SSD6204 VMware vSphere Hypervisor (ESXi) 7.0b

Installation Guide

Version 1.00

Last updated on July 22, 2021

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1. Overview

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

For VMware vSphere (ESXi) 7.0b
Mirror link: https://my.vmware.com/en/web/vmware/downloads/#all_products

2. Installing VMware vSphere Hypervisor (ESXi) 7.0b to the 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 VMware is up and running.

Note: VMware7.0b only supports UEFI 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.

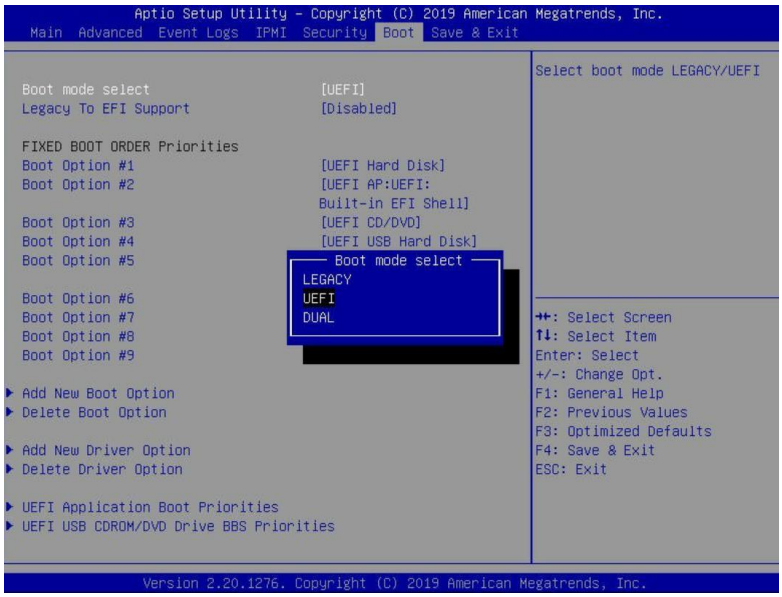
Step 2 Create an Array

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.

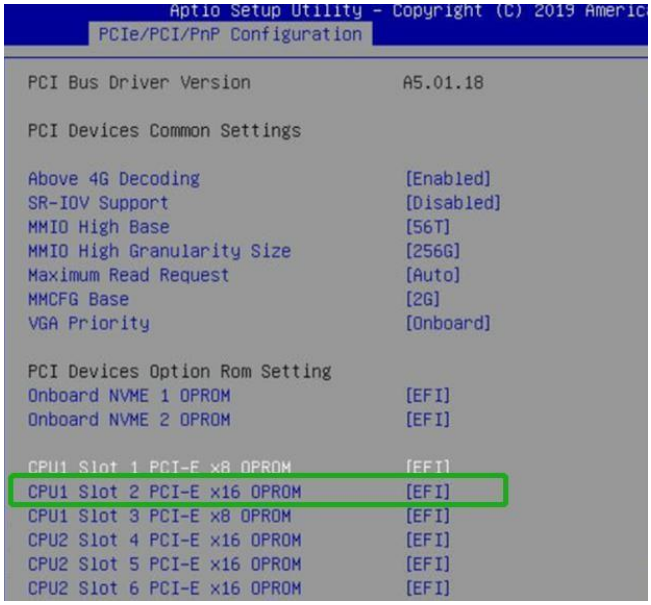
Method 1：Create a RAID array using the Motherboard BIOS

Using the SuperMicro X11DPi-NT motherboard as an example:

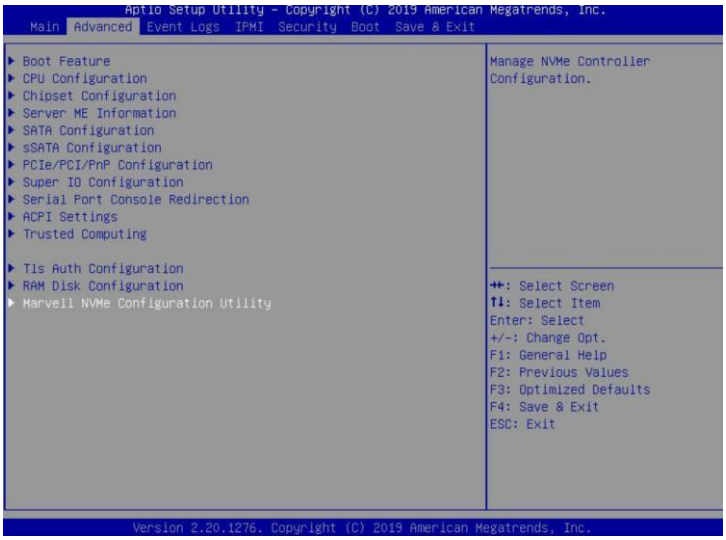
1. Set '**Boot mode select**' to '**UEFI**'.



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.

