

Configuring a RAID Set (Z590 Series)

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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 SATA controller mode in BIOS Setup.
- C. Configure a RAID array in RAID BIOS. ^(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.
- Motherboard driver disc or an Internet connected computer.
- A USB thumb drive.

Configuring SATA Controllers

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) 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 "Internal Connectors" for the installation notices for the M.2 and SATA connectors.

B. Configuring SATA controller mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup.

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 And RST Configuration**, make sure **SATA Controller(s)** is enabled. To create RAID, set **SATA Mode Selection** to **Intel RST Premium With Intel Optane System Acceleration**. Then save the settings and restart your computer (Figure 1). Note: When using a PCIe SSD, make sure to set the **RST Control PCIe Storage Devices** item under **Settings\IO Ports\SATA And RST Configuration** to **Manual**. Then depending the M.2 connector you use, set the corresponding **PCIe Storage Dev on Port XX** item to **RST Controlled**. Finally, save the settings and exit BIOS Setup.

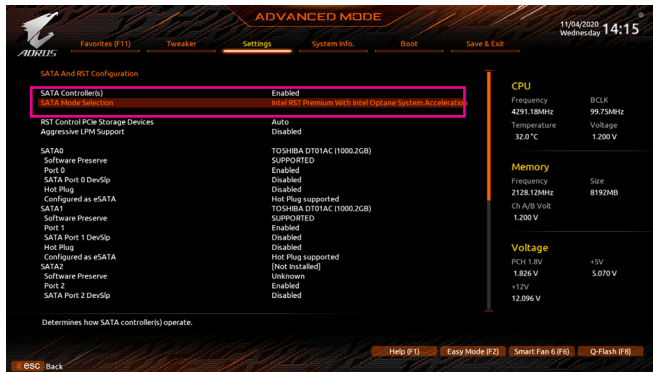


Figure 1

C. UEFI RAID Configuration

Step 1:

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

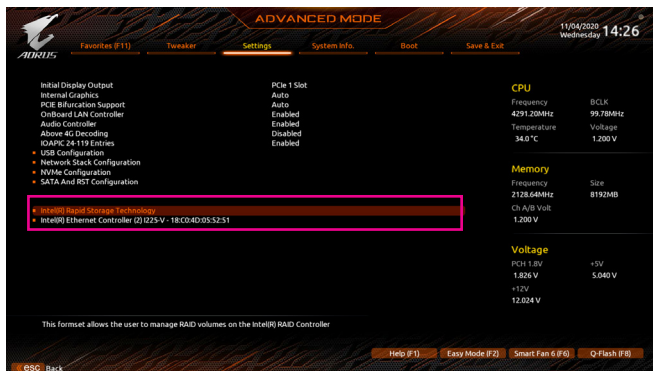


Figure 2



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**.

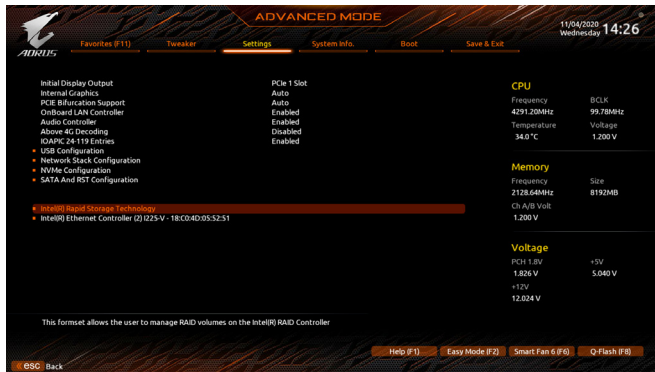


Figure 3

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 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.

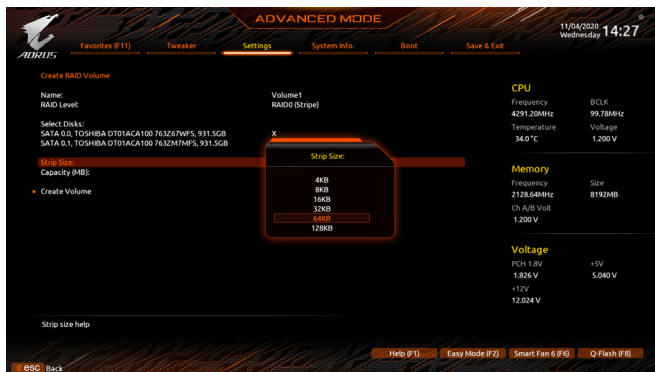


Figure 4

Step 4:

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

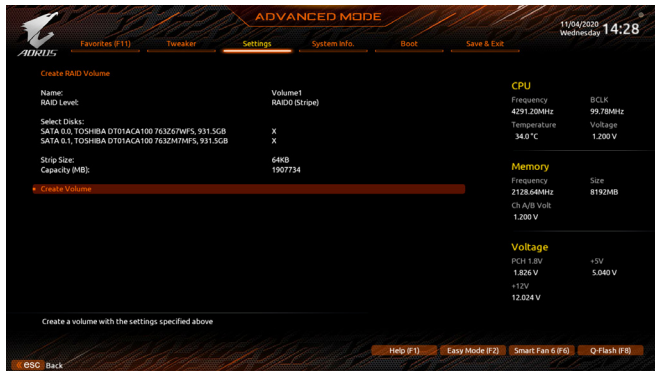


Figure 5

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)

