SSD6204 Proxmox VE 6.3 Installation Guide

Version 1.00

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1 Overview

This guide explains how to install Proxmox to an NVMe SSD or array hosted by the SSD6204 controller.

Proxmox6.3 - Mirror link: https://www.proxmox.com/en/downloads

2 Installing Proxmox VE 6.3 on SSD6204 controller

Step 1 Prepare Your Hardware for Installation

After installing the NVMe SSDs into the SSD6204 controller, you can configure the SSD's as a RAID array, or use them as separate, single disks.

Before installation, you must temporarily remove all the NVMe SSD, which are not physically attached to SSD6204 controller, from your system. These can be reinstalled after Proxmox is up and running.

Note: Proxmox VE 6.3 only supports Legacy Boot when used with the SSD6204. If you have other SCSI-class adapters installed, you must make sure the SSD6204 controller UEFI support is loaded first; otherwise the system may be unable to boot. If the SSD6204 is not loading first, try moving it to another PCIe slot.
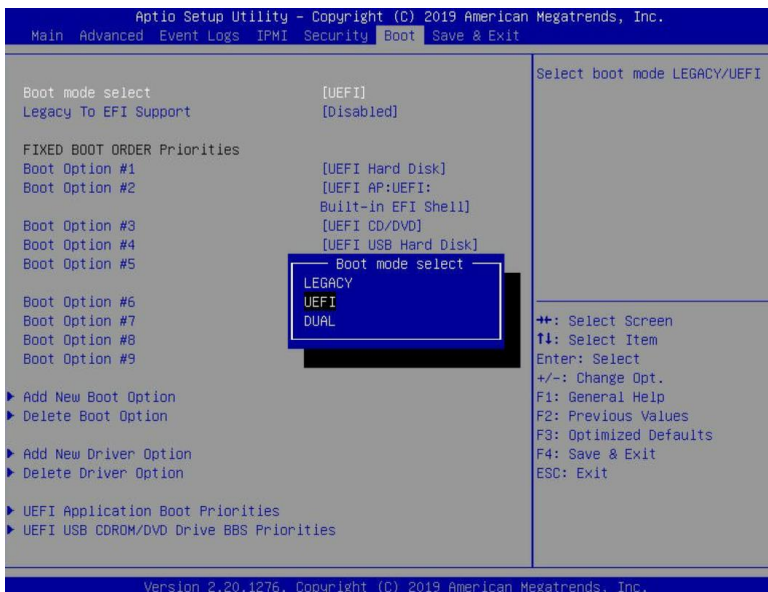
Step 2 Create an Array

If you would like to configure a RAID array using NVMe SSD's hosted by the SSD6204, please select 1 of the following 4 Methods.
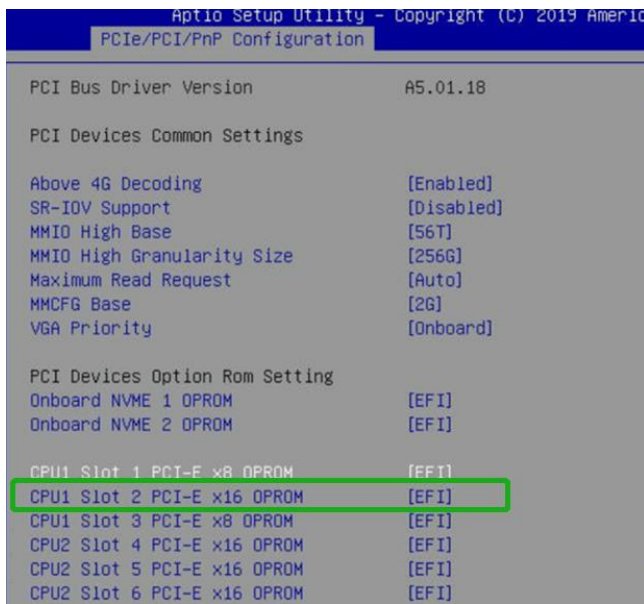
Method 1：Create a RAID array using the Motherboard BIOS

