Configuring a RAID Set (Z490 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/AHCI 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.
- 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 Use RST Legacy OROM item under Settings\IO Ports\SATA And RST Configuration to Disabled and RST Control PCIe Storage Devices 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. (If you want to use NVMe PCIe SSDs to configure RAID, make sure to set NVMe RAID mode to Enabled.)

IGABYTE		ADVA	NCED MOD	E			12/17/2019 16:08
Favorites (F11)	Tweaker	Settings	System Info.	Boot	Save & Exit		
Internal Graphics DVMT Pre-Allocated DVMT Total Crk Mem Aperture Size PCIE Bilurcation Support OnBoard LAN Controller		Auto 64M 256M 256MB PCIE X1 Enable	6 d			CPU Frequency 4201.15MHz Temperature	BCLK 99.95MHz Voltage 1 116 V
Audio Controller Above 4G Decoding IOAPIC 24-119 Entries USB Configuration NVMe Configuration SATA And RST Configuration EZ RAID		Enable Disable Enable	년 - 전 - 년			Memory Frequency 2132.28MHz Ch A/B Volt 1 200 V	Size 4096MB
TIs Auth Configuration Realtek PCIe GBE Family Control						Voltage +5V 5.100 V	+12V 11.890 V
Option Description SATA Device Options Settings							

Figure 1

Step 2:

To use the EZ RAID feature, follow the steps in "C-1." To configure UEFI RAID, follow the steps in "C-2." To enter the legacy RAID ROM, refer to "C-3" for more information. Finally, save the settings and exit BIOS Setup.



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.

C-1. Using EZ RAID

GIGABYTE motherboards provide you with the EZ RAID feature, allowing you to quickly configure a RAID array with simplified steps.

Step 1:

After restarting the computer, enter the BIOS Setup and go to **Settings**. Press <Enter> on the **EZ RAID** item. Select the type of hard drives you use for RAID in the **Type** tab and then press <Enter>. (Figure 2)



Figure 2

Step 2:

Go to the **Mode** tab to select a RAID level. 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). Then press <Enter> to move to the **Create** tab. Click **Proceed** to begin (Figure 3).



Figure 3

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 4).

GIGABYTE		ADVA		E			12/17/2019 16:22°
Favorites (F11)	Tweaker	Settings	System Info.	Boot	Save & Exit		Tuesday TOTLE
RAID VOLUME INFO Volume Actions Delete						CPU Frequency 4222-31MHz	BCLK 100.00MHz
Name: RAID Level: Strin Sing		Volun RAIDO 64KB	ne1) (Stripe)			Temperature 38.0 °C	Voltage 0.888 V
Size: Status: Bootable: SATA 0.0, TOSHIBA DT01ACA100 SATA 0.1, TOSHIBA DT01ACA100	763Z67WFS, 931.50 763ZM7MFS, 931.50	1.8TB Norm Yes GB				Memory Frequency 2133.33MHz Ch A/B Volt 1.212 V	Size 4096MB
						Voltage +SV 5.100 V	+12V 11.952 V
Option Description							
				Help (F1)	Easy Mode (F2)	Smart Fan S (FG)	Q-Flash (F8)
Cesc Back							

Figure 4

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 5).



Figure 5

C-2. UEFI RAID Configuration

Step 1:

In BIOS Setup, go to Boot and set CSM Support to Disabled (Figure 6). Save the changes and exit BIOS Setup.

						1 T	12/17/2019 Tuesday 16:27	
Favorites (F11)	Tweaker	Settings	System Info.	Boot	Save & Exit			
Boot Configuration Bootup NumLock state Security Option Full Screen LOGO Show Boot Option Priorities Boot Option #1		On Syste Enab UEFI:	im led USB FLASH DRIVE PMA			CPU Frequency 4222.31MHz Temperature 37.0°C	BCLK 100.00MHz Voltage 0.888 V	
Fast Boot Mouse Speed		Disəb 1 X	ole Link			Memory Frequency 2133.33MHz	Size 4096MB	
Windows 10 Features CSM Support		Wind Disab	ows 10 sled			Ch A/B Volt 1.200 V		
Administrator Password User Password • Secure Boot Preferred Operating Mode		Auto				Voltage +SV 5.100 V	+12V 11.952 V	
Option Description								
Enable/Disable Cam Support.				Help (F1)	Easy Mode (F2)	Smart Fan S (F6)	Q-Flash (F8)	

Figure 6

Step 2:

After the system reboot, enter BIOS Setup again. Then enter the Settings\IO Ports\Intel(R) Rapid Storage Technology sub-menu (Figure 7).

