intel Z790 RAID Set Motherboard User Guide

Contents

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Product Information

The product is a RAID system that allows users to configure various RAID levels for data storage. The supported RAID levels include RAID 0, RAID 1, RAID 5, and RAID 10. Each RAID level offers different features and fault tolerance capabilities.

To create a RAID set, the user needs to follow the steps outlined in the user manual. The process involves installing hard drives or SSDs, configuring the system BIOS, creating RAID configurations, and installing the RAID driver and operating system.

RAID Levels

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

Product Usage Instructions

Preparing the Hard Drives and BIOS Settings

1. **Installing hard drives:** If you want to create a RAID array on the SATA controller, install SATA hard drives or SSDs in your computer. Skip this step if you do not want to create

a RAID array.

2. **Configuring the BIOS settings:**
    - Turn on your computer and press <KEY> to enter BIOS Setup during the POST.
    - Go to Settings → IO Ports → SATA Configuration and make sure SATA Controller(s) is enabled.
    - To create RAID configurations, go to Settings → IO Ports → VMD setup menu. Set Enable VMD controller to Enabled and set Enable VMD Global Mapping to Disabled.
    - Depending on the SATA/M.2 connector used, set the corresponding Map this Root Port under the VMD item to Enabled.

INSTRUCTION

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. (Note 1)
- **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 2) (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). (Note 3)
- 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.

The Intel® B760 Chipset doesn't include RAID 0, RAID 1, RAID 5, and RAID 10 support for NVMe SSD storage

devices.

- **(Note 1)** Skip this step if you do not want to create RAID array on the SATA controller.
- **(Note 2)** 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 3)** Refer to the “Internal Connectors” section of the user’s manuals for the installation notices for the M.2

B. Configuring the BIOS settings

Step 1:
Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). Go to Settings\IO Ports\SATA Configuration, and make sure SATA Controller(s) is enabled. To create RAID configurations, go to Settings\IO Ports\VMD setup menu, set Enable VMD controller to Enabled, and set Enable VMD Global Mapping to Disabled. Then depending on the SATA/M.2 connector you use, set the corresponding Map this Root Port under the VMD item to Enabled.

