RAID Configuration

Workstation Creator! Rev3

RAID Support

RAID Support

4.1 RAID configurations

The motherboard supports Intel® Rapid Storage Technology with RAID 0, RAID 1, RAID 5, and RAID 10 solution.

> If you want to install a Windows® operating system to a hard disk drive included in a RAID set, you have to create a RAID driver disk and load the RAID driver during OS installation. Refer to section **4.2 Creating a RAID driver disk** for details.

4.1.1 RAID definitions

RAID 0 (Data striping) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 (Data mirroring) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 5 strips both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.

RAID 10 is data striping and data mirroring combined without parity (redundancy data) having to be calculated and written. With the RAID 10 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

4.1.2   Installing storage devices

The motherboard supports Serial ATA hard disk drives and PCIE SSD storage devices. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

> Refer to Chapter 2 for details on installing storage devices to your motherboard.

4.1.3   Intel® Rapid Storage Technology in UEFI BIOS

To enter the Intel® Rapid Storage Technology in UEFI BIOS:

1.   Enter the BIOS Setup during POST.

2.   Go to the **Advanced** menu > **PCH Storage Configuration**, then press <Enter>.

3.   Set the SATA Mode Selection item to **[Intel RST Premium With Intel Optane System Acceleration (RAID)]**.

> If you are using PCIE storage devices, ensure to enable all the **PCIE Storage RAID Support** items.

4.   Go to the **Boot** menu > **CSM (Compatibility Support Module)** > **Launch CSM**, then set the item to **[Disabled]**.

5.   Save your changes and exit the BIOS Setup, then enter the BIOS Setup again.

6.   Go to the **Advanced** menu > **Intel(R) Rapid Storage Technology**, then press <Enter> to display the Intel® Rapid Storage Technology menu.

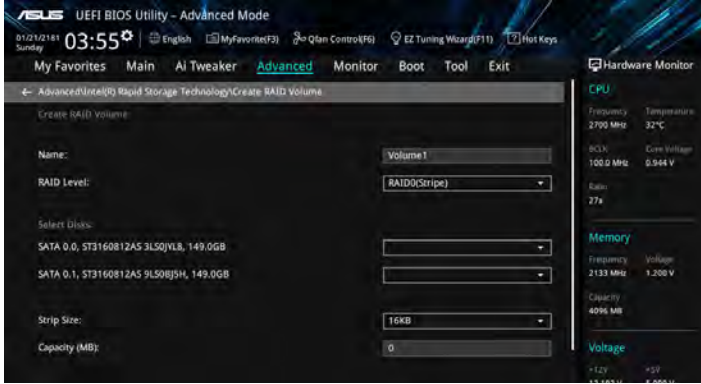> Refer to Chapter 3 for details on entering and navigating through the BIOS Setup.

> Due to chipset limitation, when SATA ports are set to RAID mode, all SATA ports run at RAID mode together.
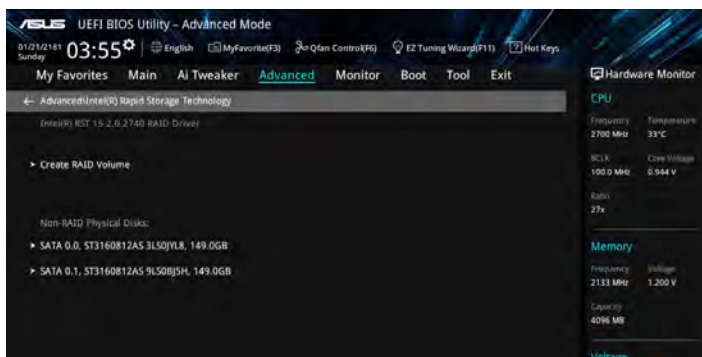
Creating a RAID set

To create a RAID set:

1.   From the Intel® Rapid Storage Technology menu, select **Create RAID Volume** and press <Enter>. The following screen appears:

2.   When the **Name** item is selected, enter a name for the RAID set and press <Enter>.

3.   When the **RAID Level** item is selected, press <Enter> to select the RAID level to create, and then press <Enter>.

4.   Under **Select Disks**, press <Enter> and select **X** for the disks you want to include in the RAID set.
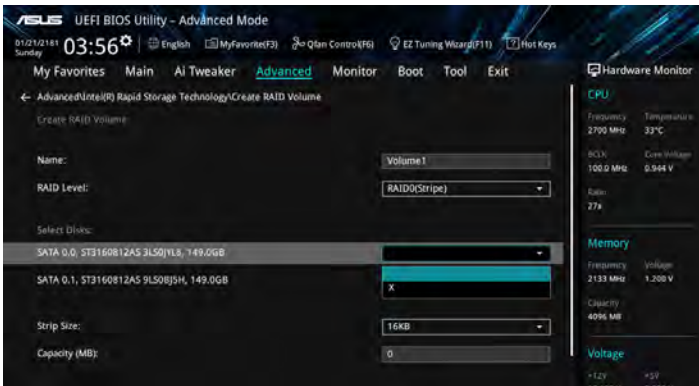
5.	When the **Strip Size** item is selected, press <Enter> to select strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:

-	RAID 0: 128 KB

-	RAID 10: 64 KB

-	RAID 5: 64 KB

> We recommend a lower strip size for server systems, and a higher strip size for multimedia computer systems used mainly for audio and video editing.

