EvoStor-400CA

SCSI-to-ATA RAID Subsystem

User Manual

EvoStor-400CA
User Manual (Version 1.1)

June 28, 2006

CUSTOMER SERVICE

To obtain service or technical support for your system, please refer to the registration card for information.

LIMITED WARRANTY

In no event shall the liability of QNAP Systems, Inc. exceed the price paid for the product from direct, indirect, special, incidental, or consequential software, or its documentation. QNAP offers no refunds for its products. QNAP makes no warranty or representation, expressed, implied, or statutory, with respect to its products or the contents or use of this documentation and all accompanying software, and specifically disclaims its quality, performance, merchantability, or fitness for any particular purpose. QNAP reserves the right to revise or update its products, software, or documentation without obligation to notify any individual or entity.

FCC STATEMENT

QNAP EvoStor-400CA has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and device.
- Connect the equipment to an outlet other than the receiver.
- Consult a dealer or an experienced radio/TV technician for assistance.

CAUTION

1. There is a danger of explosion if battery is incorrectly replaced.

2. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instruction.

3. Should you return any components of EvoStor-400CA package for refund or maintenance, make sure they are carefully packed for shipping. Any form of damages due to improper packaging will not be compensated.

Table of Contents

Chapter 1   EvoStor-400CA Overview

1.1   Introduction

RAID (Redundant Array of Inexpensive Disks) is a group of disk drives combined with two or more hard disks, accompanied with software and controller to provide a high performance of data transfer at relatively low cost. More and more users are employing RAID for disk configuration to obtain a high transfer rate of data as well as secure data protection. As two or more disks are used in RAID configuration, disk data can be stored and backed up more conveniently.

1.2   Product Overview

EvoStor-400CA (hereafter referred as EvoStor) external RAID system is designed to offer high performance, high reliability and low cost alternatives to SCSI to IDE RAID subsystems. It utilizes cost-effective IDE drives with simple storage setup and management process making it ideal for small to mid-sized companies and departments.

System Features
- Intel 64-bit RISC I/O Processor
- Built-in 128 MB cache memory, expandable up to 1 GB
- Compatible with all SCSI-3 and SCSI-2/LVD host adapters up to 160 MB/s
- LCD panel for easy RAID configuration and status monitoring
- EvoStor Management Technology: Windows-based utility monitors status of RAIDs through in-band SCSI command, enable remote management
- Supports up to 4 hot-swappable Ultra DMA 133 hard drives
- Local audible event notification buzzer
- Real time drive activity and status indicators
- Supports RAID levels 0, 1, 0+1, 3, 5 and NRAID
- Supports multiple logic volume creation, each logic volume could be configured as one RAID level independently
- Supports hot spare and automatic hot rebuild
- Transparent data transfer for all popular operating systems

1.3 Package Contents

EvoStor subsystem package contains the following items:

- EvoStor subsystem
- 68-pin SCSI 160 LVD cable
- SCSI terminator
- Power cord
- Quick installation guide
- Companion CD (user manual inclusive)

1.4 System Requirements

- An Ultra 160 SCSI host bus adaptor
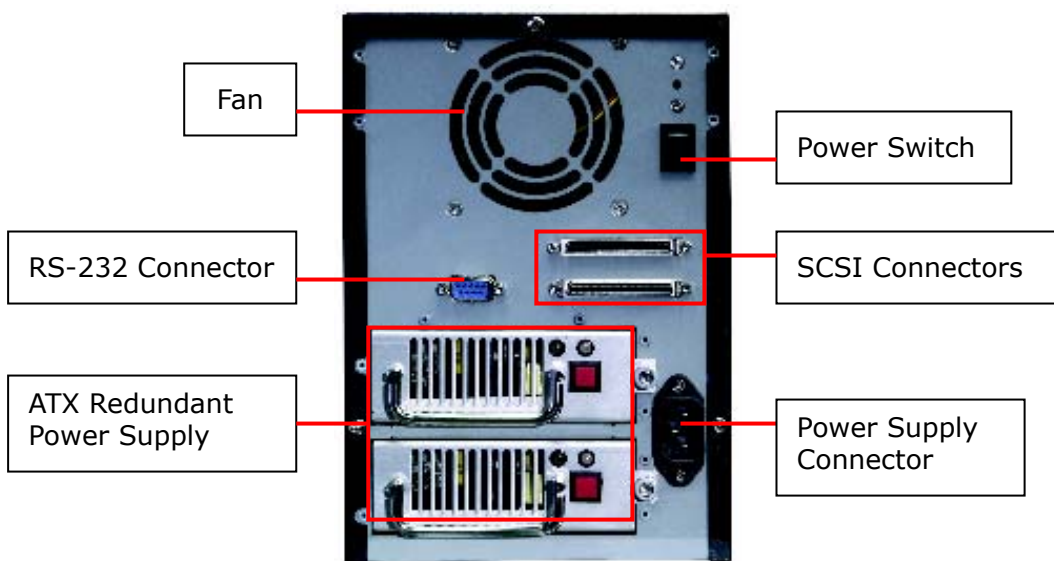- A personal computer installed with an O.S. that supports SCSI device access

Chapter 2   System Overview and Installation

2.1   System Overview

- **Front view**

LCD Panel	Configuration Switch
Function Switch	
	Disk 2
	Disk 3
	Disk 4

- **Rear View**

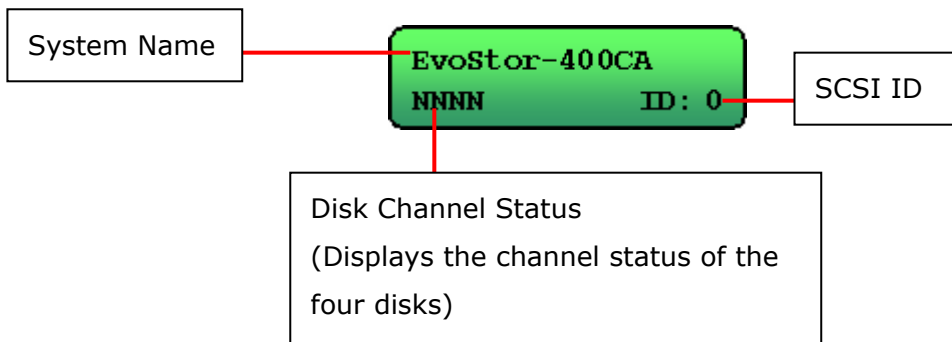|	
Fan	Power Switch
RS-232 Connector	SCSI Connectors
ATX Redundant Power Supply	Power Supply Connector

2.2　Installation

Follow the steps below to install EvoStor system:

1. Unpack EvoStor package.

2. Install hard disk. (Skip this step if a hard disk is included in the package).

   Note: Set the jumper of the hard disk in Master mode before installation.

3. Connect the power cable.

4. Turn on EvoStor. Upon successful switching on of the system, the following message will be displayed on the LCD panel.

| System Name |
| EvoStor-400CA |
| NNNN   ID: 0 |
| SCSI ID |

Disk Channel Status
(Displays the channel status of the four disks)

Note: Please refer to Appendix C for further information on symbols of disk channel status.

5. Set the SCSI ID for EvoStor via the LCD panel if the ID duplicates with other SCSI devices.

6. Create disk volume via the LCD panel. If you configure EvoStor as RAID 1, 0+1, 3, or 5, the percentage of initialization will be shown. Complete initialization before proceeding to step 7.

```
Initializing LUN1
0.1% complete!
```

Note: Please select LUN0 as the ID for this logic volume, as some O.S. are not able to recognize logic volume ID other than LUN0. For information about creating more than one logic volume, please contact the O.S. distributor. For more details on Steps 5 and 6, please refer to Chapter 3.1.2.

7. Connect a SCSI terminator to EvoStor. Then connect EvoStor to the host computer via a SCSI cable.


SCSI Terminator
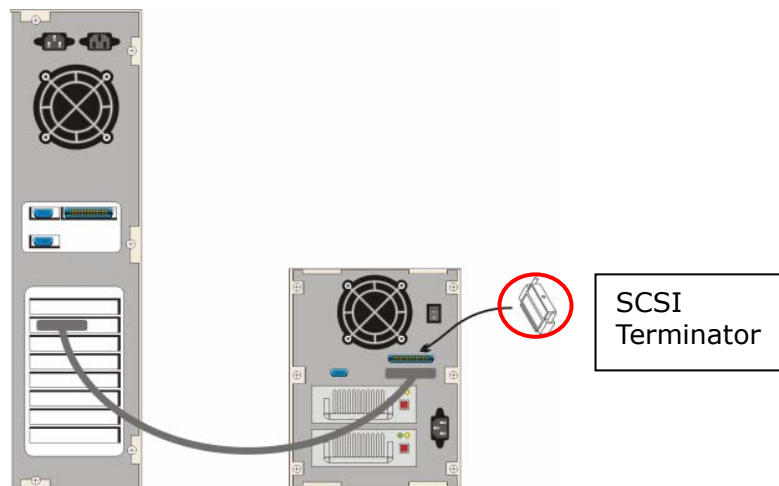
8. Turn on the host computer. In the startup screen of BIOS, it will be shown that EvoStor is detected. Note that if you create the logic volume on LUN0, EvoStor RAID Controller resided on LUN0 will not be shown.

```
LSI Logic Corp. Symbios SDMS (TM) V4.0 PCI SCSI BIOS, PCI Rev. 2.0, 2.1
Copyright 1995-2000 LSI Logic Corp.
PCI-4.17.00

HBA ID LUN VENDOR    PRODUCT           REV   SYNC  WIDE CYL/HD/SEC
---------------------------------------------------------------------
0   0  0    EvoStor   RAID Controller
0   0  1    EvoStor   Logic Drive       160.0  16  1024/255/63
0   7  0    LSILogic 53C1010-33         0001 160.0 16
1   7  0    LSILogic 53C1010-33         0001 160.0 16
```

9. Skip the following steps if the above logic volume is resided on LUN0. After Windows starts, the Found New Hardware Wizard will appear.

Found New Hardware

EvoStor RAID Controller SCSI Processor Device
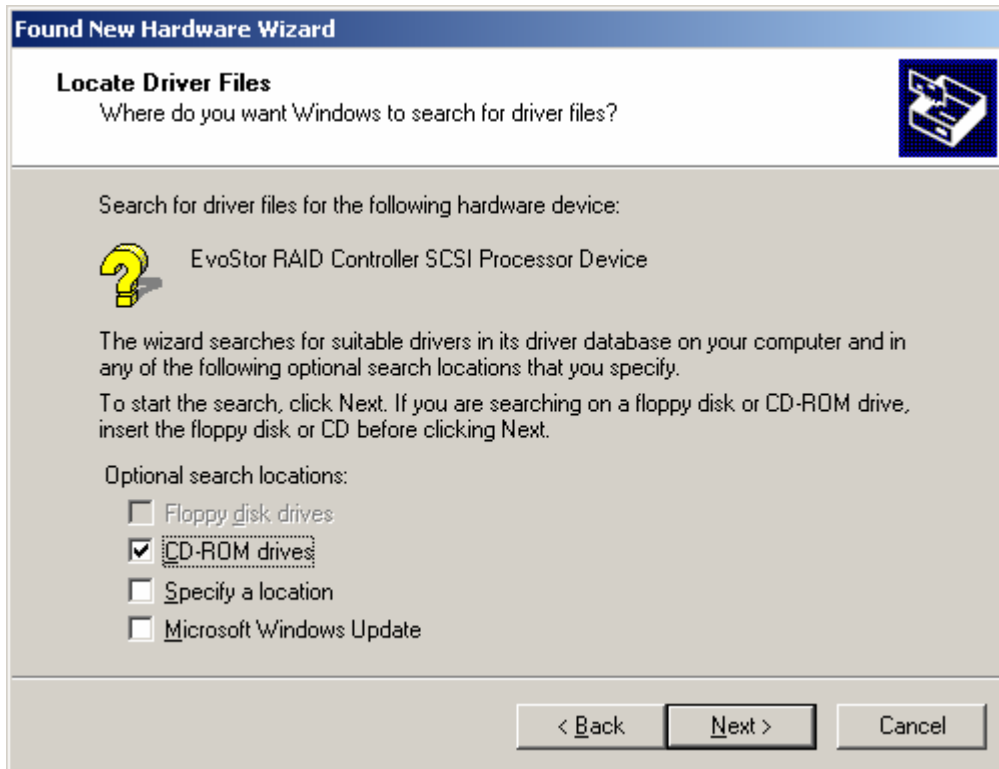
Please wait ...
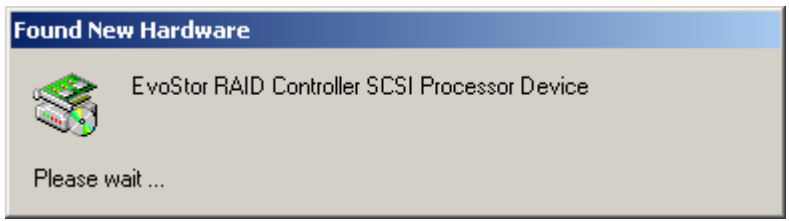
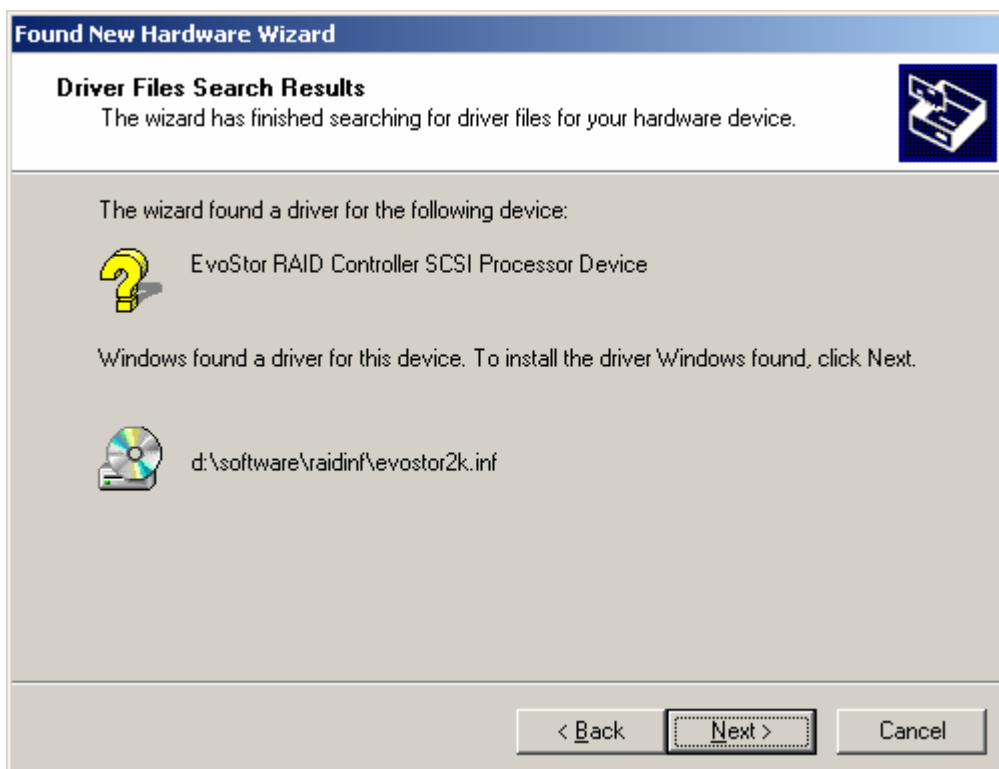10. In the Found New Hardware Wizard dialog box, click **Next**.

