HighPoint ATA RAID Management Software User's Manual

Version 1.31

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1 Overview

HighPoint ATA RAID Management Software provides you an easy-to-use graphic interface for HighPoint UDMA/ATA RAID Controllers. With this software, you can manage RAID arrays and monitor device activities on your system.

This software can run on the following HighPoint controllers.

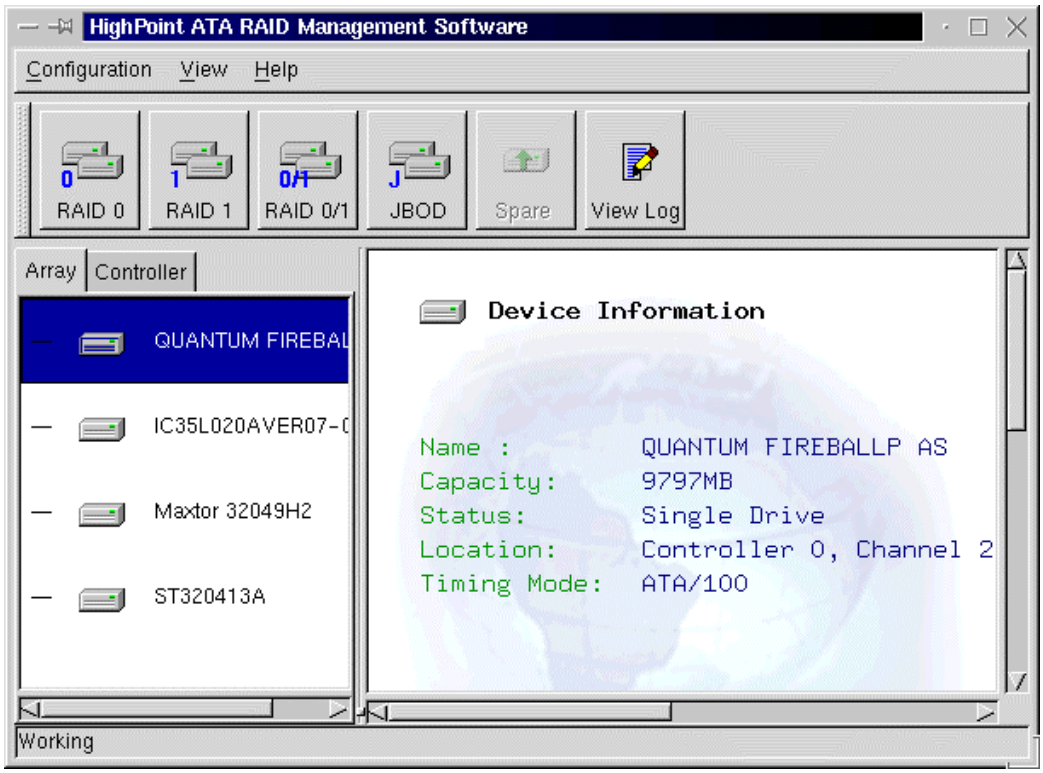
HPT370/370A UDMA/ATA100 RAID Controller
HPT372/372A UDMA/ATA133 RAID Controller
HPT374 UDMA/ATA133 RAID Controller

The corresponding device driver for Linux OS must be installed.

This software supports the following functions:

Create a RAID array (RAID 0, RAID 1, RAID 0/1 and JBOD).
Delete a specified RAID array.
View information of RAID arrays.
View information of physical disks.
View information of controllers and channels.
Rebuild and synchronize a critical array.
Add spare disk(s) to enhance data security.
View event logs.

After installation of HighPoint ATA RAID Management Software, you can type in the command "hptraid" to launch the program or click the corresponding menu in X-Window system. The main window pops up (see below).



The main window controls all functions of HighPoint ATA RAID Management Software. Here we will walk through all of the menu items and explain their usage.

Main Menu

The main menu has three items: **Configuration**, **View** and **Help**.

Configuration Menu	Includes functions such as creating a RAID array, deleting a RAID array, editing spare disk(s), synchronizing an array, renaming an array and rescanning the devices.
View Menu	Sets the visibility of toolbar and status bar and views the event logs.
Help Menu	Lists help topics for this software.

Toolbar

Provides a quick way to implement the functions of the software.

Array Tab and Controller Tab

The Array tab in the left pane displays the logical devices on your system, while the Controller tab displays the physical devices on your system. Right clicking on one of the items will bring out a pop-up menu through which you can perform various operations on that item.

Information Pane

The right pane in the main window shows the detailed information for the selected item in the left pane.

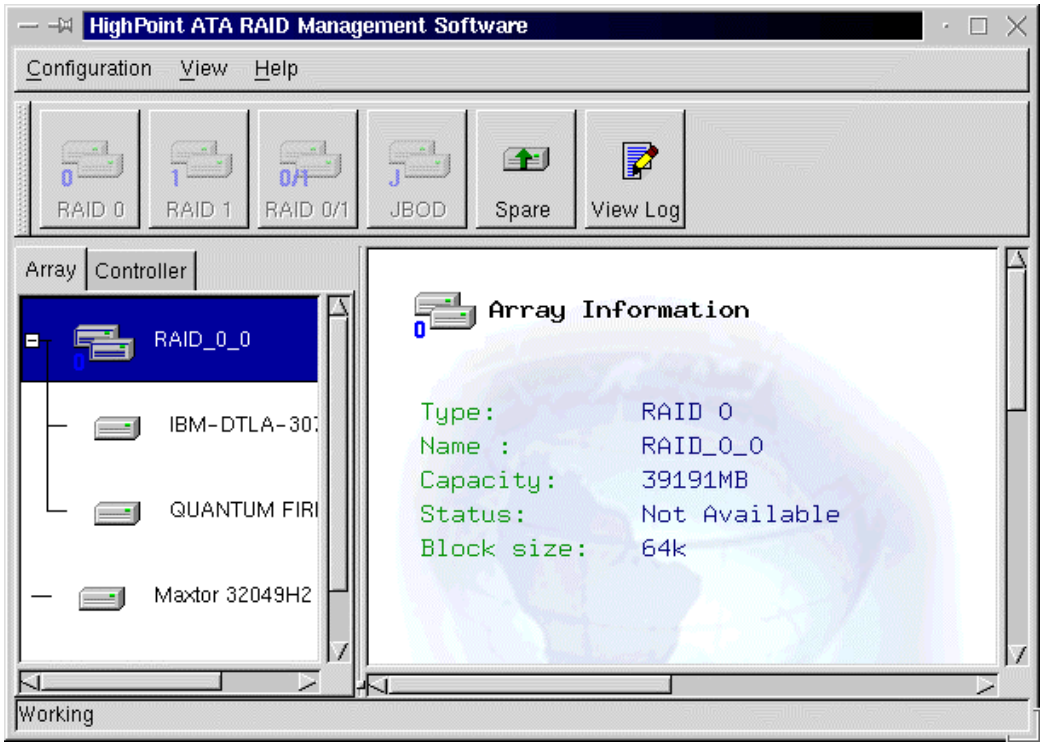
2 Using HighPoint ATA RAID Management Software

The following chapters describe how to use HighPoint ATA RAID Management Software step by step.