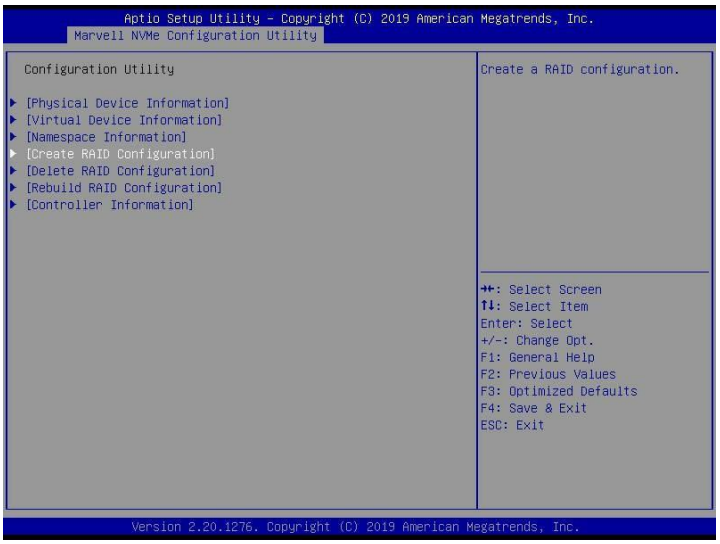


3. **Creating the RAID array:**
   a. Select "**Advanced→Marvell NVMe Configuration Utility**" ;

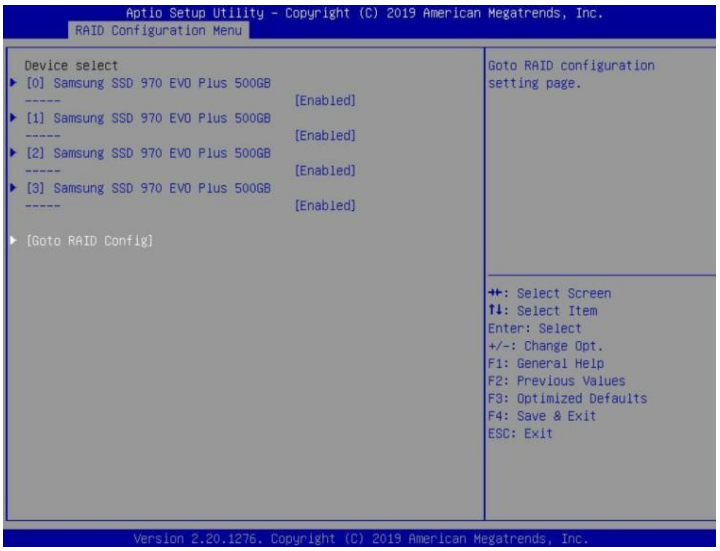


Note: If you cannot find "**Marvell NVMe Configuration Utility**" in the motherboard BIOS under "**advanced**" interface, you will need to create the array using one of the other three methods.

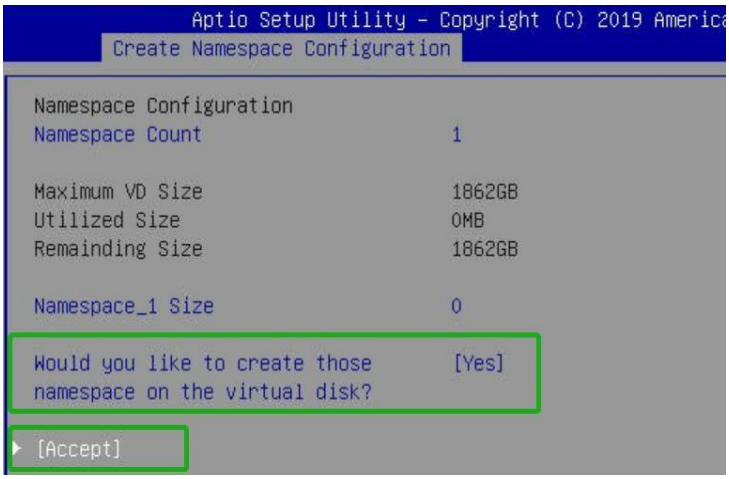
b. Next, select "**Create RAID Configuration**". Press "**Enter**" to open the Configuration Utility.



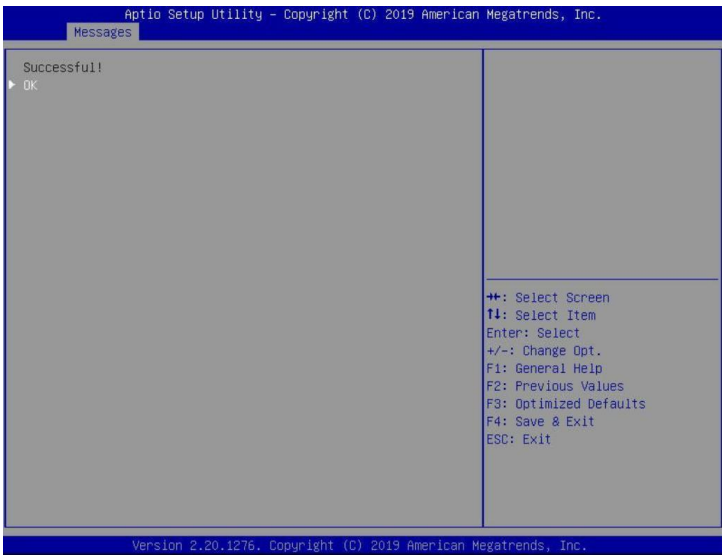
c. Set "**RAID Configuration Menu**" to "**Enabled**", and then select "**Goto RAID Config**".



