NR310C
System Configuration Guide

External 4-Bay USB 3.0, eSATA, FireWire 800 interfaces to SATA RAID Subsystem

First Edition, July 2011

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1. Introduction

This system configuration guide aims to provide users with guidelines on the Netstor RAID Manager. The configuration of the RAID system and monitor of the drives in the NR310C module are illustrated in this guide. The Netstor RAID Manager includes two programs. The first one: ManagementServer, and the second one: ManagementClient.

If you are using host with NR310C, the program ManagementServer should be activated first, and then run the program ManagementClient to manage RAID. On the other hand, if you are a client, you only need to run program ManagementClient to administer RAID through the network, but you should note that the program ManagementServer should be already activated on the host.

If you want the application program ManagementServer to be activated on the startup of the computer, you simply create a shortcut of the program ManagementServer from folder Netstor_RAID_Server under RAID_AP_v2.0, and then copy the shortcut to Start / All Programs / Startup from the Windows operating system.

2. Configuration via GUI

• 2.1 Starting the RAID Manager

If you want to use volume larger than 2 TB, the jumper on the backplane of NR310C should be placed over pin 1 and pin 2, and the operating system and the hardware should also support volume larger than 2 TB. If you want to use volume under 2 TB, the jumper should be placed over pin 2 and pin 3.

JP1：

Pin 1 and pin 2 closed (default) – volume larger than 2 TB

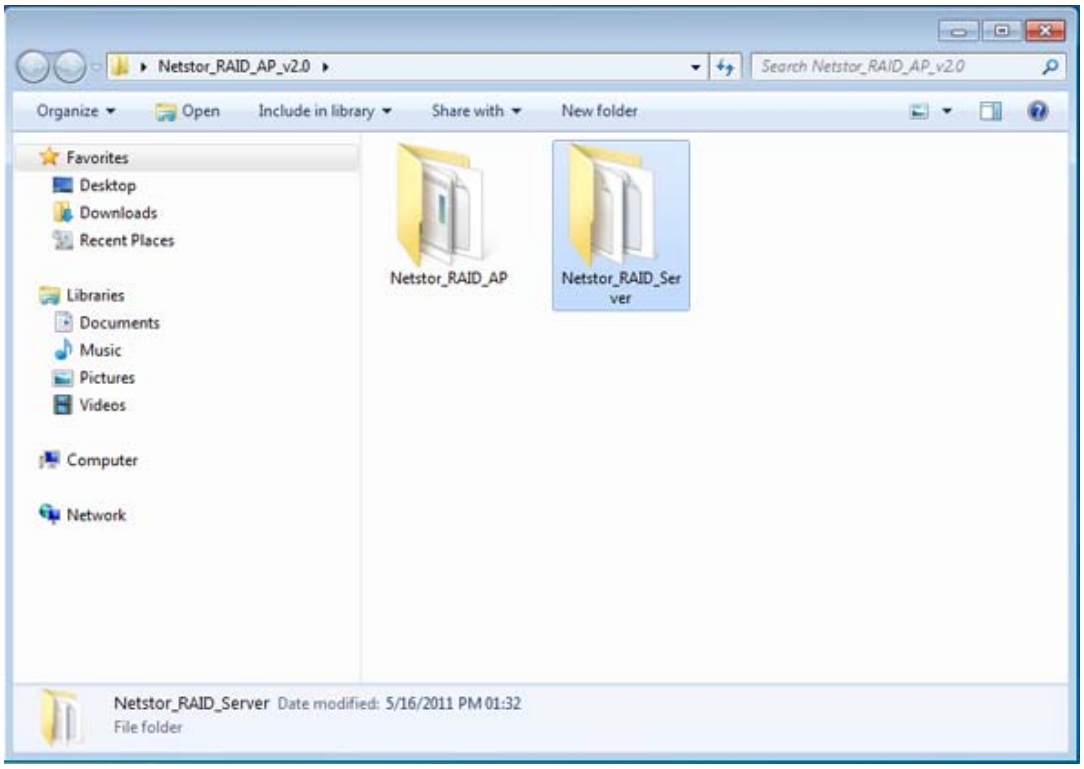
Pin 2 and pin 3 closed – volume under 2 TB

The steps illustrated below show you how to start the RAID Manager.

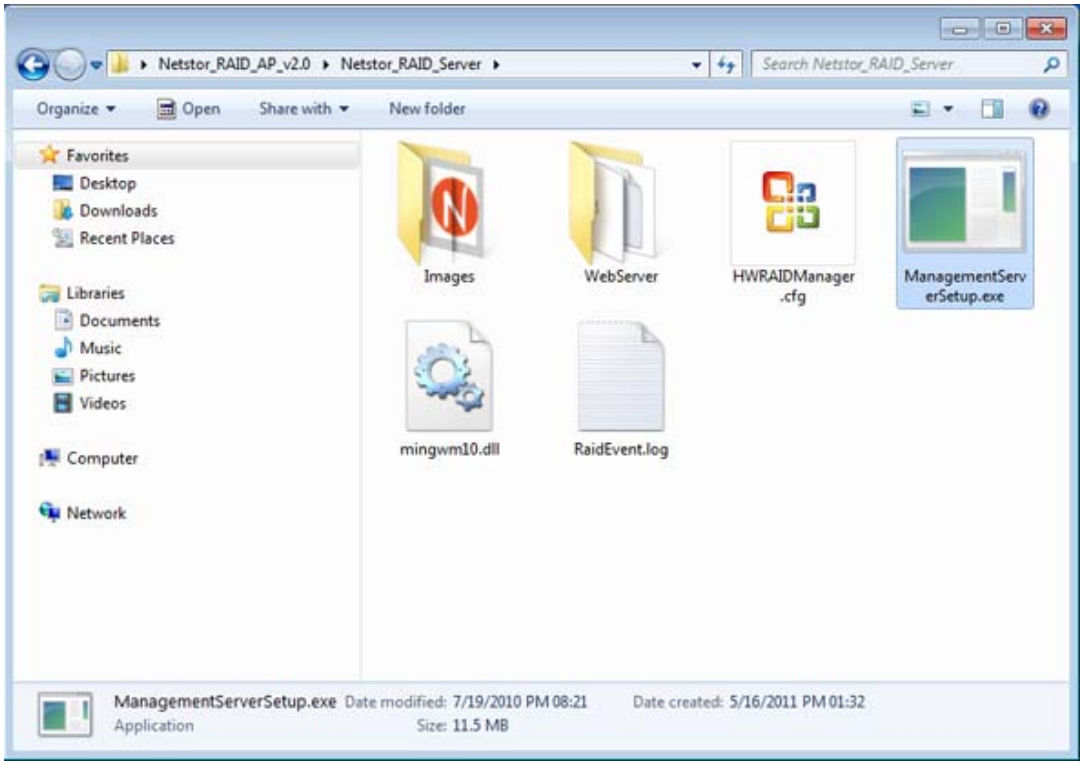
• 2.1.1 For Windows operating system

A. Find the folder **RAID_AP_v2.0** from the CD, and then copy the folder to your computer. After you copy the folder onto your computer, double click the folder on computer and you will see two sub-folders under it. Find the folder **Netstor_RAID_Server** and double click it, then find the executable program **ManagementServerSetup** and execute it. After the execution of the program, you will see the icon of Netstor H/W RAID Manager that appears at the right bottom of the screen.

• The Netstor_RAID_Server folder



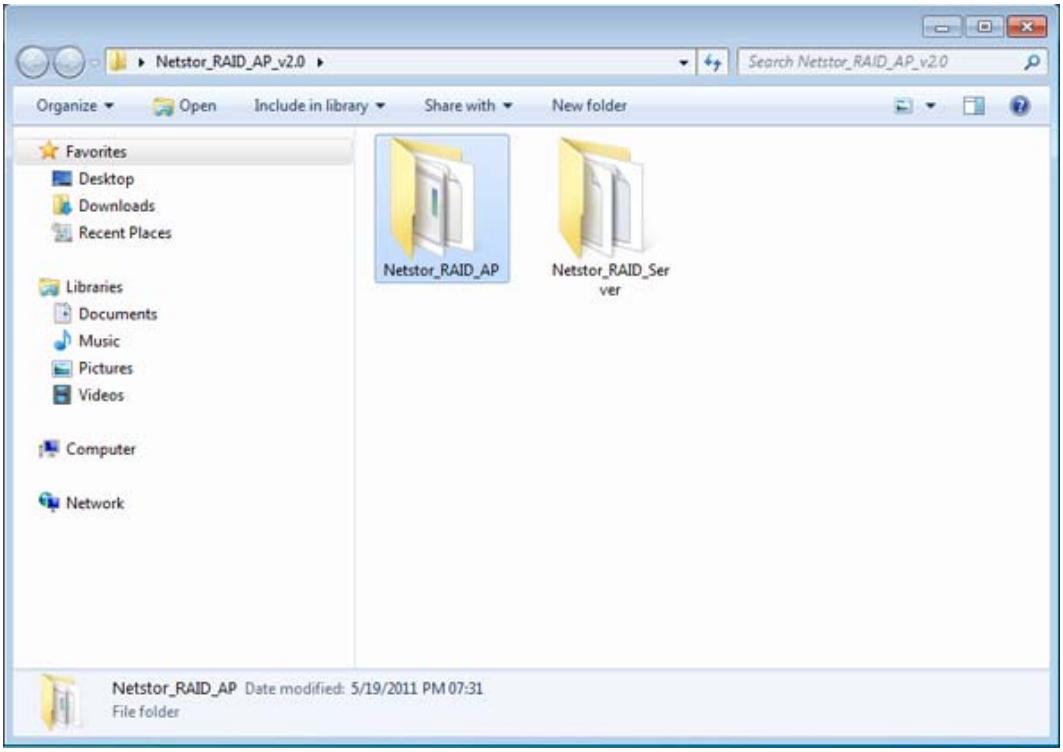
• The executable program ManagementServerSetup



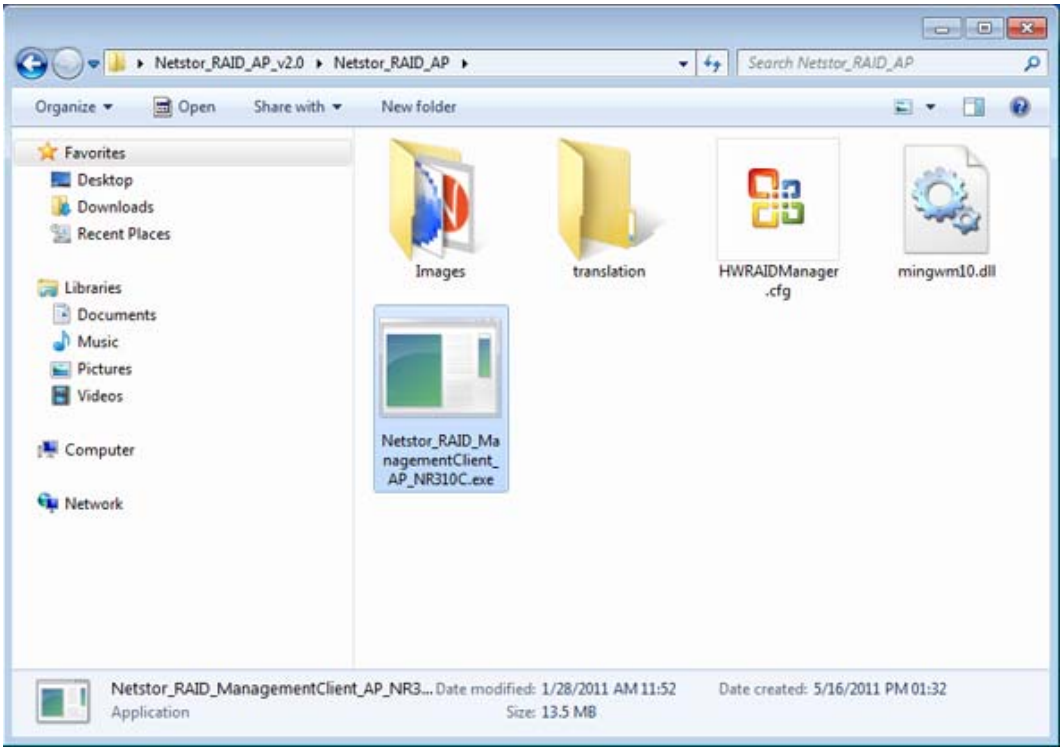
• The Netstor H/W RAID Manager appears at the bottom right of the screen

B. Go to the folder **Netstor_RAID_AP** under **RAID_AP_v2.0**, and find the executable program **Netstor_RAID_ManagementClient_AP_NR310C**, and then execute it.