11. Insert the companion CD and select "Search for a suitable driver for my device (recommended)". Then click **Next**.
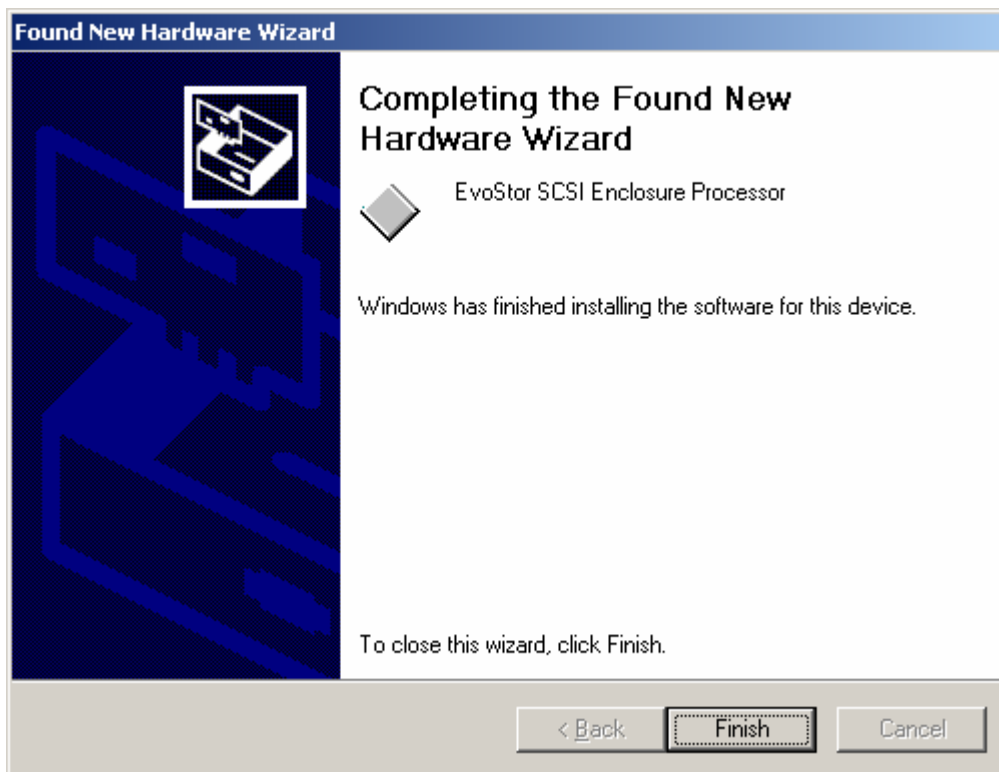
12. In Optional search locations, select CD-ROM drives and click **Next**.

13. The Found New Hardware Wizard will find the driver to install in the CD. Click **Next**.

14. Click **Finish** to complete the installation. Format EvoStor before using the system.
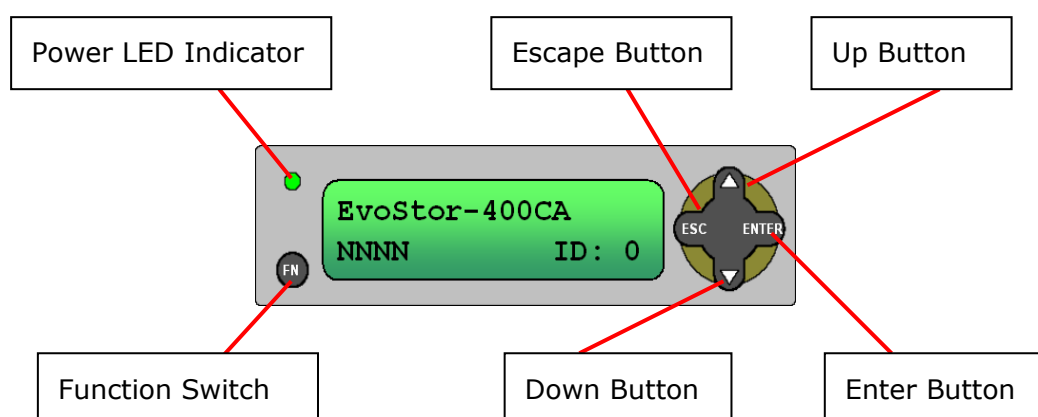

For information on EvoStor management software installation, please refer to Chapter 3.2.

Chapter 3   System Configuration

3.1 Configuring EvoStor via the LCD panel

The buttons and LED indicators of the LCD panel are described as below:

| Power LED Indicator | | Escape Button | Up Button |

EvoStor-400CA
NNNN   ID: 0

| Function Switch | | Down Button | Enter Button |

- Up and Down buttons: To navigate up and down to select the appropriate function.
- Enter: To confirm the selection or enter a value.
- ESC: To return to the previous menu.
- Function switch: To enter system configuration menu.
- Power LED Indicator: The light will be on when power is connected.

3.1.1 System Messages

To view system messages of EvoStor, press enter when the system is successfully turned on. Then press the Up and Down buttons to select the information you want to view. After that, press ESC to return to the previous menu. The following information is available currently:

Field	Description
SCSI ID Info	Current SCSI ID of EvoStor
Volume Info	Available logic volume information
Disk Info	Physical disk model name and capacity
Hardware Status	System temperature, power and fan status
Firmware Version	Firmware version of EvoStor
Mute Beeper	Turn off the beeper of EvoStor

3.1.2 Configuring EvoStor

By factory default, the value of SCSI ID Set is 0 and the password is eight empty characters.

- **Configure SCSI ID Set**
  - ➢ Step 1

    Press the Function switch and the LCD panel will display the following information:
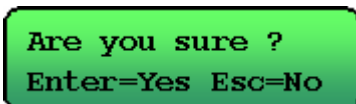
    ```
    >SCSI ID Set
     Create Volume
    ```

    Press the Enter button to proceed.

  - ➢ Step 2

    Use the Up and Down buttons to enter the password. The following message will then be shown:

    ```
    Are you sure ?
    Enter=Yes Esc=No
    ```

    Press the Enter button to confirm or ESC button to return to the previous menu.

  - ➢ Step 3

    Use the Up and Down buttons to adjust the SCSI value and press the Enter button. Make sure the SCSI ID does not duplicate with that of other SCSI devices.

  - ➢ Step 4

    Press the Enter button to confirm the SCSI value or press ESC to cancel.

  - ➢ Step 5

    When completing the setting, restart the computer. Press any key to return to the menu on the LCD panel.

    ```
    Pls restart host
    Any key to menu
    ```
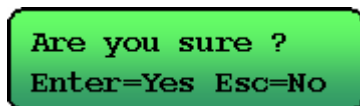
- **Create Volume**
  - ➢ Step 1

    Press the Function switch and use the Up and Down buttons to select

    Create Volume. Then press Enter.

    >Create Volume
     Delete Volume

  - ➢ Step 2

    Use the Up and Down, and Enter buttons to enter password. When

    finished, the following message will be displayed:

    Are you sure ?
    Enter=Yes Esc=No

    Press Enter to confirm the setting or ESC to cancel.

  - ➢ Step 3

    You can further configure the volume with the following advanced options:

Advanced Setting	Description	Sub-menu
Volume ID	The ID number of logic volume	LUN 0 ~ LUN 7 (Logic Unit Number)
RAID Level	RAID level	NRAID, RAID 0, 1, 0+1, 3 and 5
Spare Disks	Spare disks of EvoStor	Select spare disk
Data Disks	Data disks of EvoStor	Select data disks
Stripe Size	The size of striped block	4, 8, 16, 32, 64, and 128K
Create LUN Now	Create logic volume instantly	Yes or No

    Use the Up and Down buttons to select the configuration item and press

    Enter to proceed to the sub-menu.

  - ➢ Step 4

    Use the Up and Down buttons to select the value and press Enter to

    confirm.

  - ➢ Step 5

    When finished, restart the computer. Press any button to return to the

    menu.

- **Delete Volume**
  - ➤ Step 1

    Press the Function switch and use the Up and Down buttons to select Delete Volume. Press Enter to proceed.
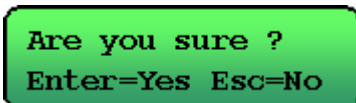
    ```
    >Delete Volume
     Set Clock Timer
    ```

  - ➤ Step 2

    Use the Up and Down, and the Enter buttons to enter the password. When finished, the following message will be displayed on the LCD panel:

    ```
    Are you sure ?
    Enter=Yes Esc=No
    ```

  - ➤ Step 3

    Use the Up and Down buttons to select the appropriate option. Then press Enter to confirm.

  - ➤ Step 4

    Press Enter to confirm and return to the main menu or press ESC to cancel.

    ```
    Del Volume 1 ?
    Enter=Yes Esc=NO
    ```

- **Set Clock Timer**
  - ➢ Step 1
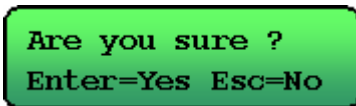
    Press the Function switch, and Up and Down buttons to select Set Clock Timer. Then press Enter to proceed:

    >Set Clock Timer
     Change Password

  - ➢ Step 2

    Use the Up and Down, and the Enter buttons to enter the password. When finished, the following message will be displayed:

    Are you sure ?
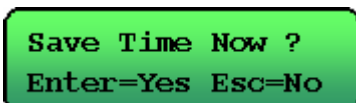   Enter=Yes Esc=No

    Press Enter to confirm or ESC to exit.

  - ➢ Step 3

    Set the time and press Enter to confirm.

  - ➢ Step 4

    Press Enter to save the time or ESC to exit.

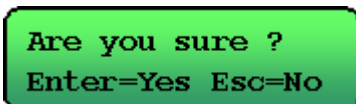   Save Time Now ?
    Enter=Yes Esc=No

- **Change Password**

  - ➤ Step 1

    Press Enter and the Up and Down buttons to select Change Password.
    Then press Enter to proceed.

    ```
    >Change Password
     Restore Config
    ```

  - ➤ Step 2

    Enter the password. The following message will be displayed on the LCD
    panel:

    ```
    Are you sure ?
    Enter=Yes Esc=No
    ```

    Press Enter to confirm or ESC to exit.

  - ➤ Step 3

    Enter the new password and press Enter.

    ```
    New Password
    ▬
    ```

  - ➤ Step 4

    Press Enter to save the new password or ESC to exit.

    ```
    Save Pwd now ?
    Enter=Yes Esc=No
    ```
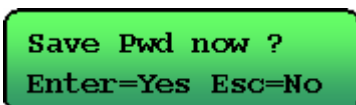
- **Restore Configuration**
  - ➢ Step 1

    Press the Function button and select Restore Config.

    ```
    >Restore Config
     Restart System
    ```

  - ➢ Step 2

    Enter the password and Press Enter to confirm.

    ```
    Are you sure ?
    Enter=Yes Esc=No
    ```

  - ➢ Step 3

    Wait for the system to restart.

    ```
    Restoring Config
    System Restart..
    ```

    Note: The password will not be restored when selecting restoring

    configuration. To restore the password to default, refer to Chapter 5.5.

- **Restart System**
  - ➢ Step 1

    Press the Function switch and select Restart System. Press Enter to confirm.

    ```
    >Restart System
     Shutdown System
    ```

  - ➢ Step 2

    Enter the password and press Enter to confirm. To quit, press ESC.

    ```
    Are you sure ?
    Enter=Yes Esc=No
    ```

  - ➢ Step 3

    Wait for the system to restart.

    ```
    Restarting
    System..
    ```

- **Shut down System**
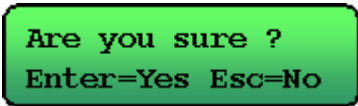 - ➢ Step 1

    Press the Function switch and select Shutdown System. Then press ESC to proceed.

    ```
    >Shutdown System
     SCSI ID Set
    ```

  - ➢ Step 2

    Enter the password and press Enter to confirm.

    ```
    Are you sure ?
    Enter=Yes Esc=No
    ```

  - ➢ Step 3

    The system will shut down and the following message will be shown.

    ```
    Shutdown System.
    ..
    ```

3.2 Using EvoStor Management Utilities

Besides configuration via the LCD panel, you can also configure EvoStor via the management utilities included in the companion CD. The utilities are:

- **EvoStor Manager**

  EvoStor Manager is a GUI software which provides system monitoring and configuration functions via the Internet. Make sure EvoStor Agent has been run before running EvoStor Manager.

- **EvoStor Agent**

  EvoStor Agent works as a communication means between EvoStor and EvoStor Manager. It receives management request from EvoStor Manager in the Internet and transfers the request to SCSI command of EvoStor to provide remote management and monitoring functions.

- **EvoStor ActiveX Control**

  EvoStor ActiveX Control is a standard ActiveX control using Microsoft® ActiveX and Component Object Model (COM) technology. This ActiveX control provides an interface for web page script or other OLE control container programs to use the functions of EvoStor Manager. For further information, please refer to Chapter 3.2.3.
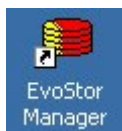
3.2.1 EvoStor Management Software (EvoStor Manager)

1. Run Install EvoStor Manager in the companion CD.

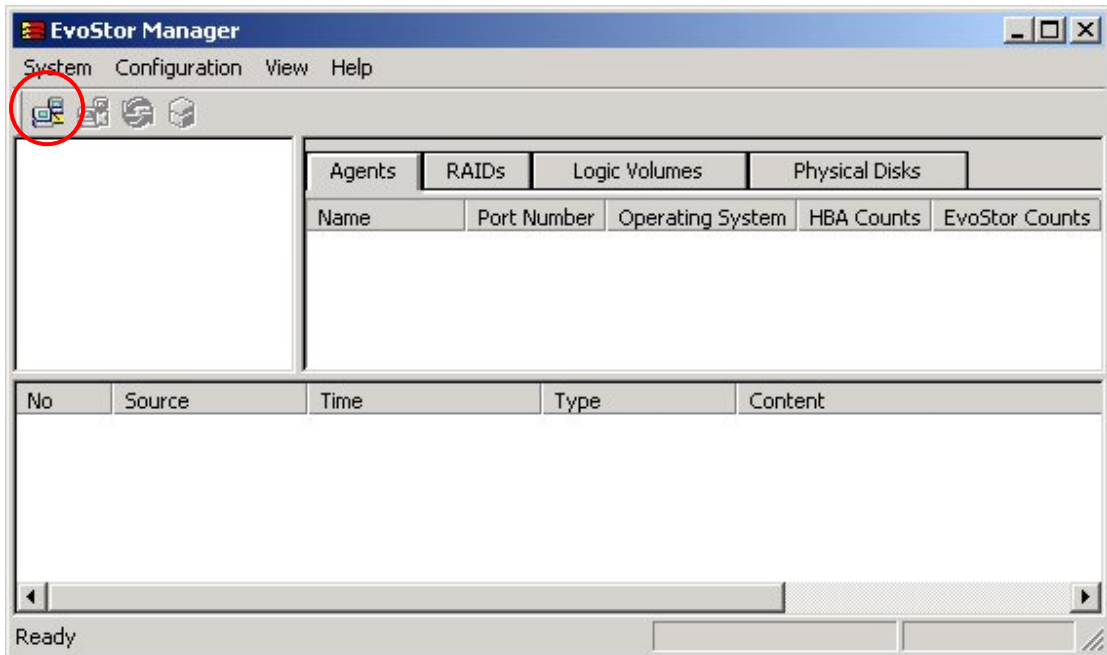2. Follow the instructions to complete the installation. When finished, a shortcut will be created on the desktop.

- **Using EvoStor Manager**

Run EvoStor Manager, the following screen will pop up. Click the Connect icon
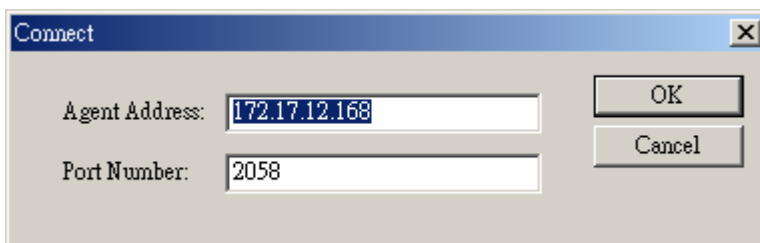 or select Connect in System.

Enter the agent address, e.g. 172.17.12.168 and port number (default value:
2058). Then click OK.

**Note:** The port number must be the same as that preset by EvoStor

Agent for successful connection. For further details on port number

configuration of EvoStor Agent, please refer to Chapter 3.2.2.

Note: The port number for EvoStor Manager must be the same as that for

EvoStor Agent for successful connection.