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;

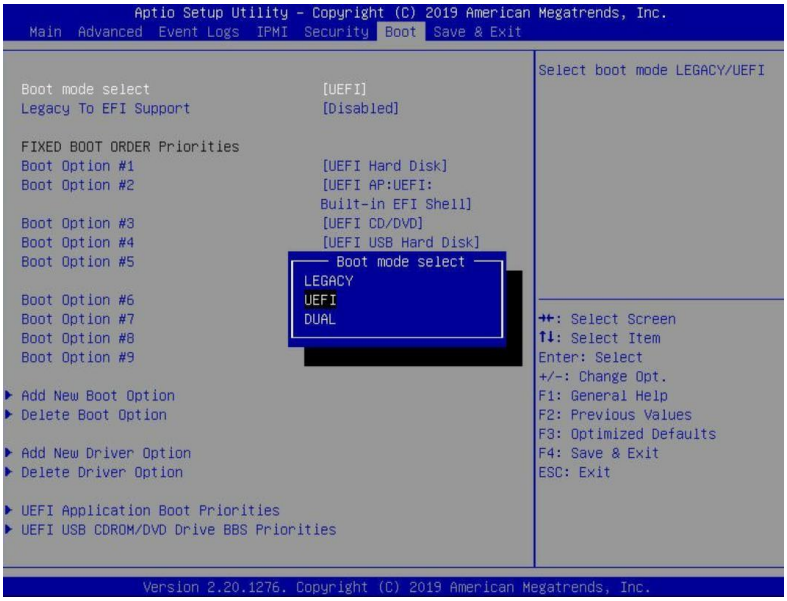


Method 2：Create RAID in UEFI

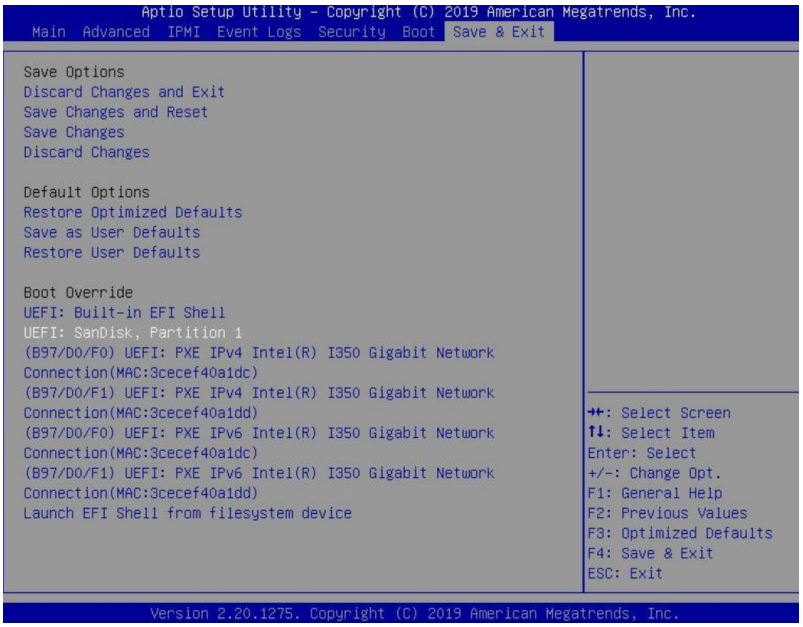
1. First, prepare the UEFI Tool. This file should be copied to the root of a bootable USB flash drive.

Using the SuperMicro X11DPi-NT motherboard as an example:

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

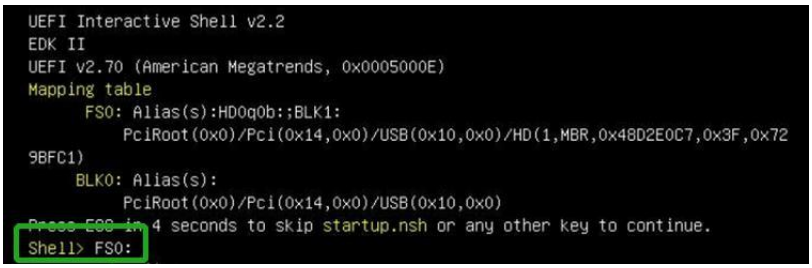


3. Choose to boot from the USB flash drive (shown as "**UEFI：SanDisk，Partition 1**" for the example below):



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.