• The Netstor_RAID_AP folder

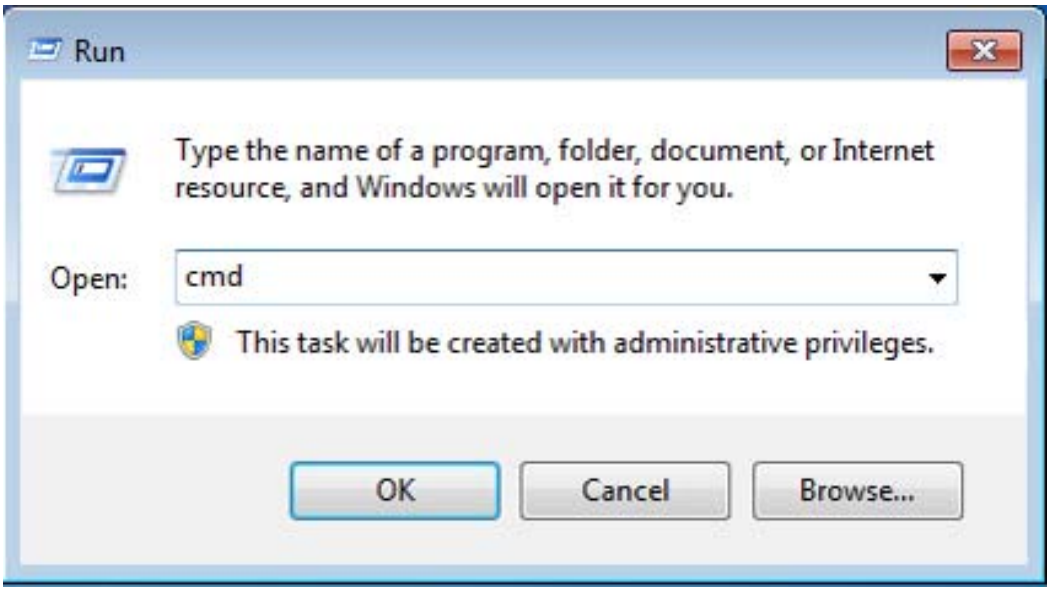


• The executable program Netstor_RAID_ManagementClient_AP_NR310C

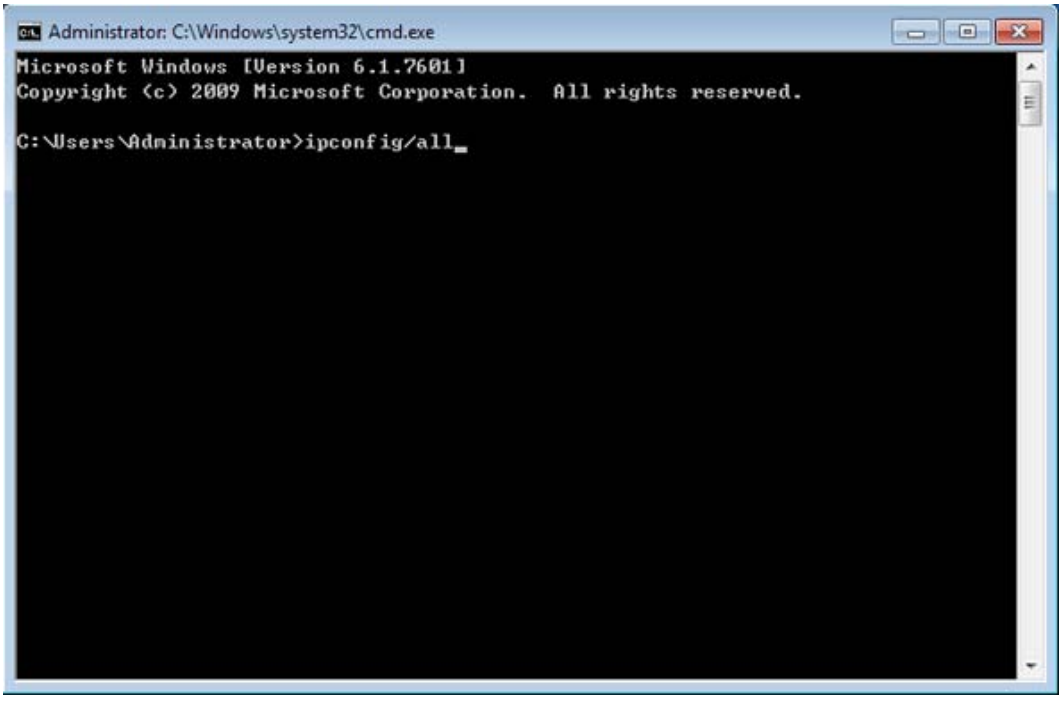


C. For Windows 7, go to **Start**, click **All Programs**, and click **Accessories**, and then select **Run**. After the window shows up, key in **cmd** (meaning command prompt) in the space, and then click **OK**. A MS-DOS mode appears, and then key in **ipconfig/all** and press the enter key. Find **IPv4 Address** shown from the screen. For example, 192.168.0.123.
For Windows XP, go to **Start**, and click **Run**, then key in **cmd** (meaning command prompt) in the space, and click **OK**. A MS-DOS mode shows up, and then key in **ipconfig/all** and press the enter key. Find your **IP Address** shown from the screen. For example, 192.168.0.128.

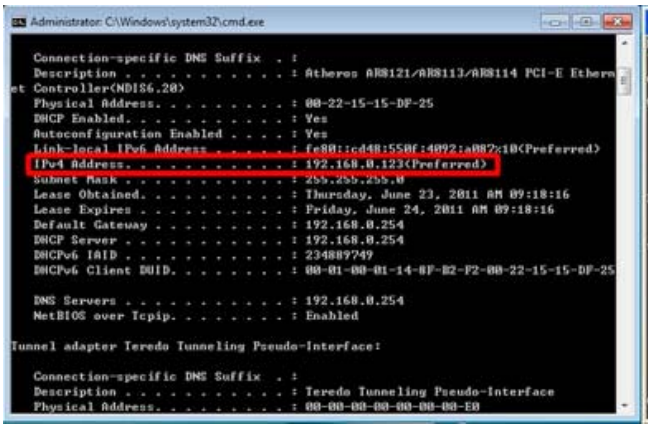
• Key in **cmd** in the space and then click **OK**



• Key in **ipconfig/all** and then press the enter key



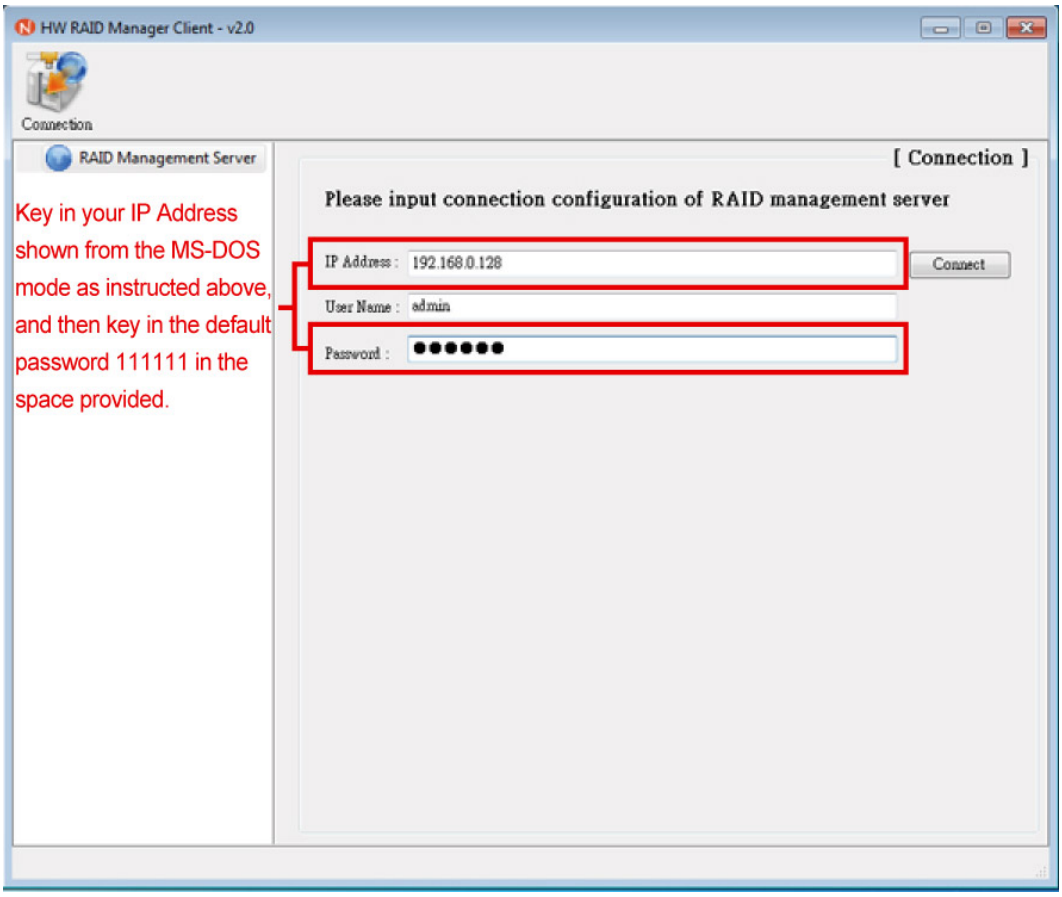
• Find your IP Address from the MS-DOS mode



Windows 7 Windows XP

D. If you are using computer that connects to NR310C enclosure, you enter **localhost** or your IP Address shown from the MS-DOS mode as directed above, and **admin** in User Name, and then you enter the default password **111111**. After you key in the three entries above, you click **Connect** to make connection from client to server.