- **Monitoring Page Overview**

Upon successful connection, the following screen will be displayed:
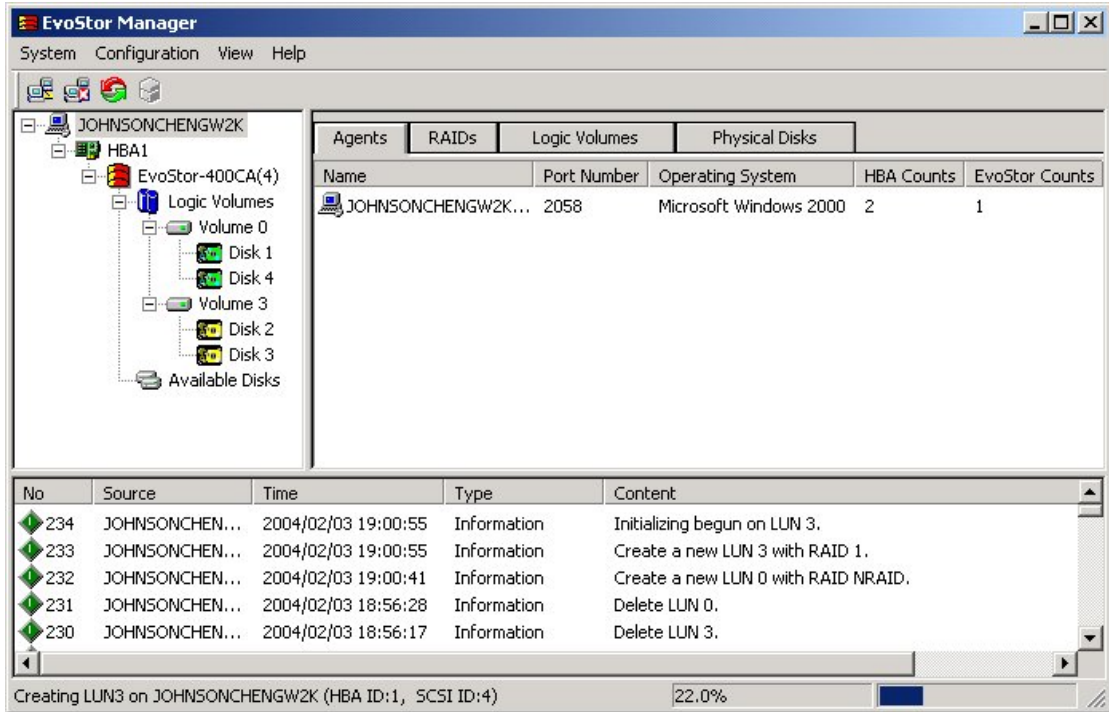
Four options in the main menu:

1. System

Manager Menu Options
- ✓ Connect: To establish connection with EvoStor.
- ✓ Disconnect: To disconnect from EvoStor.
- ✓ Alert Setting: To specify the alert level for sending notification email and the recipients.

Click Option and the window below will be shown:
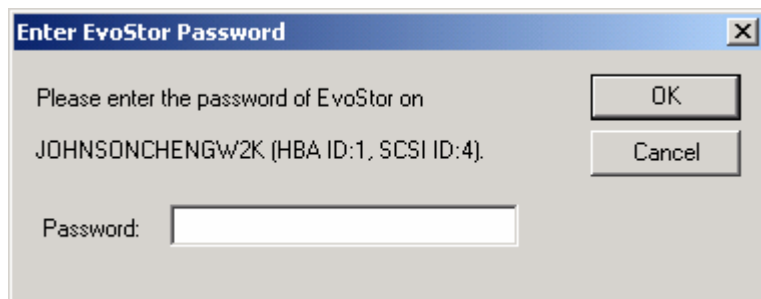
Field	Option
Type	Alert type: warning or error messages.
Interval	Time interval for sending an alert mail.
Range	Monitoring items and the safety range, including voltage, CPU temperature (℃), system temperature (℃), and fan speed.

Alert emails will be sent to particular recipients when the values of the items being monitored are out of the safety range.

✓ Upgrade Firmware: To upgrade the firmware version.
✓ Rescan: Enable this option to detect the status of connection to Agent.
✓ Save Log As: To back up event logs.
✓ Clear All Logs: To clear all event logs.
✓ Exit: To exit the monitoring page and EvoStor Manager.

2. Configuration

A password must be entered when modifying any setting in Configuration. The default password is 8 empty characters. Hence, you can press Enter directly.

The options include:
- ✓ SCSI ID Setting: Set SCSI ID.

✓ Create Logic Volume

Follow the steps below to create logic volume for EvoStor:

➢ Step 1
Select logic volume ID.

Note: Please select LUN0 as the ID for EvoStor, as some O.S. are not able to recognize logic volume ID other than LUN0. For information about creating more than one logic volume, please contact the O.S. distributor.
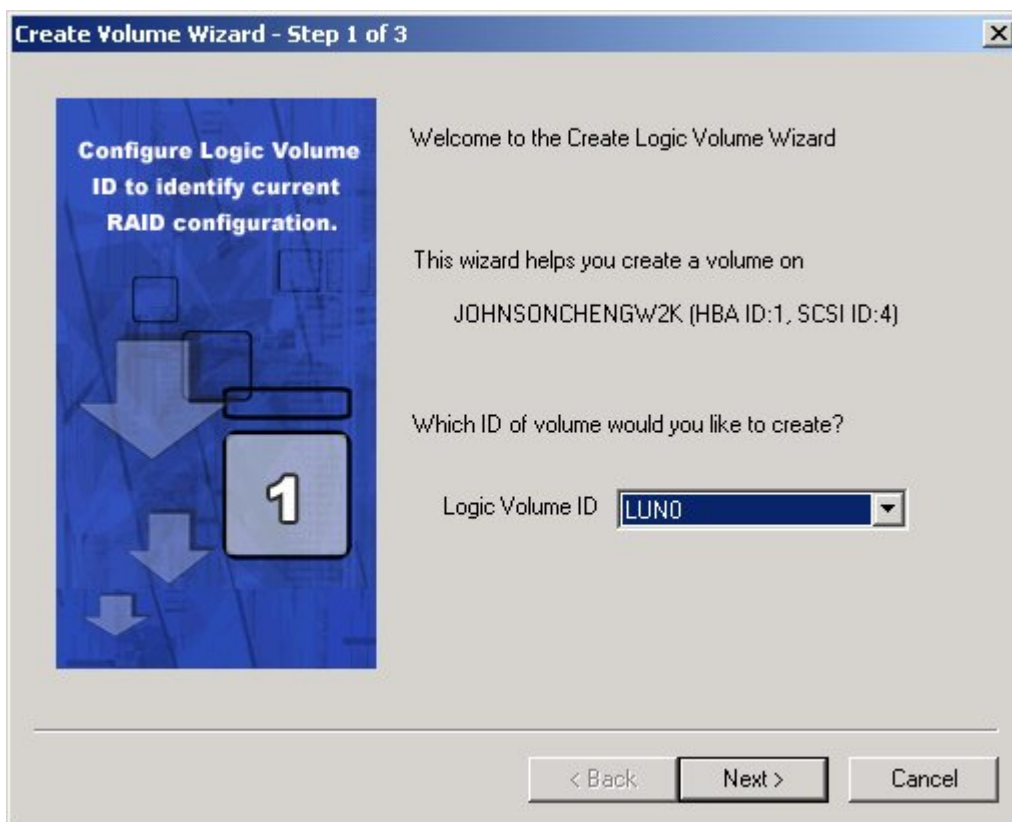
➢ Step 2

Select the RAID level and stripe size to create for EvoStor.
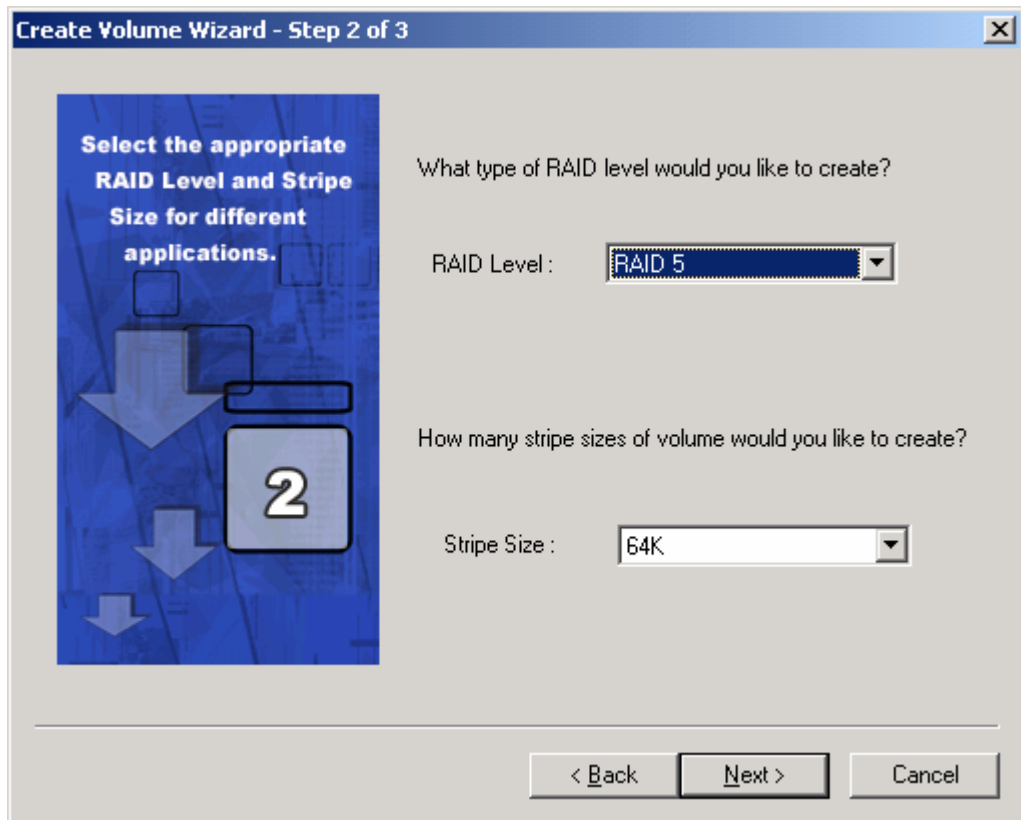
➢ Step 3

Select the data and spare disk(s) to create for a volume. Then click Finish.
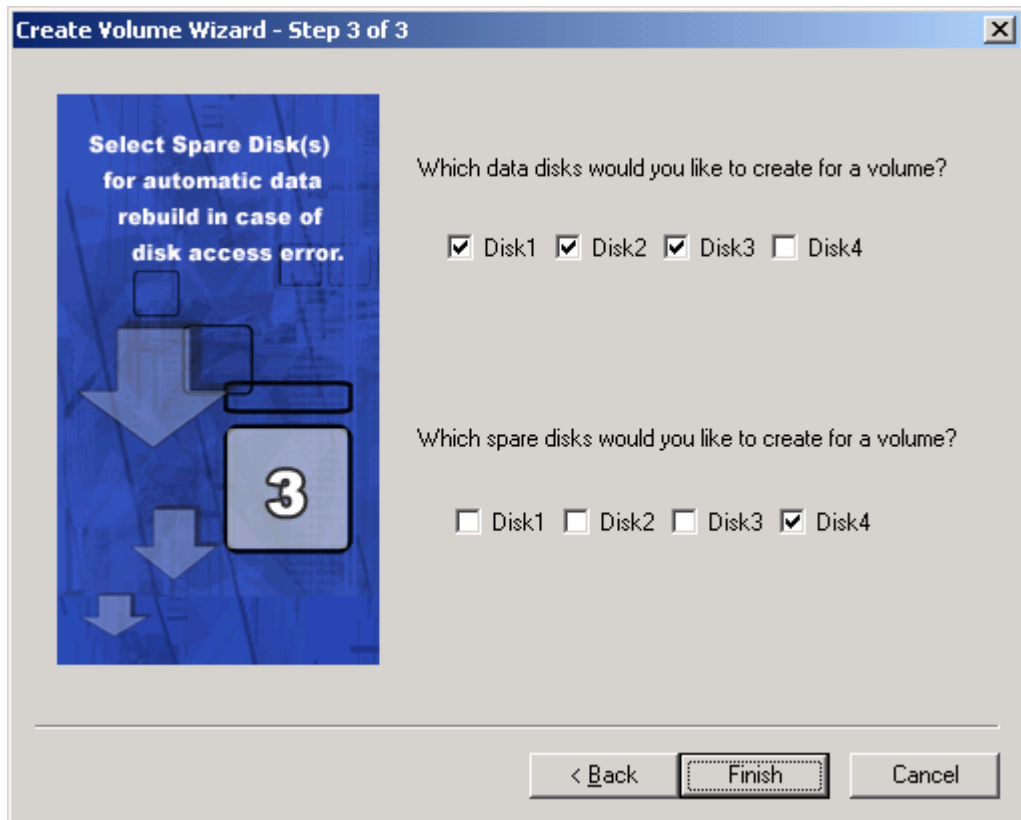
➢ Step 4

When finished, the following screen will be shown to display new volume

information.
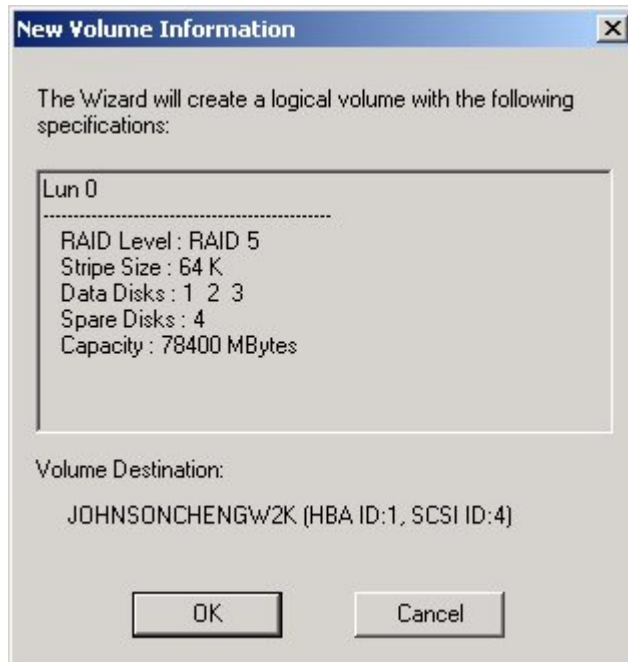
➤ Step 5

When the system is being configured and begins to initialize logic volumes,
the number of percentage for initialization will be displayed on the tool bar.

Creating LUN0 on JOHNSONCHENGW2K (HBA ID:1, SCSI ID:4)   3.2%

Field	Option
Logic Volume	Select logic volume (LUN 0 ~ 7)
Member Disks	Spare Disks: Configure spare disks
	Data Disks: Configure data disks

✓ Delete Logic Volume: To remove logic volume.

✓ Change password: To change password.

Change Password

Change password of EvoStor on
JOHNSONCHENGW2K (HBA ID:1, SCSI ID:4).

Old Password:

New Password:

Confirm Password:

OK

Cancel
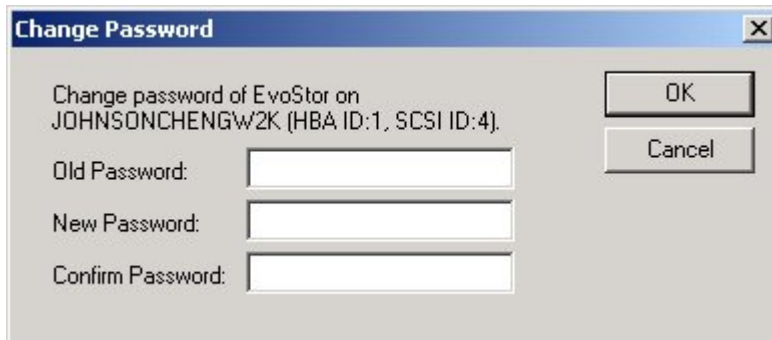
3. View

Select the items for viewing in Manager Menu.

Available options include:

✓ Agents:

Agents	RAIDs	Logic Volumes	Physical Disks			
Name			Port Number	Operating System	HBA Counts	EvoStor Counts
🖥 JOHNSONCHENGW2K (172.17.12.168)			2058	Microsoft Windows 2000	2	1

Field	Description
Name	The server name running EvoStor Agent.
Port Number	The TCP port number for Manager/Agent connection.
Operating System	The OS of the server running EvoStor Agent.
HBA Counts	The number of ASPI interface cards supported by the server.
RAID Counts	The number of EvoStor connected to this agent.

✓ RAIDs:

Field	Description
Model Name	EvoStor model
Agent	The server running EvoStor Agent
HBA ID	The ID of SCSI adaptor connected by EvoStor
SCSI ID	The SCSI ID of EvoStor
Firmware Version	EvoStor firmware version
Power	The voltage value of EvoStor 5V and 3.3V
Fan	Fan speed
Temperature	The CPU temperature and system temperature of EvoStor.