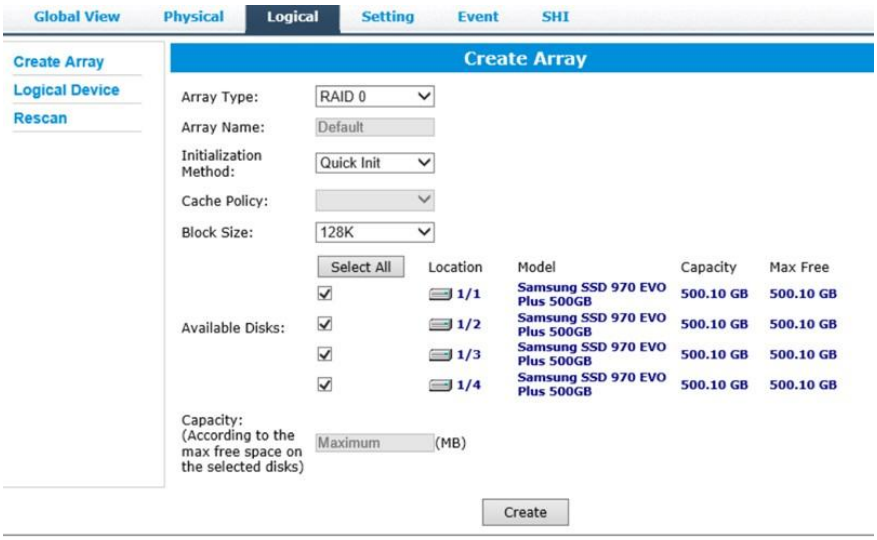
6. To create a RAID0 array using four NVMe SSD's, enter the following command:
create -r 0 -d 0,1,2,3

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 example 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**.

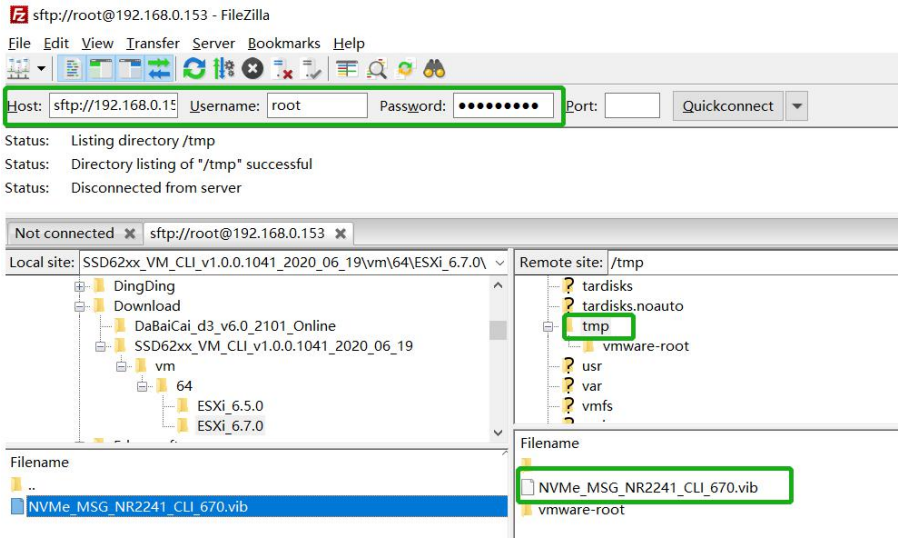
Method 4：Create a RAID array using VMware vSphere (ESXi) 7.0b via CLI

a. This method requires you to prepare the VMware vSPhere system and download the SSD6200 VMware CLI software package from the HighPoint official website.

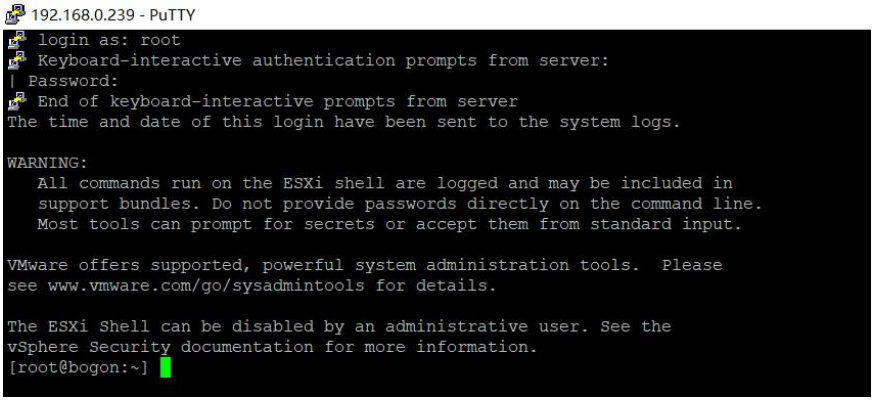
b. Boot the system, and enter the username and password to start VMware.

c. Please download the file transfer tool and upload the SSD6200 VMware CLI to the tmp directory under VMware;

Take FileZilla as an example, output the IP address and password of the virtual machine, and upload the file to the tmp directory of the virtual machine.

