Intel ICH7R/ICH9R HostRAID Setup Guidelines

After all the hardware has been installed, you must first configure the Intel SATA HostRAID before you install the Windows Operating System and other software drivers.

✏️ Important Notes to the User

1. If you do not wish to configure onboard SATA RAID functions, please go directly to Section 2 or Section 3 for the operating system installation instructions.

2. This chapter describes RAID Configuration Instructions for the Intel ICH7R/ICH9R Host RAID Controller designed for the Windows OS. To configure the Adaptec HostRAID for your motherboard, please refer to the Adaptec folder on the CD that came with your board, and documentation on our web site @ www.supermicro.com.

3. The Windows 2000 OS is not supported by ICH9R SATA RAID.

1 Introduction to Serial ATA and Parallel ATA

To configure the SATA RAID functions, you must first use the Intel ICH7R/ICH9R SATA RAID Utility program to configure the RAID Level that you desire before installing the Windows XP/2000/2003 operating system and other software drivers. The necessary drivers are all included in the Supermicro CD that came packaged with your motherboard. Please note that the current version of the ICH7R SATA RAID utility supports Windows XP/2000/2003 Operating Systems. However, the ICH9R SATA RAID can only support Windows XP and 2003 Operating Systems.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface that uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link, which supports transfer rates up to 3.0 Gbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis. In addition, the cables used in PATA are limited to a length of 40cm, while Serial ATA cables can be up to one meter in length. Overall, SATA provides better functionality than PATA.

Introduction to the Intel ICH7R/ICH9R Serial RAID

Located in the South Bridge of an Intel chipset, the I/O Controller Hub (ICH7R/ICH9R) provides the I/O subsystem with access to the rest of the system. It supports 1-channel Ultra ATA/100 Bus Master IDE controller (PATA) and six Serial ATA (SATA) ports. The ICH7R/ICH9R supports the following PATA and SATA device configurations: the Legacy mode and the Native mode.

The Intel HostRAID Configurations

The following types of Intel's HostRAID configurations are supported:

- RAID 0 (Data Striping): this writes data in parallel, interleaved ("striped") sections of two hard drives. Data transfer rate is doubled over using a single disk.

- RAID1 (Data Mirroring): identical data from one drive is copied to another drive. The second drive must be the same size or larger than the first drive.

- RAID 10 (Striping & Mirroring): RAID 0 and 1 schemes are combined (without parity information) to get the benefits of both.

- RAID 5: both data and parity information are striped and mirrored across three or more hard drives.

Intel Matrix Storage

The Intel Matrix Storage Technology, supported by the ICH7R/ICH9R, allows the user to create RAID 0, RAID 1, RAID 10 and RAID 5 by using only six identical hard disk drives. The Intel Matrix Storage Technology creates two partitions on each hard disk drive, and generate a virtual RAID 0, RAID 1, RAID 10 and RAID 5 sets. It also allows you the change the HDD partition size without losing any data.

Configuring BIOS settings for SATA RAID Functions (-the Native Mode)

Press the <Del> key during system bootup to enter the BIOS Setup Utility.

1. Use the arrow keys to select the "Exit" Settings in the BIOS. Once in the "Exit" settings, Scroll down to select "Load Optimized Default Settings" and press the <Enter> key. Select "OK" to confirm the selection.

   Note: If it is the first time powering on the system, we recommend that you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the Main menu in the BIOS.

4. Scroll down to "SATA Controller Mode" and press the <Enter> key to select "Enhanced."

5. Scroll down to "SATA RAID Enabled" and press <Enter>. Then, select "Enabled."

6. Scroll down to "Exit". Select "Save and Exit" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

7. Once you've exited the BIOS Utility, the system will re-boot.

8. During the system bootup, press the <Ctrl> and <I> keys simultaneously to run the Intel RAID Configuration Utility when prompted by the following message: Press <Ctrl> <I> for the Intel RAID Configuration Utility.

