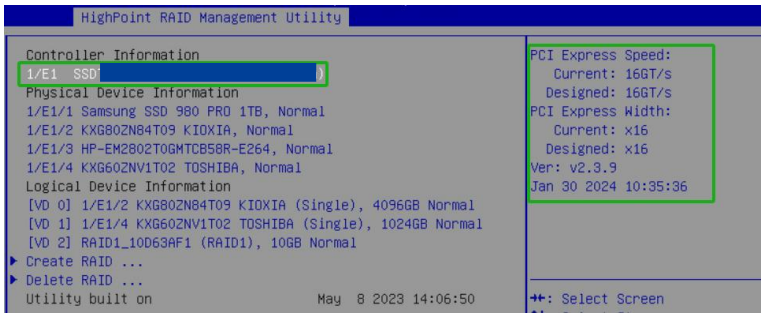

**Keys**

The UEFI HII Utility utilizes the following keys:

- **Arrow keys** – Use these to move between different menu items.
- **Enter** – Open the selected toolbar command/execute the selected command.
- **N or Esc** – Return to the previous menu, cancel the selected operation, or exit the BIOS Utility.

## 4.2.1. View the Controller Information

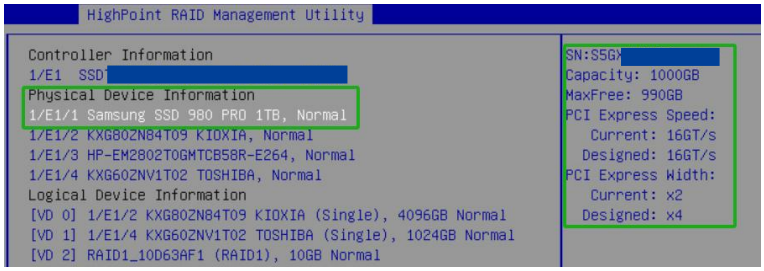
The UEFI HII Utility view allows you to view the Controller Information. The AIC that has been connected to the system will appear here.




- **Location –** The AIC location (example: 1/E1 represents the AIC1， AIC with ID 1)
- **Model –** The model name of the AIC connected.
- **PCI Express Speed –** The rate of current bandwidth and the rate of designed bandwidth.
- **PCI Express Width –** The current AIC occupies the PCIe width, and the designed AIC occupies the PCIe width.
- **Version –** The UEFI HII Utility version of the AIC.

## 4.2.2. View the Physical Device Information

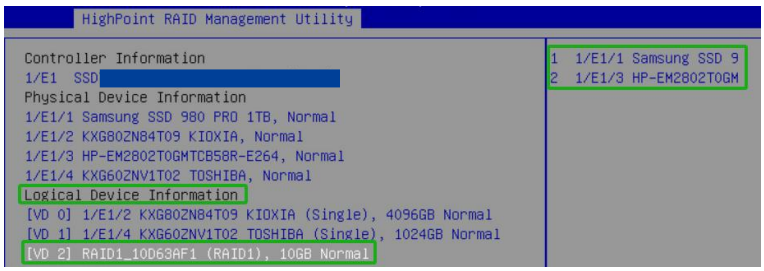
The UEFI HII Utility view allows you to view the Physical Device Information. The disks hosted by the AIC will appear here.




- **Location –** The disk location. (example: 1/E1/2 represents the AIC1, Port2)
- **Model –** The model number of the disk connected.
- **Status –** The (Normal) status of the disk.
- **SN –** The serial number of the physical disk.
- **Capacity –** The total capacity of the disk.
- **Max Free –** The total capacity that is not configured.
- **PCI Express Speed –** The current bandwidth rate and the designed rate.
- **PCI Express Width –** The current disk occupies the PCIe bandwidth, and the designed disk occupies the PCIe bandwidth.

## 4.2.3. View the Logical Device Information

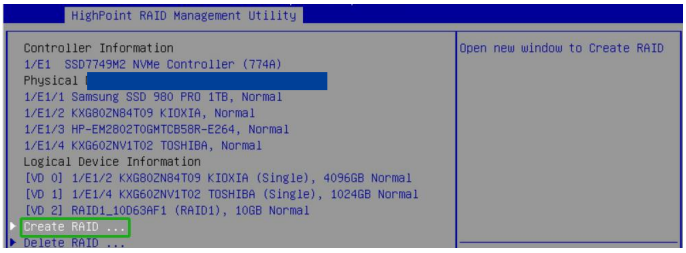
The UEFI HII Utility view allows you to view the Logical Device Information. The disks and arrays you create and their associated properties will appear here.




- **Name –** The name of the arrays you create.
- **Type –** The RAID level of the arrays you create.
- **Capacity –** The total capacity of the disk.
- **Status –**The (Normal, critical, disabled) status of the disk.
- **Member disk–** The member disk of the arrays.

# 4.2.4. Create a RAID array

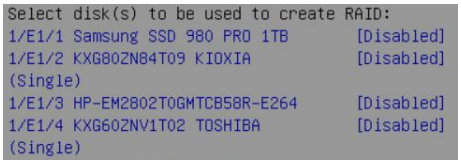
The UEFI HII Utility view allows you to create the RAID array.



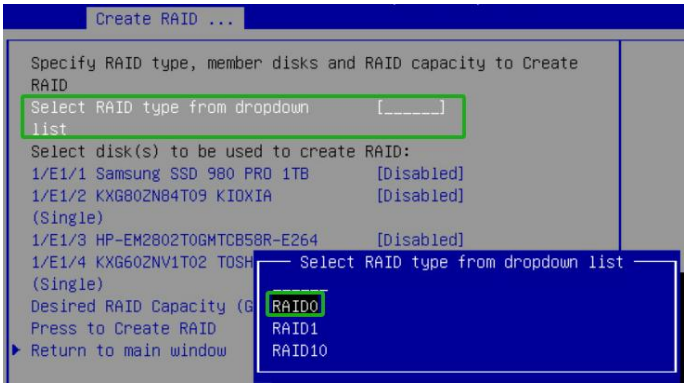

Note: RocketAIC series NVMe AIC SSDs are already pre-configured with RAID0. You can skip those steps. You can follow the steps if you want to use another type of RAID.

To create a RAID, perform the following steps:

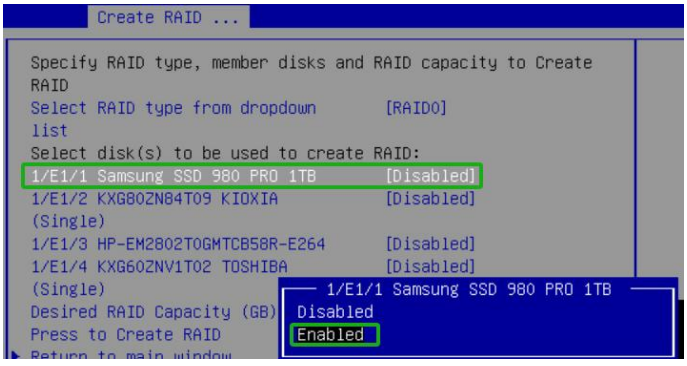
1. Select **Create RAID...** from the HighPint RAID Management Utility.
2. On the **Create** menu. A disk list will appear, and all available disks will be displayed.



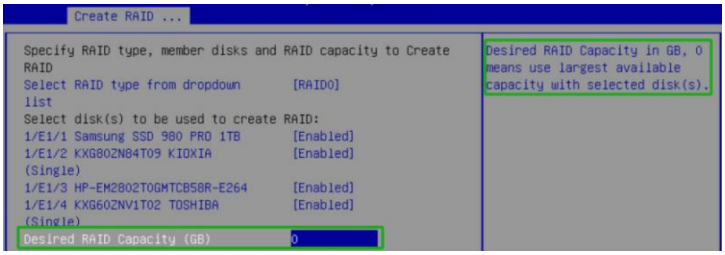

3. Select the **RAID type** from the dropdown list. Use the keyboard or mouse's up and down keys to select the RAID type and press **Enter**.



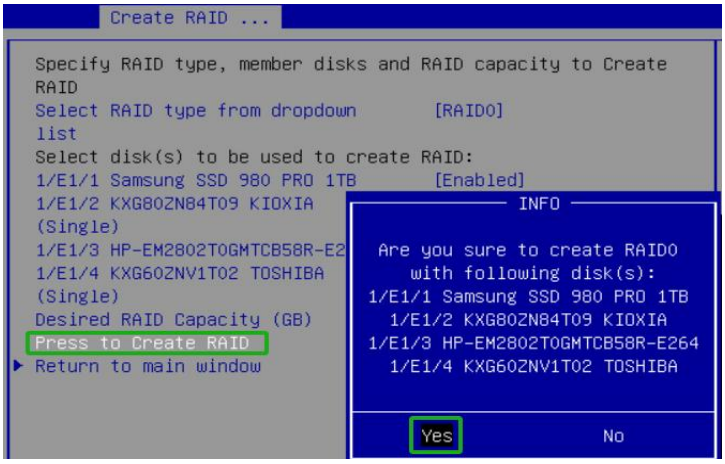

4. Select the disk that needs to create a RAID array and the status of the disk changes from **Disabled** to **Enabled.**



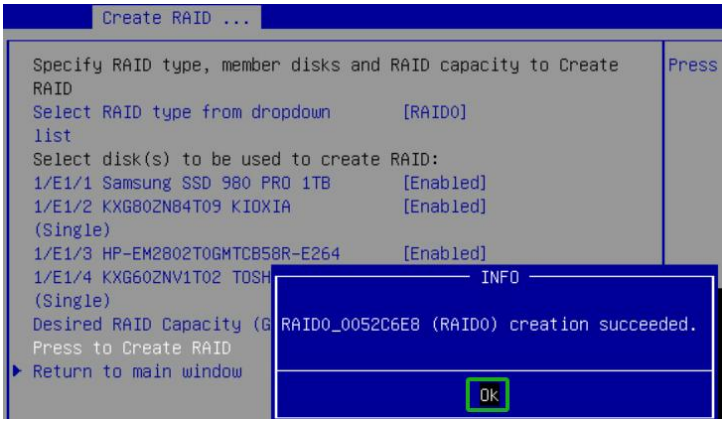
5. Use the keyboard to input the space (GB) you want to set aside for this array. You can decide how much storage capacity will be assigned to the array.



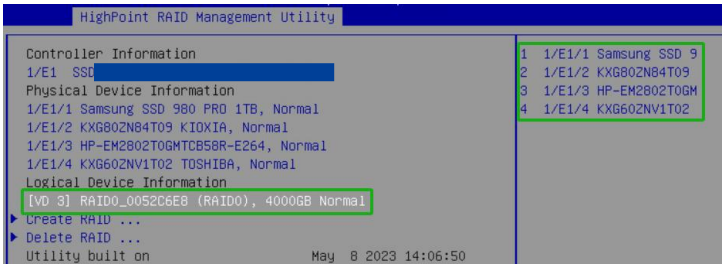

6. Select and **press to create RAID** to complete the RAID Array creation. A pop-up window prompt: **Are you sure to create RAID0 with following disk(s).** Press **Enter** to confirm.




7. A pop-up window will state that **RAID*** creation succeeded.** Press **Enter** to confirm the operation again.

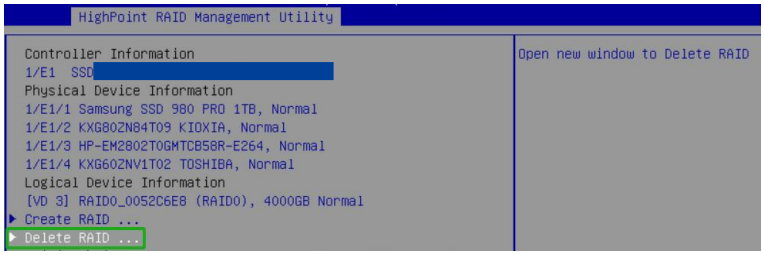



8. The array you create, and its associated properties will appear under the **Logical Device Information**.



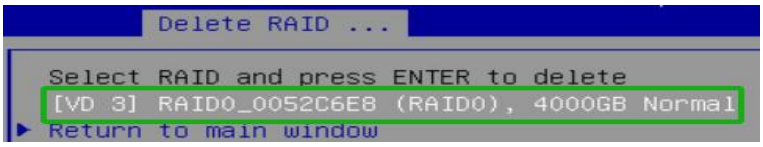
# 4.2.5. Delete a RAID array

The UEFI HII Utility view allows you to delete the created RAID array.



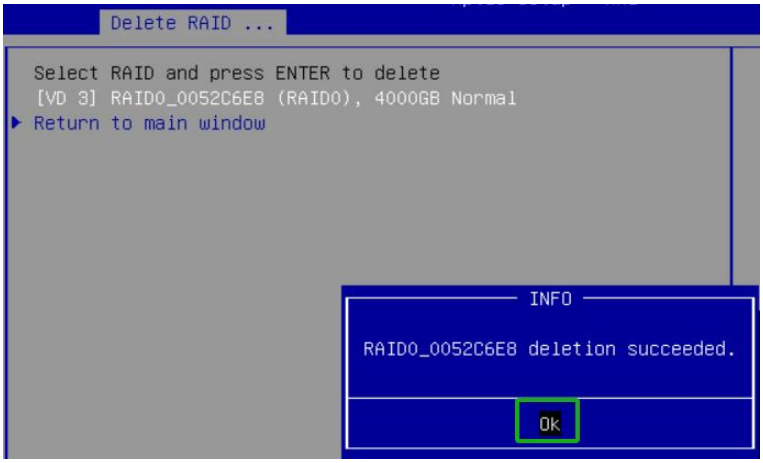

To delete a RAID, perform the following steps:

1. Select **Delete RAID...** from the HighPint RAID Management Utility.
2. Select the array you wish to delete and press **Enter**.




3. The utility will display a warning message. Press **Enter** to delete the array.


4. Press **Enter** to confirm the operation again.



# 5. Install the HighPoint Software

## HighPoint Software Overview

The HighPoint Software includes the HighPoint driver and RAID Management. HighPoint driver and RAID Management need to be used together.

- **HighPoint driver Overview**

The HighPoint driver is used for the AIC to communicate with the operating system. This driver enables the operating system to recognize AIC, ensuring that it loads and operates correctly in the operating system.

- **HighPoint RAID Management Overview**

The HighPoint RAID Management configures and monitors NVMe SSDs hosted by the AIC.

The HighPoint RAID Management includes two parts:

- Web RAID Management Interface (WebGUI)
- Command Line Interface (CLI)

The Web RAID Management Interface (WebGUI) is a simple and intuitive web-based management tool for Windows and Linux operating systems. It is an ideal interface for customers unfamiliar with RAID technology. The Wizard-like Quick Configuration menu allows even the most novice user to get everything up and running with a few simple clicks. Experienced users can fine-tune configurations for specific applications using the Setting Options menu.

The Command Line Interface (CLI) is a powerful, text-only management interface for advanced users and professional administrators. The universal command lines work with Linux and Windows platforms.

## HighPoint Driver Prerequisites

1. The AIC must be installed into a PCIe slot.
2. Ensure any non-HighPoint drivers are uninstalled for SSDs hosted by the AIC. 3rd party software and manufacturer-provided drivers may prevent the AIC from functioning properly.
3. Download the appropriate driver from the AIC's Software Downloads webpage.
4. Secure Boot must be disabled.

- **For Linux operating system**

  HighPoint Linux Driver capability has not been signed and certified. If Secure Boot is enabled, the driver will not load.

  1) Boot the system and access the motherboard BIOS menu.

2) Set **Secure Boot** to **Disabled**.


Warnings:

Failing to remove the AIC and SSDs when uninstalling the driver may result in data loss.

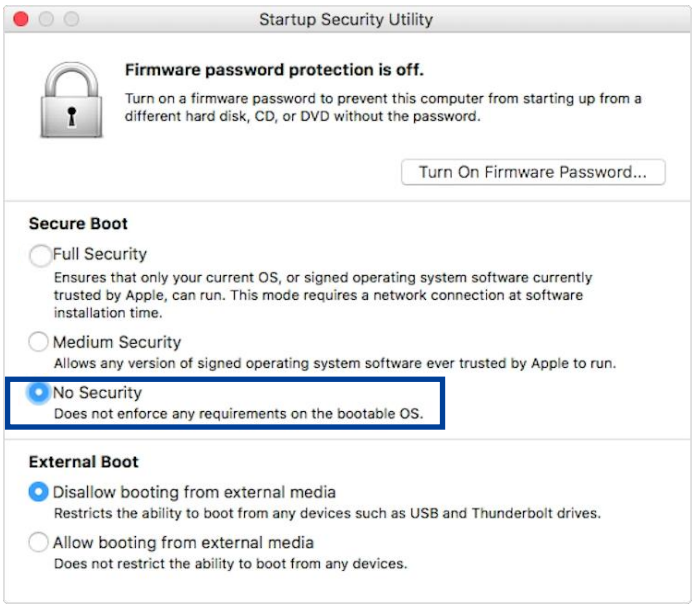
Always install the HighPoint NVMe driver before moving the AIC & RAID array to another operating system.

- **For Mac computers with the Apple T2 Security Chip**

The T2 security chip will need to disable the Secure Boot to load drivers for third-party devices. If Secure Boot is enabled, the driver will not load.

1) Boot the system and press the **Command (⌘)-R** keys to access the Startup Security Utility.

2) Set **Secure Boot** to **No Security.**




Note: For a list of products with the T2 Security Chipset, please visit the following website: Mac computers that have the Apple T2 Security Chip.

- **For Mac computers with the Apple M1 & M2 Chip**

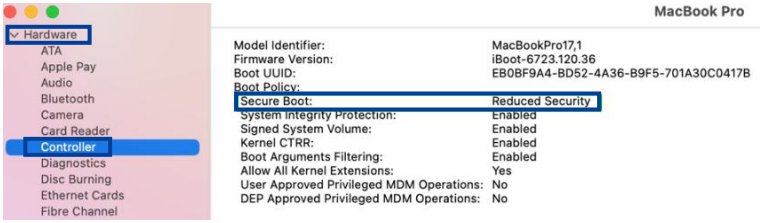
  The Apple M1 & M2 Chip must reduce the Security Policy to load drivers for third-party devices. If not, the driver will not load.

  1) Turn the system off and hold down the **Power Button** until you see **Loading Startup Options**.

  2) Set **Startup Security Utility** to **Reduced Security.**


  3) Click the **Apple** logo in the upper left-hand corner of the desktop and select **Restart** to reboot the system.

  4) Check the system's Security Policy settings: **System Information → Hardware → Controller → Boot Policy.**




Note: Mac computers with Apple M1 & M2 chips, please visit the following website:
Mac computers that have the Apple M1 & M2 Chip

- **For macOS 10.13x and earlier**

  The SIP (System Integrity Protection) must be disabled. If the SIP is enabled, the older macOS versions prevent the driver from loading.

  1) macOS enters System Recovery mode.

     ○ **For Mac with an Intel chip**

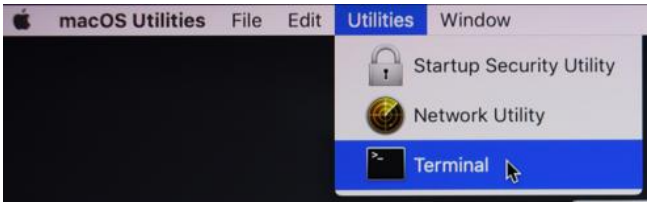
     Boot the system and hold down the **Command (⌘)-R** keys until the macOS enters System Recovery mode.

Note: Make sure you are using a wired keyboard and mouse for this procedure. Wireless devices may not be recognized or function properly when booting into the Recovery mode.

○ **For Mac with an Apple M1/ M2 chip**

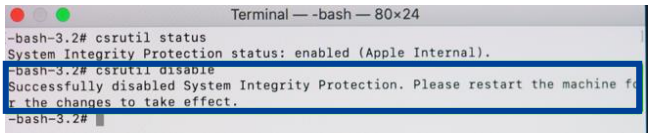
Turn the system off and hold down the **Power Button** until the macOS enters System Recovery mode.

2) Click on Utilities in the upper left corner and select Terminal.

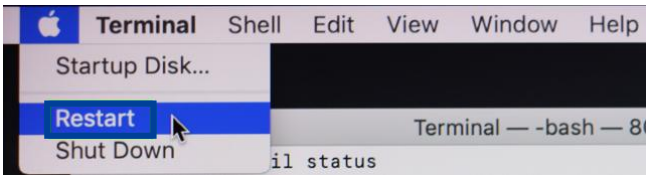



3) Enter the following command to set the SIP to disabled:

**csrutil disable**

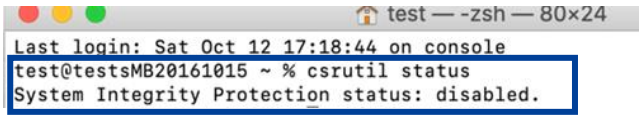



4) Click the **Apple** logo in the upper left-hand corner of the desktop and select **Restart** to reboot the system.




5) Enter the following command to check the SIP status:

**csrutil status**

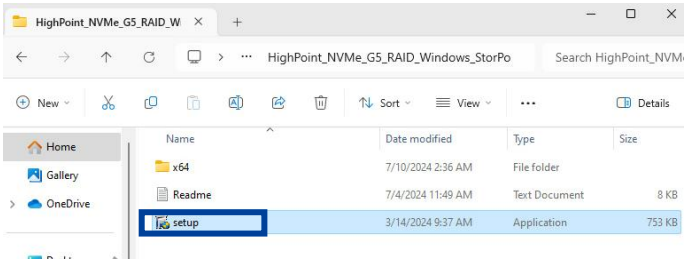


# 5.1. Install the driver on Windows

To install the HighPoint driver on the Windows operating system, perform the following steps.

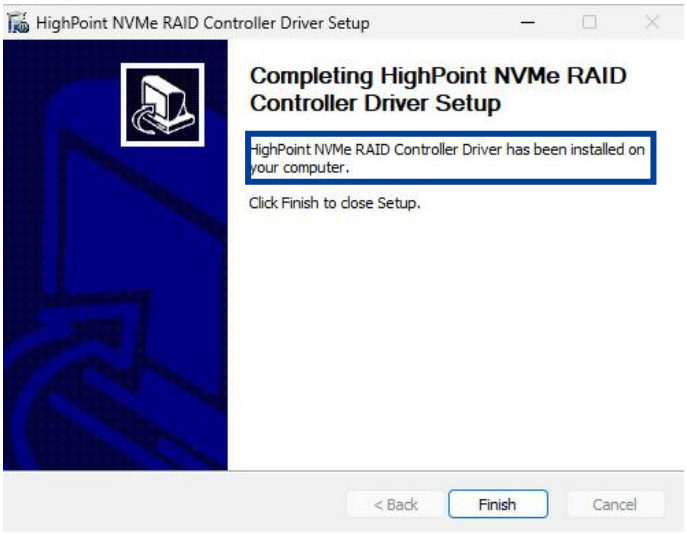
1. Locate the HighPoint driver download and open the file.

2. Double-click **setup.exe**.




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

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



## 5.1.1. Uninstall the driver on Windows

Perform the following steps to uninstall the HighPoint driver on the Windows Operating System.

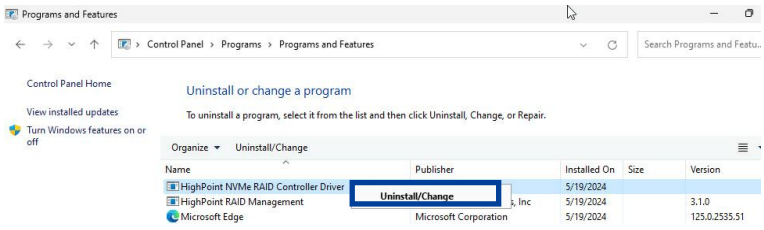
1. Power down the system and remove the AIC from the motherboard.

   Notes:

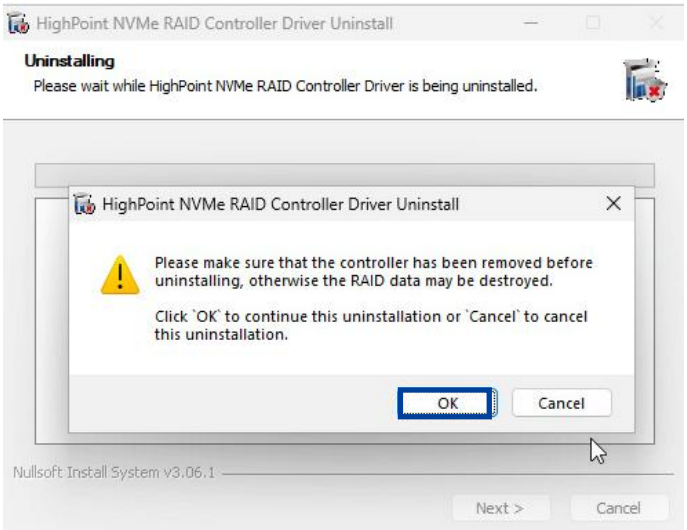
   Failing to remove the AIC from the system during the uninstall process may result in data loss.

   Whenever the driver is uninstalled, the Windows Operating System will attempt to install the default AIC, which may corrupt the RAID configurations and any data stored on SSDs hosted by the AIC.

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. Click **OK** to continue the driver uninstallation.

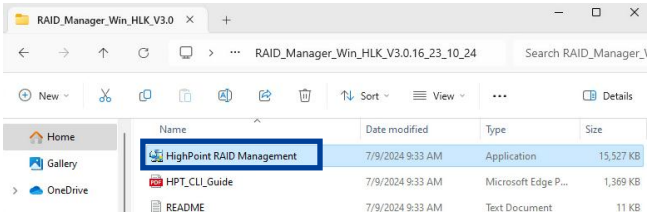


6. After uninstalling the driver, click **Finish**.

# 5.2. Install the RAID Management on Windows

To install the HighPoint RAID Management on the Windows operating system, perform the following steps.

1. Make sure you have installed the HighPoint driver. If not, please refer here to install.
2. Locate the HighPoint RAID Management Software download and open the file.
3. Double-click **HighPoint RAID Management.exe**.

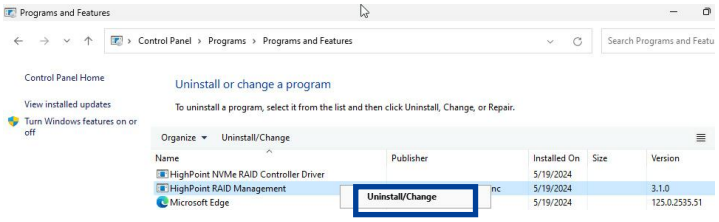



4. After the driver installation is complete, click **Finish** to proceed.

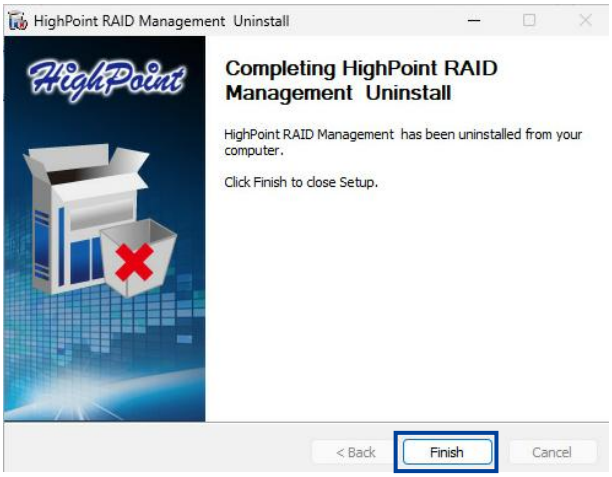
## 5.2.1. Uninstall the RAID Management on Windows

Perform the following steps to uninstall the HighPoint RAID Management on the Windows Operating System.

