FAQ / Application Note

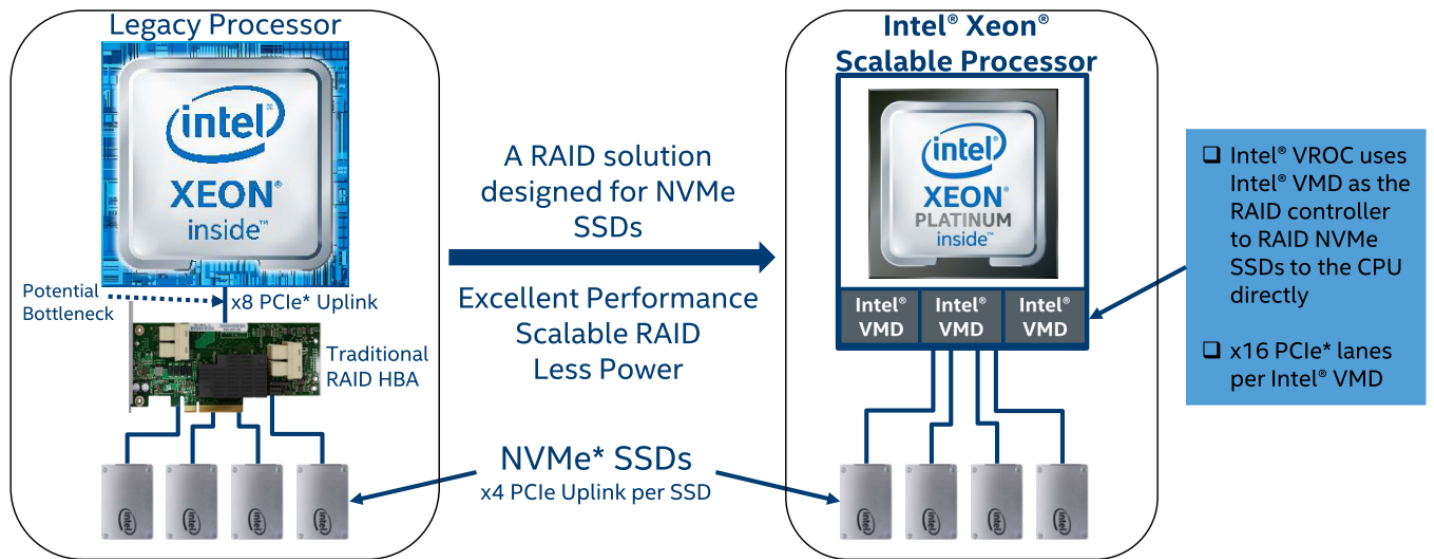| Subject : Intel Virtual RAID on CPU	
FAQ Document No: S23008	Date: 2023/07/27
Model Name: HPM-SRSUA	Rev. 1.0
Category: ☐General ☐H/W ■S/W ☐Others,	
Purpose: Intel VROC introduction, requirements and restrictions.	

1. Introduction

The Intel VROC family of products provide enterprise solutions for both NVMe SSD and SATA devices for enterprise servers and workstations. The product family includes the following three products:

Intel VROC interface Types:

1. Intel VROC NVMe RAID *
2. Intel VROC PCH SATA RAID
3. Intel VROC PCH NVMe RAID

HPM-SRSUA is equipped with 4th Gen Xeon SP processor and supports VMD HW Gen 3.0 and VROC 8.0.

Requirements and Restrictions

- Intel VROC is only available when the system is configured for UEFI boot mode.
- To enable Intel VMD VROC, a **hardware key** must be inserted on the motherboard, and the appropriate processor's Virtual Management Devices must be enabled in the BIOS setup.
- Supported SSDs and Operating Sytems
  To see the supported configurations: Intel® Virtual RAID on CPU (Intel® VROC) Supported Configurations Guide 8.0PV

Hardware Key

The key Intel VROC features are activated based on four different configurations that can be used. Standard and Premium Upgrade Keys enable the use of Intel VROC features on Intel and approved 3 rd party NVMe drives. Intel VROC Pass-thru is the default state, where no upgrade key has been plugged into the system, and can be upgraded based on the features desired. These features are also restricted to approved operating systems for proper operational functionality.