Using the SuperMicro X11DPi-NT motherboard as an example:
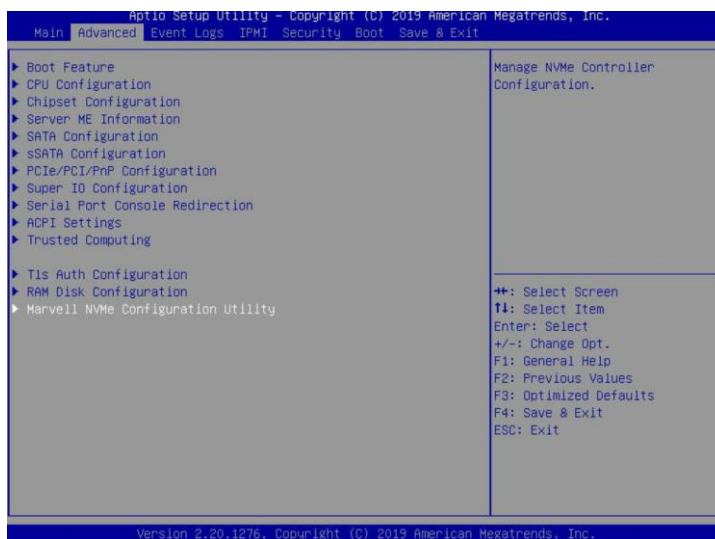
1. Set '**Boot mode select**' to '**UEFI**'.

2. Next, under "**Advanced->PCIe/PCI/PnP Configuration**, change **"CPU Slot x PCI-E OPROM**" to "**EFI**". "**x**" refers to the slot number (slot 2 was used when the screenshot was taken).

Please consult the motherboard manual for more information.

3. **Creating the RAID array:**

   a. Select "**Advanced→Marvell NVMe Configuration Utility**" ;