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




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



# 5.3. Install the driver on Linux

To install the HighPoint driver on the Linux operating system, perform the following steps.

1. Power on the system and boot the Linux distribution.

2. Open a terminal with root privileges and enter the following command to enter the path where the HighPoint driver is located.

   **#cd /home/test/Downloads/**

```
test@test-Super-Server:~/Desktop$ sudo su
[sudo] password for test:
root@test-Super-Server:/home/test/Desktop# cd /home/test/Downloads/
root@test-Super-Server:/home/test/Downloads#
```

3. Enter the following command to extract the HighPoint driver:

   **#tar zxvf HighPoint_NVMe_G5_Linux_Src_vx.x.xx_xx_xx_xx.tar.gz**

```
root@test-Super-Server:/home/test/Downloads# tar zxvf HighPoint_NVMe_G5_Linux_Src_v1.6.17.0_2024_07_01.tar.gz
hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.bin
README
```

4. Enter the following command to install the HighPoint driver.

   **#sh hptnvme_g5_linux_sre_vxx.x.x_xx_xx_xx.bin or**

   **#./ hptnvme_g5_linux_sre_vxx.x.x_xx_xx_xx.bin**

```
root@test-Super-Server:/home/test/Downloads# ./hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....................................
............
Checking and installing required toolchain and utility ...
Installing program gcc ... ^CSignal caught, cleaning up
root@test-Super-Server:/home/test/Downloads# ./hptnvme_g5_linux_src_v1.6.17.0_2024_07_01.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.....................................
............
Checking and installing required toolchain and utility ...
Installing program gcc ... done
Installing program make ... done
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
Found program gcc-13 (/usr/bin/gcc-13)
Sourcing file `/etc/default/grub'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-6.8.0-31-generic
Found initrd image: /boot/initrd.img-6.8.0-31-generic
Found memtest86+ 64bit EFI image: /boot/memtest86+x64.efi
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
Synchronizing state of hptdrv-monitor.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable hptdrv-monitor
update-rc.d: warning: enable action will have no effect on runlevel 1
Created symlink /etc/systemd/system/default.target.wants/hptdrv-monitor.service → /usr/lib/systemd/system/hptdrv-monito
.service.

SUCCESS: Driver hptnvme is installed successfully for kernel 6.8.0-31-generic.
Please restart the system for the driver to take effect.
If you want to uninstall the driver from the computer,please run hptuninhptnvme to uninstall the driver files.
root@test-Super-Server:/home/test/Downloads#
```

5. After the HighPoint driver installation, the system will prompt you to restart to make the driver take effect. Manually restart the system.

### 5.3.1. Uninstall the driver on Linux

Perform the following steps to uninstall the HighPoint driver on the Linux Operating System.

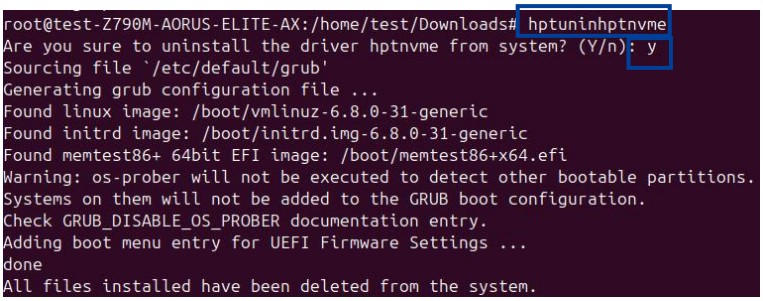
1. Power down the system and remove the AIC from the motherboard.

   Note: Failing to remove the NVMe product and SSDs when uninstalling the driver may result in data loss. The Linux distribution will load the default NVMe support after uninstalling the HighPoint Linux – this driver will only recognize the NVMe SSDs as separate disks.

2. Open the system terminal with root privileges.

3. Enter the following command to uninstall the driver, and press **Y/y** to confirm.

   **#hptuninhptnvme**



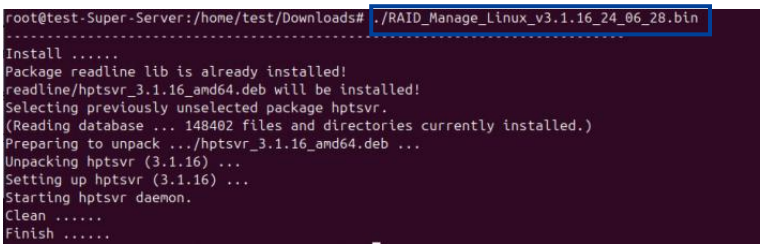

4. After uninstalling the driver, manually reboot the system.

# 5.4. Install the RAID Management on Linux

To install the HighPoint RAID Management on the Linux operating system, perform the following steps.

1. Make sure you have installed the HighPoint driver. If not, please refer here to install.
2. Using the system terminal with root privileges, browse to the directory where the software is downloaded and enter the following commands to extract the management software package:
   **tar zxvf RAID_Manage_Linux_v3.x.x.x_x_x_x.tgz**

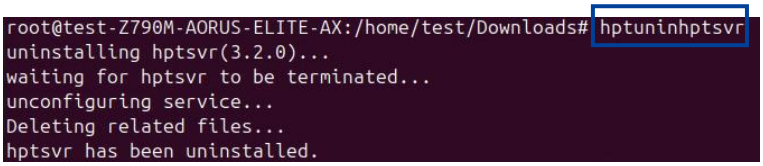

3. Install the HighPoint RAID management software (WebGUI & CLI) using the following command:
   **./ RAID_Manage_Linux_v3.x.x_x_x_x.bin**




## 5.4.1. Uninstall the RAID Management on Linux

To uninstall the HighPoint RAID Management on the Linux operating system, perform the following steps.

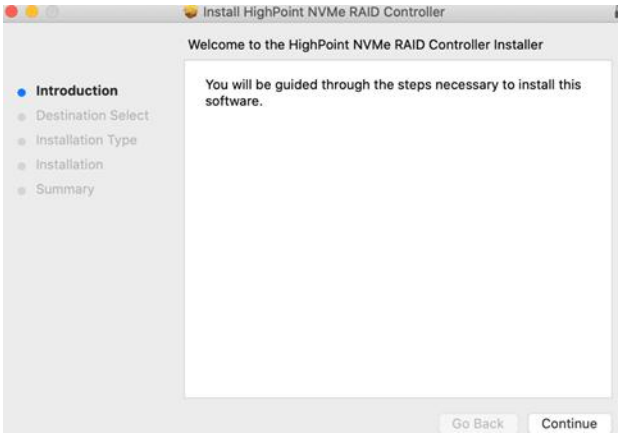
1. Open the system terminal with root privileges.
2. Enter the following command to uninstall the RAID Management:
   **#hptuninhptsvr**



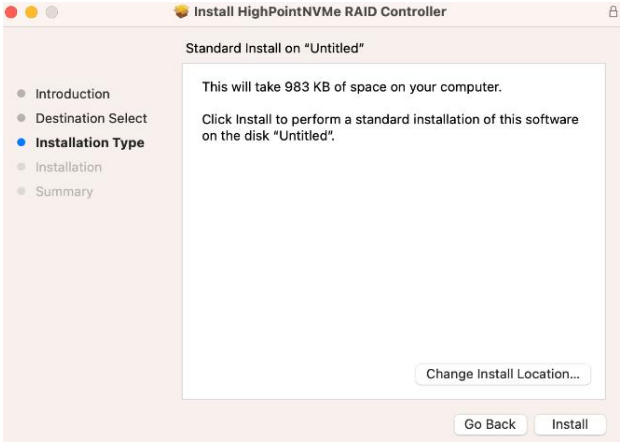
# 5.5. Install the driver on macOS

To install the HighPoint driver on the macOS, perform the following steps.

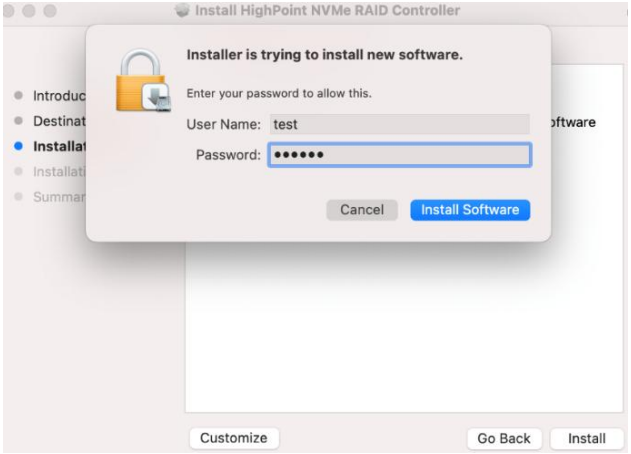
1. Locate the download and double-click the **HighPointNVMe.pkg** package to start the installer. Click the **Continue** button.



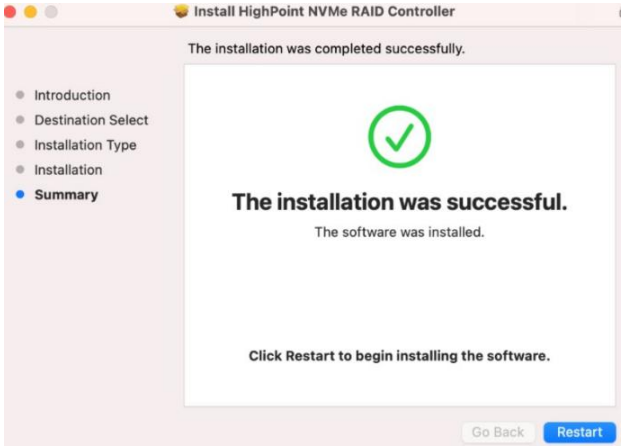

2. macOS will prompt you to install the driver. Click **Install** to proceed.



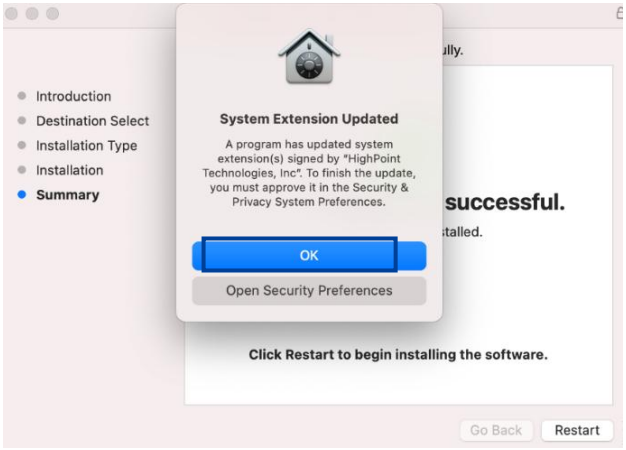

3. You will be prompted that the installer is trying to install new software; enter the ***Administrator*** Username and Password. Once these have been entered, Click **Install Software**.



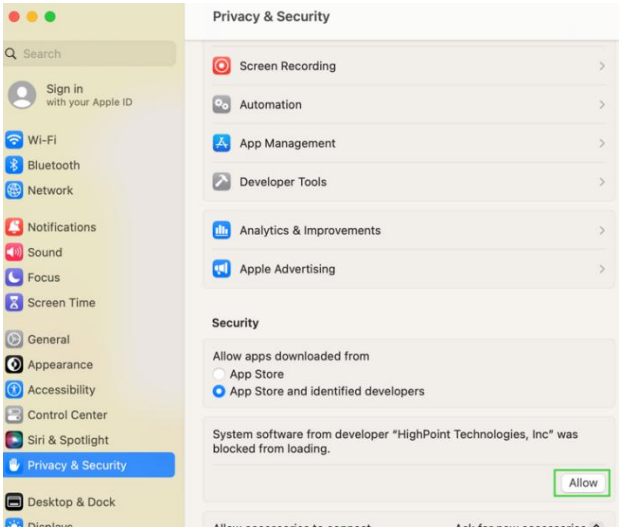
4. If no pop-ups appear, please proceed to the next step of installation. Click **Restart.**



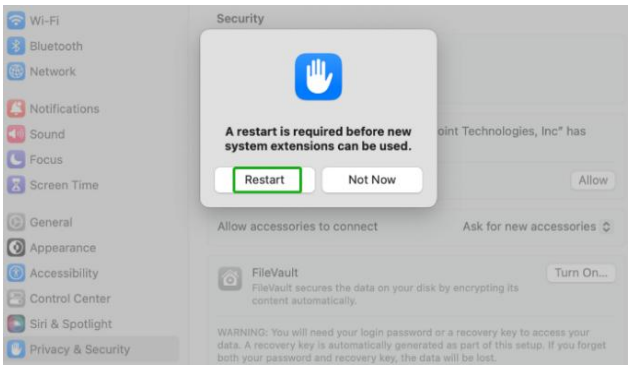

5. If you receive a popup window prompting you for permission, click **Open Security Preferences**.



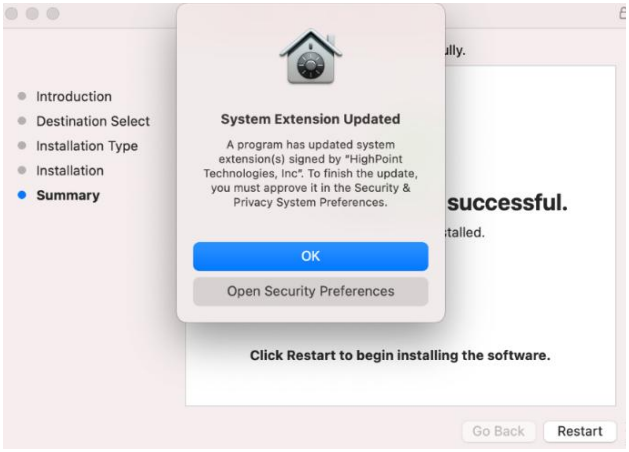

6. Make sure the **App Store and identified developers** is checked, and then click **Allow**.



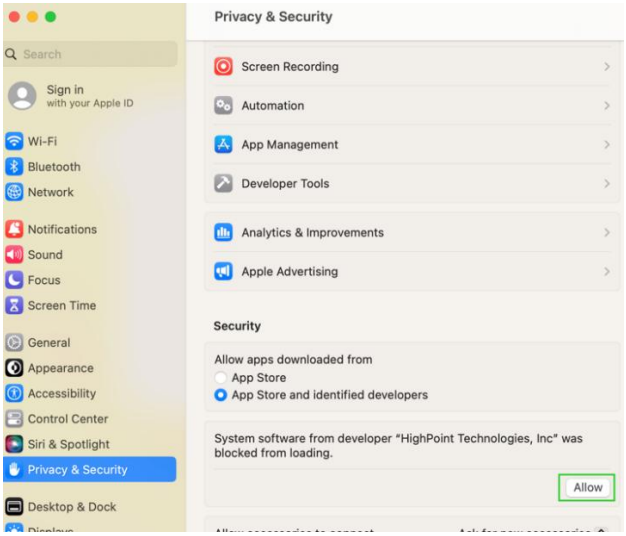
7. You will see a popup window prompting you to restart. Click **Restart**.



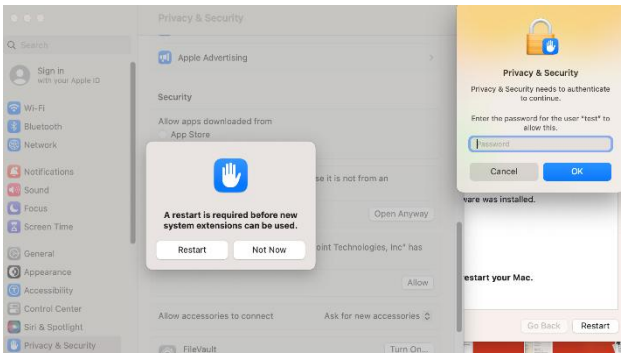

8. If you receive the permission prompt for the second time, click "**Open Security Preferences**" again.



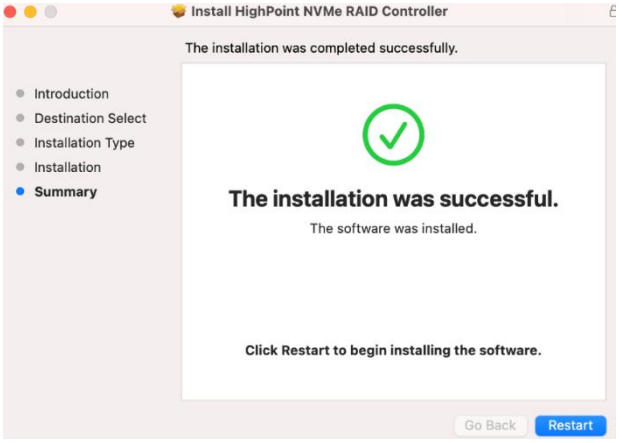

9. Make sure the **App Store and identified developers** is checked, and then click **Allow**.



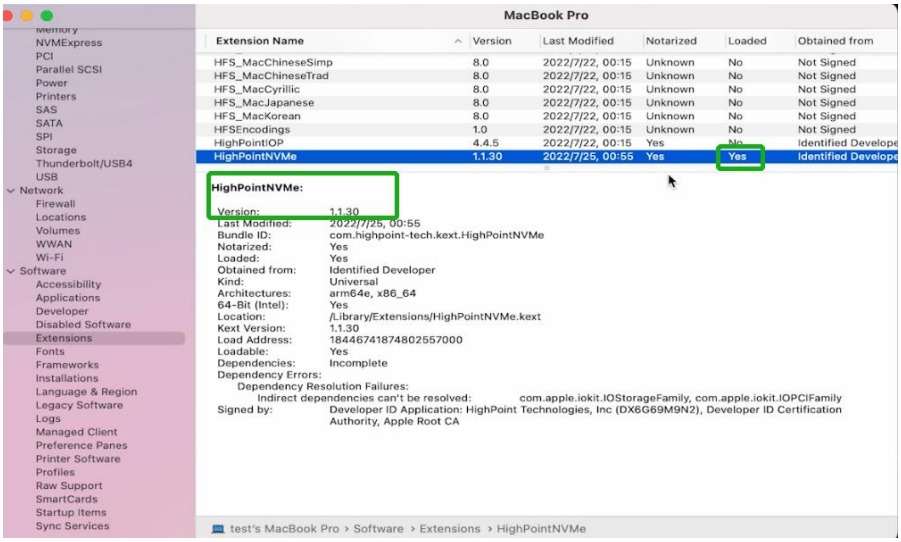
10. You will see a popup window prompting you to restart. Enter the ***Administrator*** Username and Password and click **Restart**.




11. Return to the driver installation window. Click **Restart** to restart the system.




12. After the system restarts, the driver's status can be viewed under **System Information→Extensions**; The following screenshot shows the **HighPointNVMe** driver has been **loaded**:




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

## 5.5.1. Uninstall the driver on macOS

To uninstall the HighPoint driver on the macOS, perform the following steps.

1. Power off the system and remove the NVMe product from the motherboard.

   Notes:

   Failing to remove the NVMe product and SSDs when uninstalling the driver may result in data loss.

   The macOS will load the default NVMe support after the HighPoint driver has been uninstalled – this driver will only recognize the NVMe SSDs as separate disks.

2. To uninstall the NVMe driver, you will need to open the terminal window and enter the following command:

   **sudo rm -rf /Library/Extensions/HighPointNVMe.kext**

   **sudo kextcache –i /**

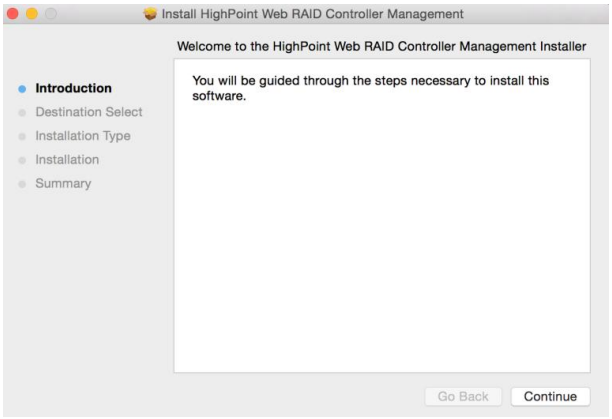

3. After uninstalling the driver, manually reboot the system.

# 5.6. Install the RAID Management on macOS

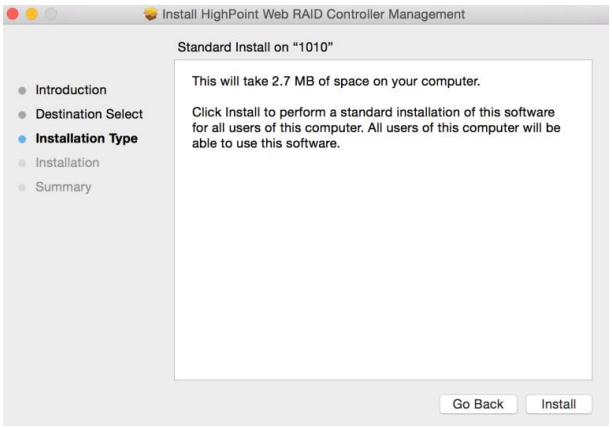
To install the HighPoint RAID Management on the macOS, perform the following steps.

1. Make sure you have installed the HighPoint driver. If not, please refer here to install.

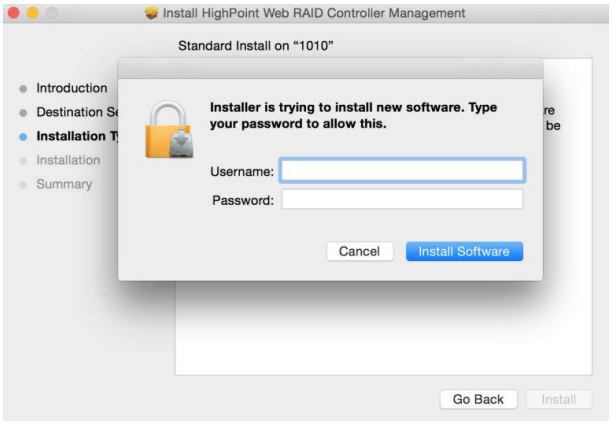
2. Double-click the package named **HighPointWebGUI.pkg** to start the installer. When the window appears, click the **Continue** button.



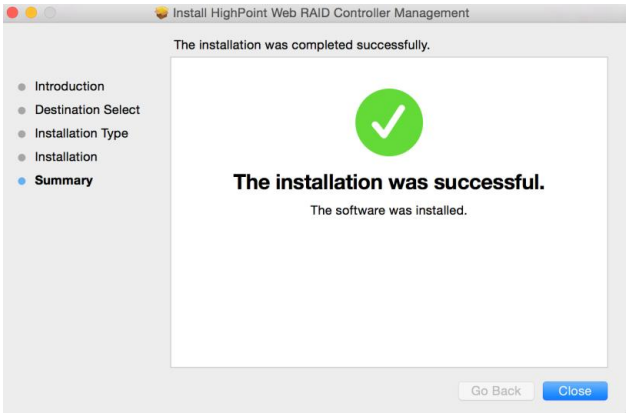

3. You will be promoted to click the **Install** button. Click **Install** to continue.




4. You will then be prompted to enter the ***Administrator*** Username and Password. Once these have been entered, click **Install Software** to continue.



5. The WebGUI Management software has been installed. Click **Close** to complete the procedure.

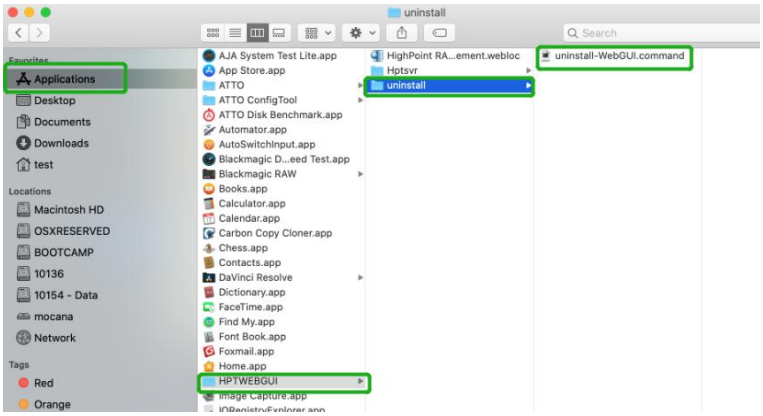


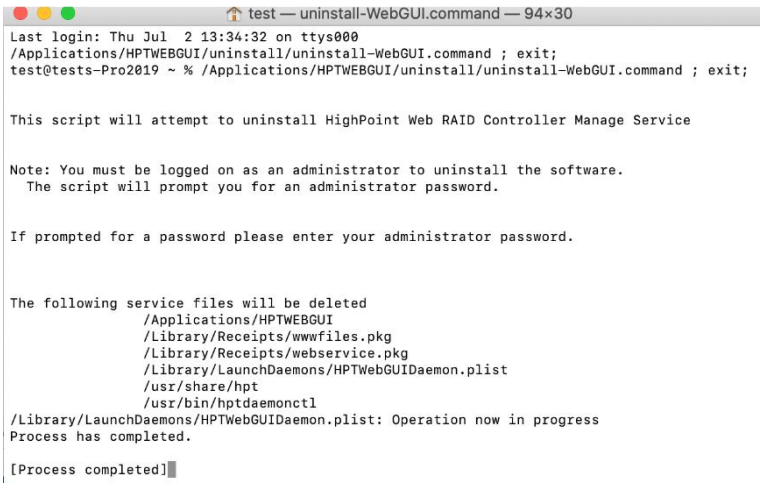

## 5.6.1. Uninstall the RAID Management on macOS

To uninstall the HighPoint RAID Management on the macOS, perform the following steps.

1. Access **Applications**, click **HPTWEBGUI**.

2. Select **uninstall**, and double-click the **uninstall-WEBGUI.command**. The uninstall command will automatically open a terminal and uninstall the software.



# 6. Web RAID Management Interface


Web RAID Management Interface is often referred to as WebGUI. While you are in the WebGUI view, if the WebGUI detects any new events, it checks and updates the AIC status, updates disk counts, updates disk group counts, updates virtual disk counts, and so on.

This section describes how to use the Web RAID Management Interface.

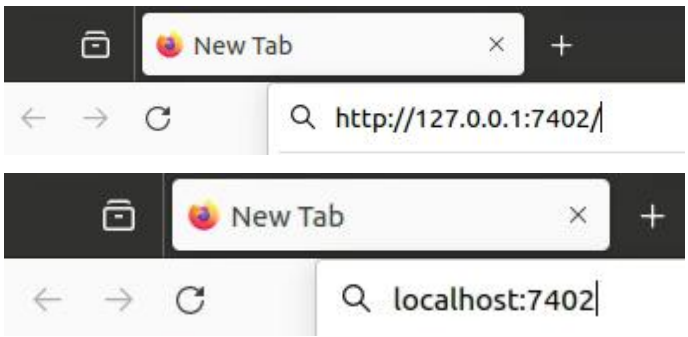
## 6.1. Start the WebGUI

**For Windows Users**

Double-click the **HighPoint RAID Management** ICON to start the software using the system's default web browser. It will automatically log in to the WebGUI.


**For Linux Users**

Open the browser and enter http://127.0.0.1:7402 or localhost:7402 to log into WebGUl. 7402 is the WebGUI's Port Number, which can be modified.




**For macOS Users**

Double-click the **HighPoint RAID Management** ICON to start the software using the system's default web browser. It will automatically log in to the WebGUI.

# 6.2. Global View

The **Global view** provides an overview of what each AIC connected to your computer detects. It is also the first page you see when logging in.

A drop-down menu on the top left of the page lets you select which AIC you want to manage if you connect multiple HighPoint AICs.