Viewing Device Information

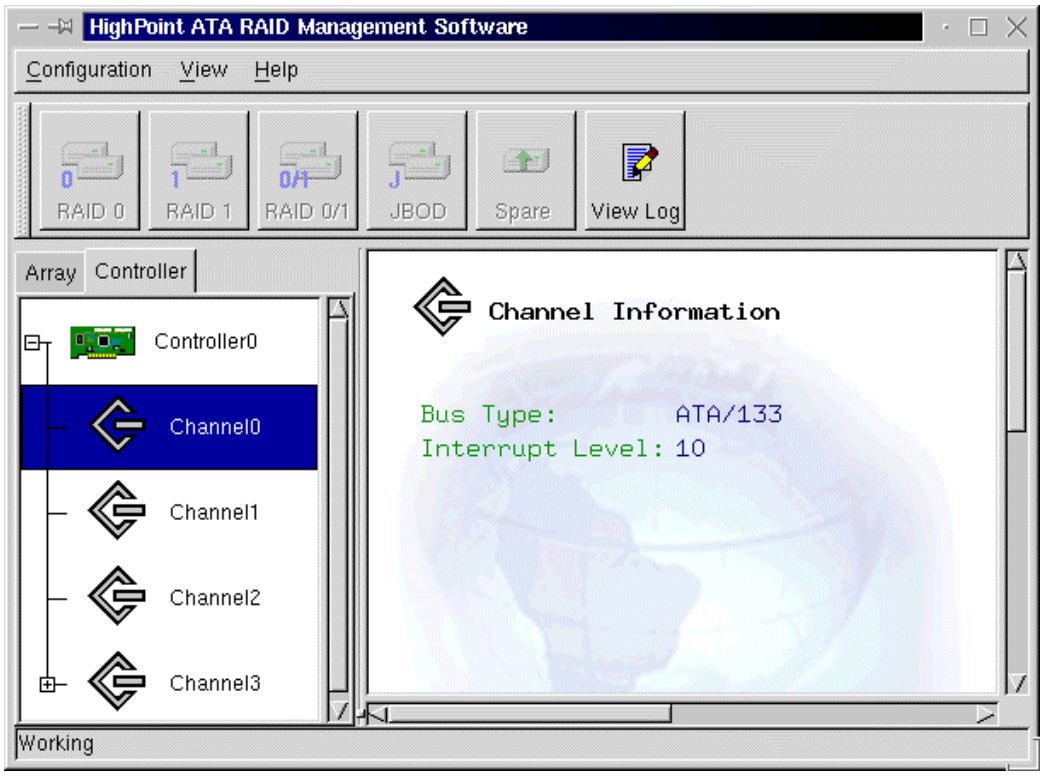
Viewing Array Information

The **Array** tab in the main window shows a list of logical devices on your system in a tree type format. Clicking on any of the arrays in this pane will activate the **Array Information** on the right pane (see below).



Viewing Controller/Channel Information

The **Controller** tab in the main window shows a list of physical devices attached to your controller(s). Clicking on one of the items will activate the right pane, showing the corresponding information about the selected controller, channel or hard disk (see below).


HighPoint ATA RAID Management Software
Configuration
View
Help
RAID 0
RAID 1
RAID 0/1
JBOD
Spare
View Log
Array
Controller
Controller0
Channel0
Channel1
Channel2
Channel3
Channel Information
Bus Type: ATA/133
Interrupt Level: 10
Working

Creating a RAID Array

There are three ways to create a RAID array.

1 Right click one of the devices on the array tree. Select the array type you want to create.
2 Click **Create** on the **Configuration** menu. Choose a type of the array you want to create on the pop-up submenu.
3 Click the corresponding tool buttons on the toolbar.

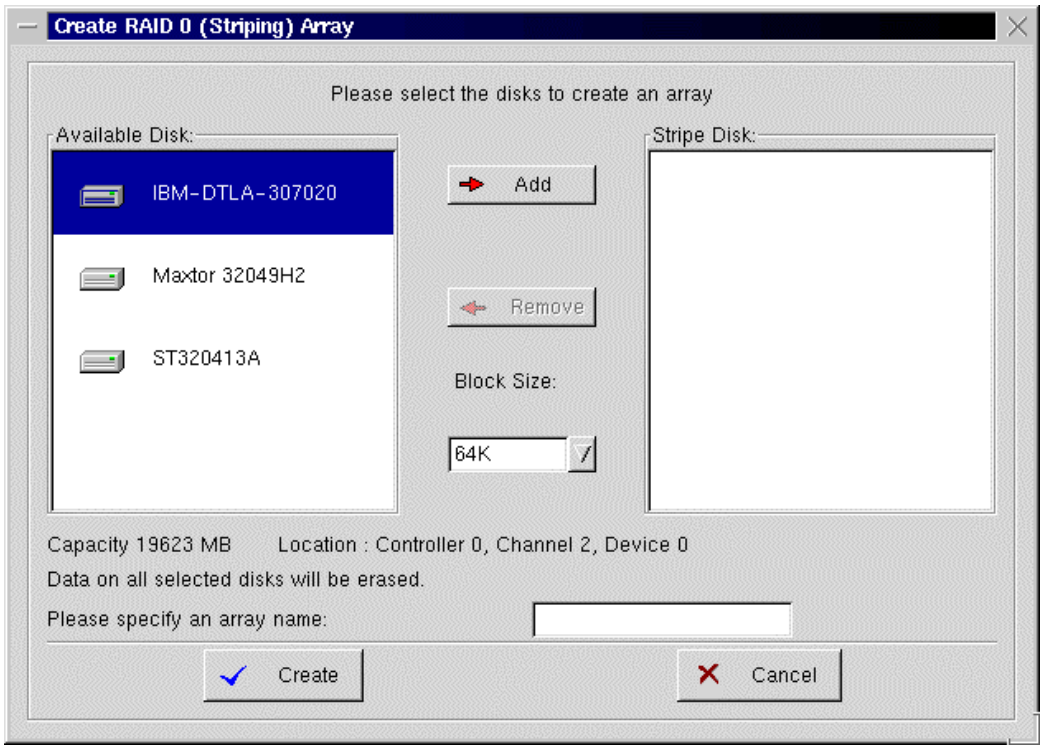
The hard disks used to create an array must meet the following requirements:

1 For RAID 0, RAID 0/1 and JBOD array, the disk must have no active partition on it (a non-bootable disk). For RAID 1 array, the mirror disk must be a non-bootable disk.
2 The disk is not mounted by Linux OS. Otherwise, you must dismount it first.

Creating a RAID 0 Array

You can follow these steps to create a RAID 0 array.

1 Click on the **RAID 0** button on the toolbar, the **Create Raid 0 (Striping) Array** window appears (see below).



2 Select the disks to create the array. You can add each disk to the **Stripe Disk** list box by selecting a physical disk from the **Available Disk** list box and

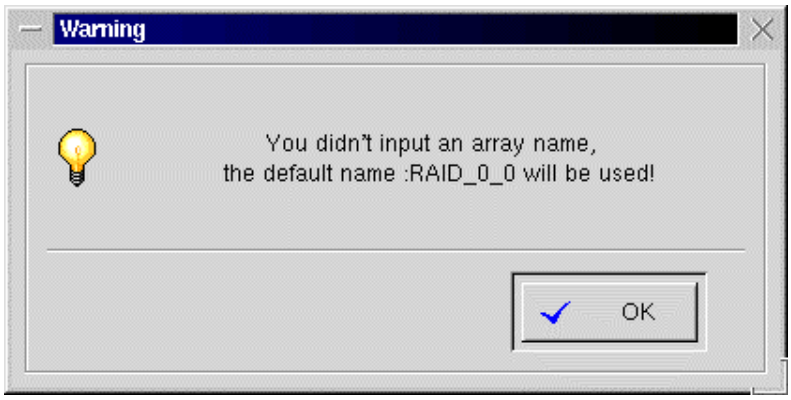
clicking the **Add** button. If you want to unselect a disk, just click the **Remove** button to return the selected disk from the **Stripe Disk** list box back to the **Available Disk** list box.

When you create a RAID 0 (Striping) array, you must select at least two physical disks. Otherwise, a warning window will appear, prompting you to add more disks. Click **OK** and return to the Create RAID 0 (Stripping) Array window.