GIGABYTE		ADVA		E		12/	8/2019 15:30°
Favorites (F11)	Tweaker	Settings	System Info.	Boot	Save & Exit		nesday 1919 9
Internal Graphics DMAIT Prevaluested DMAIT Trevaluested DMAIT Trevaluested Ottomer Carlo Constant Constant Constant Office Constant House Constant House Constant House Constant House Constant House Constant Science Constant Constant Science Constant		Auto 64M 256M PCIE x Enable Enable Disable	। 16 17 17 17 17 17 17 17 17 17 17 17 17 17			CPU Frequency 4201.5MHz Temperature 37.0°C Memory Frequency 2132.28MHz Ch A/B Volt 1.212 V	BCLK 99.95MHz Voltage 0.888 V Size 4096MB
Intel® Rapid Storage Technolog Realtek PCIe GBE Pamily Controll Option Description This formest allows the user to o	MAC 00:00:00:00	00:00)	n Controller			Voltage +5V 5.100 V	+12V 11.952 V
this romset allows the user to h	anage ratio volum	es on enclarter(n) rouis	- controller	Help (F1)	Easy Mode (F2)	Smart Fan 5 (FG)	Q-Flash (F8)
« esc Back							

Figure 7

Step 3:

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 8). 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.

IGABYTE		ADVA	NCED MUDI			12/1	8/2019 15:32
Favorites (F11)	Tweaker	Settings	System Info.	Boot	Save & Exit	-	nesoay
Create RAID Volume							
Name'		Volum	un1			CPU	
RAID Level:		RAIDO	(Stripe)				
Select Disks: SATA 0.0, TOSHIBA DT01ACA100	763Z67WFS, 931.50					4201.15MHz Temperature 37.0*C	99.95MHz Voltage 0.888 V
SATA 0.1, TOSHIBA DT01ACA100	1763ZM7MFS, 931.5						
Capacity (MB):			RAID Level			memory	
Create Volume			RAID0 (Stripe)			Prequency 2132 20MHz	Size A096MB
			RAID1 (Mirror)			Ch A/B Volt	405000
Select at least two disks			necovery			1.200 V	
						Voltage	
						5.100 V	11.952 V
Option Description							
Select RAID Level							
				Help (F1)	Easy Mode (F2)	Smart Fan 5 (FG)	Q-Flash (F8)
G Back							

Figure 8

Step 4:

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 9). 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.

GIGABYTE		ADVA	NCED MOD	E		12/1	8/2019 15:34°
Favorites (F11)	Tweaker	Settings	System info.	Boot	Save & Exit	wet	mesoay 1919 1
Create RAID Volume Name: RAID Level: Select. Disks: SATA 0.0, TOSHIBA DT01ACA SATA 0.1, TOSHIBA DT01ACA	100 763267WF5, 931.5GB 100 7632M7MF5, 931.5GB	Volum RAIDO X X	e1 (Stripe)			CPU Frequency 4201.15MHz Temperature 37.0 °C	BCLK 99.95MHz Voltage 0.888 V
(Strip Size: Capacity (MB): • Create Volume		64K 190	Strip Size: 4KB 8KB 16KB 32KB 64KB 128KB			Memory Frequency 2132.28MHz Ch A/B Volt 1.212 V	Size 4096MB
						Voltage +5V 5.100 V	+12V 11.952 V
Option Description Strip size help				Help (F1)	Easy Mode (F2)	Smart Fan S (F6)	Q-Flash (FII)
« esc Back							

Figure 9

Step 5:

After setting the capacity, move to Create Volume and press <Enter> to begin. (Figure 10)

GIGABYTE		ADVA	NCED MOD	E		12 W	/18/2019 15:38°
Favorites (F1	1) Tweaker	Settings	System info.	Boot	Save & Exit		
Create RAID Volume Name: RAID Level:		Volume RAID0 (e1 (Stripe)			CPU Frequency	
Select Disks: SATA 0.0, TOSHIBA DT01 SATA 0.1, TOSHIBA DT01	IACA100 763Z67WFS, 931.SGB IACA100 763ZM7MFS, 931.SGB					4201.15MHz Temperature 37.0 °C	99.95MHz Voltage 0.888 V
Strip Size: Capacity (MB):		64KB 190773				Memory	
Create Volume						Frequency 2132.28MHz Ch A/B Volt 1.200 V	Size 4096MB
						Voltage +5V 5.100 V	+12V 11.952 V
Option Description Create a volume with th	e settings specified above						
				Help (F1)	Easy Mode (F2)	Smart Fan S (F6)	Q-Flash (F8)
« esc Back							