## 6.2.1. HBA Properties

The **HBA Properties** section displays the following information.

- **Host Adapter model** — The name of the HighPoint product or solution.
- **Controller Count** — The number of the AICs detected.
- **Enclosure Count** — The number of external enclosures detected.
- **Physical Drives** — The number of disks hosted by the AIC.
- **Legacy Disk** — The number of Legacy disks connected.
- **RAID Count** — The number of RAID arrays.

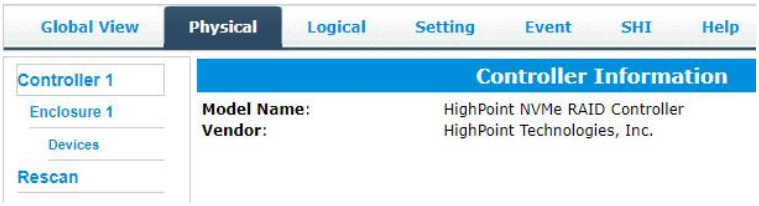
## 6.2.2. Storage Properties

The **Storage Properties** section displays the following information.

- **Total capacity** — The combined capacity of each disk connected to the AIC.
- **Configured capacity** — The amount of space used for creating RAID arrays.
- **Free Capacity** — The total amount of space unused.

# 6.3. Physical

The **Physical** tab shows general and extended information about the AIC and any hosted NVMe SSDs.



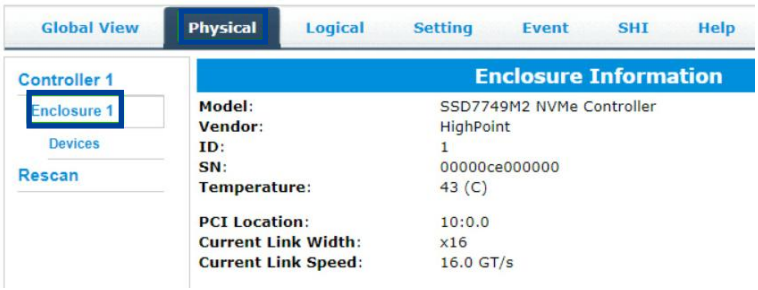

## 6.3.1. Controller Information

The **Controller Information** section displays the following information.


- **Model name** — The model name of the HighPoint AIC.
- **Vendor** — The manufacturer of the AIC.

## 6.3.2. Enclosure Information

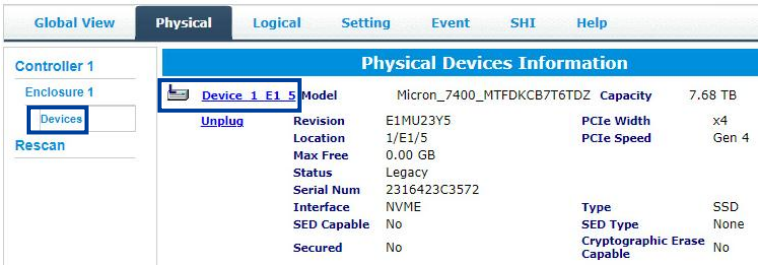
The **Enclosure Information** section displays the following information.




- **Model** — The name of the AIC.
- **Vendor** — The manufacturer of the AIC.
- **ID** — The number of the AIC.
- **SN** — The serial number of the AIC.
- **PCI Location —** The PCI slot location where the AIC is located.
- **Current Link Width —** The PCIe width occupied by the current AIC.
- **Current Link Speed** — The current link bandwidth of the AIC.

## 6.3.3. Physical Devices Information

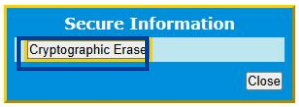
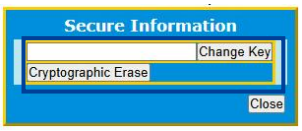
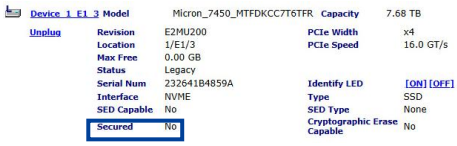
The **Devices Information** section displays the following information.




- **Model** – The model number of the physical disk.
- **Capacity** – The total capacity of the physical disk.
- **Revision** – The physical disk firmware revision number.
- **Location** – The physical disk location (e.g., Device 1_E1_5 represents the disk on AIC 1 port 5).
- **Max Free** – The space on the physical disk is not configured in an array.
- **Status** – The status of the physical disk.
  - **Legacy:** The disk's status is legacy.
  - **Disabled:** The disk cannot be used. (May be related to disk failure)
  - **Normal:** The disk is a member of a RAID array.
  - **Spare:** The disk has been set as a spare disk.
- **Serial Number** – The serial number of the physical disk.
- **Interface** – The interface of the physical disk.
- **Type** – The type of the physical disk.
- **PCIe Width** – The PCIe width of the current physical disk.
- **PCIe Speed** – The PCIe speed of the current physical disk.
- **SED Capable** – Whether the physical disk supports the SED feature.
- **SED Type** – The current SED Type of the physical disk is OPAL.
- **Cryptographic Erase Capable** – Whether the physical disk supports the Cryptographic Erase feature.
- **Unplug** – Safely eject the selected disk.
- **Secured** – Whether the physical disk is secured.

The following table describes the **Secured** in detail.

### Table 8: Secured Status & Description

| Secured Status | Description |
|---|---|
| **Yes**<br>  | Indicates that security for the disk is enabled and unlocked.<br>Your optional option is:<br>  <br>- **Cryptographic Erase**<br>The **Cryptographic Erase** function will erase the secured key inside each disk, making it impossible to decrypt data stored on these devices. |
| **Yes (Locked)**<br>  | Indicates that the security of the disk is enabled, but the disk's key does not match the key on the AIC.<br>Your optional options are:<br>  <br>- **Change key**<br>Enter the disk's **old password** and click **Change Key** to unlock the Disk Security key.<br>If you do not enter the correct disk key five times, this function will be locked, and you will need to power cycle your system to change the disk key again.<br>- **Cryptographic Erase**<br>The **Cryptographic Erase** function will erase the secured key inside each disk, making it impossible to decrypt data stored on these devices. |
| **No**<br>  | Indicates that disk security is not enabled or not supported. |
| **Yes** | Indicates that security for the disk is enabled and unlocked. Data can |

| | |
|---|---|
|  | be accessed. |
| **Yes (Locked)**<br>  | Indicates that the security of the disk is enabled, but the disk's key does not match the key on the AIC. |

## 6.3.3.1.Change Disk Security

When the AIC Security Key and Disk Security Key do not match, the ability to change the Disk Security Key will be displayed. The secured disk is now in the Yes (Locked) state.

To change disk security, perform the following steps:

1. Click the **Physical** tab.
2. Under the **Physical Devices** section, click the name of each disk in blue text to view the Secured setting.
3. Click Yes (Locked), a new pop-up window providing a Change Key option will be displayed.
4. Enter the disk's old password and click Change Key to unlock the Disk Security key.


Notes:

Change Key: Input the old Disk Security key to unlock the disk and write the AIC Security key on this disk.

There is a limit to the number of times you can change the disk key. If you do not enter the correct disk key **five times,** this function will be locked, and you will need to power cycle your system to change the disk key again.

5. After the system restarts, the secure attribute of the disk should change from Yes (Locked) to Yes.

## 6.3.3.2.Disable Disk Security

We use **Cryptographic Erase** to disable Disk Security. The **Cryptographic Erase** replaces the encryption key inside each disk; this makes it impossible to decrypt data stored on these devices. When executed, data is rendered inaccessible and considered cryptographically erased. The disks can then be reset to an unowned state and reused once a new Disk Security key is generated.

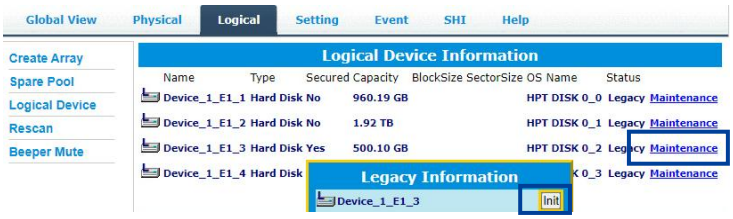
Warning: Cryptographic erase will delete the Security (Encryption) key from the target disk/ array members. Data stored on these disks will no longer be accessible.

Note: When the disk is in Legacy status or is a RAID member disk, you cannot disable Disk Security directly. You need to initialize the legacy disk or delete the RAID.

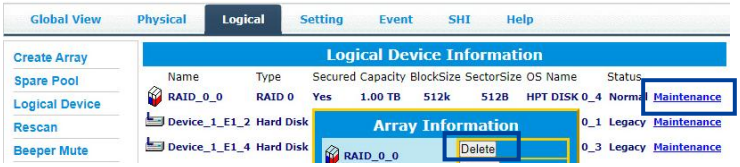
To disable disk security, perform the following steps:

1. Click the **Physical** tab.
2. Click the **Maintenance**. There are two situations.

- Situation 1: If the disk is in Legacy status, you can remove this by using the **Init** function.




- Situation 2: If the disk is a member disk in the secured RAID array, you can delete the array by using the **Delete** function.



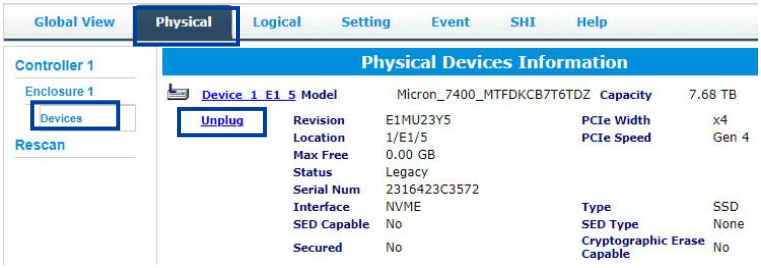

3. Under the **Physical Devices** section of the Physical tab, check the **Secured** status of the target disk. If enabled, this will be displayed as Yes or Yes (Locked);
4. Click the Secured status (blue text); a pop-up window will be displayed, providing a **Cryptographic Erase** button.


5. After the system restarts, the secure attribute of the disk should change from Yes to No.

# 6.3.3.3. Unplug the Physical Device

If you want to eject the disk while the system is working, you want to use the **Unplug** to keep the disk safe. Other methods of disk removal will trigger an alarm.

1. Open the **WebGUI.**
2. Click the **Physical** tab.
3. Select the disk you want to unplug, and click **Unplug**.




4. Manually remove the disk.
5. If you want to plug a new disk. Manually plug the disk, and click **Rescan**; the disk you just plugged in is displayed under **Physical Devices Information**.

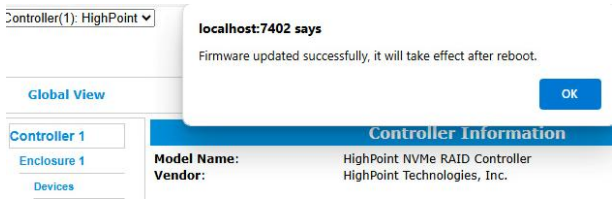
## 6.3.4. Update the Firmware

You can upgrade to a newer version of the AIC firmware here. This help update the firmware version and the UEFI HII Utility version. The process may take some time.


To update the AIC firmware, perform the following steps:

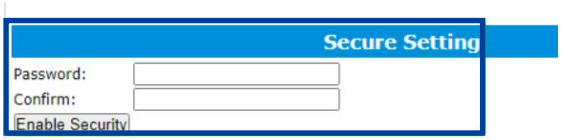
1. Open the **WebGUI**.
2. Click the **Physical** tab.
3. Click **Choose File** to select the file with a suffix of blf you want to update the firmware.


4. Click **Submit**.
5. Reboot the system to make the update take effect.



## 6.3.5. Secure Setting

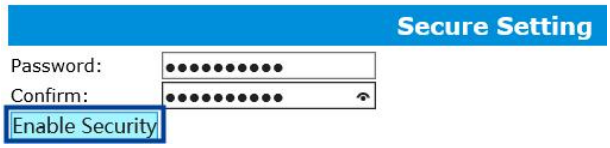
This **Secure Setting** supports enable, disable and change AIC security key.




### 6.3.5.1. Enable AIC Security

To enable AIC security, perform the following steps:

1. Open the **WebGUI**.
2. Click the **Physical** tab.
3. Under **Secure Setting.** Enter the password a second time for the **Confirm** field. The password length is 8-32 digits, and there is no limit to the valid complexity of the password.
4. Set the password and click **Enable Security** to enable the AIC Security.

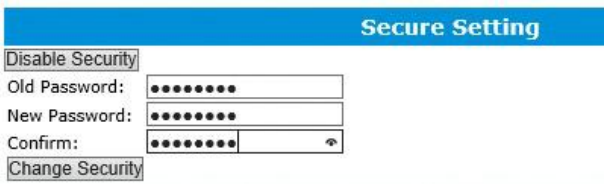



Warning: If you forget the security key, you will lose access to your data.

### 6.3.5.2. Change AIC Security

To change AIC security, perform the following steps:

1. Open the **WebGUI**.
2. Click the **Physical** tab.
3. Enter the current password under the **Old Password** field.
4. Enter a new password under the **New Password** field. The password length is 8-32 digits, and there is no limit to the valid complexity of the password.
5. After entering a new password, click **Change Security**.

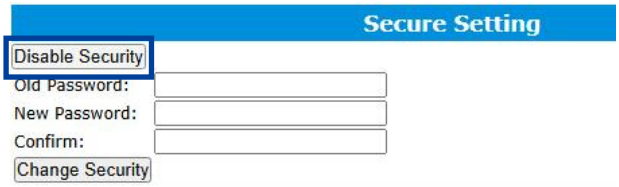



6. Confirm the change by clicking **OK** when the pop-up window is displayed.

### 6.3.5.3.Disable AIC Security

To disable AIC security, perform the following steps:

1. Open the **WebGUI**.
2. Click the **Physical** tab.
3. Under **Secure Setting**, click **Disable Security**.



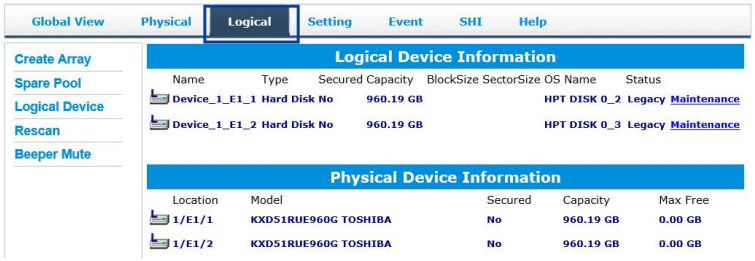

## 6.3.6. Rescan the Physical Device

When the WebGUI initiates **Rescan**, the driver will immediately check and see whether the status of any disk has changed. If any changes occur, the disks and RAID array status will be updated to reflect this.

- **Disk Status** – if any disks were added or removed, or if a disk is no longer responding, the status will change.
- **RAID status** – the RAID array's status may change depending on the status of the disks.

# 6.4. Logical

The **Logical** tab is where you can create, delete, and maintain your RAID configurations and add disks to your spare pool.




## 6.4.1. Logical Device Information

The **Logical Device Information** tab is the default page when clicking the **Logical** tab of the WebGUI. The Logical Device Information section displays the following information.


- **Name** – The physical disk location (e.g., Device 1_E1_1 represents the disk on AIC 1 port 1).
- **Type** – The type of the physical disk.
- **Secured** – Whether the physical disk or RAID array is secured.
- **Capacity** – The total capacity of the physical disk or RAID array.
- **OS Name** – The name of the physical disk or RAID array in the system.
- **Status** – The status of the physical disk. (Normal, Disabled, Critical, Legacy, etc.)
- **Maintenance** – Once an array has been created, click maintenance for options to manage your array. Different array or disk statuses will have other maintenance options.

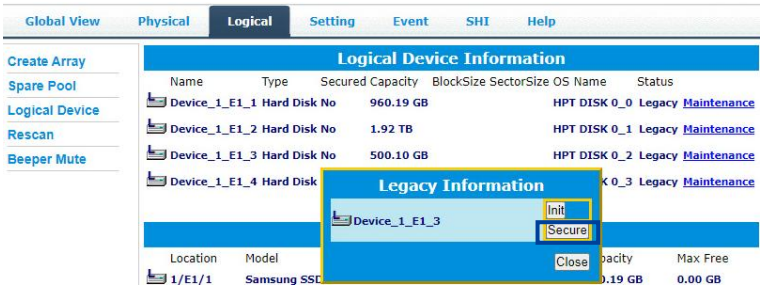
# 6.4.1.1.Enable Disk Security

To enable disk security, perform the following steps:

There are two methods to enable Disk Security.

- **Method 1: Enabling Disk Security for disks with the Legacy status**

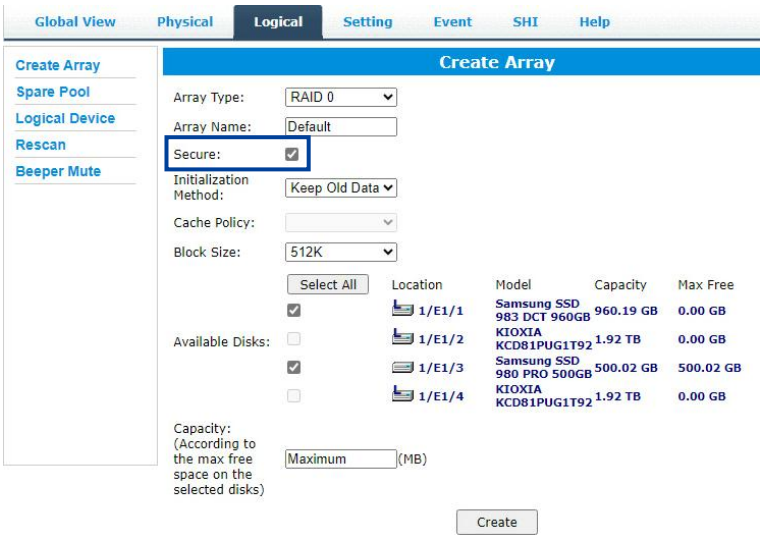
1. Click the **Logical tab** and check the **Logical Device** section of the page**.**
2. Click the **Maintenance** option displayed on the right-hand side of each disk.
3. Click **Secure** to enable Disk Security.




4. After Disk Security has been enabled.

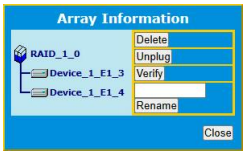
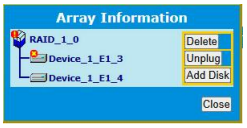
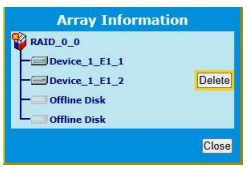

- **Method 2: Enabling Disk Security when creating a RAID array**

1. Click the **Logical** tab.
2. Check the box before the **Secure** option when creating a RAID array.



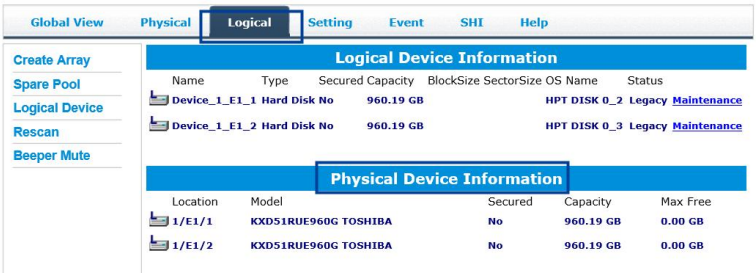
The following table describes the **Maintenance** in detail.

**Table 9: Logical Device Status &Maintenance Options**

| Logical Device Status | Maintenance Options |
|---|---|
| **Legacy Status**<br>  | Disks with the **Legacy** status are healthy and functioning correctly.<br>Your optional options in Maintenance are:<br>- **init** – Initialization of a disk sets all data bits to 0, clearing all the data on the disk. It is important to initialize disks as previous data physically stored on the disk may interfere with new data.<br>- **Secure** – Enable Security for disks. |
| **Normal Status**<br>  | Arrays with the **Normal** status are healthy and functioning correctly.<br>Your optional options in Maintenance are:<br>- **Delete** – Delete the selected RAID array.<br>- **Unplug** – If you want to unplug the RAID array while the system works, use the **Unplug** first and then unplug the disks.<br>- **Verify** – Verify the integrity of the RAID array. (RAID1/10 support only)<br>- **Rename** – Rename the RAID array. |
| **Critical Status**<br>  | Arrays in the **Critical** status can be accessed and utilized but are no longer fault-tolerant. A Critical array should be rebuilt as soon as possible to restore redundancy.<br>Your optional options in Maintenance are:<br>- **Delete** – deletes the selected RAID array.<br>- **Unplug** – If you want to unplug the RAID array while the system works, use the **Unplug** first and then unplug the disks.<br>- **Add Disk** – reinsert the same disk or insert a new disk. (RAID1/10 support only)<br>Reinserting the same disk should trigger the rebuilding status since data on the disk would be recognized.<br>If you insert a new disk, clicking **Add Disk** will allow you to select and add it to the array. |
| **Disabled Status**<br>  | An array with the **Disabled** status means that the RAID level does not have enough disks to function.<br>Your optional option in Maintenance is:<br>- **Delete** – deletes the selected RAID array. |

## 6.4.2. Physical Device Information

The **Physical Device Information** tab is the default page when clicking the **Logical** tab of the WebGUI. The Physical Device Information section displays the following information.




- **Location** – The physical disk location (e.g., 1/E1/2 represents the disk on AIC 1 port 2).
- **Model** – The model number of the physical disk.
- **Secured** – Whether the physical disk is secured.
- **Capacity** – The total capacity of the physical disk or RAID array.
- **Max Free** – The space on the physical disk is not configured in an array.

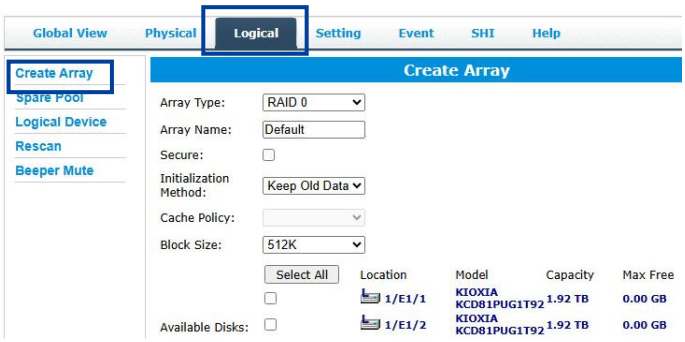
# 6.4.3. Create a RAID Array

A RAID array is a collection of physical disks that will be one virtual disk by your Operating System. You need to follow the steps below to create a RAID array.

Note: RocketAIC series NVMe AIC SSDs are already pre-configured with RAID0. You can skip those steps. You can follow the steps if you want to use another type of RAID.

To create a RAID array, perform the following steps:

1. Open the **WebGUI**.
2. Select the proper **AIC** from the drop-down on the top left.
3. Click the **Logical** tab.
4. Click **Create Array.**



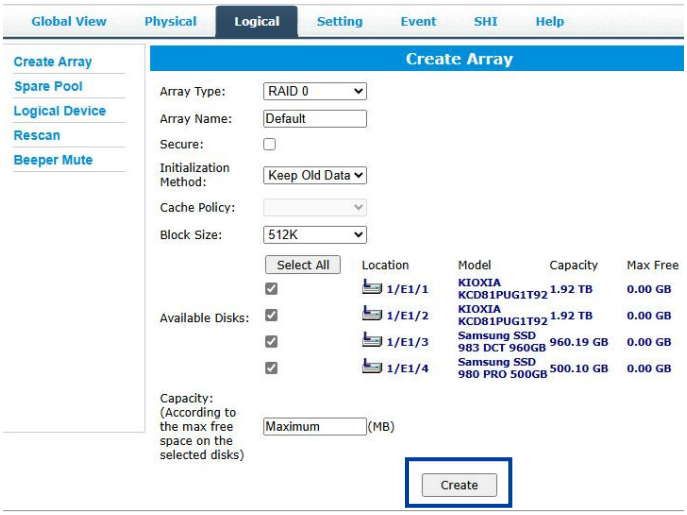

The following table describes the profile options.

**Table 10: RAID Array Creation Profile Options**

| Property Name | Description |
|---|---|
| **Array Type** | Displays the RAID array level that is based on the profile selected.<br>- RAID0<br>- RAID1<br>- RAID10 |
| **Array Name** | Allows you to create the RAID array name. The name will be displayed on the **Logical Device**.<br>(Default: RAID_<level>_<array number>) |
| **Secure** | Allows you to use the RAID array's SED capabilities.<br>Only AIC that supports the SafeStorage Encryption feature will have this option. |
| **Initialization Method** | Displays the RAID array initialization setting. Default Initialization displays the following options:<br>- **Keep Old Data:** This option skips the initialization process, and all data on each physical disk of the array will be untouched.<br>- **Quick Init:** This option grants immediate access to the RAID array by skipping the |

| | |
|---|---|
| | initialization process, but it will delete all data. (Recommended)<br>- **Foreground:** The array initialization process will be set to high priority. The array is inaccessible during this time, but the initialization process will complete faster. (Not recommended)<br>- **Background:** The array initialization process will be set to low priority. The array is accessible during this time, but the initialization process will take much longer to complete. (Not Recommended)<br>Important Note: The Foreground and Background Initialization options will cause NVMe SSD to result in TBW and performance degradation. Initialization of a disk sets all data bits to 0, clearing all the data on the disk. It is important to initialize disks as previous data physically stored on the disk may interfere with new data. |
| **Block Size** | It allows you to adjust the block size to fit your disk usage, thus improving performance.<br>- 128K<br>- 256K<br>- 512K (Default)<br>In a typical RAID configuration, virtual disk data is striped (or spread across) the physical disks. A smaller array block size will increase the likelihood of accessing all physical disks when processing large I/O requests. Multiple physical disks working in parallel increase the throughput, meaning better performance. |
| **Available Disks** | Specifies member disks that will compose a new array. |
| **Capacity** | Displays the amount of RAID array storage space. By default, the maximum capacity available for the RAID array is displayed. |

5. Select the creation profile options and click **Create.**



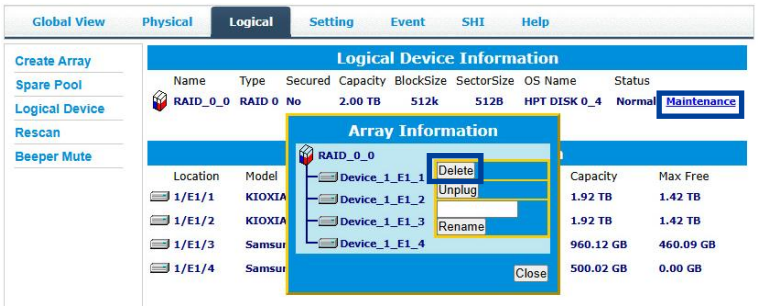

6. The created RAID array is displayed under **Logical Device Information.**

## 6.4.4. Delete a RAID Array

All data on a RAID array is lost when you delete it. Back up the data you want to keep before you delete a RAID array.

To delete a RAID array, perform the following steps:

1. Open the **WebGUI**.
2. Click the **Logical** tab**.**
3. Click **Maintenance**.
4. Click **Delete** to delete the RAID array.




5. A pop-up box pops up on the page. Click **OK** to confirm the RAID array deletion.
6. There is no deleted RAID array information at **Logical Device Information**, indicating that the RAID array deletion operation is complete.

Notes:

When the RAID array is in a rebuild, verify, foreground/background init status, deleting the RAID array will prompt in use. You can choose to stop the current operation and continue to delete it.

