

SSD6202 VMware vSphere Hypervisor (ESXi) 7.0b Installation Guide

Version 1.00

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1. Overview

This guide explains how to install VMware to an NVMe SSD or array hosted by the SSD6202 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 SSD6202 controller

Step 1 Prepare Your Hardware for Installation

After installing the NVMe SSDs into the SSD6202 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 SSD6202 controller, from your system. These can be reinstalled after VMware is up and running.

Note: VMware 7.0b only supports UEFI Boot when used with the SSD6202. If you have other SCSI-class adapters installed, you must make sure the SSD6202 controller UEFI support is loaded first; otherwise the system may be unable to boot. If the SSD6202 is not loading first, try moving it to another PCIe slot.

Step 2 Create an Array

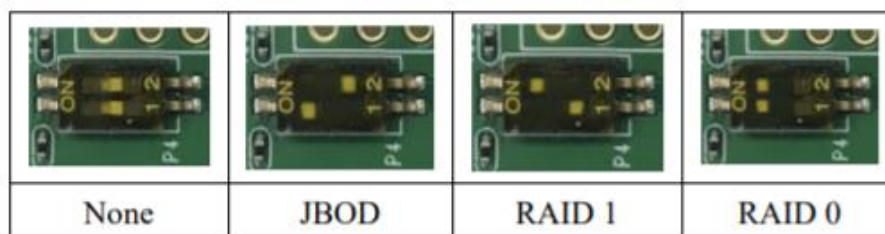
If you would like to configure a RAID array using NVMe SSD's hosted by the SSD6202, please select 1 of the following 5 Methods.

Method 1: Create a RAID array via RAID Switch settings

1. Connect two NVMe SSD's to the SSD6202.

Note: Make sure that there is no RAID or residual partitions in the two NVMe SSD's.

2. Create RAID arrays via RAID Switch settings.

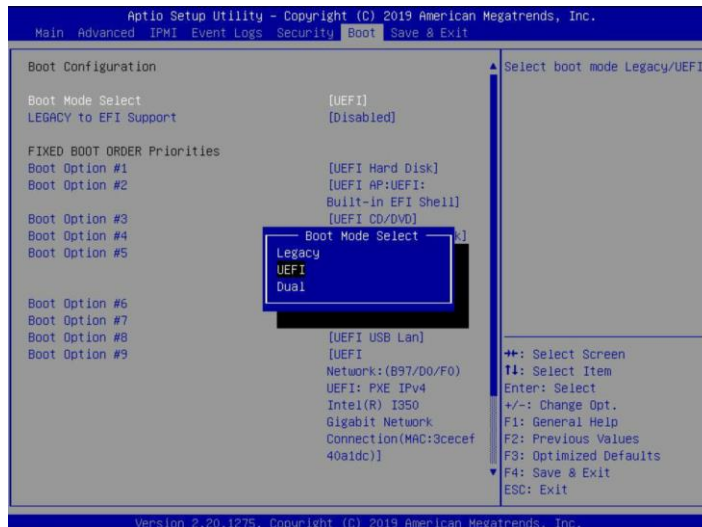


Note: If you don't want to use RAID Switch to create RAID, please make sure the switch setting is None.

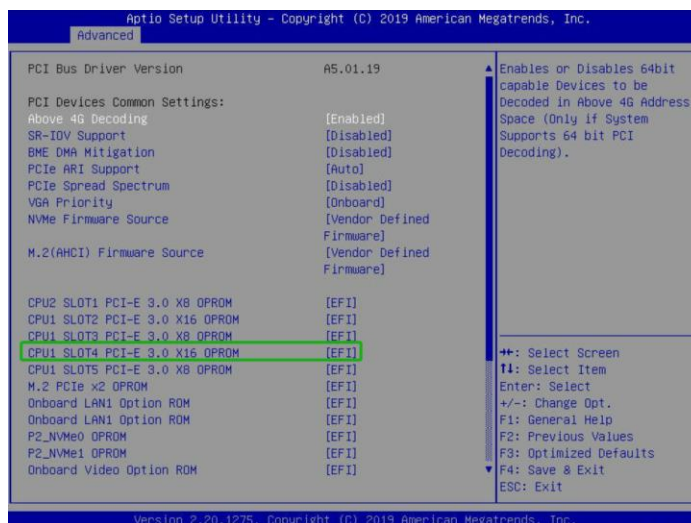
Method 2: Create a RAID array using the Motherboard BIOS

Using the SuperMicro H11DSi motherboard as an example:

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

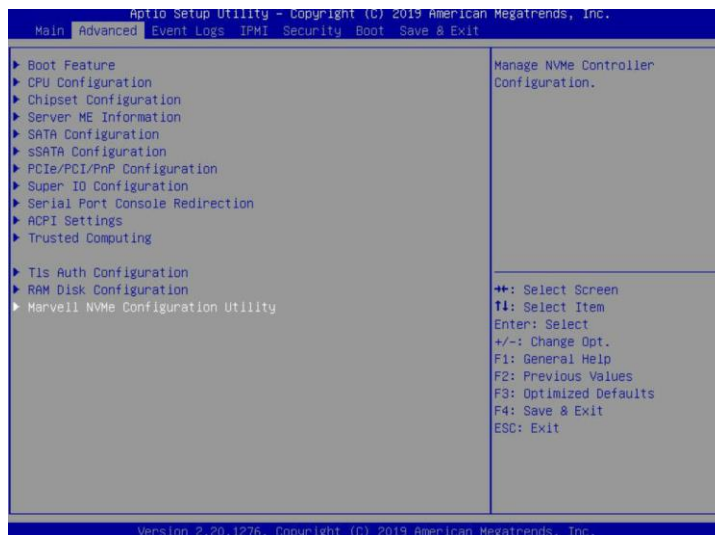


2. Next, under "Advanced->PCIe/PCI/PnP Configuration, change "CPU Slot x PCI-E OPRM" to "EFI". "x" refers to the slot number (slot 2 was used when the screenshot was taken). Please consult the motherboard manual for more information.



