Configuring a RAID Set (W790 Series)

RAID Levels

	RAID 0	RAID 1	RAID 5	RAID 10
Minimum Number of Hard Drives	≥2	2	≥3	4
Array Capacity	Number of hard drives * Size of the smallest drive	Size of the smallest drive	(Number of hard drives -1) * Size of the smallest drive	(Number of hard drives/2) * Size of the smallest drive
Fault Tolerance	No	Yes	Yes	Yes

To create a RAID set, follow the steps below:

A. Install SATA hard drive(s) or SSDs in your computer.
B. Configure the system BIOS.
C. Create RAID configurations.
D. Install the RAID driver and operating system.

Before you begin, please prepare the following items:

- At least two SATA hard drives or SSDs (Note 1) (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). (Note 2)
- A Windows setup disc.
- An Internet connected computer.
- A USB thumb drive.

Preparing the Hard Drives and BIOS Settings

A. Installing hard drives

Install the hard drives/SSDs in the Intel® Chipset controlled connectors on the motherboard. Then connect the power connectors from your power supply to the hard drives.

(Note 1) An M.2 PCIe SSD cannot be used to set up a RAID set either with an M.2 SATA SSD or a SATA hard drive.
(Note 2) Refer to the "Internal Connectors" section of the user's manuals for the installation notices for the M.2 and SATA connectors.

B. Configuring the BIOS settings

Step:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). Go to **Platform Configuration\PCH-IO Configuration\SATA And RST Configuration**, make sure **SATA Controller(s)** is enabled. To create RAID, set **SATA Mode Selection** to **RAID** (Figure 1). Then save the settings and restart your computer.

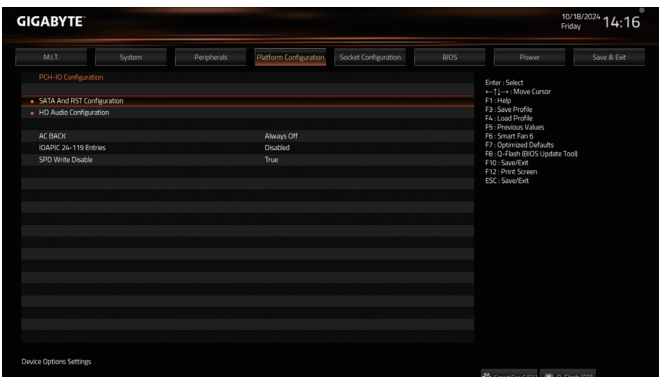


Figure 1

C. Configuring a RAID Array

Step 1:

After the system reboot, enter BIOS Setup again. Then enter the **Peripherals\Intel(R) VROC SATA Controller** sub-menu (Figure 2).

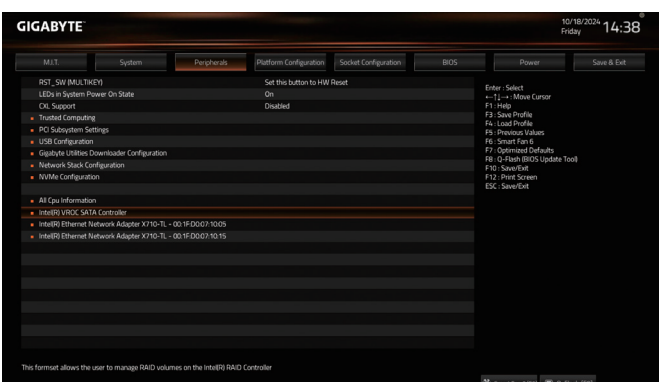


Figure 2

The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

Step 2:

On the **Intel(R) VROC SATA Controller** menu, press <Enter> on **Create RAID Volume** to enter the **Create RAID Volume** screen. Enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 3). RAID levels supported include RAID 0, RAID 1, RAID 10, and RAID 5 (the selections available depend on the number of the hard drives being installed). Next, use the down arrow key to move to **Select Disks**.

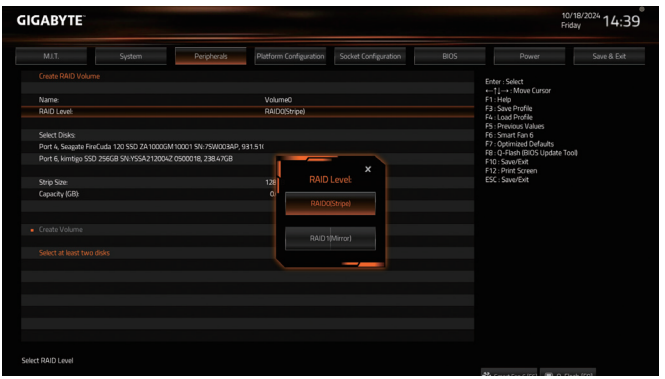


Figure 3

Step 3:

Under **Select Disks** item, select the hard drives to be included in the RAID array. Press the <Space> key on the hard drives to be selected (selected hard drives are marked with "X"). Then set the stripe block size (Figure 4). The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, set the volume capacity.

