RAID Configuration

Workstation W60 Rev5

RAID Support

RAID Support

4.1　RAID configurations

The motherboard supports Intel® Rapid Storage Technology enterprise Option ROM Utility with RAID 0, RAID 1, RAID 10, and RAID 5 support.

> 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 stripes 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 Serial ATA hard disks

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

To install the SATA hard disks for a RAID configuration:

1. Install the SATA hard disks into the drive bays.

2. Connect the SATA signal cables.

3. Connect a SATA power cable to the power connector on each drive.

4.1.3 Setting the RAID item in BIOS

You must set the RAID item in the BIOS Setup before you can create a RAID set from SATA hard disk drives attached to the SATA connectors supported by Intel® C621 chipset.

To do this:

1. Enter the BIOS Setup during POST.

2. Go to the **Platform Configuration** menu > **PCH Configuration** menu > **PCH SATA Configuration**, then press <Enter>.

3. Set **Configure SATA as** to **[RAID Mode]**.

4. Press <F10> to save your changes and exit the BIOS Setup.

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

4.1.4 RAID configuration utilities

Depending on the RAID connectors that you use, you can create a RAID set using the utilities embedded in each RAID controller. For example, use the Intel® Rapid Storage Technology if you installed Serial ATA hard disk drives on the Serial ATA connectors supported by the Intel® C621 chipset.

Refer to the succeeding section for details on how to use the RAID configuration utility.

4.2 Intel® Rapid Storage Technology enterprise SATA/SSATA Option ROM Utility

The Intel® Rapid Storage Technology enterprise SATA/SSATA Option ROM utility allows you to create RAID 0, RAID 1, RAID 10 (RAID 1+0), and RAID 5 set from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

> Before you proceed, ensure that you have installed the Serial ATA hard disk drives, and have set the correct SATA mode in the BIOS setup. You can refer to the **Installing hard disk drives**, and **Setting the RAID mode** sections in this manual for more information.

To launch the Intel® Rapid Storage Technology enterprise SATA/SSATA 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 enterprise - SATA Option ROM - 3.6.0.1023
       Copyright(C) 2003-12 Intel Corporation.  All Rights Reserved.
========================[ MAIN MENU ]========================
        1. Create RAID Volume            3. Reset Disks to Non-RAID
        2. Delete RAID Volume            4. Exit

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

    Physical Disks:
    ID  Drive Model   Serial #            Size    Type/Status(Vol ID)
    0   ST3300656SS   HWAS0000991753TR    279.3GB   Non-RAID Disk
    1   ST3300656SS   37VN00009846RAJ1    279.3GB   Non-RAID Disk
    2   ST3300656SS   3976000009846UEDY   279.3GB   Non-RAID Disk
    3   ST3300656SS   GWC50000991756G6    279.3GB   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.
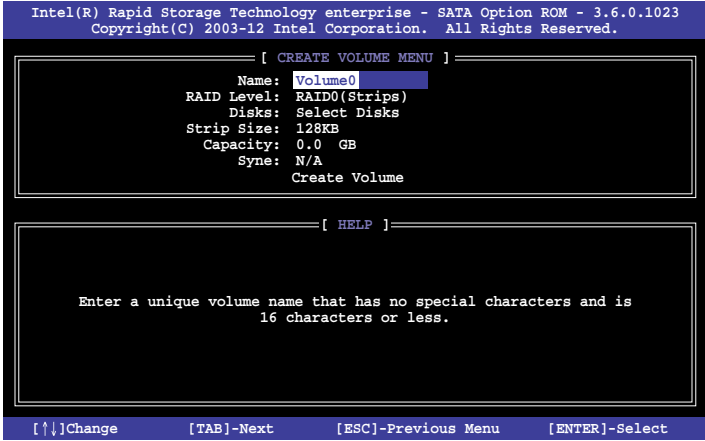
> The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.
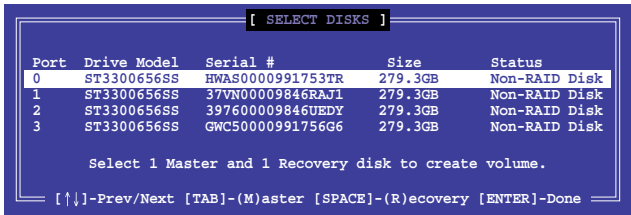
4.2.1   Creating a RAID set

To create a RAID set:

1.   From the utility main menu, select **1. Create RAID Volume** and press <Enter>.

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

```
     Intel(R) Rapid Storage Technology enterprise - SATA Option ROM - 3.6.0.1023
           Copyright(C) 2003-12 Intel Corporation.  All Rights Reserved.
    ══════════════════════[ CREATE VOLUME MENU ]══════════════════════
                          Name:  Volume0
                    RAID Level:  RAID0(Strips)
                         Disks:  Select Disks
                    Strip Size:  128KB
                      Capacity:  0.0  GB
                          Syne:  N/A
                               Create Volume

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



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




     [↑↓]Change         [TAB]-Next         [ESC]-Previous Menu      [ENTER]-Select
```

3.   Press the up/down arrow keys to select a RAID Level that you wish to create then
      press <Enter>.

4.   From the **Disks** item field, press <Enter> to select the hard disk drives that you want to
      include in the RAID set.

```
    ══════════════════════════[ SELECT DISKS ]══════════════════════════

    Port  Drive Model    Serial #             Size       Status
    0     ST3300656SS    HWAS0000991753TR     279.3GB    Non-RAID Disk
    1     ST3300656SS    37VN00009846RAJ1     279.3GB    Non-RAID Disk
    2     ST3300656SS    397600009846UEDY     279.3GB    Non-RAID Disk
    3     ST3300656SS    GWC50000991756G6     279.3GB    Non-RAID Disk

          Select 1 Master and 1 Recovery disk to create volume.

    ══ [↑↓]-Prev/Next [TAB]-(M)aster [SPACE]-(R)ecovery [ENTER]-Done ══
```

5.   Use the up/down arrow keys to move the selection bar then press <Space> to select a
      disk. A small triangle before the Port number marks the selected drive. Press <Enter>
      when you are done.

6.   Use the up/down arrow keys to select the stripe size for the RAID array (for RAID 0, 10 and 5 only) then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The following are typical values:
RAID 0:   128KB
RAID 10:   64KB
RAID 5:   64KB

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

7.   In the **Capacity** field item, key in the RAID volume capacity that you want to use and press <Enter>. The default value field indicates the maximum allowed capacity.

8.   Press <Enter> to start creating the RAID volume.

9.   From the following warning message, press <Y> to create the RAID volume and return to the main menu, or press <N> to go back to the **CREATE VOLUME** menu.

```
        WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

      Are you sure you want to create this volume? (Y/N):
```

4.2.2   Deleting a RAID set

⚠ Take caution 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>.

2.   From the Delete Volume Menu, press the up/down arrow keys to select the RAID set you want to delete then press <Del>.

```
   Intel(R) Rapid Storage Technology enterprise - SATA Option ROM - 3.6.0.1023
           Copyright(C) 2003-12 Intel Corporation.  All Rights Reserved.
  ─────────────────────────[ 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
```

3.   Press <Y> to confirm deletion of the selected RAID set and return to the utility main menu, or press <N> to return to the **DELETE VOLUME** menu.

```
  ════════════════[ 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 volume "Volume0"? (Y/N):
```

4.2.3   Resetting disks to Non-RAID

⚠ Take caution before you reset a RAID volume hard disk drive to non-RAID. Resetting a RAID volume hard disk drive deletes all internal RAID structure on the drive.

To reset a RAID set:

1.   From the utility main menu, select **3. Reset Disks to Non-RAID** and press <Enter>.

2.   Press the up/down arrow keys to select the drive(s) or disks of the RAID set you want to reset, then press <Space>. A small triangle before the Port number marks the selected drive. Press <Enter> when you are done.

```
================[ RESET RAID DATA ]================
        Resetting RAID disk will remove its RAID structures
        and revert it to a non-RAID disk.

WARNING: Resetting a disk causes all data on the disk to be lost.
(This does not apply to Recovery volumes)

Port  Drive Model   Serial #              Size      Status
0     ST3300656SS   HWAS0000991753TR      279.3GB   Member Disk
1     ST3300656SS   37VN00009846RAJ1      279.3GB   Member Disk

            Select the disks that should be reset.

===== [↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete =====
```

3.   Press <Y> in the confirmation window to reset the drive(s) or press <N> to return to the utility main menu.

4.2.4   Exiting the Intel® Rapid Storage Technology enterprise SATA/SSATA Option ROM utility

To exit the utility:

1.   From the utility main menu, select **4. Exit** then press <Enter>.

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

```
===============[ CONFIRM EXIT ]===============

            Are you sure you want to exit? (Y/N):

```

4.2.5 Rebuilding the RAID

This option is only for the RAID 1 set.