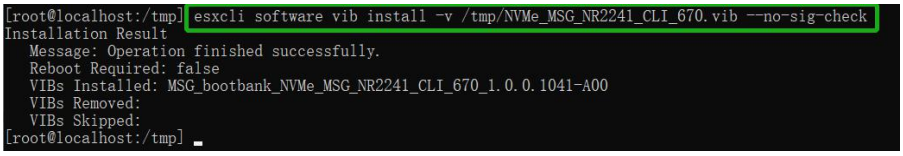


d. Open VMware vSphere (ESXi) 7.0b Shell (Alt+F1) locally or log in via SSH.

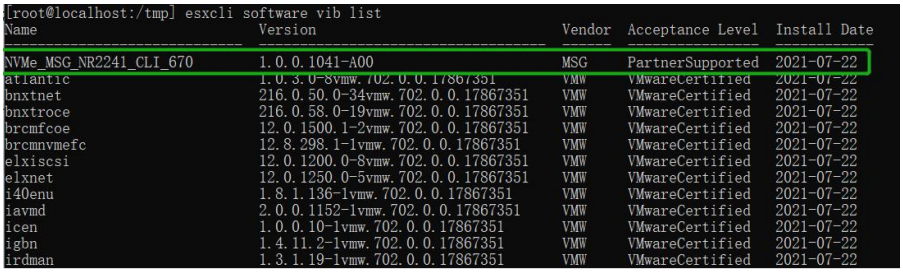


e. Install SSD6200 series CLI software package using the following command: Take NVMe_MSG_NR2241_CLI_670 as an example.

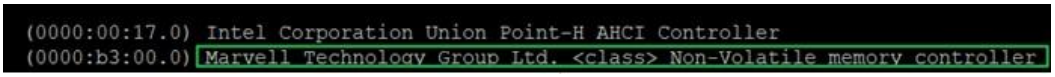
esxcli software vib install -v /tmp/NVMe_MSG_NR2241_CLI_670.vib--no-sig-check



f. Restart the system and use the following command to verify that NVMe_MSG_NR2241_CLI_670 was installed (as shown below)： **esxcli software vib list**

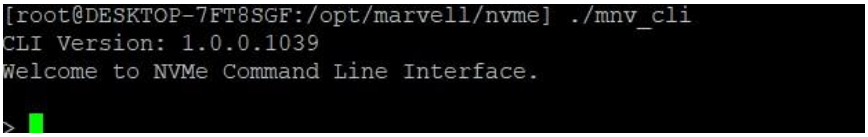


g. Next, enter the following command to check whether the SSSD6204 is recognized. If it displays the phrase “Marvell Technology Group Ltd”, the SSD6204 is recognized by VMware. **esxcfg-scsidevs -a**



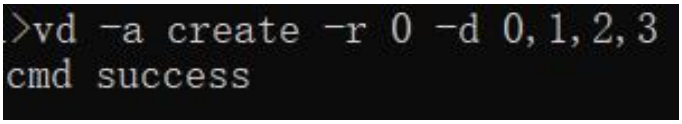
h. Enter the**/opt/marvell/nvme** directory.

i. enter the following command to run cli: **./mnv_cli**



j. To create a RAID0 array using four NVMe SSD’s, enter the following command.

vd -a create -r 0 -d 0,1,2,3

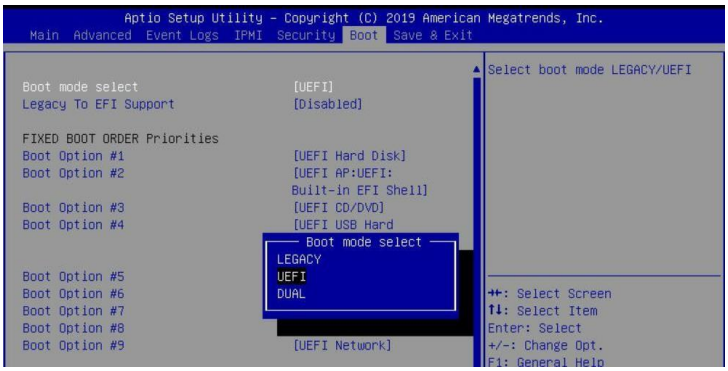


For more CLI commands, please download the CLI manual from the product page of the official website.

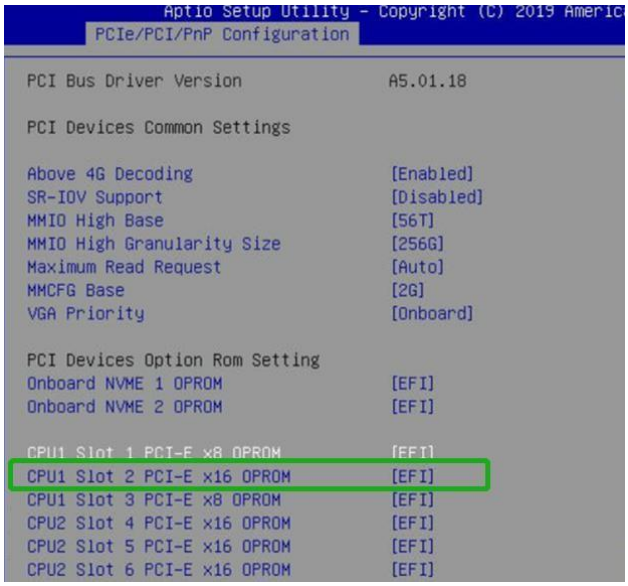
Step 3 Adjust System’s UEFI BIOS Settings