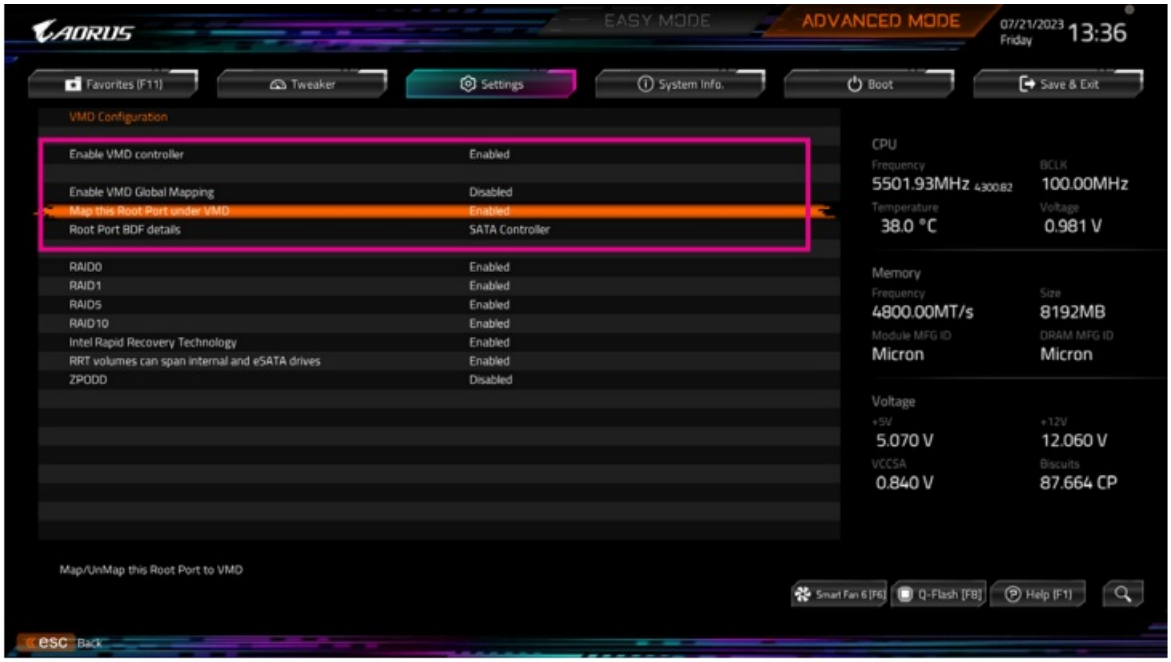


Figure 1

C. Configuring a RAID Array

Step 1:
After the system reboots, enter BIOS Setup again. Then enter the Settings\IO Ports\Intel(R) Rapid Storage Technology sub-menu (Figure 2).

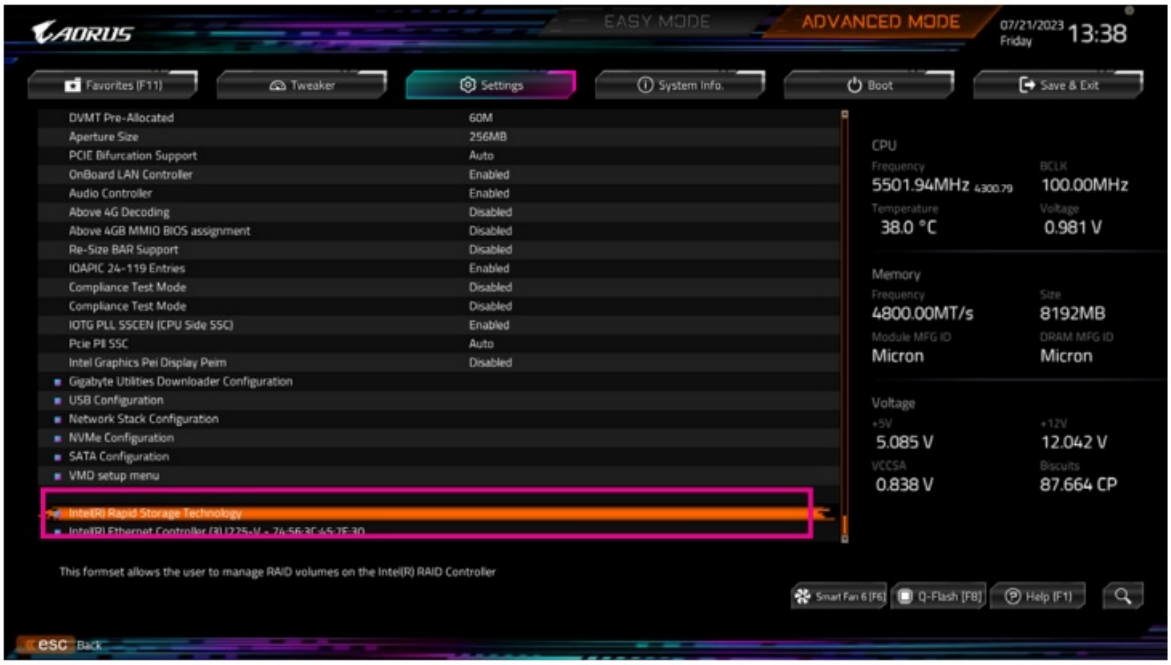


Figure 2

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) Rapid Storage Technology 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.