		Pass-thru SKU	Standard SKU	Premium SKU	Intel® SSD SKU
	MM#	**NA**	**951605**	**951606**	**956822**
NVMe* RAID	CPU attached NVMe	√	√	√	√
	3rd party SSD support	√	√	√	-
	Hot-Plug/ Surprise Removal	√	√	√	√
	LED management	√	√	√	√
	Web UI management	√	√	√	√
	Bootable RAID	-	√	√	√
	RAID 0/1/10	-	√	√	√
	RAID 5	-	-	√	√
	RAID Write Hole closed (BBU replacement)	-	NA	√	√
SATA RAID	Bootable RAID Volume	√	√	√	√
	RAID 0/1/5/10	√	√	√	√

VROC_HW_KEY

PIN 1

GND KEY1 GND KEY2

2. Enable VMD in BIOS:

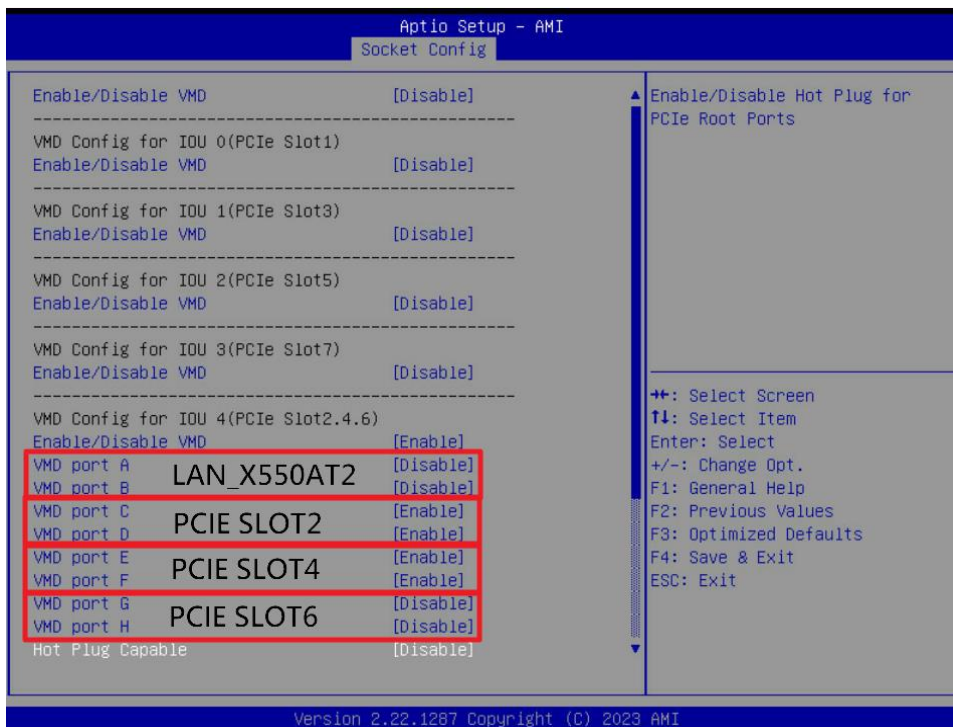2.1 Power on the system and press [DEL] to enter BIOS

2.2 Navigate to **Socket Config > IIO Configuration > Intel VMD technology >Intel VMD for Volume Management Device on Socket 0 >**