Using the SuperMicro X11DPi-NT motherboard as an example:

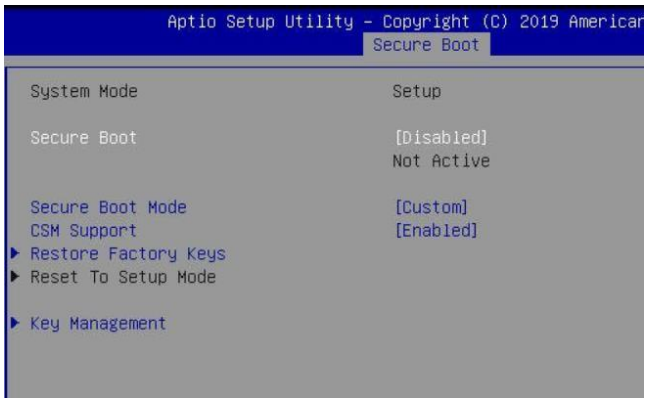
1. In the system BIOS SETUP menu, change ‘**Boot mode select**’ to ‘**UEFI**’;



2. Next, under "**Advanced->PCIe/PCI/PnP Configuration**", change “**CPUx Slot 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.



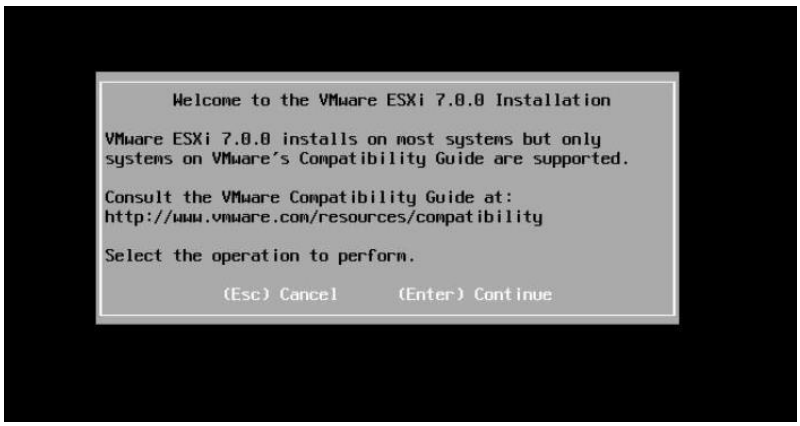
3. Set "Secure Boot" to "Disabled".



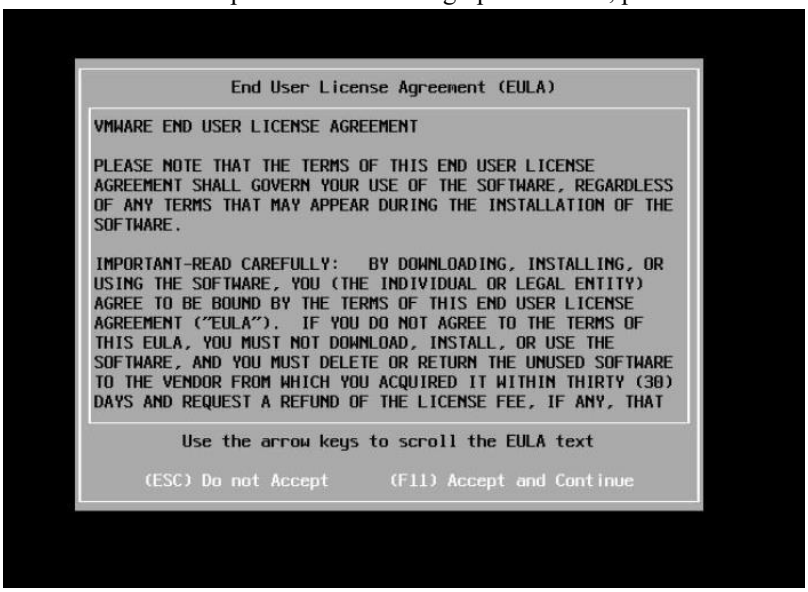
Step 4 Install VMware vSphere Hypervisor (ESXi) 7.0b to the SSD6204

a. Boot from the installation DVD (UEFI mode).