✓ Logic Volumes:

Field	Description
Logic Volume ID	The ID number of logic volume
Agent	The server running EvoStor Agent
HBA ID	The ID of SCSI adaptor connected by EvoStor
SCSI ID	The SCSI ID of EvoStor
Status	Status of EvoStor: ● Degrading ● Initializing ● Ready ● Rebuilding ● Error
RAID Level	RAID level configured for EvoStor
Data Disks	The data disk ID number of EvoStor
Spare Disks	The spare disk ID number of EvoStor
Capacity	The capacity of logic volume

✓ Physical Disks

Field	Description
Disk ID	The slot ID of ATA hard disk
Agent	The server running EvoStor Agent
HBA ID	The ID of SCSI adaptor connected by EvoStor
SCSI ID	The SCSI ID of EvoStor
Logic Volume ID	The logic volume ID of EvoStor
Status	Status of ATA hard disk: ● Degrading ● Error ● Initializing ● On line ● Off line ● Rebuilding ● Vacant
Model Name	The model name of ATA hard disk
Capacity	The disk capacity of ATA hard disk

4. Help
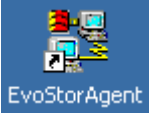
The version number of EvoStor Manager will be shown:
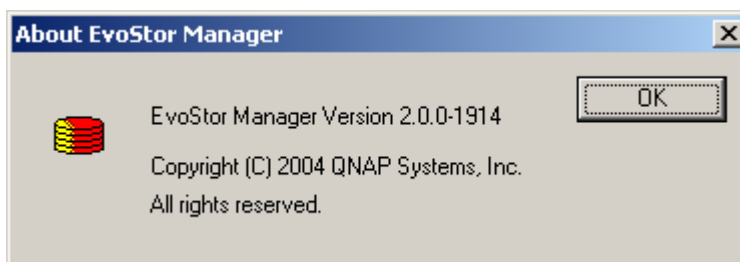
3.2.2 EvoStor Agent

1. Run Install EvoStor Agent in the companion CD.

2. Follow the instructions to complete the installation. A shortcut will be created on the desktop.

Note: You will be prompted to install ASPI (Advanced SCSI Programming Interface) if it has not been installed to the PC. Restart the PC after installation. For further details, please refer to Appendix A.

● **Using EvoStor Agent**

When EvoStor Agent is installed, it will be run every time when Windows starts up. An icon will be created in the toolbar.
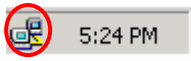
Right click the icon and choose to stop or exit EvoStor Agent.

- Stop: Stop the functions of EvoStor Agent. The communication and processing between EvoStor Agent and EvoStor will stop. Right click the mouse and a list will be displayed:
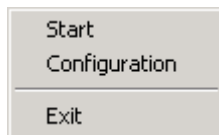
i.   Start: To restart EvoStor Agent. EvoStor Agent will accept and process the commands between EvoStor Manager and EvoStor.

ii. Configuration: To configure the parameters of EvoStor Agent. The available parameters are shown in the following screen:
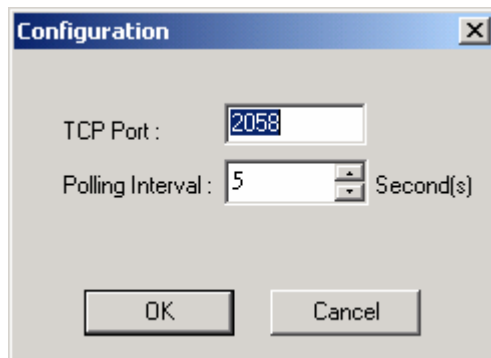
TCP Port: The TCP port number for EvoStor service. The default value is 2058. Make sure the port number is the same as the one entered for EvoStor Manager connection.

Polling Interval: The time interval for EvoStor Agent to inquire RAID status. The default value is 5 seconds. Note that if the value of time interval is too small, system performance will be affected.

iii. Exit: Shut down EvoStor Agent. The agent icon will be removed from the toolbar. You need to run the agent again from the desktop.

- Exit: Same as the above exit function.

3.2.3 EvorStor View ActiveX Control

- **Introduction**

  EvoStor View ActiveX Control is a standard ActiveX control using Microsoft$^{®}$ ActiveX and Component Object Model (COM) technology. This ActiveX control provides an interface for web page script or other OLE control container programs to use the functions of EvoStor Manager. Instead of monitoring disk array status provided by EvoStor Manager, this ActiveX control can help easily build your own manager application or manager web page.

- **System Requirements**

  PC: IBM or IBM-compatible PC.

  Operation system: Windows 98 SE, Windows ME, Windows 2000, or Windows XP.

- **Installation Instruction**

  Run "Install EvoStor ActiveX Control" from companion CD to install the software. After the setup program complete, all files will be installed to:
  "[Program Files] \QNAP\EvoStorActiveX\"

  Note: [Program Files] is the path of Windows Program Files folder. The typical path is "C:\Program Files". The setup program also creates a shortcut of a demo html file. You can open it to see if this ActiveX control has been installed correctly.

- **Un-installation Instruction**

  To remove EvoStor ActiveX control, follow the steps below:

  1. Open the Control Panel by choosing Settings from the Start Menu.
  2. Select "Add/Remove Program" and choose "EvoStor ActiveX Control" from the list.
  3. Click on the "Add/Remove" button and follow the instructions to uninstall the program.

- **Usage**

  Open "EvoStorDemo.htm" in a web browser to see this ActiveX control in an html file. Click on the "Connect" button and input the IP address and IP port of EvoStor Agent, of which the EvoStor is on.
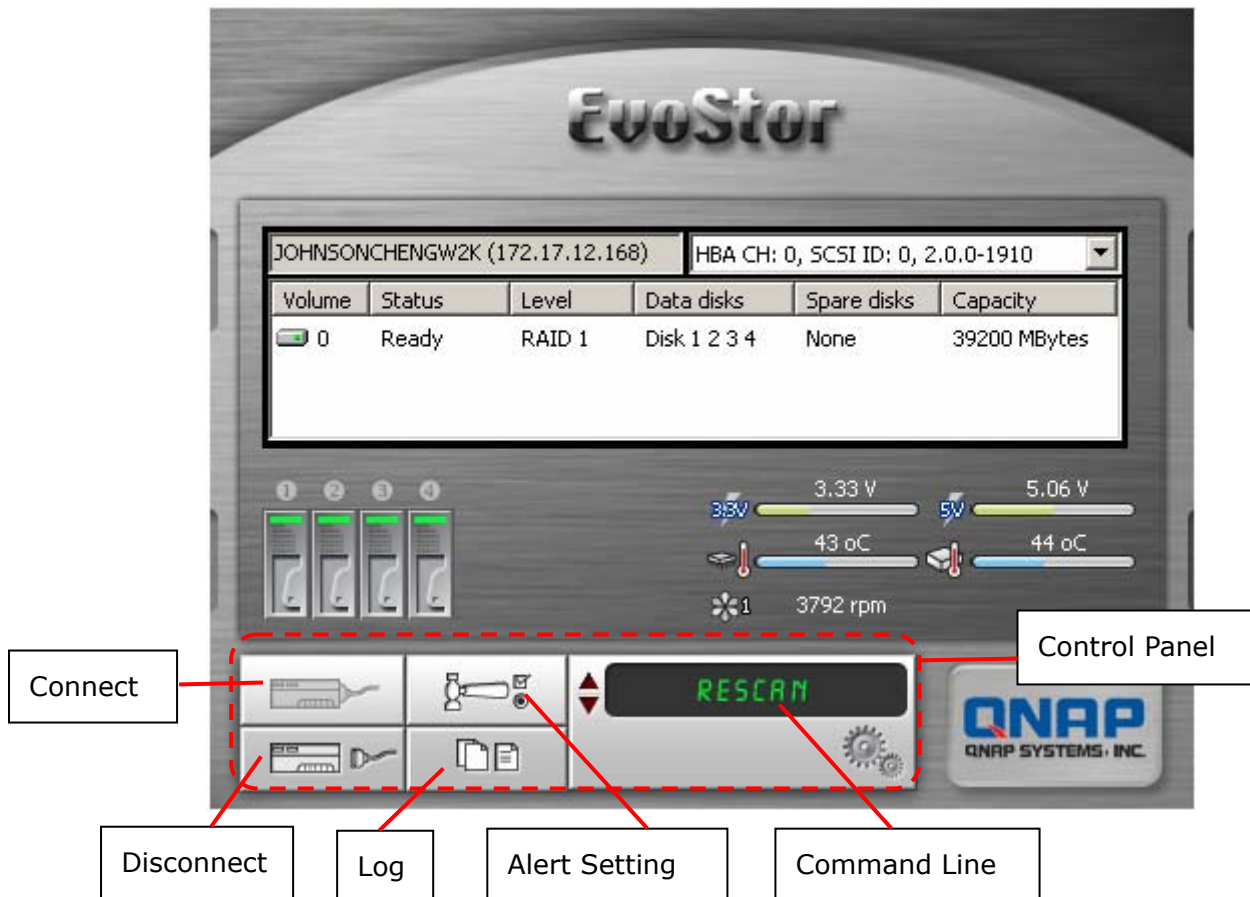
  EvoStor View ActiveX Control resides in Control Panel. You can manipulate most of EvoStor's functions by using the buttons and Windows controls on it. The functions and commands available are listed below:

  Connect

  Connect an EvoStor Agent to manage EvoStor.

  Disconnect

  To disconnect EvoStor Agent.

Alert Setting

After you click this button, an alert setting dialog box will pop up and prompt you to configure alert email and hardware status settings.

Command Line

Use the Up/Down key to select a command and click this button to execute it.

Log

After you click this button, an event log dialog box will pop up and prompt you for filename to store the event logs.

- **Object Interface**

  EvoStor View ActiveX Control uses the concept of objects to expose programming functions. You can configure EvoStor or other monitoring functions of EvoStor Manager by issuing a simple programming statement. The complete list of the programming interface is described in the following section "Object Interface List".

- **Web Support**

  To let users distribute ActiveX control on their own web page to manage EvoStor. Here is an HTML page example as following:

```
<HTML>
<BODY>
<OBJECT
      ID="EvoStorViewCtrl"
   CLASSID="CLSID:31AA7BDE-2F5D-4845-A4CD-014BD9FA9B5C"
   HEIGHT=400
   WIDTH=491>
</OBJECT>
</BODY>
</HTML>
```

- **Object Interface List**

Methods		
[Name]	**[Param]**	**[Note]**
BOOL Connect()		Pop up a dialog for inputting IP address and IP port of EvoStor Agent to establish a connection to an EvoStor Agent
BOOL Connect(LPCTSTR pszAgentAddr, short sAgentPort)	pszAgentAddr: IP address of EvoStor Agent sAgentPort: IP port of EvoStor Agent	Establish a connection to a specified IP address and IP port of EvoStor Agent
BOOL DisConnect()		Disconnect from EvoStor Agent
BOOL CreateLun()		Pop up a create volume wizard to create a volume on the specified EvoStor
BOOL DeleteLun()		Delete a volume from a specified EvoStor
BOOL ChangeSCSIID()		Pop up a dialog to change the SCSI ID of a specified EvoStor
BOOL ChangePasswd()		Pop up a dialog to change the password of a specified EvoStor
void Rescan()		Rescan all SCSI bus on all host adapters, and identify the EvoStor devices available on the SCSI bus
void AlertSetting()		Pop up a dialog to set alert configuration
BOOL UpgradeFirmware()		Upgrade firmware on a specified EvoStor

Events		
[Name]	**[Param]**	**[Note]**
void EventLog(BSTR pszOwner, short sType, BSTR pszTime, BSTR pszContent)	pszOwner: Which EvoStor send out the event log sType: 1(Debug), 2(Error), 3(Warning), 4(Information) pszTime: The time of event log occurs pszContent: The content of event log	Fired when an event takes place for EvoStor
Void SocketClosure()		Fired when receiving notification of socket closure

Examples:

```
CRaidView m_RAIDViewCtrl;
m_RAIDViewCtrl.Connect();                // Connect to EvoStor Agent
m_RAIDViewCtrl.Rescan();                 // Rescan EvoStor devices on all
SCSI bus
m_RAIDViewCtrl.AlertSetting()       // Set alert configuration
m_RAIDViewCtrl.CreateLun();         // Create a logic volume on EvoStor
m_RAIDViewCtrl.DeleteLun();         // Delete a logic volume on EvoStor
m_RAIDViewCtrl.UpgradeFirmware();  // Upgrade firmware of EvoStor
m_RAIDViewCtrl.ChangeSCSIID();           // Change SCSI ID of EvoStor
m_RAIDViewCtrl.ChangePasswd();           // Change password of EvoStor
m_RAIDViewCtrl.DisConnect();        // Disconnect
```

Chapter 4   Accessing EvoStor

EvoStor emulates a standard SCSI-3 direct access device (hard disk) to host, it is compatible with all SCSI-3 or SCSI-2/LVD host adapters, so no special access software for specific operating system is required. Like any other type of fixed disk media in your system, a RAID must also be partitioned and formatted before use. The method of partitioning and formatting on a RAID is the same as that for other disks. The following sections provide a brief overview on how to access EvoStor in Windows 2000 and Red Hat Linux operating system. For other operating system, please contact your operating system supplier for further information.

4.1   Using Microsoft Windows 2000

 i. Detecting new drive

Right click My **Computer** on the desktop and select **Manage**. Select **Disk Management** when the following screen pops up, the computer will detect the new logical disk. If there is an existing hard disk, the newly detected one will be numbered as disk 1.
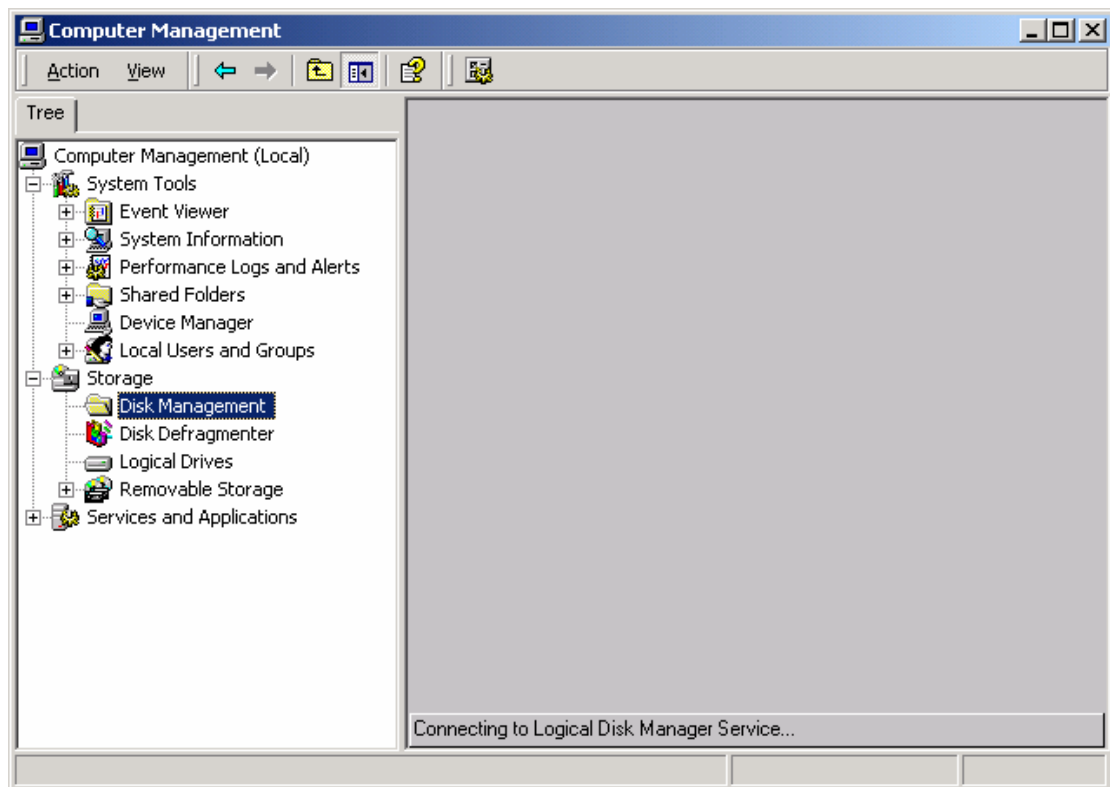
ii. Writing Signature