Rebuilding the RAID with other non-RAID disk

If any of the SATA hard disk drives included in the RAID 1 array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You can rebuild the RAID array with other installed non-RAID disks.

To rebuild the RAID with other non-RAID disk:

1. During POST, press <Ctrl>+<I> at the prompt to enter the Intel Rapid Storage Technology option ROM utility.

2. If there is a non-RAID SATA Hard Disk available, the utility will prompt you to rebuild the RAID. Press the up/down arrow keys to select the destination disk then press <Enter> to start the rebuilding process, or press <ESC> to exit.

```
======================[ DEGRADED VOLUME DETECTED ]======================

  "Degraded" volume and disk available for rebuilding detected. Selectign
  a disk initiates a rebuild. Rebuild completes in the operating system.

    Select the port of destination disk for rebuilding (ESC to exit):
    Port  Drive Model   Serial #               Size
    X     XXXXXXXXXXX   XXXXXXXX               XXX.GB


=================[↑↓]-Previous/Next [ENTER]-Select [ESC]-Exit=================
```

Select a destination disk with the same size as the original hard disk.

3. The utility immediately starts rebuilding after the disk is selected. When done, the status of the degraded RAID volume is changed to **"Rebuild"**.

```
Intel(R) Rapid Storage Technology enterprise - SATA Option ROM - 3.6.0.1023
         Copyright(C) 2003-12 Intel Corporation.  All Rights Reserved.
================================[ MAIN MENU ]================================
         1. Create RAID Volume          3. Reset Disks to Non-RAID
         2. Delete RAID Volume          4. Exit

=========================[ DISK/VOLUME INFORMATION]=========================
   RAID Volumes:                                    *=Data is Encrypted
   ID    Name     Level1        Strip        Size   Status     Bootable
   1     Volume0  RAID1(Mirror) N/A        149.0GB   Rebuild    Yes

   Physical Devices:
   Port  Drive Model   Serial #            Size     Type/Status(Vol ID)
   1     ST3160812AS   9LS0F4HL          149.0GB    Member Disk(0)
   2     ST3160812AS   3LS0JYL8          149.0GB    Member Disk(0)



