VMware® ESXi® on Intel® VMD VROC

THOR200-U8-D

Revision1.0

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Manual Revision 1.0 Release Date: 5/21/2025

Document Revision History

Date	Revision	Description
07/07/2025	1.0	Initial document.

Contents

1. Overview

This document is a guide for field application engineers, system engineers, and technicians to install redundant VMware® ESXi® hypervisor images on a RAID1 volume on an Intel Gen 1, 2, 3 Intel® Xeon Scalable platform.

1.1   Software Requirements

Make sure the platform BIOS supports VROC EFI 7.6.

At the time of this writing, VMware® ESXi® does not have native support for RAID1 mirroring. Refer to the link below to create a VMware® ISO that has the out-of-box VMD driver.

https://www.intel.com/content/dam/support/us/en/documents/memory-and-storage/ssd-software/Intel_VMD_NVMe_VMWare_User_Guide.pdf

Drivers	Software Layer
VROC EFI 7.6	Platform BIOS
Intel VMD/NVMe Driver	VMware ESXi

Table 1-1. Required Drivers at Each Software Layer

1.2   Hardware Requirements

The system requires an Intel VROC key and two M.2 NVMe drives. Gen 1 and 2 processors do not support VMD lanes on the PCH.
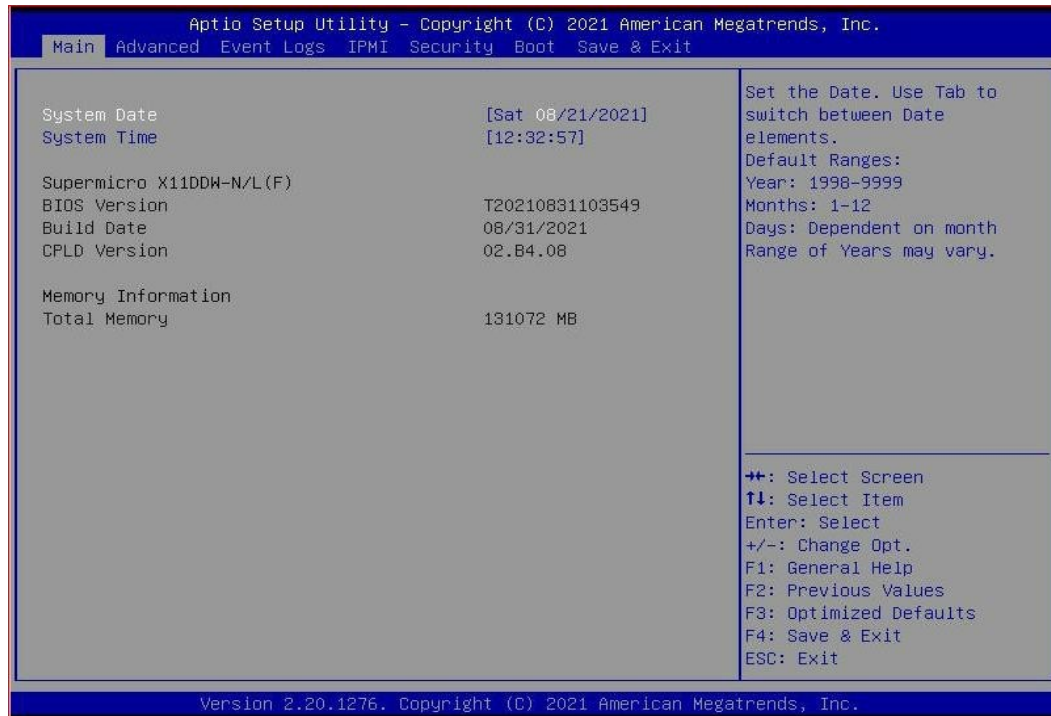
Processor	PCH	CPU	Number of RAID1 Volumes per VMD Lane
Gen 1, 2	No	Yes	One
Gen 3	Yes	Yes	One

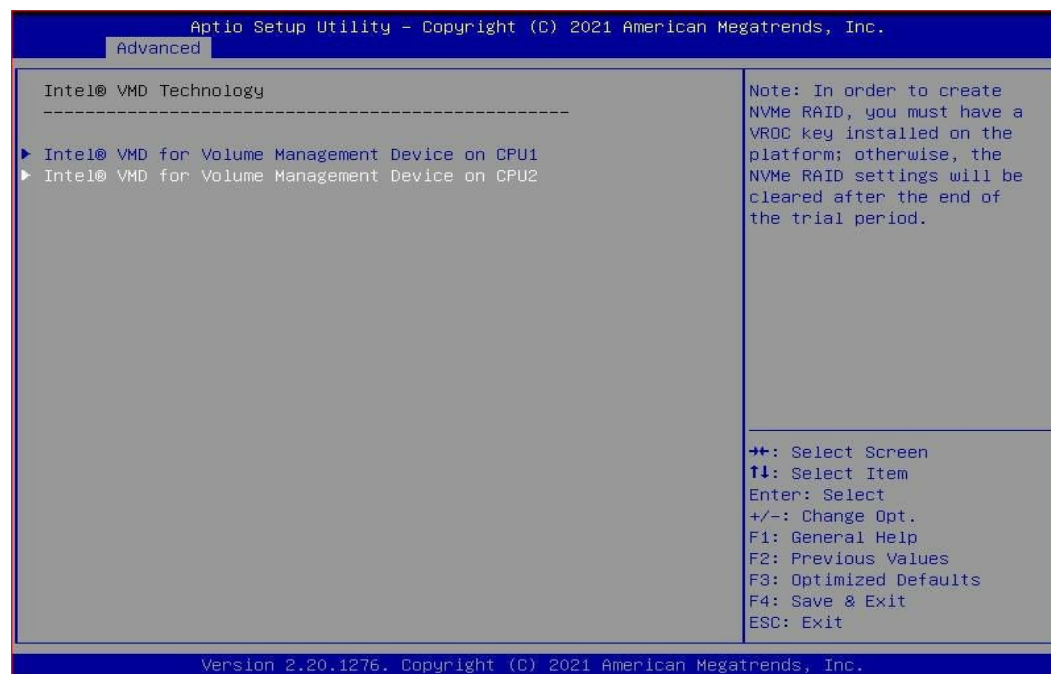**Table 1-2.** Processor Generation and Supported VMD Lanes