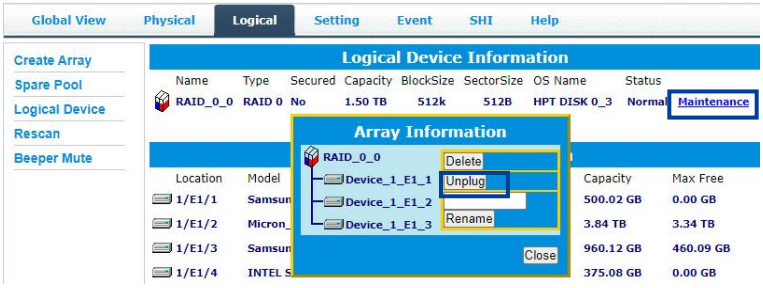
When the RAID array is mounted, deleting the RAID array will prompt in use. You can unmount it and continue to delete it.

## 6.4.5. Unplug a RAID Array

If you want to unplug the RAID array while the system works, use the Unplug first and then unplug the disks.

To unplug a RAID array, perform the following steps:

1. Open the **WebGUI**.
2. Click the **Logical** tab**.**
3. Click **Maintenance**.
4. Click **Unplug** to unplug the RAID array.



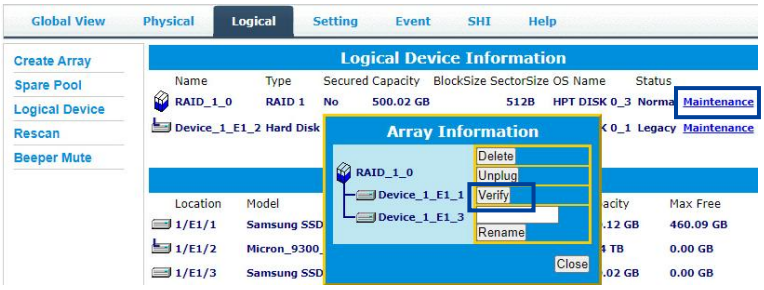

5. Manually remove all RAID member disks.
6. If you want to hot-plug the RAID member disks. Manually plug the disks, and click **Rescan**. The disks you just plugged in are displayed under **Logical Device Information**.

# 6.4.6. Verify a RAID Array

Check that the data spread across the disks of the array is consistent and ensure that the redundancy is the same between RAID members. (RAID1/10 support only)

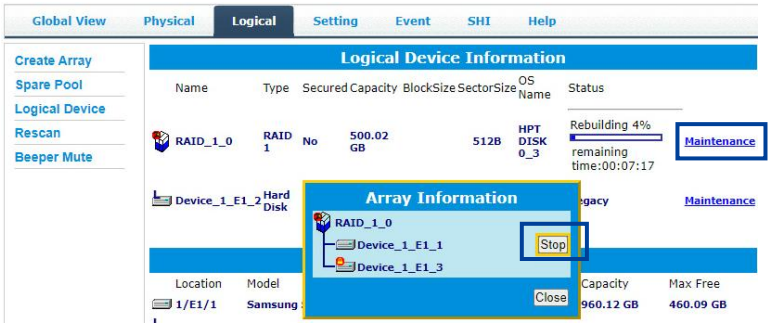
To verify the integrity of the RAID array, perform the following steps:

1. Open the **WebGUI**.
2. Click the **Logical** tab**.**
3. Click **Maintenance**.
4. Click **Verify** to verify the integrity of the RAID array.




5. The status of the RAID array changes from **Normal** to **Rebuilding**, showing the duration of the verification process.


6. You can stop the process by clicking **Stop**.



# 6.4.7. Add a Spare Disk

You can use spare disks to replace failed or defective disks in the RAID array group. A new disk must be at least as large as the defective disk.

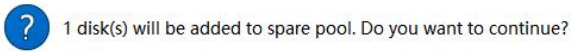
If a disk used in a RAID array fails, the spare disk automatically takes its place, and the data on the failed disk is rebuilt on the spare disk.

This feature minimizes the chances of data loss by reducing the time an array is in critical status.

To add a spare disk, perform the following steps:

1. Open the **WebGUI**.
2. Click **Logical.**
3. Click **Spare Pool**.


4. Check the box for the disk you want as a spare under **Available Disks**.
5. Click **Add Spare** and confirm by selecting **OK** from the pop-up window.



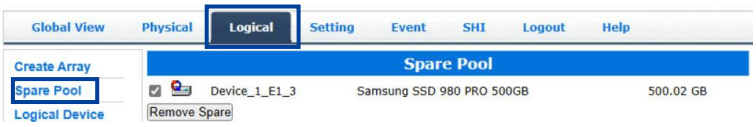

6. The disk has now been assigned as a spare. Click **OK** to confirm.
7. The created spare disks are displayed under the **Spare Pool.**

## 6.4.8. Remove a Spare Disk

Disks added to the spare pool will be displayed under the **Spare Pool**. You can also remove the spare disk from the Spare Pool.

To remove a spare disk, perform the following steps:

1. Open the **WebGUI**.
2. Click **Logical**.
3. Click **Spare Pool**.

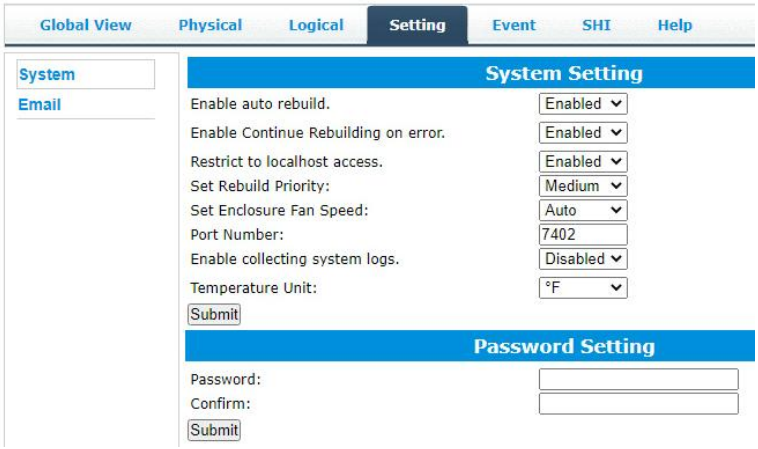



4. Select the spare disk from the **Spare Pool**.
5. Click **Remove Spare.**
6. There is no deleted spare disk information at the **Spare Pool**, indicating that the spare disk has been successfully removed.

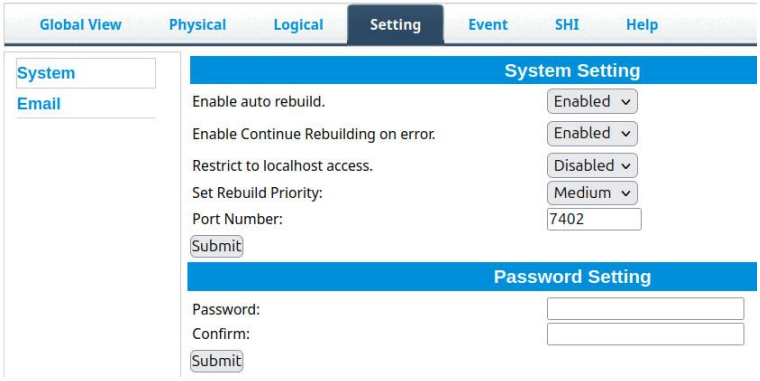
# 6.5. Setting

You can change the WebGUI settings in the **Setting** tab according to your preferred behavior and requirements. The **Setting** tab is divided into **System Setting**, **Password Setting** and **Email Setting**.

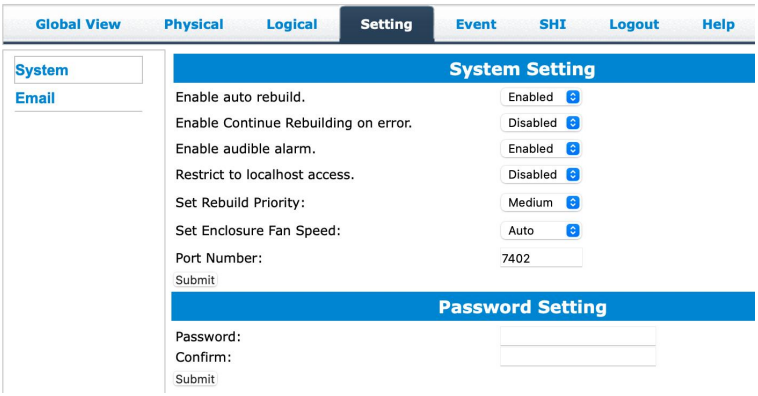
- **For Windows Users:**




- **For Linux Users:**

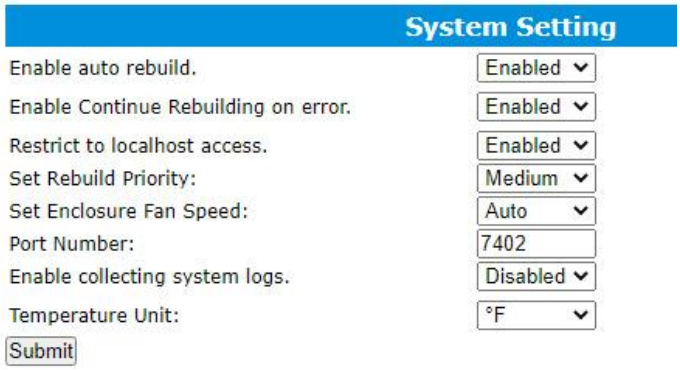



- **For macOS Users:**



## 6.5.1. System Setting

Using this tab, you can change the following system setting:




The following table enumerates the **System Setting** that you can adjust.

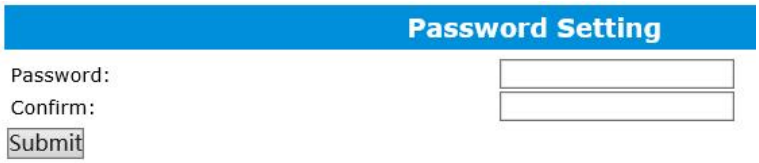
**Table 11: System Setting Options**

| Option | Description |
|---|---|
| **Enable auto rebuild** | (default: Enabled)<br>When a disk fails, the NVMe RAID AIC will take the disk offline. The NVMe RAID AIC will automatically rebuild the array after you have configured spare disks or replaced the disk, but only if the Enable auto rebuild option is enabled. |
| **Enable continue rebuilding on error** | (default: Enabled)<br>When enabled, the rebuilding process will ignore bad disk sectors and continue rebuilding until completion. When the rebuild is finished, the data may be accessible but inconsistent due to any bad sectors that were ignored during the procedure. HighPoint recommends checking the event log periodically for bad sector warnings if this option is enabled. |
| **Enable audible alarm** | (default: Enabled)<br>The audible alarm sounds when the following conditions occur:<br>- Disk Dropped<br>- Fan Speed lower than 600 RPM<br>- SSD Temperature is higher than the SSD warning threshold<br>- Broadcom Chipset Temperature is higher than 105°C<br>You can adjust the **audible alarm** setting here.<br>Warning: **Disabled audible alarm** is permanently disabling the beeper, so please proceed with caution! |
| **Restrict to localhost access** | (default: Enabled) |

| | |
|---|---|
| | Remote access to the AIC will be restricted when enabled; other users in your network cannot log in to the WebGUI remotely.<br>It is used as follows:<br>1. Set **Restrict to localhost access** to **Disabled**.<br>2. Click **Submit**.<br>3. Turn off the local firewall.<br>4. View the local IP address.<br>5. Use another system to access WebGUI remotely by typing **http://IP address:port number** in the browser. |
| **Set Rebuild Priority** | (default: Medium)<br>You can specify the amount of system resources you want to dedicate to rebuilding the array. There are 5 levels of priority [Lowest, Low, Medium, High, Highest] |
| **Set Enclosure Fan Speed** | (default: Auto)<br>You can adjust the speed of the fan. There are 5 levels [Auto, Off, Low, Medium, High] |
| **Port Number** | (default: 7402)<br>You may change it to any open port. (only for Windows) |
| **Enable collecting system logs** | (default: Disabled)<br>You can set it to enable the collection of system logs at any time. The collected system logs are stored on C:/Windows/hpt_diagdriver. The maximum size of the collected system log is 840MB; anything over 840MB will be overwritten forward.<br>This setting is only supported by the Windows HighPoint RAID Management.<br>It is used as follows:<br>1. Set **Enable collecting system logs** to **Enabled**.<br>2. Click **Submit.**<br>3. Reboot the system.<br>4. Duplicate the problems encountered.<br>5. Collect system logs with one click. |
| **Temperature Unit** | (default: °F)<br>The default temperature unit is Fahrenheit, and you can change it to Celsius.<br>This setting is only supported by the Windows HighPoint RAID Management. |

## 6.5.2. Password Setting

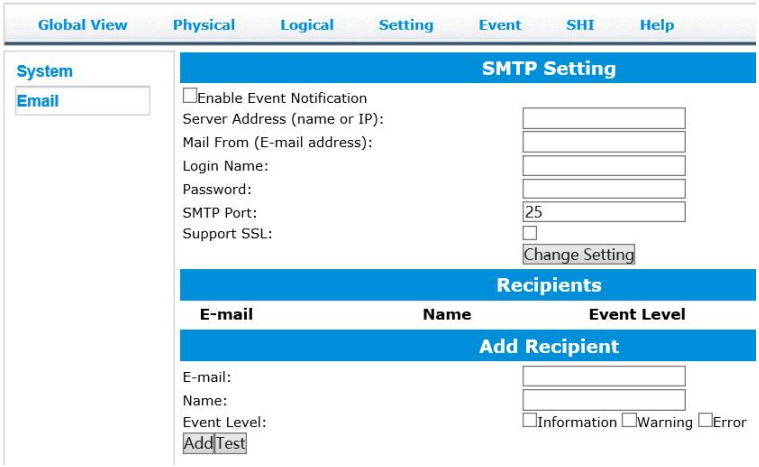
Using this tab, you can set or change your WebGUI password. The password length is less than or equal to 8 bits, and there is no limit to the valid complexity of the password.




Type your new password, confirm it, then click **Submit**.

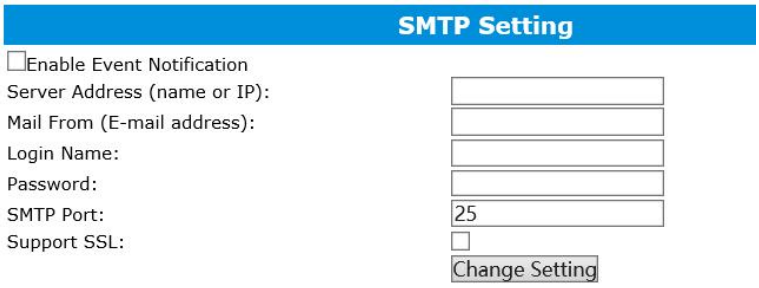
## 6.5.3. Email Setting

Using this tab, you can instruct the AIC to email the recipients of your choosing when certain events trigger.




### 6.5.3.1. Add an Email Server

To add an email server, complete the items in the **SMTP Setting**.




The following table enumerates the **SMTP Setting**.

**Table 12: SMTP Setting Options**

| SMTP Setting Option | Description |
|---|---|
| **Enable Event Notification** | Check the Enable Event Notification box to use the Event Notification. |
| **Server Address (name or IP)** | Enter the ISP (Internet service provider) **Server Address** or SMTP name. |
| **Mail From (E-mail address)** | Enter the email address of the sender. |
| **Login Name** | Enter the email account name of the sender. |
| **Password** | Enter the sender's email account password. |
| **SMTP Port** | Enter the SMTP port. (default: 25) |

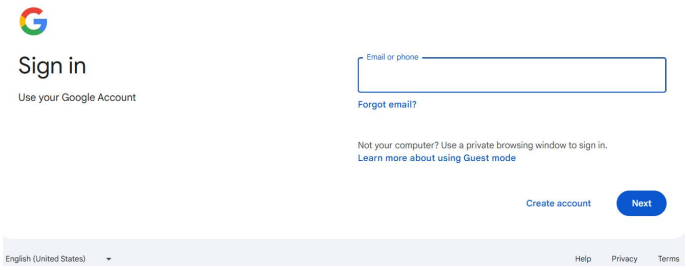
| | |
|---|---|
| **Support SSL** | Check the Support SSL box if SSL is supported by your ISP (port value will change to 465; refer to your ISP if you have a specific SMTP port. |

To add an email server, perform the following steps:

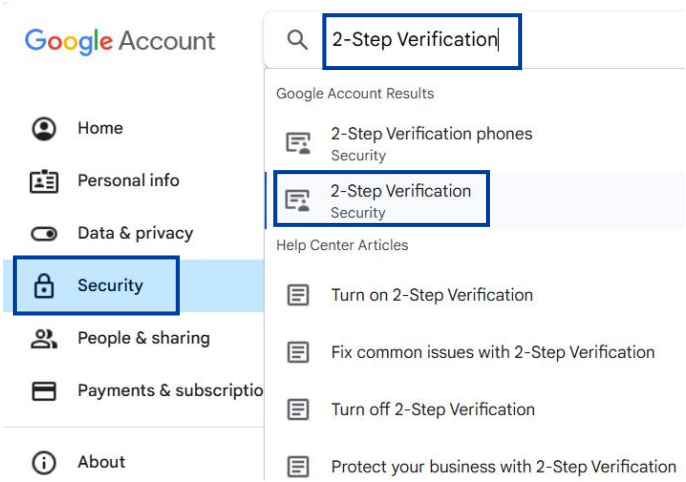
1. Open the **WebGUI**.
2. Click the **Setting** tab.
3. Check the **Enable Event Notification** box.
4. Enter the ISP server address or SMTP name in the **Server Address (name or IP)**.
5. Enter the email address of the sender (email account that is going to send the alert) in the **Mail From (E-mail address)**
6. Enter the account name of the sender in the **Login Name.**
7. Enter the sender's account password in the **Password.**

**Example: Gmail**

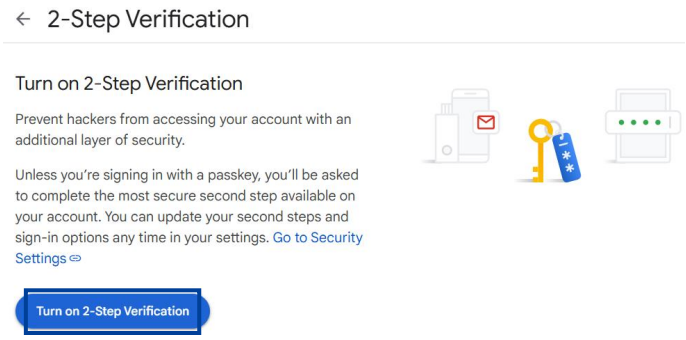
1) Sign in to Gmail and set it up, Login email address link: https://accounts.google.com/Login



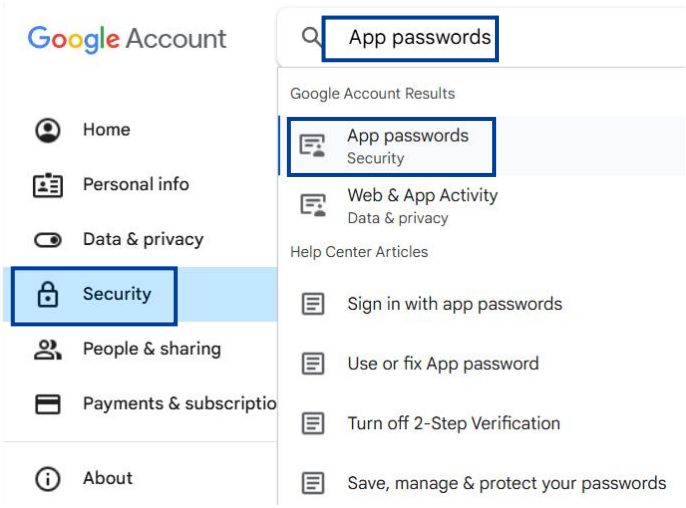

2) Click the **Security** and search for the **2-Step Verification.**



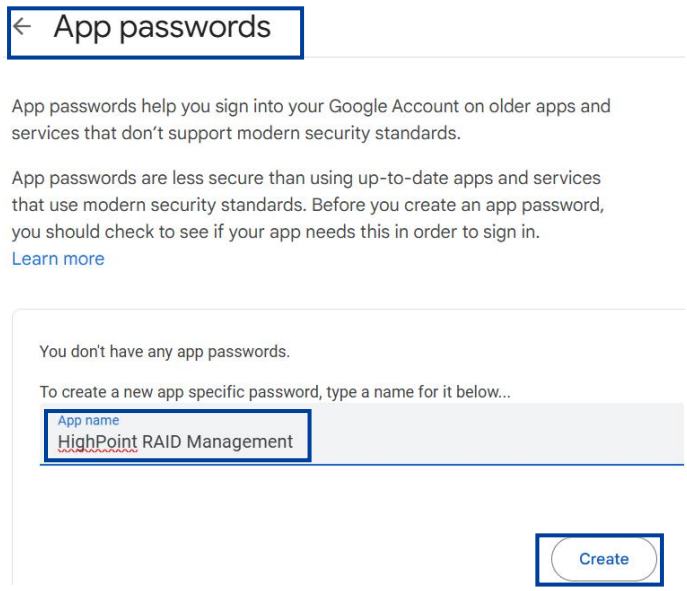
3) Click the **Turn on 2-Step Verification** and follow Gmail's prompts to complete the operation.



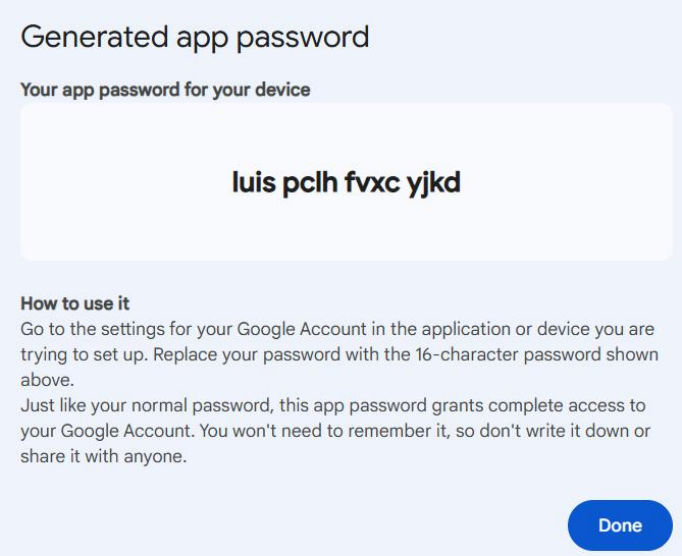

4) Click the **Security** and search for the **App passwords**.



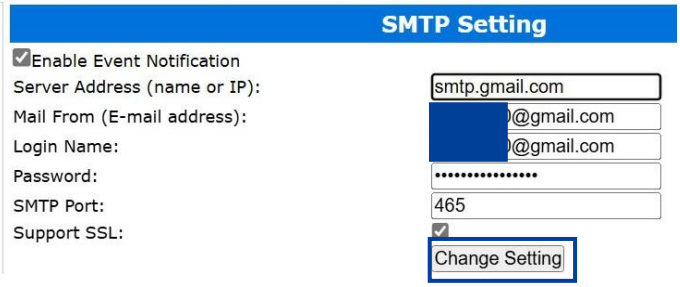

5) Click the **App passwords** and enter the app name.



6) Click **Create**, and you will get the new app-specific password. Enter this app-specific password into the **Password.**

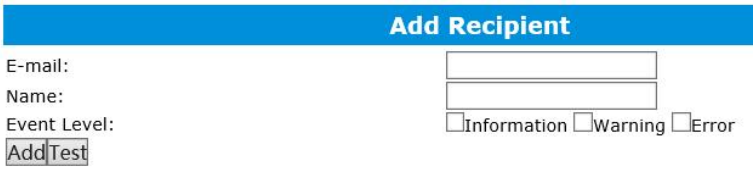



8. Enter the SMTP port (default:25) in the **SMTP Port**.
9. Check the **Support SSL** box if your ISP supports SSL.
10. Click **Change Setting**.



## 6.5.3.2. Add an Email Recipient

To add multiple email addresses as notice receivers, you need to complete the items in **Add Recipient.**




The following table enumerates the **Add Recipient.**

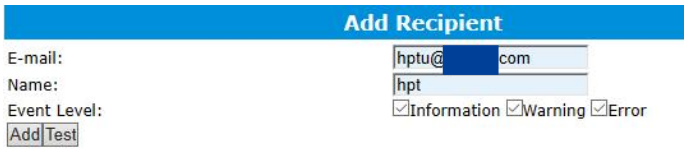
**Table 13: Add Recipient Options**

| Add Recipient Option | Description |
|---|---|
| **E-mail** | Enter the email address of the recipient.<br>If you want to receive notification mail using a Webmail account, you may need to modify the mailbox's permissions. |
| **Name** | Enter the name of the recipient. |
| **Event Level** | Check which type(s) of events will trigger an email in the respective **Event Level** check boxes.<br>- Inf (Information)<br>- War (Warning)<br>- Err (Error) |
| **Add/ Test** | (Optional)<br>- Click **Add** to add the recipient.<br>The added recipient will be displayed under Recipients.<br>The email will send your recipients the output recorded in the event log.<br>- Click **Test** to confirm settings are correct by sending a test email. |

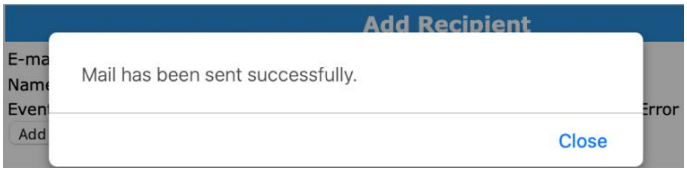
To add an email recipient, perform the following steps:

1. Open the **WebGUI**.
2. Click the **Setting** tab.
3. Type the email of the recipient in the **E-mail**.
4. Type the name of the recipient in the **Name**.

5. Select which type(s) of events will trigger an email using the respective **Event Level** check boxes.




6. **(Optional)** Click **test** to confirm the settings are correct by sending a test email.




7. Click **add** to add the email recipient to the recipient list.

## 6.5.3.3. List all Email Recipients

The added recipient will be displayed under **Recipients.**


## 6.5.3.4. Delete an Email Recipient

To delete an existing email recipient, perform the following steps:

1. Open the **WebGUI**.
2. Click the **Setting** tab.
3. Select the email recipient you want to delete under **Recipients.**
4. Click **Delete** to delete the email recipient.

# 6.6. Event

The **Event View** is a basic error logging tool built into the HighPoint WebGUI. You can see log entries associated with the HighPoint device. The event log provides useful information when troubleshooting your setup.


## 6.6.1. View the Event Log

You can view the event log of RAID creation, RAID deletion, disk drop, disk up, etc.

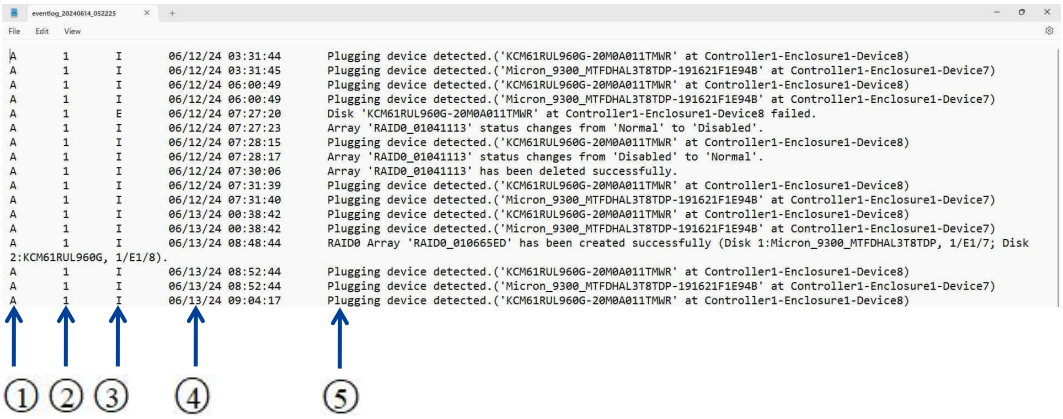

You can switch between event views by clicking on **Prev** and **Next.**

- **Prev –** View the previous log page
- **Next –** View the next log page

# 6.6.2. Save the Event Log

You can click **Download** to save the events log file on your system.