Select the VMD controller according to your SSD location, for example PCIe Slot2 and Slot4.
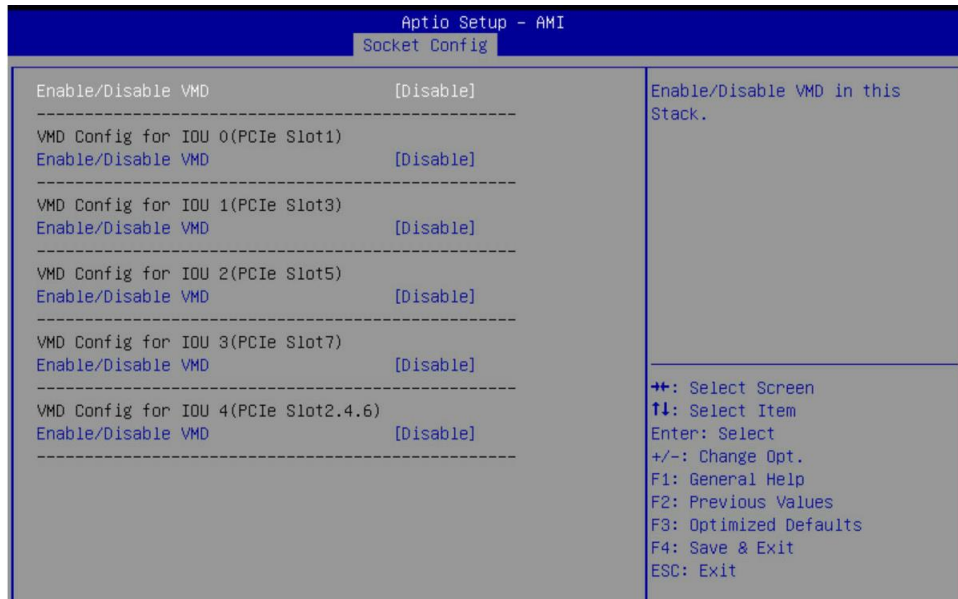
Enable VMD port C/D/E/F for PCIE slot2 and slot 4. Press [F4] to Save and Exit Setup.
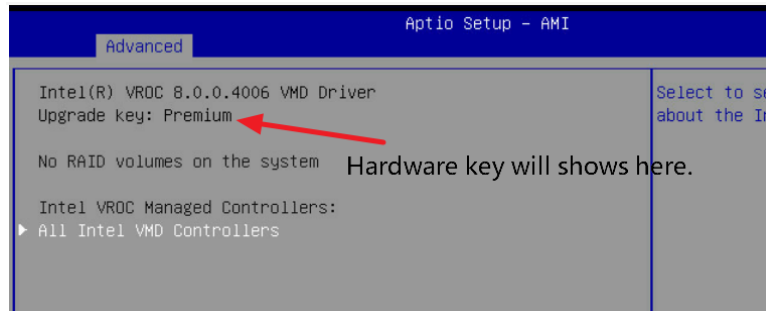
When VMD is enabled, PCIe can only be used as a VMD device.

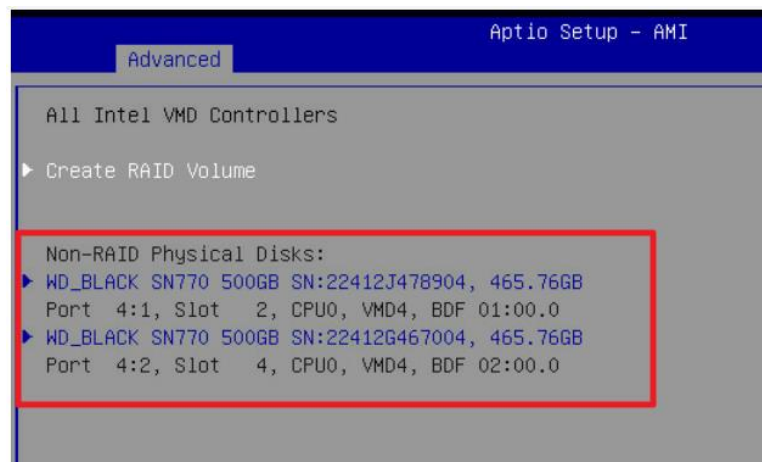**For example, if VMD port A/B is enabled, LAN X550AT will not have any functionality.**