6.	When the **Capacity (MB)** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.

7.	When the **Create Volume** item is selected, press <Enter> to create the RAID volume and return to the Intel® Rapid Storage Technology menu.
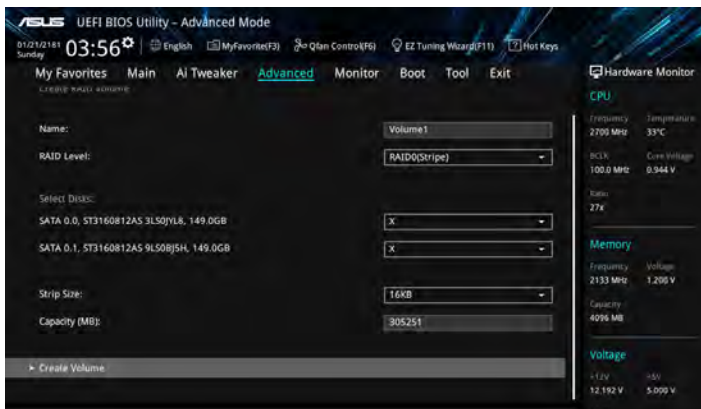
Deleting a RAID set

![warning icon] Be cautious when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.
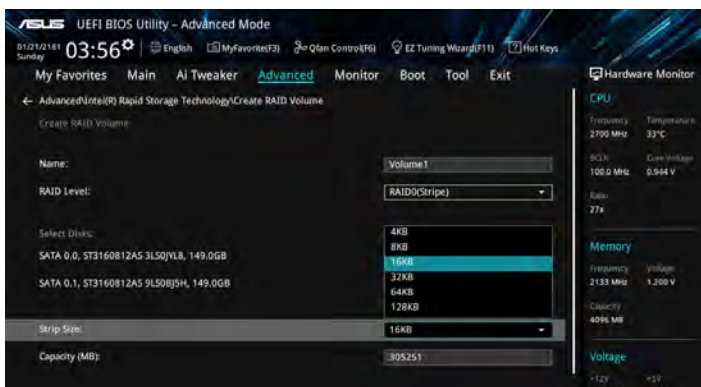
To delete a RAID set:

1. From the Intel® Rapid Storage Technology menu, select the RAID volume you want to delete and press <Enter>. The following screen appears:
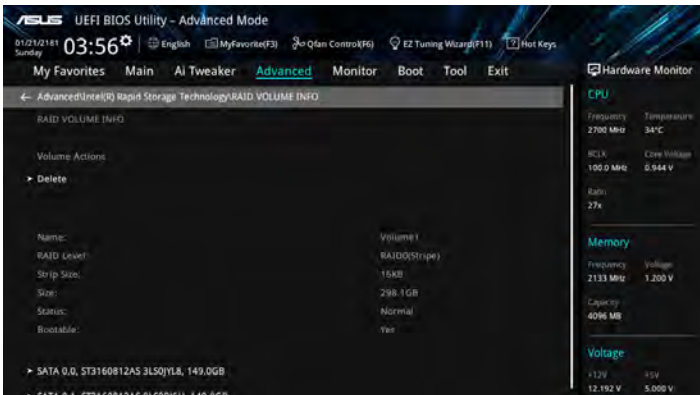
2. When the **Delete** item is selected, press <Enter>, then select **Yes** to delete the RAID volume and return to the Intel® Rapid Storage Technology menu, or select **No** to cancel.
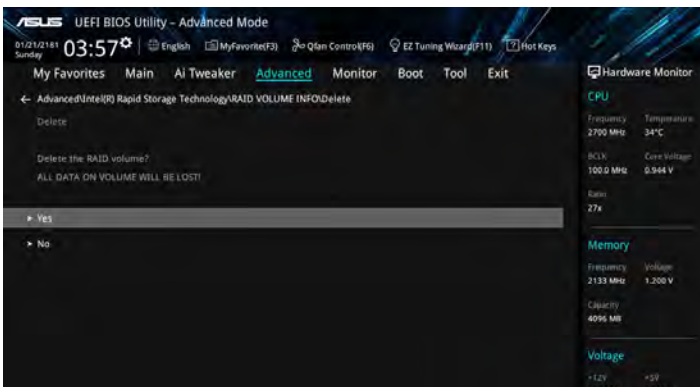
4.1.4   Intel® Rapid Storage Technology Option ROM utility