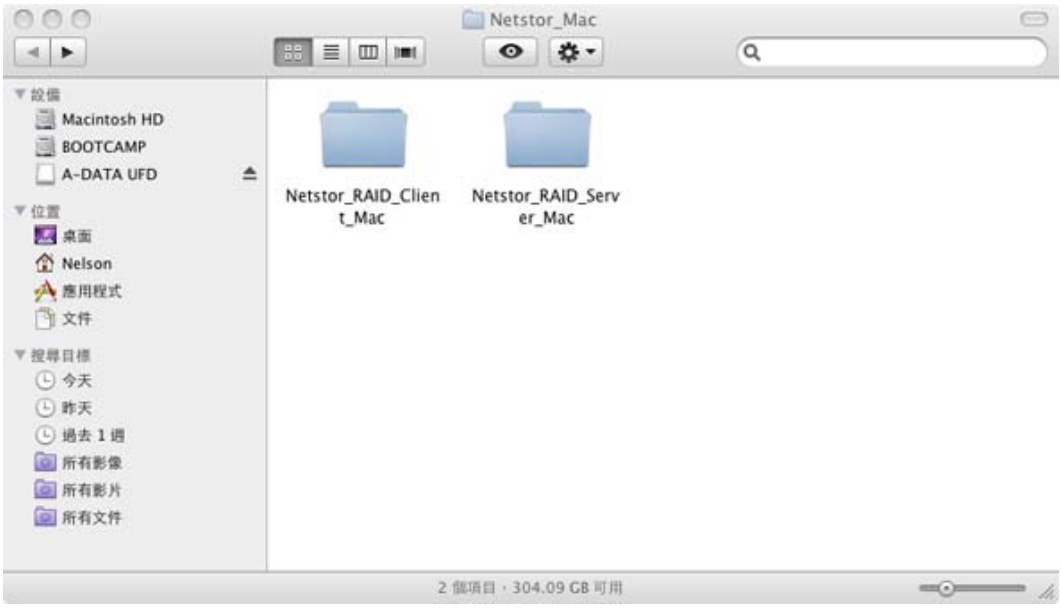
• The connection from client to server



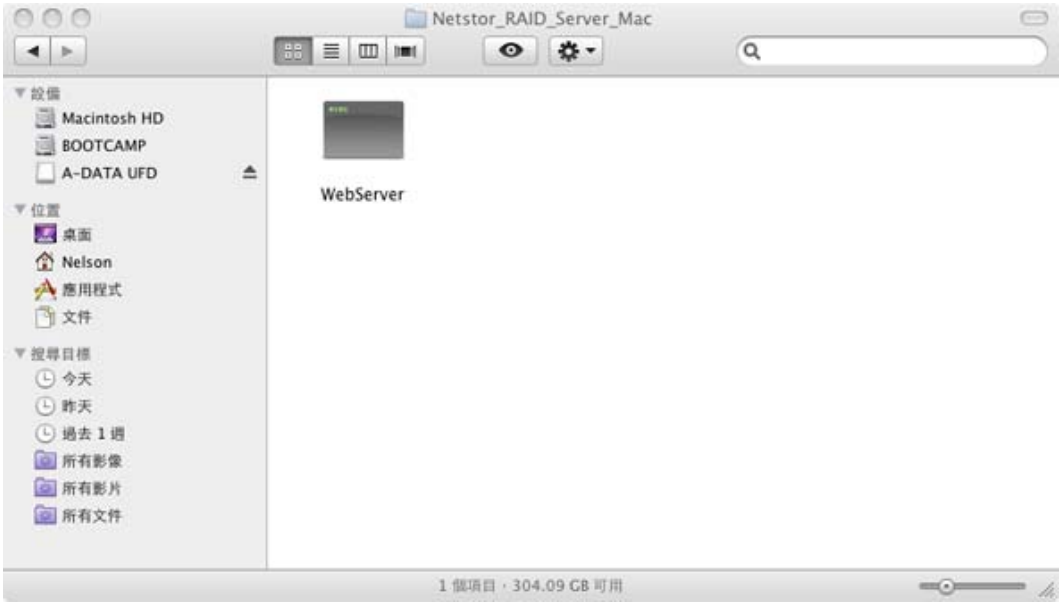
• 2.1.2 For Mac OS X

A. Find the folder **Netstor_Mac** from the CD, and then copy the folder onto your computer. After you copy the folder onto the computer, double click the folder and you will see two sub-folders under it. Find the folder **Netstor_RAID_Server_Mac** and double click it, then find the executable program **WebServer** and execute it. After the execution of the program, you will see the icon of Netstor H/W RAID Manager appearing at the right bottom of the screen.

• Find the Netstor_RAID_Server_Mac folder

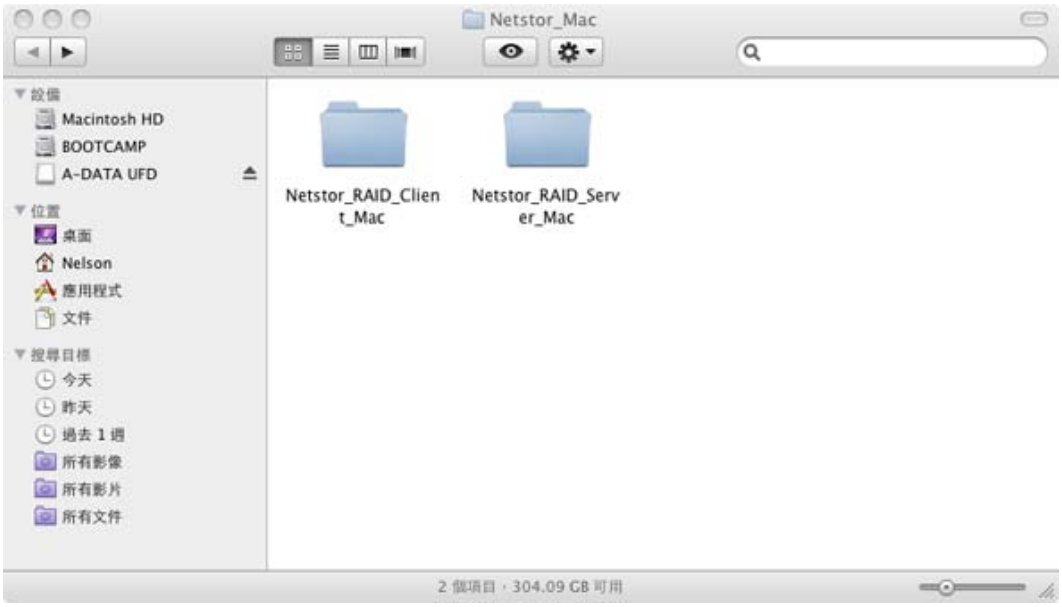


• The executable program WebServer

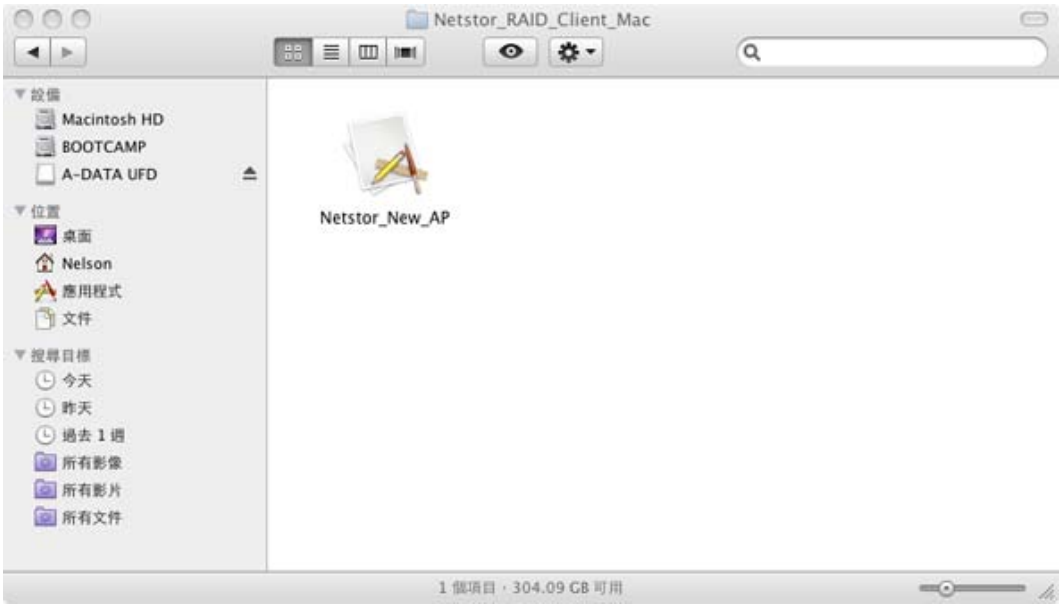


B. Go to the folder **Netstor_RAID_Client_Mac** under **Netstor_Mac**, and find the executable program **Netstor_New_AP**, and then execute it.

• Find the Netstor_RAID_Client_Mac folder

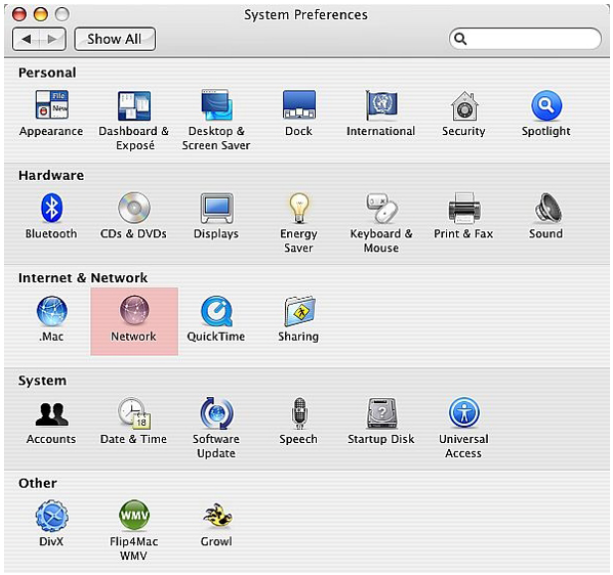


• The executable program Netstor_New_AP



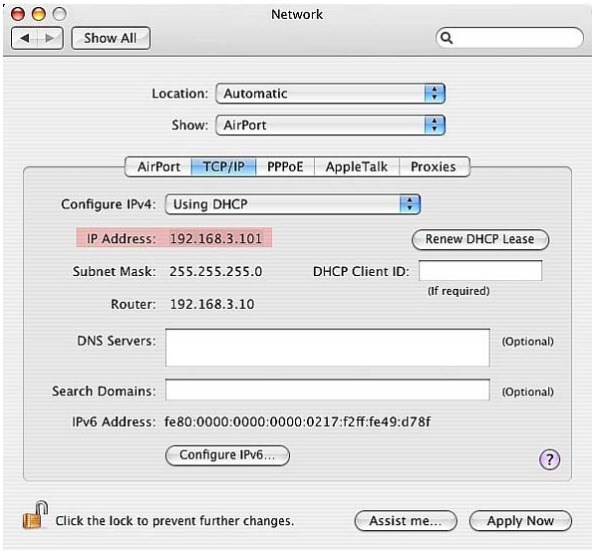
C. Click the Apple logo on the top left of the screen, and then select **System Preferences**. After a window appears, select **Network** under the Internet and Network section. Select **AirPort** in the **Show drop-down** menu. Select **TCP / IP** on the Network screen, and then find your computer's IP address on the subsequent screen displayed on your Mac. For example, 192.168.3.101.