 Volumes with "Rebuild" status will be rebuilt within the operating system.

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

4. Press <Esc> to exit Intel Rapid Storage Technology and reboot the system.

5. Select **Start > Programs > Intel Rapid Storage > Intel Rapid Storage Console** or click the **Intel Rapid Storage Technology** tray icon to load the Intel Rapid Storage Manager utility.

6. From the **View** menu, select **Advanced Mode** to display the details of the Intel Rapid Storage Console.

7. From the **Volumes view** option, select **RAID volume** to view the rebuilding status. When finished, the status is changed to "**Normal**".

Rebuilding the RAID with a new hard disk

If any of the SATA hard disk drives included in the RAID array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You may replace the disk drive and rebuild the RAID array.

To rebuild the RAID with a new hard disk:

1. Remove the failed SATA hard disk and install a new SATA hard disk of the same specification into the same SATA Port.

> Select a destination disk with the same size as the original hard disk.

2. Reboot the system then follow the steps in section **Rebuilding the RAID with other non-RAID disk**.

4.2.6　Setting the Boot array in the BIOS Setup Utility

You can set the boot priority sequence in the BIOS for your RAID arrays when creating multi-RAID using the Intel® Rapid Storage Technology enterprise SATA Option ROM utililty.

To set the boot array in the BIOS:

Set at least one of the arrays bootable to boot from the hard disk.

1.　Reboot the system and press <Del> to enter the BIOS setup utility during POST.

2.　Go to the **Boot** menu and select the boot option priority.

3.　Use up/down arrow keys to select the boot priority and press <Enter>. See the **Boot menu** section of Chapter 5 for more details.

4.　From the **Exit** menu, select **Save Changes & Exit**, then press <Enter>.

5.　When the confirmation window appears, select **Yes**, then press <Enter>.

4.3 Intel® Rapid Storage Technology enterprise (Windows)

The Intel® Rapid Storage Technology enterprise allows you to create RAID 0, RAID 1, RAID 10 (RAID 1+0), and RAID 5 set(s) from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