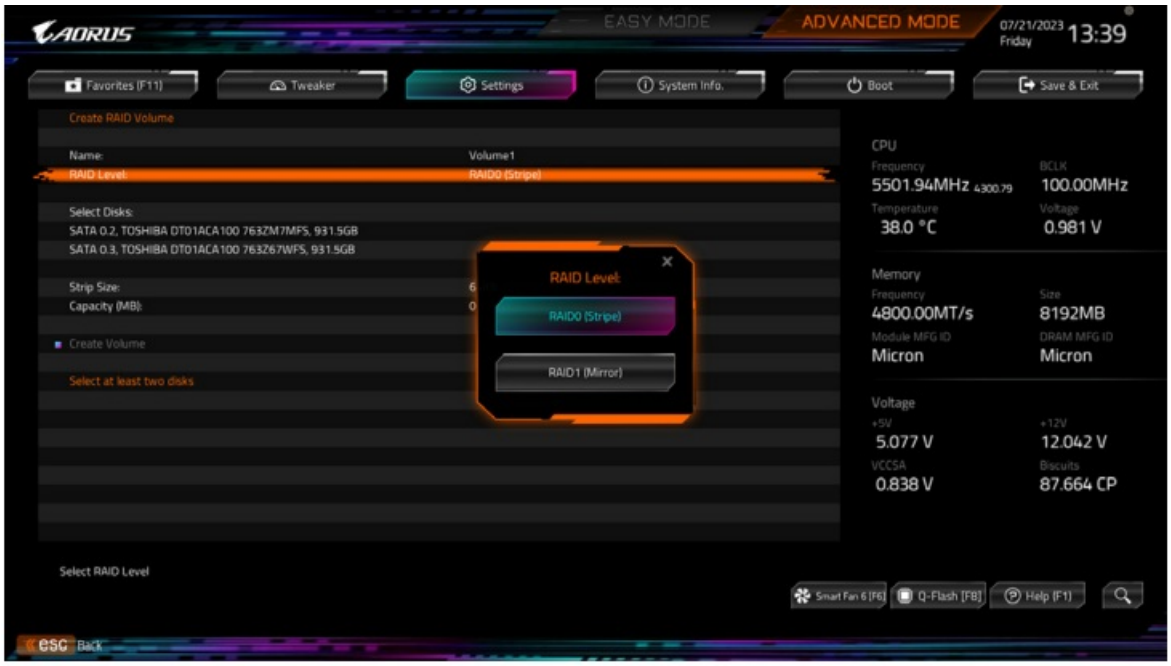


Figure 3

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 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.

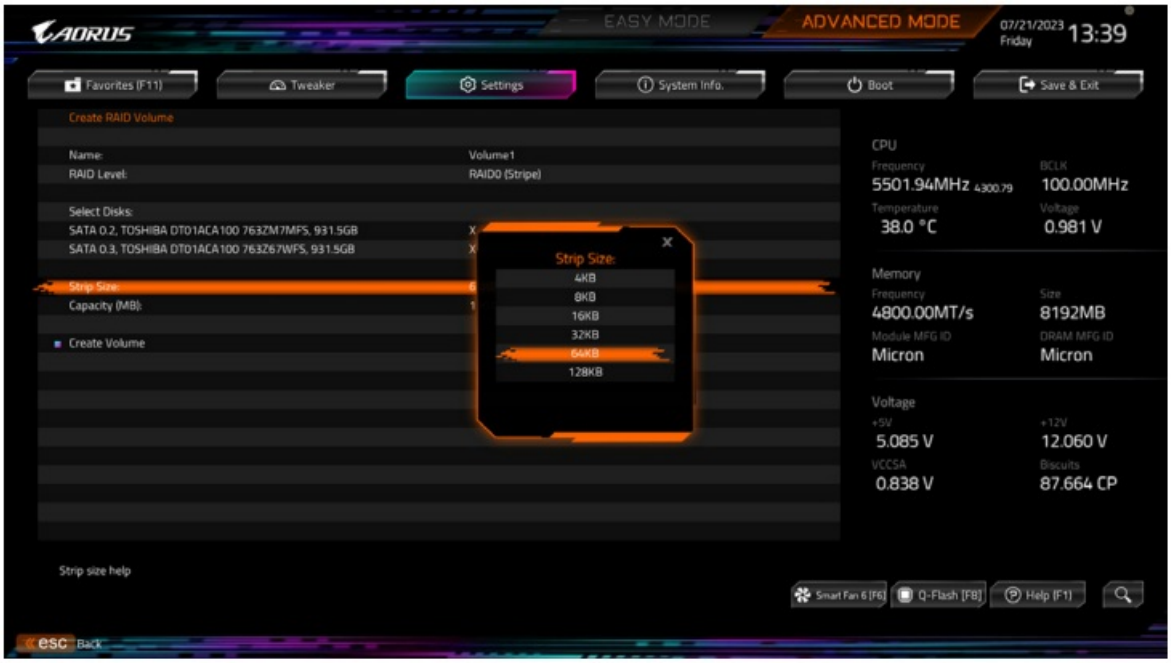


Figure 4

Step 4: After setting the capacity, move to Create Volume and press <Enter> to begin. (Figure 5)