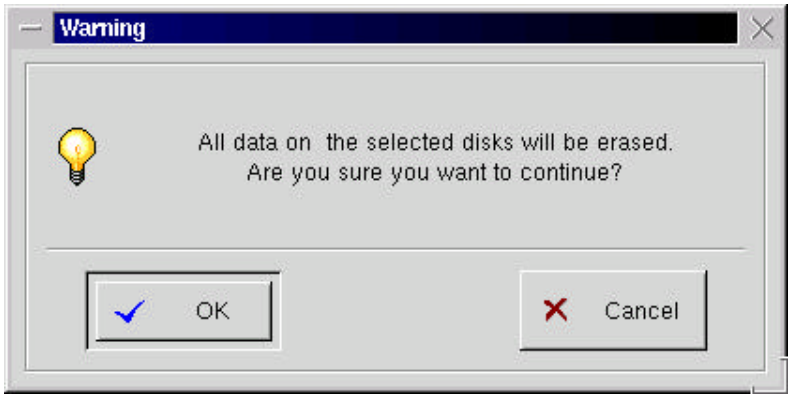


3 Select the block size for the RAID 0 array. Click the drop-down arrow to choose a block size. 64K is the default size. Generally, the larger the size is, the more performance the system gets.

4 Specify a name for the selected array. You can type in up to 8 characters. If you don't specify an array name, the system will assign a default name automatically for the array (see below).

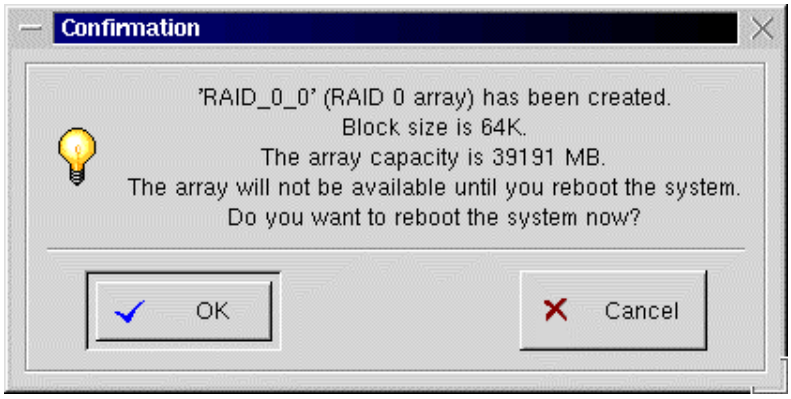


5 Click the **Create** button. The following warning window will pop up, warning you that all data on the selected disks will be erased.



6 Click **OK** to create the RAID 0 array. A confirmation dialog box will appear, prompting you that the RAID 0 (Striping) array has been created and it will not be available until you reboot the system.

WARNING: You must reboot the system to use the newly created array.



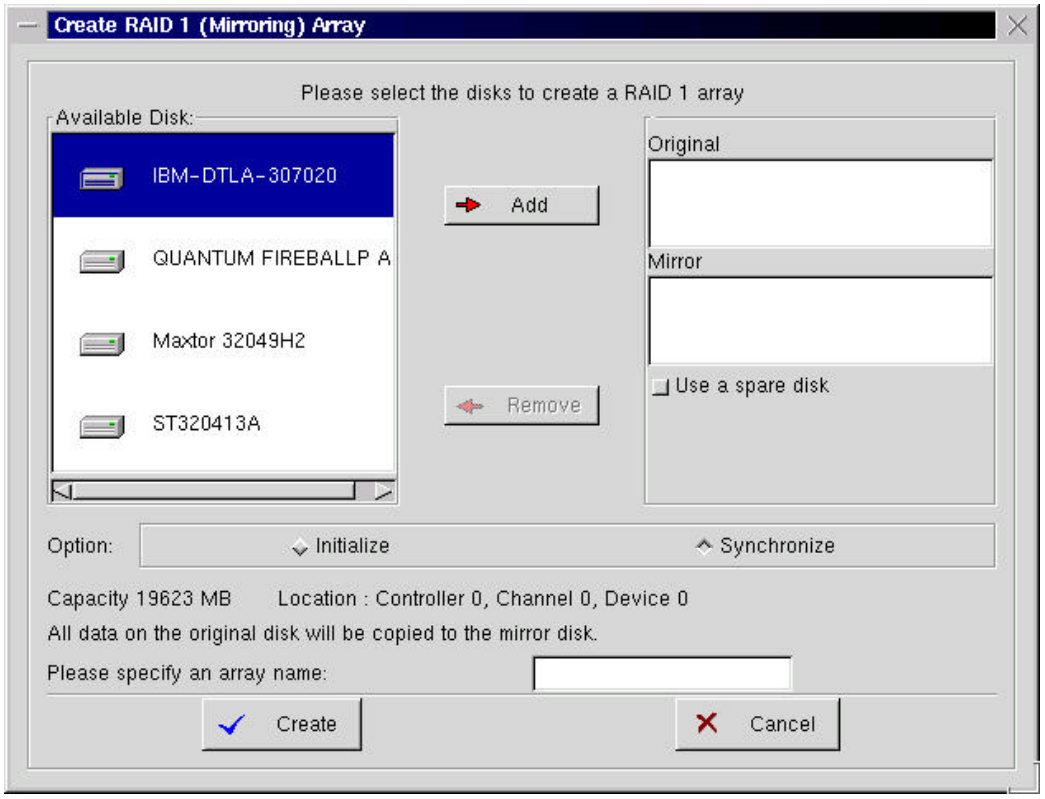
7 Click **OK** to reboot the system.

Creating a RAID 1 Array

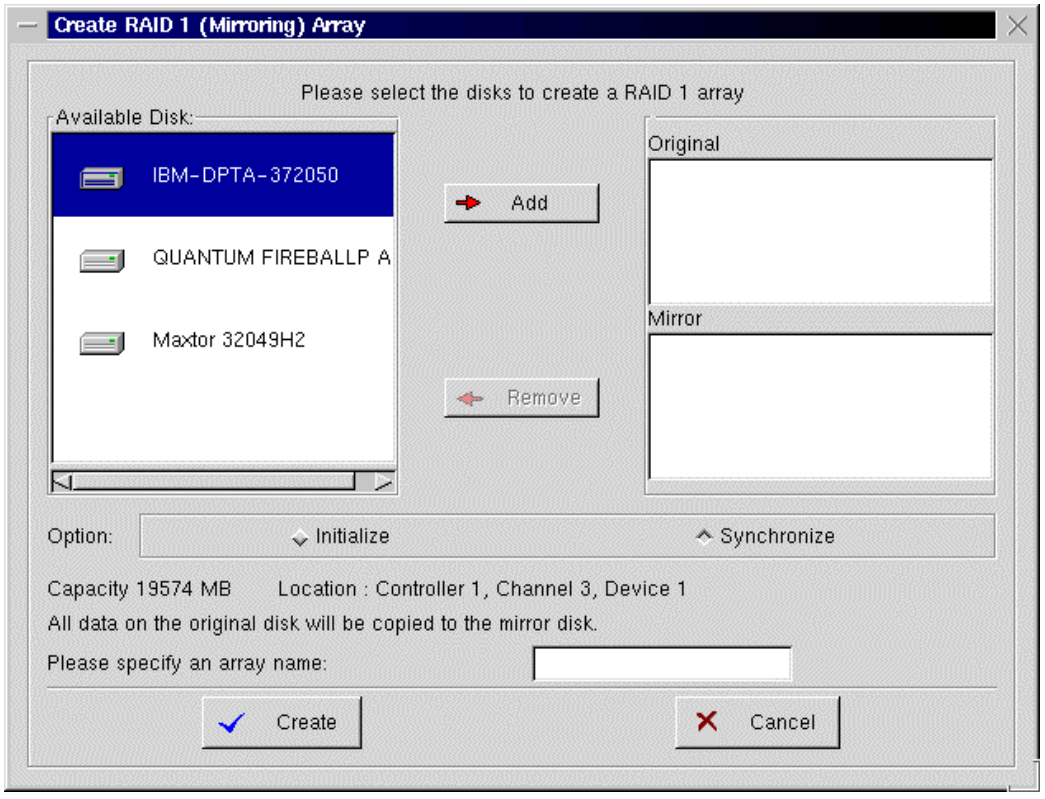
You can follow these steps to create a RAID 1 array.