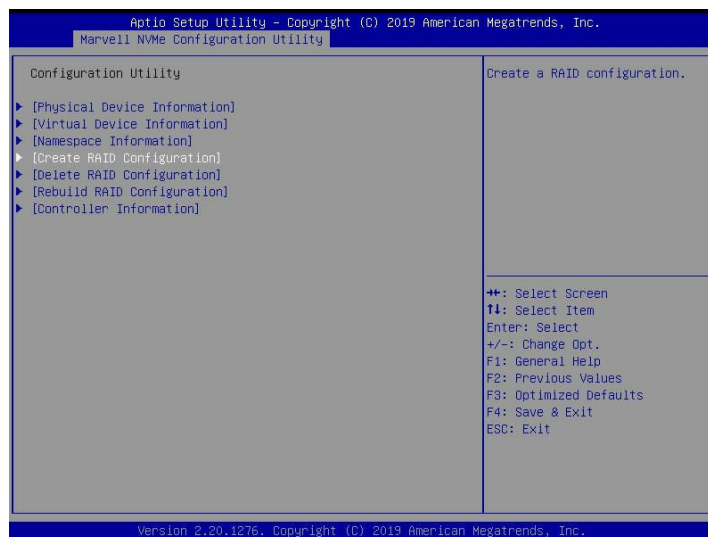
3. Creating the RAID array:

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

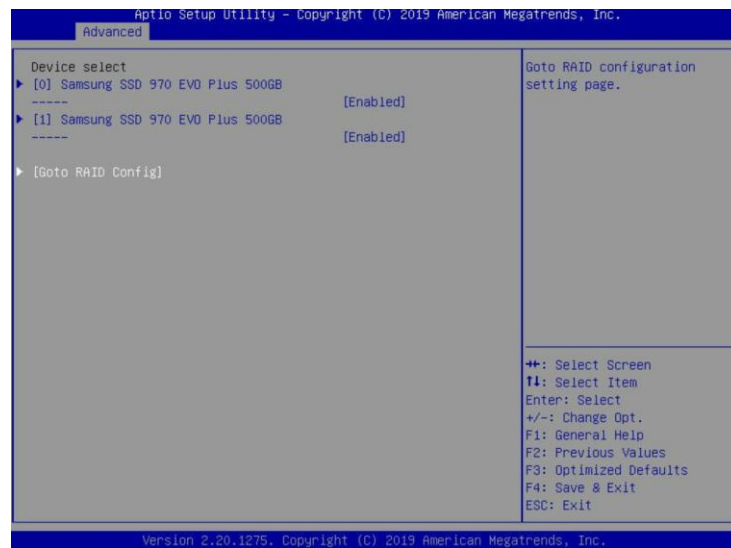


Note: If you cannot find “**Marvell NVMe Configuration Utility**” in the motherboard BIOS under “**advanced**” interface, you will need to create the array using one of the other four methods.

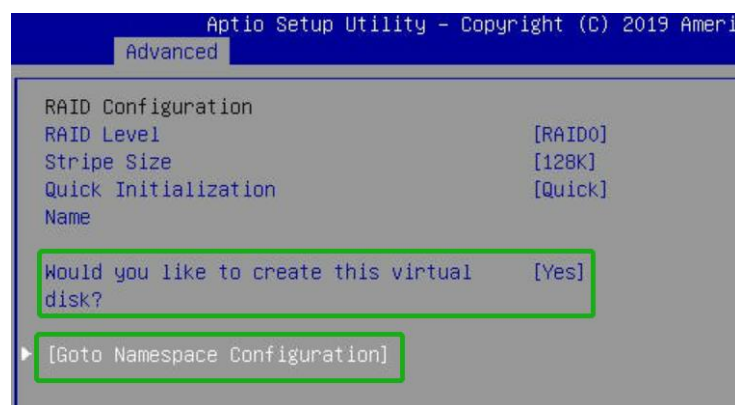
- b. Next, select “**Create RAID Configuration**”. Press “**Enter**” to open the Configuration Utility.



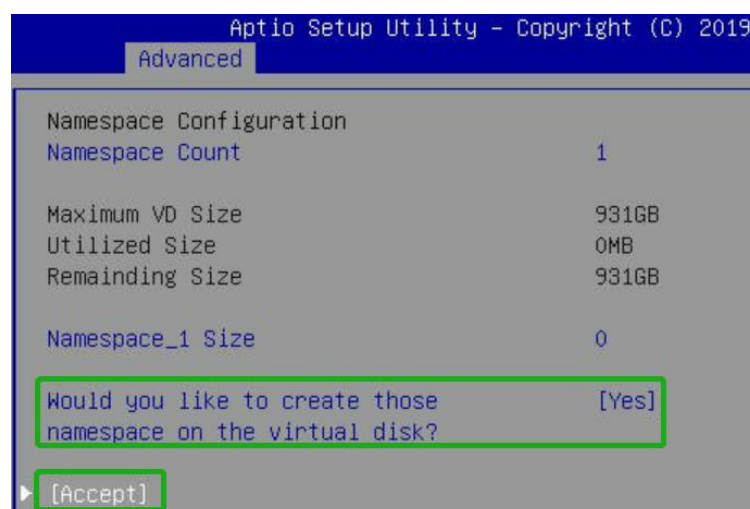
- c. Set “**RAID Configuration Menu**” to “**Enabled**”, and then select “**Goto RAID Config**”.



