Configuring a RAID Set (Intel[®] Z790/B760 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 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 and SATA connectors.

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, 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 VMD item to Enabled.

>				Save & Exit	Friday	2022 13:5
Favorites (F11) Tweaker	Settings	System Info.		Save & Exit		
VMD Configuration						
Enable VMD controller	Enabled				CPU Frequency	BCLK
Enable VMD Global Mapping	Disabled				5501.59MHz 4300.24	100.00MHz
Map this Root Port under VMD	Enabled				Temperature	Voltage
Root Port BDF details	SATA Contro	ller			49.0 °C	0.975 V
RAID0	Enabled					
RAID1	Enabled Enabled				Memory	
RAIDS RAID10	Enabled					
Intel Rapid Recovery Technology	Enabled				4800.00MHz	8192MB
RRT volumes can span internal and eSATA drives	Enabled				Module MFG ID	DRAM MFG
ZPODD	Disabled				Micron	Micron
					Voltage	
					PCH 0.82V	
					0.814 V	5.032 V
					12.042 V	0.803 V
Map/UnMap this Root Port to VMD						
			Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8

Figure 1

C. Configuring a RAID Array

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).

1 0	Control of	ADVA	NCED MOD			09/23/	2022 13:51
Favorites (F11)		Settings	System Info.			Friday	15.5
DVMT Pre-Allocated		60M					
Aperture Size PCIE Bifurcation Support		256MB Auto				CPU	
OnBoard LAN Controller		Fnabled				Frequency	BCIK
OnBoard LAN Controller#2		Enabled				5501.24MHz 4100 12	100.00MHz
Above 4G Decoding		Auto				Temperature	Voltage
Re-Size BAR Support		Auto				S3.0°C	0.975 V
IOAPIC 24-119 Entries		Enabled				3370 6	0.313
Compliance Test Mode		Disabled					
Compliance Test Mode IOTG PLL SSCEN (CPU Side SSC)		Disabled Enabled				Memory	
Pcie PILSSCEN (CPU Side SSC)		Auto					
Intel Graphics Pei Display Peim		Disabled				4800.00MHz	8192MB
Gigabyte Utilities Downloader Cor	figuration					Module MFG ID	DRAM MEG
Thunderbolt(TM) Configuration						Micron	Micron
USB Configuration							
Network Stack Configuration							
NVMe Configuration						Voltage	
SATA Configuration							
VMD setup menu						0.803 V	5.017 V
Intel/R) Rapid Storage Technology							
Inteli®) Ethernet Controller 1226-V	D8:5E:D3:8F:BB:	5				12.024 V	0.800 V
This formset allows the user to m	anage RAID volum	ies on the Intel(R) RAID	Controller				
				Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8)
Back				time manager and	Torrer of the second second		

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.

1		1 de la	ADV		E	1/0	09/23/	2022 13:57
ADRUS	Favorites (F11)		Settings	System info.			Friday	13.51
Name: RAID Lev Select Di SATA 0.4				pe)			CPU Frequency SS01.24MHz 4300.32 Temperature S1.0 °C	BCLK 100.00MHz Voltage 0.975 V
Strip Size Capacity Create V Select at	(MB):		64K 0	RAID Level: RAID0 (Stripe) RAID1 (Mirror)			Memory Frequency 4800.00MHz Module MFG ID Micron	Size 8192MB DRAM MFG ID Micron
							Voltage PCH 0.82V 0.814 V +12V 12.060 V	+SV 5.017 V VCCSA 0.800 V
Select R	AID Level							
esc Back	140	11-1-			Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8)

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.

					2022 13:5
Favorites (91) Toreaster Create RAID Volume Name: RAID Levels Series Disks: Sarta a, TOSHERA DTOTACA100 7632/07WFS, 931.50 Song Stars: Song Stars:		Strip Size:		CPU Frequency 5501.24MHz 4300.32 Temperature 51.0°C Memory	BCLK 100.00MHz Voltage 0.978 V
Cepacity (MB): Create Volume	190 7234	4KB 8KB 16KB 32KB 64KB 128KB		Frequency 4800.00MHz Module MFG ID Micron	Size 8192MB DRAM MFG Micron
				PCH 0.82V 0.814 V +12V 12.042 V	+SV 5.017 V VCCSA 0.800 V
Strip size help					

Figure 4

Step 4:

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

RU5					E		09/23/	2022 13:58
	avorites (F11)	Tweaker	Settings	System Info.				15.5
Name:			Volume1				CPU	
RAID Level:			RAID0 (Stripe)				Frequency 5501.24MHZ among	BCLK 100.00MHz
Select Disks:							Temperature	Voltage
		0 763ZM7MFS, 931.5GB 0 763Z67WFS, 931.5GB					51.0*C	0.978 V
Strip Size:			64KB				Memory	
Capacity (MB)			1907734					
Create Volum							4800.00MHz Module MFG ID	8192MB DRAM MEG I
							Micron	Micron
							Voltage	
							PCH 0.82V	
							0.814 V	5.017 V
							12.042 V	0.800 V
Create a volu	ime with the setting	gs specified above						
					Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8)

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)

1		ADVAN				09/23/	2022 13:59
ADRUS Favorites (F11)	Tweaker	Settings	System Info.			Friday	15.55
RAID VOLUME INFO Volume Actions						CPU Frequency	
Name: RAID Level: Strip Size:		Volume1 RAID0 (Stripe) 64KB				5501.24MHz 4300.32 Temperature 51.0 °C	100.00MHz Voltage 0.975 V
Strip Stet: Size: Status: Bootable: • SATA 0.4, TOSHIBA DT01ACA100 76 • SATA 0.5, TOSHIBA DT01ACA100 76		6488 1.8TB Normal Yes				Memory Frequency 4800.00MHz Module MFG ID Micron	Size 8192MB DRAM MFG ID Micron
						Voltage PCH 0.82V 0.814 V +12V 12.042 V	+SV 5.025 V VCCSA 0.800 V
esc Back				Help (F1)	Easy Mode (F2)	Smart Fan 6 (F6)	Q-Flash (F8)

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.

Intel RST VME	O Controller 467F (D	\IRST\VMD\f6v	mdflpy-x64\iaS	torVD.inf)	

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.
- 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

Constant II		Settings	System into			Friday	13:56
Twottes PI		Settlege					
An Alberty of Area							
						CPU Frequency	
Enable VMD Global Mapp	ing .	Disabled				5501.594912 ecc.34	100.004942
						Temperature	
Root Port BOF details		SATA Controller					
RAIDO		Enabled					
		Enabled				Memory	
		Enabled				Frequency	
RAID13 Intel Rasid Recovery Tech		Enabled				4900.004942	8192MB
ROH Ragid Recovery Tech RRT volumes can span int		Enabled				Multile M/CID	DIAMANECID
2POOD	Serie and examples	Disabled				Miran	Menne
		0.380.04					PROVE
						Voltage	
						PCH0.82V	
						Gatey	1432 V
Map/UnMap this Root Po							
MapjUnMap this Root Pc	ont bo VIMD			Help of 1	Easy Model F2		
	Set to VMD	14-11 C		H4631	Easy Mode (F2)		
SCI Reds	ort to VMD	emore and Storage N	fanaserreert	H651	Easy Mode F2) - D		
SC Beck	Intel® Optane ¹⁴ Me	emory and Storage N	lanagement	H46.81		+12V 12242V Smart Fan 6(FG)	
SC Ruck Ref Manage	Intel® Optane® Me Status	emory and Storage h	lanagement.	H4631		+12V 12242V Smart Fan 6(FG)	
SC Ruck Ref Manage	Intel® Optane ^{ter} Mo Status © Statee		fanagement.	HHE 81		+12V 12242V Smart Fan 6(FG)	
60 Resk	Intel® Optane® Me Status		fanagement.	HALE \$*1.		+12V 12242V Smart Fan 6(FG)	
50 [°] Eacle Sel Manage Create RAD Volume	Intel® Option® Me Status © Status Select fast Intel® Option®		fanagement .	Heb \$1		+12V 12242V Smart Fan 6(FG)	
62) Neck Tel Manage Create RAD Volume Instit Option ²⁴ Memory	Intel® Optane® Mo Status © Shated Select fait Intel® Optane® 12 da tool* Optane® M	memory drive: temory (Controller 3, Fort 0)		Heb S 1		+12V 12242V Smart Fan 6(FG)	
60 Resk	Intel® Optano [®] Me Status © Status Select tast intel® Optane [®] 32 dil seni® Optane [®] M Select accepublics drive	memory drive: temory (Controller 3, Fort 0)	×	Heb.91)		+12V 12242V Smart Fan 6(FG)	

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 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 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 2:

- 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.



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**.

Step 2:

Select a new drive to rebuild the RAID and click **Rebuild**.