Before using new disk, the host computer will prompt for writing signature for the newly detected disk. Click **Next** to proceed.
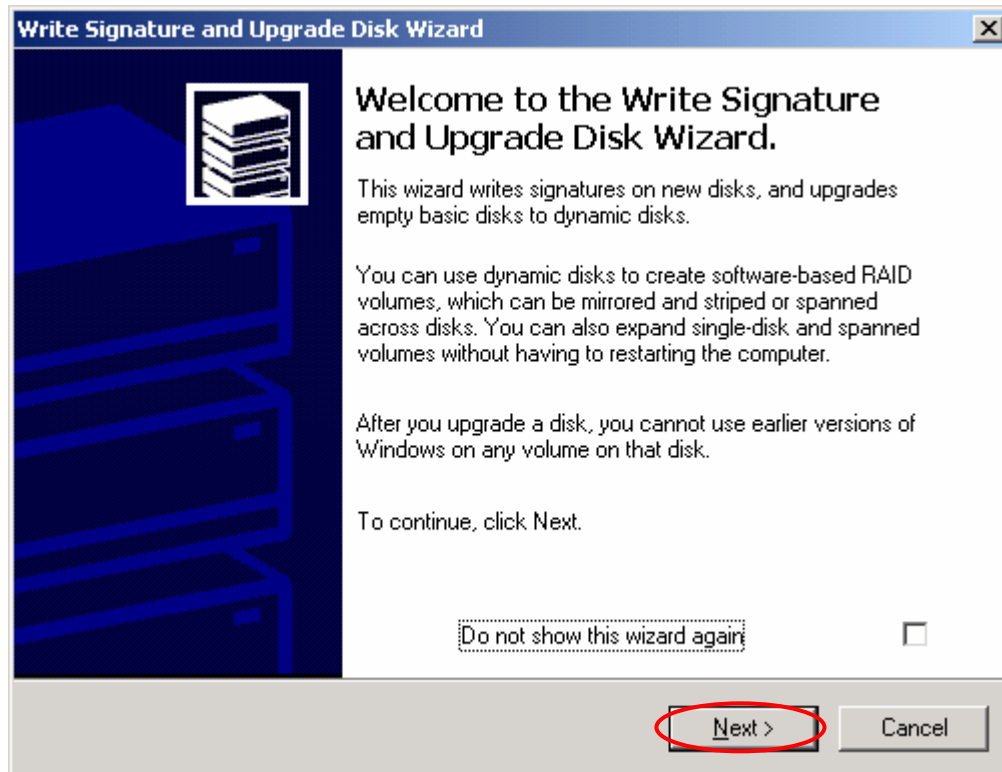
iii. The following example is based on Disk 1. Select Disk 1 and click **Next**.
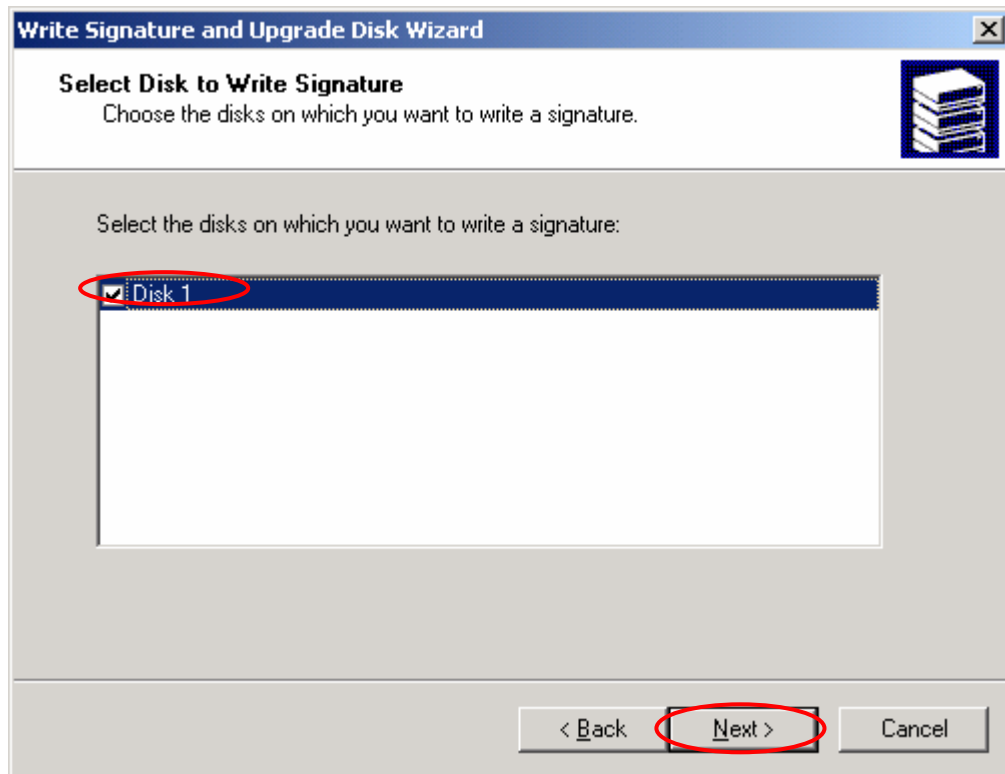
iv. Click **Finish** to complete writing signature for Disk 1. Do not select to upgrade the disk.
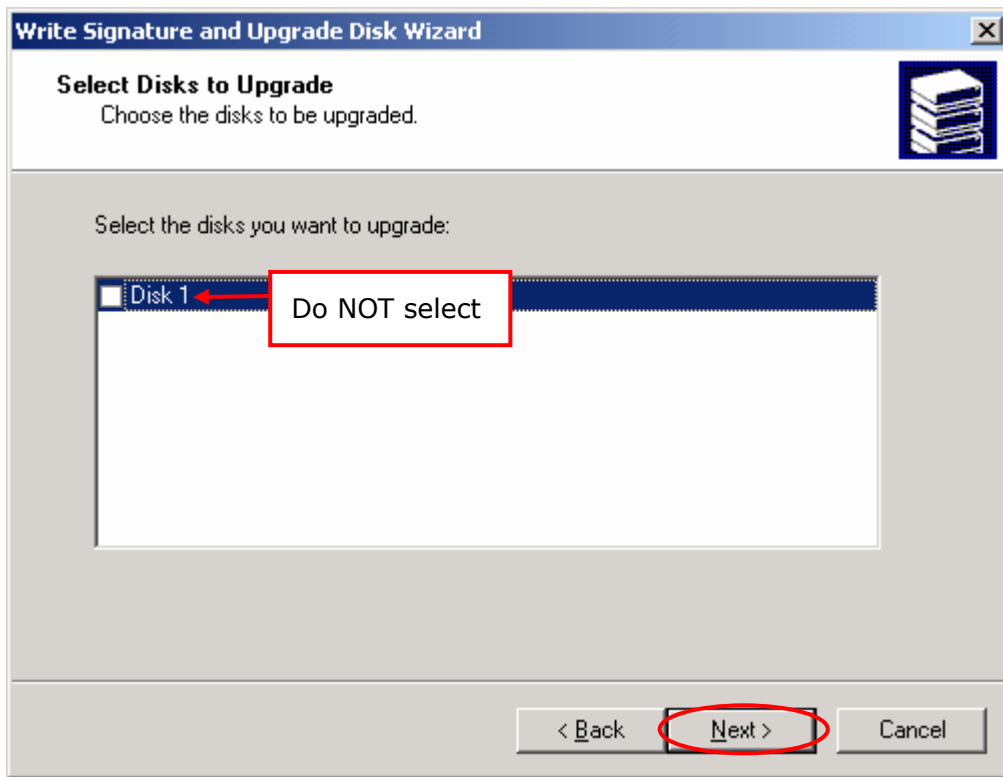
v. Click **Finish** to complete.
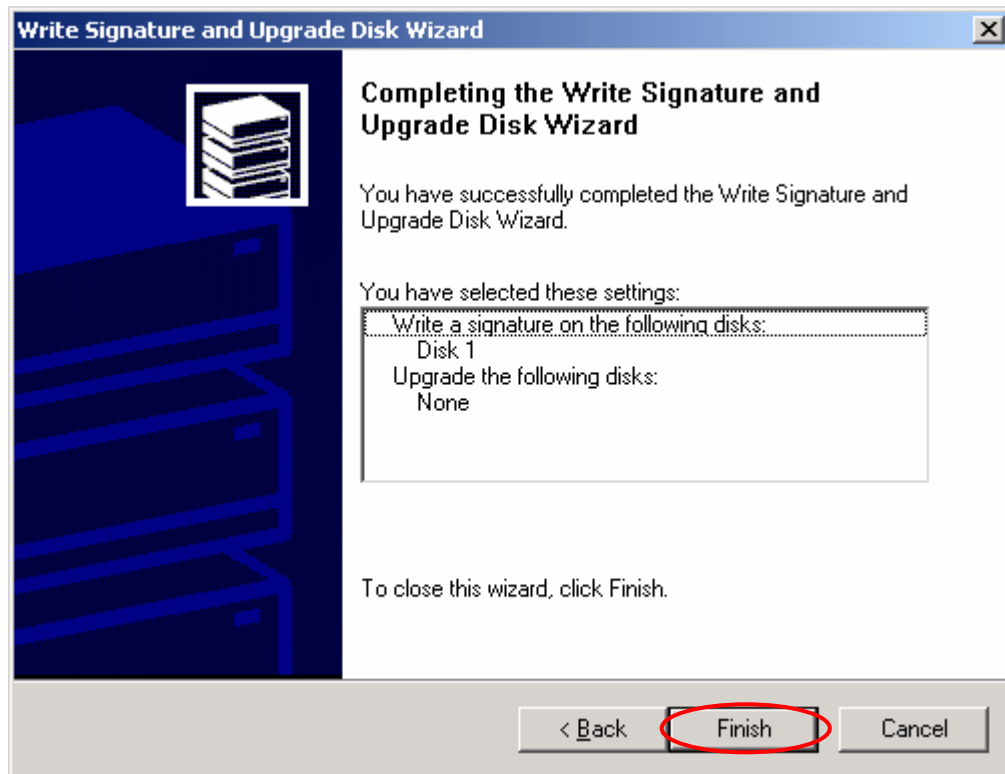
vi. Creating disk volume.