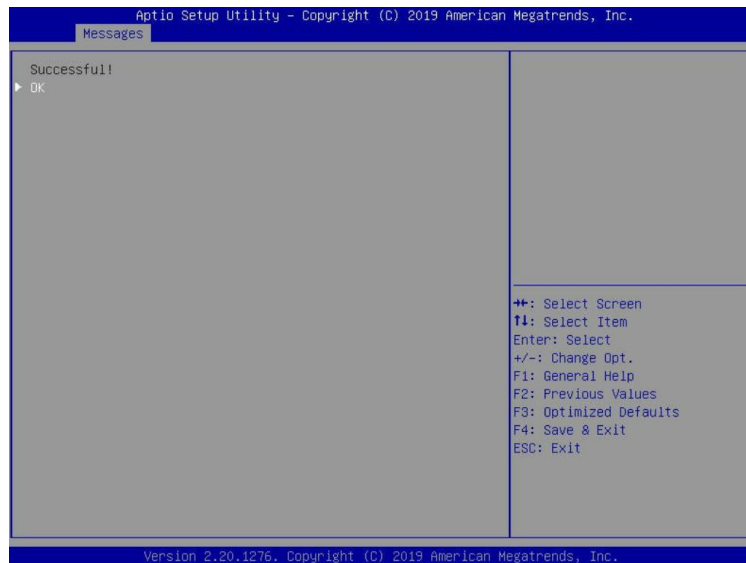
- d. For “**Would you like to create this virtual disk?**” select “**Yes**”, then select “**Goto Namespace Configuration**”.



- e. For “**Would you like to create those namespace on the virtual disk?**” select “**Yes**”, then select “**Accept**” to create the RAID0 array.



- f. When the page displays “**Successful!**” select **OK**, to exit the menu;

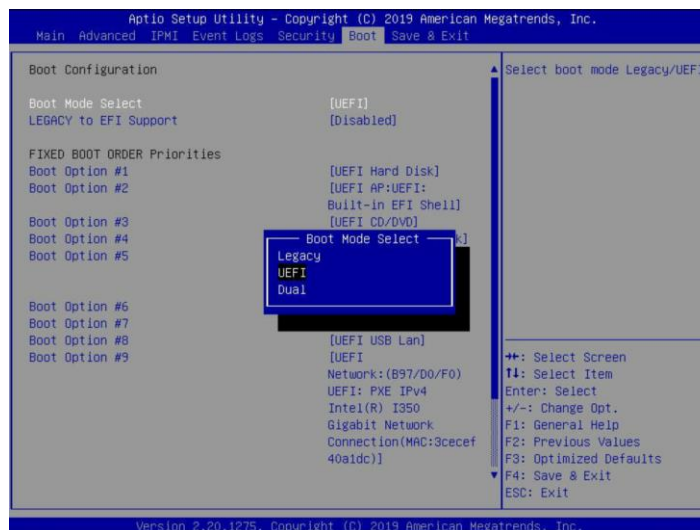


Method 3: Create RAID in UEFI

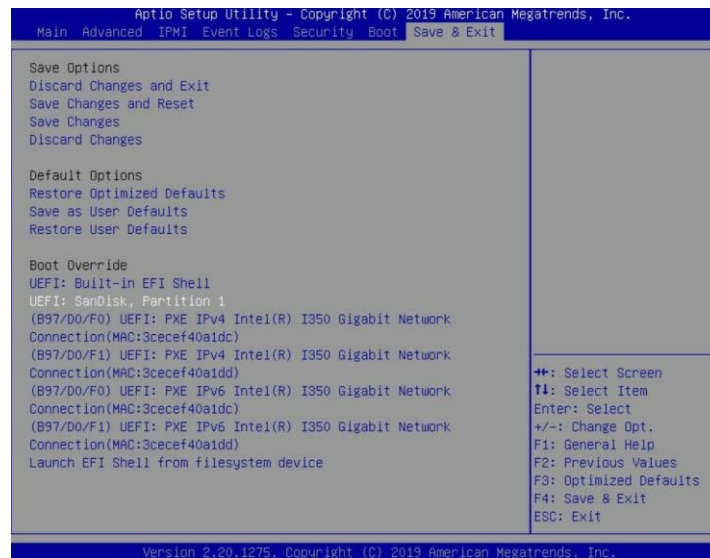
1. First, prepare the UEFI Tool. This file should be copied to the root of a bootable USB flash drive.