Figure 10

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 11)

GIGABYTE		ADVA		E		12/1	8/2019 15:39°
Favorites (F11)	Tweaker	Settings	System info.	Boot	Save & Exit		niesday - E - E -
RAID VOLUME INFO						CPU	
Delete						Frequency 4201.15MHz	BCLK 99.95MHz
Name: RAID Level: Strip Size:		Volun RAID0 64KB	ne1 (Stripe)			Temperature 37.0 *C	Voltage 0.888 V
Size: Status: Bootable:		1.8TB Norm Yes				Memory Frequency	
 SATA 0.0, TOSHIBA DT01ACA100 SATA 0.1, TOSHIBA DT01ACA100 	0 763Z67WFS, 931.50 0 763ZM7MFS, 931.50	B GB				2132.28MHz Ch A/B Volt 1.200 V	4096MB
						Voltage +SV 5.100 V	+12V 11.952 V
Option Description							
				Help (F1)	Easy Mode (F2)	Smart Fan 5 (F6)	Q-Flash (F8)
« esc Back			******				

Figure 11

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 12).

GIGA	BYTE™		ADVA	ADVANCED MODE			12/	18/2019 15·41
	Favorites (F11)	Tweaker	Settings	System Info.	Boot	Save & Exit	we	anesday 1 21-11
Delete							(0)	
Delete t ALL DAT	he RAID volume? A ON VOLUME WILL BE						Frequency 4201 15MHz	BCLK 99.95MHz
 Yes No 							Temperature 37.0 °C	Voltage 0.888 V
							Memory Frequency 2132.28MHz Ch A/B Volt 1.200 V	Size 4096MB
							Voltage +5V S.100 V	+12V 11.952 V
Option	Description							
Deletin	g a volume will reset the	disks to non-RAID.						
					Help (F1)	Easy Mode (F2)	Smart Fan S (FG)	Q+Tash (F8)

Figure 12

C-3. Configuring Legacy RAID ROM

You'll need a discrete graphics card to enter the legacy RAID ROM utility. Enter the Intel[®] legacy RAID BIOS setup utility to configure a RAID array. Skip this step and proceed with the installation of Windows operating system for a non-RAID configuration.

Step 1:

In BIOS Setup, go to **Boot** and set **CSM Support** to **Enabled** and **Storage Boot Option Control** to **Legacy**. Next, go to **Settings\IO Parts\SATA And RST Configuration** and make sure **USE RST Legacy OROM** is set to **Enabled**. Save the changes and exit BIOS Setup. After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-I> to enter Configuration Utility" (Figure 13). Press <Ctrl> + <I> to enter the RAID Configuration Utility.



Figure 13

Step 2:

After you press <Ctrl> + <l>, the MAIN MENU screen will appear (Figure 14).

Create RAID Volume

If you want to create a RAID array, select Create RAID Volume in MAIN MENU and press < Enter>.



Step 3:

After entering the **CREATE VOLUME MENU** 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 15). 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). Press <Enter> to proceed.

Intel(R) Rapid Storage Technology - Option ROM - 17.8.0.4460 Copyright (C) Intel Corporation. All Rights Reserved.								
	CREATE VOI Name : RAID Level : Disks : Strip Size : Capacity : Sync :	UME MENU] Volume0 RAID0(Stripe) Select Disks 16KB 1863.0 GB N/A Create Volume						
	[HE	CLP]						
	RAID 0: Stripes	data (performance).						
[↑↓]-Change	[TAB]-Next	[ESC]-Previous Menu	[ENTER]-Select					
Figure 15								

Step 4:

Under **Disks** item, select the hard drives to be included in the RAID array. If only two hard drives are installed, they will be automatically assigned to the array. Set the stripe block size (Figure 16) if necessary. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, press <Enter>.