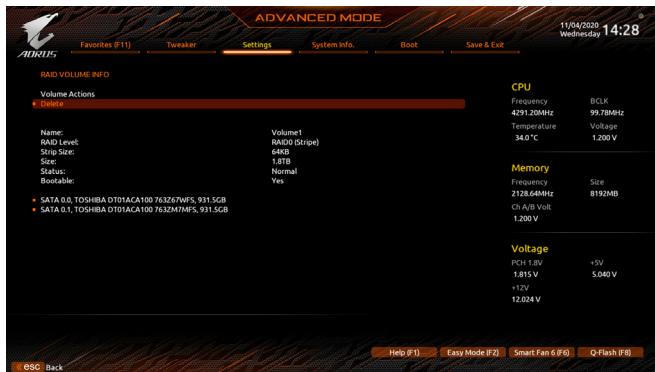


Figure 6

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).

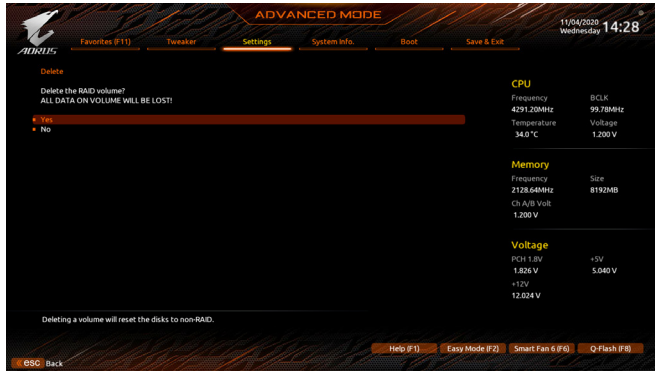


Figure 7

Installing the RAID Driver and Operating System

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

As some operating systems already include RAID driver, you do not need to install separate RAID driver during the Windows installation process. After the operating system is installed, we recommend that you install all required drivers from the motherboard driver disc using "Xpress Install" or from the GIGABYTE APP Center to ensure system performance and compatibility. If the operating system to be installed requires that you provide additional RAID driver during the OS installation process, please refer to the steps below:

Step 1:

Method 1: Copy the **IRST** folder under **Boot** in the driver disc to your USB thumb drive.

Method 2: 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 in Figure 1 appears, select **Intel(R) Chipset SATA/PCIe RST Premium Controller (D:\IRST\rdpy-df\iaStorAC.inf)** and click **Next** to load the driver and continue the OS installation.

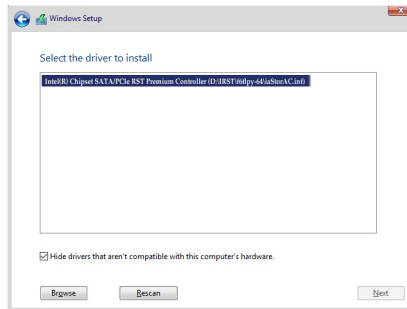
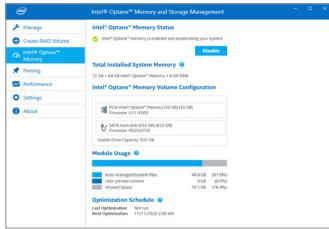
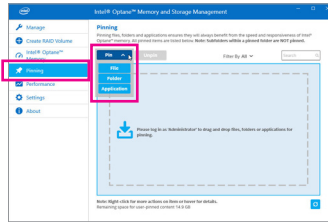


Figure 1



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.



Step 4:
If you want to accelerate the system drive, you can select specific folders, files, or applications to accelerate using the **Intel® Optane™ Memory Pinning** function. (The Optane™ memory used must have at least 32 GB capacity.)



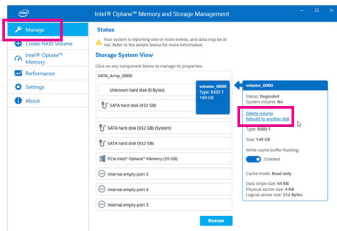
- An Optane™ memory cannot be used to accelerate an M.2 PCIe SSD.
- If more than one Optane™ memory is installed, you can select only one of them to accelerate your SATA-based boot drive. The other(s) can only be used as data drive(s).
- Do not abruptly remove the Optane™ memory. Doing so will cause 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

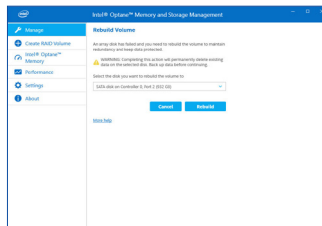
Rebuilding is the process of restoring data to a hard drive from other drives in the array. Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 5 or RAID 10 arrays. The procedures below assume a new drive is added to replace a failed drive to rebuild a RAID 1 array. (Note: The new drive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

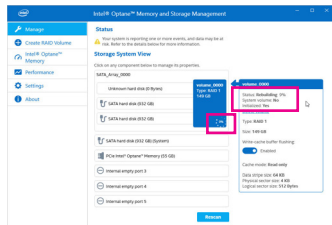
While in the operating system, launch the Intel® Optane™ Memory and Storage Management utility from the Start menu.



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**.