Open the downloaded event log.




The following table describes the Event Log.

**Table 14: Event Log**

| No | Property Name | Description |
|---|---|---|
| ① | Enclosure | Shows which specific Enclosure occurred the event. |
| ② | Email delivery | Includes the followings:<br>● **0** – Indicates that the event was not sent by Email.<br>● **1** – Indicates that the event has been sent by Email or the event log can not be sent because the mail is not set up recipients.<br>● **2** – Indicates that the mailbox recipient has been set up, but the event log is in pending status, waiting for the mail to be sent. |
| ③ | Event Levels | Includes the following event levels:<br>● **I** – Information<br>● **W** – Warning<br>● **E** – Error |
| ④ | Event Time | Shows the exact time of the event. |

| | | |
|---|---|---|
| ⑤ | Event Content | Shows the specifics of the event that occurred. |

## 6.6.3. Event Log Icon Guide

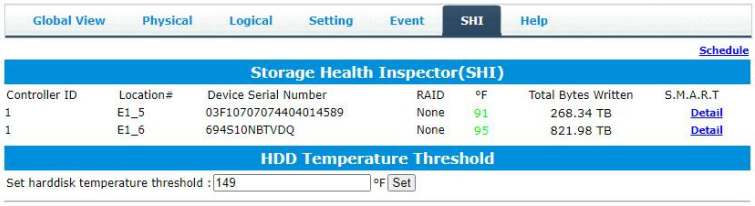
The following table describes the Event Log Icon.

**Table 15: Event Log Icon**

| Icon | Name | Definition |
|---|---|---|
|  | Information | Includes general administrative tasks:<br>● Create/delete arrays<br>● Configuring spares<br>● Rebuilding arrays<br>● Configuring eventnotifications<br>● Configuring maintenance |
|  | Warning | Alerts issued by the HostAdapter:<br>● High temperatures<br>● Sector errors<br>● Communication errors<br>● Verification errors |
|  | Error | Hardware related problems:<br>● Disk failure<br>● Broken errors<br>● Memory failure |

# 6.7. SHI

Storage Health Inspector (SHI) outputs information collected using SMART (Self-Monitoring Analysis and Reporting Technology) Disk Technology. The data provided on this tab helps you anticipate any disk failures based on various monitored disk properties.




## 6.7.1. View the SHI Information

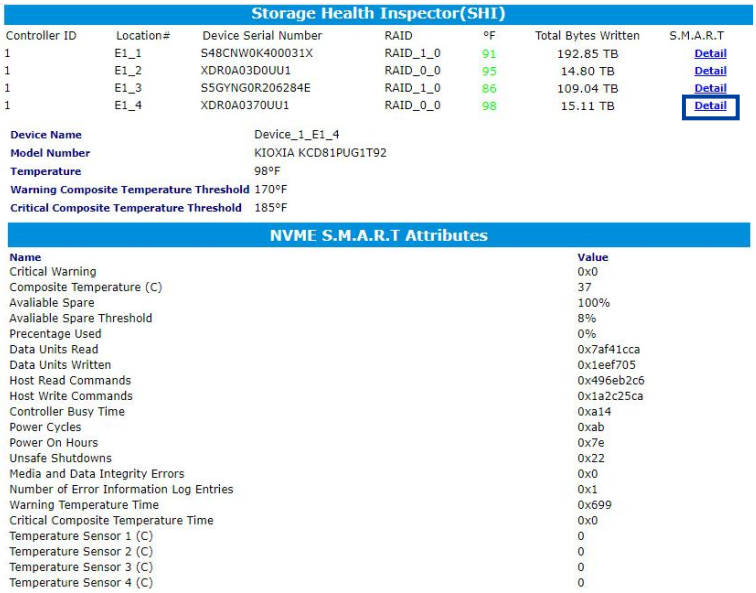
The **Storage Health Inspector (SHI)** tab is the default page when clicking the **SHI** tab of the WebGUI. The **Storage Health Inspector (SHI)** section displays the following information.


- **Controller ID** – Controller ID where the disk is hosted.
- **Location** – The physical disk location (e.g., Device 1_E1_2 represents the disk on AIC 1 port 2).
- **Device Serial Number** – The serial number of the physical disk.
- **RAID** – The RAID array in which the disk resides.
- **°F/ °C** – Current temperature of the physical disk. Unit: °F/ °C.
- **Total Bytes Written** – The total number of bytes that can be written over the life of the SSD.
- **S.M.A.R.T** – Click **Detail** to display the SMART information of a single physical disk.

## 6.7.2. View the SMART Information

To access the SMART information of a single disk, perform the following steps:

1. Open the **WebGUI**.
2. Click the **SHI** tab.
3. Click the **Detail** on the desired disk.



**Storage Health Inspector(SHI)**

| Controller ID | Location# | Device Serial Number | RAID | °F | Total Bytes Written | S.M.A.R.T |
|---|---|---|---|---|---|---|
| 1 | E1_1 | S48CNW0K400031X | RAID_1_0 | 91 | 192.85 TB | Detail |
| 1 | E1_2 | XDR0A03D0UU1 | RAID_0_0 | 95 | 14.80 TB | Detail |
| 1 | E1_3 | S5GYNG0R206284E | RAID_1_0 | 86 | 109.04 TB | Detail |
| 1 | E1_4 | XDR0A0370UU1 | RAID_0_0 | 98 | 15.11 TB | Detail |

| | |
|---|---|
| **Device Name** | Device_1_E1_4 |
| **Model Number** | KIOXIA KCD81PUG1T92 |
| **Temperature** | 98°F |
| **Warning Composite Temperature Threshold** | 170°F |
| **Critical Composite Temperature Threshold** | 185°F |

**NVME S.M.A.R.T Attributes**

| Name | Value |
|---|---|
| Critical Warning | 0x0 |
| Composite Temperature (C) | 37 |
| Avaliable Spare | 100% |
| Avaliable Spare Threshold | 8% |
| Precentage Used | 0% |
| Data Units Read | 0x7af41cca |
| Data Units Written | 0x1eef705 |
| Host Read Commands | 0x496eb2c6 |
| Host Write Commands | 0x1a2c25ca |
| Controller Busy Time | 0xa14 |
| Power Cycles | 0xab |
| Power On Hours | 0x7e |
| Unsafe Shutdowns | 0x22 |
| Media and Data Integrity Errors | 0x0 |
| Number of Error Information Log Entries | 0x1 |
| Warning Temperature Time | 0x699 |
| Critical Composite Temperature Time | 0x0 |
| Temperature Sensor 1 (C) | 0 |
| Temperature Sensor 2 (C) | 0 |
| Temperature Sensor 3 (C) | 0 |
| Temperature Sensor 4 (C) | 0 |

Note: The TBW (Total Bytes Written) information can be used to monitor the lifespan of the NVMe disks.

## 6.7.3. Set the Temperature Threshold

To set the disks's temperature threshold, perform the following steps:

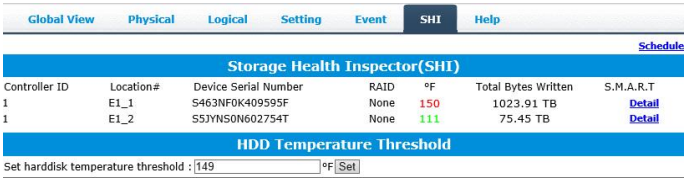
Notes:

This setting is not supported by the Linux HighPoint RAID Management.

149°F is the default. This setting can correspond with the disk manufacturer's official specifications.

1. Log in to the WebGUI.
2. Select the proper AIC using the drop-down menu on the top left.
3. Click the SHI tab.
4. Type temperature value.


If the temperature exceeds 149°F, it will display "Red".



# 6.7.4. Create a Health Inspector Scheduler

The **Health Inspector Scheduler** (**HIS**) enables you to schedule the disk and RAID array checkups to ensure they function optimally.


If you install the software for the first time, there will be a default check disk task here, which you can decide whether to keep or not, depending on your needs.

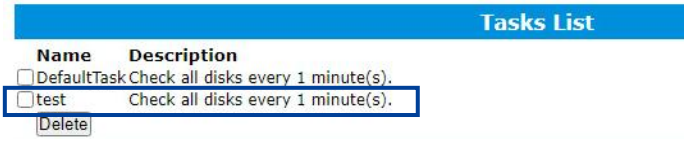

When the operating temperature of the disk exceeds the warning temperature threshold, or when the critical warning in the disk's smart message is not 0x0, a Warning event will appear in the **Event** view.

To create a Health Inspector Scheduler, perform the following steps:

To create a Health Inspector Scheduler, perform the following steps:

1. Open the **WebGUI**.
2. Click the **SHI** tab.
3. Set the **Task Name** and the time value in the **Occurs every.**

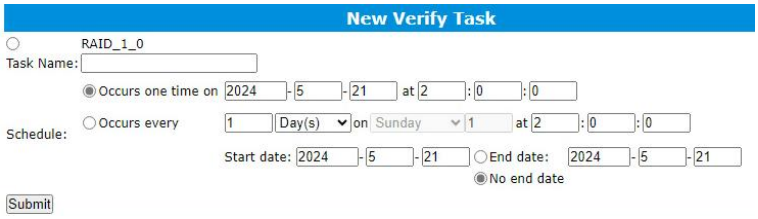

4. After clicking **Submit**, your task will be shown under the **Task List**.



## 6.7.5. Create a New Verify Task

The Scheduler enables you to schedule disk/array checkups to ensure arrays are functioning optimally.

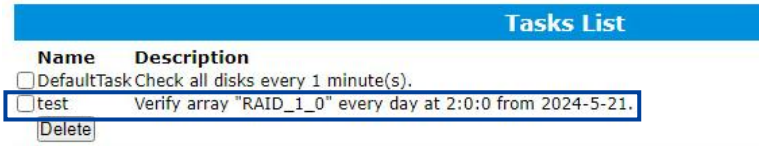
All redundant RAID arrays (RAID1/ RAID10) will appear under the New Verify Task.




To create a Health Inspector Scheduler, perform the following steps:

If you want to create a new verify task. You need to follow the steps below.

1. Open the **WebGUI**.
2. Select the proper AIC from the top left drop-down.
3. Click **SHI.**
4. Click **Schedule.**
5. Select the array you want to schedule the verify task.
6. Type the name in the **Task Name** entry box.
7. Choose whether you want to schedule.
8. One-time verify task on a specific date (YYYY-MM-DD) at (HH:MM: SS, 24-hr clock). Or a specific schedule you can adjust based on Daily, Weekly, or Monthly options.
9. Click **Submit.**
10. Your entry will appear under the **Tasks List.**




Note: The New Verify Task box only appears if you have normal status arrays. If you have a critical array, the New Rebuild Task will replace the New Verify Task.

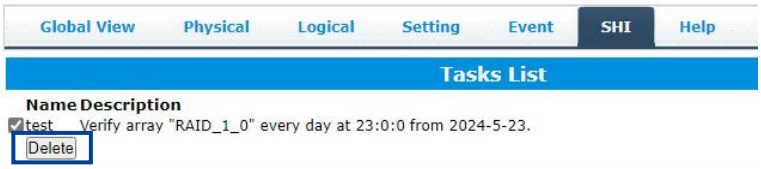
## 6.7.6. Delete a Task

The Scheduler enables you to schedule disk/array checkups to ensure arrays are functioning optimally.

All redundant RAID arrays (RAID1/ RAID10) will appear under the New Verify Task.

To delete an existing task, perform the following steps:

1. Open the **WebGUI**.
2. Click **SHI**.
3. Click **Schedule**.
4. Select the task you want to delete under the **Tasks List.**
5. Click **Delete** to delete the task.



# 6.8. Help

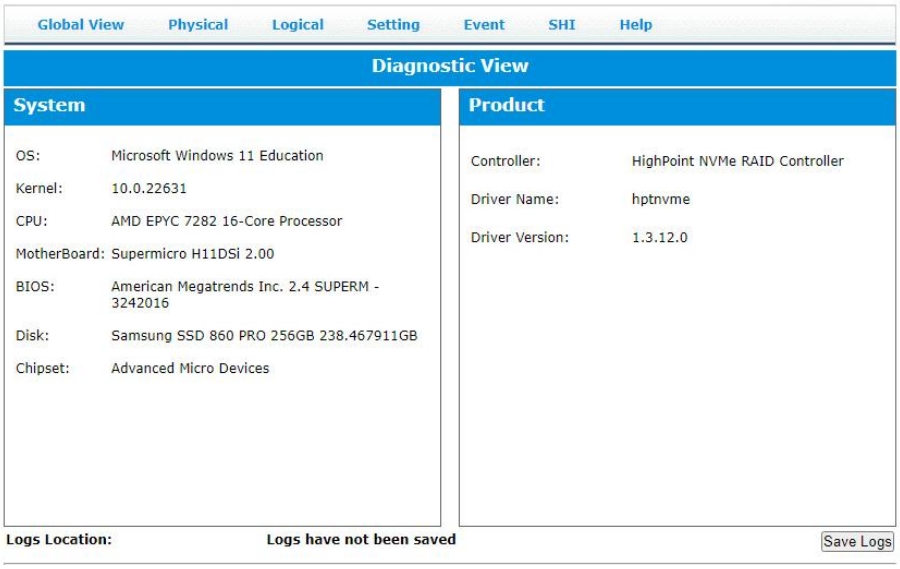

The **Help** displays help related to the WebGUI. The **Help** displays information about the AIC connection to the system and the AIC and driver status.

## 6.8.1. Online Help

Online Help redirects you to the official HighPoint website.

## 6.8.2. Diagnostic View

Diagnostic View provides a **1-click** information collection system for troubleshooting. It will gather and compile all necessary hardware, software, and storage configuration data into a single file.

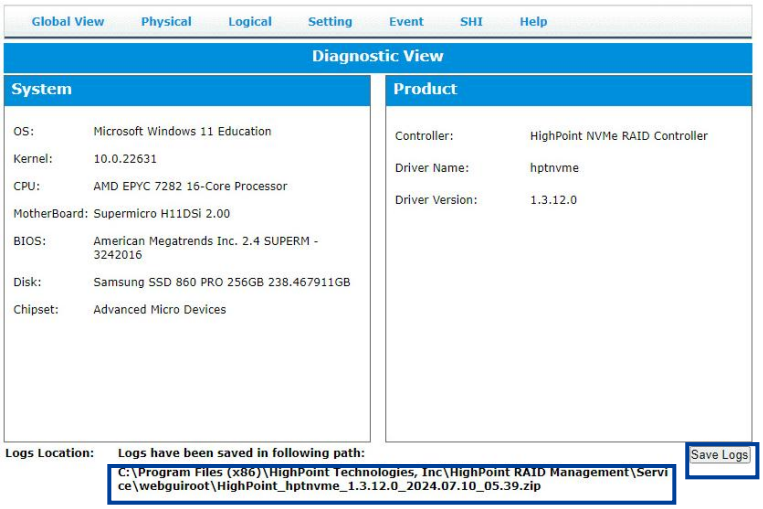


# 6.8.3. Save the Diagnostic Log

To save the Diagnostic log, perform the following steps:

1. Click the **Save Logs** button to create the diagnostic file.
2. **Logs Location** will display the location of the saving path.

- **For Windows User**




The following table lists and describes each folder in the log zip file.

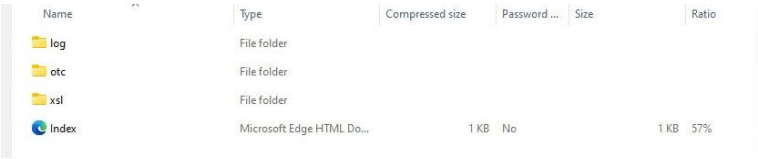
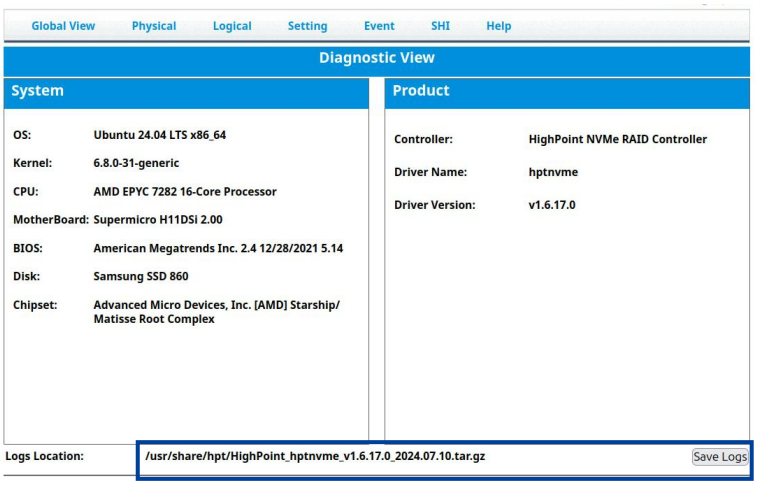



**Table 16: Description of each folder in the log zip file (Windows)**

| Folder | Property | Description |
|---|---|---|
| Log | hpt CPU.txt | CPU configuration of the current system. |
| | hpt Disk.txt | Number and names of disks in the current system. You can also see the capacity of the disk. |
| | hpt driver.txt | Record all driver information used in Windows. Include the driver's name, version, and status. |
| | hpt Pci.txt | Information about all PCIe devices connected to the motherboard. |
| | hpt {drivername}.log | Record activity log in WebGUI. Collect driver runtime logs to check if the driver is working properly. |
| | hpt service.txt | Record the status of all services in the system. |
| | hpt diag.txt | Collect the runtime logs of management software to detect any abnormalities. |
| | drInst.{date}.dmp | Collect the crash logs of management software for analysis. |
| | hpt temperature.txt | Collects chip and disk temperature information to monitor thermal conditions. |
| | hpt_temperature.csv | |
| | hpt_xxx.txt | AIC log information, including creation/deletion of RAID and exception |

| | | |
|---|---|---|
| | | events. xxx is the SN number of AIC. |
| | hpt systemEvent.log | Event from Windows. |
| | MEMORY.DMP | Record information after system BSOD/Crash; you can just collect it in DataRAID. |
| | setupapi.dev.txt | Record the installation log of the driver. This is the log generated by the operating system itself. This can be used to check the log of the AIC installed driver showing an exclamation mark. |
| | hptnvmeco.txt | This is generated by HighPoint and is used to determine the reason for the exclamation mark when the NVMe driver is installed. |
| | hpt diagdriver.txt | Debug driver log information, including error information. |
| Index.xml | RAID Management web page | On the HTML webpage, record the screenshot information for each page of this WebGUI.<br>● Diagnostic View—CPU, Motherboard model, BIOS, driver version.<br>● Global view—Record disk and RAID utilization.<br>● Physical—Record the RAID Controller and disk PCIe width.<br>● Logical—Record the RAID status and the member of the RAID.<br>● Setting—Record the status of the WebGUI function setting.<br>● Event—Record activity log in WebGUI.<br>● SHI—Record the smart info of disks. |
| xsl | RAID Management web page | It contains components that allow local html files to be opened. |
| otc | 0-switch | ● event.txt—Collect sensor information every minute, including power voltage, fan speed, and temperature.<br>● info.txt—Collect AIC information, including firmware, SN, firmware version, chip/board temperature, voltage/power, and fan speed.<br>● log.txt—AIC log, including RAID operation, disk drop, fan speed abnormal, temperature abnormal, voltage abnormal.<br>● Port.txt—AIC downstream port info, including width, speed, and PCIe configuration space.<br>● trace.txt—Collect firmware runtime log.<br>● {sn}.bin—AIC factory data, including the initial setup parameters. |

- **For Linux User**




The following table lists and describes each folder in the log zip file.


**Table 17: Description of each folder in the log zip file (Linux)**

| Folder | Property | Description |
|---|---|---|
| log | cpu info.txt | CPU configuration of the current system. |
| | disk info.txt | Number and names of disks in the current system. |
| | dmesg info.txt | Kernel log in Linux. |
| | dmidecode info.txt | Instructions to view hardware information, BIOS, system, motherboard, processor, memory, cache, etc. |
| | hptdrv log | HighPoint driver installation log. |
| | lsmod info | Record all driver information used in Linux. |
| | kern.log | System kernel log. |
| | lspci info | Information about the PCIe device connected to the motherboard. |
| Index.xml | RAID Management web page | HTML webpage, record the screenshot information of each page of this WebGUI<br>● Diagnostic View—CPU, Motherboard model, BIOS, driver version.<br>● Global view—Record disk and RAID utilization.<br>● Physical—Record the RAID Controller and disk PCIe width. |

| | | |
|---|---|---|
| | | ● Logical—Record the RAID status and the member of the RAID.<br>● Setting—Record the status of the WebGUI function setting.<br>● Event—Record activity log in WebGUI.<br>● SHI—Record the smart info of disks. |
| xsl | RAID Management web page | It contains components that allow local html files to be opened. |
| crash | N/A | It contains logs saved by the Linux system crash. |
| otc | 0-switch | ● event.txt—Collect sensor information every minute, including power voltage, fan speed, and temperature.<br>● info.txt—Collect AIC information, including firmware, SN, firmware version, chip/board temperature, voltage/power, and fan speed.<br>● log.txt—AIC log, including RAID operation, disk drop, fan speed abnormal, temperature abnormal, voltage abnormal.<br>● Port.txt—AIC downstream port info, including width, speed, and PCIe configuration space.<br>● trace.txt—Collect firmware runtime log.<br>● {sn}.bin—AIC factory data, including the initial setup parameters. |

- **For macOS User**


The following table lists and describes each folder in the log zip file.

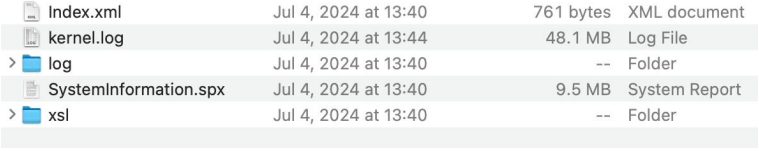



**Table 18: Description of each folder in the log zip file (macOS)**

| Folder | Property | Description |
|---|---|---|
| log | DiagnosticReports | This is the crash log, including driver and WebGUI crashes in this directory, which have error file generation. |
| | Log | Mainly, system and application runtime logs |
| | Disk log | Number and names of disks in the current system. |
| | Ioreg log | Information about the Pcie device connected to the macOS. |
| Index.xml | RAID Management web page | HTML webpage, record the screenshot information of each page of this WebGUI<br>● Diagnostic View—CPU, Motherboard model, BIOS, driver version.<br>● Global view—Record disk and RAID utilization.<br>● Physical—Record the RAID Controller and disk PCIe width.<br>● Logical—Record the RAID status and the member of the RAID.<br>● Setting—Record the status of the WebGUI function setting.<br>● Event—Record activity log in WebGUI.<br>● SHI—Record the smart info of disks. |
| Kernel.log | N/A | Kernel log in macOS. |
| Systeminformation.spx | N/A | System report for macOS, including macOS version, CPU, pci log. |
| xsl | RAID Management web page | It contains components that allow local html files to be opened. |

# 7. Command Line Interface

The Command Line Interface is often referred to as CLI. This section describes the various HighPoint CLI commands: query, create, delete, rebuild, verify, unplug, switch, lscard, rescan, init, events, mail, task, set, clear, diag, help, exit, ver, diag secure and update.

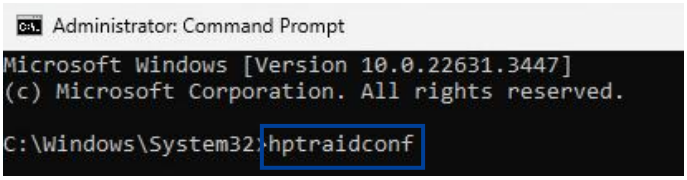
Warning: Using create/ delete commands may destroy data stored in the disks, and this lost data can never be recovered.

Please be cautious when executing these commands. The CLI utility will not prompt you before each command is executed.

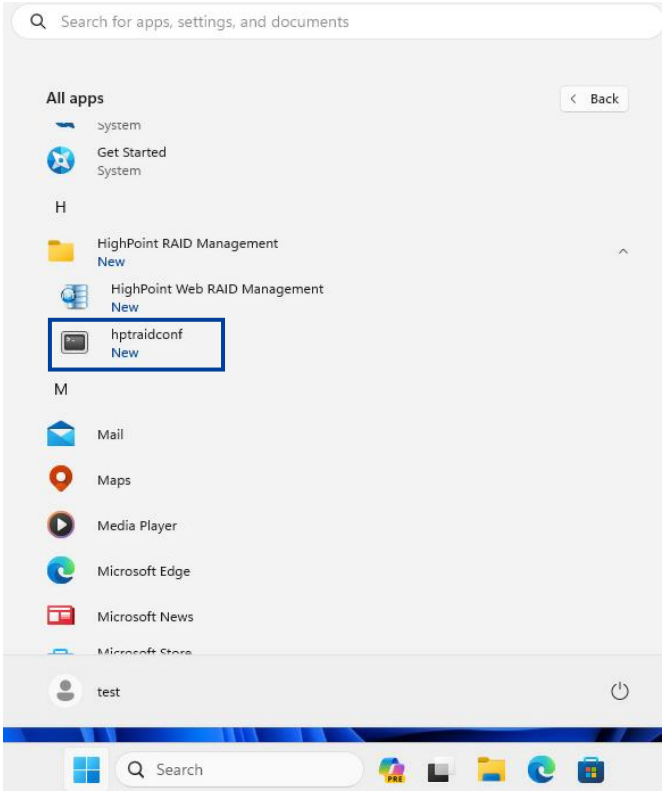
## 7.1. Start the CLI

**For Windows Users**

- **Method 1**: Run **Command Prompt** as Administrator, enter **hptraidconf,** and press **Enter**.



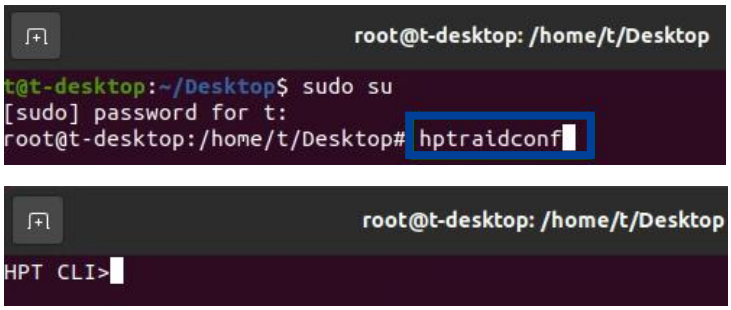

- **Method 2:** Click **Start** to find the **HighPoint RAID Management** folder, and click on **hptraidconf**.