Using the SuperMicro H11DSi motherboard as an example:

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

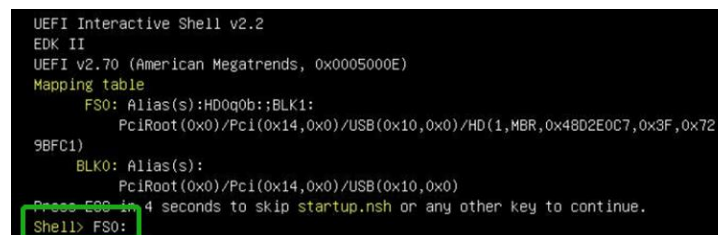


3. Choose to boot from the USB flash drive (shown as "UEFI: SanDisk, Partition 1" for the example below):



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



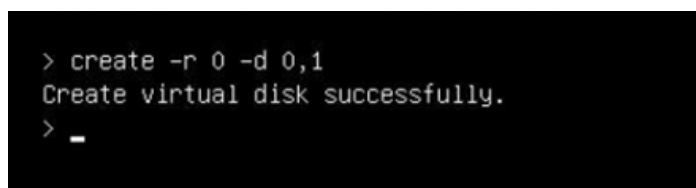
5. Next, locate the "**mnv_cli.efi**" program and run it:



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 4: 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 2 NVMe SSD’s configured as a RAID 0 array).

Create Array

Array Type: RAID 0

Array Name: Default

Initialization Method: Quick Init

Cache Policy:

Block Size: 128K

Select All

Available Disks:	Location	Model	Capacity	Max Free
<input checked="" type="checkbox"/>	1/1	Samsung SSD 970 EVO Plus 500GB	500.10 GB	500.10 GB
<input checked="" type="checkbox"/>	1/2	Samsung SSD 970 EVO Plus 500GB	500.10 GB	500.10 GB

Capacity: (According to the max free space on the selected disks) Maximum (MB)

Create

3. Once the array has been created, it will be displayed under **Logical Device Information**.

Logical Device Information

Name	Type	Capacity	BlockSize	SectorSize	OS Name	Status
VD_0	RAID 0	1.00 TB	128k	512B	HighPoint SSD6202	Normal Maintenance

Physical Device Information

Location	Model	Capacity	Max Free
1/1	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB
1/2	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB

Method 5: Create a RAID array using VMware vSphere (ESXi) 7.0b via CLI

1. This method assumes that you have already prepared a VMware vSphere system.
2. Boot the system, and enter the username and password to start VMware.
3. Open the VMware vSphere (ESXi) 7.0b Shell (Alt+F1).

```

192.168.0.239 - PuTTY
login as: root
Keyboard-interactive authentication prompts from server:
| Password:
End of keyboard-interactive prompts from server
The time and date of this login have been sent to the system logs.

WARNING:
  All commands run on the ESXi shell are logged and may be included in
  support bundles. Do not provide passwords directly on the command line.
  Most tools can prompt for secrets or accept them from standard input.

VMware offers supported, powerful system administration tools. Please
see www.vmware.com/go/sysadmintools for details.

The ESXi Shell can be disabled by an administrative user. See the
vSphere Security documentation for more information.
[root@bogon:~]

```

4. Install **vmware-esx-mnv_cli.vib** using the following command:

esxcli software vib install -v /tmp/vmware-esx-mnv_cli.vib --no-sig-check

```

[root@bogon:/tmp] esxcli software vib install -v /tmp/vmware-esx-mnv_cli.vib --no-sig-check
Installation Result
  Message: Operation finished successfully.
  Reboot Required: false
  VIBs Installed: MRVL_bootbank_vmware-esx-mnv_cli_1.0.0.1039-mrvl
  VIBs Removed:
  VIBs Skipped:
[root@bogon:/tmp]

```

5. Restart the system and use the following command to verify that **vmware-esx-mnv_cli.vib** was installed (as shown below):

esxcli software vib list

```

[root@bogon:~] esxcli software vib list
Name                                Vendor  Ac
-----
Acceptance Level  Install Date  Version
-----
dell-shared-perc8  2020-07-06    06.806.90.00-10EM.650.0.0.4598673  Avago  VM
wareCertified
lsi-mr3            2020-07-06    7.703.18.00-10EM.650.0.0.4598673  Avago  VM
wareCertified
dell-configuration-vib  2020-07-06    6.7-0A01                          DellEMC Pa
rtnerSupported
dellmc-osname-idrac    2020-07-06    6.7-0A00                          DellEMC Pa
rtnerSupported
vmware-esx-mnv_cli     2020-07-06    1.0.0.1039-mrvl                    MRVL    VM
wareCertified

```

6. Next, enter the following command to check whether the SSD6202 is recognized. If it displays the phrase “Marvell Technology Group Ltd”, the SSD6202 is recognized by VMware.

esxcfg-scsidevs -a

```

(0000:00:17.0) Intel Corporation Union Point-H AHCI Controller
(0000:b3:00.0) Marvell Technology Group Ltd. <class> Non-Volatile memory controller

```

7. Browse to the `/opt/marvell/nvme` directory, and enter 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.
>
```

8. To create a RAID0 array using two NVMe SSD's, enter the following command.