Note: If you cannot find "**Marvell NVMe Configuration Utility**" in the motherboard BIOS under "**advanced**" interface, you will need to create the array using one of the other three methods.
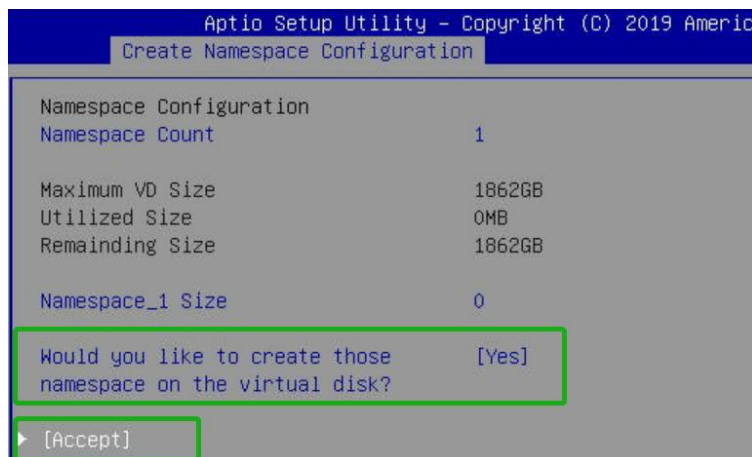
b. Next, select "**Create RAID Configuration**". Press "**Enter**" to open the Configuration Utility.
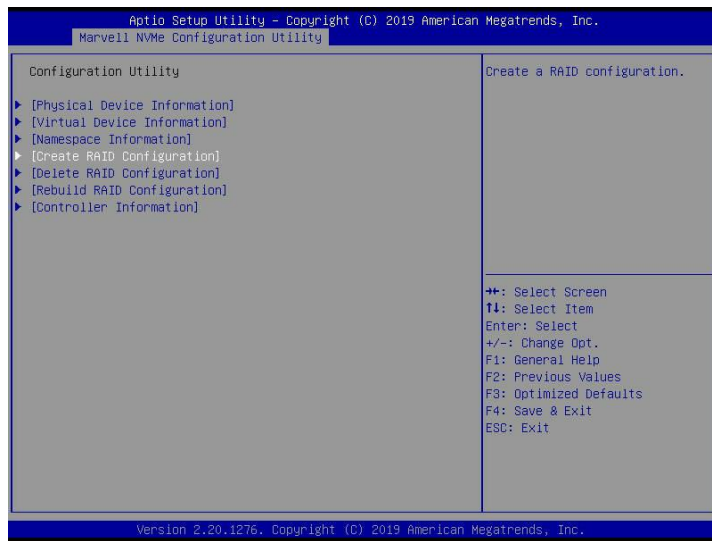
c. Set "**RAID Configuration Menu**" to "**Enabled**", and then select "**Goto RAID Config**".
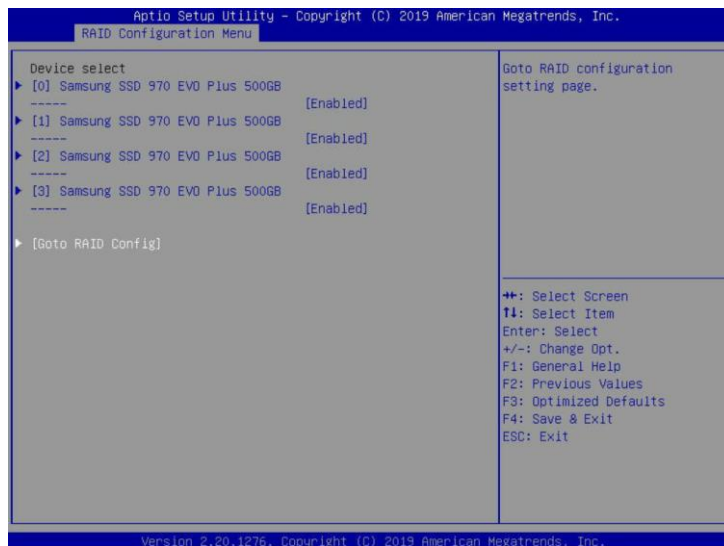
d. For "**Would you like to create this virtual disk**" select "**Yes**", then select "**Accept**" to create the RAID0 array.

e.   When the page displays "**Successful!**" select **OK**, to exit the menu;
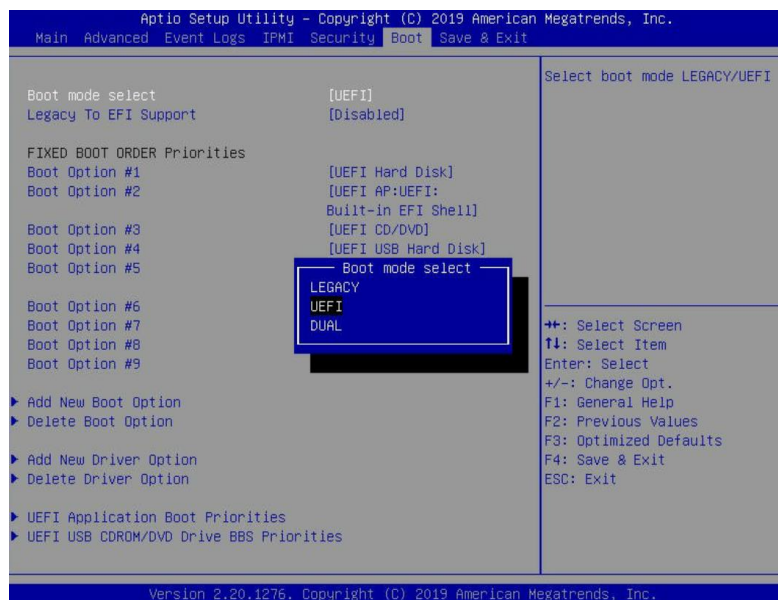