3. Create NVMe RAID

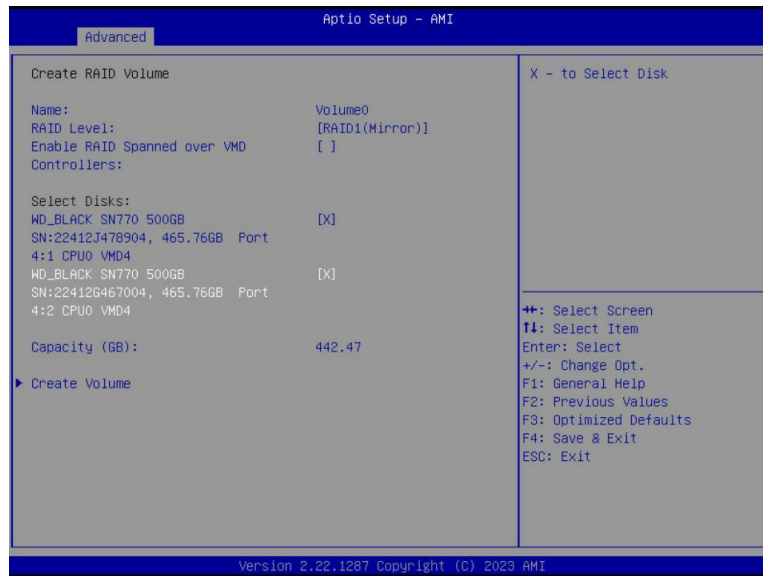   3.1   Power on the system and press [DEL] to enter BIOS

    3.2   Navigate to **Advanced > Intel(R) Virtual RAID on CPU >**

```
                                    Aptio Setup - AMI
 Advanced

 Intel(R) VROC 8.0.0.4006 VMD Driver              Select to see
 Upgrade key: Premium                             about the In

 No RAID volumes on the system      Hardware key will shows here.

 Intel VROC Managed Controllers:
▶ All Intel VMD Controllers
```

Enter "**All Intel VMD Controllers**" to check if all SSDs are recognized.

```
                                    Aptio Setup - AMI
    Advanced

 All Intel VMD Controllers

▶ Create RAID Volume


 Non-RAID Physical Disks:
▶ WD_BLACK SN770 500GB SN:22412J478904, 465.76GB
  Port  4:1, Slot   2, CPU0, VMD4, BDF 01:00.0
▶ WD_BLACK SN770 500GB SN:22412G467004, 465.76GB
  Port  4:2, Slot   4, CPU0, VMD4, BDF 02:00.0
```