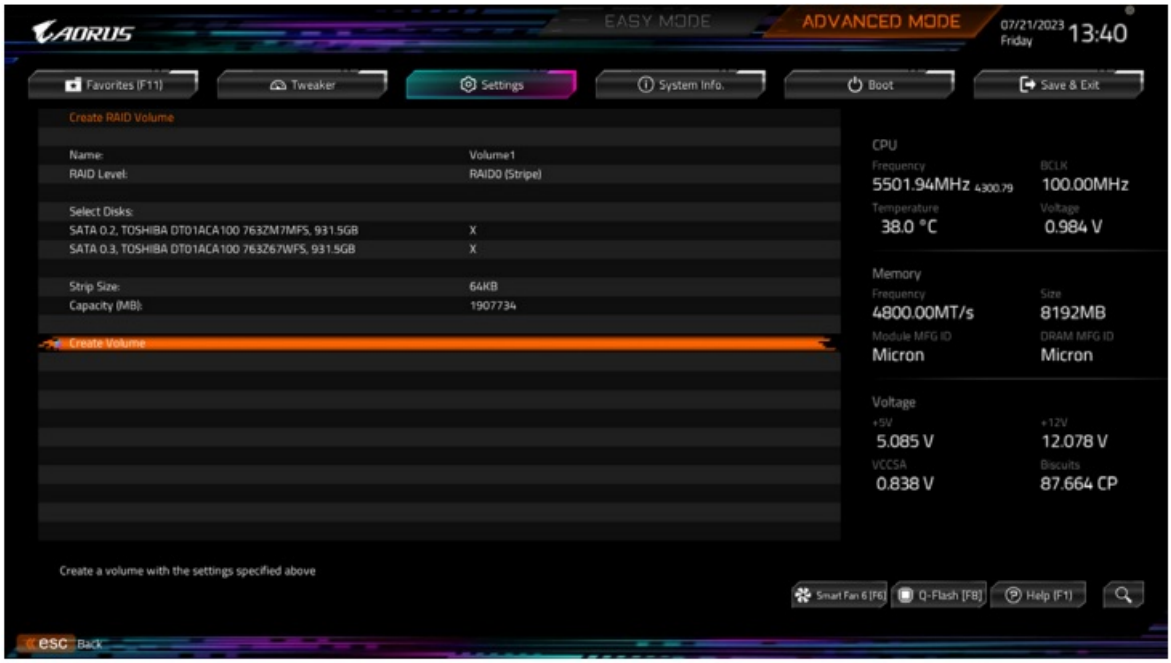


Figure 5

After completing, you'll be brought back to the Intel(R) Rapid Storage Technology 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)