2. Example 1

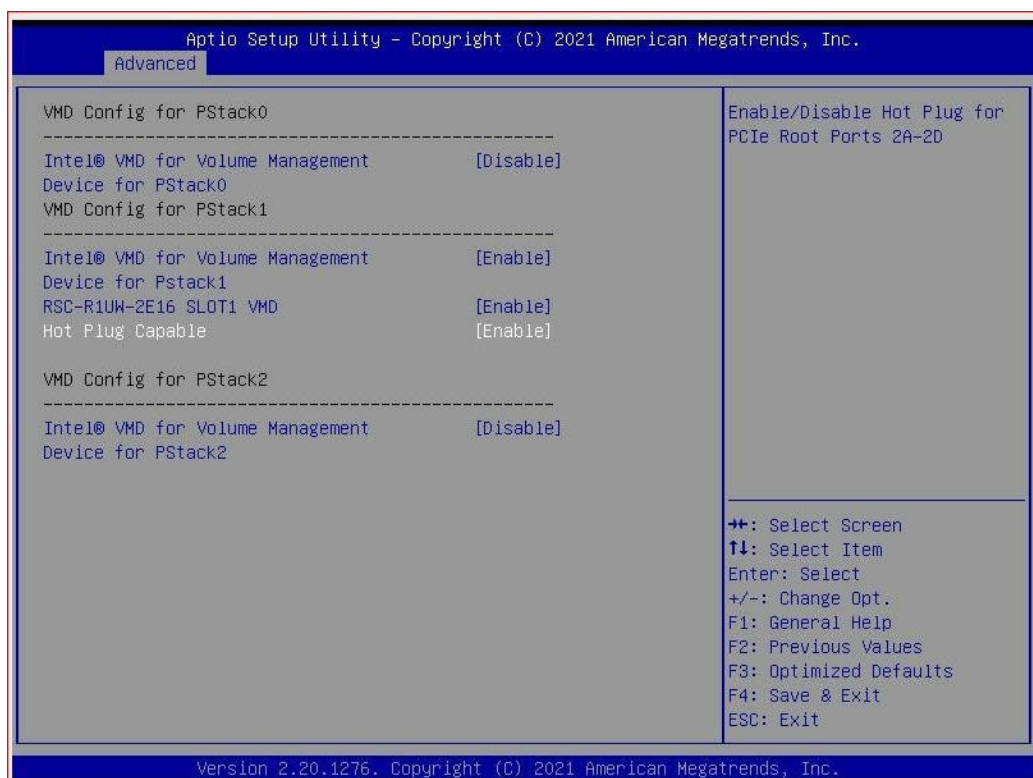This example Follow the system manual to install the M.2 AOC.

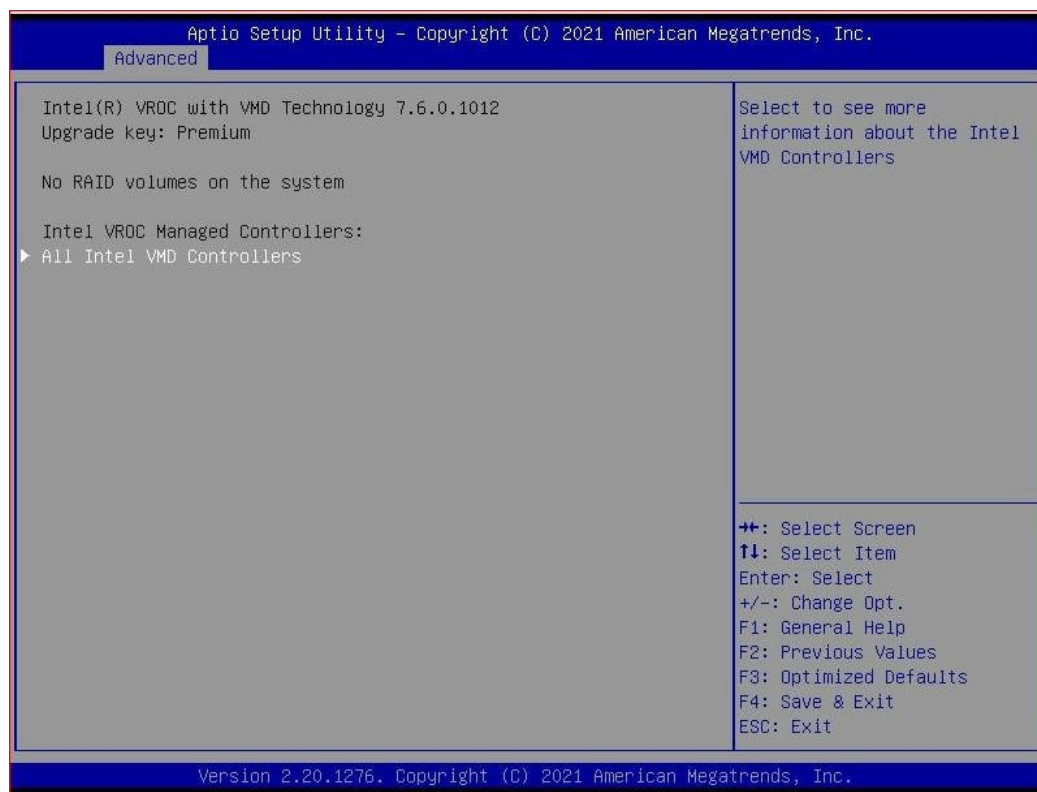Upgrade to the latest BIOS to enable VROC EFI 7.6 driver support.

```
                    Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
  Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

                                                                   Set the Date. Use Tab to
  System Date                        [Sat 08/21/2021]              switch between Date
  System Time                        [12:32:57]                    elements.
                                                                   Default Ranges:
  Supermicro X11DDW-N/L(F)                                         Year: 1998-9999
  BIOS Version                       T20210831103549               Months: 1-12
  Build Date                         08/31/2021                    Days: Dependent on month
  CPLD Version                       02.B4.08                      Range of Years may vary.

  Memory Information
  Total Memory                       131072 MB



                                                                   →←: Select Screen
                                                                   ↑↓: Select Item
                                                                   Enter: Select
                                                                   +/-: Change Opt.
                                                                   F1: General Help
                                                                   F2: Previous Values
                                                                   F3: Optimized Defaults
                                                                   F4: Save & Exit
                                                                   ESC: Exit

                    Version 2.20.1276. Copyright (C) 2021 American Megatrends, Inc.
```