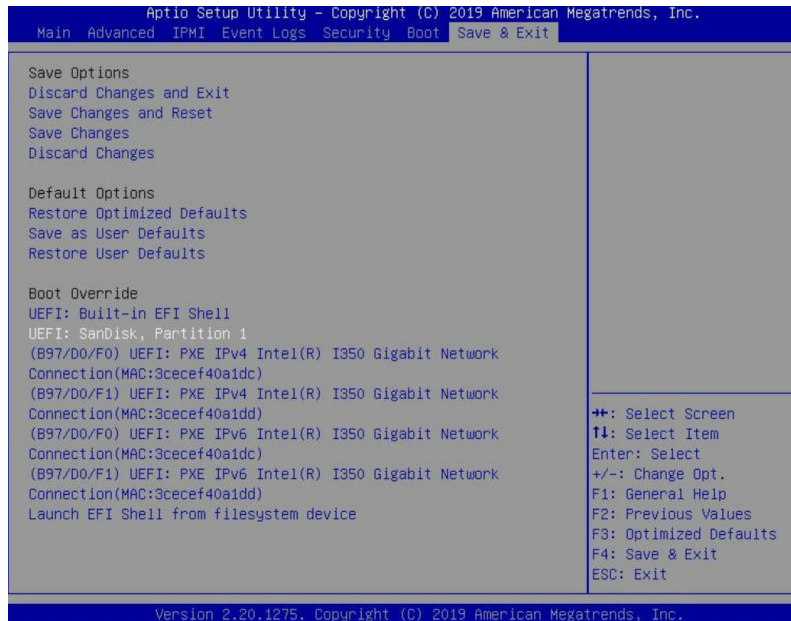**Method 2：Create RAID in UEFI**

1.   First, prepare the UEFI Tool. This file should be copied to the root of a bootable USB flash drive.

   Using the SuperMicro X11DPi-NT motherboard as an example:
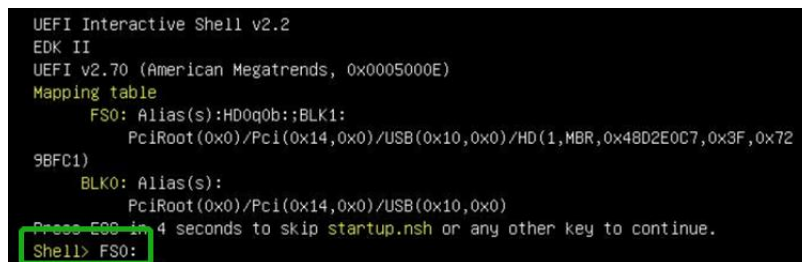
2.   Set '**Boot mode select**' to '**UEFI**';

3. Choose to boot from the USB flash drive (shown as "**UEFI：SanDisk，Partition 1**" for the example below):

4. After entering the UEFI Shell, select "**FS0**:" to access the USB flash drive:.

    Note: "FS0" is the name of the USB flash drive used for this example

5. Next, locate the "**mnv_cli.efi**" program and run it:

    Note: *if the CLI reports that "No NVMe Controller is found", please see Appendix – Troubleshooting.*

6. To create a RAID0 array using two NVMe SSD's, enter the following command:
   create -r 0 -d 0,1

For more CLI commands, please download the CLI manual from the product page of the official website.

Method 3：Create the RAID array using a Windows operating System, and the WebGUI management software:

1. This method assumes you have access to a Windows Server 2019 system and have installed the WebGUI software.

2. Open the WebGUI, select the Logical tab. Click "Create Array", and configure the array as desired using the drop-down menus and selection boxes. Once configured, click the "Create"button to create the array (the exampe below shows 4 NVMe SSD's configured as a RAID 0 array).
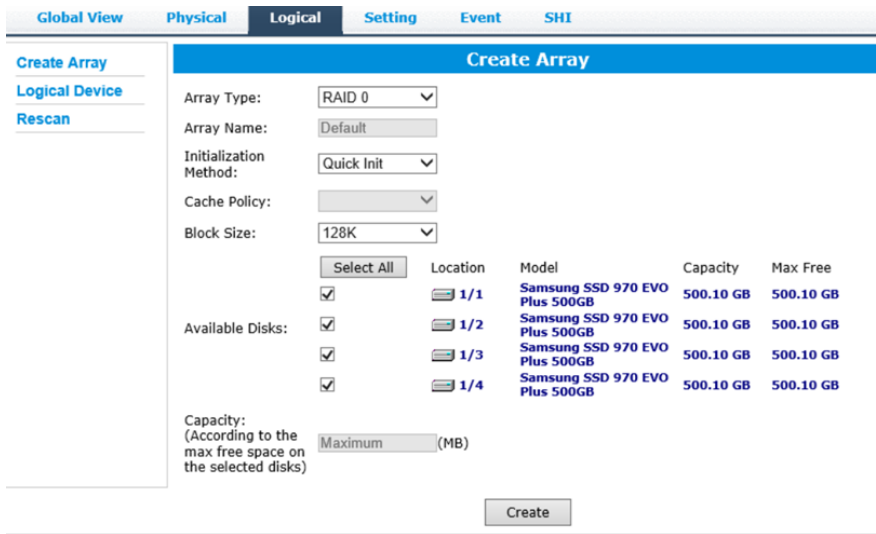
3. Once the array has been created, it will be displayed under **Logical Device Information**.

Method 4：Create a RAID array in Proxmox VE 6.3 using the CLI Tool

a. This method assumes that you have already prepared a Proxmox VE 6.3 system.

b. Boot the system, and enter the username and password to start Proxmox VE 6.3.

c. Copy the CLI package into the root directory of a USB flash drive. Use the following command to copy the mnv_cli package to home directory:

cp mnv_cli /home

d. Access the home directory and enter the following command to start the CLI:

./mnv_cli

e. To create a RAID0 array using two NVMe SSD's, enter the following command. For more CLI commands, please download the CLI manual from the product page of the official website.
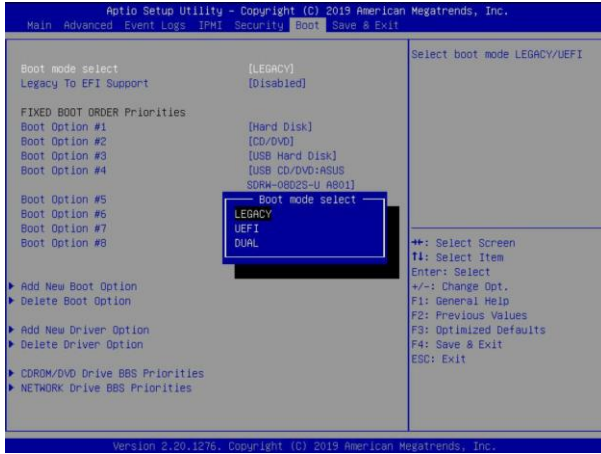
create -r 0 -d 0,1,2,3

Step 3 Adjust the Motherboard BIOS Legacy Settings

Using the SuperMicro X11DPi-NT motherboard as an example:

1. In the system BIOS SETUP menu, change 'Boot mode select' to '**Legacy**';

2. Next, under '**Advanced->PCIe/PCI/PnP Configuration"** change the setting for "**CPU Slot x PCI-E OPROM**' to '**Legacy**'. "**x**" refers to the slot number (slot 4 was used when the screenshot was taken). Please consult the motherboard manual for more information.
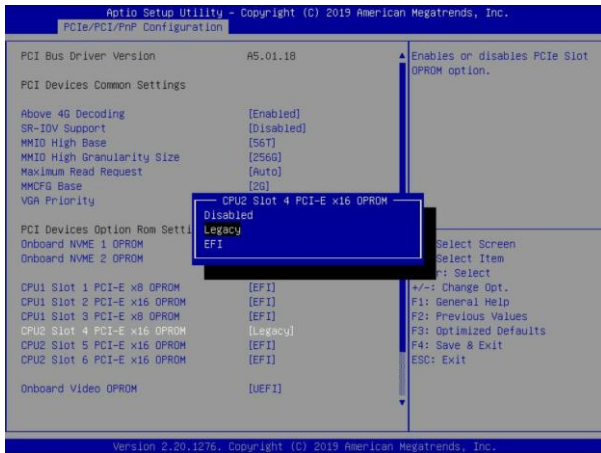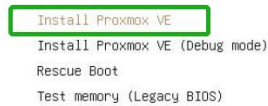