Right click the newly detected disk and select **Create Volume**.
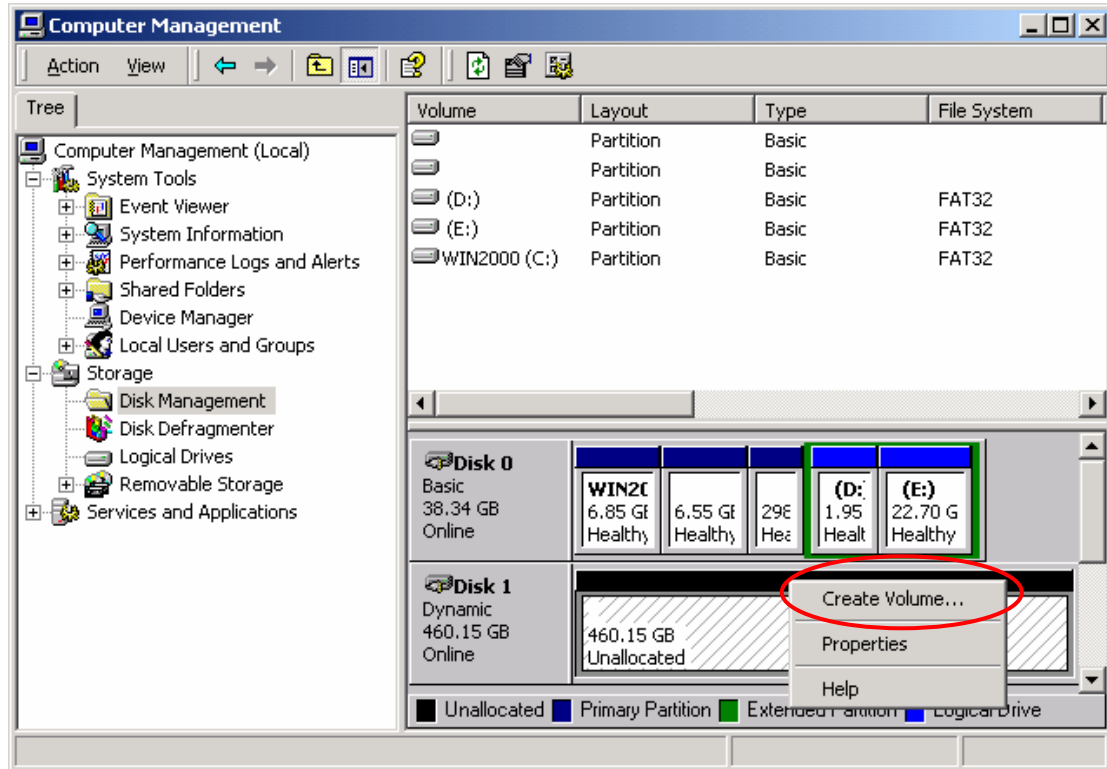
vii. Create Volume Wizard will appear. Click **Next** to proceed.
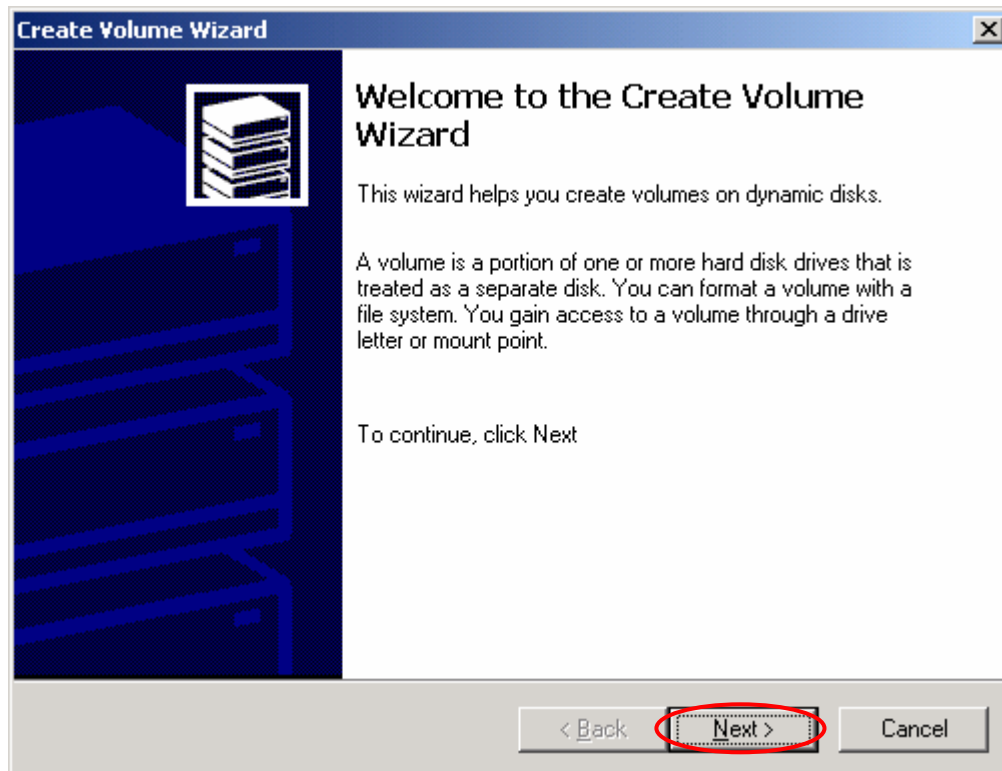
viii. Select simple volume as the volume type. Click **Next** to proceed.
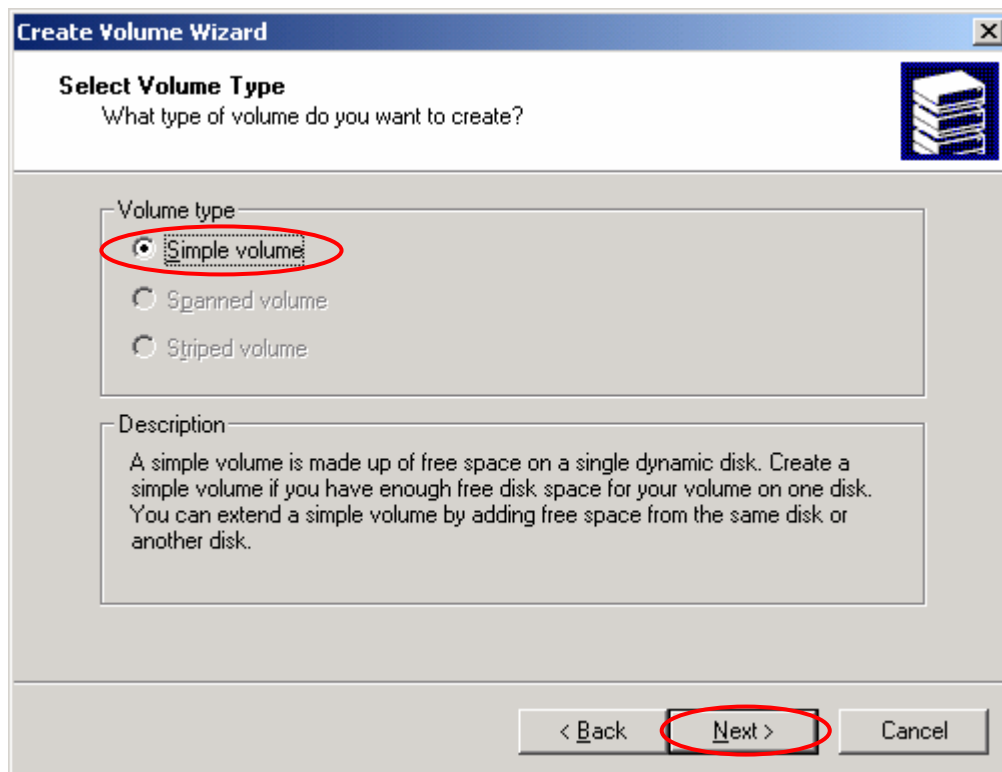
ix. Select the disk and set the disk size for the volume. Click **Next** to proceed.
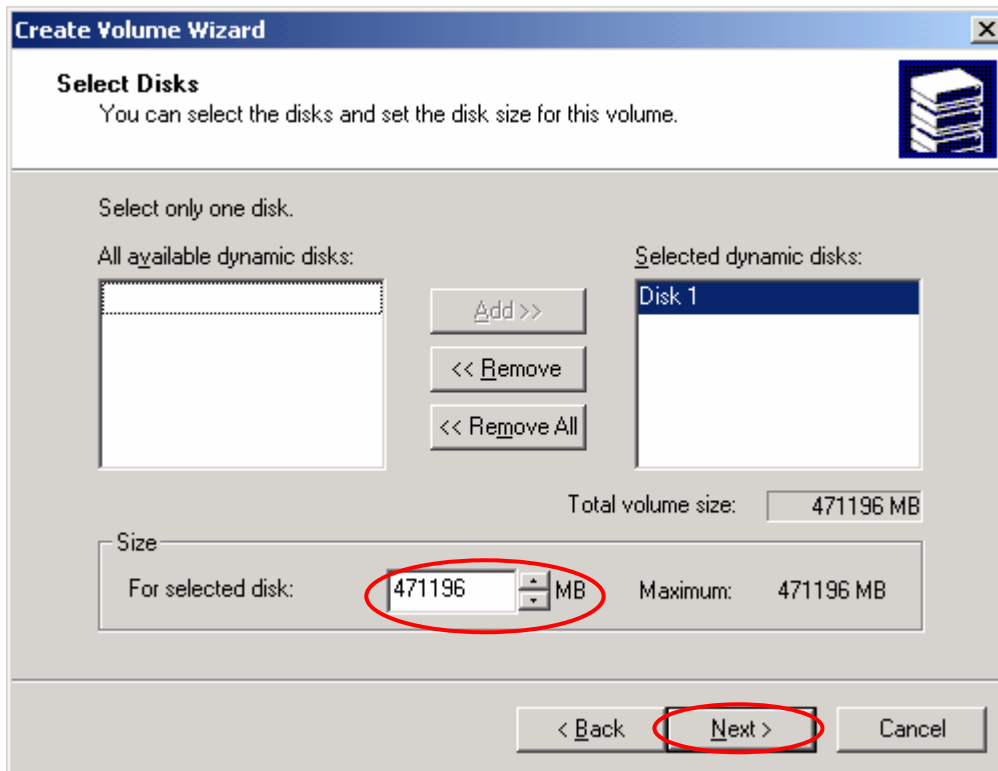
x. Assign a drive letter or drive path to the volume. Click **Next** to proceed.
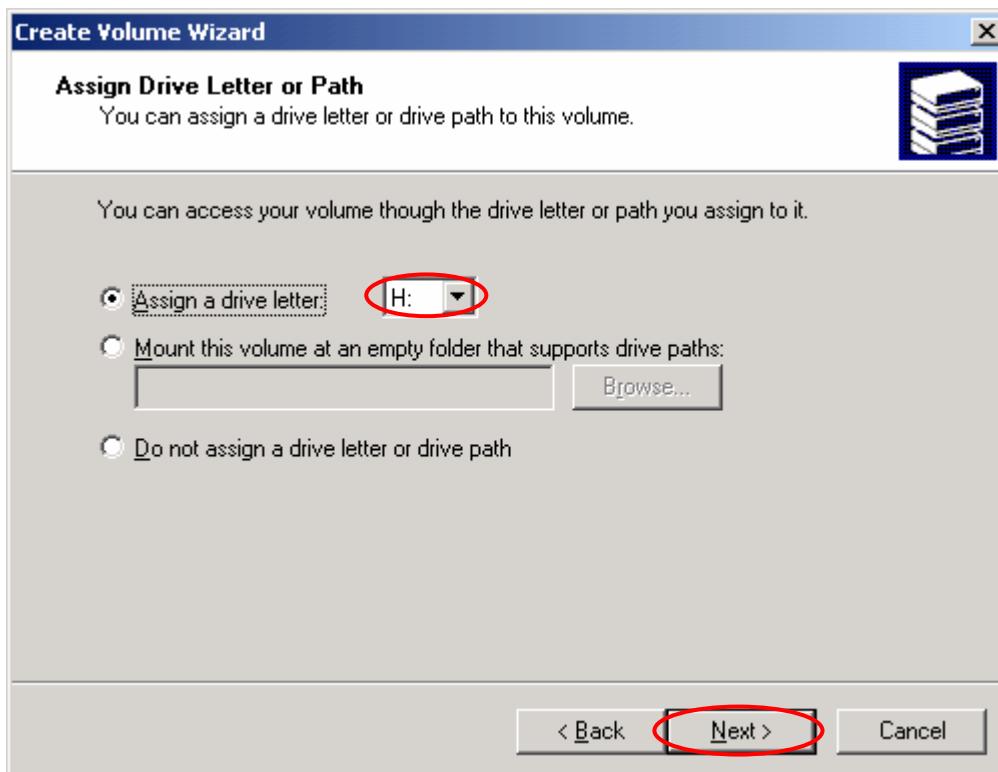
xi. Customize the formatting of the partition. Click **Next** to proceed.
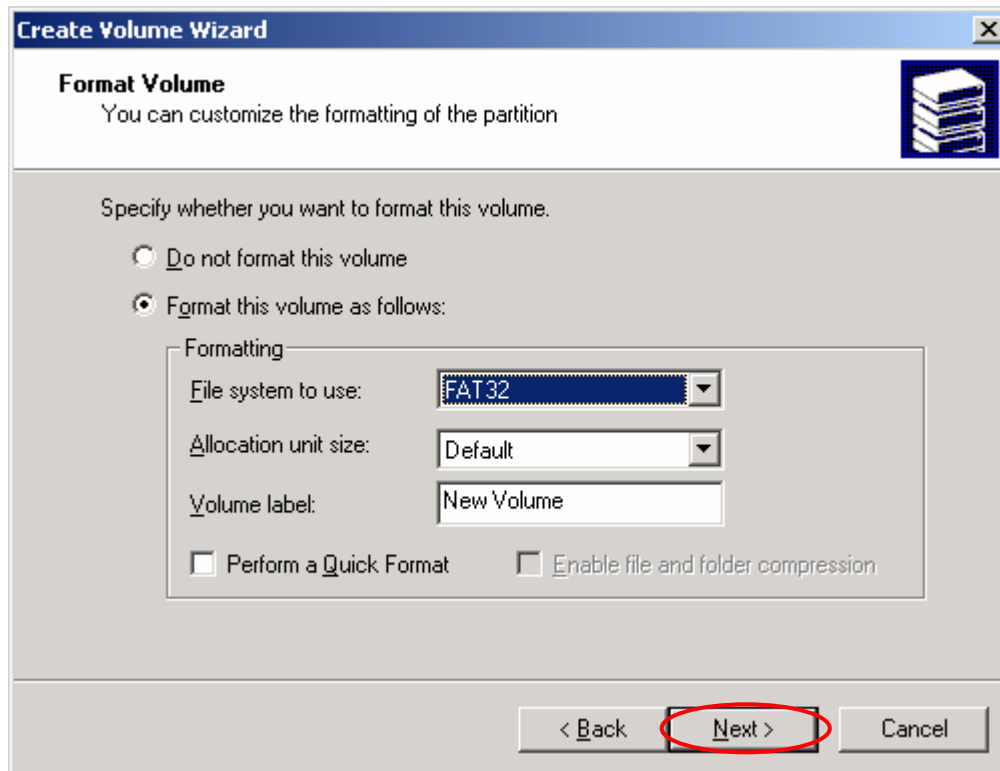
xii. Click **Finish** to complete the Create Volume Wizard.
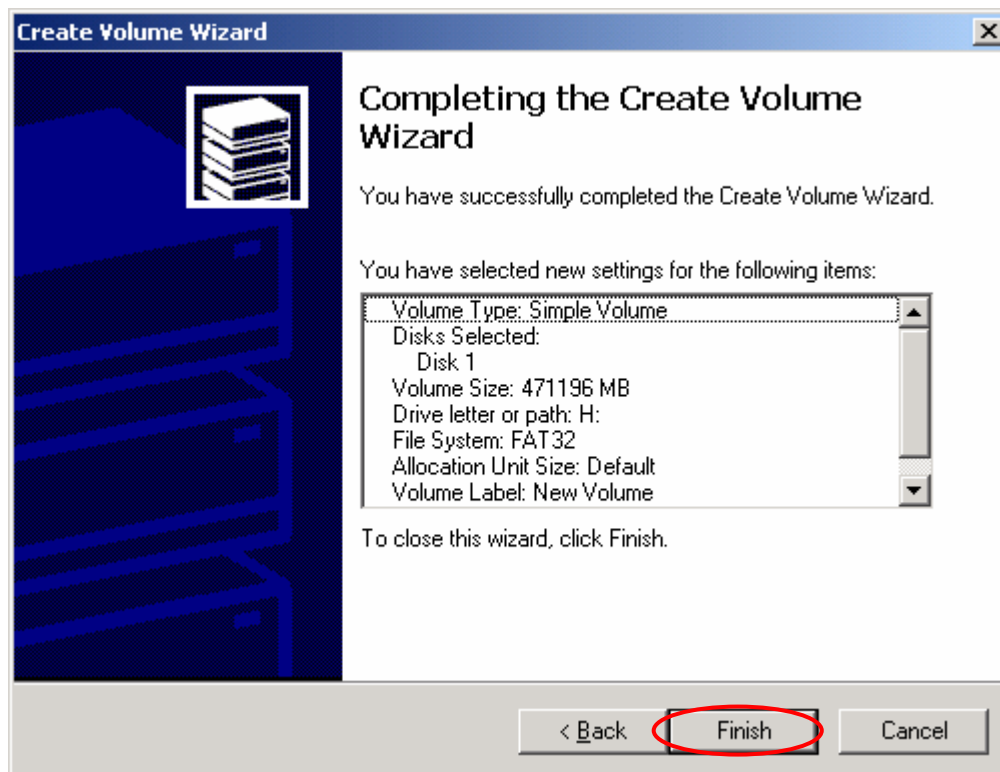
xiii. The disk will be formatted. It will be ready for use when its status is Healthy.
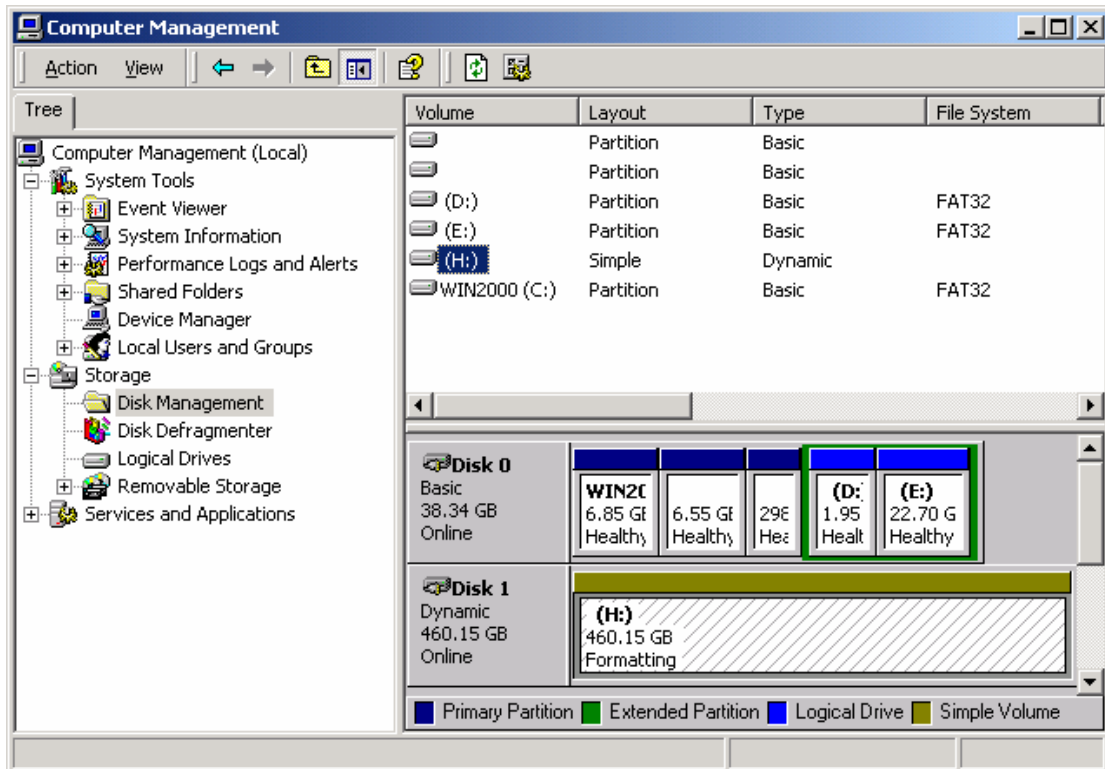
4.2 Using Red Hat Linux

1. Confirm SCSI support

Enter Linux operation system, run 'make menuconfig' in Linux kernel source directory to enter Linux Kernel Menu Configuration page. Press the down arrow button, select SCSI support and press Enter.

```
Linux Kernel v2.4.18 Configuration

                            Main Menu
  Arrow keys navigate the menu.  <Enter> selects submenus --->.
  Highlighted letters are hotkeys.  Pressing <Y> includes, <N> excludes,
  <M> modularizes features.  Press <Esc><Esc> to exit, <?> for Help.
  Legend: [*] built-in  [ ] excluded  <M> module  < > module capable

            Networking options  --->
            Network device support  --->
            Amateur Radio support  --->
            IrDA (infrared) support  --->
            ATA/IDE/MFM/RLL support  --->
            SCSI support  --->
            IEEE 1394 (FireWire) support (EXPERIMENTAL)  --->
            I2O device support  --->
            ISDN subsystem  --->
            Input core support  --->
            Character devices  --->

              <Select>     < Exit >    < Help >
```