You need to manually install the Intel® Rapid Storage Technology enterprise utility on a Windows® operating system.

To enter the Intel® Rapid Storage Technology enterprise utility under Windows operating system:

1. Turn on the system and go to the windows desktop.

2. Click the **Intel® Rapid Storage Technology enterprise** icon to display the main menu.

   Your storage system is configured for data protection, increased performance and optimal data storage capacity. You can create additional volumes to further optimize your storage system.
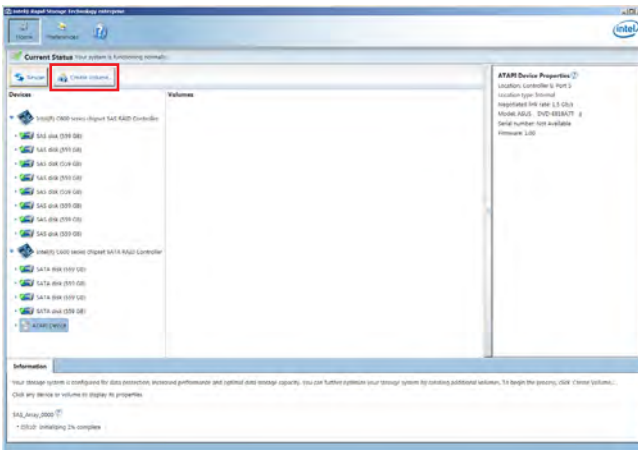
You can click **Rescan** to re-scan any attached hard disks.

4.3.1   Creating a RAID set

To create a RAID set:

1.   From the utility main menu, select **Create Volume** and select volume type.

2.   Click **Next**.
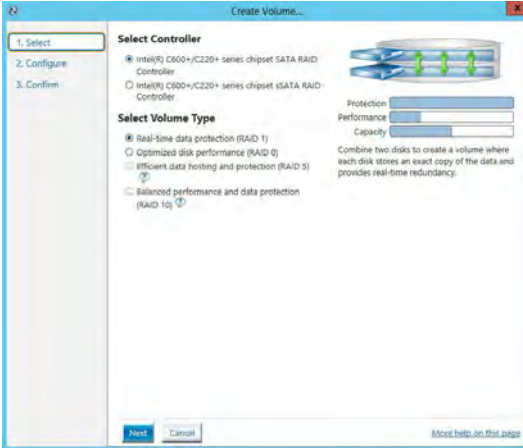
3.   Enter a name for the RAID set, then select the array disks.

4.   Select **Volume Size** tab, you can drag the bar to decide the volume size.

5.   Click **Next**.
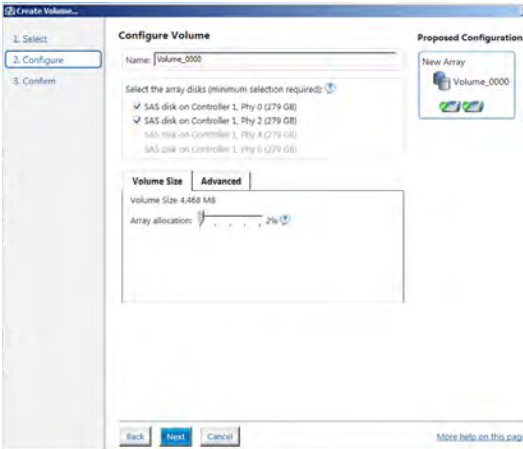
•   If you do not want to keep the data on one of the selected disks, select NO when prompted.

•   If you want to **Enable volume write-back cache** or **Initialize volume**, click **Advanced**.

6. Confirm the volume creation, than click **Create Volume** to continue.

> This process could take a while depending on the number and size of the disks. You can continue using other applications during this time.
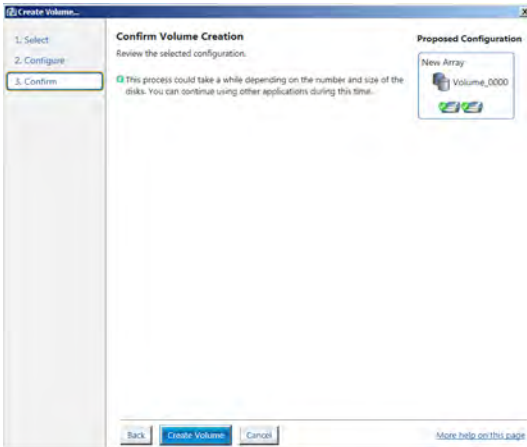
7. Wait until the process is completed, then click **OK** when prompted.
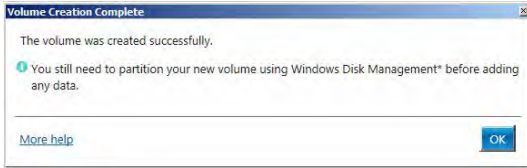
> You still need to partition your new volume using Windows Disk Management before adding any data.

The RAID set is displayed in the **Volumes** list and you can change the settings in **Volume Properties**.
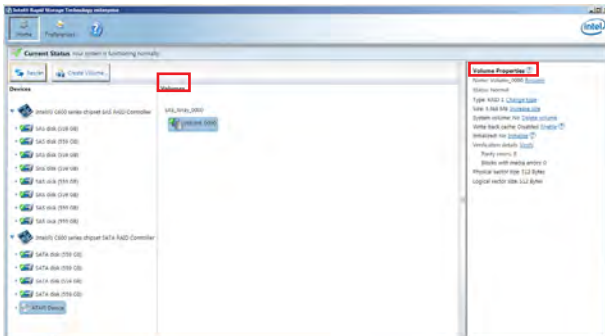
4.3.2 Changing a Volume Type

To change the volume type in **Volume Properties**:

1. Click the SATA array items you want to change in **Volumes** field.

2. From the **Volume Properties** field, select **Type: RAID 1 Change type**.
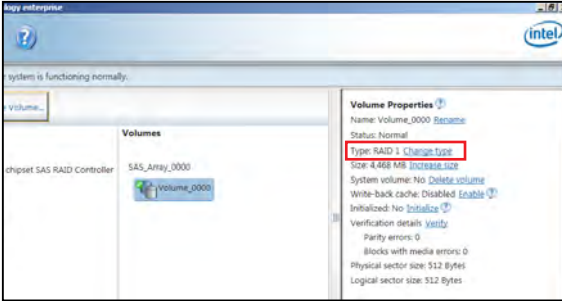
3. You can change the **Name**, **Select the new volume type**, and **Select additional disks to include in the new volume** if needed.