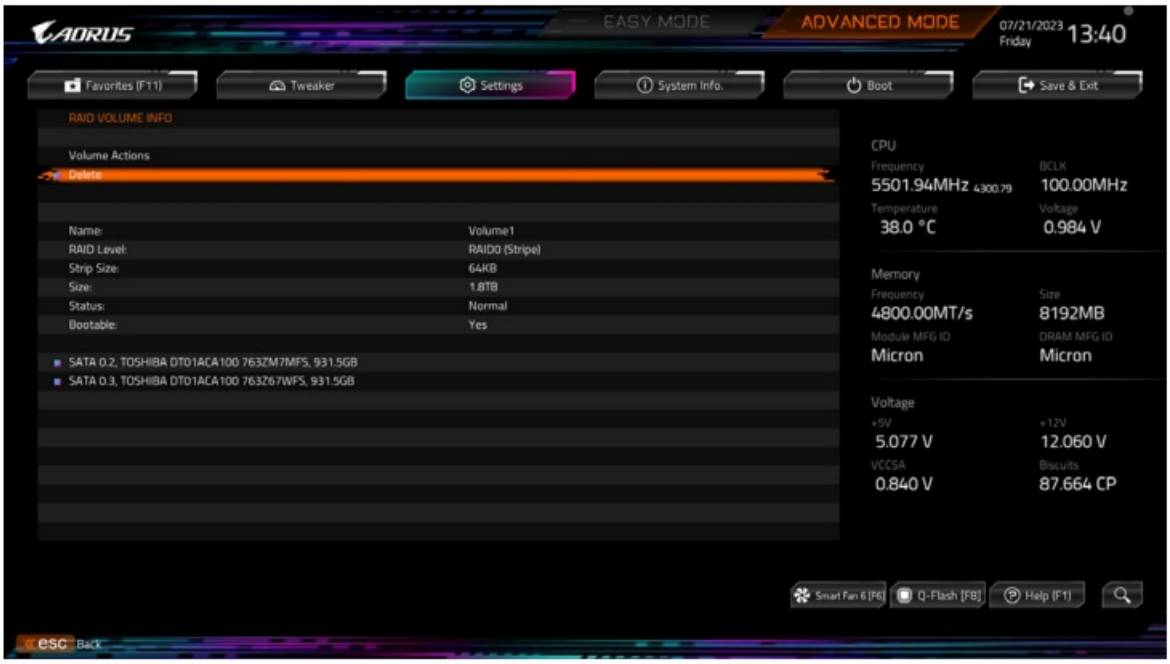


Figure 6

Delete RAID Volume

To delete a RAID array, press <Enter> on the volume to be deleted on the Intel(R) Rapid Storage Technology 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

Installing the RAID Driver and Operating System

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

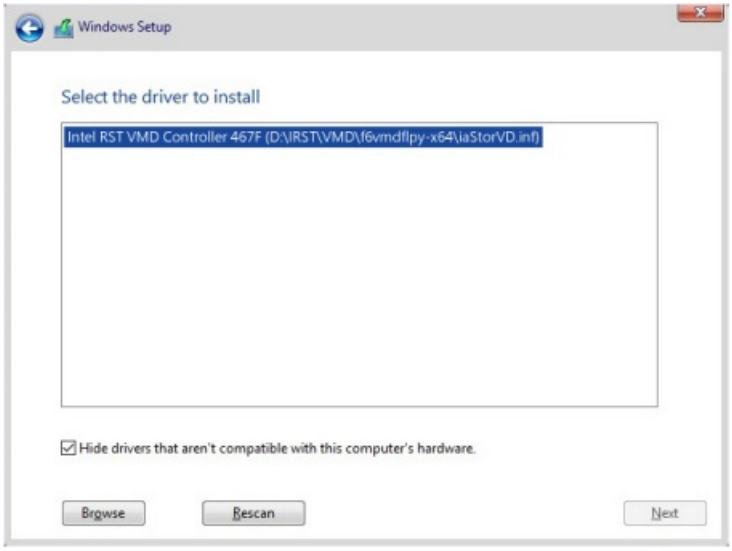
If you want to install an operating system on an M.2 PCIe SSD or a RAID volume, you need to install the Intel® RST VMD Controller driver first during the OS installation process. Refer to the steps below:

Step 1:

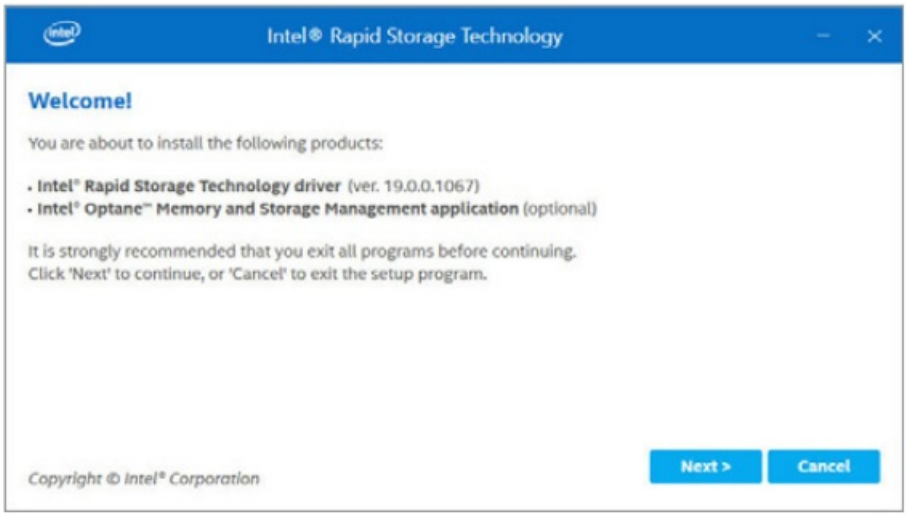
Go to GIGABYTE's website, browse to the motherboard model's web page, download the Intel SATA Preinstall driver file on the Support\Download\SATA RAID/AHCI page, unzip the file and copy the files to your USB thumb drive.

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.

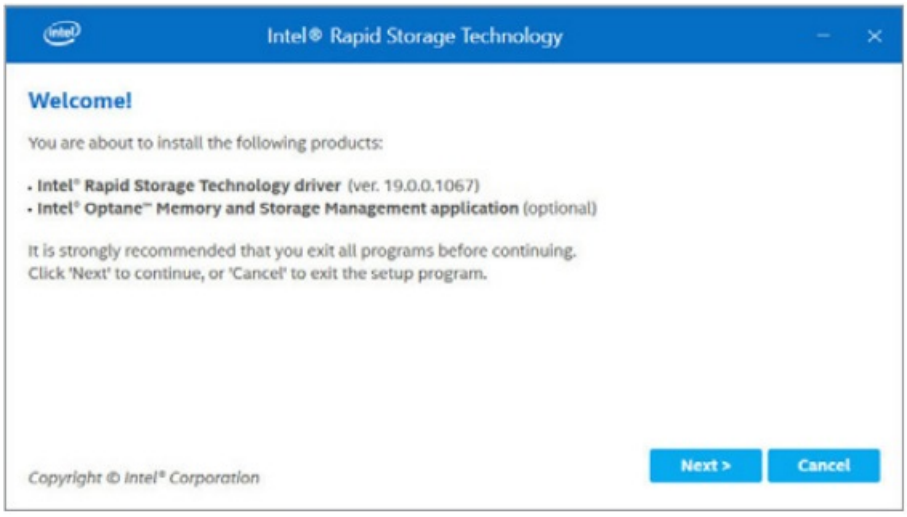
Step 3:
Insert the USB thumb drive and then browse to the location of the driver. When a screen as shown below appears, select Intel RST VMD Controller 467F and click Next to load the driver and continue the OS installation.



Installing Intel® Optane™ Memory and Storage Management



After entering the operating system, make sure your Internet connection works properly.
Launch the GIGABYTE Control Center (GCC). On the “Not Installed\New Drivers” screen, select Intel® Rapid Storage Technology driver to install. Follow the on-screen instructions to continue.
When completed, restart the system.



A. Enabling an Intel® Optane™ Memory

A-1. System Requirements

1. Intel® Optane™ memory H10/H20.
2. System acceleration with Intel® Optane™ Memory can only be enabled on the M.2 connectors supported by the Chipset.
3. Only the system drive partition on the Intel® Optane memory being used can be enabled for system acceleration. The system drive partition must be GPT formatted and have Windows 10 64-bit (or later version) installed.
4. An Internet-connected computer.