Make sure the following highlighted items are selected—SCSI support, SCSI disk support, SCSI generic support, and Probe all LUNs on each SCSI device.

```
Linux Kernel v2.4.18 Configuration
┌───────────────────────────── SCSI support ─────────────────────────────┐
│ Arrow keys navigate the menu.  <Enter> selects submenus --->.           │
│ Highlighted letters are hotkeys.  Pressing <Y> includes, <N> excludes,  │
│ <M> modularizes features.  Press <Esc><Esc> to exit, <?> for Help.      │
│ Legend: [*] built-in  [ ] excluded  <M> module  < > module capable      │
│ ┌─────────────────────────────────────────────────────────────────────┐ │
│ │ <*> SCSI support?                                                   │ │
│ │ --- SCSI support type (disk, tape, CD-ROM)                          │ │
│ │ <*>    SCSI disk support                                            │ │
│ │ (40) Maximum number of SCSI disks that can be loaded as modules     │ │
│ │ < >    SCSI tape support                                            │ │
│ │ < >    SCSI OnStream SC-x0 tape support                             │ │
│ │ < >    SCSI CD-ROM support                                          │ │
│ │ <*>    SCSI generic support                                         │ │
│ │ --- Some SCSI devices (e.g. CD jukebox) support multiple LUNs       │ │
│ │ [ ]    Enable extra checks in new queueing code                     │ │
│ │ [*]    Probe all LUNs on each SCSI device                           │ │
│ │ ─┤(+)─                                                              │ │
│ └─────────────────────────────────────────────────────────────────────┘ │
│              <Select>     < Exit >     < Help >                          │
└─────────────────────────────────────────────────────────────────────────┘
```
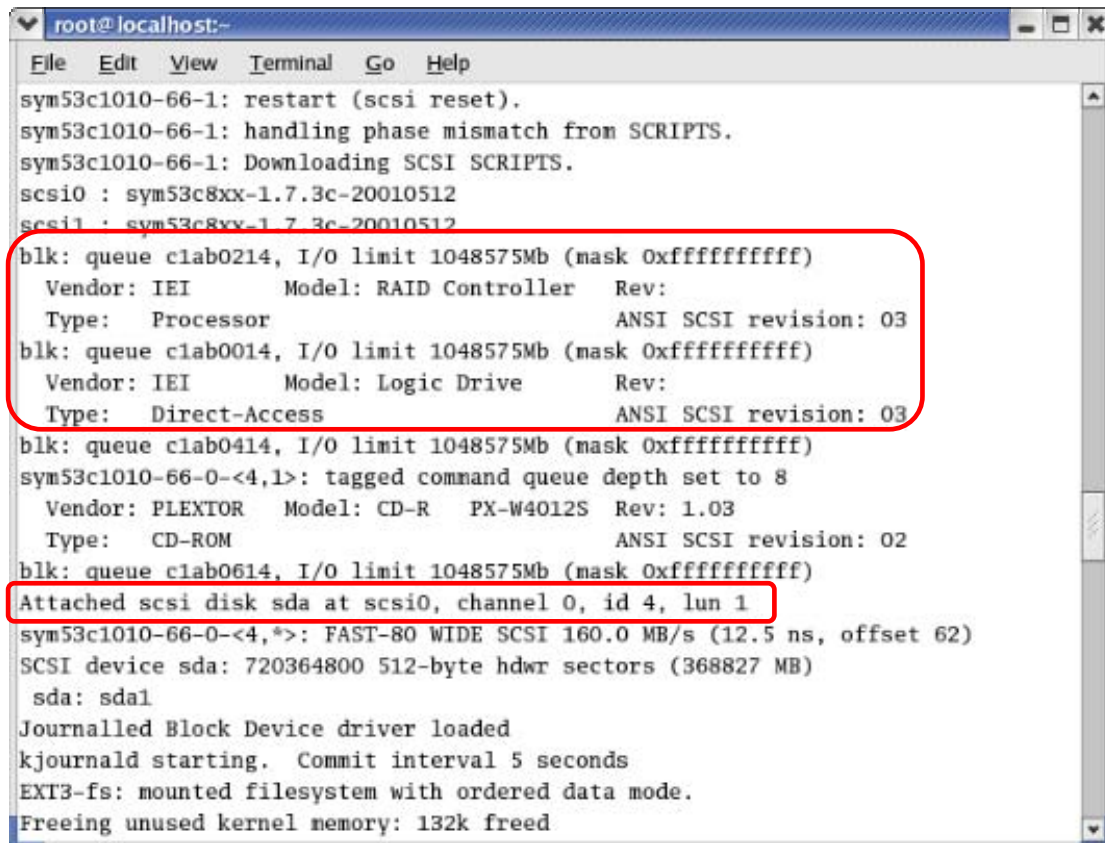
EvoStor subsystem supports multiple logic volumes; hence "Probe all LUNs on each SCSI device" must be selected. If the operation system has been installed with SCSI support, the above highlighted items will be selected. If not, save the above settings and compile a new kernel. Restart the system with the new kernel.

2. Confirm disk name detected by the system after restart

SCSI devices are named with **/dev/sda, /dev/sdb**, … by Linux operation system in the order that the devices are detected. When disk volume has been created on EvoStor, turn on Linux system and run **dmesg** to view the names of all detected SCSI devices.

```
root@localhost:~
File  Edit  View  Terminal  Go  Help
sym53c1010-66-1: restart (scsi reset).
sym53c1010-66-1: handling phase mismatch from SCRIPTS.
sym53c1010-66-1: Downloading SCSI SCRIPTS.
scsi0 : sym53c8xx-1.7.3c-20010512
scsi1 : sym53c8xx-1.7.3c-20010512
blk: queue c1ab0214, I/O limit 1048575Mb (mask 0xffffffffff)
  Vendor: IEI       Model: RAID Controller   Rev:
  Type:    Processor                         ANSI SCSI revision: 03
blk: queue c1ab0014, I/O limit 1048575Mb (mask 0xffffffffff)
  Vendor: IEI       Model: Logic Drive       Rev:
  Type:    Direct-Access                     ANSI SCSI revision: 03
blk: queue c1ab0414, I/O limit 1048575Mb (mask 0xffffffffff)
sym53c1010-66-0-<4,1>: tagged command queue depth set to 8
  Vendor: PLEXTOR   Model: CD-R   PX-W4012S  Rev: 1.03
  Type:    CD-ROM                            ANSI SCSI revision: 02
blk: queue c1ab0614, I/O limit 1048575Mb (mask 0xffffffffff)
Attached scsi disk sda at scsi0, channel 0, id 4, lun 1
sym53c1010-66-0-<4,*>: FAST-80 WIDE SCSI 160.0 MB/s (12.5 ns, offset 62)
SCSI device sda: 720364800 512-byte hdwr sectors (368827 MB)
 sda: sda1
Journalled Block Device driver loaded
kjournald starting.  Commit interval 5 seconds
EXT3-fs: mounted filesystem with ordered data mode.
Freeing unused kernel memory: 132k freed
```

As shown in the example above, Linux has detected two SCSI devices. The first one (LUN 0) is a SCSI processor used by EvoStor for SCSI management. The second one (LUN 1) is a SCSI logic volume created by the user. The system has named it as **/dev/sda**.

After turning on EvoStor, if the Linux host computer cannot detect EvoStor, check the connection of SCSI cable and terminator. Then enter **echo "scsi add-single-device W X Y Z > /proc/scsi**. Add EvoStor in the host computer, W, X, Y, and Z represents SCSI adaptor, SCSI ID, EvoStor SCSI ID, and newly created LUN respectively. You can then enter **cat/proc/scsi** to check if the new EvoStor has been added to the system.

3. Create disk partition

When a name has been assigned, e.g. **/dev/sda**, use fdisk or other disk partitioning tool to create disk partition, e.g. **/dev/sda1, /dev/sda2**.

4. Format disk partition

Format the new partitions as appropriate file system, to format the partition **/dev/sda1** as ext2 file system, run **#mke2fs /dev/sda1**.

5. Mount newly added disk partition to system directory

Mount newly added disk partition to system directory, EvoStor subsystem is then ready for use.

Chapter 5   EvoStor Maintenance

Note: The cover of EvoStor has to be opened for maintenance. Please contact the product supplier for technical suggestion before maintaining EvoStor to avoid damage to the machine.

EvoStor supports self-diagnosis and RAID recovery, the options are described below:

Options on LCD Panel	Description
Enter Diagnosis mode, no need to select any functions	Restore firmware
Auto Test	Test the system automatically
Reset Password	Reset password to default
RAID Recovery	Recover RAID configuration

5.1   Entering Diagnosis Mode

To enter diagnosis mode, follow the steps below:

4. Turn off EvoStor. It is recommended to turn off EvoStor via LCD panel.
5. Detach the cover and main board components of EvoStor.
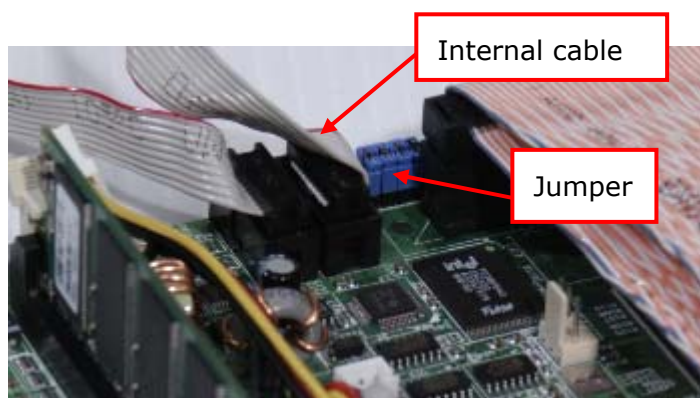
6. Unplug the internal cable.

7. Remove the jumper on the left most position.

8. Attach the cable tie to the main board and close the cover.

9. Turn on EvoStor. The system will restart and the following message will be shown on the LCD panel to indicate that the system is in diagnosis mode. Press the configuration switch to select other functions.

Diagnosis Mode
Ver. 1.0 (1208)
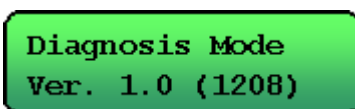
5.2 Exiting Diagnosis Mode

1. Turn off EvoStor via LCD panel.
2. Unplug the internal cable (as shown in step 3 of the previous section).
3. Attach the jumper unplugged in step 4 of the previous section back to the main board.
4. Attach the internal cable to the original position.
5. Close the cover of EvoStor.
6. Connect the power supply and restart EvoStor.

5.3 Restoring Firmware

If EvoStor cannot be turned on due to firmware upgrade failure caused by power outage or unexpected interruption, restore the firmware again in diagnosis mode. Then following the instructions above to exit diagnosis mode and restart the system.

5.4   Auto Test

EvoStor Auto Test function supports self-checking of hardware, including system voltage, temperature, fan, RS-232 connector and basic IDE hard disk writing. Follow the steps below to run Auto Test:

1. Enter diagnosis mode, press the Function switch and Up & Down buttons to select Auto Test. Press Enter to proceed.

    >Auto Test

2. All testing items will be shown on LCD panel in the process. If no errors are found, the following message will appear. Otherwise, those items that do not pass the test will be displayed. Press any button to return to the main menu.

    ALL PASS !
    Any key to Exit.

Note: An extra loop back test tool is required for RS-232 connector test. Please contact our company for purchase or further information.

5.5   Resetting Password

To restore the password of EvoStor via LCD panel, follow the steps below:

1. Enter diagnosis mode, press the Function switch and Up & Down buttons to select Reset Password. Then press Enter to proceed.

```
>Reset Password
```

2. In the resetting process, the screen below will be shown.

```
Resetting Passwd
...
```

3. When finished, the LCD panel will return to the main menu.

5.6   RAID Recovery

When an EvoStor is unable to run properly due to machine failure, you can detach the hard disks of that EvoStor to a new one. You can then perform the steps below to recover RAID in order to restore RAID configuration and data to the new EvoStor.

1. Take out the hard disks of RAID in order.
2. Plug the disks to the new EvoStor in the order that they are taken out. Note that the new EvoStor should not be turned on.
3. Enter diagnosis mode, press the Up and Down buttons to select RAID Recovery. Press Enter to proceed.

>RAID Recovery

4. In the recovery process, the following message will be shown:

RAID Recovering
...

When recovery is done, the message below will be shown. Press any key to return to the main menu and turn off the system.

Recovery
Successfully

Exit diagnosis mode and restart EvoStor. When entering to the normal startup screen, the new EvoStor is ready to use.

Appendix A   SCSI

SCSI stands for Small Computer System Interface. SCSI interface provides fast data transfer to individual attached devices. All devices connected to a SCSI interface should be assigned with a SCSI ID, which cannot duplicate with one another. A SCSI controller is used to ensure the maximum performance of all connected SCSI devices.

SCSI Interface			Bus Width (bit)	Bus Speed (MHz)	Speed (MB/s)	PIN	Maximum number of connected devices (interface cards inclusive)
SCSI-1			8	5	5	50-pin	8
SCSI-2		Fast	8	10	10	50-pin	8
		Wide	16	5	10	68-pin	16
		Fast Wide	16	10	20	68-pin	16
SCSI-3	SPI-1 (Fast-20)	Ultra	8	20	20	50-pin	8
		Wide Ultra	16	20	40	68-pin	16
	SPI-2 (Fast-40)	Ultra2	8	40	40	50-pin	8
		Wide Ultra2	16	40	80	68-pin	16
	SPI-3 (Fast-80)	Ultra160	16	80	160	68-pin	16
	SPI-4 (Fast-160)	Ultra320	16	160	320	68-pin	16

Advanced SCSI Programming Interface (ASPI)

SCSI interface can support various devices which may have their own drivers that are incompatible with one another. To solve this problem, SCSI programming interfaces are developed, e.g. LADDR by Microsoft, CAM by ANSI and ASPI by Adaptec. ASPI (Advanced SCSI Programming Interface) is an interface specification for sending commands to SCSI host adapters. Software drivers can be classified as two components with ASPI—ASPI Manager and ASPI Module.

➢ ASPI Manager (for management of SCSI card)

   ASPI Manager is OS and hardware dependent. It accepts commands and sends SCSI command to the target.

➢ ASPI Module (driver for SCSI device)

   ASPI Module is a driver for the communication between ASPI Manager and SCSI card.

Select SCSI ID

Each SCSI device should be assigned with a unique SCSI ID for identification. The SCSI ID of the SCSI adaptor of host will be 7 usually, which indicates a higher priority. EvoStor can select SCSI ID from 0-15, the default value is 4.

Logic volume and LUN (Logic unit number)

Each SCSI device can be attached with several logic units, to which each SCSI command can be sent. LUN-0 is reserved for the first logic volume and processing management commands for EvoStor. Other logic volumes created by users are mapped to LUN 1-7 for the main server to read and write the disk.

SCSI Terminator

A SCSI terminator must be installed at the end of a SCSI connection. If EvoStor is the last SCSI device in a SCSI connection, a SCSI terminator must be installed. SCSI terminator will provide a suitable SCSI cable to reject arrival of command.

Appendix B   RAID

RAID stands for Redundant Arrays of Inexpensive Disks, which is an idea initiated by Gibson Patterson and Katz at the University of California Berkeley in 1988. The basic idea of RAID is to combine multiple inexpensive disk drives into an array of disk drives that acquires a performance which is better that a single large expensive drive. RAID can be classified as five types of array architectures to make disk arrays fault-tolerant and provide a better storing performance. When there is a disk failure, RAID read the mirror copy in another disk, which enhances data recovery.

To distribute data evenly to each disk, data will be partitioned as a block, usually 32 K or 64 K. Data will be written to the disk according to RAID type.

RAID can be classified as below:

NRAID (Non-RAID)

The capacity of all drives is combined to a single logical drive. When a drive is full, data will be written to another drive until it is full. Access speed will not be increased and data redundancy is not provided. The capacity of the logical drive is the total capacity of all physical drives. When one of the drives fails, NRAID will not function properly.

RAID 0

RAID 0 (striping disk) combines two or more disks into one larger disk. It offers the fastest disk access but it does not have any protection of your data if the striped array fails. The disk capacity equals the number of disks in the array times the size of the smallest disk. Striping disk is usually used to maximize your disk capacity or for fast disk access but not for storing important data.

RAID 1

RAID 1 (mirroring disk) protects your data by automatically backing up the contents of one disk onto the second disk of a mirrored pair. This protects your data if one of the disks fails. Unfortunately, the storing capacity is equal to a single disk, as the second drive is used to automatically back up the first. Mirroring Disk is suitable for personal or corporate use to store important data.

RAID 0+1

RAID 0+1 (disk stripping with mirroring) is a combination of RAID 0 and RAID 1 to provide disk striping with mirroring performance. It provides full redundancy of the hard drives that and allows multiple disk failure, which enhances file access speed and data recovery capacity. At least four drives are needed for RAID 0+1. Half of them will be used for mirroring.