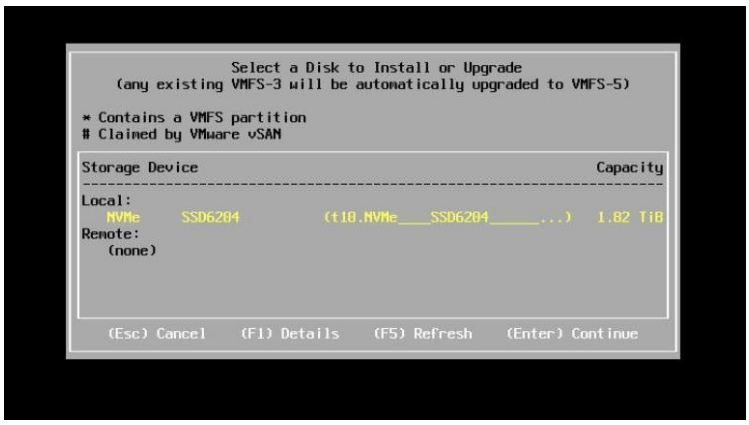
b. When the Installation screen appears, please press "**Enter**" to start installation:



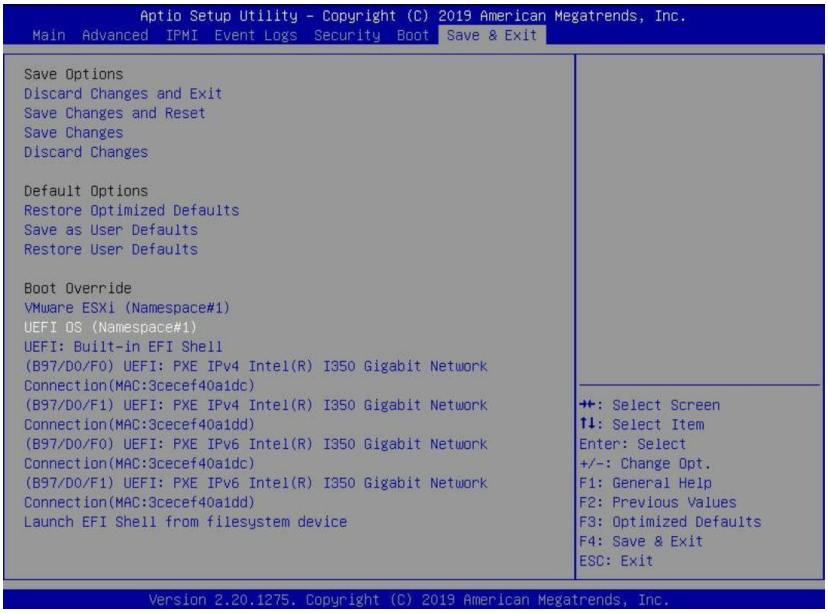
c. When the installation process switches to graphical mode, press "**F11**".



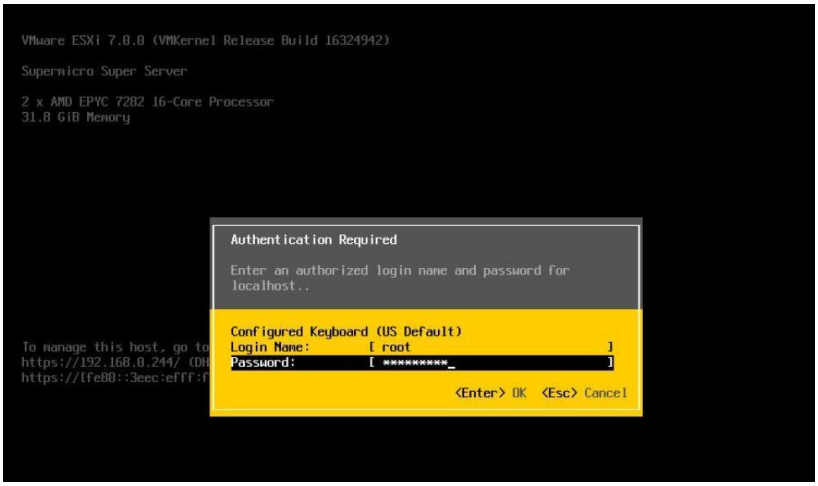
d. When the graphical interface returns, select the previously created RAID0 as the target disk:



e. After installation is complete, select the appropriate startup item to boot the system:



f. Enter the user name and password, to log into VMware vSphere Hypervisor (ESXi) 7.0b.

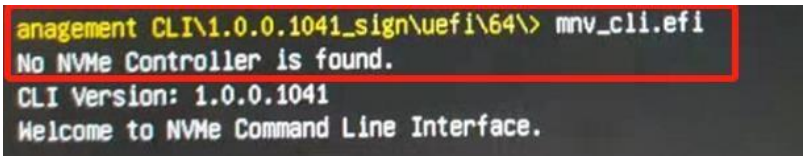


Appendix

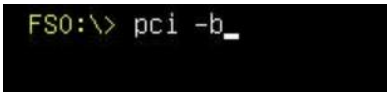
Troubleshooting

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:

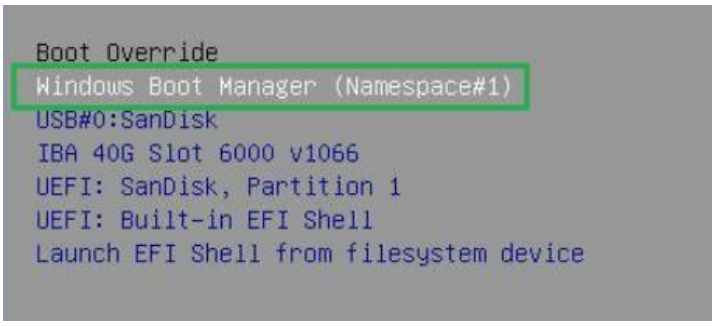
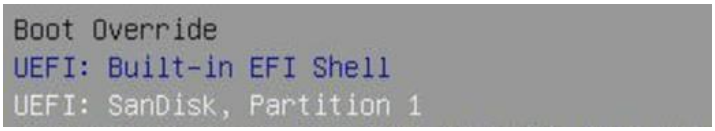


Diagram after replacing NVMe to the new SSD6204:



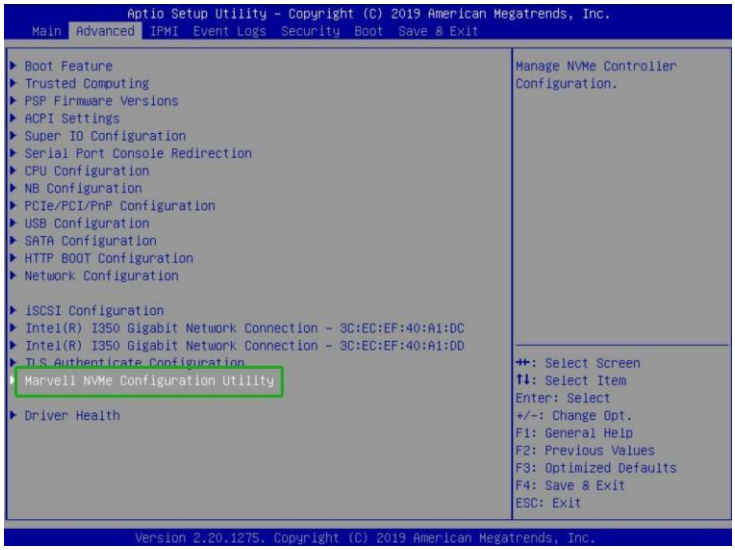
This problem can be resolved by importing the array using the new host controller. There are 3 ways to import an existing RAID configuration. This command is a Simple API feature to import a VD when an importable VD roams from one controller to another. If NVMe Controller supports the RAID mode, this 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.

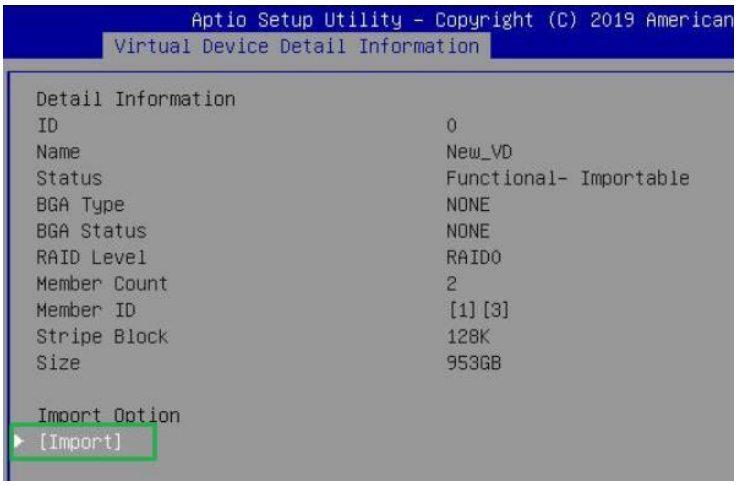
Method 1：Import the RAID array using the BIOS Utility

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**":

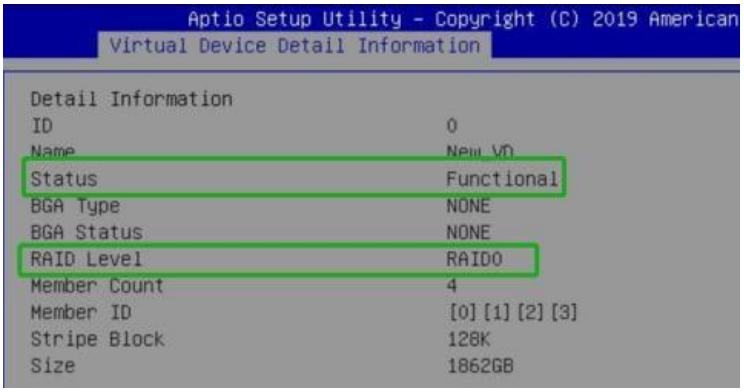


4) Next, select "**Virtual Device Information**":

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**

```
CLI Version: 1.0.0.1041
Welcome to NVMe Command Line Interface.

> import -l 0
VD 0 import successfully. Please shutdown and power on the system.
>
```

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**