> **Note: T**he Intel RAID Configuration Utility is only available for systems with two or more drives installed. The Intel RAID Utility screen will not display in systems with one drive installed.

```
RAID Volumes:
None defined.

Physical Disks:
Port Drive Model       Serial #              Size      Type/Status(Vol ID)
0    WDC WD2500SD-01K WD-WMAL72034971        232.9GB   Non-RAID Disk
1    WDC WD2500SD-01K WD-WMAL72034599        232.9GB   Non-RAID Disk
2    WDC WD2500JD-00F WD-WMAEH1376109        232.9GB   Non-RAID Disk
3    WDC WD2500JD-00F WD-WMAEH1449527        232.9GB   Non-RAID Disk

Press <CTRL-I> to enter Configuration Utility...

Adaptec SCSI BIOS v4.30.0
Copyright 2003 Adaptec, Inc. All Rights Reserved.

◄◄◄ Press <Ctrl><A> for SCSISelect(TM) Utility! ►►►

Slot Ch ID LUN  Vendor       Product           Size  Bus Status
_____

04  A  10  0
```

Using the Intel ICH7R/ICH9R SATA RAID Utility Program

Creating, Deleting and Resetting RAID Volumes

1. After the system exits from the BIOS Setup Utility, the system will automatically reboot. The following screen appears after Power-On Self Test (POST) routines.

2. When you see the above screen, press the <Ctrl> and the <I> keys simultane-
   ously. The main menu of the SATA RAID Utility will appear.

    Note: All graphics and screen shots shown in the manual are for refer-
    ence only. The screen shots shown in the manual do not imply Supermi-
    cro's endorsement or non-endorsement on any 3rd party products. Your
    screens may or many not look exactly the same as the graphics shown
    in this manual.

Creating a RAID 0 Volume
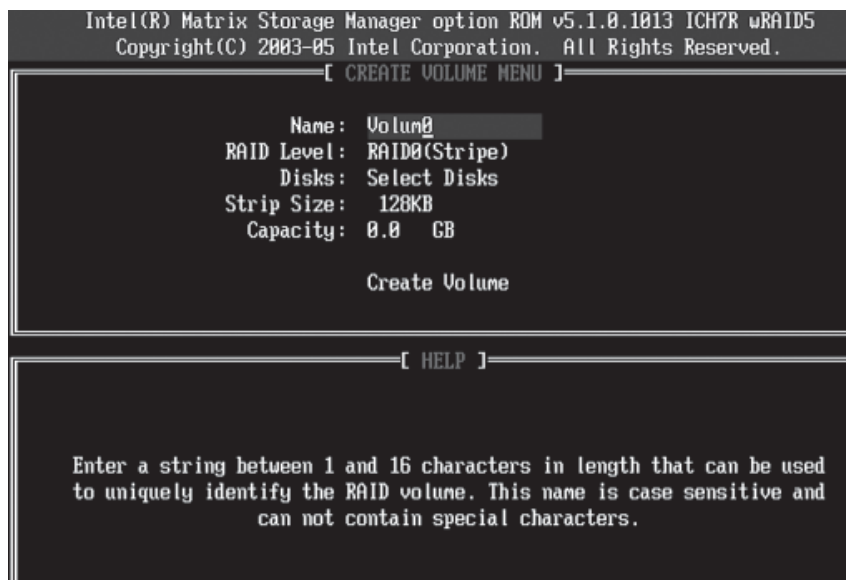
1. Select "Create RAID Volume" from the main menu and press the <Enter> key.
    The following screen will appear:

2. Specify a name for the RAID 0 set, and press the <Tab> key or the <Enter>
    key to go to the next field. (You can use the <Esc> key to select the previous
    menu.)

3. When the RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow>
    keys to select RAID 0 (Stripe) and hit <Enter>.
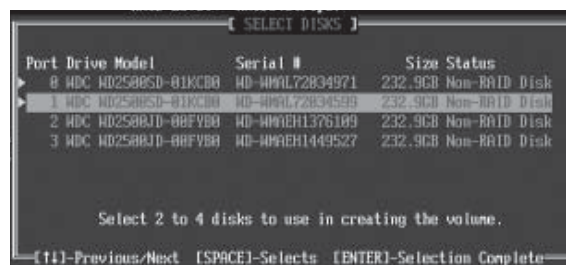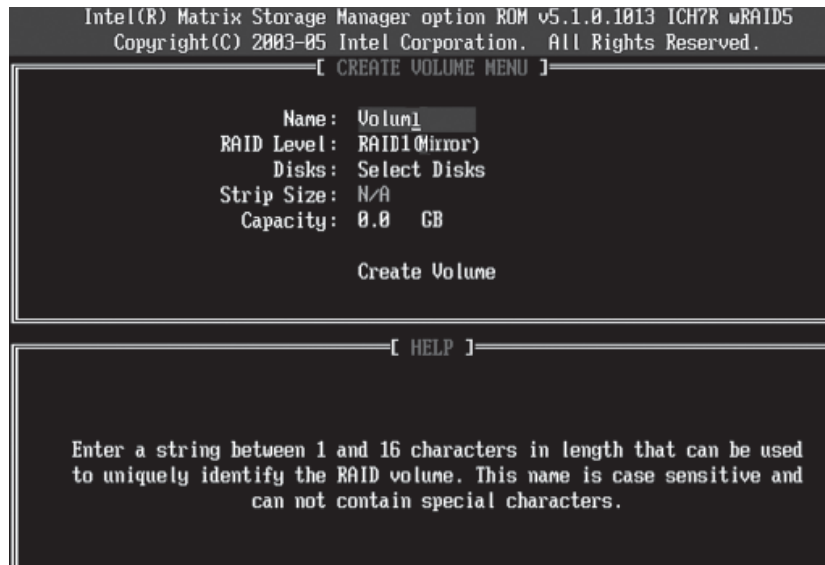
4. When the Disks item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen displays.

5. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

6. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranging from 4 KB to 128 KB for the RAID 0 array, and hit <Enter>.

   Note: For a server, please use a lower stripe size; for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.

7. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

8. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 1 Volume

```
Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
    Copyright(C) 2003-05 Intel Corporation.  All Rights Reserved.
                    =[ CREATE VOLUME MENU ]=

            Name:  Volum1
      RAID Level:  RAID1(Mirror)
           Disks:  Select Disks
      Strip Size:  N/A
        Capacity:  0.0   GB

                   Create Volume

                        =[ HELP ]=



    Enter a string between 1 and 16 characters in length that can be used
    to uniquely identify the RAID volume. This name is case sensitive and
                    can not contain special characters.
```
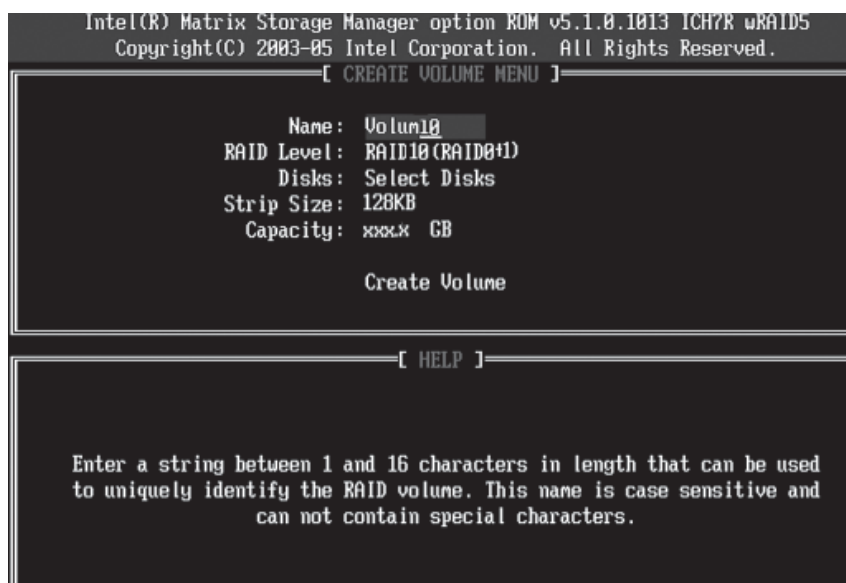
1. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:

2. Specify a name for the RAID 1 set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

3. When the RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select RAID 1 (Mirror) and hit <Enter>.

4.   When the Capacity item is highlighted, enter your RAID volume capacity and hit
     <Enter>. The default setting is the maximum capacity allowed.

5.   Press <Enter> when the Create Volume item is highlighted. A warning message
     displays.

6.   When asked "Are you sure you want to create this volume (Y/N), press "Y" to
     create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 10 (RAID 1+ RAID 0):

1.   Select "Create RAID Volume" from the main menu and press the <Enter> key.
     The following screen will appear:

```
Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
   Copyright(C) 2003-05 Intel Corporation.  All Rights Reserved.
=============[ CREATE VOLUME MENU ]=============

             Name:  Volum10
       RAID Level:  RAID10(RAID0+1)
            Disks:  Select Disks
       Strip Size:  128KB
         Capacity:  xxx.x  GB

                    Create Volume

===================[ HELP ]===================



     Enter a string between 1 and 16 characters in length that can be used
     to uniquely identify the RAID volume. This name is case sensitive and
                    can not contain special characters.
```

2.   Specify a name for the RAID 10 set and press <Enter>.

3.   When the RAID Level item is highlighted, use the <Up Arrow>, <Down Arrow>
     keys to select RAID 10 (RAID1 + RAID0) and hit <Enter>.