To enter the Intel® Rapid Storage Technology Option ROM utility:

1.   Turn on the system.

2.   During POST, press <Ctrl> + <I> to display the utility main menu.

```
          Intel(R) Rapid Storage Technology - Option - v10.5.1.1070
          Copyright(C) 2003-14 Intel Corporation. All Rights Reserved.

  ═══════════════════════ [ MAIN MENU ] ═══════════════════════
    1.   Create RAID Volume           4.   Recovery Volume Options
    2.   Delete RAID Volume           5.   Acceleration Options
    3.   Reset Disks to Non-RAID      6.   Exit

  ══════════════════ [ DISK/VOLUME INFORMATION ] ══════════════════
  RAID Volumes:
  None defined.

  Physical Devices:
  Port   Device Model   Serial #       Size        Type/Status(Vol ID)
  0      ST3160812AS    9LS0HJA4       149.0GB     Non-RAID Disk
  1      ST3160812AS    9LS0F4HL       149.0GB     Non-RAID Disk
  2      ST3160812AS    3LS0JYL8       149.0GB     Non-RAID Disk
  3      ST3160812AS    9LS0BJ5H       149.0GB     Non-RAID Disk


[↑↓]-Select            [ESC]-Exit            [ENTER]-Select Menu
```

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

> The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.
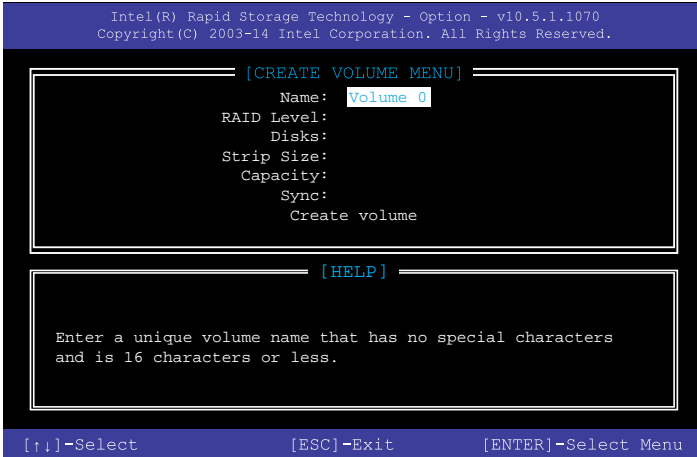
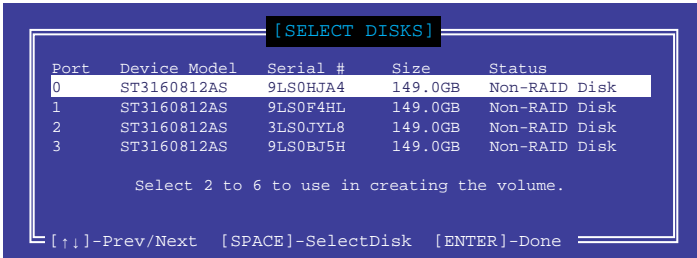> The utility supports maximum four hard disk drives for RAID configuration.

Creating a RAID set

To create a RAID set:

1. From the utility main menu, select **1. Create RAID Volume** and press <Enter>. The following screen appears:

```
        Intel(R) Rapid Storage Technology - Option - v10.5.1.1070
        Copyright(C) 2003-14 Intel Corporation. All Rights Reserved.

  ═══════════════════════ [CREATE VOLUME MENU] ═══════════════════════
                          Name:   Volume 0
                    RAID Level:
                         Disks:
                    Strip Size:
                      Capacity:
                          Sync:
                           Create volume

  ═══════════════════════════════ [HELP] ═══════════════════════════════

     Enter a unique volume name that has no special characters
     and is 16 characters or less.



 [↑↓]-Select              [ESC]-Exit              [ENTER]-Select Menu
```

2. Enter a name for the RAID set and press <Enter>.

3. When the RAID Level item is selected, press the up/down arrow key to select a RAID level to create, and then press <Enter>.