3. Disable 'Secure Boot', set '**Secure Boot**' to '**Disabled**';

Step 4 Install Proxmox VE 6.3

1. Boot from the Installation DVD (Leagcy mode).

2. When the Installation screen appears, please select "**Install Proxmox VE**" to install.

3. When the EULA is displayed select "**I Agree**" to continue:

4. Next, select the **target startdisk**; select the array you configured preiously.

5. Follow the onscreen prompts to install Proxmox VE 6.3.

6. After installation is complete, select the appropriate startup item to boot the system.
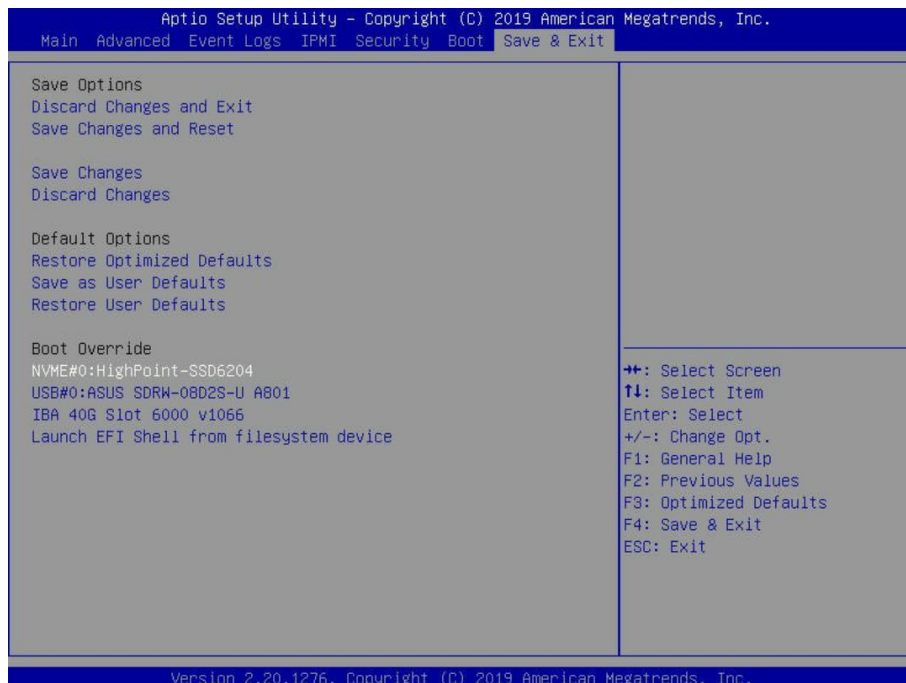
7. Enter the username and password, to log into Proxmox.

Appendix

Troubleshooting

1. **The CLI reports that "No NVMe Controller is found"**

   1) After starting "**mnv-cli.efi**" , the utility reports "**No NVME Controller is found**" (as shown below):

   2) You will need check and make sure the system recognizes the SSD6204. First, enter the following command using the UEFI tool:

      pci -b

   3) If the interface reports "**Vendor 1B4B Device 2241 Prog Interface 2**", the SSD6204 is recognized by the motherboard, but cannot support the UEFI tool. In this case, you will need to create the array using one of the other methods described in this manual (BIOS, CLI or WebGUI).