	Intel(R) Rapid Storage Te Copyright (C) Intel	echnology - Option ROM - 17.8.0.4 Corporation. All Rights Reserved.	4460
	[CREATE Nat RAID Le Di Strip S Capac Sy	VOLUME MENU] me : Volume0 vel : RAID0(Stripe) sks : Select Disks ize : 16KB ity : 1863.0 GB mc : N/A Create Volume	
[r		[HELP]	
	The following	g are typical values:	
	RAIDO RAIDO RAID5	- 128KB) - 64KB - 64KB	
[↑↓]-Change	[TAB]-Next	[ESC]-Previous Menu	[ENTER]-Select
		Figure 10	

Figure 16

Step 5:

Enter the array capacity and press <Enter>. Finally press <Enter> on the **Create Volume** item to begin creating the RAID array. When prompted to confirm whether to create this volume, press <Y> to confirm or <N> to cancel (Figure 17).

	Intel	(R) Rapid Storage Technolo Copyright(C) Intel Corpora	gy - Option ROM - 17.8.0.4460 ttion. All Rights Reserved.	
		[CREATE VOI Name : RAID Level : Disks : Strip Size : Capacity :	UME MENU] Volume0 RAID0(Stripe) Select Disks 16 KB 1863.0 GB	
	WAR	NING : ALL DATA ON SE Are you sure you want to	LECTED DISKS WILL BE LOST. create this volume? (Y/N) :	
		Press ENTER to crea	te the specified volume.	
[1	`↓]-Change	[TAB]-Next	[ESC]-Previous Menu	[ENTER]-Select
		=:		



When completed, you can see detailed information about the RAID array in the **DISK/VOLUME INFORMATION** section, including the RAID level, stripe block size, array name, and array capacity, etc. (Figure 18)



To exit the RAID BIOS utility, press <Esc> or select 6. Exit in MAIN MENU.

Now, you can proceed to install the SATA RAID/AHCI driver and operating system.

Recovery Volume Options

Intel[®] Rapid Recover Technology provides data protection by allowing users to easily restore data and system operation using a designated recovery drive. With the Rapid Recovery Technology, which employs RAID 1 functionality, users can copy the data from the master drive to the recovery drive; if needed, the data on the recovery drive can be restored back to the master drive.

Before you begin:

- The recovery drive must have equal or greater capacity than the master drive.
- A recovery volume can be created with two hard drives only. A recovery volume and a RAID array cannot co-exist in the system at the same time, that is, if you have already created a recovery volume, you are unable to create a RAID array.
- By default, only the master drive can be viewed in the operating system; the recovery drive is hidden.

Step 1:

Select Create RAID Volume in MAIN MENU and press < Enter> (Figure 19).



Step 2:

After entering the volume name, select Recovery under the RAID Level item and press <Enter> (Figure 20).

	Intel(R) Rapid Storage Technol Copyright (C) Intel Corpor	ogy - Option ROM - 17.8.0.4460 ration. All Rights Reserved.		
	CREATE VO Name : RAID Level : Disks : Strip Size : Capacity : Sync :	LUME MENU] Volume0 Recovery Select Disks N/A 931.5 GB Continuous Create Volume		
	[HI	ELP]	1	
Recovery: Copies data between a master and a recovery disk.				
[↑↓]-Change	[TAB]-Next	[ESC]-Previous Menu	[ENTER]-Select	
	Fig	ire 20		

Step 3:

Press <Enter> under the Select Disks item. In the SELECT DISKS box, press <Tab> on the hard drive you want to use for the master drive and press <Space> on the hard drive you want to use for the recovery drive. (Make sure the recovery drive has equal or larger capacity than the master drive.) Then press <Enter> to confirm (Figure 21).

	Intel(R) Rapid Copyright	Storage Technolog (C) Intel Corporati	y - Option ROM - 17.8.0.446 ion. All Rights Reserved.	50	
		= [CREATE VOLU Name : N RAID Level : F SELECT	JME MENU] ======= Volume0 Recovery F DISKS]===================================		
ID M1 R2	Drive Model TOSHIBA DT01ACA1 TOSHIBA DT01ACA1	Serial # 763ZM7MFS 763ZLL4FS	Size 931.5GB 931.5GB	Status Non-RAID Disk Non-RAID Disk	
	Select 1 Maste [↑↓]-Prev/Next	r and 1 Recovery di [TAB]-(M)aster [S	sk to create volume. PACE]-(R)ecovery [ENTEI	R]-Done	
[↑↓]-(Change [TAB]-	Next	[ESC]-Previous Menu	[ENTER]-Select	



Step 4:

Under **Sync**, select **Continuous** or **On Request** (Figure 22). When set to **Continuous**, changes made to the data on the master drive will be automatically and continuously copied to the recovery drive when both hard drives are installed in the system. **On Request** allows users to update data from the master drive to the recovery drive manually using the Intel® Rapid Storage Technology utility in the operating system. **On Request** allows users to restore the master drive to a previous state.