```
create -r 0 -d 0,1
```

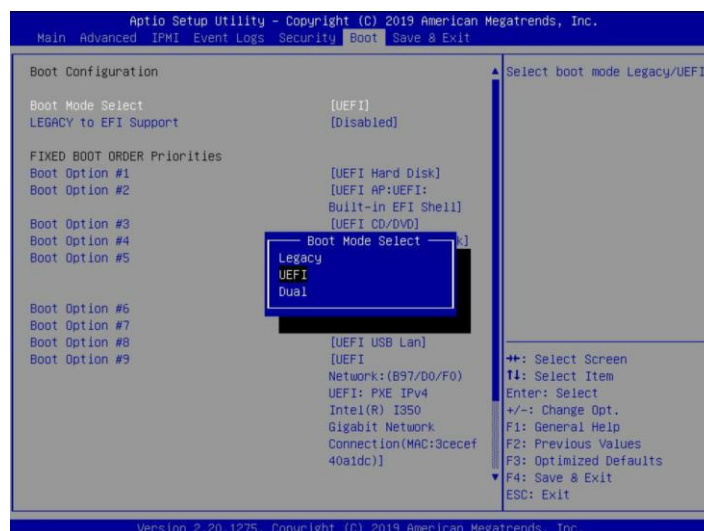
```
> create -r 0 -d 0,1
Create virtual disk successfully.
> _
```

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

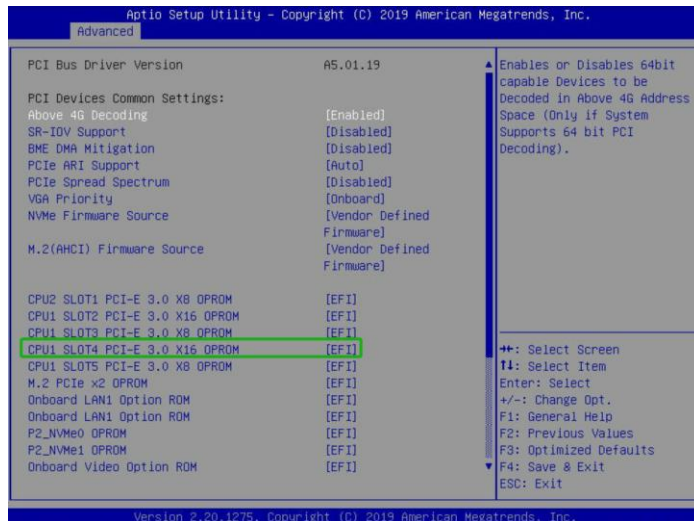
Step 3 Adjust the Motherboard BIOS Settings

Using the Super Micro H11DSi motherboard as an example:

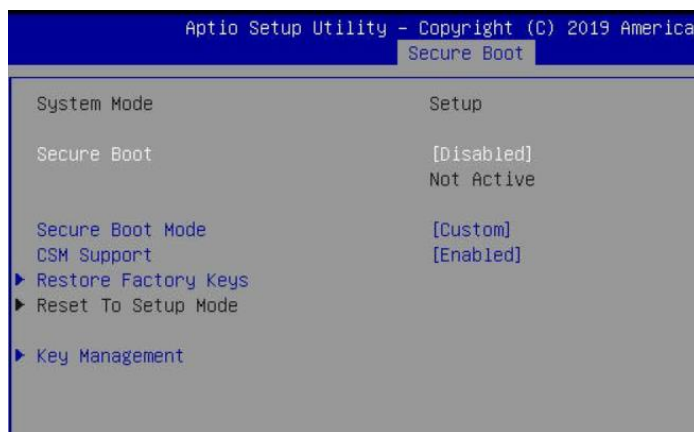
1. In the system BIOS SETUP menu, change 'Boot mode select' to 'UEFI';



2. Under "Advanced→PCIe/PCI/PnP Configuration", change the setting for "CPU Slot x PCI-E OPRM" to "EFI". "x" refers to the slot number (slot 4 was used when the screenshot was taken). Please consult the motherboard manual for more information.

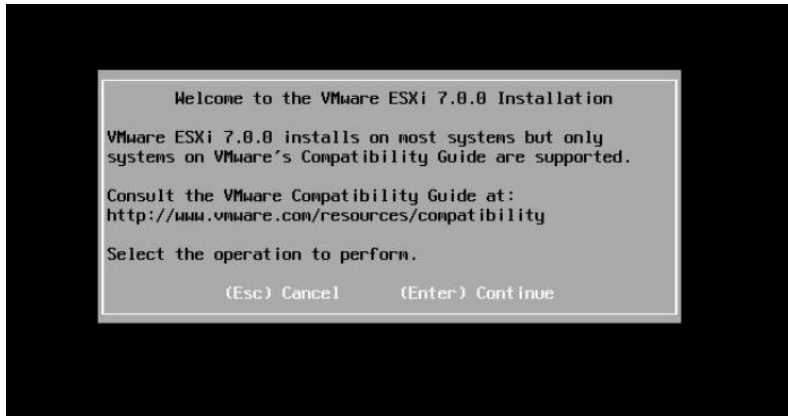


- Set "Secure Boot " to "Disabled".

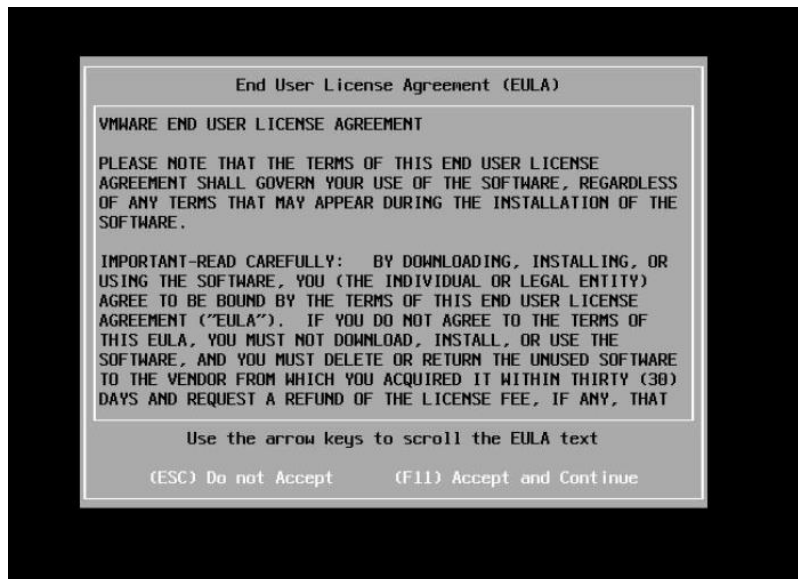