   4) If the interface does not display "**Vendor 1B4B Device 2241 Prog Interface 2**", then the motherboard does not recognize the SSD6204.

      a. Power down the system, and make sure the SSD6204 is securely installed into the PCIe slot

      b. Boot the system and enter the motherboard BIOS utility. Make sure the required BIOS settings are still enabled (refer to page 1)

2. **The replacement SSD6204 controller cannot recognize the RAID array**

Existing RAID arrays may not be recognized if you simply transfer the NVMe SSD's from one controller to another.

Diagram before replacing NVMe to the new SSD6204:

```
Boot Override
Windows Boot Manager (Namespace#1)
USB#0:SanDisk
IBA 40G Slot 6000 v1066
UEFI: SanDisk, Partition 1
UEFI: Built-in EFI Shell
Launch EFI Shell from filesystem device
```

Diagram after replacing NVMe to the new SSD6204:

```
Boot Override
UEFI: Built-in EFI Shell
UEFI: SanDisk, Partition 1
```
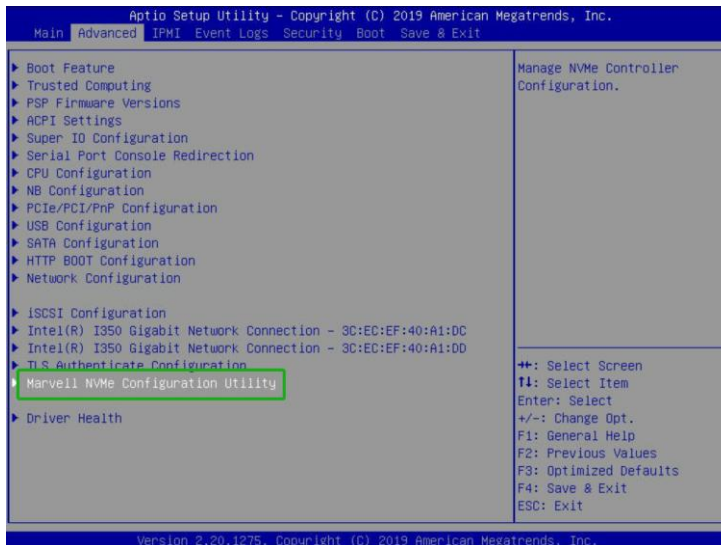
This problem can be resolved by importing the array using the new host controller. There are 3 ways to import an existing RAID configuration. This command is a Simple API feature to import a VD when an importable VD roams from one controller to another. If NVMe Controller supports the RAID mode, this function will import VD.

If VD is created from one controller and the SSD with VD roamed to another controller, the VD needs to be imported first before the firmware reports the VD to the OS.

Note: The user can use > info -o VD command to check if the VD status to be imported or not.

Method 1：Import the RAID array using the BIOS Utility

1) Set the Slot Storage OPROM of SSD6204 in the motherboard BIOS to **UEFI.**

2) Set '**Boot mode select**' to '**UEFI**'.

3) From the motherboard BIOS menu, select "**Marvell NVME Configuration Utility**":

```
          Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  IPMI  Event Logs  Security  Boot  Save & Exit

  ▶ Boot Feature                                          Manage NVMe Controller
  ▶ Trusted Computing                                     Configuration.
  ▶ PSP Firmware Versions
  ▶ ACPI Settings
  ▶ Super IO Configuration
  ▶ Serial Port Console Redirection
  ▶ CPU Configuration
  ▶ NB Configuration
  ▶ PCIe/PCI/PnP Configuration
  ▶ USB Configuration
  ▶ SATA Configuration
  ▶ HTTP BOOT Configuration
  ▶ Network Configuration

  ▶ iSCSI Configuration
  ▶ Intel(R) I350 Gigabit Network Connection - 3C:EC:EF:40:A1:DC
  ▶ Intel(R) I350 Gigabit Network Connection - 3C:EC:EF:40:A1:DD
  ▶ TLS Authenticate Configuration                        ↔: Select Screen
  ▶ Marvell NVMe Configuration Utility                    ↑↓: Select Item
                                                          Enter: Select
  ▶ Driver Health                                         +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

          Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.
```