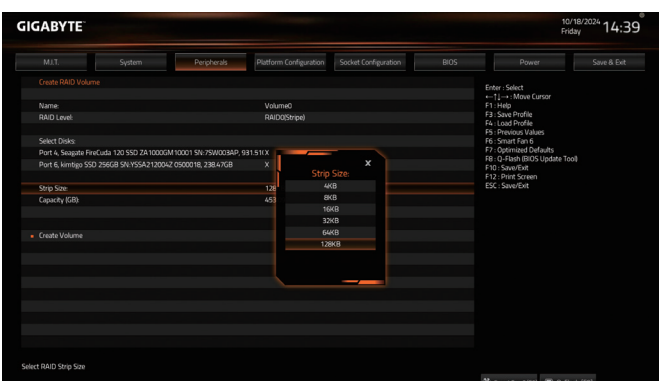


Figure 4

Step 4:
After setting the capacity, move to **Create Volume** and press <Enter> to enter the **Create Volume** screen. Press <Enter> on **Yes**. (Figure 5)

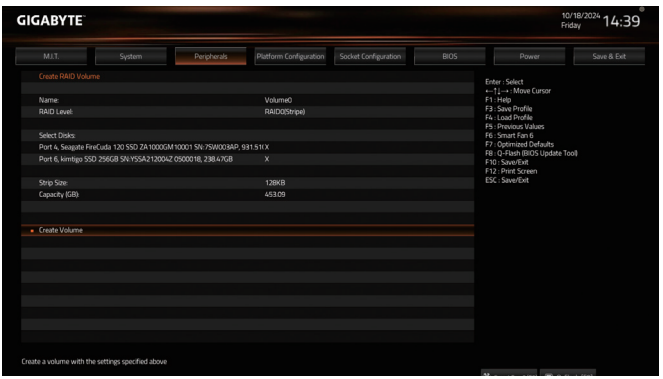


Figure 5

After completing, you'll be brought back to the **Intel(R) VROC SATA Controller** screen. Under **RAID Volumes** you can see the new RAID volume. To see more detailed information, press <Enter> on the volume to check for information on RAID level, stripe block size, array name, and array capacity, etc. (Figure 6)

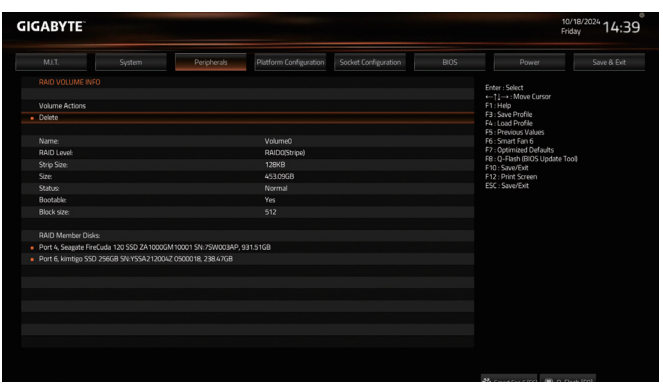


Figure 6

Delete RAID Volume

To delete a RAID array, press <Enter> on the volume to be deleted on the **Intel(R) VROC SATA Controller** screen. After entering the **RAID VOLUME INFO** screen, press <Enter> on **Delete** to enter the **Delete** screen. Press <Enter> on **Yes** (Figure 7).

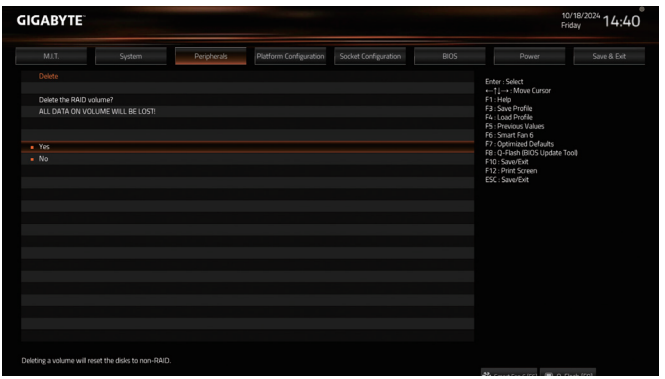


Figure 7

Configuring Intel® Virtual RAID on CPU (Intel® VROC)

System Requirements

1. An Intel® VROC Upgrade Key (purchased separately)
2. At least two Intel® NVMe SSDs (to ensure optimal performance, it is recommended that you use SSDs with identical model and capacity).