4. Select the **Data stripe size** for the RAID array (for RAID 0, 10 and 5 only), and click **OK**. The available stripe size values range from 4 KB to 128 KB. The following are typical values:
   RAID 0:   128KB
   RAID 10:   64KB
   RAID 5:   64KB
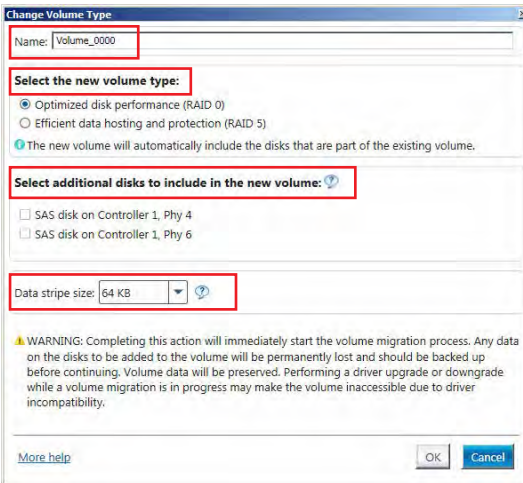
We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

4.3.3 Deleting a volume

⚠️ Be cautious when deleting a volume. You will lose all data on the hard disk drives. Before you proceed, ensure that you back up all your important data from your hard drives.

To delete a volume:

1. From the utility main menu, select the volume (ex. Volume_0000) in **Volumes** field you want to delete.
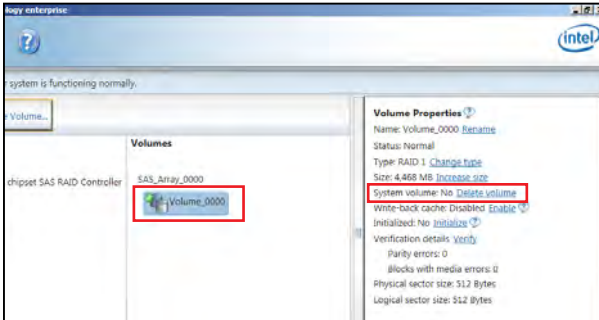
2. Select **Delete volume** in **Volume Properties** field. The following screen appears.
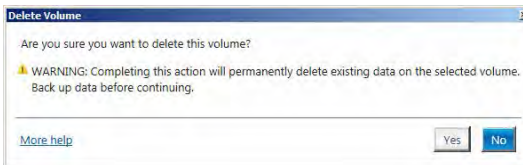
3. Click **Yes** to delete the volume and return to the utility main menu, or click **No** to return to the main menu.

4.3.4   Preferences

System Preferences

Allow you to set to show the notification area icon and show system information, warning, or errors here.
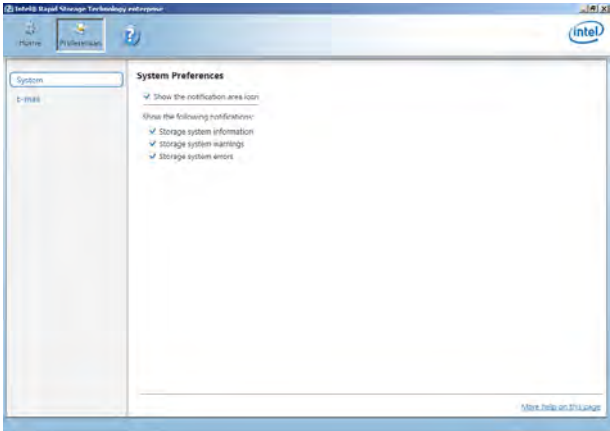
E-Mail Preferences

Allow you to set to sent e-mail of the following events:

- Storage system information

- Storage system warnings

- Storage system errors
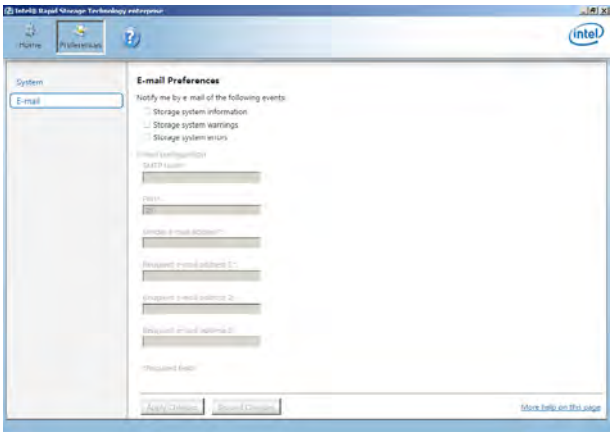
4.4 Intel® Virtual Raid on CPU in BIOS

This feature requires a KEY module to enable CPU RAID functions with Intel® CPU RSTe.

- The KEY module is purchased separately.

- Due to chipset behavior, CPU RAID functions with Intel® CPU RSTe only supports Intel® Core™ X-series Processors (6-core or above) and Intel® SSD modules.

- Refer to section **1.1.9 Internal connectors** for the location of the VROC_HW_KEY connector.

Due to hardware design, your motherboard does not support CPU RAID configurations as OS drives.

To enter the Intel® Virtual Raid on CPU in BIOS:

1.   Enter the BIOS Setup during POST.

2.   Go to the **Advanced** menu > **Intel(R) Virtual Raid on CPU** > **All Intel VMD Controllers** then press <Enter> to display the Intel® Virtual Raid on CPU 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.