• Select **Network** under the Internet and Network section.



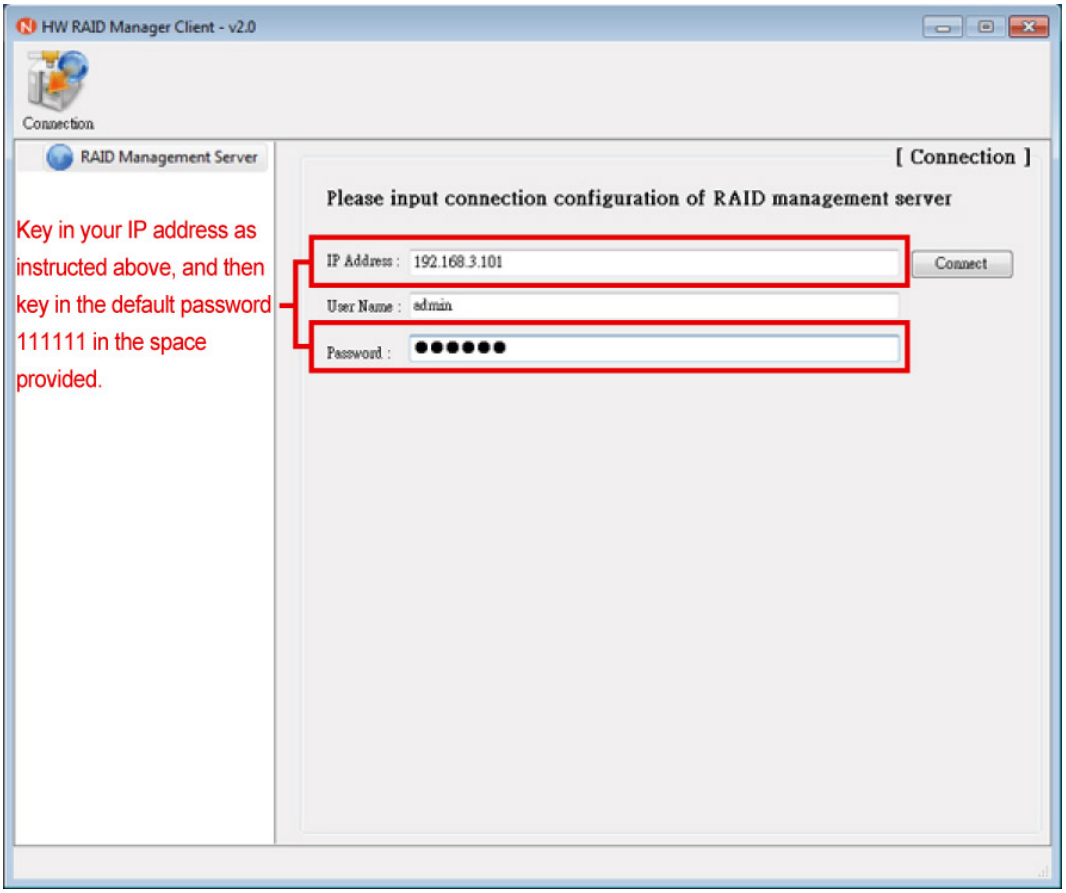
• Select **AirPort** in the **Show drop-down** menu.

• Select **TCP / IP** on the Network screen, and then find the IP address.



D. If you are using computer that connects to NR310C enclosure, you enter **localhost** or your IP address as directed above, and **admin** in User Name, and then you enter the default password **111111**. After you key in the three entries above, you click **Connect** to make connection from client to server.

• The connection from client to server



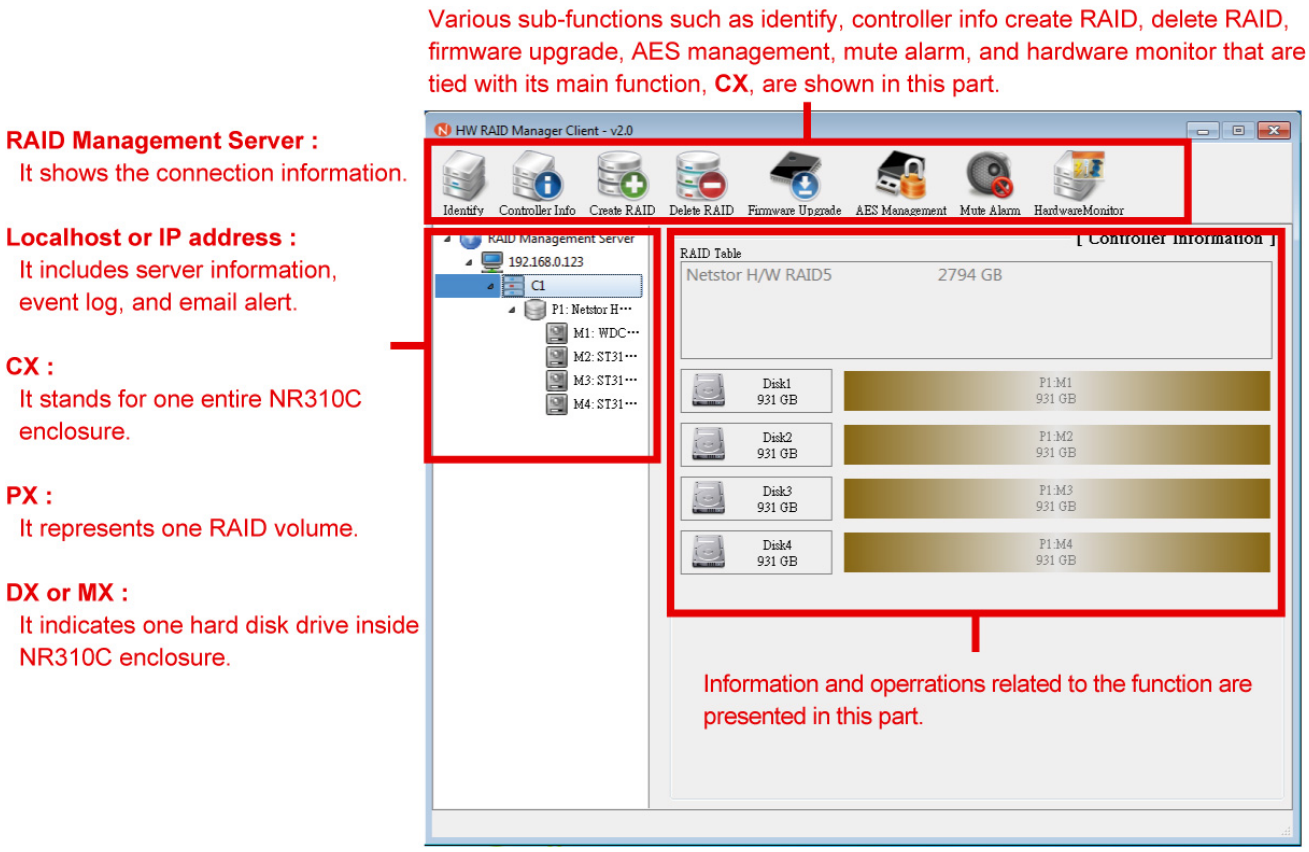
• 2.2 Understanding the GUI

There are three parts in the GUI (Graphical User Interface).

The first part of the GUI is the controller part that is at the left side of the interface. In the controller part, a hierarchical menu is shown. It contains five main functions: RAID Management Server, localhost/IP Address, C1, P1, and M1.

The second part of the GUI is the function part that is at the top side of the interface. Various sub-functions such as server info, event log and email alert that are tied with its main function, localhost/IP Address, are shown in this part.

The third part of the GUI is the details of the function that are at the right side of the interface. Information and operations related to the function are presented in this part.



C1 on the left side of the GUI interface represents one entire NR310C enclosure. As you click C1, you will see eight buttons standing for eight functions on top of GUI. The eight functions you will see are identify, controller info, create RAID, delete RAID, firmware upgrade, AES management, mute alarm, and hardware monitor. Each of the functions has its specific purpose. For the detail of the function, please see the following sections.

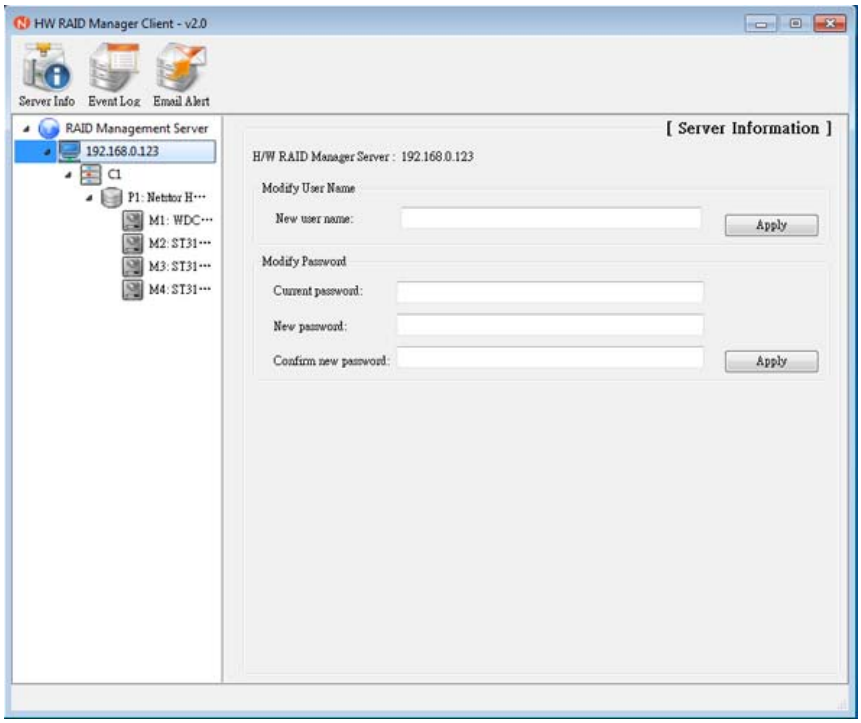
2.3 The Host

The localhost or IP address appearing in the first part of the GUI signifies the host to which the NR310C is connected. It consists of server information, event log, and e-mail alert.

• 2.3.1 The Server Information

In the server information, you can change the **user name** and **password**. If you want to change the user name, find New user name and enter a name in the space, and then click Apply. If you want to change the password, enter the current password and the new password in the spaces provided, and then click Apply. After the user name and password are changed, you will need to key in the new user name and password for entering the GUI.