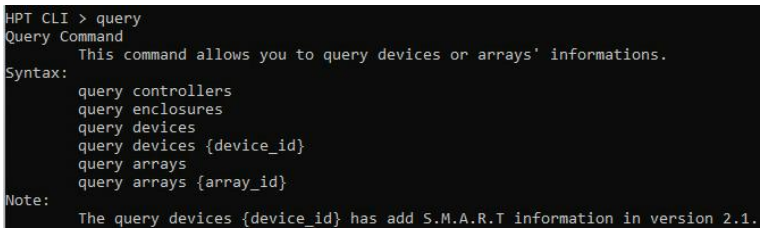
**For Linux Users**

1. Open the **Terminal** and enter root permissions.

2. Execute the command **hptraidconf** to enter the CLI.



# 7.2. Query Commands




You can use the query command to view the AIC status and disk information.

The following table lists and describes the properties of the query command.

**Table 19: Properties for query Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **query** | controllers | N/A | This command reports AIC information |
| **query** | enclosures | N/A | This command reports AIC Product ID information. |
| | | {enclosure_id} | This command presents information of the specified AIC. |
| **query** | devices | N/A | This command presents information of the physical disks hosted by the AIC. |
| **query** | | {device_id} | This command presents information for the specified physical disk. |
| **query** | arrays | N/A | This command lists information about each configured array, such as ID, capacity, RAID type, and status. |
| **query** | | {arrays_id} | This command presents information of each disk of a specified array. |

# 7.2.1. Query Controller

**HPT CLI>query controllers**

This command reports AIC information.

**Input example:**

HPT CLI>query controllers


- **ID -** The number of the AIC.
- **Channel -** The HighPoint NVMe AIC is a virtual device with a channel default of 0.
- **Name -** The AIC's model name.

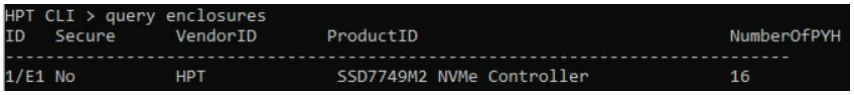
# 7.2.2. Query Enclosure

**HPT CLI>query enclosures**

This command reports AIC Product ID information.

**Input example:**

HPT CLI>query enclosures




- **ID -** An AIC ID is a string used to represent an AIC. It is in the format “1/AIC” for AICs.
- **Secure -** Whether the AIC is secured
- **VendorID -** An AIC property indicating the vendor-assigned ID number of the AIC.
- **ProductID -** The model name of the AIC.
- **NumberOfPYH -** The number of connected physical devices supported by the AIC.

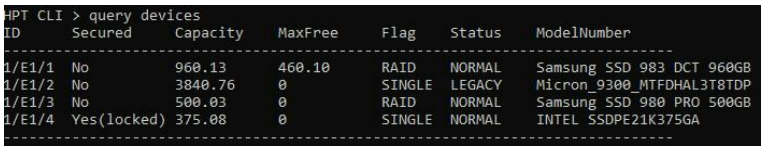
# 7.2.3. Query Device

**HPT CLI>query devices**

This command will provide the status of each physical disk hosted by the AIC.

**Input example:**

HPT CLI>query devices



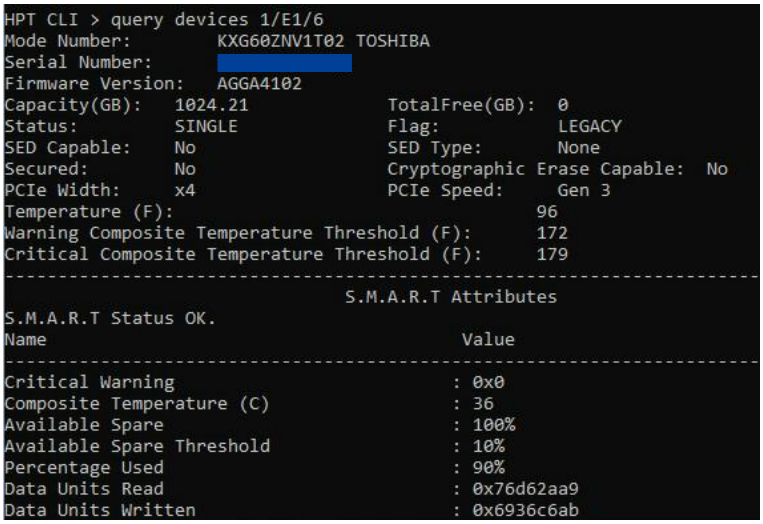

- **ID -** A disk ID is a string used to represent a disk. It is in the "AIC/port/ device" format for NVMe AICs. e.g., 1/E1/2 represents the disk on AIC 1 port 2.
- **Secured -** Whether the physical disk is secured.
- **Capacity -** The disk's capacity is GB.
- **MaxFree -** The maximum sequence free space on the disk can be used to create the array.
- **Flag -** Shows whether the disk is SINGLE or has been created RAID.
- **Status -** This will display the disk status (1 of 4 possible states):
  - **LEAGACY:** The disk's status is legacy.
  - **DISABLED:** The disk cannot be used. (May be related to disk failure)
  - **NORMAL:** The disk is a member of a RAID array.
  - **SPARE:** The disk has been set as a spare disk.
- **ModelNumber -** The disk's model number.

**HPT CLI>query devices {device_id}**

This command presents information for the specified physical disk.

**Input example:**

HPT CLI>query devices 1/E1/6




- **Mode Number -** The disk's model number.
- **Serial Number -** The serial number of the physical disk.
- **Firmware Version -** The disk's Firmware version.
- **Capacity -** The disk's capacity.
- **TotalFree (GB) -** The total capacity that is not configured.
- **Status -** The disk's status.
  - **LEGACY:** The disk's status is legacy.
  - **DISABLED:** The disk cannot be used. (May be related to disk failure)
  - **RAID:** The disk is a member of a RAID array.
  - **SPARE:** The disk has been set as a spare disk.
- **Flag -** Shows whether the disk is single or has been created RAID.
- **SED Capable -** Whether the disk supports the SED feature.
- **SED Type -** The current SED Type of the physical disk is OPAL
- **Secured -** Whether the disk is secured.
- **Cryptographic Erase Capable -** Whether the disk supports the Cryptographic Erase feature.
- **PCIe Width -** The disk's PCIe width.
- **PCIe Speed -** The disk's PCIe speed.

- **Temperature -** The disk's temperature.
- **Warning Composite Temperature Threshold (F) -** The disk's warning composite temperature threshold.
- **Critical Composite Temperature Threshold (F) -** The disk's critical composite temperature threshold.
- **S.M.A.R.T Attributes** - S.M.A.R.T Attributes detailed information reported by disk.

# 7.2.4. Query Array

**HPT CLI>query arrays**

This command lists information about each configured array, such as array ID, secured status, capacity, RAID type, status, and array attributes.

**Input example:**

HPT CLI> query arrays

```
HPT CLI > query arrays
ID      Secured Capacity(GB)    Type        Status   Block  Sector   Cache          Name
-------------------------------------------------------------------------------
1           No      7681.01   RAID0       NORMAL    512k    512B    NONE       RAID_0_0
```

**HPT CLI>query arrays {arrays_id}**

This command will present information of each disk of a specified array.

**Input example:**

HPT CLI>query arrays 1

```
HPT CLI > query arrays 1
ID:             1                   Name:           RAID10_0
Type:           RAID10              Status:         NORMAL
Capacity(GB):   1919.85             BlockSize:      512k
SectorSize:     512B                CachePolicy:    NONE
Progress:       --                  Secure:         No
ID      Secured Capacity(GB)    Type        Status   Block  Sector   Cache          Name
-------------------------------------------------------------------------------
1-1         No      239.98    RAID1       NORMAL      --    512B    NONE      [RAID10_0]
1-2         No      239.98    RAID1       NORMAL      --    512B    NONE      [RAID10_0]
1-3         No      239.98    RAID1       NORMAL      --    512B    NONE      [RAID10_0]
1-4         No      239.98    RAID1       NORMAL      --    512B    NONE      [RAID10_0]
1-5         No      239.98    RAID1       NORMAL      --    512B    NONE      [RAID10_0]
1-6         No      239.98    RAID1       NORMAL      --    512B    NONE      [RAID10_0]
1-7         No      239.98    RAID1       NORMAL      --    512B    NONE      [RAID10_0]
1-8         No      239.98    RAID1       NORMAL      --    512B    NONE      [RAID10_0]
-------------------------------------------------------------------------------
```

- **ID -** The array's ID. A number generally represents an array ID.
- **Secured -** Whether the array is secured.
- **Capacity -** The capacity of the array is GB.
- **Type -** The array's type. (RAID0, RAID1, RAID10)
- **Status -** The array's status.
  - **NORMAL:** The array status is normal.
  - **CRITICAL:** The array is degraded (no data redundancy).
  - **DISABLED:** The array is disabled.
  - **REBUILDING:** The array is being rebuilt.
  - **VERIFYING:** The array is verifying.
  - **INIT(F):** Initializing an array using Foreground mode.

- **INIT(B):** Initializing an array using Background mode.
- **UNINITIALIZED:** The array is not initialized.

- **Block -** The block size of the array.
- **Sector -** The bytes per sector of the array.
- **Name -** The name of the RAID array in the system.

# 7.3. Init Commands

```
HPT CLI > init
init command
        Init the array or device.
Syntax:
        init {device id| array id} {start|stop}
```

You can use init commands to initialize disks or arrays. A disk must be initialized first before being used to create arrays.

The following table lists and describes the properties of the init command.

**Table 20: Properties for init Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **init** | {device_id} | The disk hosted by the AIC | This command initializes a disk for first use or a legacy disk on the AIC. |
| **init** | {array_id} | The created RAID array | This command starts/stops the initialization process of a redundant RAID array (RAID1). |
| | {start\|stop} | start/ stop | |

## 7.3.1. Init a Physical Disk

**HPT CLI>init {device_id}**

This command initializes a disk for first use or a legacy disk on the AIC.

**Input example:**

HPT CLI>init 1/E1/1

```
HPT CLI > query devices
ID      Secured     Capacity    MaxFree     Flag    Status    ModelNumber
------------------------------------------------------------------------------
1/E1/1  No          960.13      460.10      RAID    NORMAL    Samsung SSD 983 DCT 960GB
1/E1/2  No          3840.76     0           SINGLE  LEGACY    Micron_9300_MTFDHAL3T8TDP
1/E1/3  No          500.03      0           RAID    NORMAL    Samsung SSD 980 PRO 500GB
1/E1/4  Yes(locked) 375.08      0           SINGLE  NORMAL    INTEL SSDPE21K375GA
------------------------------------------------------------------------------

HPT CLI > init 1/E1/2
Init device(1/E1/2) successfully!

HPT CLI > query devices
ID      Secured     Capacity    MaxFree     Flag    Status    ModelNumber
------------------------------------------------------------------------------
1/E1/1  No          960.13      460.10      RAID    NORMAL    Samsung SSD 983 DCT 960GB
1/E1/2  No          3840.64     3840.64     SINGLE  NORMAL    Micron_9300_MTFDHAL3T8TDP
1/E1/3  No          500.03      0           RAID    NORMAL    Samsung SSD 980 PRO 500GB
1/E1/4  Yes(locked) 375.08      0           SINGLE  NORMAL    INTEL SSDPE21K375GA
------------------------------------------------------------------------------
```

## 7.3.2. Init a RAID Array

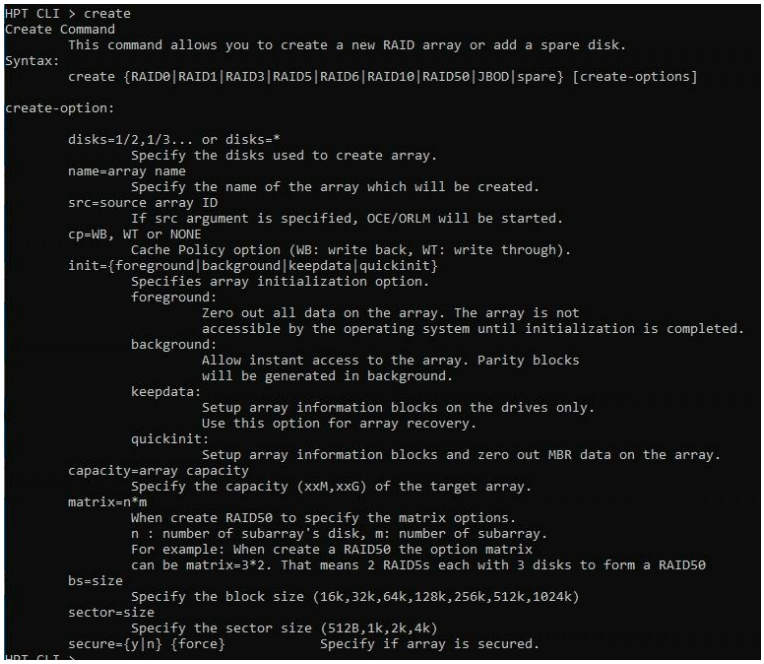
**HPT CLI>init{array_id} {start|stop}**

This command starts/stops the initialization process of a redundant RAID array (RAID1).

**Input example:**

HPT CLI>init 1 stop

# 7.4. Create Command



```
HPT CLI > create
Create Command
        This command allows you to create a new RAID array or add a spare disk.
Syntax:
        create {RAID0|RAID1|RAID3|RAID5|RAID6|RAID10|RAID50|JBOD|spare} [create-options]

create-option:

        disks=1/2,1/3... or disks=*
                Specify the disks used to create array.
        name=array name
                Specify the name of the array which will be created.
        src=source array ID
                If src argument is specified, OCE/ORLM will be started.
        cp=WB, WT or NONE
                Cache Policy option (WB: write back, WT: write through).
        init={foreground|background|keepdata|quickinit}
                Specifies array initialization option.
                foreground:
                        Zero out all data on the array. The array is not
                        accessible by the operating system until initialization is completed.
                background:
                        Allow instant access to the array. Parity blocks
                        will be generated in background.
                keepdata:
                        Setup array information blocks on the drives only.
                        Use this option for array recovery.
                quickinit:
                        Setup array information blocks and zero out MBR data on the array.
        capacity=array capacity
                Specify the capacity (xxM,xxG) of the target array.
        matrix=n*m
                When create RAID50 to specify the matrix options.
                n : number of subarray's disk, m: number of subarray.
                For example: When create a RAID50 the option matrix
                can be matrix=3*2. That means 2 RAID5s each with 3 disks to form a RAID50
        bs=size
                Specify the block size (16k,32k,64k,128k,256k,512k,1024k)
        sector=size
                Specify the sector size (512B,1k,2k,4k)
        secure={y|n} {force}            Specify if array is secured.
HPT CLI >
```

You can use create commands to create a new RAID array and add a spare disk.

Note: RocketAIC series NVMe AIC SSDs are already pre-configured with RAID0. You can skip those steps. You can follow the steps if you want to use another type of RAID.

The following table lists and describes the properties of the create command.

**Table 21: Properties for create Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **create** | ArrayType | RAID0<br>RAID1<br>RAID10 | Specify the RAID level to be created.<br>The AIC supports RAID levels 0, 1, and 10. |
| | create-options | disks | Specifies member disks that will compose a new array.<br>disks=1/2,1/3...or disks=*<br>* Indicates creation of RAID array using all member disks. |
| | | name | Specify the name of the array which will be created.<br>(Default: RAID_<level>_<array number>) |
| | | src | Specifies an existing array to be expanded/migrated. All data on the |

| | | | |
|---|---|---|---|
| | | | source array will be redistributed online to the target array. If this parameter is omitted, a new array is created. |
| | | init | Specifies array initialization option.<br>- **foreground:** Zero out all data on the array. The array is not accessible by the operating system until initialization is completed. (Not Recommended)<br>- **background:** Allow instant access to the array. Parity blocks will be generated in the background. (Not Recommended)<br>- **keepdata**: Setup array information blocks on the drives only. Use this option for array recovery.<br>- **quickinit:** Setup array information blocks and zero out MBR data on the array.<br>Important Note: The Foreground and Background Initialization options will cause NVMe media to result in TBW and performance degradation. Initialization of a disk sets all data bits to 0, clearing all the data on the disk. It is important to initialize disks as previous data physically stored on the disk may interfere with new data. |
| | | capacity | Specify the capacity of the target array.<br>capacity=10MB/1000MB...or capacity=*<br>* Indicates creation of RAID array using all disk capacities. |
| | | bs | It allows you to adjust the block size to fit your disk usage, which can result in some performance gain.<br>- 128K<br>- 256K<br>- 512K (Default)<br>In a typical RAID configuration, virtual disk data is striped (or spread across) the physical disks. A smaller array block size will increase the likelihood of accessing all physical disks when processing large I/O requests. Multiple physical disks working in parallel increase the throughput, meaning better performance. |
| | | sector | Specifies the target array's logical sector size in B/KB. This option is only valid for stripped RAID levels. |
| | | secure | Allows you to use the RAID array’s SED capabilities. |

| | | | |
|---|---|---|---|
| | | | Only AIC that supports the SafeStorage Encryption feature will have this option. |
| **create** | space | spare | This command allows you to add a spare disk. |
| | {device_id} | The disk hosted by the AIC | |

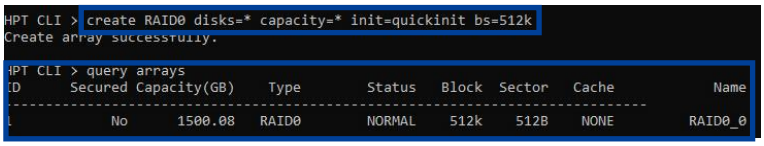
## 7.4.1. Create a RAID Array

**HPT CLI>create RAID{RAID0|RAID1|RAID10} [create-options]**

This command allows you to create a new RAID array.

**Input example:**

HPT CLI>create RAID0 disks=* capacity=* init=quickinit bs=512k



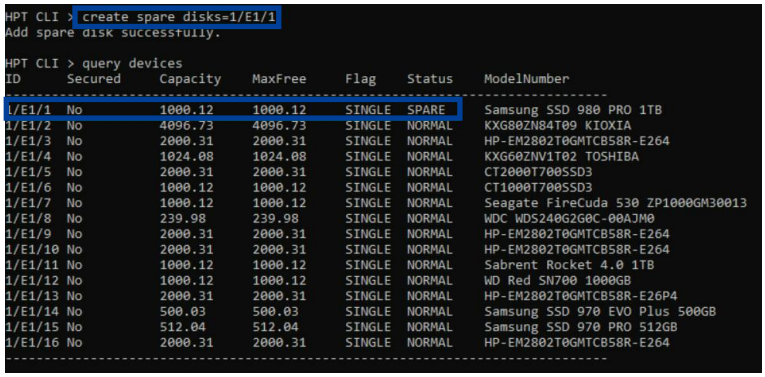

## 7.4.2. Create a Spare Disk

**HPT CLI>create spare {device_id}**

This command allows you to add a spare disk.

**Input example:**

HPT CLI>create spare disks=1/E1/1



# 7.5. Delete Command

```
HPT CLI > delete
Delete Command
       This command allows you to delete an existing RAID array or remove
       a spare disk. After deletion, the original array and all data on it
       will be lost. All the member disks will be listed as available single disks.
Syntax:
       delete {array id | spare id}
```

You can use delete commands to delete an existing RAID array or remove a spare disk.

After deletion, the original array and all data will be lost. All the member disks will be listed as available single disks.

The following table lists and describes the properties of the delete command.

**Table 22: Properties for delete Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **delete** | {spare_id} | The added spare disk | This command instructs the system to delete the spare disk. |
| **delete** | {array_id} | The created RAID array | This command instructs the system to delete the array. |

## 7.5.1. Delete a RAID Array

**HPT CLI>delete {array_id}**

This command allows you to delete an existing RAID array.

**Input example:**

HPT CLI>delete 1

```
HPT CLI > query arrays
ID      Secured Capacity(GB)    Type        Status   Block  Sector   Cache          Name
-------------------------------------------------------------------------------
1           No      1500.08   RAID0       NORMAL    512k    512B    NONE        RAID0_0

HPT CLI > delete 1
Delete array(1) successfully!
```

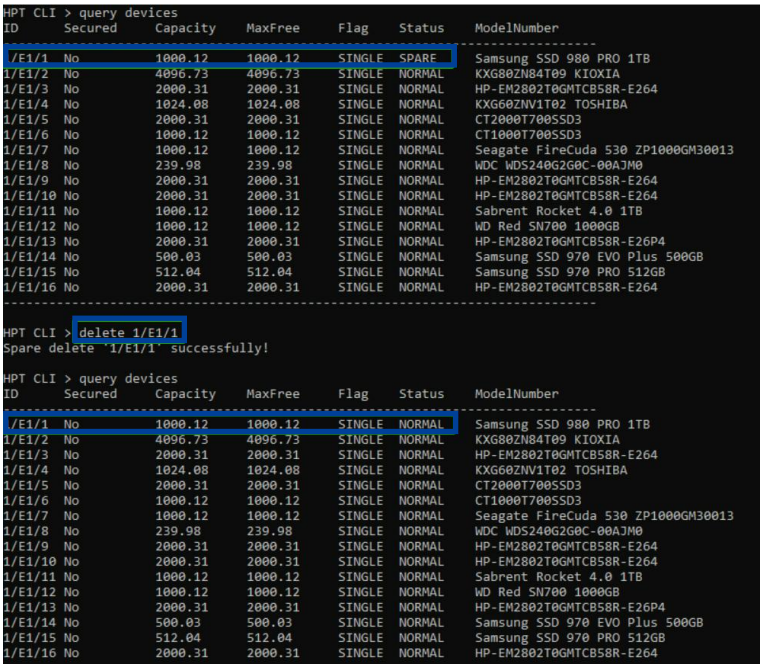
# 7.5.2. Delete a Spare Disk

**HPT CLI>delete {spare_id}**

This command allows you to delete an existing spare disk.

**Input example:**

HPT CLI>delete 1/E1/1



# 7.6. Rebuild Command

```
HPT CLI > rebuild
Rebuild Commands
       You can use rebuild commands to rebuild a RAID1 RAID5 RAID6,
       when it is critical or broken.
Syntax:
       rebuild {array_id} {device_id}
       rebuild {array_id} {start|stop}
```

You can use rebuild commands to rebuild a RAID array when it is critical or broken.

The following table lists and describes the properties of the rebuild command.

**Table 23: Properties for rebuild Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **rebuild** | {array_id} | The created RAID array | This command allows you to add the specified disk to a critical RAID array and rebuild it. |
| | {device_id} | The disk hosted by the AIC | |
| **rebuild** | {array_id} | The created RAID array | This command lets you start or stop the rebuilding process on the specified array. |
| | {start\|stop} | start/ stop | |

## 7.6.1. Rebuild a RAID array

**HPT CLI>rebuild {array_id} {device_id}**

This command allows you to add the specified disk to a critical RAID array and rebuild it.

**Input example:**

HPT CLI>rebuild 1 1/E1/4

```
HPT CLI > query arrays
ID      Secured Capacity(GB)    Type        Status   Block  Sector   Cache          Name
-------------------------------------------------------------------------------
1           No       500.03   RAID1      CRITICAL      --    512B    NONE       RAID_1_0

HPT CLI > rebuild 1 1/E1/4

HPT CLI > query arrays 1
ID:             1               Name:           RAID_1_0
Type:           RAID1           Status:         REBUILDING
Capacity(GB):   500.03          BlockSize:      --
SectorSize:     512B            CachePolicy:    NONE
Progress:       1.30%           Secure:         No
ID      Secured     Capacity    MaxFree     Flag    Status    ModelNumber
-------------------------------------------------------------------------------
1/E1/4  No          960.13      460.10      NORMAL  CRITICAL  Samsung SSD 983 DCT 960GB
1/E1/3  No          500.03      0           NORMAL  RAID      Samsung SSD 980 PRO 500GB
-------------------------------------------------------------------------------
```

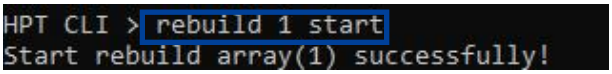
## 7.6.2. Start Rebuilding the RAID Array

**HPT CLI>rebuild {array_id} {start}**

This command allows you to start the rebuilding process on the specified array.

**Input example:**

HPT CLI>rebuild 1 start



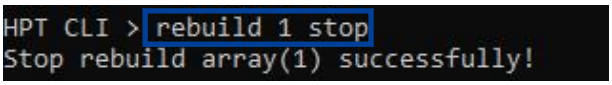

## 7.6.3. Stop Rebuilding the RAID Array

**HPT CLI>rebuild {array_id} {stop}**

This command allows you to stop the rebuilding process on the specified array. After you stop a rebuilding process, you can resume it later with the rebuild start command.

**Input example:**

HPT CLI>rebuild 1 stop



# 7.7. Verify Command

```
HPT CLI > verify
Verify Command
        This command starts or stops the verifying process on the specified array.
Syntax:
        verify {array_id} {start|stop}
```

You can use the verify command to start or stop the verifying process on the specified array.

The following table lists and describes the properties of the verify command.

**Table 24: Properties for verify Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **verify** | {array_id} | The created RAID array | This command starts or stops the verifying process on the specified array. |
| | {start\|stop} | start/ stop | |

## 7.7.1. Start Verifying the RAID Array

**HPT CLI>verify {array_id} {start}**

This command starts the verification process on the specified array.

**Input example:**

HPT CLI>verify 1 start

```
HPT CLI > verify 1 start
Start verify array(1) successfully!

HPT CLI > query arrays
ID      Secured Capacity(GB)    Type        Status   Block  Sector   Cache          Name
-------------------------------------------------------------------------------------
1           No       500.03   RAID1     VERIFYING      --    512B    NONE       RAID_1_0
```

## 7.7.2. Stop Verifying the RAID Array

**HPT CLI>verify {array_id} {stop}**

This command stops the verification process on the specified array.

**Input example:**

HPT CLI> verify 1 stop

```
HPT CLI > verify 1 stop
Stop verify array(1) successfully!

HPT CLI > query arrays
ID      Secured Capacity(GB)    Type        Status   Block  Sector   Cache          Name
-------------------------------------------------------------------------------------
1           No       500.03   RAID1        NORMAL      --    512B    NONE       RAID_1_0
```

# 7.8. Rescan Command

```
HPT CLI > rescan
```

When the CLI initiates **Rescan**, the driver will immediately check and see whether the status of any disk has changed. If any changes occur, the disks and RAID array status will be updated to reflect this. When a disk drop triggers the beeper, the beeper can be turned off temporarily by rescan command.

- **Disk Status** – if any disks were added or removed, or if a disk is no longer responding, the status will change.
- **RAID status** – the RAID array's status may change depending on the status of the disks.

The following table lists and describes the properties of the rescan command.

**Table 25: Properties for rescan Command**

| cmd | Property Name | Description |
|---|---|---|
| **rescan** | N/A | This command rescans all of the physical devices attached to the AIC. |

## 7.8.1. Rescan the Physical Devices

**HPT CLI>rescan**

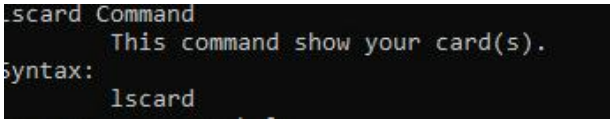
This command rescans all of the physical devices attached to the AIC.

**Input example:**

HPT CLI> rescan

```
HPT CLI > rescan
Rescan successfully.
```

# 7.9. Lscard Command




The lscard command is used to list multiple AICs.

The following table lists and describes the properties of the lscard command.

**Table 26: Properties for lscard Command**

| cmd | Property Name | Description |
|---|---|---|
| **lscard** | N/A | This command displays the list of multiple AICs.<br><br>**Active:** Indicates the AIC you are using.<br><br>**Inactive**: Indicates another AIC connected to the system but not in use. |

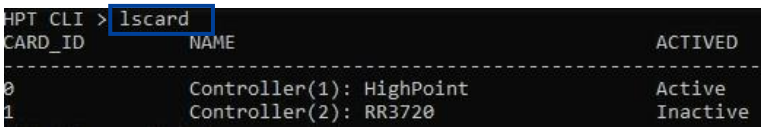
## 7.9.1. Lscard all AICs

**HPT CLI>lscard**

This command displays the list of multiple AICs.