Step 4 Install VMware vSphere Hypervisor (ESXi) 7.0b to the SSD6202

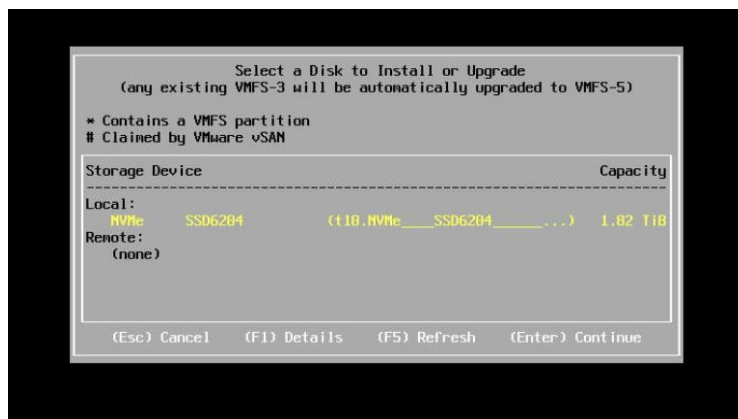
- a. Boot from the installation DVD (UEFI mode).
- b. When the Installation screen appears, please press **"Enter"** to start installation:



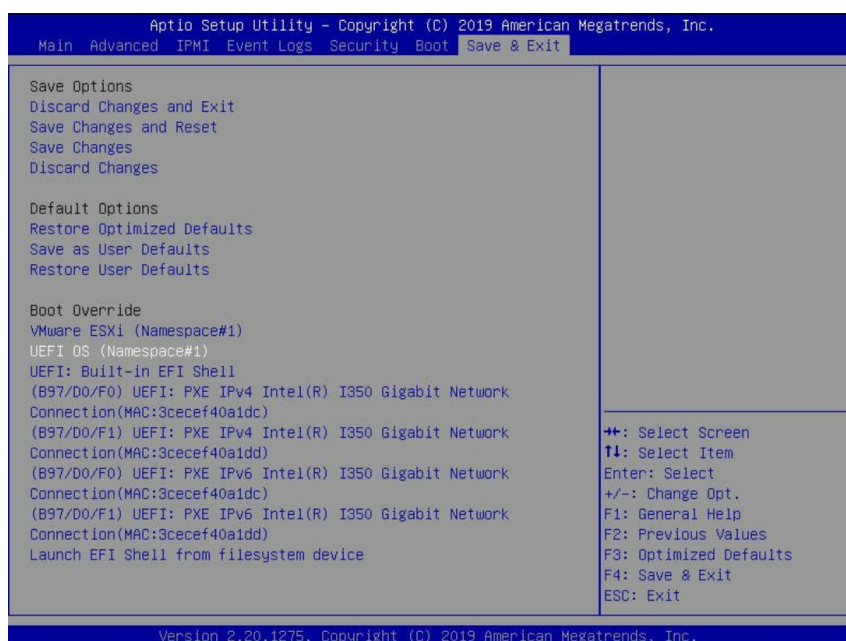
- c. When the installation process switches to graphical mode, press **"F11"**.



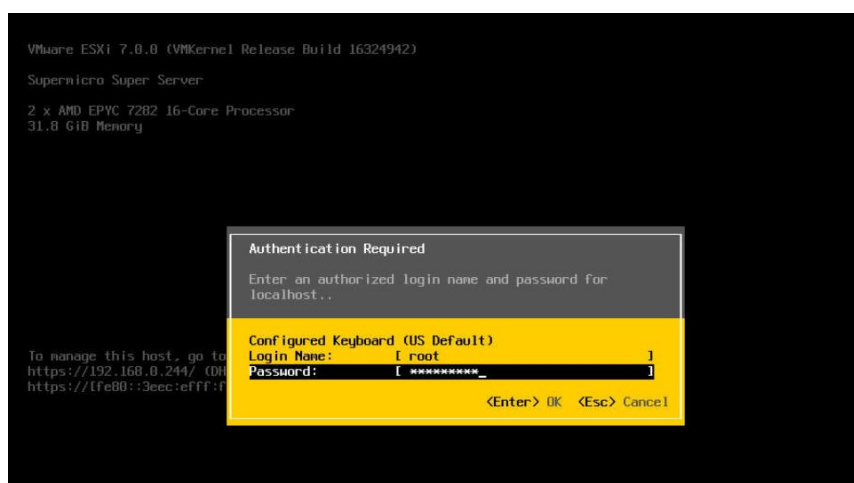
- d. When the graphical interface returns, select the previously created RAID0 as the target disk:



- 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.

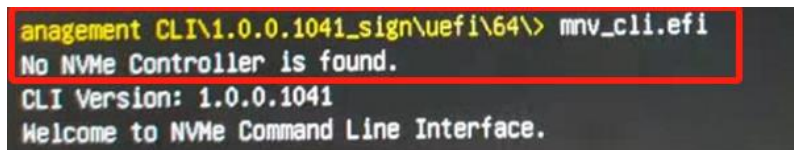


Appendix

Troubleshooting

1. The CLI reports that “No NVMe Controller is found”

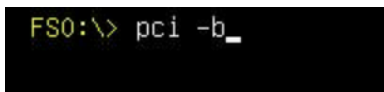
- 1) After starting “**mnv-cli.efi**”, the utility reports “**No NVME Controller is found**” (as shown below):