Intel® VROC Upgrade Key	Supported RAID Levels
No Key Installed	RAID 0
Standard Key	RAID 0, 1, 10
Premium Key	RAID 0, 1, 5, 10

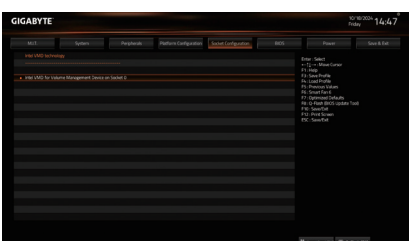
Installation Guidelines

A: Hardware Installation

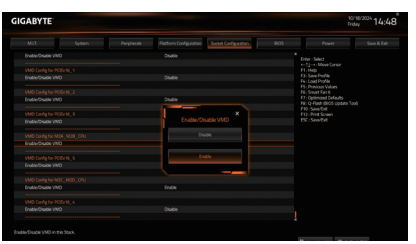
Plug the Intel® VROC Upgrade Key into the VROC header on the motherboard and install the Intel® NVMe SSDs in the PCIe slot(s) or the M.2 connector(s) controlled by the CPU.

To install the operating system onto the RAID array, make sure the Intel® NVMe SSDs are installed in the PCIe slots managed by the same VMD controller.

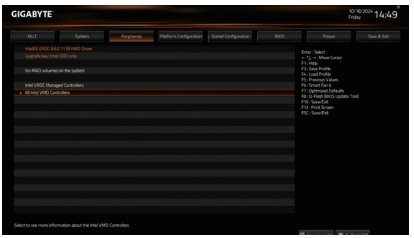
B: Creating a RAID Array



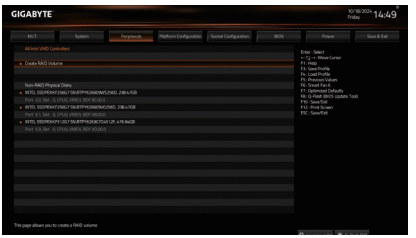
Step 1:
After the system reboots, enter BIOS Setup again. Then enter the **Socket Configuration\ IIO Configuration\Intel VMD technology** sub-menu. Press <Enter> on **Intel VMD for Volume Management Device on Socket 0**.



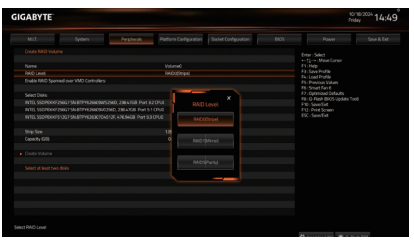
Step 2:
Depending on the connector you're using, set **Enable/ Disbale VMD** to **Enabled**. Save the changes and exit BIOS Setup.



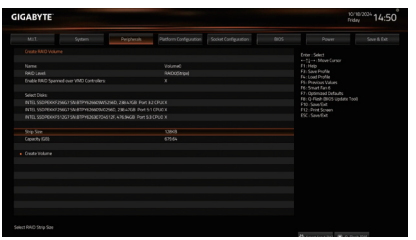
Step 3:
After the system reboots, enter BIOS Setup again. Then enter the **Peripherals\IO Ports\Intel(R) Virtual RAID on CPU** sub-menu. Press <Enter> on **All Intel VMD Controllers**.



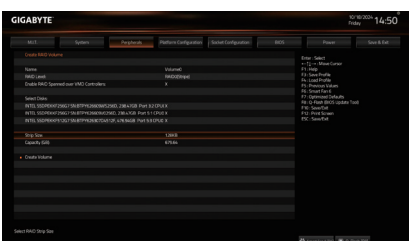
Step 4:
Press <Enter> on **Create RAID Volume** to enter the **Create RAID Volume** screen.



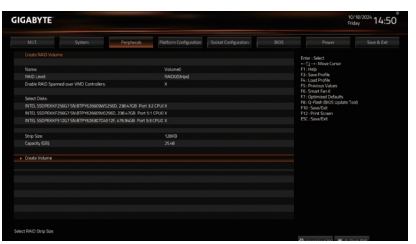
Step 5:
Enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a **RAID level**. (The selections available depend on the number of the hard drives and type of the Intel® VROC Upgrade Key being installed)



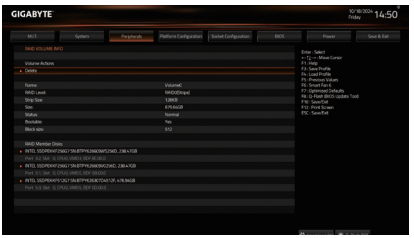
Step 6:
If the SSDs are installed to different VMDs, be sure to press the <Space> key on the **Enable RAID spanned over VMD Controllers** item to enable this function first. X means SSDs managed by different VMDs can be included in a RAID array but the RAID array can be used as a data drive only.