1 Click the **RAID 1** button on the toolbar, the **Create RAID 1 (Mirroring) Array** window appears (see below).

If the controller supports dedicated spare disk for RAID 1 array, the window appears as below:

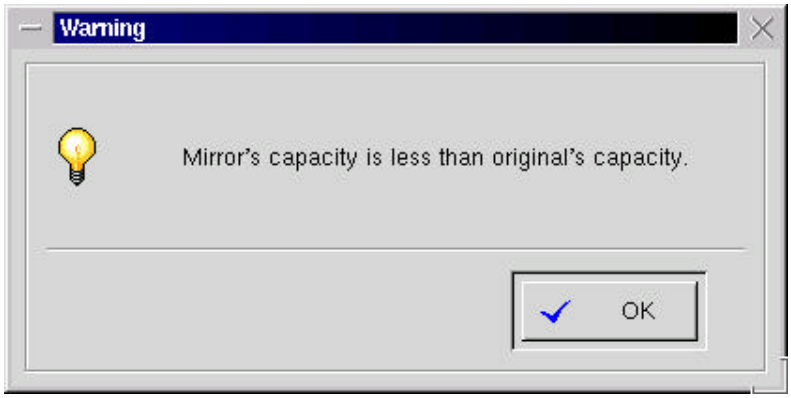


Otherwise the window will appear as below:



2 All the detected available disks on your system are listed in the **Available Disk** list box. You can specify the original disk and the mirror disk by selecting the disk and clicking **Add** button to add it to the **Original** box and **Mirror** box.

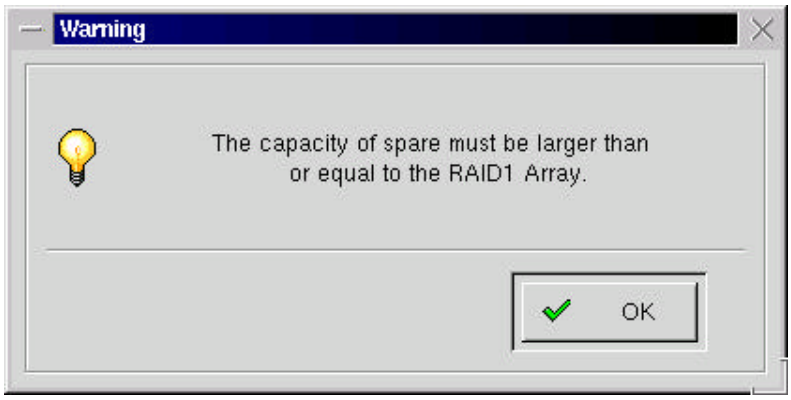
Note: The capacity of the original disk must be smaller than the mirror disk. Otherwise you will see the following warning message. You have to reselect another disk.



3 You can optionally specify a spare disk for the array if the controller supports it.

To add a spare disk, click the **Use a spare disk** option and select a spare disk from the **Available Disk** list box. You can also add a spare disk after you have created the RAID 1 array (See **Adding/Removing Spare Disk(s)**).

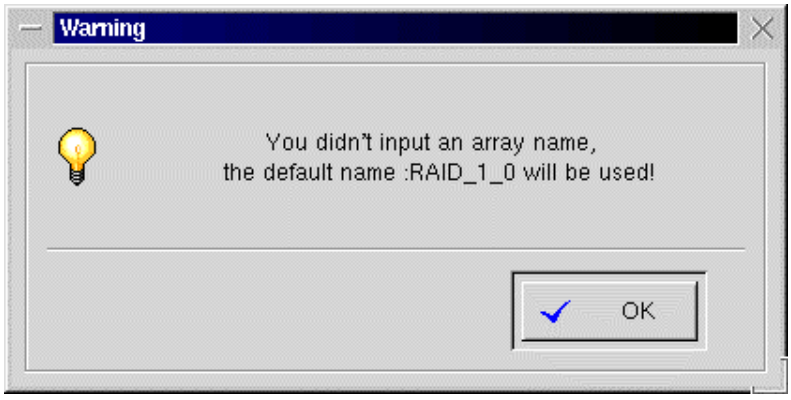
Note: The capacity of spare disk must be more than the mirror disk; otherwise you will get this warning message and reselect a disk:



4 Select **Initialize** or **Synchronize** option alternatively. **Synchronize** is the default option.

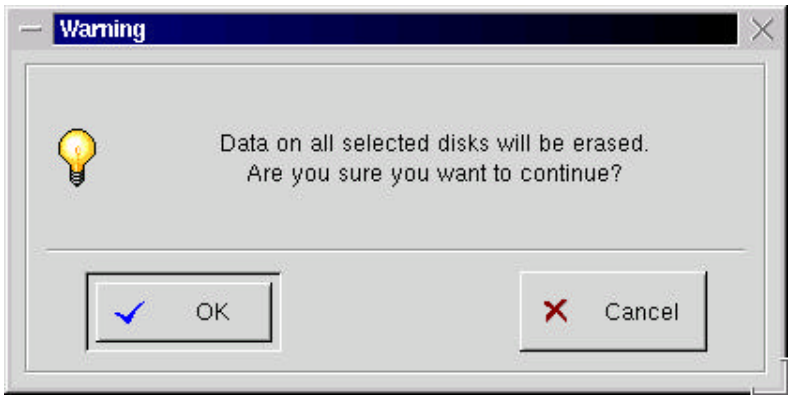
Initialize: Create a RAID 1 array and clears all data on the disks.
Synchronize: Create a RAID 1 array and duplicates all data from the original disk to the mirror disk.

5 Specify a name for the array. You can type in up to 8 characters. If you don't specify an array name, the system will assign a default name for it.

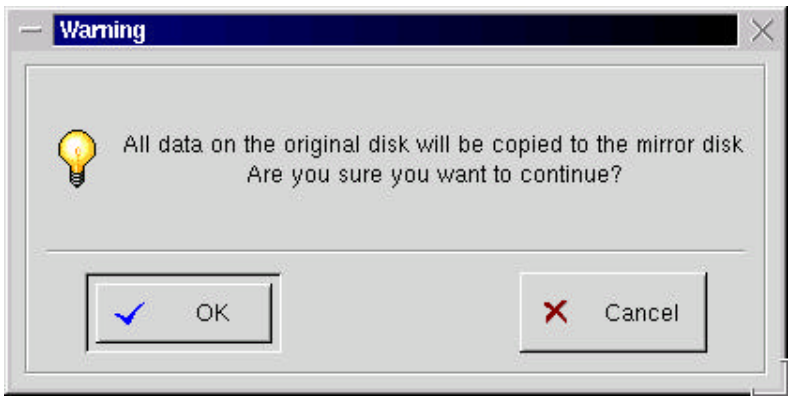


6 Click the **Create** button to create a RAID 1 array.

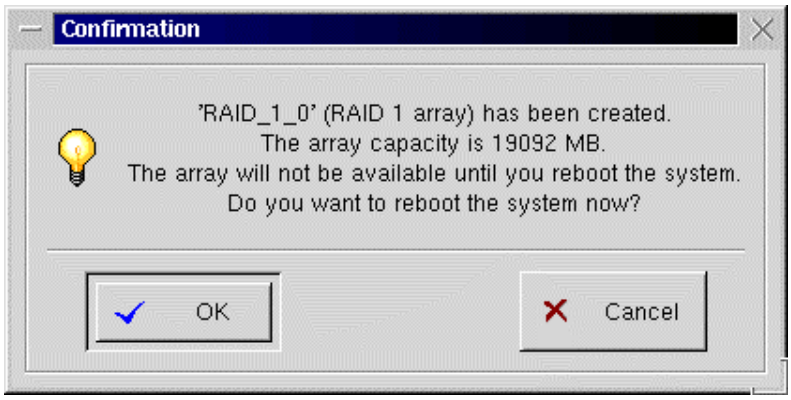
If you have selected the **initialize** option, the following warning window will pop up, warning you that all data on the selected disks will be erased.