:	intel(R) Rapid Storage Tec Copyright (C) Intel Co	hnology - Option ROM - 17.8.0.446 orporation. All Rights Reserved.	0
	CREATF Na RAID Le Di Strip S Capac Sy	: VOLUME MENU] me : Volume0 vel : Recovery sks : Select Disks ize : N/A ize : N/A ize : Old State ize : Old State ize : Create Volume	
		: [HELP]	
	Sele On Request: v Continuous: vol	ect a sync option: olume is updated manually ume is updated automatically	
[↑↓]-Change	[TAB]-Next	[ESC]-Previous Menu	[ENTER]-Select
		Figure 22	

Step 5:

Finally press <Enter> on the **Create Volume** item to begin creating the Recovery Volume and follow the onscreen instructions to complete.

Delete RAID Volume

To delete a RAID array, select **Delete RAID Volume** in **MAIN MENU** and press <Enter>. In the **DELETE VOLUME MENU** section, use the up or down arrow key to select the array to be deleted and press <Delete>. When prompted to confirm your selection (Figure 23), press <Y> to confirm or <N> to abort.

	Intel(R) F Copy	tapid Storage Techno right (C) Intel Corpo	logy - Option ROM - 17. pration. All Rights Reser	8.0.4460 wed.	
		E DELETE VO	DLUME MENU] ——		
Name Volume0	Level RAID0(Stripe)	Drives 2	Capacity 1.8TB	Status Normal	Bootable Yes
	A	= [DELETE VOLUI LL DATA IN THE V (This does not app e you sure you want	ME VERIFICATION] = /OLUME WILL BE LOS ly to Recovery volumes) to delete "Volume0"? (Y/	TTI N) :	
	Do WA	eleting a volume will RNING: ALL DISK (This does not app	reset the disks to non-RA DATA WILL BE DELE ly to Recovery volumes)	ND. TED.	
[↑	↓]-Select	[ESC]-I	Previous Menu	[DEL]-Delete Volur	ne
		Fig	ure 23		

Installing the RAID/AHCI Driver and Operating System

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

A. Installing Windows

As some operating systems already include Intel® RAID/AHCI driver, you do not need to install separate RAID/ AHCI 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" to ensure system performance and compatibility. If the operating system to be installed requires that you provide additional SATA RAID/AHCI driver during the OS installation process, please refer to the steps below:

Step 1:

Copy the IRST folder under Boot in the driver disc 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. The location of the driver is as follows: \IRST\f6flpy-x64

Step 4:

When a screen as shown in Figure 1 appears, select Intel(R) Chipset SATA/PCIe RST Premium Controller and click Next to load the driver and continue the OS installation.

Intel(R) Chipsel	SATA/PCIe RST Pren	nium Controller (D	AIRST\/6flpy-64\ia	StorAC.inf)	

Figure 1

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.

· Performing the Rebuild in the Operating System

While in the operating system, make sure the chipset driver has been installed from the motherboard driver disc. Then launch the Intel[®] Rapid Storage Technology 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 left 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**.

Restoring the Master Drive to a Previous State (for Recovery Volume only)

When two hard drives are set to Recovery Volume in Update on Request mode, you can restore the master drive data to the last backup state when needed. For example, in case the master drive detects a virus, you can restore the recovery drive data to the master drive.

Step 1:

Select 4. Recovery Volume Options in the MAIN MENU of the Intel® RAID Configuration Utility. On the RECOVERY VOLUMES OPTIONS menu, select Enable Only Recovery Disk to show the recovery drive in the operating system. Follow the on-screen instructions to complete and exit the RAID Configuration Utility.





Step 2:

Go to the Manage menu of the Intel[®] Rapid Storage Technology utility and click **Recover data** in Manage Volume.



The **Status** item on the left of the screen displays the recovering status. After the recovery volume is completed, the **Status** will display as **Normal**.

Data Recovery	
Are you sure you want to copy all the data from the	he recovery disk to the master disk?
A WARNING: Completing this action will override	e any master disk changes since the last update.
You can continue using other applications during the second se	ng this time.
More help	Yes

Step 3:

Click Yes to begin the data recovery.