A-2. Installation Guidelines

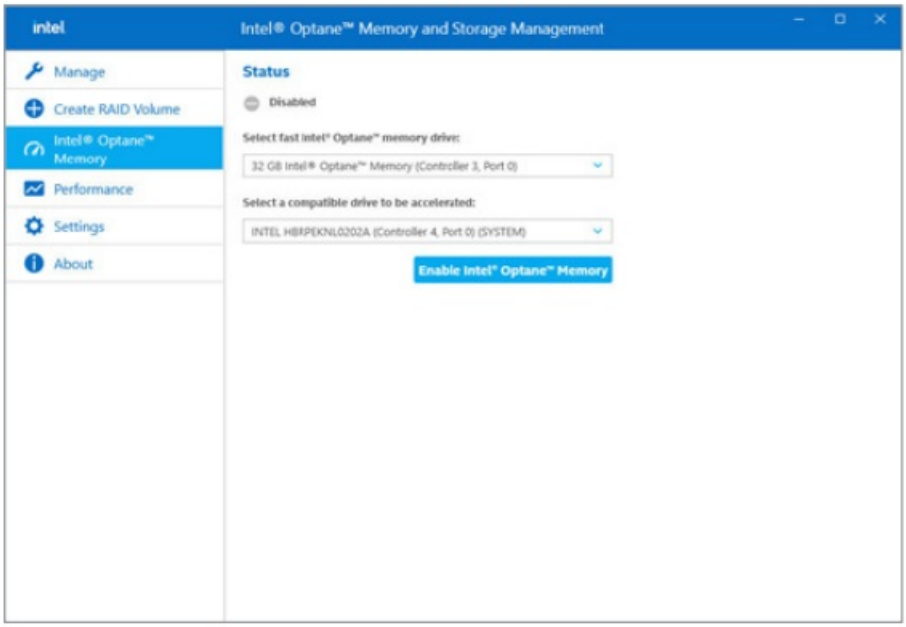
Step 1:

In BIOS Setup, go to Settings\IO Ports\VMD setup menu, set Enable VMD controller to Enabled and set Enable VMD Global Mapping to Disabled. Then depending on the SATA/M.2 connector you use, set the corresponding Map this Root Port under VMD item to Enabled.

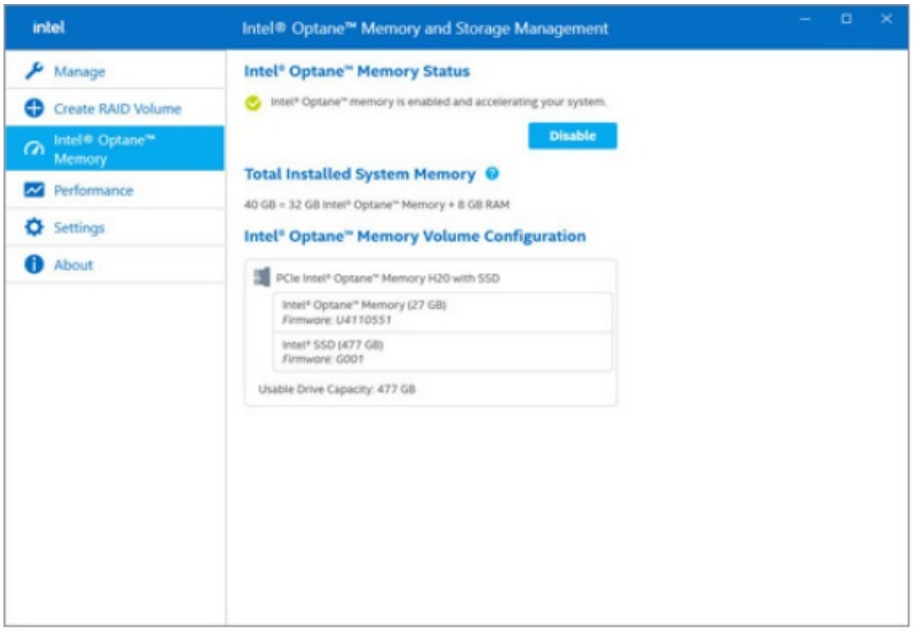
Step 2

After re-entering the operating system, launch the Intel® Optane™ Memory and Storage Management application

from the Start menu. Click Enable Intel® Optane™ Memory. When completed, restart the system.



Step 3
Launch the Intel® Optane™ Memory and Storage Management application from the Start menu and make sure the Intel® Optane™ Memory has been enabled.