    3.3   Enter **"Create RAID Volume"** to create RAID. For example, RAID 1.

```
                           Aptio Setup - AMI
  Advanced

  Create RAID Volume                                  X - to Select Disk

  Name:                          Volume0
  RAID Level:                    [RAID1(Mirror)]
  Enable RAID Spanned over VMD   [ ]
  Controllers:

  Select Disks:
  WD_BLACK SN770 500GB           [X]
  SN:22412J478904, 465.76GB  Port
  4:1 CPU0 VMD4
  WD_BLACK SN770 500GB           [X]
  SN:22412G467004, 465.76GB  Port
  4:2 CPU0 VMD4
                                                  →←: Select Screen
  Capacity (GB):                 442.47           ↑↓: Select Item
                                                  Enter: Select
▶ Create Volume                                   +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit


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```

3.4   Press [F4] to save and reboot.

4   Installing Windows on a NVME RAID Volume

With RAID boot volumes through Intel VROC available, additional drivers are required in order to properly install a Windows operating system. This is a brief guide to show you the slight difference in order to introduce the F6 Drivers appropriate to utilize your BIOS created RAID volume as a system disk.

4.1   Down load F6 Drivers from avalue web site.

HPM-SRSUA

Windows 10 64bit

No.	Release Date	Model	Description	Download
1	2023-03-08	HPM-SRSUA	Intel QTA2.0 driver Device:Other	
2	2023-03-08	HPM-SRSUA	ASPEED VGA Driver Device:Video	
3	2023-03-08	HPM-SRSUA	Intel LAN 27.6 Device:Gigabit_Ethernet	
4	2023-03-08	HPM-SRSUA	Realtek Audio control panel Device:Video	
5	2023-03-08	HPM-SRSUA	Realtek Audio driver Device:Video	
6	2023-03-08	HPM-SRSUA	Intel VROC RAID F6 DRIVER Device:Other	
7	2023-03-08	HPM-SRSUA	Intel VROC Driver Device:Other	
8	2023-03-08	HPM-SRSUA	Intel Chipset driver Device:Chipset	

4.2 Installation Destination Selection

Click **Load driver**.

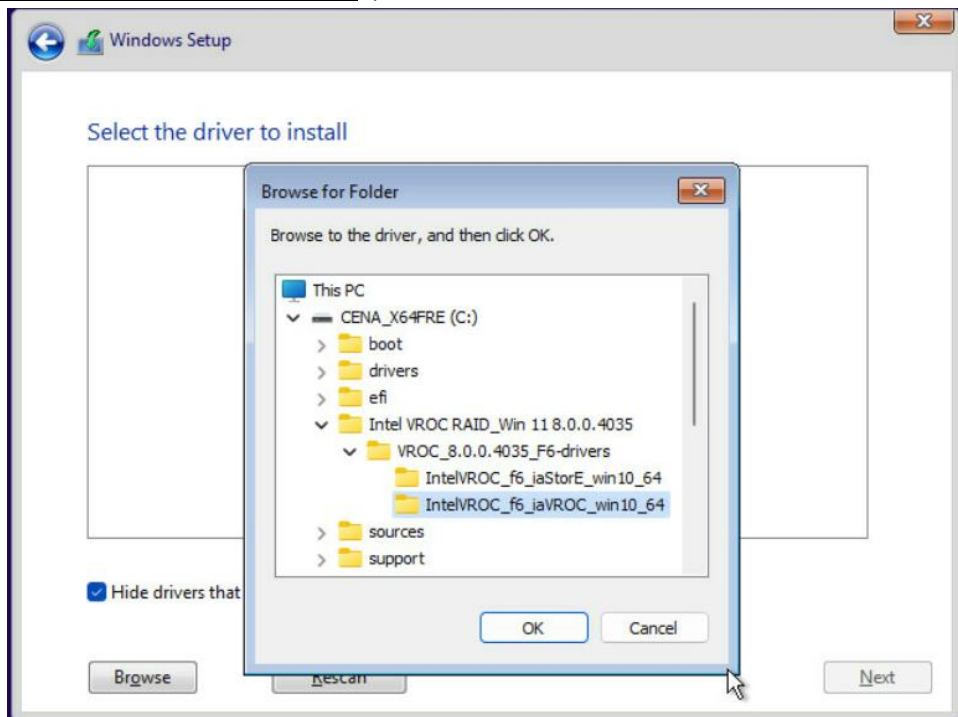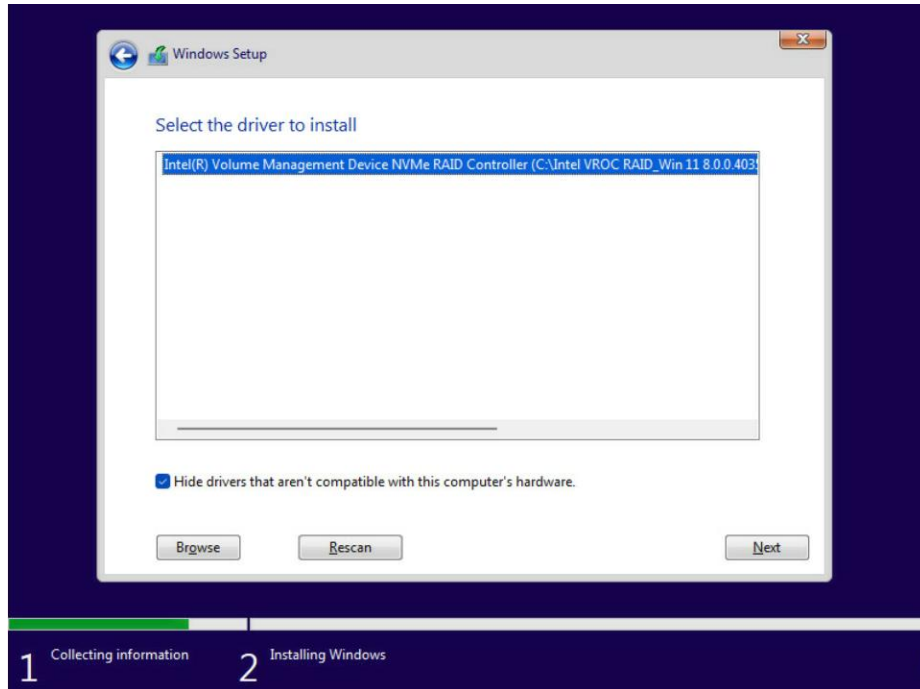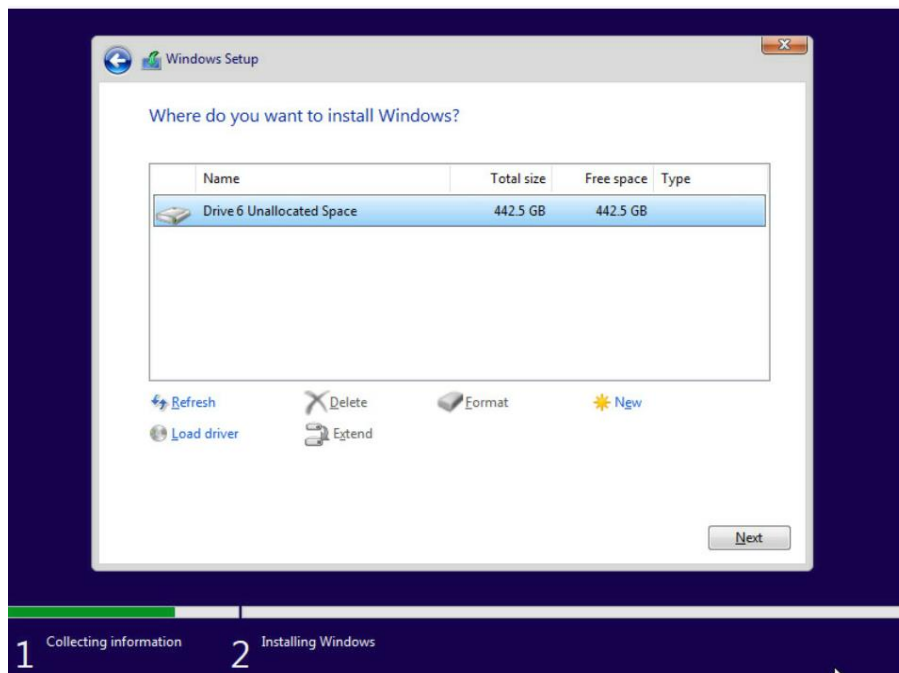Click **Browse**.

4.3 Navigate to where you have the correct F6 driver stored. <u>iaStorE drivers are for SATA and sSATA drives, iaVROC will be for NVMe drives</u> (when attached to the Intel VMD controller).

4.4 Highlight the selected driver and click OK to install. It require several minutes to complete installation of the selected driver.

4.5 The RAID Volume should now appear once the driver has installed. Select the volume and proceed with your operating system installation for Windows as normal. <u>If the drive does not immediately appear, use the Refresh tool to rescan the system for the RAID volume and proceed</u>.