Installing an Intel[®] Optane[™] Memory

A. System Requirements

- 1. Intel[®] Optane[™] memory
- 2. The Optane[™] memory must have at least 16 GB capacity, and it must have equal or smaller capacity than the hard drive/SSD to be accelerated.
- The Optane[™] memory cannot be used to accelerate an existing RAID array; the accelerated hard drive/SSD cannot be included in a RAID array.
- 4. The hard drive/SSD to be accelerated must be a SATA hard drive or M.2 SATA SSD.
- 5. The hard drive/SSD to be accelerated can be a system drive or data drive. The system drive must be GPT formatted and have Windows 10 64-bit (or later version) installed on it. The data drive must also be GPT formatted.
- 6. The motherboard driver disc.

B. Installation Guidelines

B-1: Installation in AHCI mode

If the SATA controller has been configured in AHCI mode, please follow the steps below:

You are about to install the following product: Intel® Optime [™] Memory It is strongly recommended that you exit all program before continuing. Click Yeard to continue, or click 'Canvel' to exit the setup program.	
Too are count or in an one tooking product: Intel® Optime ^{TT} Henrory It is stongly recommended that you exit all programs before continuing. Click Next to continue, or click 'Cancef to exit the setup program.	
Intel® Optane [™] Hemory It is strongly recommended that you exit all programs before continuing. Click Nexif to continue, or click "Cancel" to exit the setup program.	
It is strongly recommended that you exit all programs before continuing. Click Next' to continue, or click 'Cancel' to exit the setup program.	
Please review the <u>ReadHe</u> file before installing.	



Step 2:

Step 1:

After entering the operating system, insert the motherboard driver disc into your optical drive. On the **Xpress Install** screen, select **Intel(R) Optane(TM) Memory System Acceleration** (Note) to install. Follow the on-screen instructions to continue. When completed, restart the system.



Step 3:

Launch the Intel® Optane" Memory application from the Start menu and make sure the Intel® Optane" Memory has been enabled. (The SATA controller mode is changed to "Intel RST Premium With Intel Optane System Acceleration" from AHCI mode. DO NOT change your SATA controller mode back to AHCI. Doing so will cause the Optane" memory unable to function properly.) instructions to complete the settings, and then the Intel® Optane[™] Memory application will appear automatically. If you install more than one Optane[™] memory, please select which one you are going to use. Then select which drive to be accelerated. Click Enable. All data on the Optane[™] memory will be erased. Make sure you back up the data before continuing. Follow the on-screen instructions to proceed. When completed, restart the system.

After re-entering the operating system, follow the on-screen



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.)

(Note) If the system already has Intel[®] Rapid Storage Technology utility installed, you have to remove it first before installing the Intel(R) Optane(TM) Memory System Acceleration application.

B-2: Installation in Intel RST Premium With Intel Optane System Acceleration mode

If the SATA controller has been configured in Intel RST Premium With Intel Optane System Acceleration mode, please follow the steps below:



Step 1:

After system restarts, go to the BIOS Setup, make sure **CSM Support** under the **Boot** menu is disabled.



Step 3:

Enter the operating system, launch the Intel[®] Rapid Storage Technology utility from the Start menu, and then enable Intel[®] Optane[™] Memory on the Intel[®] Optane[™] Memory tab.



Step 5:

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Step 2:

Go to Settings\IO Ports\SATA And RST Configuration and make sure USE RST Legacy OROM is disabled and RST Control PCIe Storage Devices is set to Manual. Then depending on which M.2 connector you install the Optane[™] memory in, set the corresponding PCIe Storage Dev on Port XX item to RST Controlled.

Enable Intel® Optane™ memory	I
Select a compatible fast drive:	
PCIe SSD on Controller 1, Port 0 (27 GB)	~
elect a compatible data drive:	
SATA SSD on Controller 0, Port 0 (112 GB) (system)	-
After Intel® Optane [™] memory is enabled, please restart your operations.	PC before performing any partition or formatting
O Ensure that the PC is connected to an AC power source during	g this process.
▲ This process will take some time and may negatively imp drive will be erased. Do you want to enable intel® Optan	act system performance. All data on the fast ne ²⁴ memory now?
More help	Yes No

Step 4:

If you install more than one Optane[™] memory, please select which one you are going to use. Then select which drive to be accelerated. Click **Yes** to continue. Follow the on-screen instructions to proceed. When completed, restart the system.

Launch the Intel® Rapid Storage Technology utility from the Start menu and make sure the Intel® Optane[™] Memory has been enabled. 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 SATAbased 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[®] Rapid Storage Technology or Intel(R) Optane Memory application first.
- After enabling the Optane[™] memory, the related BIOS settings will remain even after a BIOS update.