Step 7:
Under the **Select Disks** item, select the hard drives to be included in the RAID array. Press the <Space> key on the hard drives to be selected (selected hard drives are marked with "X").

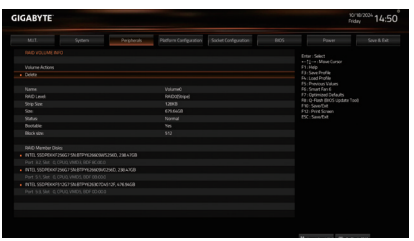


Step 8:
Then set the stripe block size. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, set the volume capacity. After setting the capacity, move to **Create Volume** and press <Enter> to enter the **Create Volume** screen. Press <Enter> on **Yes**.



Step 9:
After completing, you'll be brought back to the **Intel(R) Virtual RAID on CPU** screen. Under **Intel VROC Managed Volumes** you can see the new RAID volume.

C: Delete RAID Volume



To delete a RAID array, press <Enter> on the volume to be deleted on the **Intel(R) Virtual RAID on CPU\Intel VROC Managed Volumes** screen. After entering the **RAID VOLUME INFO** screen, press <Enter> on **Delete** to enter the **Delete** screen. Press <Enter> on **Yes**.

Installing the RAID Driver and Operating System

With the correct BIOS settings, you are ready to install the operating system.

To install an operating system on a RAID volume, you need to install the driver frst during the OS installation process. Refer to the steps below:

Step 1:
Go to GIGABYTE's website, browse to the motherboard model's web page, download the **Intel SATA Preinstall driver** file on the **Support\Download\SATA RAID/AHCI** page, unzip the file and copy the files to your USB thumb drive.

Step 2:
Boot from the Windows setup disc and perform standard OS installation steps. When the screen requesting you to load the driver appears, select **Browse**.

Step 3:
Insert the USB thumb drive and then browse to the location of the drivers. Choose the driver based on the storage devices you are using:

① For NVMe SSD RAID drives, select "Intel(R) Volume Management Device NVMe RAID Controller."
② For SATA RAID drives, select "Intel(R) VROC SATA Controller."

Finally, continue the OS installation.

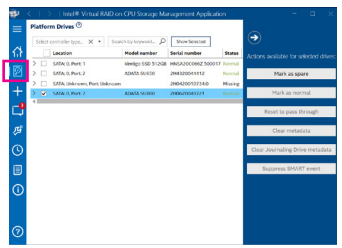
* If the RAID volume does not immediately appear, click **Refresh** to rescan the system for the RAID volume and proceed.

Rebuilding an Array

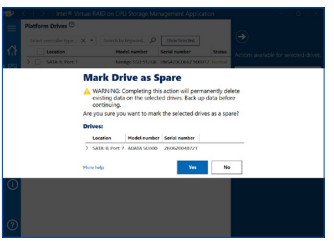
Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 5 or RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new drive must have equal or greater capacity than the old one.)

Turn off your computer and replace the failed hard drive with a new one. Restart your computer.

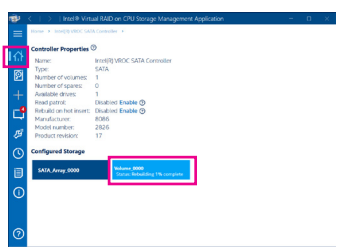
While in the operating system, make sure the chipset driver has been installed from the motherboard driver. Then launch the **Intel® Virtual RAID on CPU Storage Management Application** utility from the Start menu.



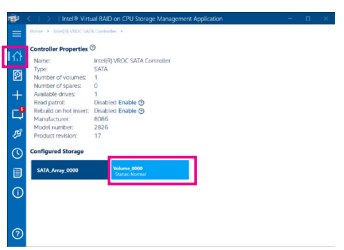
Step 1:
Go to the **Platform Drives** section on the main screen. Select a new drive to rebuild the RAID and click **Mark as spare**.



Step 2:
When the confirmation dialog box appears, click **Yes** to begin the rebuild process.



Click on **Home\Intel(R) VROC SATA Controller** on the main screen to display the rebuild progress.



After the rebuild is complete, the **status** will display **Normal**.