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4.6 Select the desired volume and click Next to proceed with the installation of your Windows operating system.

5 Install Intel® VROC GUI

The Intel VROC GUI allows for fully integrated management of the disks installed on your Windows system. The VROC driver can be downloaded from avalue website.

Windows 10 64bit

No.	Release Date	Model	Description	Download
1	2023-03-08	HPM-SRSUA	Intel QTA2.0 driver Device:Other	📁
2	2023-03-08	HPM-SRSUA	ASPEED VGA Driver Device:Video	📁
3	2023-03-08	HPM-SRSUA	Intel LAN 27.6 Device:Gigabit_Ethernet	📁
4	2023-03-08	HPM-SRSUA	Realtek Audio control panel Device:Video	📁
5	2023-03-08	HPM-SRSUA	Realtek Audio driver Device:Video	📁
6	2023-03-08	HPM-SRSUA	Intel VROC RAID F6 DRIVER Device:Other	📁
7	2023-03-08	HPM-SRSUA	Intel VROC Driver Device:Other	📁
8	2023-03-08	HPM-SRSUA	Intel Chipset driver Device:Chipset	📁

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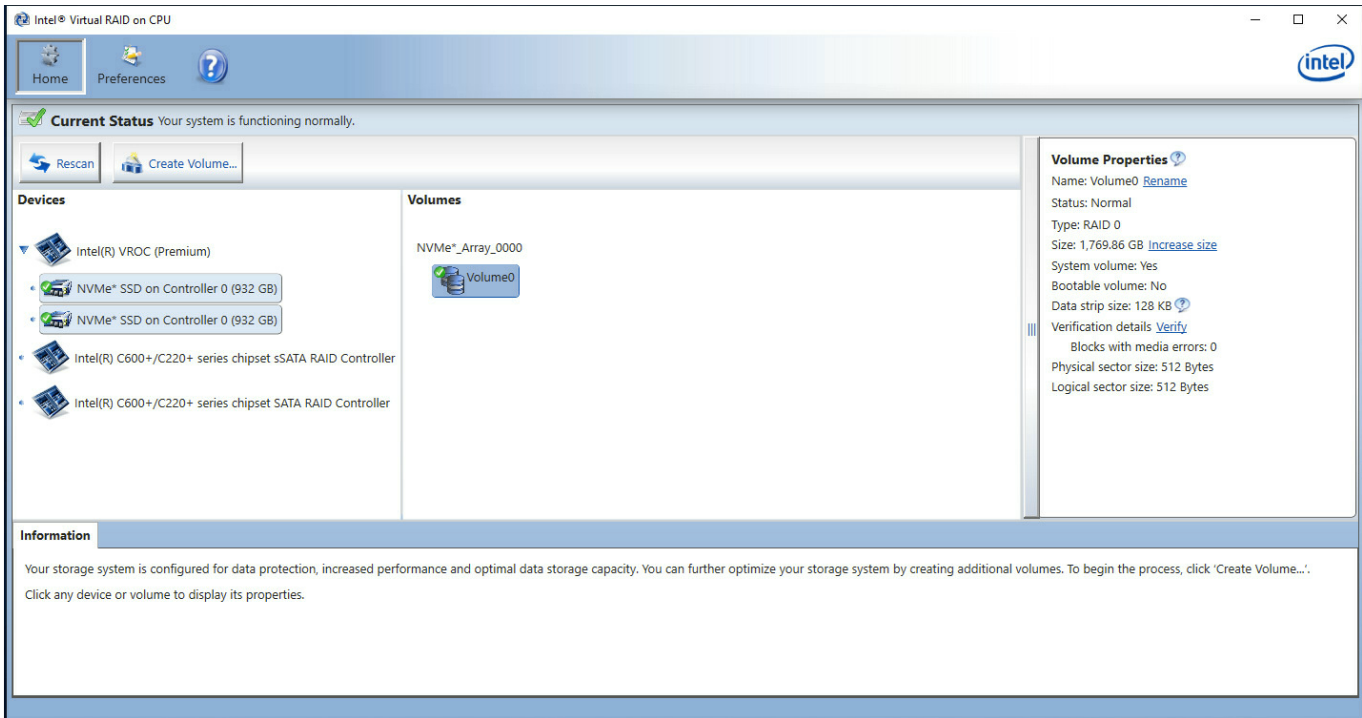| www.avalue.com.tw
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Note: The procedure to create a bootable RAID volume using the Intel VROC UEFI HII should only be used for a newly built system or for reinstallation of the operating system. It is advised to use the Intel VROC GUI within the Windows operating system for the creation of RAID volumes after the operating system is installed.

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