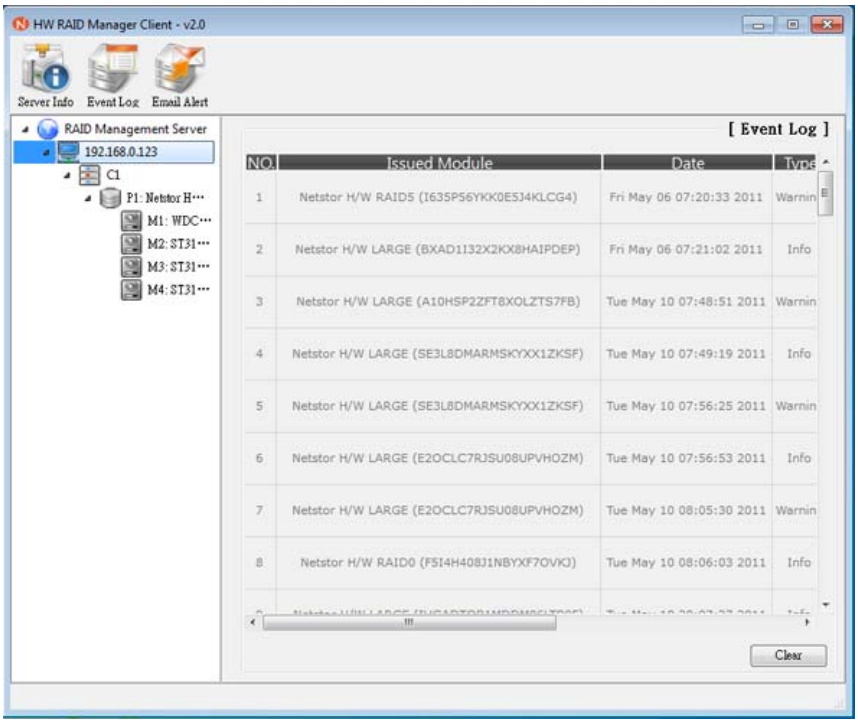
• The server information



• 2.3.2 Event Log

Activities of the disk drives inside the enclosure are monitored and recorded by the Netstor H/W RAID Manager. Go to the server information, and click **Event Log** at the top side of the interface, and then you will see events of the disk drives recorded in the event log. If you want the records to be erased, click **Clear** on the interface to erase all the records of the events.

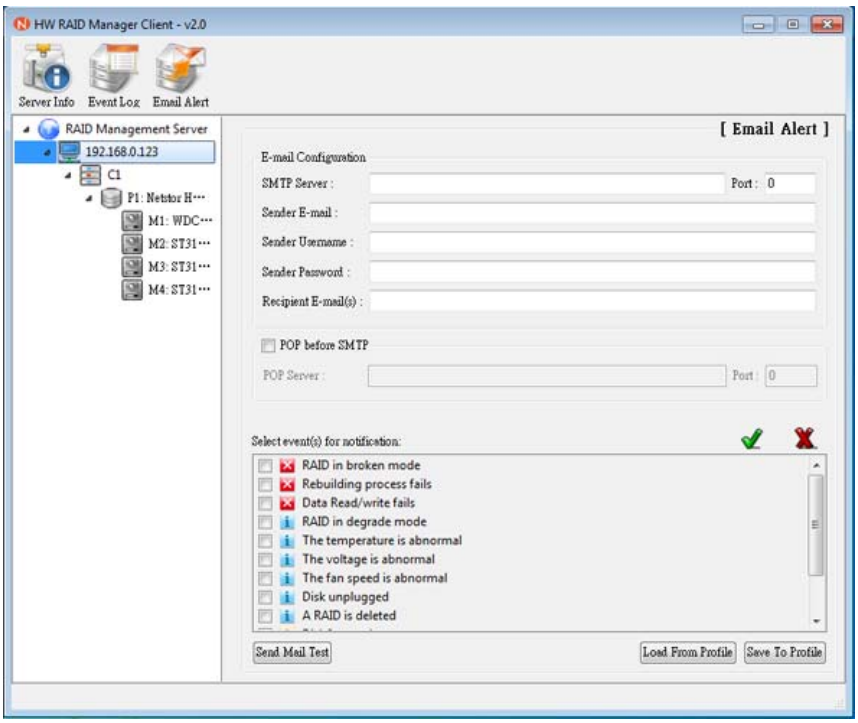
• The event log



• 2.3.3 E-mail Alert

If events such as RAID malfunctioned, temperature overheated or fan failure take place and you want to be notified of the occurrence, you click **Email Alert** at the top side of the interface, and you input information in the spaces of sender e-mail, sender username, sender password, and recipient e-mail, and then you will be notified of the event that is happened by e-mail sent to your e-mail addresses.

• The e-mail alert



• 2.4 The NR310C System

CX at the left side of the GUI represents the NR310C enclosure. As one NR310C enclosure is connected with the host, **C1** standing for the NR310C appears, and as a second NR310C is connected with the host, **C2** indicating the second NR310C shows up. Various functions are included in this part.

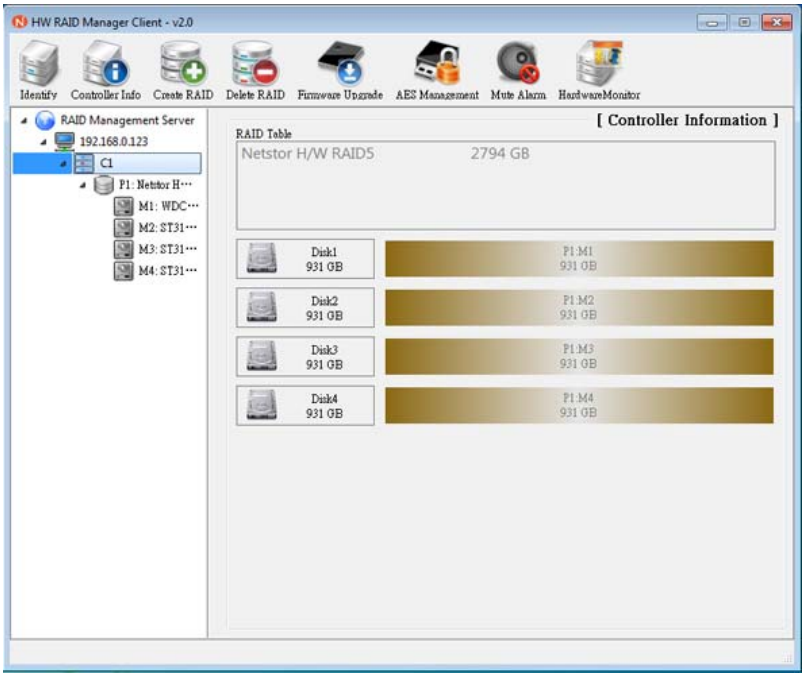
• 2.4.1 Identification

As you click the button **Identify**, the blue LEDs of all member disks on the selected NR310C enclosure appear flashing.

• 2.4.2 Information on Controller

If you click **C1** from the hierarchical menu at the left side of the interface, the RAID level, the capacity of RAID, and disk drives will be shown in the controller information.

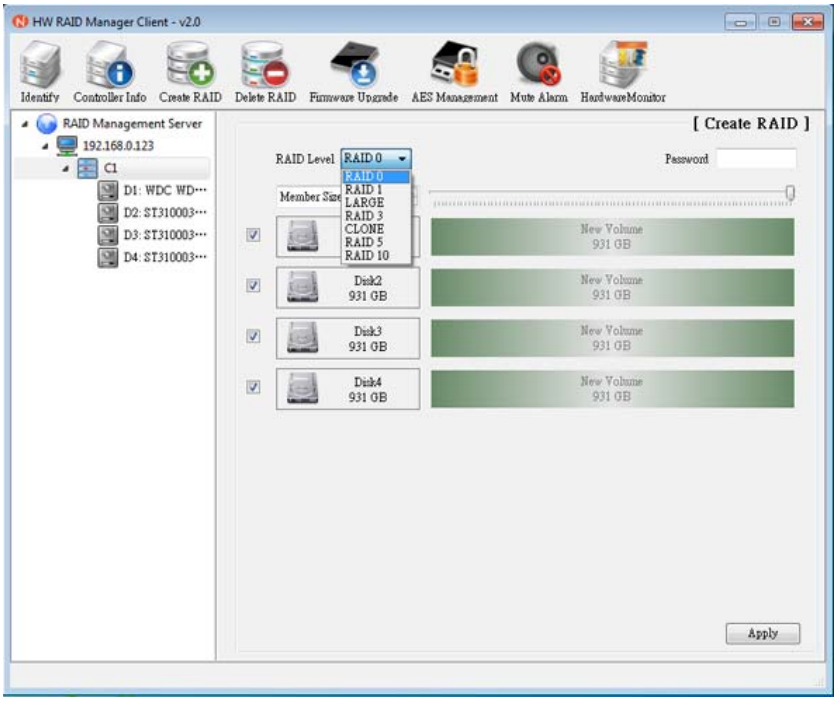
• The controller information



• 2.4.3 RAID Configuration

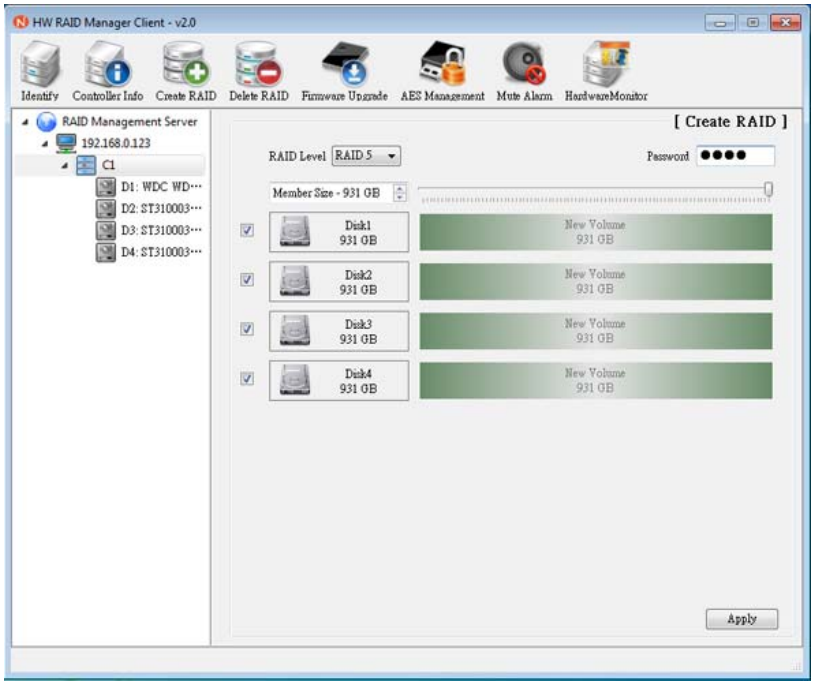
You can configure the RAID system through the Netstor H/W RAID Manager. RAID levels such as RAID 0, RAID 1, RAID 3, RAID 5, and RAID 10 are provided. When you have chosen a RAID level, the Netstor H/W RAID Manager will map out the disk drives that are selected and the capacity of RAID will be shown. On the interface, each of the disk drives accompanies with a check box in front of the drive. You are allowed to select the disk drives you want to use for RAID by putting a check in the check box; furthermore, a scroll bar is provided on the interface for you to manage the capacity of the disk drive.