4.   When the Stripe Size is highlighted, use the <Up Arrow>, <Down Arrow> keys
     to select the stripe size from 4 KB to 128 KB for your RAID 10, and hit <Enter>.
     The default setting is 64 KB. (Note: For a server, please use a lower stripe size;
     for a multimedia system, use a higher stripe size.)

5.   When the RAID Volume Capacity item is highlighted, enter your RAID volume ca-
     pacity and hit <Enter>. The default setting is the maximum capacity allowed.

6.   Press <Enter> when the Create Volume item is highlighted. A warning message
     displays.

7. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 5 Set (Parity):

1. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:

2. Specify a name for the RAID 5 set and press <Enter>.
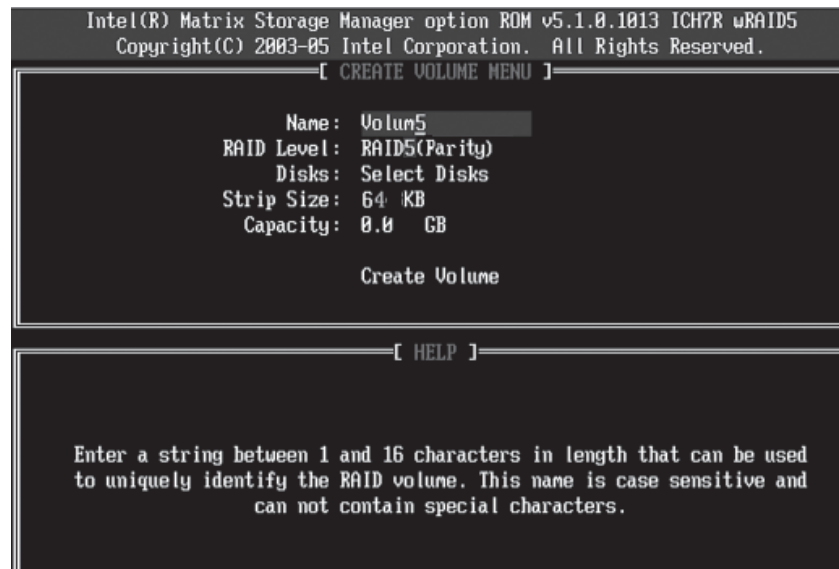
3. When the RAID Level is highlighted, use the <Up Arrow>, <Down Arrow> keys to select RAID 5 (Parity) and hit <Enter>.

4. When the Disk item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen displays:

5. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

6. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranging from 4 KB to 128 KB for the RAID 5 array, and hit <Enter>.

Note: For a server, please use a lower stripe size; for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.

7. Enter your desired RAID volume capacity and press <Enter> when the capacity item is highlighted. The default setting is the maximum capacity allowed.

8. Press Enter when the Create Volume item is highlighted. A warning message displays.

9. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Deleting RAID Volume

Warning: Be sure to back up your data before deleting a RAID set. You will lose all data on the disk drives when deleting a RAID set.

1. From the main menu, select item2-Delete RAID Volume, and press <Enter>.

2. Use the <Up Arrow>, <Down Arrow> keys to select the RAID set you want to delete and press <Del>. A Warning message displays.

3. When asked "Are you sure you want to delete this volume (Y/N), press "Y" to delete the RAID volume, or type "N" to go back to the Delete Volume menu.

### Resetting to Non-RAID and Resetting a RAID HDD

Warning: Be cautious when you reset a RAID volume HDD to a non-RAID HDD or Resetting a RAID HDD. Resetting a RAID volume HDD or Resetting a RAID HDD will reformat the HDD, and delete the internal RAID structure on the drive.