If you have selected the **Synchronize** option, you will be warned that all data on the original disk will be copied to the mirror disk.



7 Click **OK**. If you have selected "initialize "option, a confirmation dialog box will appear, prompting you that the array will not be available until you reboot the system.



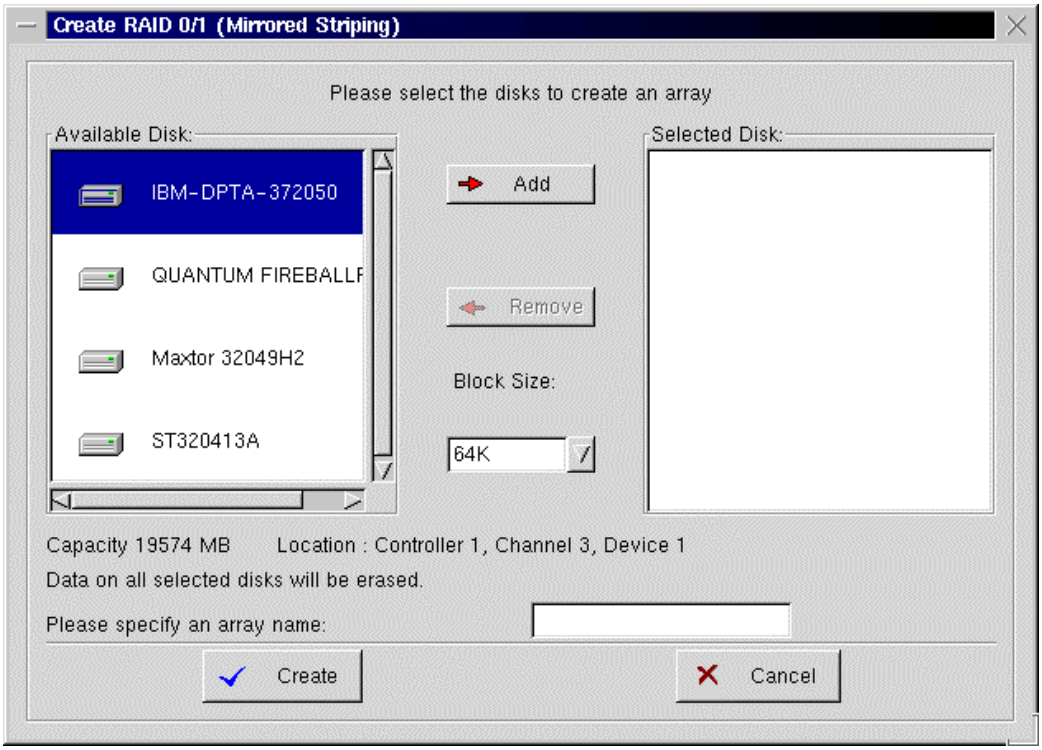
Click **OK** to reboot the system.

If you have selected "synchronize "option, the array will start synchronizing.

Creating a RAID 0/1 Array

You can follow these steps to create a RAID 0/1 array.

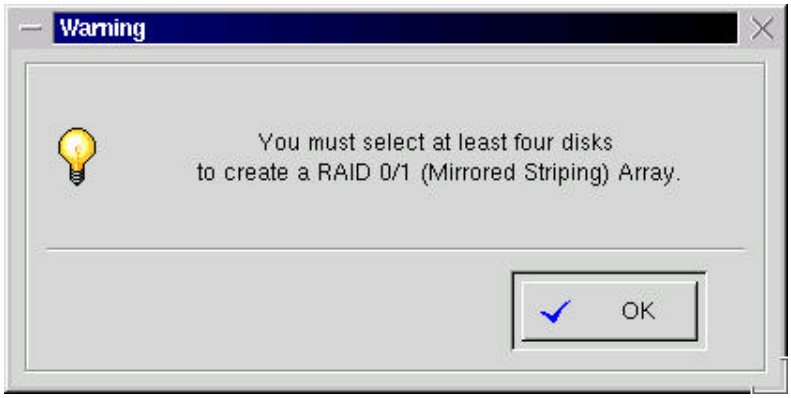
1 Click the **RAID 0/1** button on the toolbar, the **Create RAID 0/1 (Mirrored Striping) Array** window appears (see below).



Note: You must attach at least four hard disks to the controller to create a RAID 0/1 array.

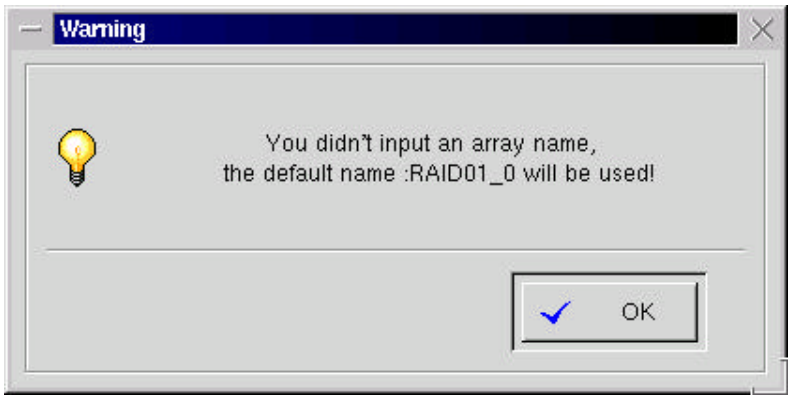
First select the disks from the Available Disk list box to create the array. Select a physical disk in the **Available Disk** list box. And then click the **Add** button. This disk will be added to the **Selected Disk** list box. If you want to unselect a disk, just click the **Remove** button to return the disk from the **Selected Disk** list box back to the **Available Disk** list box.

When you create a RAID 0/1 (Mirrored Striping) array, you must select four physical disks. Otherwise, a warning window will appear, prompting you to add more disks. Click **OK** and return to the Create RAID 0/1 (Mirrored Striping) Array window.

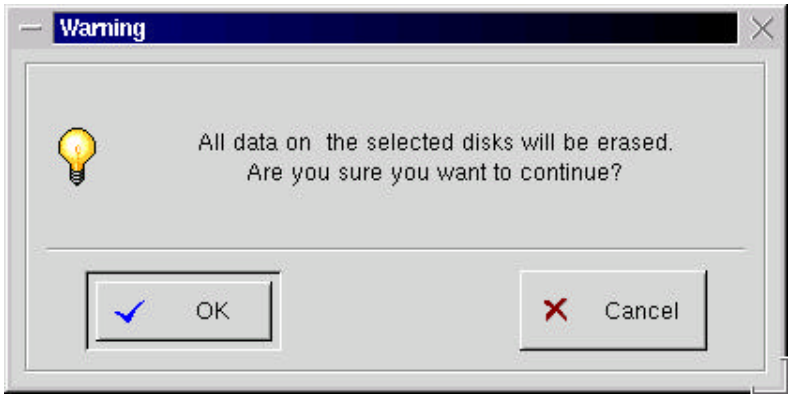


2 Select a block size from the drop-down list. 64k is the default size. Generally, the larger the size is, the better performance the system gets.