Follow the system manual to find which CPU supports the M.2 AOC. In this example, the AOC is supported by CPU2.

```
                    Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
        Advanced

  Intel® VMD Technology                                            Note: In order to create
  ------------------------------------------------                 NVMe RAID, you must have a
                                                                   VROC key installed on the
  ▶ Intel® VMD for Volume Management Device on CPU1                platform; otherwise, the
  ▶ Intel® VMD for Volume Management Device on CPU2                NVMe RAID settings will be
                                                                   cleared after the end of
                                                                   the trial period.



                                                                   →←: Select Screen
                                                                   ↑↓: Select Item
                                                                   Enter: Select
                                                                   +/-: Change Opt.
                                                                   F1: General Help
                                                                   F2: Previous Values
                                                                   F3: Optimized Defaults
                                                                   F4: Save & Exit
                                                                   ESC: Exit

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```
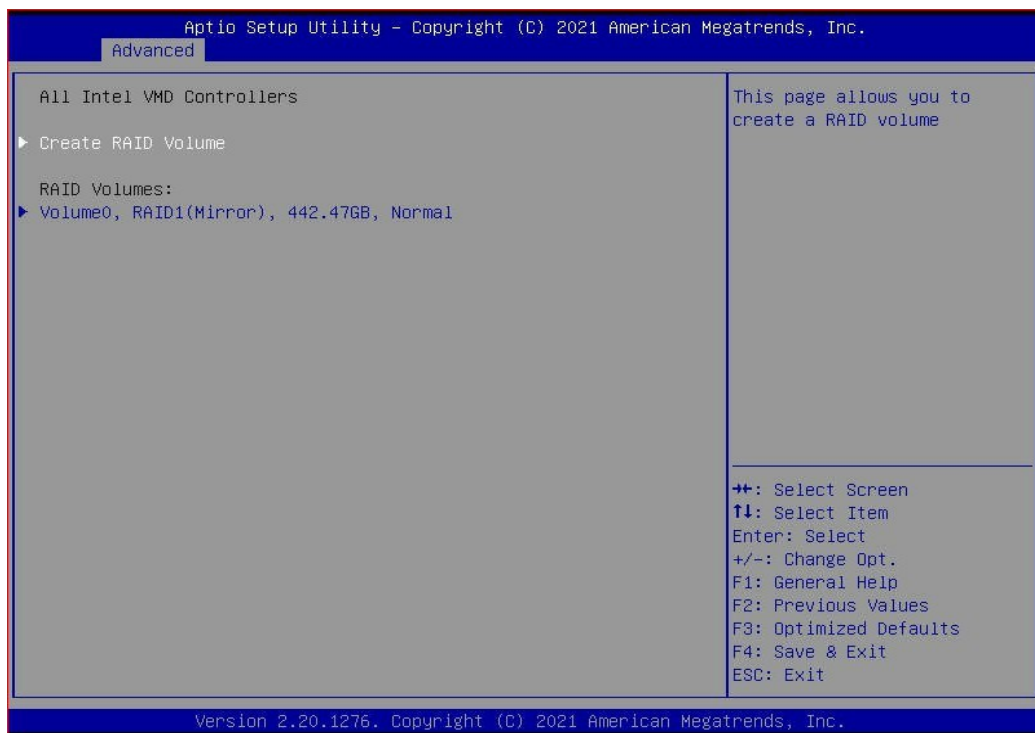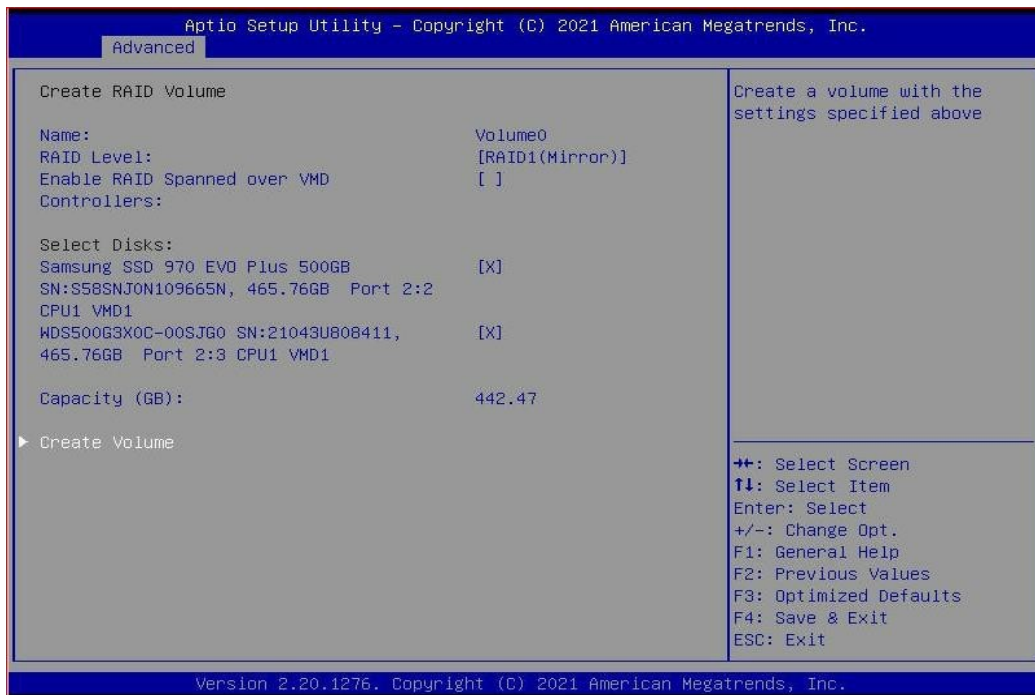
Enable the "VMD" for RSC-R1UW-2E16 that contains the M.2 NVMe devices. The other two VMDs will remain disabled.
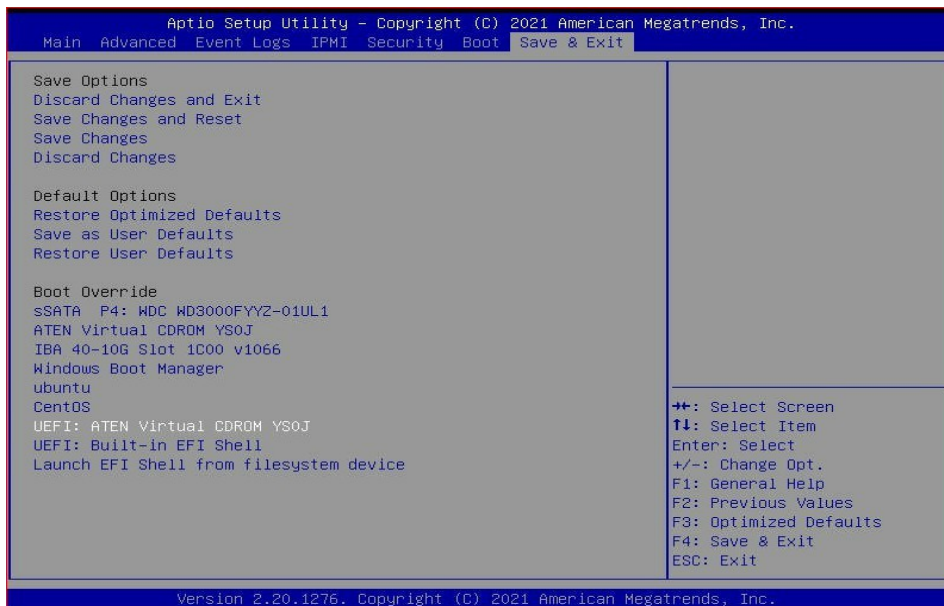

Configure the VMD VROC RAID.

Configure RAID1 for the M.2 NVMe devices.