4. When the Disks item is selected, press <Enter> to select the hard disk drives you want to include in the RAID set. The SELECT DISKS screen appears:

```
                      ═══════ [SELECT DISKS] ═══════
  ═══════════════════════════════════════════════════════════════════
   Port   Device Model   Serial #     Size      Status
   0      ST3160812AS    9LS0HJA4     149.0GB   Non-RAID Disk
   1      ST3160812AS    9LS0F4HL     149.0GB   Non-RAID Disk
   2      ST3160812AS    3LS0JYL8     149.0GB   Non-RAID Disk
   3      ST3160812AS    9LS0BJ5H     149.0GB   Non-RAID Disk

          Select 2 to 6 to use in creating the volume.

  ═ [↑↓]-Prev/Next  [SPACE]-SelectDisk  [ENTER]-Done ═
```

5.	Use the up/down arrow key to select a drive, and then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

6.	Use the up/down arrow key to select the strip size for the RAID array (for RAID 0, 10 and 5 only), and then press <Enter>. The available strip size values range from 4 KB to 128 KB. The following are typical values:

	-	RAID 0: 128 KB

	-	RAID 10: 64 KB

	-	RAID 5: 64 KB

> We recommend a lower strip size for server systems, and a higher strip size for multimedia computer systems used mainly for audio and video editing.

7.	When the **Capacity** item is selected, enter the RAID volume capacity that you want and press <Enter>. The default value indicates the maximum allowed capacity.

8.	When the **Create Volume** item is selected, press <Enter>. The following warning message appears:

```
WARNING:  ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N)
```

9.	Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the CREATE VOLUME menu.
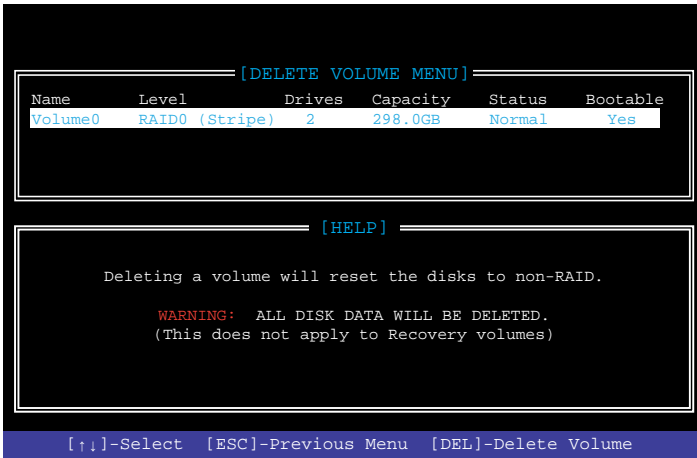
Deleting a RAID set

⚠️ Be cautious when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the utility main menu, select **2. Delete RAID Volume** and press <Enter>. The following screen appears:

```
                        ═══[DELETE VOLUME MENU]═══
   Name          Level         Drives  Capacity    Status    Bootable
   Volume0     RAID0 (Stripe)    2      298.0GB     Normal      Yes




                            ═══[HELP]═══

        Deleting a volume will reset the disks to non-RAID.

             WARNING:  ALL DISK DATA WILL BE DELETED.
             (This does not apply to Recovery volumes)



      [↑↓]-Select  [ESC]-Previous Menu  [DEL]-Delete Volume
```

2. Use the up/down arrow key to select the RAID set you want to delete, and then press <Delete>. The following warning message appears:

```
                 ═══[DELETE VOLUME VERIFICATION]═══
            ALL DATA IN THE VOLUME WILL BE LOST!
           (This does not apply to Recovery volumes)

      Are you sure you want to delete "Volume0"? (Y/N):
```
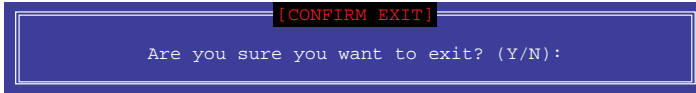
3. Press <Y> to delete the RAID set and return to the utility main menu, or press <N> to return to the DELETE VOLUME menu.

Exiting the Intel® Rapid Storage Technology Option ROM utility

To exit the utility:

1. From the utility main menu, select **6. Exit**, then press <Enter>. The following warning message appears:

```
                         [CONFIRM EXIT]
          Are you sure you want to exit? (Y/N):
```

2. Press <Y> to exit or press <N> to return to the utility main menu.

4.2   Creating a RAID driver disk

4.2.1   Creating a RAID driver disk in Windows®

To install the RAID driver for Windows® OS:

1. During the OS installation, click **Load Driver** to allow you to select the installation media containing the RAID driver.

2. Insert the USB flash drive with RAID driver into the USB port or the support DVD into the optical drive, and then click **Browse**.

3. Click the name of the device you've inserted, go to **Drivers** > **RAID**, and then select the RAID driver for the corresponding OS version. Click **OK**.

4. Follow the succeeding screen instructions to complete the installation.

> Before loading the RAID driver from a USB flash drive, you have to use another computer to copy the RAID driver from the support DVD to the USB flash drive.

> To set up a Windows® UEFI operating system under RAID mode, ensure to load the UEFI driver for your optical drive.