```
anagement CLI\1.0.0.1041_sign\uefi\64\> mnv_cli.efi
No NVMe Controller is found.
CLI Version: 1.0.0.1041
Welcome to NVMe Command Line Interface.
```

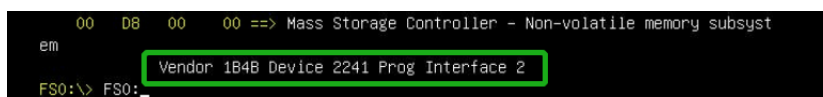
- 2) You will need check and make sure the system recognizes the SSD6202. First, enter the following command using the UEFI tool:

pci -b



```
FS0:\> pci -b_
```

- 3) If the interface reports “**Vendor 1B4B Device 2241 Prog Interface 2**”, the SSD6202 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).



```
00 D8 00 00 ==> Mass Storage Controller - Non-volatile memory subsystem
em
Vendor 1B4B Device 2241 Prog Interface 2
FS0:\> FS0:_
```

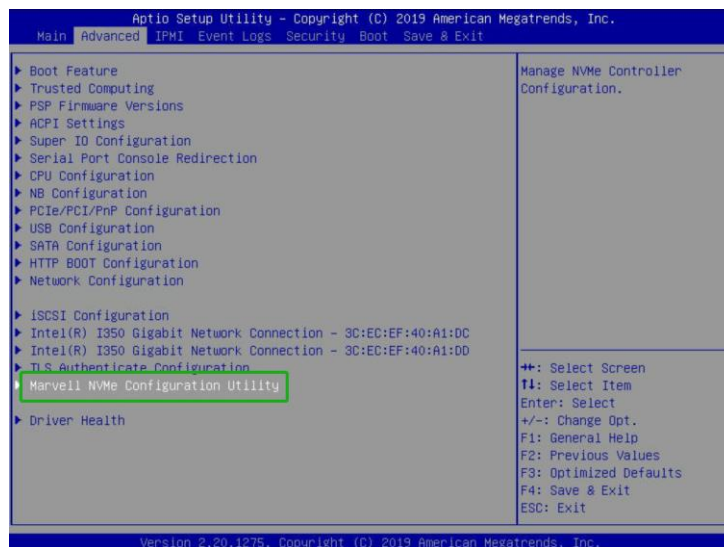
- 4) If the interface does not display “**Vendor 1B4B Device 2241 Prog Interface 2**”, then the motherboard does not recognize the SSD6202.
 - a. Power down the system, and make sure the SSD6202 is securely installed into the PCIe slot
 - b. Boot the system and enter the motherboard BIOS utility. Make sure the required BIOS settings are still enabled (refer to page 1)

2. Check the RAID create via RAID Switch settings is created or not

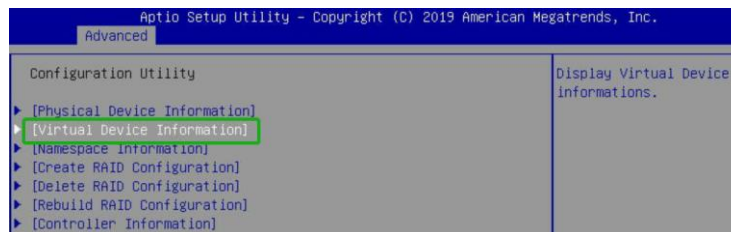
Method 1: Check in BIOS Utility

- 1) Set the Slot Storage OPROM of SSD6202 in the motherboard BIOS to **UEFI**.
- 2) Set ‘**Boot mode select**’ to ‘**UEFI**’.

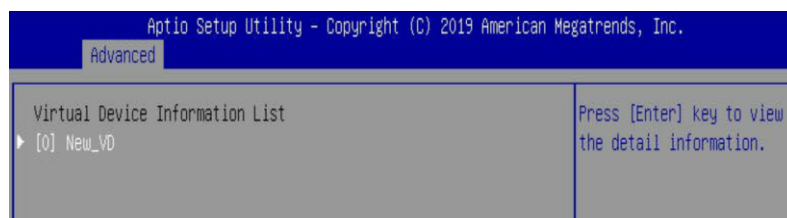
- 3) From the motherboard BIOS menu, select “**Marvell NVMe Configuration Utility**”:



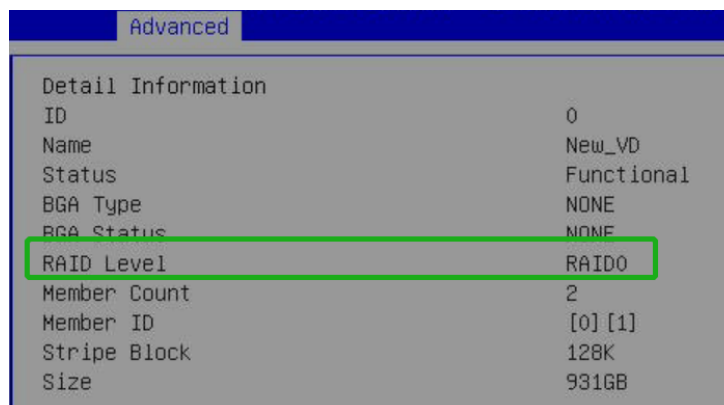
- 4) Select the “**Virtual device information**”



- 5) Select the “[0] **New_VD**”

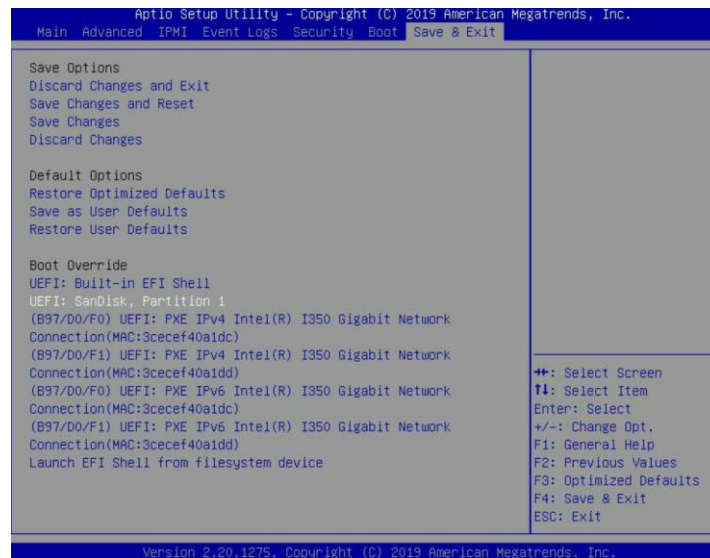


- 6) As shown in the figure below, you can see the RAID0 information:



Method 2: check in UEFI

- Choose to boot from the USB flash drive (shown as “**UEFI: SanDisk, Partition 1**” for the example below):

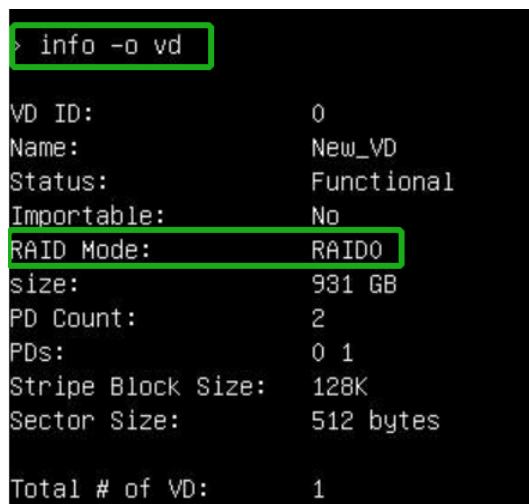


- Next, locate the “**mnv_cli.efi**” program and run it:



- you can recognized the RAID0 by entering the following command:

info -o vd



Method 3: check in a windows operating System