```
          Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
              Advanced

   Create RAID Volume                                    Create a volume with the
                                                         settings specified above
   Name:                              Volume0
   RAID Level:                        [RAID1(Mirror)]
   Enable RAID Spanned over VMD       [ ]
   Controllers:

   Select Disks:
   Samsung SSD 970 EVO Plus 500GB     [X]
   SN:S58SNJ0N109665N, 465.76GB  Port 2:2
   CPU1 VMD1
   WDS500G3X0C-00SJG0 SN:21043U808411, [X]
   465.76GB  Port 2:3 CPU1 VMD1

   Capacity (GB):                     442.47

 ▶ Create Volume
                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

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```

```
          Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
              Advanced

   All Intel VMD Controllers                             This page allows you to
                                                         create a RAID volume
 ▶ Create RAID Volume

   RAID Volumes:
 ▶ Volume0, RAID1(Mirror), 442.47GB, Normal

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

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```

After finishing the VMD VROC configuration, you can use "Boot Override" to select the ISO boot.
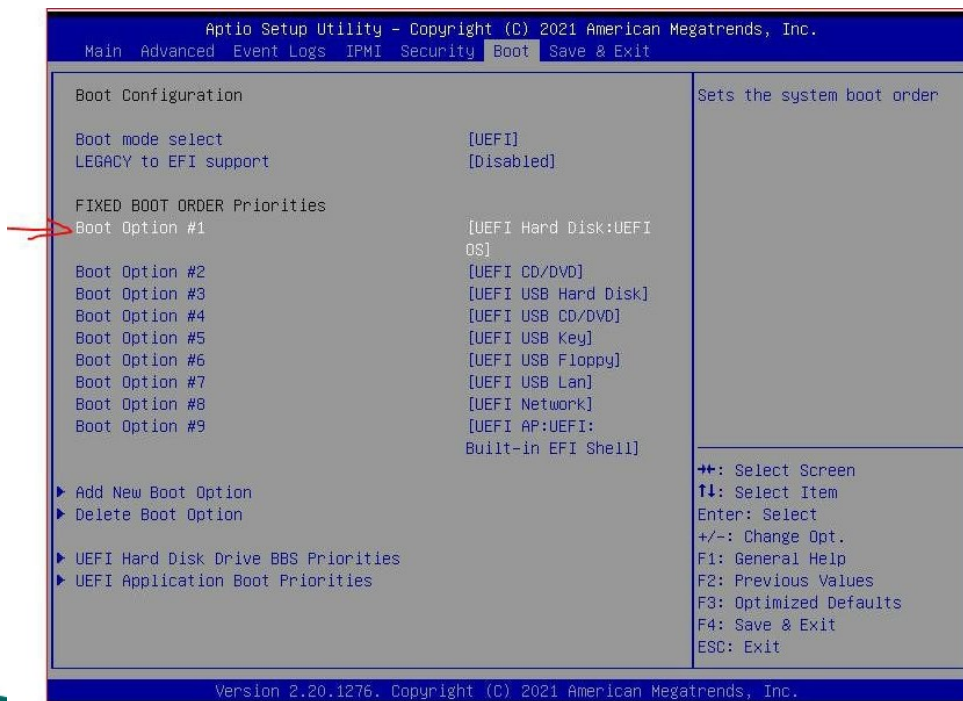
<mark>You must boot the ISO in EFI mode in order for VMware to load the VMD EFI and detect the VMRAID.</mark>
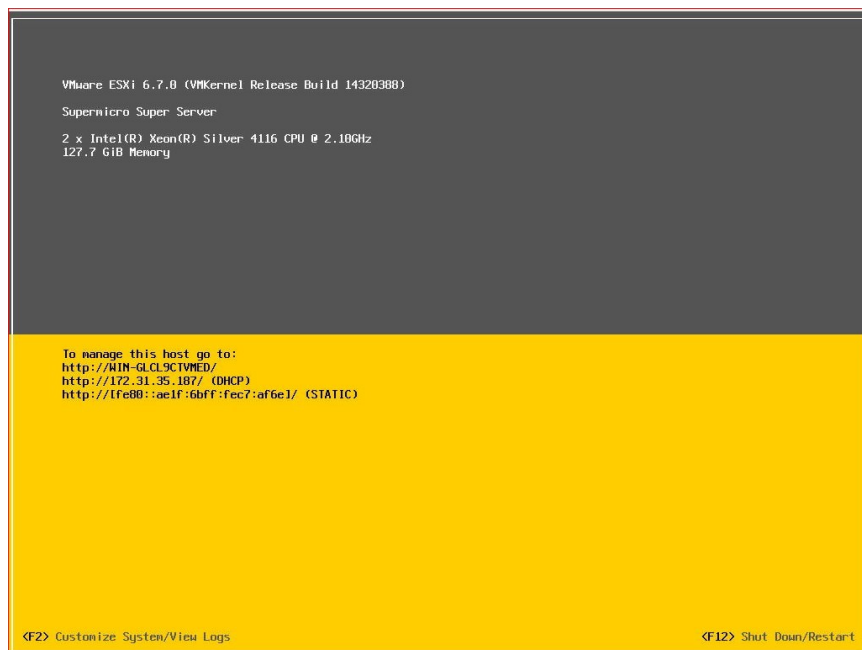

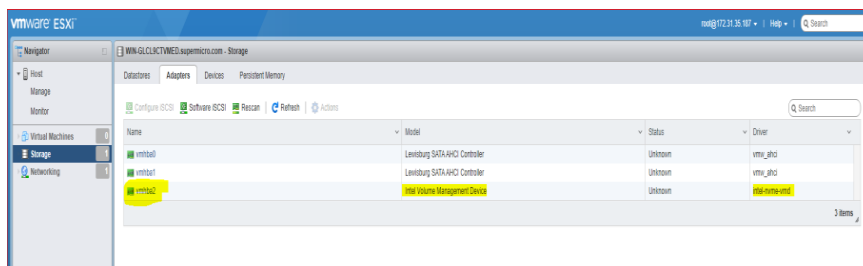Select the VMRAID as the target VD for VMWare ESXi installation.

Configure the first boot device as "UEFI Hard Disk: UEFI OS".
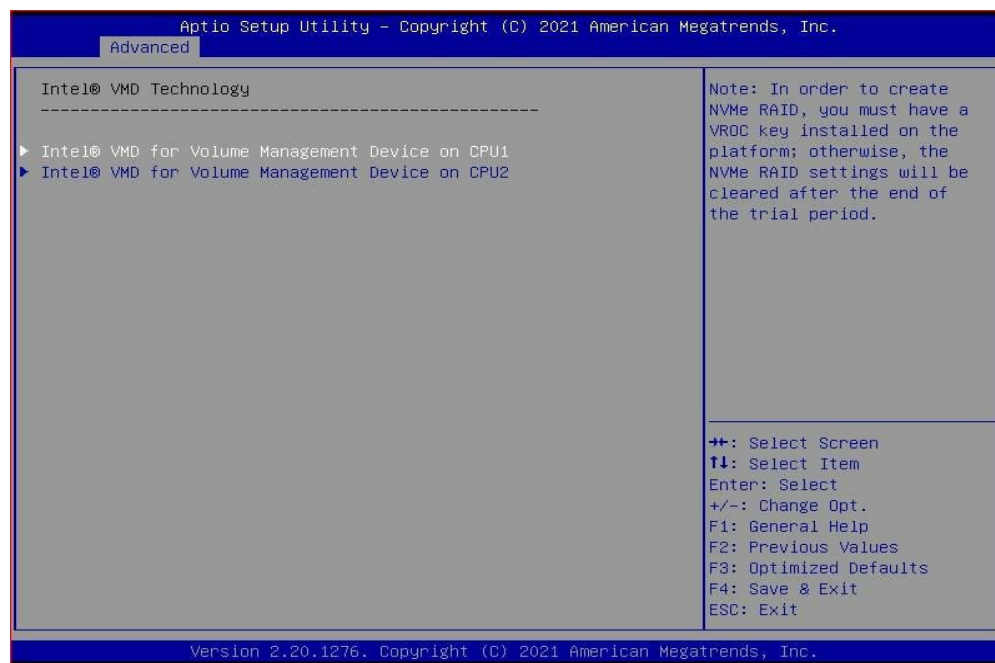
VMWare ESXi will run after OS installation.

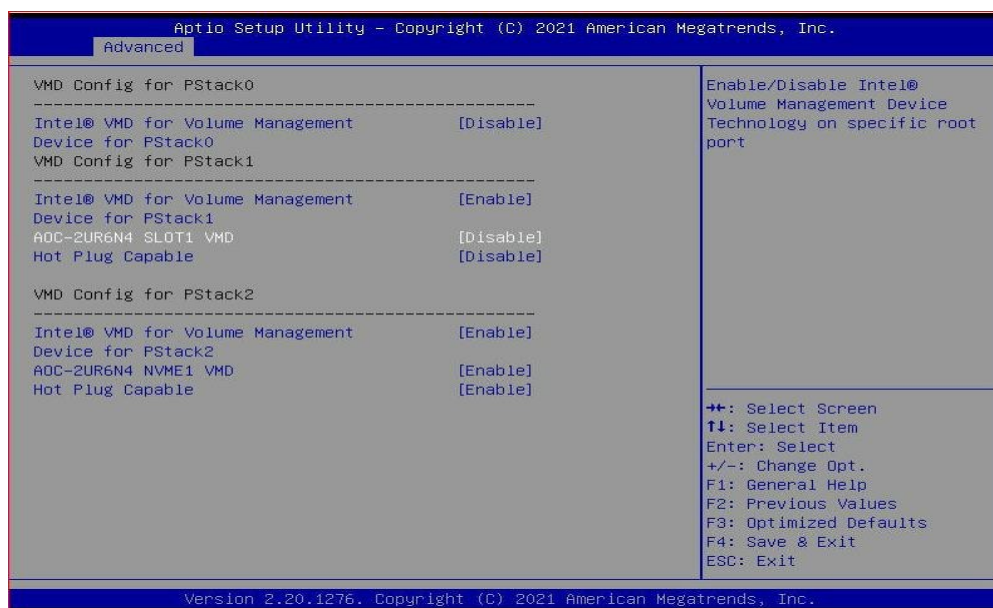Screenshot of the successfully launched ESXi VSphere GUI.

3. Example 2

Upgrade to the latest BIOS to enable VROC EFI 7.6 driver support. Disable the VMD lane connected to AOC-2UR6N4 slot 1.

Chipset Configuration > North Bridge > IIO Configuration > Intel VMD Technology > Intel VMD for Volume Management Device on CPU1.