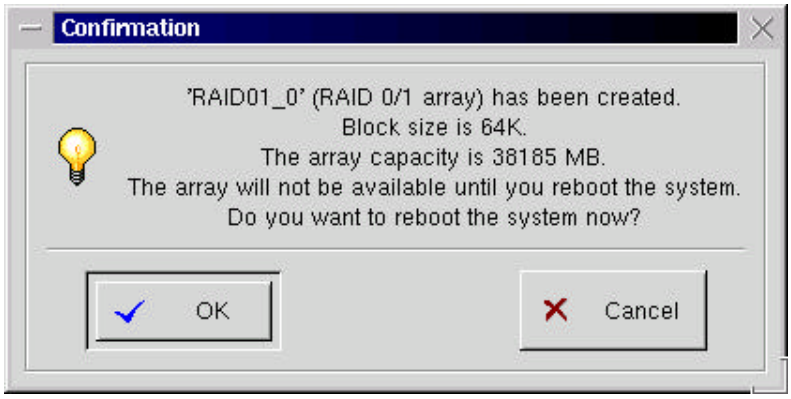
3 Specify a name for the selected array. You can type in up to 8 characters. If you don't specify an array name, the system will assign a default name for the new array.



4 Click **Create** to create a RAID 0/1 array. The following warning window pops up, warning you that all data on the selected disks will be erased.



5 Click **OK**. A confirmation dialog box appears, prompting you that the RAID 0/1 (Mirrored Striping) Array you specified has been created successfully and the array will not be available until you reboot the system.

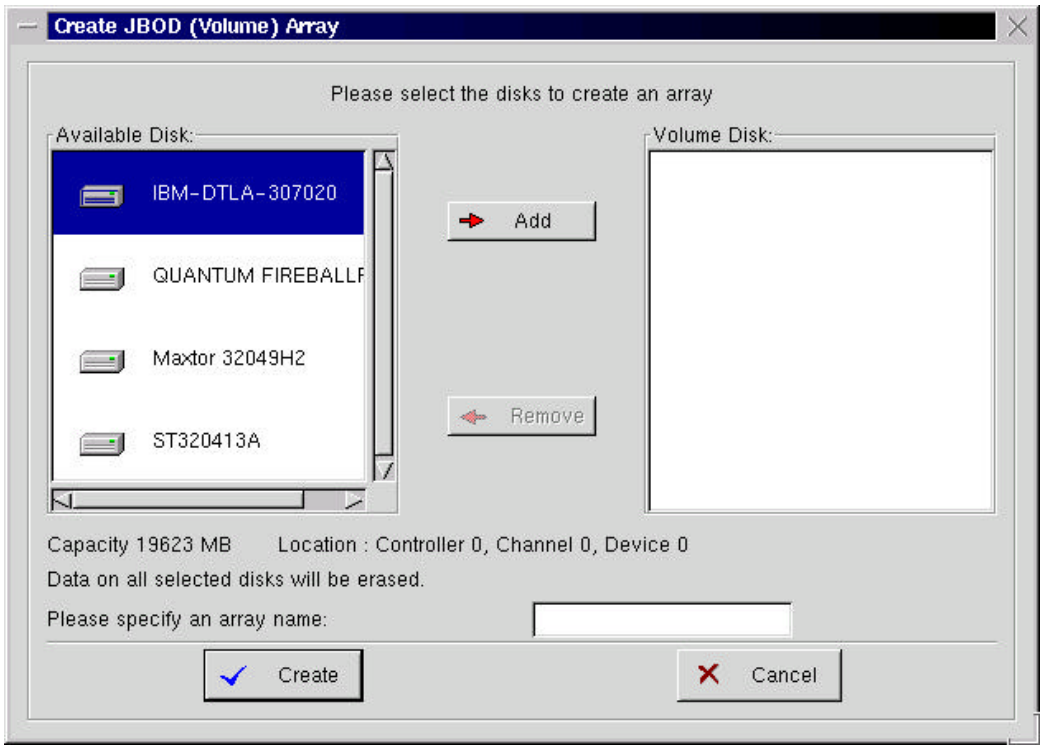


6 Click **OK** to reboot the system.

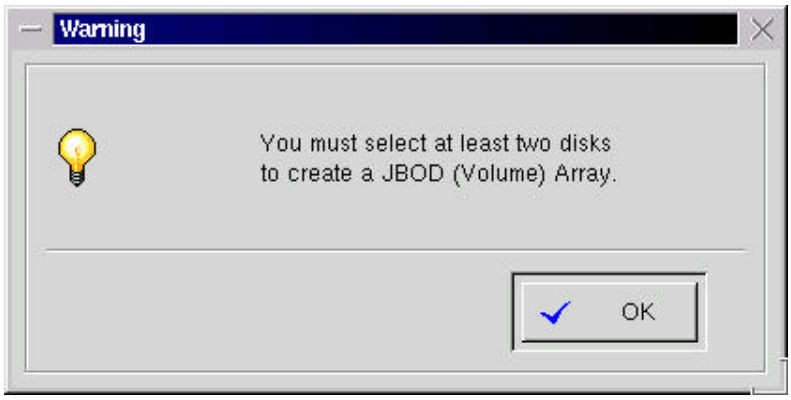
Creating a JBOD Array

You can follow these steps to create a JBOD array.

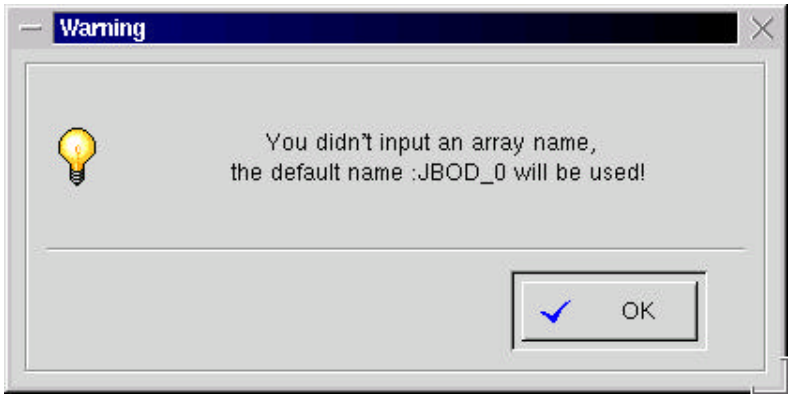
1 Click the **JBOD** button on the toolbar. The **Create JBOD (Volume) Array** window appears (see below).



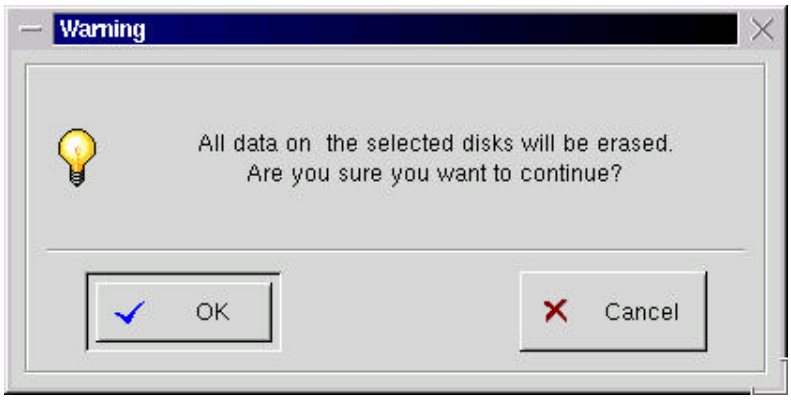
You must select at least two physical disks to create a JBOD (Volume) array. Otherwise, a warning window appears, prompting you to add more disks. Click **OK** and return to the **Create JBOD (Volume) Array** window.



2 Specify a name for the selected array. You can type in up to 8 characters. If you don't specify an array name, a default name will be assigned.