RAID 3

Three or more drives are required for RAID 3. One of the drives will be used specifically for storing parity data. When a drive fails, replace it with a new one. The controller will recover the lost data from the parity drive. RAID 3 is featured with its fast reading and slow writing (due to checking parity data in the same volume).

RAID 5

Three or more hard disks can be teamed up to form a large-capacity RAID 5 disk volume. It is similar to RAID 3 except that parity information is interspersed across the drive array. When one of the disks fails, data can be recovered from other disks.

Stripe Size

RAID distributes data is distributed across each drive. The data should be striped evenly, e.g. 4KB, 8KB, 16KB, 32KB, 64 KB or 128KB, and written to RAID subsystem according to the RAID level.

RAID Initialization

RAID initialization will clear all data on RAID subsystem for accurate parity data checking. It is applicable for RAID 1, RAID 0+1, RAID 3 and RAID 5. When RAID subsystem is configured as the one of these configurations, initialization will start and the information will be displayed on the LCD panel. Initialization time will depend on the size of RAID subsystem.

Spare Drives

Spare drives are attached to RAID subsystem directly but are not a member of the subsystem. For RAID configuration that supports fault tolerance (i.e. data recovery), when any of the subsystem members fails, a spare disk will be added to replace that failed disk. RAID subsystem will recover the data from hot swap disk. When the failed disk is repaired or replaced, it will become a spare disk automatically.

Appendix C   Abbreviations for RAID Status

Abbreviation	Description
D	Data disk of RAID
F	Disk failure
G	Data access degrading
I	Data initialization
N	Normal (Status of disks)
R	Data recovery
S	Spare disks
T	Disk testing
U	Unable to restore RAID
X	No disk in disk tray

Appendix D   Troubleshooting

1. Why EvoStor LCD cannot enter normal startup screen and keeps showing "PowerOn Self Test"?

    Please follow the steps below to check:
    1) Press the ESC button on the LCD panel and check if there is any change. If not, press the power on/off button to turn off EvoStor. Then turn on EvoStor. Check if the same error persists. If yes, go to the next step.
    2) If EvoStor is connected to the host computer, disconnect the SCSI cable. Restart EvoStor and check the status. If the error persists, go to the next step.
    3) Shut down EvoStor, open the case cover and check if the cable of EvoStor LCD panel is disconnected. If yes, connect the cable and restart EvoStor. If the error still exists, the LCD panel is damaged.

2. When a host computer is connected to EvoStor and turned on, why EvoStor cannot be shown by SCSI BIOS scan or the system hangs?

    Please follow the steps below to check:
    1) Check if there is any device ID duplication on SCSI bus. If yes, change the EvoStor ID and restart EvoStor. When EvoStor is restarted, turn on the host. If the error persists, go to the next step.
    2) Check if the connectors on both sides of the SCSI cable have broken or fallen off. If not, connect and fasten the cable carefully. Then check if the SCSI terminator has broken pin or fallen off. If not, connect and fasten the terminator carefully. Restart EvoStor. When EvoStor is restarted, turn on the host. If the error persists, go to the next step.
    3) Shut down EvoStor. Go to SCSI BIOS settings of the host computer. Change the rate to 40 MB/S and restart EvoStor. When EvoStor is restarted, turn on the host. If the error persists, go to the next step.
    4) Turn off EvoStor and take out all hard drives. Restart EvoStor. When EvoStor is restarted, turn on the host and check if the error persists. If yes, please send the server to maintenance. If the server starts up successfully, insert all hard drives to EvoStor. Wait until EvoStor finishes detection and use Disk Management to scan the disks. If the system can detect the partitions and file systems, checking is finished. If not, the partitions and file system are damaged. You will then need to delete the partitions and file system manually and create them again. (Note: When doing this, all data saved on EvoStor will be deleted.)

3. When connecting EvoStor to the host computer, EvoStor cannot be detected by SCSI BIOS scan after turning on the host. However, why I cannot see EvoStor or the system hangs after logging in the operation system?

    Please follow the steps below to check:
    1) Shut down EvoStor. Go to SCSI BIOS settings of the host computer. Change the rate to 40MB/S. Restart EvoStor. When EvoStor is restarted, turn on the host. If the error persists, go to the next step.
    2) Shut down EvoStor. When the host computer is turned on, download the latest SCSI adapter driver. Restart EvoStor. When EvoStor is restarted, turn on the host. If the error persists, go to the next step.
    3) Shut down EvoStor. Take out all hard drives and restart EvoStor. When EvoStor is restarted, turn on the host. If the error persists, send the server to maintenance.
    4) If EvoStor starts up properly after step 3, insert all hard drives to EvoStor. Wait until EvoStor finishes detection and use Disk Management to scan the disks. If the system can detect the partitions and file systems, checking is finished. If not, the partitions and file system are damaged. You will then need to delete the partitions and file system manually and create them again. (Note: When doing this, all data saved on EvoStor will be deleted.)

4. After upgrading RAIDWare1.XX or RAIDWare2.XX to RAIDWare3.XX, why there are always warning logs for temperature and fan detection?

    As the FAQ "What is the functional difference between EvoStor firmware version 2.XX and 3.XX?" says, the calculation formula of temperature and fan speed has been changed. After upgrading to RAIDWare 3.0, please also install Windows EvoStor Manager 3.0 to monitor your EvoStor.

5. Why the original data in EvoStor is not accessible after upgrading the firmware from RAIDWare1.XX or RAIDWare2.XX to RAIDWare3.XX?

    As the FAQ "Can disk array configuration created in firmware version 2.XX be used in version 3.XX?" says, the RAID format of RAIDWare 3.XX is not compatible with RAIDWare2.XX and RAIDWare1.XX. To upgrade EvoStor to RAIDWare 3.XX and use the original data, please follow the procedure below:
    1) Degrade the firmware of EvoStor to RAIDWare2.XX.
    2) Back up the original data in EvoStor to another storage device.
    3) Upgrade the firmware to RAIDWare3.XX.
    4) Configure RAID using RAIDWare3.XX.
    5) Restore the original data from the storage device used in step 2 to EvoStor.

Appendix E   FAQ

Q: If EvoStor uses RAID 1, 3 or 5 disk volume configuration, is data backup necessary?

A: Redundant RAID levels (RAID 1, 3 and 5) provide protection for single disk only. As technology progresses, the size of a single drive becomes larger and larger, so does the Non-recoverable Read Error per bits Read (NRER). Since more hard drives are configured for RAID configuration, the chance of disk failure will be increased. According to certain statistics, the possibility of error occurrence of data rebuilding for ATA/ SATA drive is 16%. Therefore, regular backup is necessary while the frequency depends on how often the data is updated.

Q: What kind of management does EvoStor provide?

A: EvoStor provides two mechanisms for users to configure and monitor EvoStor.

1. In-Band Management: EvoStor provides a Windows utility (EvoStor Manager) with graphic user interface to monitor EvoStor. This utility transfers management commands to EvoStor via SCSI bus.
2. LCD Panel: The LCD panel can help manage the settings of EvoStor.

Q: When an error occurs, how will EvoStor alert the administrator?

A: When an error occurs, e.g. drive failure or operation temperature is too high, the buzzer of EvoStor will sound and the event will be recorded in system logs. User could use "mute beeper" function of LCD panel to stop the sound. When Windows is running EvoStor Manager and the relevant settings are configured, an alert e-mail will be sent to the administrator.

Q: How to shut down EvoStor?

A: Select "Shutdown System" from the LCD panel. Do not press the power switch of the EvoStor directly. Otherwise, the memory cache may not be written to the hard drives immediately and will lead to data inconsistency.

Q: EvoStor is turned off by pressing the power switch or due to power outage. When restarting the server, the message "Rebuilding" is shown on the LCD panel. Is it normal?

A: Yes. When pressing the power switch or power outage occurs, the data in memory cache is not written to the drive and will lead to data inconsistency. When EvoStor is restarted, data rebuilding will be executed to rebuild parity data. This problem is improved in firmware version 3.0. RAIDWare 3.0 will rebuild data depending on the situation to reduce rebuilding time.

Q: How to identify the firmware version of EvoStor?

A: Press the "Enter" button on the LCD panel. Press the up and down buttons to select "Firmware Ver.".

Q: What is the functional difference between EvoStor firmware version 2.XX and 3.XX?

A: The new features and enhancement of RAIDWare3.xx:

1. Remove Hybrid RAID (0+1, 10, 30 and 50) level support
2. RAID engine and cache manager enhancement
3. Array roaming support
4. 64-Bit SCSI CDB support
5. "Add/Remove Hot Spare" function in separate LCD options
6. "Show log" function in separate LCD options
7. "Activate volume" for incomplete RAID configuration
8. Remove unnecessary data rebuilding after power loss or user presses the power switch
9. The calculation formula of temperature and FAN speed has been changed. After upgrading to RAIDWare 3.0, please install EvoStor Manager 3.0 to monitor your EvoStor.
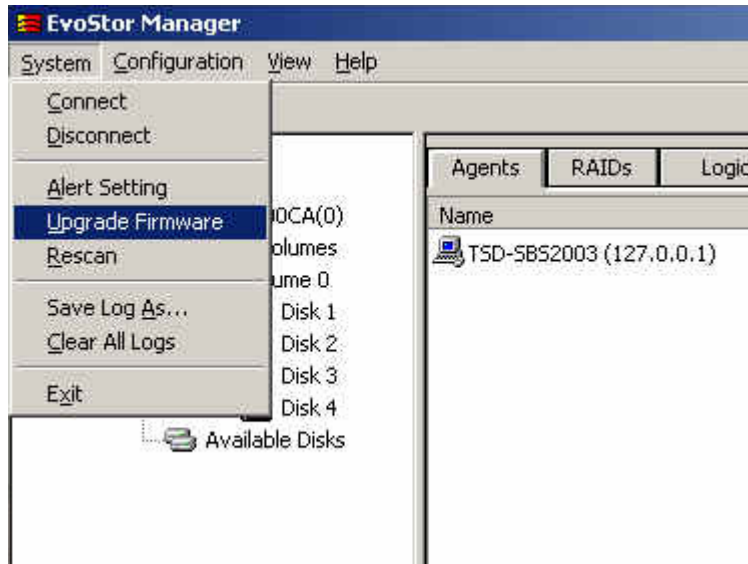
Q: Can disk array configuration created in firmware version 2.XX be used in version 3.XX?

A: No. RAIDWare 3.XX has re-designed disk array configuration format to provide new disk array function. Therefore, it is not compatible with previous versions.
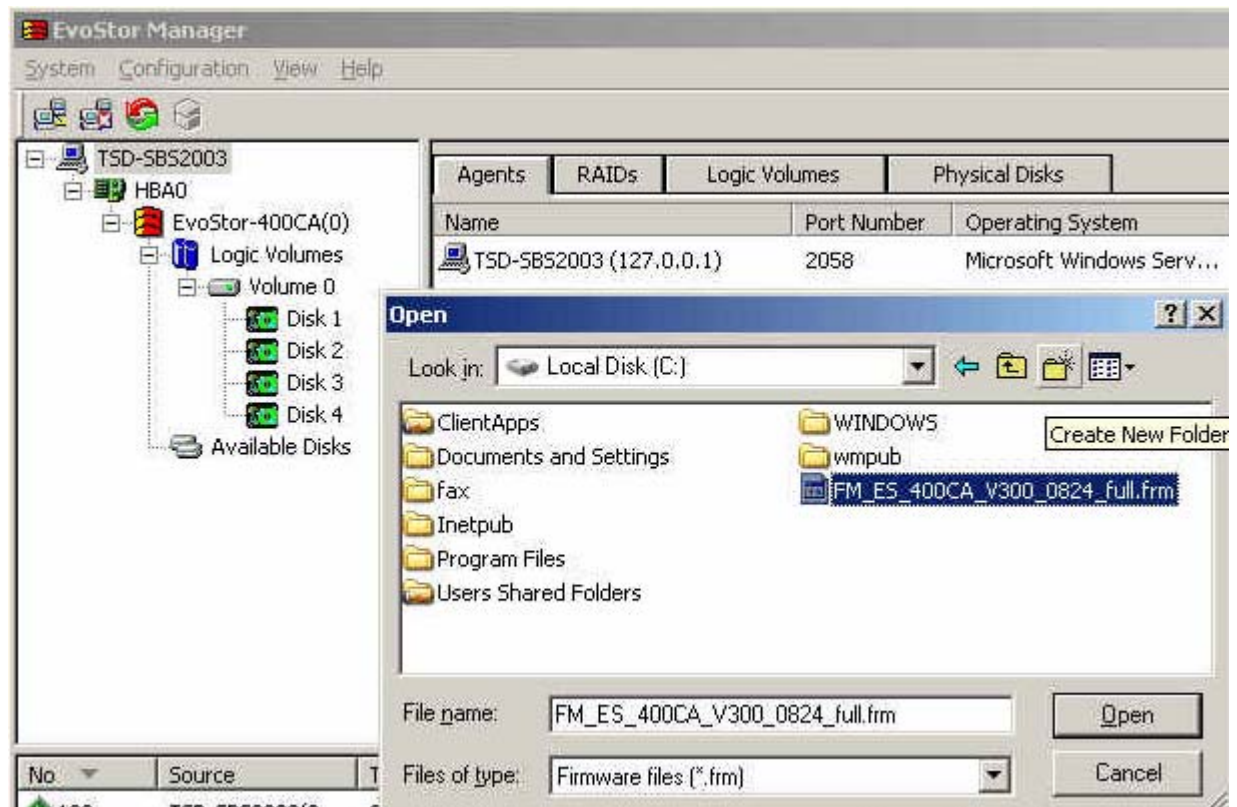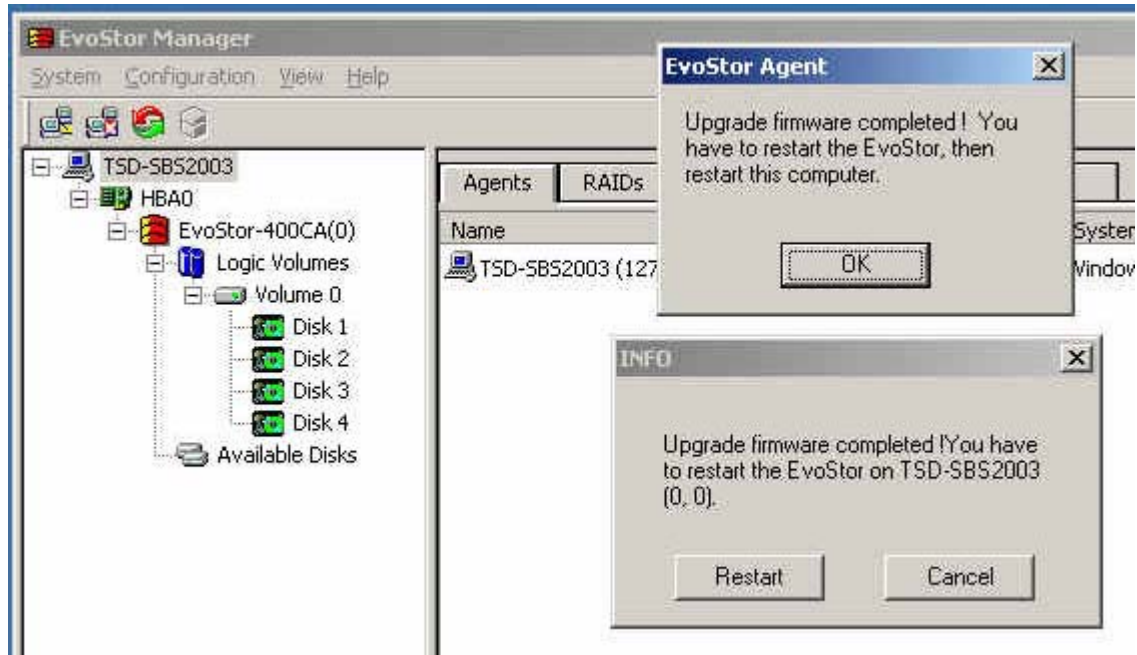
Q: How to upgrade EvoStor firmware?

A: Execute EvoStor Manager.

   (1) Click **System** on the menu and select **Upgrade Firmware**.

   (2) Choose the new firmware file, e.g. "FM_ES_400CA_V300_0824_full.frm".

(3) After upgrade completes, restart Evostor.

(4) Restart your host server.