```
               Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
       Advanced

   All Intel VMD Controllers                        This page allows you to create
                                                    a RAID volume
 ▶ Create RAID Volume


   Non-RAID Physical Disks:
 ▶ Port 0, VMD0, INTEL SSDPE2MX400G4 SN:CVPD6212006W400NGN,...
 ▶ Port 1, VMD0, INTEL SSDPE2MX400G4 SN:CVPD6212008H400NGN,...
 ▶ Port 2, VMD0, INTEL SSDPE2MX400G4 SN:CVPD6212004T400NGN,...
 ▶ Port 3, VMD0, INTEL SSDPE2MX400G4 SN:CVPD621200D5400NGN,...




                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F5: Optimized Defaults
                                                    F10: Save Changes & Reset
                                                    F12: Print Screen
                                                    ESC: Exit
```

4.4.1 Creating a RAID set

To create a RAID set:

1. From the Intel® Virtual Raid on CPU menu, select **Create RAID Volume** and press <Enter>. The following screen appears:

```
            Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
            Advanced

  Create RAID Volume                                            Select RAID Level

  Name:                              Volume0
  RAID Level:                        [RAID0(Stripe)]
  Enable RAID spanned over VMD Contr  [ ]

  Select Disks:
  Port 0, VMD0, INTEL SSDPE2MX400G4   [ ]
  Port 1, VMD0, INTEL SSDPE2MX400G4   [ ]
  Port 2, VMD0, INTEL SSDPE2MX400G4   ┌──── RAID Level: ────┐
  Port 3, VMD0, INTEL SSDPE2MX400G4   │ RAID0(Stripe)       │
                                      │ RAID1(Mirror)       │
  Strip Size:                         │ RAID5(Parity)       │
  Capacity (MB):                      │ RAID10(RAID0+1)     │
                                      └─────────────────────┘
▶ Create Volume                                              ↑↓: Select Screen
                                                            ↑↓: Select Item
  Select at least two disks                                 Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F5: Optimized Defaults
                                                            F10: Save Changes & Reset
                                                            F12: Print Screen
                                                            ESC: Exit
```

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. When the **Enable RAID spanned over VMD Controllers** item is selected, press <Enter> and select **X** to enable this function.

5. Under Select Disks, press <Enter> and select **X** for the disks you want to include in the RAID set.

6. 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.

7. 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.

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

```
              Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
          Advanced

    Create RAID Volume                                      Create a volume with the
                                                            settings specified above
    Name:                               Volume0
    RAID Level:                         [RAID5(Parity)]
    Enable RAID spanned over VMD Contr  [X]

    Select Disks:
    Port 0, VMD0, INTEL SSDPE2MX400G4   [X]
    Port 1, VMD0, INTEL SSDPE2MX400G4   [X]
    Port 2, VMD0, INTEL SSDPE2MX400G4   [X]
    Port 3, VMD0, INTEL SSDPE2MX400G4   [X]

    Strip Size:                         [128KB]
    Capacity (MB):                      1087416              ++: Select Screen
    RWH Policy                          [Disable]            ↑↓: Select Item
                                                             Enter: Select
  ▶ Create Volume                                            +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F5: Optimized Defaults
                                                             F10: Save Changes & Reset
                                                             F12: Print Screen
                                                             ESC: Exit
```

4.4.2 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 Intel® Virtual Raid on CPU menu, select the RAID volume you want to delete and press <Enter>. The following screen appears:
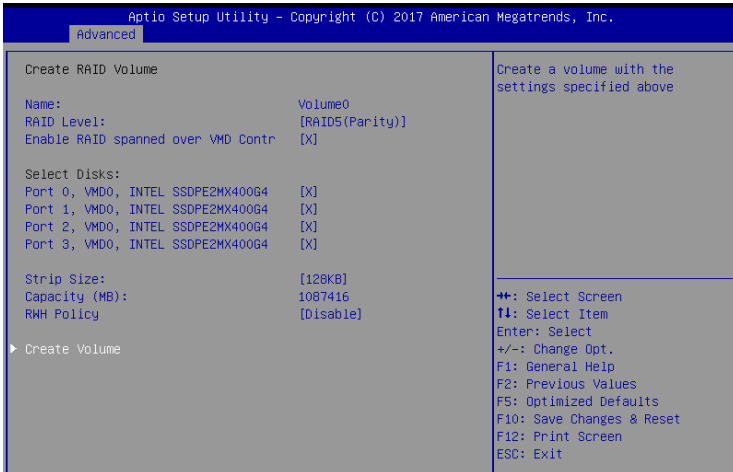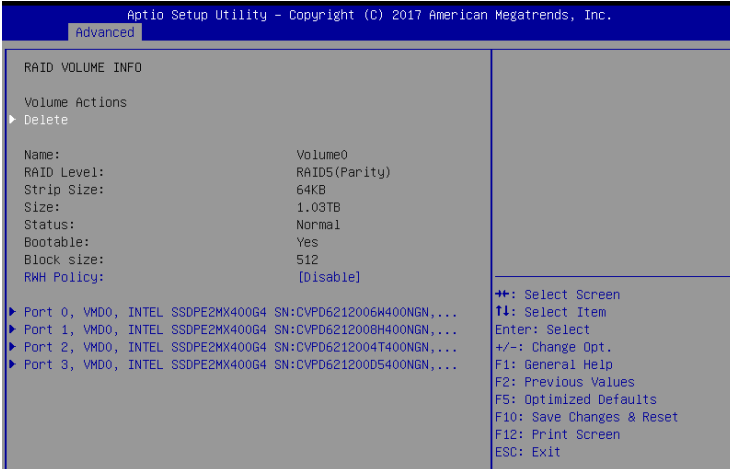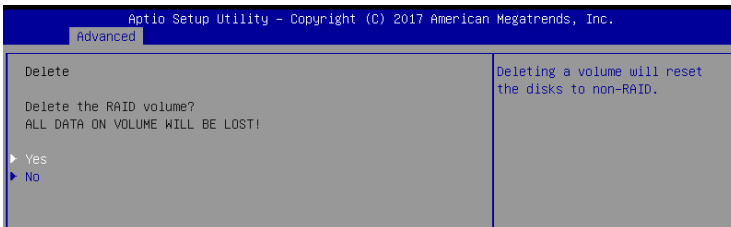
```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
      Advanced