- Do not abruptly remove the Optane™ memory. Doing so will cause the operating system to stop functioning correctly.
- If you want to change/remove the Optane™ memory, you must disable it using the Intel® Optane™ Memory and Storage Management application first.
- After enabling the Optane™ memory, the related BIOS settings will remain even after a BIOS update.

B. Rebuilding an Array

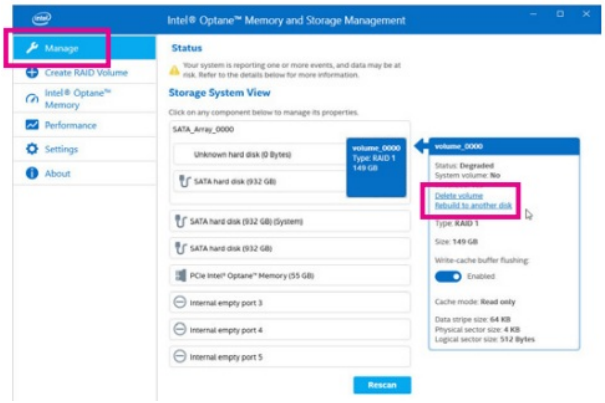
- Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 5 or RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new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

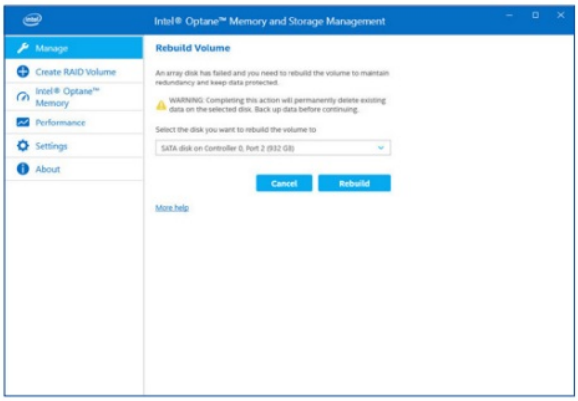
- Turn off your computer and replace the failed hard drive with a new one. Restart your computer.

While in the operating system, launch the Intel® Optane™ Memory and Storage Management utility from the Start menu.

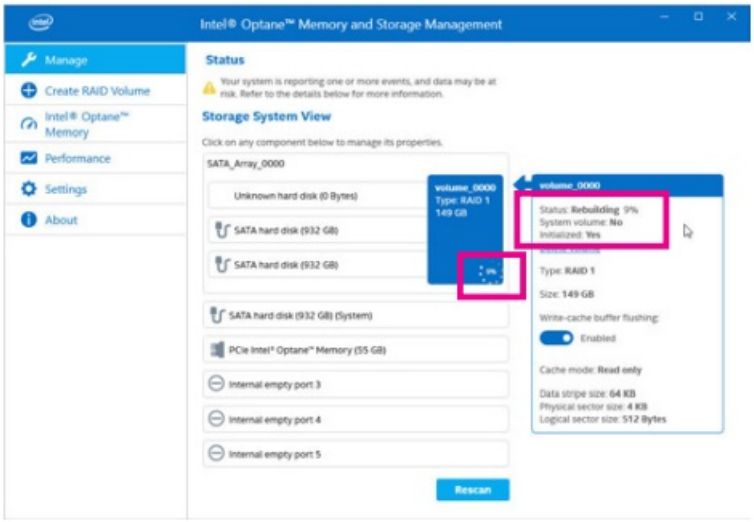
Step 1:
Go to the Manage menu and click Rebuild to another disk in Manage Volume.

Step 2:
Select a new drive to rebuild the RAID and click Rebuild.

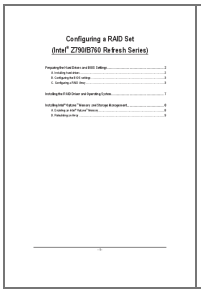




The Status item on the right of the screen displays the rebuild progress. After the RAID 1 volume rebuilding, the Status will display as Normal.



Documents / Resources



Configuring a RAID Set
(Intel® Z790/B760 Refresh Series)

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