**Input example:**

HPT CLI>lscard



# 7.10. Events Command

```
Events Commands
       The CLI system will auto record three types of events: Information
       (shortened to 'Inf'), Warning (shortened to 'War'), and Error
       (shortened to 'Err') on the screen output.output These commands allow you to
       query, save the logged events.
Syntax:
       events
       events save {file_name}
```

The CLI system will automatically record three types of events on the screen output. Events commands allow you to view and save the logged events.

The following table lists and describes the properties of the events command.

**Table 27: Properties for events Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **events** | N/A | N/A | This command will display the events log for the selected page number, displaying 20 log messages per page.<br>Event Level:<br>- Inf (Information)<br>- War (Warning)<br>- Err (Error) |
| **events** | save | N/A | This command will save all the logged events as a plain text file. |
| | {file_name} | File path | |

## 7.10.1. View the Event Log

**HPT CLI>events**

This command will display a list of all the logged events.

**Input example:**

HPT CLI>events

```
HPT CLI > events
1  Inf  [07/10/2024 05:18:03]          Plugging device detected.('Sabrent Rocket 4.0 1TB-03F10707074404014589' at Controller
1-Enclosure1-Device5)

2  Inf  [07/10/2024 05:18:03]          Plugging device detected.('KXG60ZNV1T02 TOSHIBA-694S10NBTVDQ' at Controller1-Enclosur
e1-Device6)

3  Inf  [07/10/2024 05:08:56]          RAID 1 Array 'RAID_1_0' has been created successfully (Disk 1:Micron_7400_MTFDKCB7T6
DZ, 1/E1/5; Disk 2:Micron_7450_MTFDKCC7T6TFR, 1/E1/6).

4  Inf  [07/10/2024 05:08:41]          Array 'RAID_0_0' has been deleted successfully.

5  Inf  [07/10/2024 05:08:26]          RAID 0 Array 'RAID_0_0' has been created successfully (Disk 1:Micron_7400_MTFDKCB7T6
DZ, 1/E1/5; Disk 2:Micron_7450_MTFDKCC7T6TFR, 1/E1/6; Disk 3:INTEL SSDPF2KX076TZO, 1/E1/7; Disk 4:INTEL SSDPF2KX038TZO, 1/E1/
8).

6  Inf  [07/10/2024 05:08:25]          Device 'Device_1_E1_8' (1/E1/8) has been initialized.
```

# 7.10.2.Save the Event Log

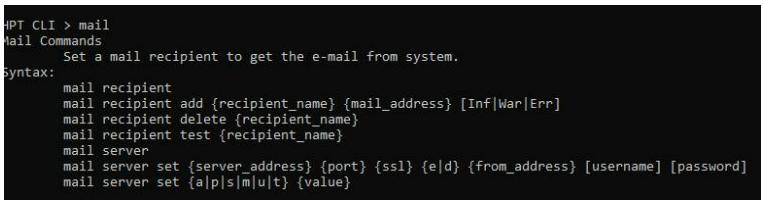
**HPT CLI>events save {file_name}**

This command will save all the logged events as a plain text file.

**Input example:**

HPT CLI> events save C:/raidlog.txt

# 7.11. Mail Command




The mail command instructs the AIC to email your chosen recipients when certain events trigger.

The following table lists and describes the properties of the mail command.

**Table 28: Properties for mail Commands**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **mail** | recipient | N/A | Use this command to list all of the mail recipients. |
| **mail** | add | {options} | Use this command to add a new recipient. |
| **mail** | test | {options} | Use this command to send a test email to a specified recipient. |
| **mail** | delete | {options} | Use this command to delete an existing recipient. |
| | {options} | {recipient_name} | The name of the recipient. |
| | | {mail_address} | The email address of the recipient. |
| | | [Inf\|War\|Err] | The type(s) of events will trigger an email in the respective Event Level.<br>- Inf (Information)<br>- War (Warning)<br>- Err (Error) |
| **mail** | server | N/A | Use this command to display the SMTP server information. |
| **mail** | set | {options} | Use this command to configure mail server settings. |
| | options | {server_address} | The SMTP server address. |
| | | {port} | The SMTP port is generally 25. |
| | | {ssl} | 1 for enable and port needs 465, 0 for disabled. |
| | | {e\|d} | Enable Event Notification status, e for enabled or d for disabled. |
| | | {from_address} | The mail from address. |
| | | [username] | The mail username. |

| | | | |
|---|---|---|---|
| | | [password] | The mail password. |
| | | {a\|p\|s\|m\|u\|t}<br>{value} | Use this command to set your mail server value.<br>- a – The SMTP server address.<br>- p – The SMTP port is generally 25.<br>- s – Enable Event Notification status, e for enabled or disabled.<br>- m – The mail from the address.<br>- u – The mail username.<br>- t – The mail password.<br>- value – Setting parameters. |

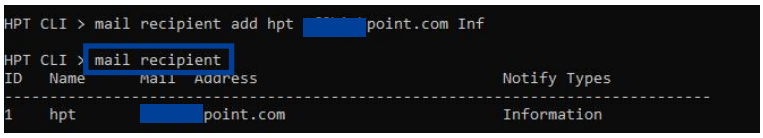
## 7.11.1. Add a Mail Recipient

**HPT CLI>recipient add {recipient_name} {mail_address} [Inf|War|Err]**

This command will add a new recipient.

**Input example:**

HPT CLI> mail recipient add hpt admin@highpoint-tech.com Inf




## 7.11.2. List all Mail Recipients

**HPT CLI>mail recipient**

This command will display a list of all mail recipients.

**Input example:**

HPT CLI>mail recipient

## 7.11.3. Test the mail recipient

**HPT CLI>mail recipient test {recipient_name}**

This command will send a test email to a specified recipient.

**Input example:**

HPT CLI> mail recipient test hpt


## 7.11.4. Delete a Mail Recipient

**HPT CLI>mail recipient delete {recipient_name}**

This command will delete an existing mail recipient.

**Input example:**

HPT CLI> mail recipient delete hpt

## 7.11.5. Add a Mail Server

**HPT CLI>mail server set {server_address}{port} {ssl} {e|d} {from_address} [username] [password]**

This command will configure mail server settings.

**Input example:**

HPT CLI> mail server set smtp.gmail.com 465 1 e name@somecompany.com name@somecompany.com password


Note: Gmail requires dual authentication and logging in with the app-specific password. Please refer to step 7 to get the app-specific password.

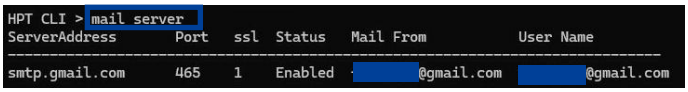
## 7.11.6. List all Mail Servers

**HPT CLI>mail recipient server**

This command will configure mail server settings.

**Input example:**

HPT CLI> mail server



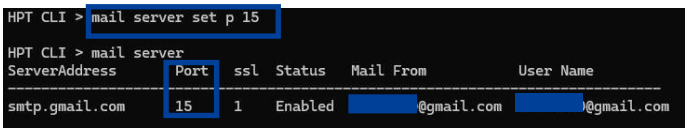

## 7.11.7. Set the Mail Server

**HPT CLI>mail server set {a|p|s|m|u|t} {value}**

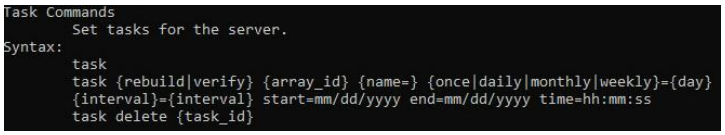
This command will separate and set your mail server value.

**Input example:**

HPT CLI> mail server set p 15



# 7.12. Task Command




When an array requires regular verification or rebuilding, you can use the task commands to automate this process in the background. You can add new tasks and modify or delete existing tasks.

The following table lists and describes the properties of the task command.

**Table 29: Properties for task Commands**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **task** | N/A | N/A | This command displays detailed information about all scheduled tasks. |
| **task** | rebuild | {options} | This command allows you to schedule a specified array.<br>Note: When you add a task to rebuild a selected array once, the parameter {day} should be omitted. |
| **task** | verify | {options} | This command allows you to schedule a verification task. |
| | {options} | {array_id} | The created RAID array. |
| | | {once\|daily\|monthly\|weekly}={day} | Schedule the frequency as once, daily, weekly, or monthly. |
| | | interval={interval} | Intervals between task executions. |
| | | start=mm/dd/yyyy time=hh:mm:ss | The task start date.<br>- yyyy - year<br>- dd - day<br>- mm - month<br>- hh - hour<br>- mm - minute<br>- ss - second |
| | | end=mm/dd/yyyy time=hh:mm:ss | The task end date. |

| | | | |
|---|---|---|---|
| **task** | delete {task_id} | The created task | This command allows you to delete a scheduled task. |

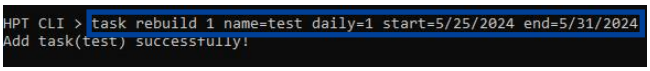
## 7.12.1.Create a New Rebuild Task

**HPT CLI>task rebuild {array_id} {name=} {once|daily|weekly|monthly={day} interval={interval} start=mm/dd/yyyy end=mm/dd/yyyy time=hh:mm:ss**

This command allows you to schedule the frequency as once, daily, weekly, or monthly, and the detailed time range to rebuild a specified array. The first mm/dd/yyyy specifies the task start date, while the second mm/dd/yyyy specifies the task end date.

**Input example:**

HPT CLI>task rebuild 1 name=test daily=1 start=5/25/2024 end=5/31/2024



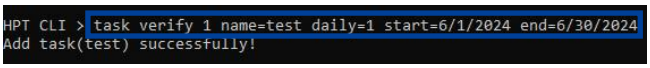

## 7.12.2.Create a New Verify Task

**HPT CLI>task verify {array_id} {name=} {once|daily|weekly|monthly}={day} interval={interval} start=mm/dd/yyyy end=mm/dd/yyyy time=hh:mm:ss**

This command allows you to schedule a verification task. The usage of this command is the same as adding a rebuild task schedule.

**Input example:**

HPT CLI>task verify 1 name=test daily=1 start=6/1/2024 end=6/30/2024




Note: Verify Task can only be created if the RAID1 array is in a normal status.

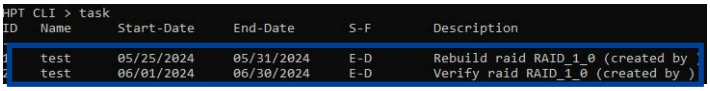
## 7.12.3.List all Tasks

**HPT CLI>task**

This command displays detailed information about all scheduled tasks.

**Input example:**

HPT CLI>task



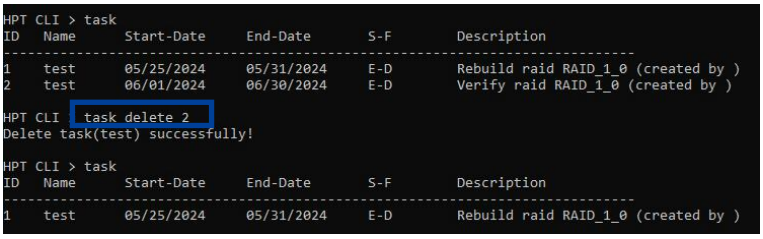
# 7.12.4.Delete a Task

**HPT CLI>task delete {task_id}**

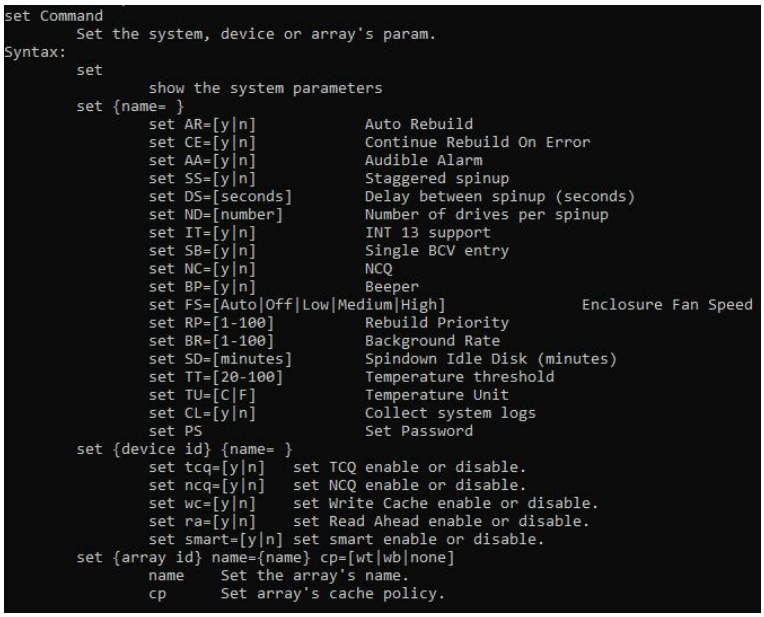
This command allows you to delete a scheduled task.

**Input example:**

HPT CLI>task delete 2



# 7.13. Set Command




You can change the CLI settings by setting commands according to your preferred behavior and requirements.

The following table lists and describes the properties of the set command.

**Table 30: Properties for set Commands**

| cmd | Property Name | Description |
|---|---|---|
| **set** | AR | Set enable or disable to the **[Auto Rebuild]** parameter.<br><br>When a disk fails, the NVMe RAID AIC will take the disk offline. The NVMe RAID AIC will automatically rebuild the array after you have configured spare disks or replaced the disk, but only if the Enable auto rebuild option is enabled. |
| | CE | Set enable or disable to the **[Continue Rebuilding On Error]** parameter.<br><br>When enabled, the rebuilding process will ignore bad disk sectors and continue rebuilding until completion. When the rebuild is finished, the data may be accessible but inconsistent due to any bad sectors that were ignored during the procedure. HighPoint recommends checking the event log periodically for bad sector warnings if this option is enabled. |
| | AA | Set enable or disable to the **[Audible Alarm]** parameter. |

| | | |
|---|---|---|
| | | The audible alarm sounds when the following conditions occur:<br>- Disk Dropped<br>- Fan Speed lower than 600 RPM<br>- SSD Temperature is higher than the SSD warning threshold<br>- Broadcom Chipset Temperature is higher than 105°C<br>  Warning: **Disabled audible alarm** is permanently disabling the beeper, so please proceed with caution! |
| | BP | Set enable or disable [**Beeper**].<br>When a disk drop triggers the beeper. |
| | RP | Change [**Rebuilding Priority**]. If an AIC is not specified, this command will set the global rebuilding priority.<br>[0-12] Lowest<br>[13-37] Low<br>[38-67] Medium<br>[68-87] High<br>[>88] Highest |
| | RL | (default: Enabled)<br>Remote access to the AIC will be restricted when enabled; other users in your network cannot log in to the WebGUI remotely.<br>It is used as follows:<br>1. Set **Restrict to localhost access** to **n.**<br>2. Turn off the local firewall.<br>3. View the local IP address.<br>4. Use another system to access WebGUI remotely by typing **http://IP address:port number** in the browser. |
| | TT | Set the disks's **temperature threshold.**<br>Notes:<br>This setting is not supported by the Linux HighPoint RAID Management.<br>149° F is the default. This setting can correspond with the disk manufacturer's official specifications. |
| | TU | Set the **[Temperature Unit]** to Celsius or Fahrenheit. |

| | | |
|---|---|---|
| | | This setting is only supported by the Windows HighPoint RAID Management. |
| | CL | Set enable or disable **[Collecting System Logs].**<br>You can set it to enable the collection of system logs at any time. The collected system logs are stored on C:/Windows/hpt_diagdriver. The maximum size of the collected system log is 840MB; anything over 840MB will be overwritten forward.<br>This setting is only supported by the Windows HighPoint RAID Management.<br>It is used as follows:<br>1. Set **CL** to **Enabled**.<br>2. Reboot the system.<br>3. Duplicate the problems encountered.<br>4. Collect system logs with one click. |
| | PS | Set or change your **[Password]**. The password is ≤ 8 characters. |
| | FS | Change the AIC Fan Speed.This supports setting different levels of fan speed {Auto\|Off\|Low\|Medium\|High\|Full}<br>This setting is only supported by the Windows HighPoint RAID Management. |

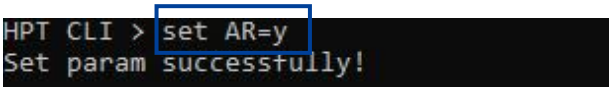
# 7.13.1.Set Auto Rebuild

**HPT CLI>set AR=[y|n]**

Set enable or disable to the **[Auto Rebuild]** parameter.

**Input example:**

HPT CLI>set AR=y



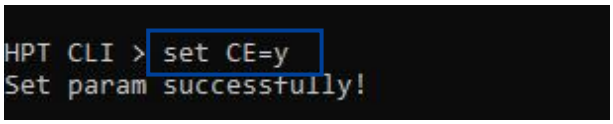
## 7.13.2.Set Continue Rebuilding On Error

**HPT CLI>set CE=[y|n]**

Set enable or disable to the **[Continue Rebuilding On Error]** parameter.

**Input example:**

HPT CLI>set CE=y



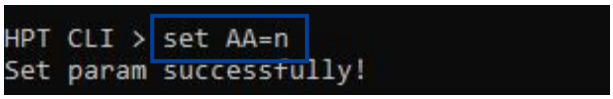

## 7.13.3.Set Audible Alarm

**HPT CLI>set AA=[y|n]**

Set enable or disable to the **[Audible Alarm]** parameter.

**Input example:**

HPT CLI>set AA=n



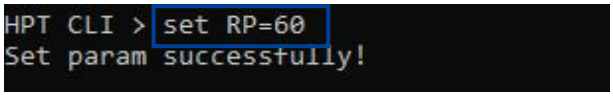

## 7.13.4.Set Rebuild Priority

**HPT CLI>set RP=[0-100]**

Change rebuilding priority.

**Input example:**

HPT CLI>set RP=60



## 7.13.5.Set Restrict to localhost access

**HPT CLI>set RL=【y|n]**

Set enable or disable restrict localhost access.

**Input example:**

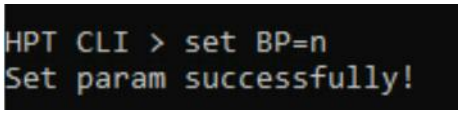
HPT CLI>set RL=y


## 7.13.6.Set Temperature Threshold

To set the disks's **temperature threshold**.

**Input example:**

HPT CLI>set BP=n




Notes:

This setting is not supported by the Linux HighPoint RAID Management.

149°F is the default. This setting can correspond with the disk manufacturer's official specifications.

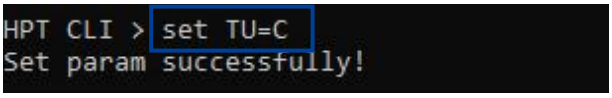
## 7.13.7.Set Temperature Unit

**HPT CLI>set TU=[C|F]**

Set the temperature unit to Celsius or Fahrenheit.

**Input example:**

HPT CLI>set TU=C



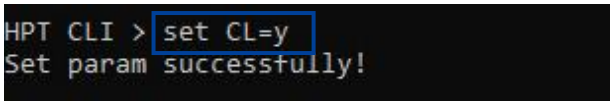
## 7.13.8.Set Collecting System Logs

**HPT CLI>set CL=[y|n]**

Set enable or disable to the **[Collecting System Logs]** parameter.

**Input example:**

HPT CLI>set CL=y



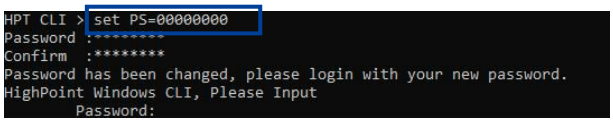

## 7.13.9.Set Password

**HPT CLI>set PS={password}**

You can set or change your HighPoint RAID Management password. The password length is less than or equal to 8 bits, and there is no limit to the valid complexity of the password.

**Input example:**

HPT CLI>set PS=00000000



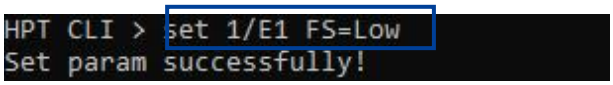

## 7.13.10. Set AIC Fan Speed

**HPT CLI>set {enclosure_id} FS=[Auto|Off|Low|Medium| High|Full]**

Change the AIC Fan Speed.

**Input example:**

HPT CLI>set 1/E1 FS=Low



# 7.14. Unplug Command

```
Unplug Command
        This command allows you to unplug an existing RAID array or device.
        After you have unpluged the array or device, you can hot plug it.
        Also by running the rescan command you can found it back.
        Please refering the rescan command help.
Syntax:
        unplug {array_or_device_ID}
```

To ensure data security, if you want to unplug an existing RAID array or disks while the system works, use the unplug command first and then unplug the disks.

The following table lists and describes the properties of the unplug command.

**Table 31: Properties for unplug Commands**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **unplug** | {device_id} | The disk hosted by the AIC | This command allows you to unplug the disk. |
| **unplug** | {array_id} | The created RAID array | This command allows you to unplug the array. |

## 7.14.1. Unplug the Physical Device

**HPT CLI>unplug {device_id}**

This command allows you to unplug the disk. After the command, manually remove the disk.

**Input example:**

HPT CLI>unplug 1/E1/6

```
HPT CLI > query devices
ID      Secured     Capacity    MaxFree     Flag    Status    ModelNumber
------------------------------------------------------------------------------
1/E1/5  No          500.03      0           RAID    NORMAL    Samsung SSD 980 PRO 500GB
1/E1/6  No          7681.50     0           SINGLE  LEGACY    Micron 7450 MTFDKCC7T6TFR
1/E1/8  No          3840.64     3340.61     RAID    NORMAL    Micron_9300_MTFDHAL3T8TDP
------------------------------------------------------------------------------

HPT CLI > unplug 1/E1/6
Unplug device(1/E1/6) successfully!

HPT CLI > query devices
ID      Secured     Capacity    MaxFree     Flag    Status    ModelNumber
------------------------------------------------------------------------------
1/E1/5  No          500.03      0           RAID    NORMAL    Samsung SSD 980 PRO 500GB
1/E1/8  No          3840.64     3340.61     RAID    NORMAL    Micron_9300_MTFDHAL3T8TDP
------------------------------------------------------------------------------
```

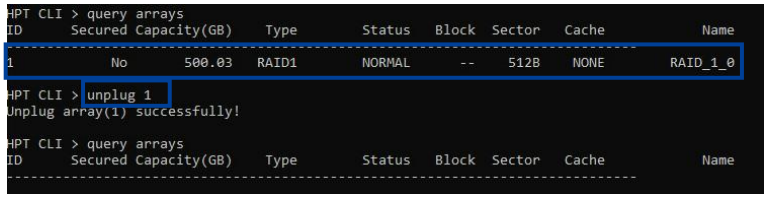
# 7.14.2. Unplug a RAID Array

**HPT CLI>unplug {array_id}**

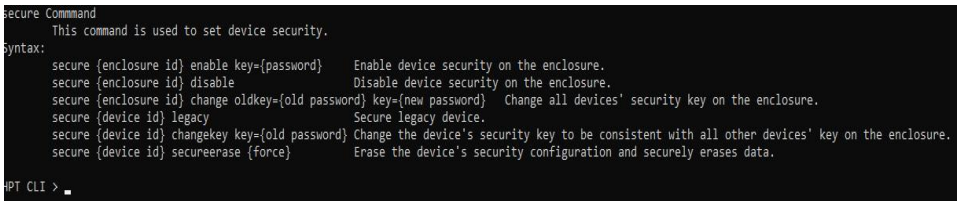
This command allows you to unplug the array. After the command, manually remove the member disks.

**Input example:**

HPT CLI>unplug 1



# 7.15. Secure Command




This Secure commands supports enable, disable and change AIC/ disks security key.

The following table lists and describes the properties of the secure command.

**Table 32: Properties for secure Commands**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **secure** | {enclosure_id} | The AIC in use | This command allows you to enable AIC security. |
| | enable | N/A | |
| | key | {password} | |
| **secure** | disable | N/A | This command allows you to disable AIC security. |
| **secure** | change | N/A | This command allows you to change the AIC security key. |
| | oldkey | {old password} | |
| | key | {new password} | |
| **secure** | {device_id} | The disk hosted by the AIC | This command allows you to enable legacy disk security. |
| | legacy | The disk is in the legacy | |
| **secure** | changekey | N/A | The command changes the disk security key to be consistent with the AIC security key. |
| | key | {old password} | |
| **secure** | secureerare | {force} | This command allows you to disable disk security. |

# 7.15.1.Enable AIC Security

**HPT CLI>secure {enclosure_id} enable key={password}**

This command allows you to enable AIC security. The password length is 8-32 digits, and there is no limit to the valid complexity of the password.

**Input example:**

HPT CLI>secure 1/E1 enable key=00000000

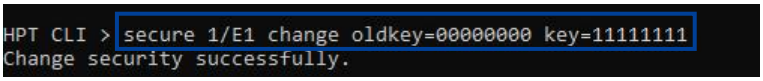

# 7.15.2.Change AIC Security key

**HPT CLI>secure {enclosure_id} change oldkey={old password} key={new password}**

This command allows you to change the AIC security key. The password length is 8-32 digits, and there is no limit to the valid complexity of the password.

**Input example:**

HPT CLI>secure 1/E1 change oldkey={00000000} key={11111111}



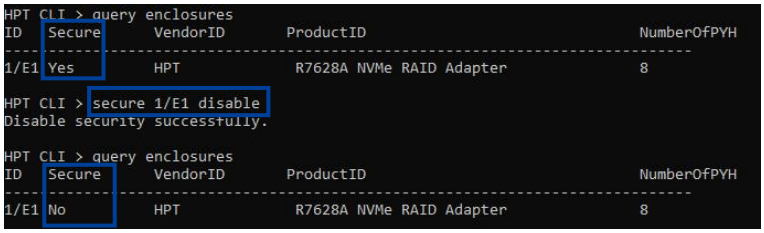
# 7.15.3.Disable AIC Security

**HPT CLI>secure {enclosure_id} disable**

This command allows you to disable AIC security.

**Input example:**

HPT CLI>secure 1/E1 disable



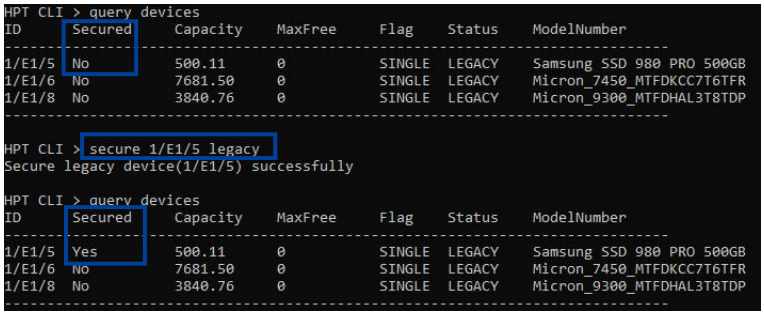

# 7.15.4.Enable Disk Security

**HPT CLI>secure {device_id} legacy**

This command allows you to enable disk security.

**Input example:**

HPT CLI>secure 1/E1/5 legacy



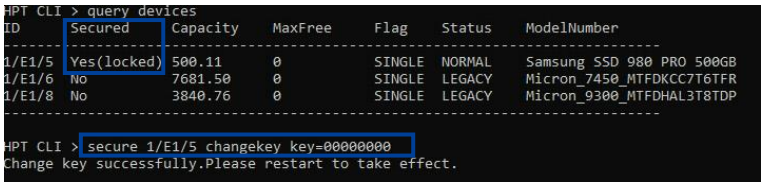
# 7.15.5.Change Disk Security key

**HPT CLI>secure {devices_id} changekey key={old password}**

This command allows you to change the AIC security key.