   RAID VOLUME INFO

   Volume Actions
 ▶ Delete

   Name:                          Volume0
   RAID Level:                    RAID5(Parity)
   Strip Size:                    64KB
   Size:                          1.03TB
   Status:                        Normal
   Bootable:                      Yes
   Block size:                    512
   RWH Policy:                    [Disable]
                                                      ←→: Select Screen
 ▶ Port 0, VMD0, INTEL SSDPE2MX400G4 SN:CVPD6212006W400NGN,...   ↑↓: Select Item
 ▶ Port 1, VMD0, INTEL SSDPE2MX400G4 SN:CVPD6212008H400NGN,...   Enter: Select
 ▶ Port 2, VMD0, INTEL SSDPE2MX400G4 SN:CVPD6212004T400NGN,...   +/-: Change Opt.
 ▶ Port 3, VMD0, INTEL SSDPE2MX400G4 SN:CVPD621200D5400NGN,...   F1: General Help
                                                      F2: Previous Values
                                                      F5: Optimized Defaults
                                                      F10: Save Changes & Reset
                                                      F12: Print Screen
                                                      ESC: Exit
```

2. When the **Delete** item is selected, press <Enter>, then select **Yes** to delete the RAID volume and return to the Intel® Virtual Raid on CPU menu, or select **No** to cancel.

```
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        Advanced

   Delete                                        Deleting a volume will reset
                                                 the disks to non-RAID.
   Delete the RAID volume?
   ALL DATA ON VOLUME WILL BE LOST!

 ▶ Yes
 ▶ No
```
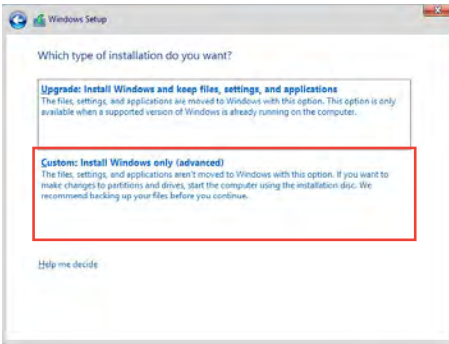
4.4.3 Installing the RAID controller driver during Windows® 10 OS installation

After creating the RAID sets, you are now ready to install an operating system to the independent drives or bootable array. This part provides the instructions on how to install the RAID controller drivers during OS installation.

To install the RAID controller driver when installing Windows® 10 OS:

1. Boot the computer using the Windows® 10 OS installation disc. Follow the screen instructions to start installing Windows® 10.

2. When prompted to choose a type of installation, click **Custom: Install Windows only (advanced)**.


3. Click **Load Driver**.
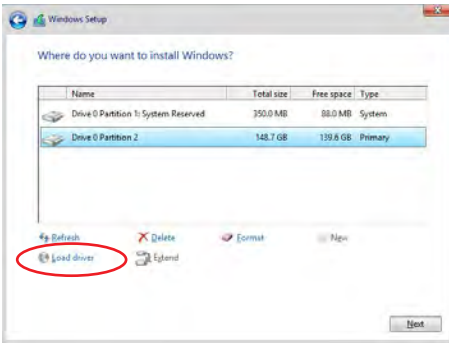
4.   A message appears, reminding you to insert the installation media containing the driver of the RAID controller driver. If you have only one optical drive installed in your system, eject the Windows OS installation disc and replace with the motherboard Support DVD into the optical drive. Click **Browse** to continue.

5.   Locate the driver in the corresponding folder of the support DVD then click **OK** to continue.

6.   Select the RAID controller driver you need from the list and click **Next**.

7.   When the system finishes loading the RAID driver, replace the motherboard Support DVD with the Windows Server installation disc. Select the drive to install Windows and click **Next**.
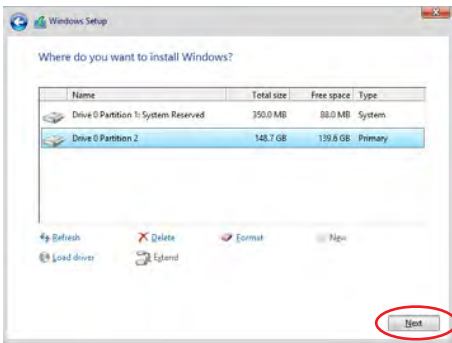
8.   Setup then proceeds with the OS installation. Follow screen instructions to continue.