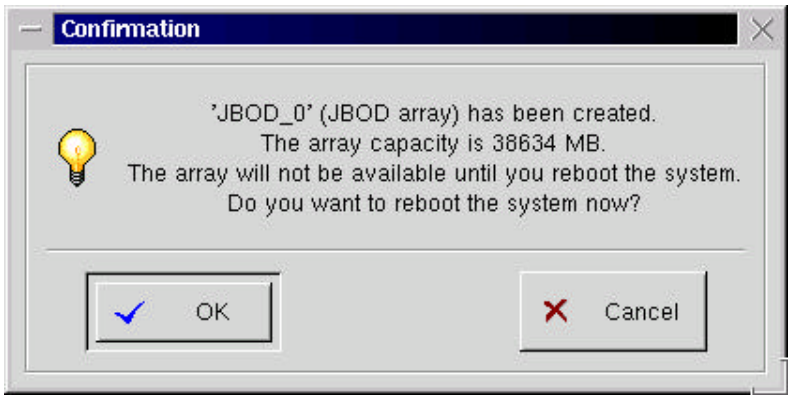
3 Click **Create**. The following warning dialog box pops up, warning you that all data on the selected disks will be erased.



4 Click **OK** to create the JBOD array.

5 Then a confirmation dialog box appears, prompting you that the array will not be available until you reboot the system.

WARNING: You must reboot the system to use the newly created array.



6 Click **OK** to reboot the system.

Deleting a RAID Array

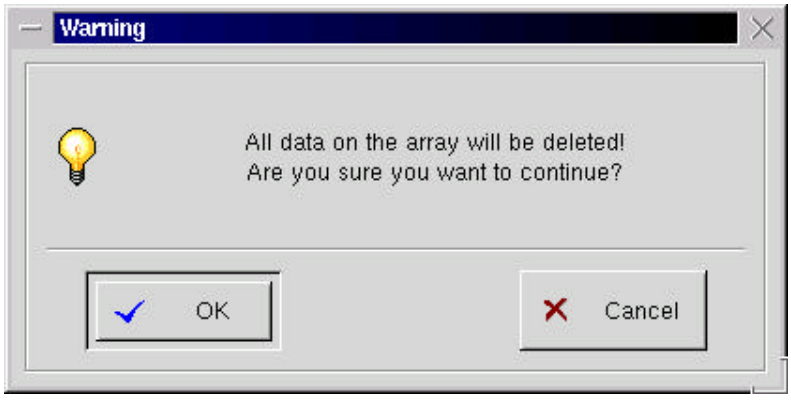
Deleting an array will break the array into single disks.

WARNING: To delete a bootable RAID array (which has an active partition on it), you must use the controller's BIOS Setting Utility.

There are two ways to delete a RAID array.

1. Right click one of the devices on the array tree. Then click **Delete** on the pop-up menu.
2. Select the array in the **Array** view of the main window. Click the **configuration** menu. Click **Delete** on the pop-up menu.

   A warning dialog box shows the following information: All data on the array will be deleted! Are you sure you want to continue?

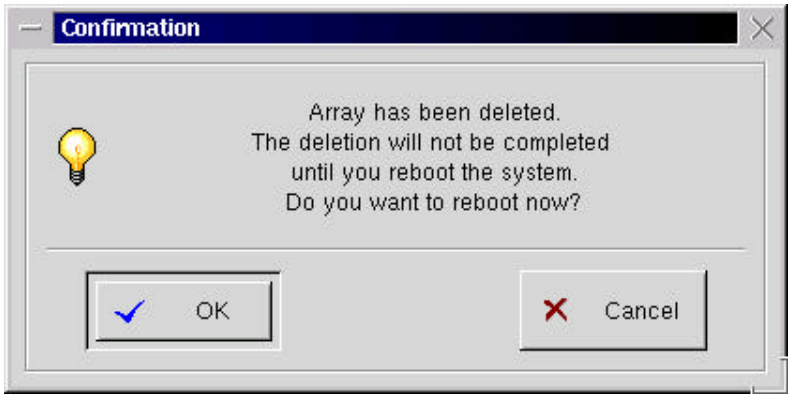


Click **OK** to delete the array, or **Cancel** to cancel deleting.

Note: Deleting an array will result in all its data loss. Make sure to backup all data on the array in case you wish to undo a deletion.

Then a confirmation dialog box appears, prompting you to reboot the system.

WARNING: The disks of the deleted array will not be accessible by OS before you reboot the system.



Click **OK** to reboot.

Rebuilding and Synchronizing

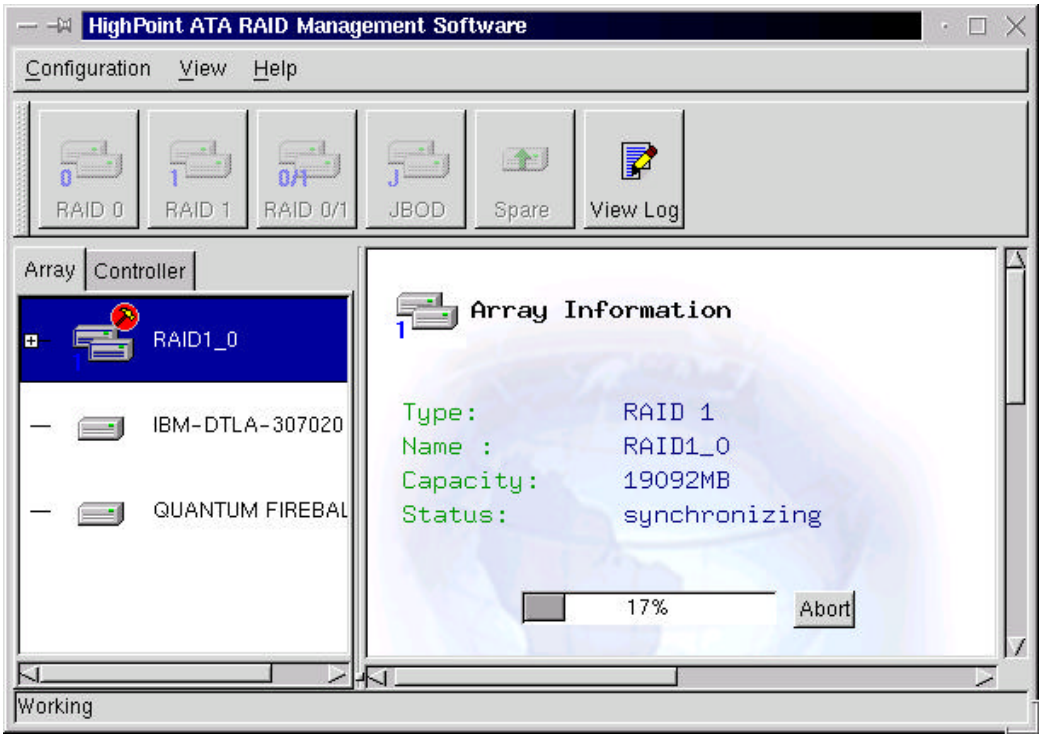
Synchronizing will copy data from the source disk to the target disk to ensure data consistency on the mirroring array. This operation will be performed when a failed array member is replaced.

Only RAID 1 array and RAID 0/1 array can be synchronized.

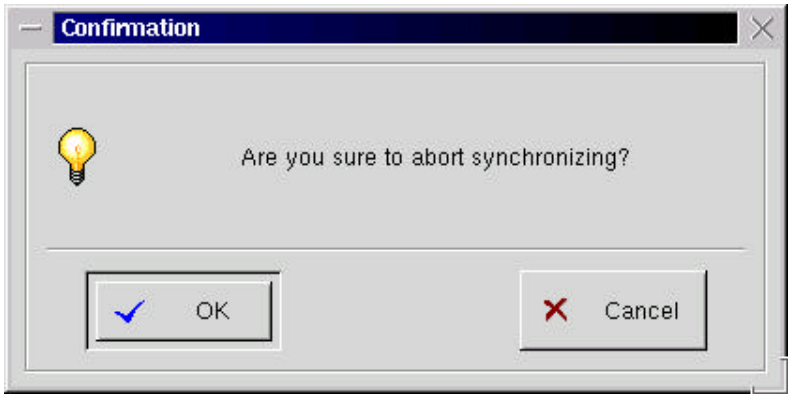
There are two ways to synchronize an array:

1. Right click a RAID 1 or RAID 0/1 array on the array tree. Click **Synchronize** on the pop-up menu.
2. Click the menu **Configuration->Monitoring->Synchronize**.