• RAID creation

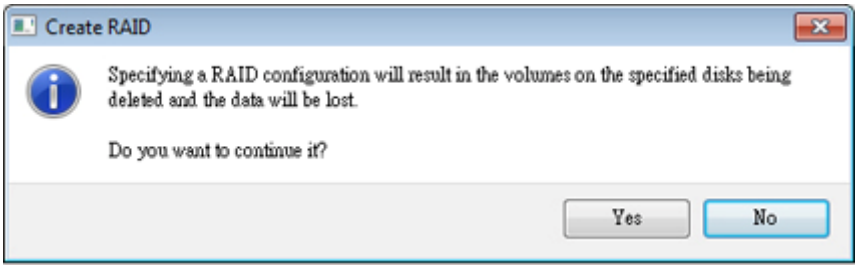


If you want to give protection for RAID, you can build a password for the system by entering a password in the space. After you have done the procedures above, click **Apply** on the interface, and then a dialog on the confirmation of RAID configuration shows up.

・Building a password for RAID

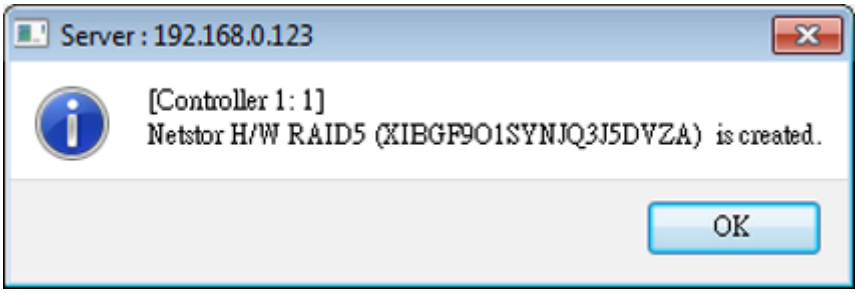


・The confirmation of the RAID configuration



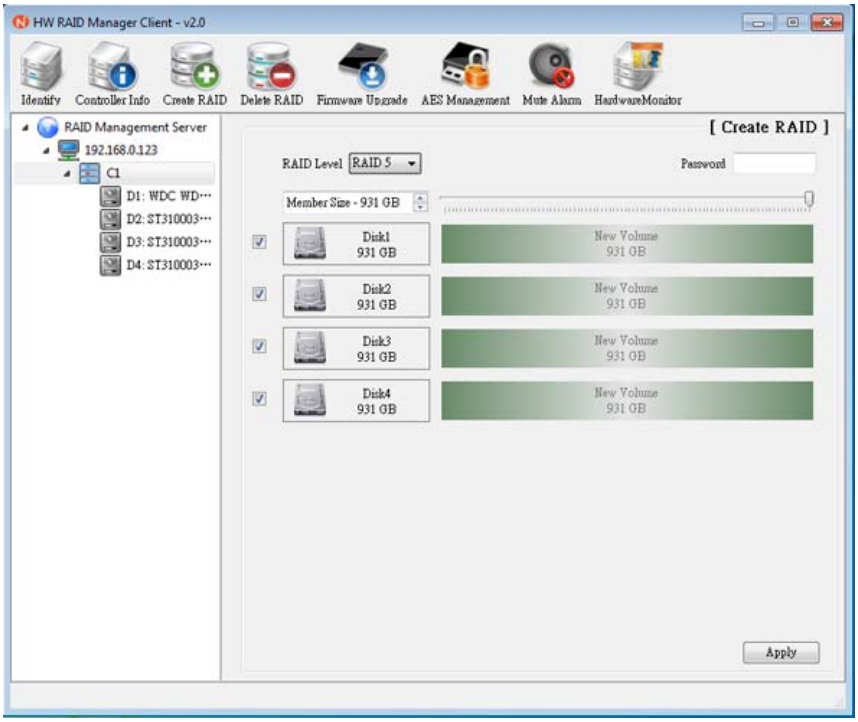
After RAID is configured, a dialog shows up to inform you the success of the configuration.

・The success of the configuration



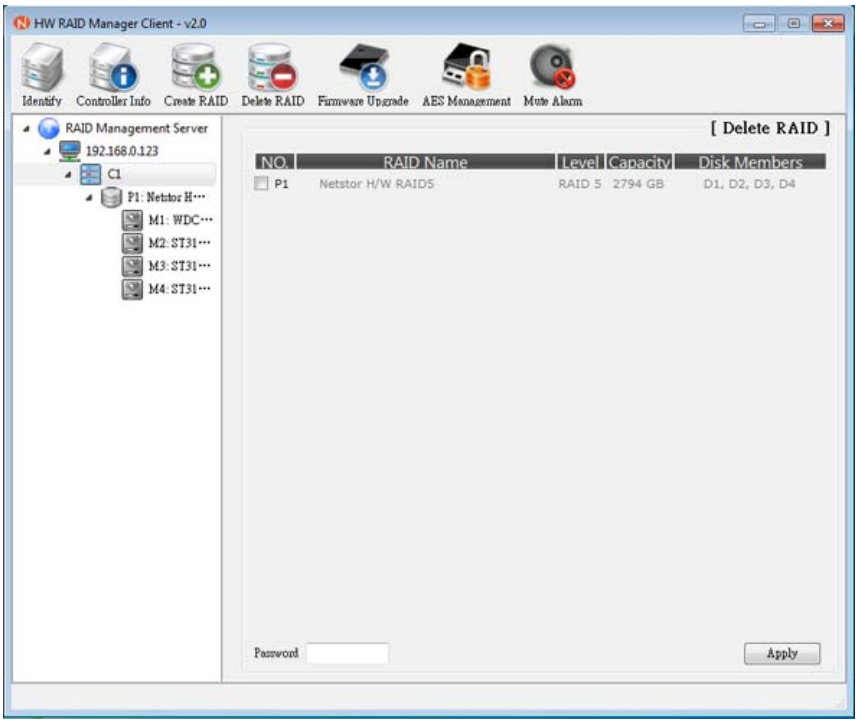
After the success of the configuration, you can click C1 at the left side of the interface, and the information about the disk drives for RAID will be given on the interface.

・The information about RAID



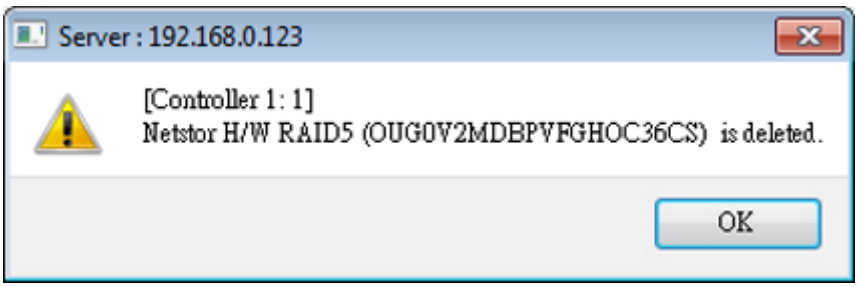
If you want to eliminate RAID, you click **Delete RAID** on the top side of the interface, and select the RAID you want to delete, and then click **Apply**.

・RAID deletion



After the deletion of RAID, a dialog shows up to inform you the success of the deletion of RAID.

• The success of the deletion of RAID



If you created a RAID 0 volume for Disk (D:) and a RAID 5 volume for Disk (E:), you will see P1 standing for Disk (D:) and P2 for Disk (E:) from the graphical user interface. If you delete P1 from the GUI, you might encounter loss of both Disk (D:) and Disk (E:) from My Computer. To solve this problem, right-click My Computer, and then select Manage. After the window of Computer Management shows, select Disk Management from the left column, and then Disk (D:) for RAID 5 appears from My Computer.

RAID Levels

The NR310C supports seven RAID levels. The following chart gives descriptions to each of the RAID levels.

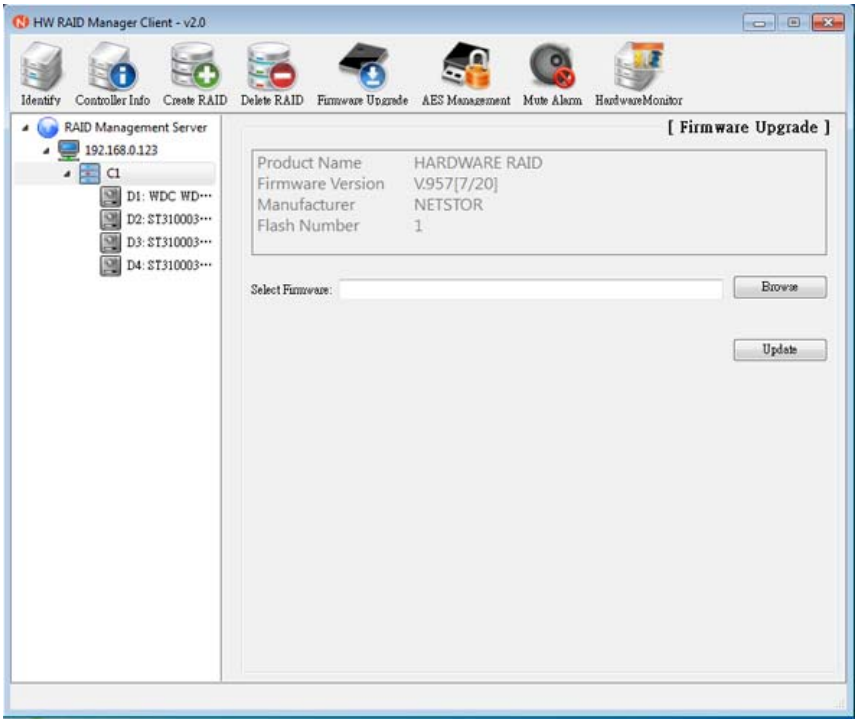
RAID Level	Description	Minimum Drives
RAID 0	No data redundancy. Offers highest data throughput.	2
RAID 1	Known as disk mirroring. It creates an exact copy of a set of data on two disks.	2
RAID 3	It uses disk striping with a dedicated parity disk, providing complete data redundancy.	3
RAID 5	It uses disk striping with parity data distributed across all member disks. Low cost of redundancy.	3
RAID 10	It builds a classic RAID 1+0 array, providing disk striping and redundancy via disk mirroring.	4

Large	Full capacity of each selected member disk is used. One or more disk drives can be set as large. Capacities of the selected member disks are strung. Firstly, data are written on the first member disk, and when capacity of the first disk is utilized, data begin to be written on the second disk. Large does not provide data redundancy.	1
Clone	Among the selected member disks, the total capacity of the volume derives from the multiplication of the number of the selected disks based on the smallest capacity of the member disk. Data are duplicated into each selected member disk. Two or more disk drives can be formatted in clone set. Disk redundancy is supported.	2

• 2.4.4 Firmware Upgrade

If you want to upgrade the firmware of NR310C, you click **Firmware Upgrade** on the top side of the interface, and click **Browse** to locate the file, and then click **Update** to upgrade the firmware of NR310C.

• Firmware upgrade



• 2.4.5 AES Management

The enclosure NR310C does not support the function of AES (Advanced Encryption Standard) Management.