- This method assumes you have access to a Windows Server 2019 system and have installed the WebGUI software.
- Open the WebGUI software, it will be displayed under **Logical Device Information**.

Global View	Physical	Logical	Setting	Event	SHI														
Create Array	Logical Device Information																		
Logical Device	<table><tr><th>Name</th><th>Type</th><th>Capacity</th><th>BlockSize</th><th>SectorSize</th><th>OS Name</th><th>Status</th></tr><tr><td> VD_0</td><td>RAID 0</td><td>1.00 TB</td><td>128k</td><td>512B</td><td>HighPoint SSD6202</td><td>Normal Maintenance</td></tr></table>					Name	Type	Capacity	BlockSize	SectorSize	OS Name	Status	 VD_0	RAID 0	1.00 TB	128k	512B	HighPoint SSD6202	Normal Maintenance
Name	Type	Capacity	BlockSize	SectorSize	OS Name	Status													
 VD_0	RAID 0	1.00 TB	128k	512B	HighPoint SSD6202	Normal Maintenance													
Rescan	Physical Device Information																		
	<table><tr><th>Location</th><th>Model</th><th>Capacity</th><th>Max Free</th></tr><tr><td> 1/1</td><td>Samsung SSD 970 EVO Plus 500GB</td><td>500.10 GB</td><td>0.00 GB</td></tr><tr><td> 1/2</td><td>Samsung SSD 970 EVO Plus 500GB</td><td>500.10 GB</td><td>0.00 GB</td></tr></table>					Location	Model	Capacity	Max Free	 1/1	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB	 1/2	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB		
Location	Model	Capacity	Max Free																
 1/1	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB																
 1/2	Samsung SSD 970 EVO Plus 500GB	500.10 GB	0.00 GB																

Method 4: check in a CLI

1. This method assumes that you have already prepared a VMware system.
2. Refer to “**Step 2 Create an array→Method 5**” to install CLI tool in the system.
3. Run CLI by 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.
>
```

4. you can recognized the RAID0 by entering the following command:

```
info -o vd
```

```
> info -o vd
VD ID:          0
Name:           New_VD
Status:         Functional
Importable:     No
RAID Mode:      RAID0
size:           931 GB
PD Count:       2
PDs:            0 1
Stripe Block Size: 128K
Sector Size:    512 bytes
Total # of VD:  1
```