```
          Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
    Advanced

 Intel® VMD Technology                                    Note: In order to create
 ------------------------------------------------         NVMe RAID, you must have a
                                                          VROC key installed on the
 ▶ Intel® VMD for Volume Management Device on CPU1        platform; otherwise, the
 ▶ Intel® VMD for Volume Management Device on CPU2        NVMe RAID settings will be
                                                          cleared after the end of
                                                          the trial period.




                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```
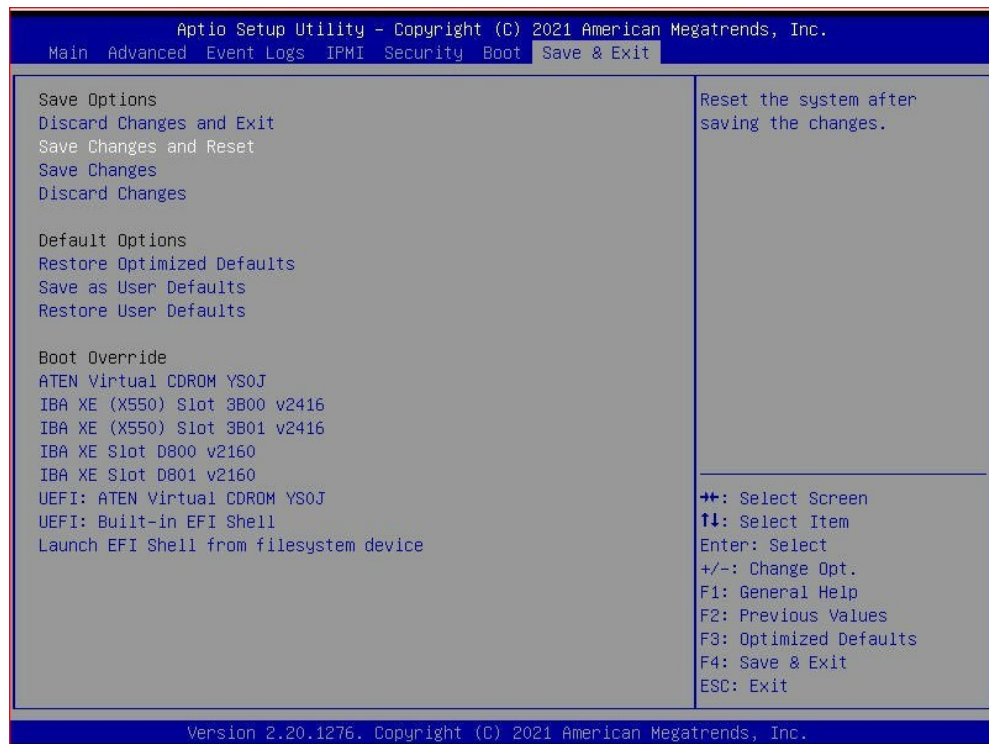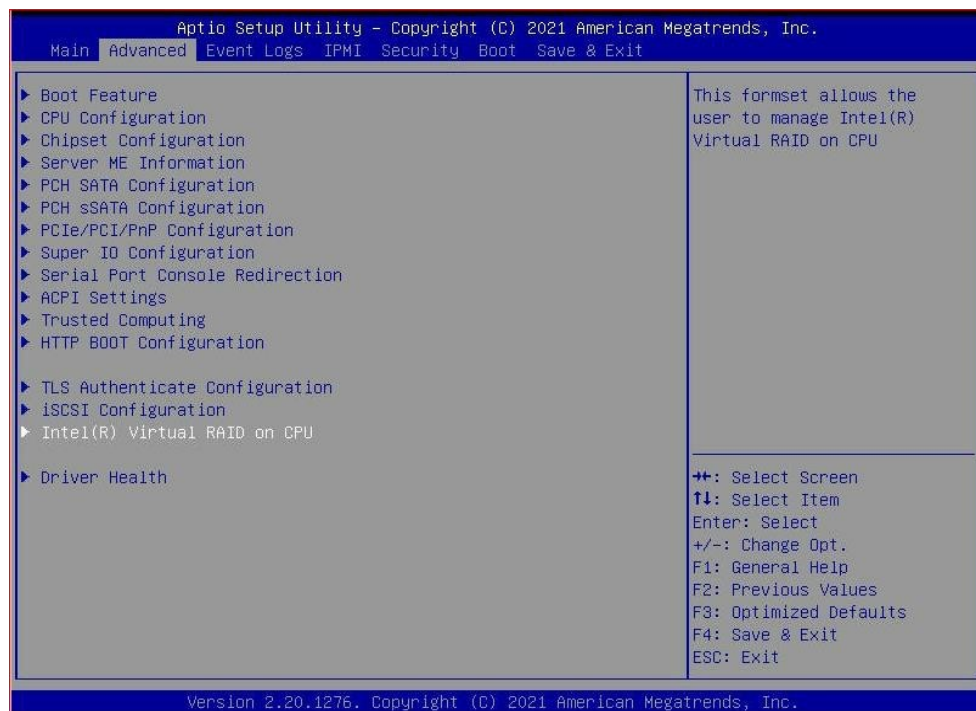
Enable hot-plug on CPU2.