• 2.4.6 Mute Alarm

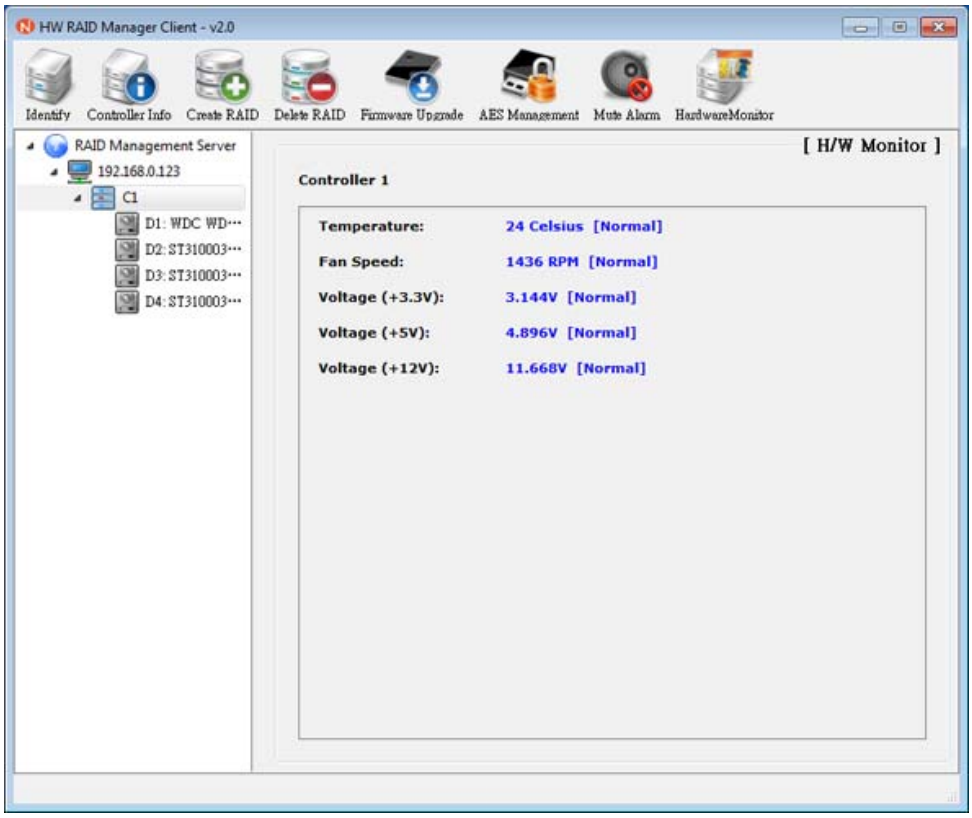
If the fan of the enclosure fails or the temperature is overheated, the buzzer beeps. If you want to stop the beeps, click **Mute Alarm** on the top side of the interface to mute the alarm.

• Mute alarm

• 2.4.7 Hardware Monitor

If you want to know the condition of the enclosure such as the temperature, the speed of fan, and the voltage, you click **Hardware Monitor** to see the information.

• Hardware monitor



• 2.5 The RAID Volume

PX at the left side of the GUI represents the RAID volume. As one RAID volume is established, **P1** standing for the RAID volume appears, and as a second RAID volume is created, **P2** indicating the second RAID volume emerges.

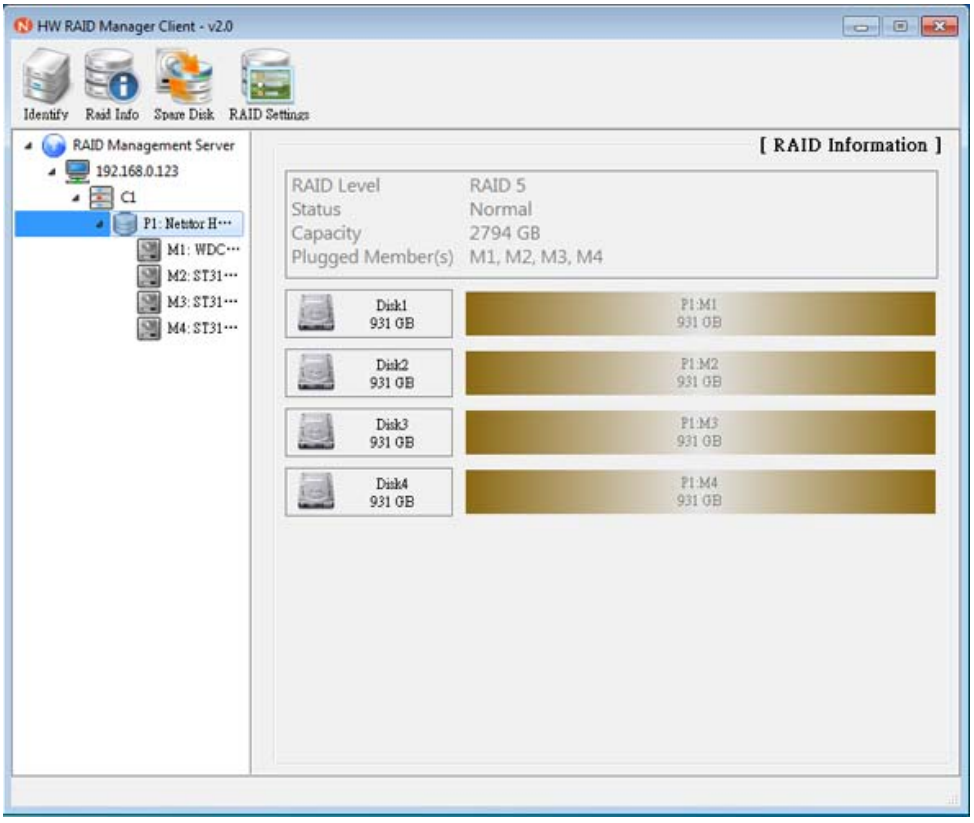
• 2.5.1 Identification

As you click the button **Identify**, the blue LEDs of the member disks of selected RAID volume appear flashing. This indicates the member disks that are within the RAID volume.

• 2.5.2 Information on RAID

If you click **P1** from the hierarchical menu at the left side of the interface, you will see RAID level, RAID status, capacity of RAID, and disk drives.

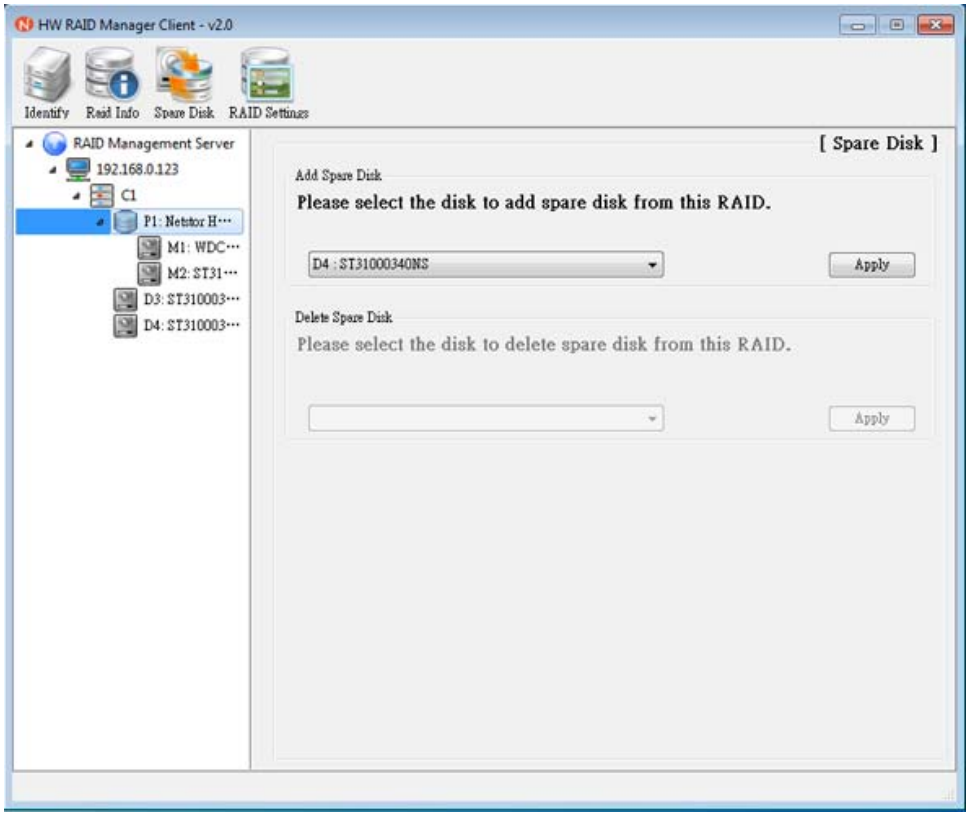
• The RAID information



• 2.5.3 Spare Disk

The unused hard disk drive from the NR310C enclosure can be set as a spare disk for a specific RAID volume. Select the RAID volume to which you want to add a spare disk at the left side of the interface, and click **Spare Disk**. Select the unused hard disk drive you want to set as a spare disk. After the unused disk drive is selected, click **Apply**. If you want to delete the spare disk from RAID volume, find section Delete Spare Disk from Spare Disk, and then click **Apply** to remove the spare disk from RAID volume.

• Spare disk



• 2.5.4 RAID Settings

Click **P1** at the left side of the interface, and then click **RAID Settings** on the top side.

There are three parts in RAID settings: (1) RAID standby timer settings, (2) RAID rebuild priority settings, and (3) modify RAID password.

For the first part **RAID standby timer settings**, when the AP and server programs are closed for cease of data transmission and the standby timer is set with a value in minute, the system will go into stand-by mode automatically for energy saving after the particular period of time is set. While it is in stand-by mode, all of the hard disk drives will be in an energy-saving mode, and the power consumption will be reduced.

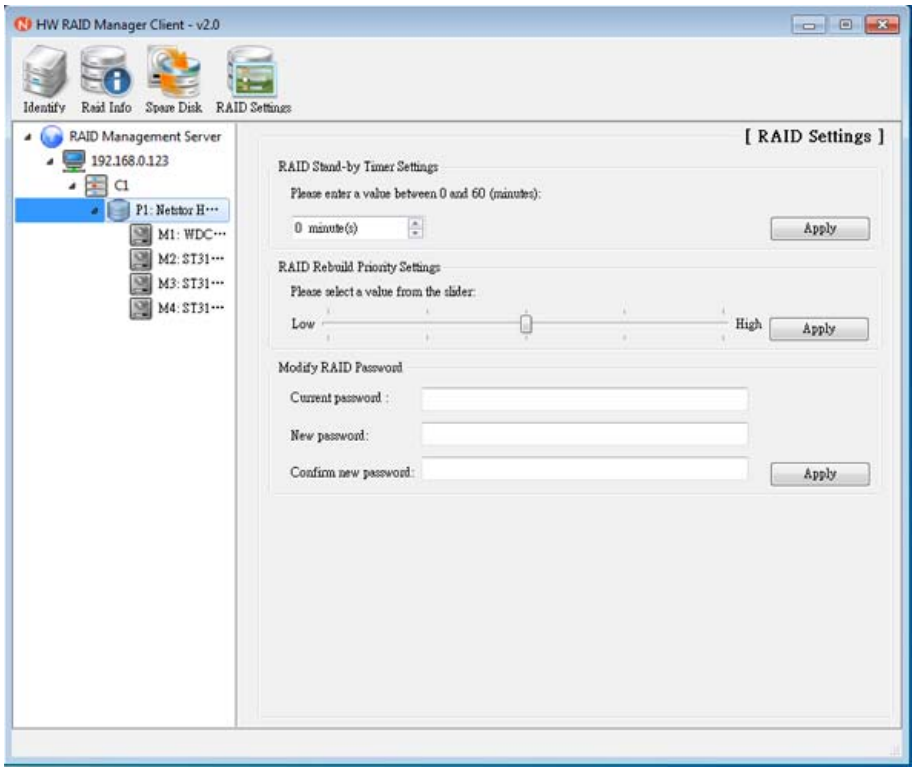
For the second part **RAID rebuild priority settings**, when the rebuild priority is set at lowest level, RAID data accessing prevails over data rebuilding; on the other hand, as the rebuild priority is set at highest level, data rebuilding dominates over RAID data accessing. As it is set at medium, both RAID data accessing and data rebuilding are of the same grade.