4) Next, select "**Virtual Device Information**":

5) Click "**Import**".
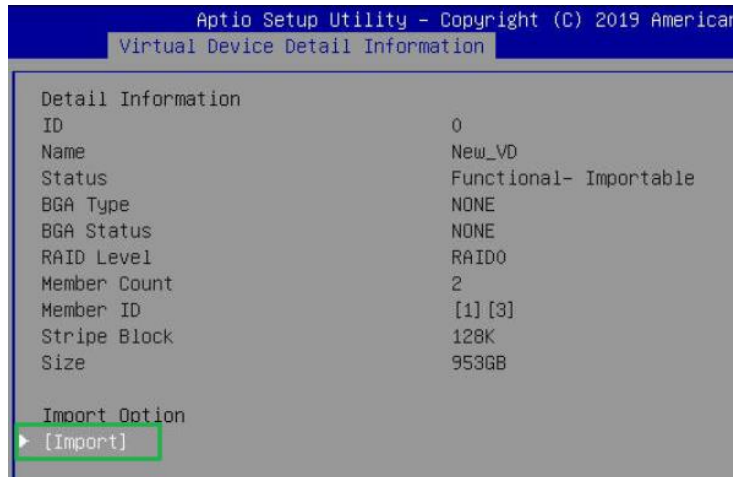
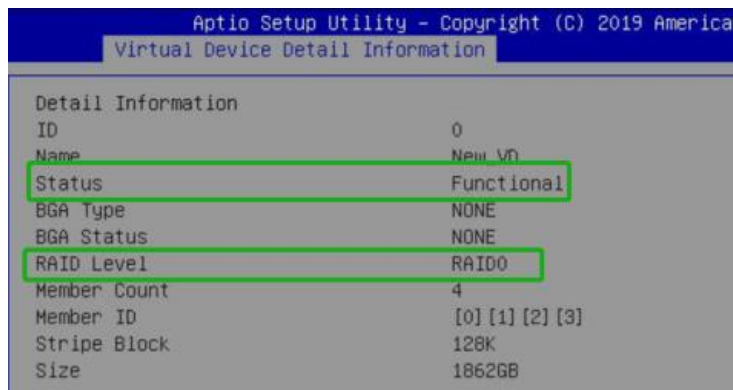6) After restarting the system, you can recognized the RAID0 and can see that the status of the RAID has changed by entering "**Virtual device information→[0] - New_VD**"

Method 2：Import the RAID array using the UEFI Utility

1) Copy **mnv_cli** to the root directory of a bootable USB flash drive.

2) Boot to the flash drive and enter the following command:

   import –l 0

```
FS0:\> mnv_cli.efi
CLI Version: 1.0.0.1041
Welcome to NVMe Command Line Interface.

> info -o vd

VD ID:              0
Name:               New_VD
Status:             Functional
Importable:         Yes
RAID Mode:          RAID0
size:               953 GB
PD Count:           2
PDs:                1 3
Stripe Block Size:  128K
Sector Size:        512 bytes

Total # of VD:      1

> import -l 0
VD 0 import successfully.
```

3) After restarting the system, you can recognized the RAID0 and can see that the status of the RAID has changed by entering the command：

   Info -o vd

```
> info -o vd

VD ID:              0
Name:               VD_0
Status:             Functional
Importable:         No
RAID Mode:          RAID0
size:               1862 GB
PD Count:           4
PDs:                0 1 2 3
Stripe Block Size:  128K
Sector Size:        512 bytes

Total # of VD:      1
```

Method 3：Import the RAID array using the CLI tool:

1) Run mnv_cli.exe using the following command:

   ./mnv_cli

```
[root@DESKTOP-7FT8SGF:/opt/marvell/nvme] ./mnv_cli
CLI Version: 1.0.0.1039
Welcome to NVMe Command Line Interface.

>
```

2) Entering the command：

import –l 0

3) After restarting the system, you can recognized the RAID0 and can see that the status of the RAID has changed by entering the command：

Info -o vd