Chipset Configuration > North Bridge > IIO Configuration > Intel VMD Technology > Intel VMD for Volume Management Device on CPU2.
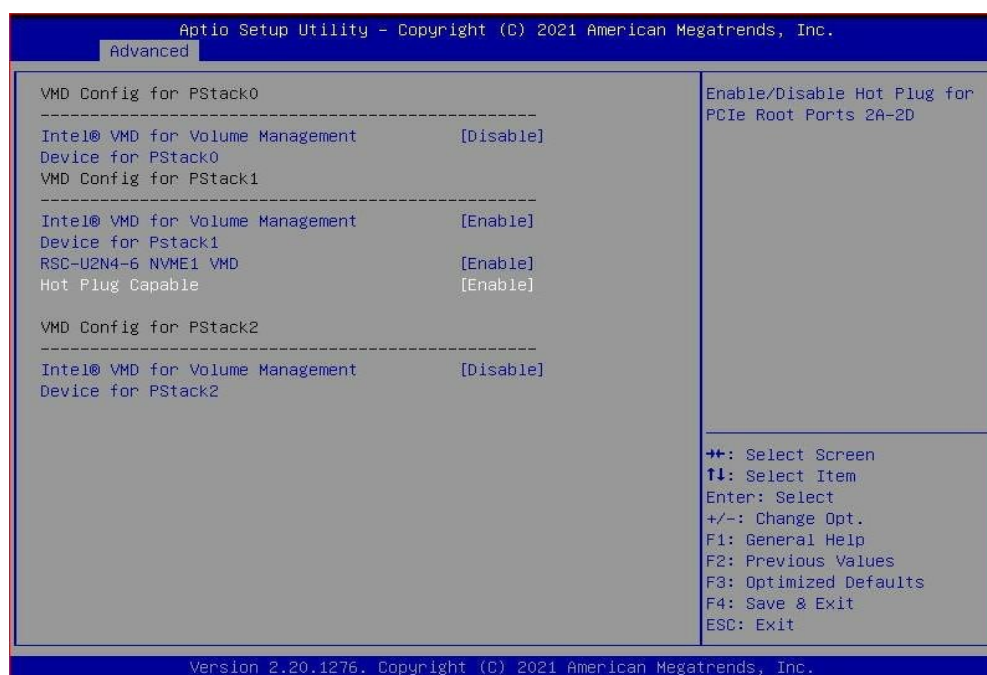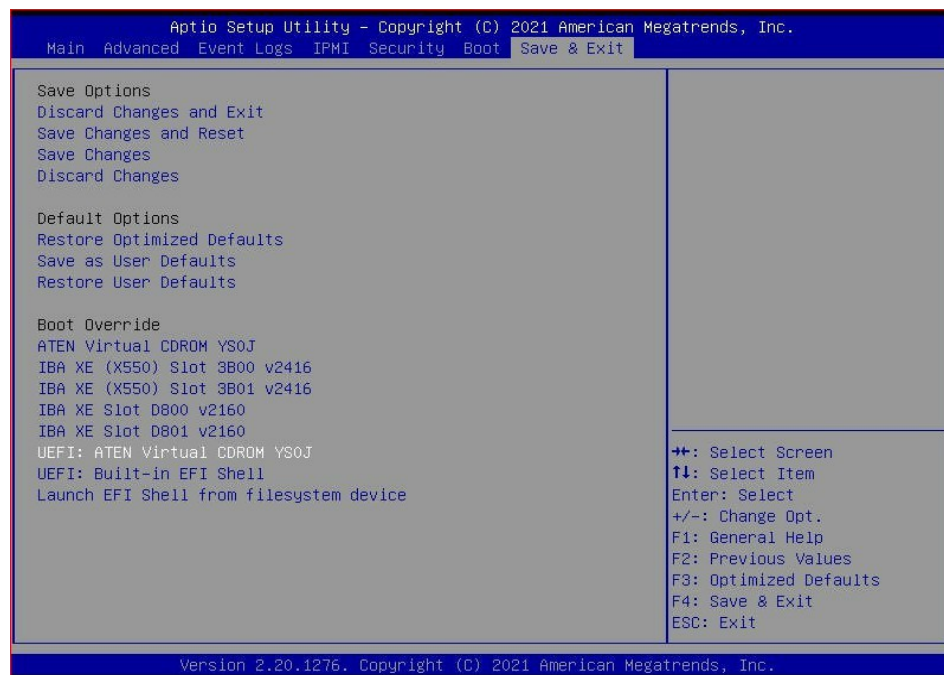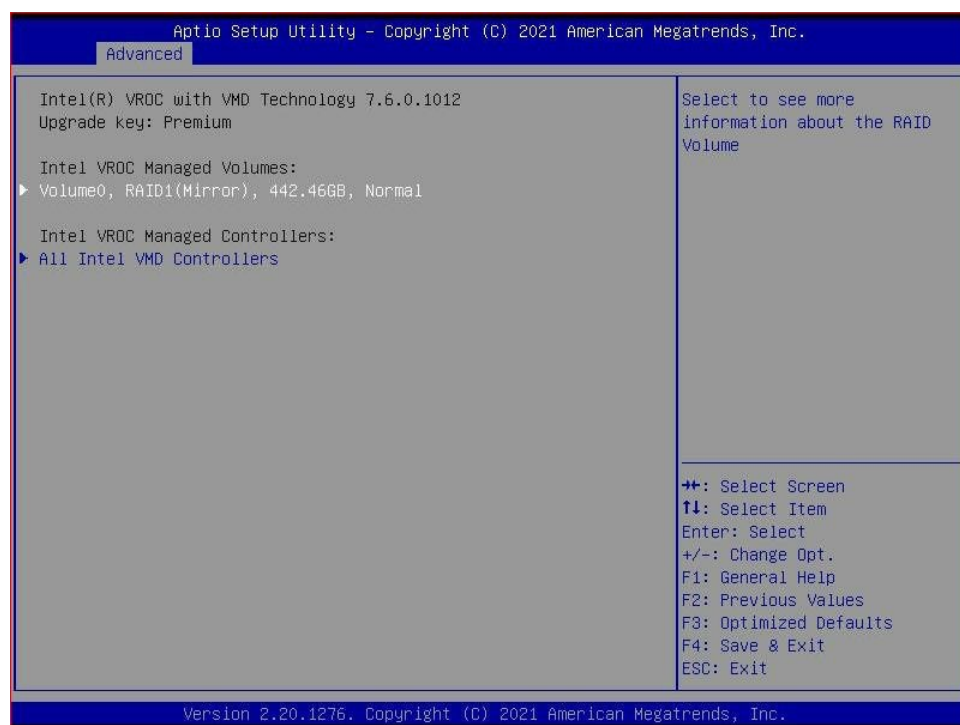
Save changes and reset.

Press the "DEL" key to re-enter the BIOS to configure VROC.

Go to the Save & Exit tab. Select to boot from the UEFI USB, CD, or PXE source that contains the VMware ESXi ISO.

Install the VMware ESXi on to VMRAID as shown in the following example:

```
                  Select a Disk to Install or Upgrade
          (any existing VMFS-3 will be automatically upgraded to VMFS-5)

* Contains a VMFS partition
# Claimed by VMware vSAN

Storage Device                                                    Capacity
--------------------------------------------------------------------------
Local:
    VMDRAID   MN (t10.VMDRAID_MNVolume000000001)                442.46 GiB
Remote:
    (none)




     (Esc) Cancel     (F1) Details     (F5) Refresh     (Enter) Continue
```