The following table gives explanation for the relationship between access of RAID volume and data rebuilding according to the level of rebuild priority that is set.

Rebuild priority	Status	
Highest Level	Rebuilding	**highest**
	Access of RAID volume	lowest
High Level	Rebuilding	**high**
	Access of RAID volume	low
Medium Level	Rebuilding	**medium**
	Access of RAID volume	medium
Low Level	Rebuilding	**low**
	Access of RAID volume	high
Lowest Level	Rebuilding	**lowest**
	Access of RAID volume	highest

For the third part **modify RAID password**, you can change the RAID password simply by entering the current password and new password in the three spaces provided by GUI.

- RAID settings



• 2.6 The Disk Drive

DX or **MX** at the left side of the GUI represents each of the member disks. **DX** means each of the hard disk drives that has not been assigned to any RAID volume; on the other hand, **MX** stands for the hard disk drive assigned to a RAID volume.

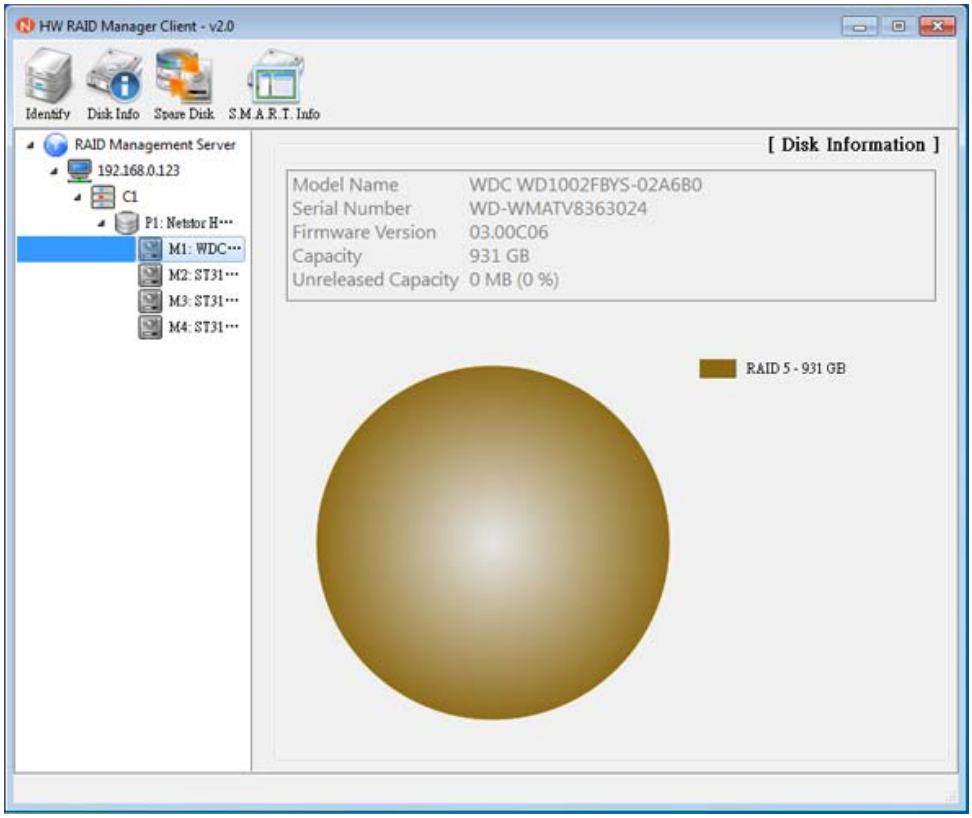
• 2.6.1 Identification

As you click the button **Identify**, the blue LED of the selected member disk appears flashing. This shows the indicated member disk on NR310C.

• 2.6.2 Information on Disk

If you click any of **DX** or **MX** from the hierarchical menu at the left side of the interface, model name, serial number, firmware version, capacity, and unreleased capacity of the disk drive will be shown.

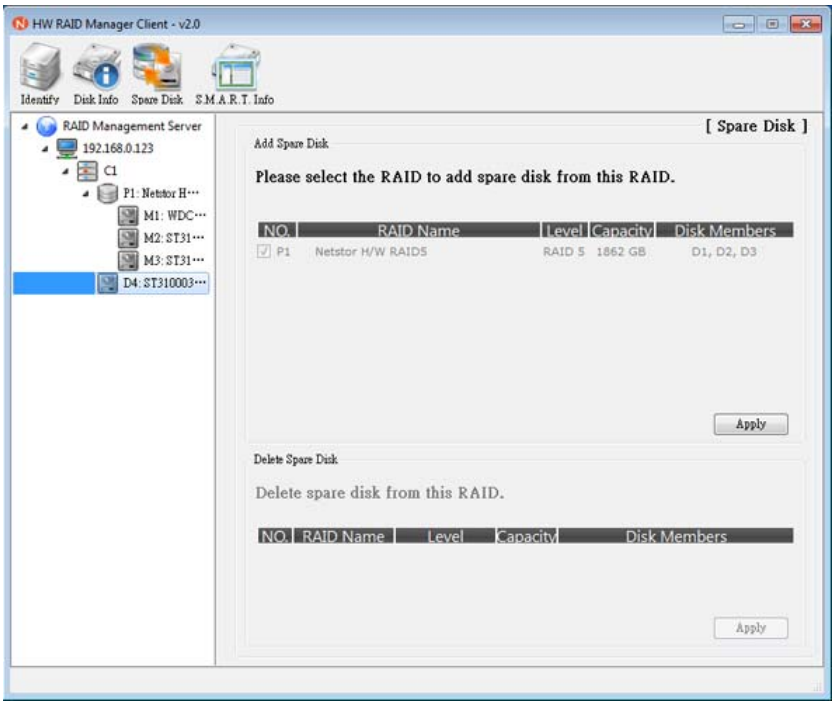
• The disk information



• 2.6.3 Spare Disk

The unused hard disk drive from the NR310C enclosure can be set as a spare disk for a specific RAID volume. Select the unused disk drive at the left side of the interface, and click **Spare Disk**. Click **Apply** from Add Spare Disk to make the disk drive a spare disk for the specific RAID volume. If you want to delete the spare disk from RAID volume, find section Delete Spare Disk from Spare Disk, and then click **Apply** to remove the spare disk from RAID volume.

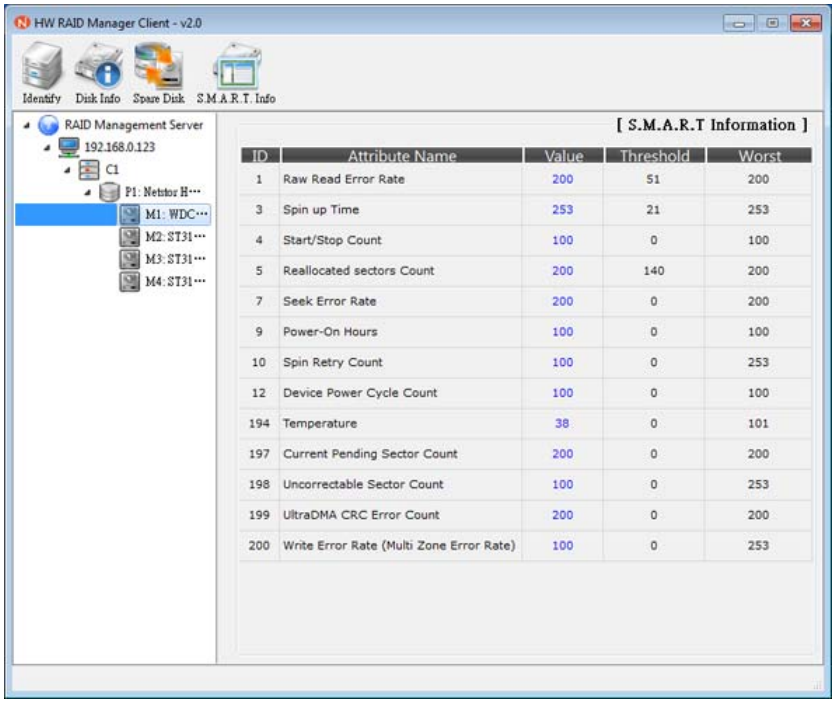
• Spare disk



• 2.6.4 S.M.A.R.T. Information

After you click any of DX or MX, you will see function S.M.A.R.T. Info at the top side of the interface. If you want to see the attributes of the disk drive, you click on **S.M.A.R.T. Info**, and then you will see the attributes of the drive along with the values. Attributes such as spin up time, seek error rate, power-on hours, and temperature are shown in the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) information.

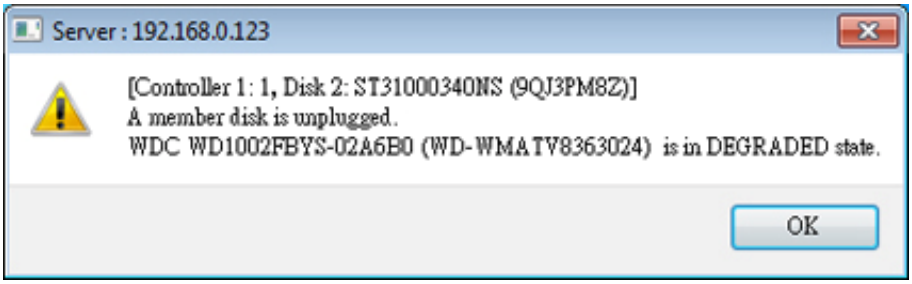
• The S.M.A.R.T. information



• 2.6.5 About the Failure of the Hard Disk Drive

If one of the hard disk drives happens to fail, a window indicating the failure of the drive will appear in the GUI interface as shown in the following.

• The window indicating the failure of the hard disk drive



If the e-mail notification is activated from the GUI, you will also be notified of the failure of hard disk drive via e-mail.

Contacting Netstor Customer Service

The Netstor website at www.netstor.com.tw has technical updates, and the most current product and support information. Please check our website for the latest updates and online support files for helpful information. If further assistance is needed, please contact us in one of the following ways:

Skype: netstor_fae

E-mail: services@netstor.com.tw

Tel: +886-2-2917-1500