**Input example:**

HPT CLI>secure 1/E1/5 changekey key=00000000




Note: There is a limit to the number of times you can change the disk key. If you do not enter the correct disk key **five times**, this function will be locked, and you will need to power cycle your system to change the disk key again.

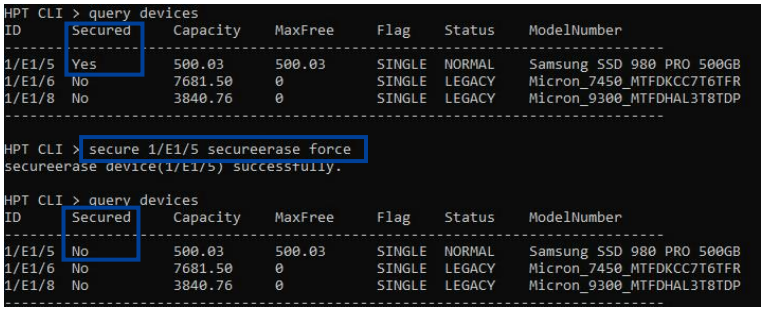
# 7.15.6.Disable Disk Security

**HPT CLI>secure {device_id} secureerase {force}**

This command allows you to disable disk security.

**Input example:**

HPT CLI>secure 1/E1/5 secureerase force



# 7.16. Diag Command

```
Diagnostic Command
        This command is used to diagnose and save HighPoint driver and controller information.
Syntax:
        If you have any questions, please send the compressed package saved by this command to support.
```

This command allows you to collect the diagnostic information.

The following table lists and describes the properties of the diag command.

**Table 33: Properties for diag Command**

| cmd | Property Name | Description |
|---|---|---|
| **diag** | N/A | This command allows you to collect the diagnostic information.<br><br>The saving path will be displayed after entering this command. |

## 7.16.1.Collect the Diagnostic Information

**HPT CLI>diag**

This command allows you to collect the diagnostic information.

**Input example:**

HPT CLI>diag

- **For Windows User**

```
HPT CLI > diag
The diagnostic information will be saved in C:\Program Files\HighPoint Technologies, Inc\HighPoint RAID Management\Servi
ce\webguiroot\HighPoint_hptnvme_1.4.0.0_2024.05.23_23.59.zip.It may take a few minutes to be ready.
```

- **For Linux User**

```
HPT CLI>diag

The diagnostic information has been saved in /usr/share/hpt/HighPoint_hptnvme_v1.8.0.0_2024.06.04.tar.gz
```

# 7.17. Switch Command

```
Swicth Command
        This command allows you switch card.
Syntax:
        switch {card_id}
```

When you use the R7000 series AICs with other series AICs, you can switch the AICs you want to use with this command.

The following table lists and describes the properties of the switch command.

**Table 33: Properties for switch Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **switch** | {card_id} | AICs connected to the system | This command allows you to switch the use of the AIC. |

## 7.17.1.Switch the AIC

**HPT CLI>switch {card_id}**

This command allows you to switch the use of the AIC.

**Input example:**

HPT CLI>switch 1

```
HPT CLI > lscard
CARD_ID         NAME                                        ACTIVED
-------------------------------------------------------------------
0               Controller(1): HighPoint                    Active
1               Controller(2): RR3720                       Inactive
HPT CLI > switch 1

HPT CLI > lscard
CARD_ID         NAME                                        ACTIVED
-------------------------------------------------------------------
0               Controller(1): HighPoint                    Inactive
1               Controller(2): RR3720                       Active
```

# 7.18. Update Command

```
HPT CLI > update
Update Command
        This command is used to update Firmware by the specified file.
        This process may take some time.
Syntax:
        update {controller_id | enclosure_id} fw={file_path}.   Select the blf file to update Firmware.
```

You can upgrade to a newer version of firmware here. This help update the firmware version and the UEFI HII Utility version. The process may take some time.

The following table lists and describes the properties of the update command.

**Table 34: Properties for update Command**

| cmd | Property Name | Value Range | Description |
|---|---|---|---|
| **update** | {enclosure_id} | The AIC in use | This command allows you to select the blf file to update AIC firmware. |
| | fw= | {file_path} | |

## 7.18.1. Update the Firmware

**HPT CLI>update {controller_id enclosure_id} fw={file path}**

This command allows you to select the blf file to update the AIC firmware.

**Input example:**

HPT CLI>update 1/E1 fw=C:\Users\test\Desktop\SSDxxxx_HLK_v5.12.4.1_v2.4.1.2_2024_05_08.blf

# 7.19. Help Command

```
HPT CLI > help
help [query|create|delete|OCE/ORLM|rebuild|verify|unplug|switch|lscard
rescan|init|events|mail|task|set|clear|help|exit|diag|secure]
```

If you input an unknown or error command, you will be told that the command is unknown; you can use help commands to find the correct commands.

```
HPT CLI > HELP
ERROR: Unknown command HELP .
You can input 'help' for more commands.
```

The following table lists and describes the properties of the help command.

**Table 35: Properties for help Commands**

| cmd | Property Name | Description |
|---|---|---|
| **help** | N/A | This command shows generic help about this utility. |
| **help** | {command} | This command shows help about a specific command. |

## 7.19.1.Show the Generic Help Command

**HPT CLI>help**

This command shows generic help about this utility.

**Input example:**

HPT CLI>help

```
HPT CLI > help
help [query|create|delete|OCE/ORLM|rebuild|verify|unplug|switch|lscard
rescan|init|events|mail|task|set|clear|help|exit|diag|secure]
```

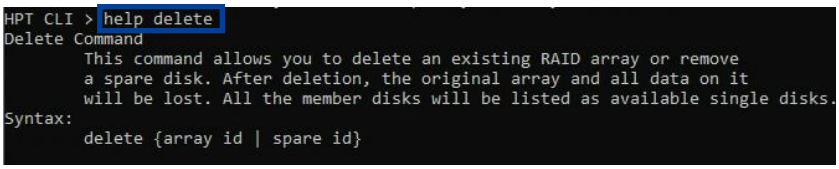
# 7.19.2.Show the Specific Command Help

**HPT CLI>help {command}**

Show help about a specific command.

**Input example:**

HPT CLI>help delete



# 7.20. Ver Command


Shows the version of RAID Management currently in use.

## 7.20.1.Show the RAID Management Version

**HPT CLI>ver**

This command shows you the version of RAID Management currently in use.

**Input example:**

HPT CLI>ver

# 7.21. Exit Command


Exit from the interactive mode and close the window.

## 7.21.1.Exit the CLI

**HPT CLI>exit**

This command lets you exit the interactive mode and close the window.

**Input example:**

```
HPT CLI>exit
```

# 7.22. Clear Command


This command is used to clear the screen.

## 7.22.1. Clear the CLI screen

**HPT CLI>clear**

This command allows you to clear the screen.

**Input example:**

```
HPT CLI>clear
```

# 8. Trouble shooting

## 8.1. Fail to compile gcc, make and other driver files

### 8.1.1. For Debian

**1. Description of the Problem**

When installing the driver, due to various factors, driver files such as **gcc** and **make** cannot be compiled, thus interrupting the driver installation process:

```
root@debian:/home/test/Documents# ./hptnvme_g5_linux_src_v1.4.4_2022_06_13.bin
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.............................
Checking and installing required toolchain and utility ...
Installing program make ... (failed)
Installing program gcc ... (failed)
Found program perl (/usr/bin/perl)
Found program wget (/usr/bin/wget)
old pcie_aspm=off iommu=off intel_iommu=off amd_iommu=off
new pcie_aspm=off iommu=off intel_iommu=off amd_iommu=off
Synchronizing state of hptdrv-monitor.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable hptdrv-monitor
update-rc.d: warning: enable action will have no effect on runlevel 1
Toolchain to built the driver is incomplete, please install the missing package to build the driver.
Exit.
```

**2. Cause of the Problem**

The system is not connected to a network (internet connection).

**3. Solution**

a. Ensure that the network is properly connected.

b. Reinstall the HighPoint software.

**If the following occurs after the network connection and reinstall driver:**

```
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe G5 RAID Linux Software package installer.......
Verifying archive integrity... All good.
Uncompressing HighPoint NVMe RAID Controller Linux Open Source package installer.............
Checking and installing required toolchain and utility ...
Installing program gcc ...
Media change: please insert the disc labeled
 'Debian GNU/Linux 12.5.0 _Bookworm_ - Official amd64 DVD Binary-1 with firmware 20240210-11:28'
in the drive '/media/cdrom/' and press [Enter]
```

**This problem can be caused by a lack of dependency packages:**

**Solution:**

a. To install using the CD-ROM: insert the CD-ROM back and press **Enter**.

b. To install using the USB flash drive:

a) The system needs to be resourced. For details, please refer to the official website file:

https://www.debian.org/doc/manuals/debian-faq/uptodate.en.html

b) Open the system terminal with root privileges.

c) Enter the following command:

**#nano /etc/apt/sources.list**

d) Replace the contents of the file with the following.

deb https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm main contrib non-free non-free-firmware

# deb-src https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm main contrib non-free non-free-firmware

deb https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm-updates main contrib non-free non-free-firmware

# deb-src https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm-updates main contrib non-free non-free-firmware

deb https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm-backports main contrib non-free non-free-firmware

# deb-src https://mirrors.tuna.tsinghua.edu.cn/debian/ bookworm-backports main contrib non-free non-free-firmware

Note: See the mirror list at https://www.debian.org/mirror/list for more information.

c. Enter the following command: **#apt-get update**

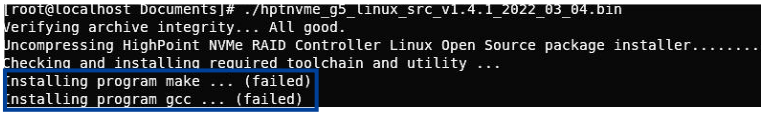
```
root@test:/home/test/Documents# nano /etc/apt/sources.list
root@test:/home/test/Documents# apt-get update
Get:1 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye InRelease [116 kB]
Get:2 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-updates InRelease [44.1 kB]
Get:3 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports InRelease [49.0 kB]
Get:4 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security InRelease [48.4 kB]
Get:5 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free Sources [81.2 kB]
Get:6 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main Sources [8,633 kB]
Get:7 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib Sources [43.2 kB]
Get:8 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main amd64 Packages [8,184 kB]
Get:9 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main Translation-en [6,239 kB]
Get:10 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main amd64 DEP-11 Metadata [4,049 kB]
Get:11 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main DEP-11 48x48 Icons [3,478 kB]
Get:12 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/main DEP-11 64x64 Icons [7,315 kB]
Get:13 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib amd64 Packages [50.6 kB]
Get:14 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib Translation-en [46.9 kB]
Get:15 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib amd64 DEP-11 Metadata [13.6 kB]
Get:16 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib DEP-11 48x48 Icons [47.2 kB]
Get:17 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/contrib DEP-11 64x64 Icons [93.3 kB]
Get:18 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free amd64 Packages [97.7 kB]
Get:19 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free Translation-en [92.4 kB]
Get:20 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free amd64 DEP-11 Metadata [17.9 kB]
Get:21 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free DEP-11 48x48 Icons [741 B]
Get:22 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye/non-free DEP-11 64x64 Icons [27.7 kB]
Get:23 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-updates/main Sources [3,588 B]
Get:24 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-updates/main amd64 Packages [6,344 B]
Get:25 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-updates/main Translation-en [5,890 B]
Get:26 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/main Sources [314 kB]
Get:27 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/non-free Sources [3,996 B]
Get:28 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/contrib Sources [2,712 B]
Get:29 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/main amd64 Packages [341 kB]
Get:30 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/main Translation-en [281 kB]
Get:31 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/contrib amd64 Packages [4,400 B]
Get:32 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/contrib Translation-en [4,320 B]
Get:33 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/non-free amd64 Packages [11.5 kB]
Get:34 https://mirrors.tuna.tsinghua.edu.cn/debian bullseye-backports/non-free Translation-en [8,960 B]
Get:35 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/main Sources [160 kB]
Get:36 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/non-free Sources [632 B]
Get:37 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/main amd64 Packages [189 kB]
Get:38 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/main Translation-en [119 kB]
Get:39 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/non-free amd64 Packages [528 B]
Get:40 https://mirrors.tuna.tsinghua.edu.cn/debian-security bullseye-security/non-free Translation-en [344 B]
Fetched 40.2 MB in 3min 13s (208 kB/s)
Reading package lists... Done
root@test:/home/test/Documents#
```

d. Reinstall the HighPoint software.

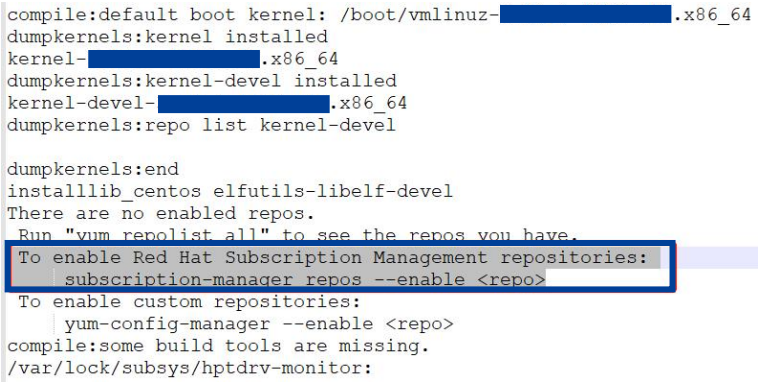
# 8.1.2. For RHEL

**1. Description of the Problem**

When installing the driver, due to various factors, driver files such as **gcc** and **make** cannot be compiled, thus interrupting the driver installation process:




**Or** a prompt with **subscription-manager repos**:




**2. Cause of the Problem**

The system is not connected to a network (internet connection) or this is not registered.

**3. Solution**

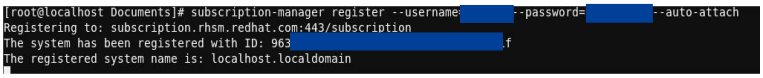
a. Ensure that the network is properly connected.

b. Go to the Red Hat website and register an account: Register for | Red Hat IDP

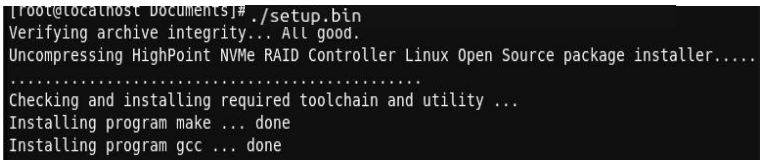
c. Open the system terminal with root privileges.

d. Enter the following command to log in:

**#subscription-manager register --username=*** --password=*** --auto-attach**



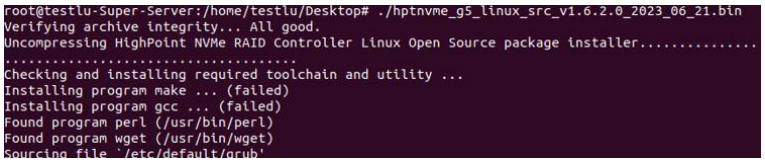

e. Reinstall the HighPoint software.



# 8.1.3. For Ubuntu

**1. Description of the Problem**

When installing the driver, due to various factors, driver files such as **gcc** and **make** cannot be compiled, thus interrupting the driver installation process:




**2. Cause of the Problem & Solution**

- **The system is not connected to a network (internet connection)**.

  **Solution:**

  a. Ensure that the network is properly connected.

  b. Reinstall the HighPoint software.

- **The system process is occupied/ busy.**

  **Solution:**

  a. Open the system terminal with root privileges and enter the following command:

  **#apt-get update**

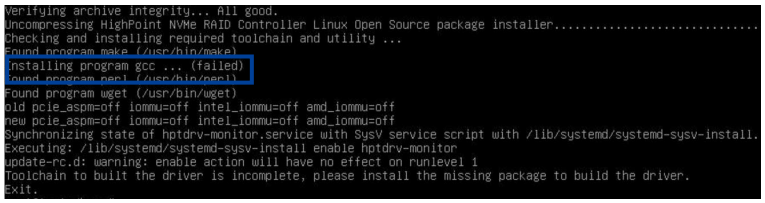
  b. Release the process and update the download source.

  c. Reinstall the HighPoint software.

# 8.1.4. For Proxmox

**1. Description of the Problem**

When installing the driver, due to various factors, driver files such as **gcc** and **make** cannot be compiled, thus interrupting the driver installation process:




**2. Cause of the Problem & Solution**

- **The system is not connected to a network (internet connection).**

  **Solution:**

  a. Ensure that the network is properly connected.

  b. Reinstall the HighPoint software.

- **The system process is occupied/ busy.**

  **Solution:**

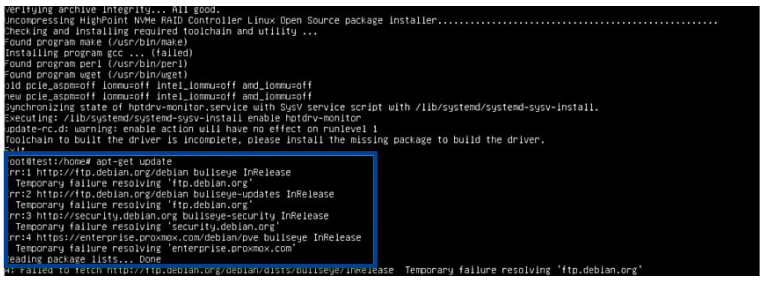
  a. Open the system terminal with root privileges and enter the following command:

  **#apt-get update**

  b. Release the process and update the download source.

  c. Reinstall the HighPoint software.

- **If you are using a completely new system, the following error occurs when installing the driver or apt-get update. This problem can be caused by a lack of dependency packages:**




**Solution:**

a. The system needs to be resourced. For details, please refer to the official website file: https://pve.proxmox.com/wiki/Downloads#Update_a_running_Proxmox_Virtual_Environment_8.x_to_latest_8.2

a) Open the system terminal with root privileges.

b) Enter the following command:

**#nano /etc/apt/sources.list**

c) Replace the contents of the file with the following.

# deb http://ftp.debian.org/debian bookworm main contrib

# deb http://ftp.debian.org/debian bookworm-updates main contrib

# deb http://security.debian.org bookworm-security main contrib

# deb http://download.proxmox.com/debian/pve bookworm pve-no-subscription

deb http://mirrors.ustc.edu.cn/debian bookworm main contrib non-free-firmware

deb http://mirrors.ustc.edu.cn/debian bookworm-updates main contrib non-free-firmware

deb http://mirrors.ustc.edu.cn/debian-security bookworm-security main contrib non-free-firmware

deb https://mirrors.ustc.edu.cn/proxmox/debian/pve bookworm pve-no-subscription

d) Enter the following command to edit the source file: /etc/apt/sources.list.d/pve-enterprise.list

**#nano /etc/apt/sources.list.d/pve-enterprise.list**

e) Enter the following command to modify proxmox software source.

# deb https://enterprise.proxmox.com/debian/pve bookworm pve-enterprise

f) Enter the following command to edit the source file: /etc/apt/sources.list.d/ceph.list

**#nano /etc/apt/sources.list.d/ceph.list**

g) Enter the following command to modify proxmox ceph source.

# deb https://enterprise.proxmox.com/debian/ceph-quincy bookworm enterprise

deb https://mirrors.ustc.edu.cn/proxmox/debian/ceph-quincy bookworm no-subscription

h) Enter the following command to /usr/share/perl5/PVE/CLI/pveceph.pm.

**#cp /usr/share/perl5/PVE/CLI/pveceph.pm /usr/share/perl5/PVE/CLI/pveceph.pm_back**

**#sed -i 's|http://download.proxmox.com|https://mirrors.ustc.edu.cn/proxmox|g' /usr/share/perl5/PVE/CLI/pveceph.pm**

i) Enter the following command to modify proxmox lxc source.

**#cp /usr/share/perl5/PVE/APLInfo.pm /usr/share/perl5/PVE/APLInfo.pm_back**

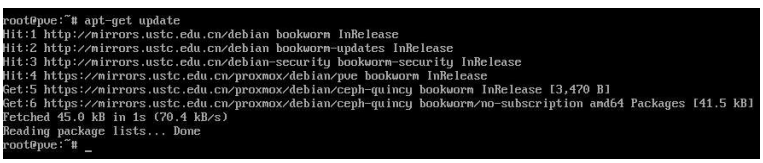
**#sed -i 's|http://download.proxmox.com|https://mirrors.ustc.edu.cn/proxmox|g' /usr/share/perl5/PVE/APLInfo.pm**

Note: See the mirror list at https://www.debian.org/mirror/list for more information.

j) Enter the following command to restart the service.

**#systemctl restart pvedaemon**

b. apt-get update

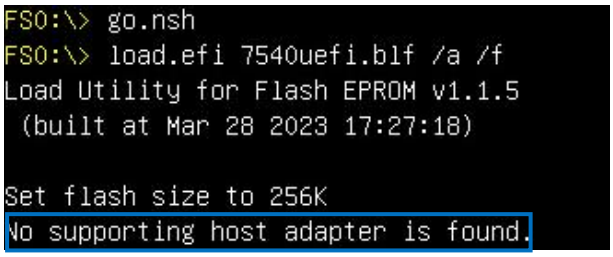



c. Reinstall the HighPoint software.

# 8.2. No supporting host adapter is found

1. **Description of the Problem**

   Run the command "**go.nsh**" in the UEFI command line, the procedure does not start and the message **No supporting host adapter is found** is displayed.




2. **Cause of the Problem**

   The system does not detect the NVMe RAID AIC.

3. **Solution**

   a. Shut down the system.

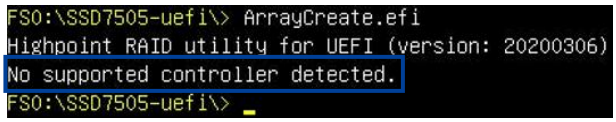
   b. Move the AIC to another PCIe slotand re-enter the command.

   If the problem still occurs, please provide a UEFI log. You can submit a support ticket using our Online Support Portal and include a problem description in as much detail as possible.

# 8.3. No supported controller detected

1. **Description of the Problem**

   Run the command "**ArrayCreate.efi**" in the UEFI command line, the procedure does not start and the message **No supported controller detected** is displayed.




2. **Cause of the Problem**

   The OPROM is not configured correctly, which prevents the UEFI driver from loading correctly.

3. **Solution**

   a. Check whether the Storage option ROM is Enabled in the system EFI setting.

   b. Check whether NVMe is connected to the NVMe RAID AIC.

   c. Replace the motherboard slot and re-enter the command.

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

# 9. Glossary

This glossary defines the terms that are used in this document.

| Glossary | Description |
|---|---|
| Array | RAID (Redundant Array of Independent Drives) array is a system that combines multiple disks to improve data storage performance and redundancy. The RAID array can provide data redundancy backup, improve read/write speed, increase storage capacity, and perform other functions. |
| AIC | AIC (Add-in Card)<br>Insert the card into the computer motherboard expansion slot to achieve a specific function of the hardware device. |
| Background | Background initialization means the array will still be created, and you can still write new data onto the array. But when your array requires rebuilding, residual data left behind may interfere with the process. |
| BIOS | BIOS is an acronym for Basic Input/Output System, a type of firmware that is solidified on a computer's motherboard and used to initialize hardware devices and boot the operating system. The BIOS connects the communication between computer hardware and the operating system and provides basic input/output functions. |
| Cache | A cache refers to a cache area in a computer system that stores data temporarily. When a computer accesses data on a disk, that data is temporarily stored in the disk cache to speed up subsequent accesses. |
| Capacity | A property that indicates the amount of storage space on a disk or virtual disk. |
| CLI | The Command Line Interface (CLI) is a powerful, text-only management interface for advanced users and professional administrators. The universal command lines work with Linux and Windows platforms. |
| Controller | A chip that controls data transfer between the microprocessor and memory or between the microprocessor and a peripheral device. |
| Diagnostic | A diagnostic view will appear when the Driver or HPT card has no effect; you can see the system and HPT Product information in this view. |
| Disk | A disk generally refers to a storage device used to store files and data. This includes solid-state disks (SSDs), both used to store data and allow computers to read and write data. |
| Enclosure | Enclosure refers to the SSD series RAID AIC currently installed in the system. |

| | |
|---|---|
| Foreground | Foreground initializing the array will completely zero out the data on the disks, meaning the disk will be completely wiped, and every bit on the disk will be set to 0. |
| Firmware | Firmware is a class of embedded systems software typically stored in the device's non-volatile memory and controls the device's hardware operations. It provides the device with a basic operating system and is usually preinstalled. |
| HBA | A Host Bus Adapter is a hardware device used to connect a computer host to a storage device. It acts as an interface between the host computer and the storage device, enabling them to communicate directly. It provides high-speed data transfer, improving the storage device's performance and reliability. |
| Host interface | The host interface is through which a computer system or device communicates with other devices outside the system. The host interface can transfer data, receive commands, control devices, and perform other operations, allowing different devices to interact and communicate. |
| Initialization | The process of making a redundant virtual disk consistent. |
| Legacy Disk | The newly inserted disk is configured as a legacy disk. |
| Link Speed | Connection speed of the port. |
| Link Width | Connection width of the port. |
| Mirroring | The process of providing complete data redundancy with two disks by maintaining an exact copy of one disk’s data on the second disk. |
| N/A | N/A means nothing is entered in the CLI (command line interface) |
| Offline | The system has marked a disk or storage device as offline, meaning the computer cannot access the data and files on that disk. |
| PCI Location | The Location of the AIC in the system. |
| Rebuild | The regeneration of all data to a replacement disk in a redundant virtual disk after a disk failure. A disk rebuild normally occurs without interrupting normal operations on the affected virtual disk, though some performance degradation of the disk subsystem can occur. |
| Rebuild Priority | The priority of rebuilding data onto a new disk after a disk in a storage configuration has failed. |
| SHI | Storage Health Inspector is used to assess and monitor the health of a storage system and ensure its proper functioning and security. |
| SMTP | The Simple Mail Transfer Protocol (SMTP) is the standard protocol for sending and receiving email online. It transfers email from the sender to the receiver's mail |

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| | server and allows communication between mail servers. |
| Temperature | The degree of head present in the supercapacitors, which is measured in Celsius |
| Vendor ID | An AIC property indicating the vendor-assigned ID number of the AIC |
| Virtual disk | A storage unit created by a RAID AIC from one or more disks. Although a virtual disk can be created from several disks, the operating system sees it as a single disk. Depending on the RAID level used, the virtual disk can retain redundant data if there is a disk failure. |
| WebGUI | The Web RAID Management Interface (WebGUI) is a simple and intuitive web-based management tool for Windows and Linux operating systems. It is an ideal interface for customers unfamiliar with RAID technology. The Wizard-like Quick Configuration menu allows even the most novice user to get everything up and running with a few simple clicks. Experienced users can fine-tune configurations for specific applications using the Setting Options menu. |

# 10. Revision History

## 10.1. Version 1.00, July 9, 2024

Initial version.

## 10.2. Version 1.01, August 13, 2024

Add RocketAIC 7749M2W Series support.

## 10.3. Version 1.02, August 28, 2024

Updade Install the driver on macOS, add description of Secure boot and SIP.

## 10.4. Version 1.03, October 10, 2024

1. Update Install the RAID Management on Windows
2. Update Install the RAID Management on Linux
3. Update Install the RAID Management on macOS
4. Add RA6542AWW-S491T5-12 support.
5. Update background initialization description.
6. Add Secured status.