1. From the main menu, select item3-Reset Disks to Non- RAID, and press <Enter>. The following screen will appear:

2. Use the <Up Arrow>, <Down Arrow> keys to highlight the RAID set drive to reset, and press <Space> to select.

3. Press <Enter> to reset the RAID set drive. A Warning message displays.

4. Press "Y" to reset the drive, or type "N" to go back to the main menu.

Exiting the Intel Matrix Storage Manager Utility

1. From the main menu, select item4-Exit, and press <Enter>. A warning message will appear.

2. Press "Y" to reset the drive, or type "N" to go back to the main menu.
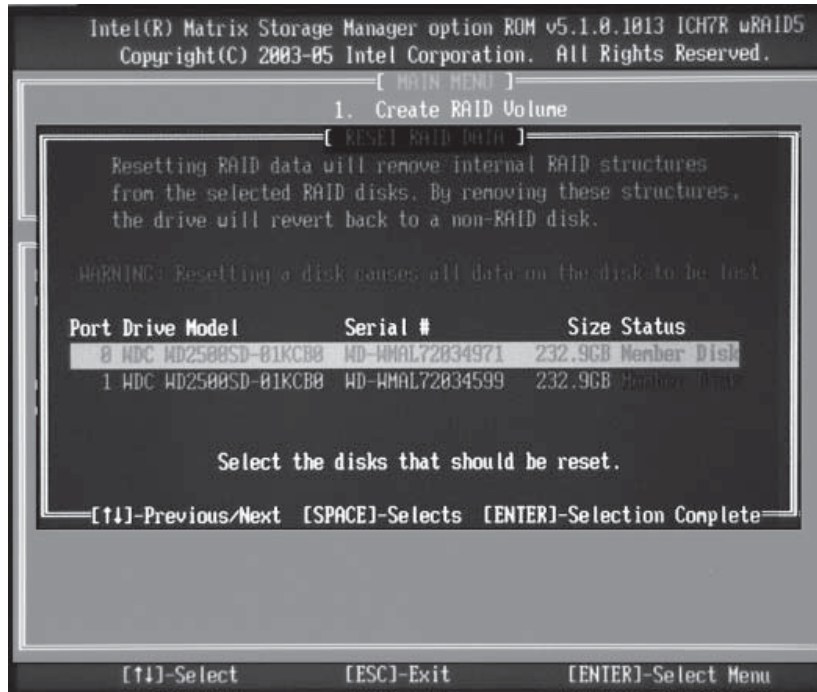
2   Installing the Windows XP/2000/2003 OS to a System with RAID Functions

Installing a New Windows XP/2000/2003 OS

1. Insert the Microsoft Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.

2. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.

3. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).

4. Insert the driver diskette-"Intel AA RAID XP/2000/2003 Driver for ICH7R or ICH9R into Drive A: and press the <Enter> key.

5. Choose the Intel(R) ICH7R or ICH9R SATA RAID Controller from the list indicated in the XP/2000/2003 Setup Screen, and press the <Enter> key.

6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

7. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.

8. After the Windows XP/2000/2003 OS Installation is completed, the system will automatically reboot.

Note: the current version of the ICH7R/ICH9R SATA RAID Utility can only support the Windows XP/2000/2003 Operating System.

3   Installing the Linux (Red Hat) OS for to a System with IDE and SATA RAID Configuration by Using CD-ROM

Note: Before installing a new Red Hat OS, be sure to check the compatibility list on our web site for the specific kernels supported by your motherboard.

Before System Boot

1. Make an ITE IDE driver disk by copying the driver files from our FTP site at ftp. supermicro.com to a floppy disk.

2. Create a SATA RAID driver disk by copying the SATA RAID driver from the Supermicro CD that came with your motherboard or download it from our FTP site.

3. Insert the Red Hat Enterprise Linux (RHEL) Boot CD into the CD-ROM.

During System Boot

4. When the Power-On-Self Test (POST) routine begins, press the <DEL> key repeatedly to enter the BIOS Setup utility.

5. While in the BIOS Setup utility, go to the Main menu. On the SATA RAID Enable item, select Enabled and hit <Enter>. On the RAID Code Base item, select Adaptec and press <Enter>.

6. Go to the Boot menu. following the instructions given on the right side of screen, select your CD-ROM as Item Number 1 item in the boot sequence.

7. Go to the Exit menu, select Save and Exit and press <Enter>, or press the <F10> key on the keyboard to save the changes and reboot the system.

8. Upon rebooting, press <CTRL> and <A> to go the Adaptec HostRAID Utility.

9. Set the Adaptec HostRAID settings to Optimal, if you have not yet done so. Following the instructions given, create RAID settings as desired. Once done, exit the Adaptec HostRAID Utility and reboot the system.

After System Reboot

10. After Adaptec Host RAID configuration, a Linux Boot prompt will appear after system reboot.

11. Type in the command "linux dd" at the prompt.

12. A pop-up window appears, displaying the message, "Do you have a driver disk?" Select Yes.

13. When prompted for the first driver disk, insert the ITE IDE driver disk which you've created on Step 1 into the dev/fd0 drive.

14. When prompted for the next driver disk, select Yes,

15. Insert the SATA RAID driver disk created on Step 2. The screen showing Loading Adp..appears.

16. When prompted for loading more driver disks, select No, and continue with the installation process.

17. When the Red Hat software program finds the disk volume to install the OS to, it will show "ADAPTEC_RAID1".

18. Choose this disk volume, and finish the installation setup procedures. Then, continue with the Red Hat OS installation as instructed.