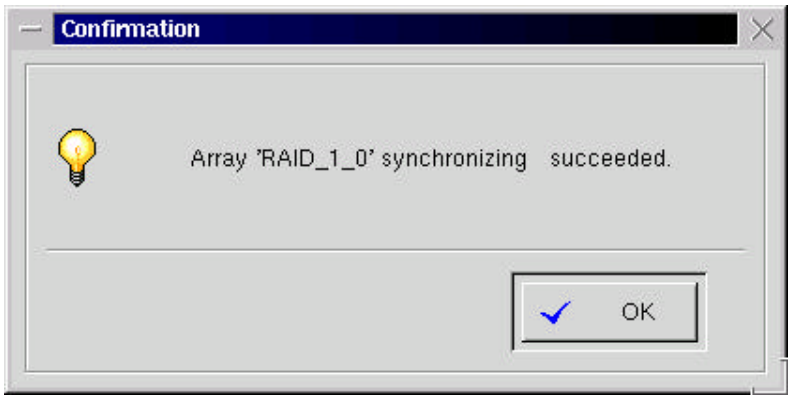
If you choose the **Synchronize** option, a progress bar will appear in the **Array Information** window, showing synchronizing in progress.



During synchronizing, you can abort this process by clicking the **Abort** button. Or you can right-click the array and choose **Abort** on the pop-up menu. Click **OK** to abort synchronizing the array.



After the synchronizing process completes, the following message box will pop up (see below). Click **OK**.



Adding/Removing Spare Disk(s)

With a spare disk, you can enhance the security of RAID 1 (or RAID 0/1, if supported) array. If one of the disks in the array fails, the spare disk will automatically take it over.

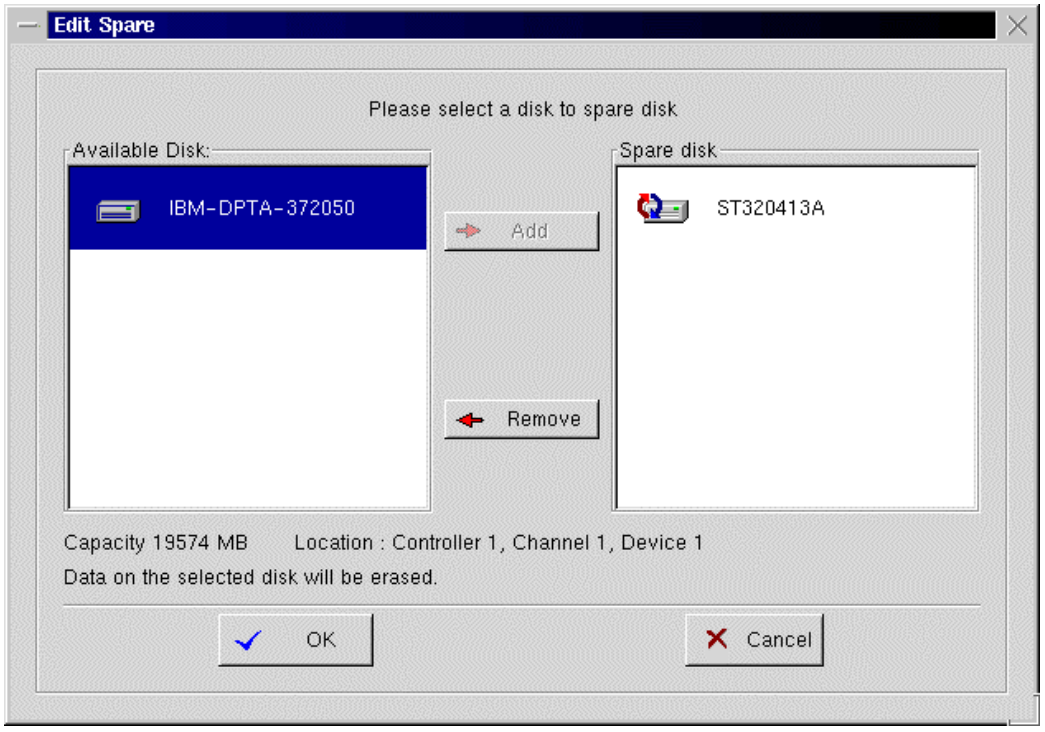
You can open the **Edit Spare** window to add or remove spare disk(s).

There are three ways to open the Edit Spare window.

1 Right click on the device item in the array tree. Select **Edit Spare** on the pop-up menu.
2 Click the menu **Configuration->Edit Spare**.
3 Click the **Spare** button on the tool bar.

To add a spare disk, you can perform the following steps:

1. Open the **Edit Spare** window.
2. Select a physical disk from the **Available Disk** list box and click the **Add** button to add the selected disk to the **Spare Disk** list box.



3. Click **OK** to activate a confirmation dialog box (see below), prompting you to reboot the system.

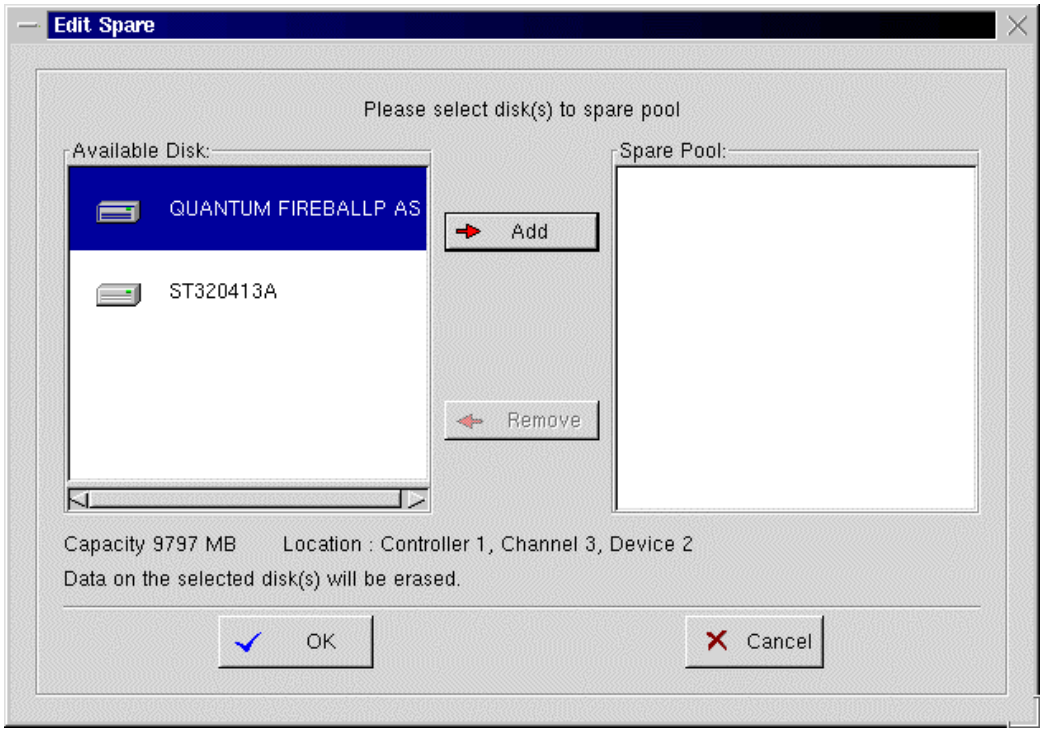


4. When the system restarts, you can see the new spare disk for a RAID 1 array appearing on the array tree and the controller tree.

To remove a spare disk, you can perform the following steps:

1. Open the **Edit Spare** window.
2. Select a physical disk from the **Spare Disk** list box and click the **Remove** button to add the selected disk to the **Available Disk** list box.
3. The next steps are just the same as adding to a spare disk (See above).

If your RAID controller supports spare pool, you can add or remove one or more spare disk(s). The dialog will be shown as below.

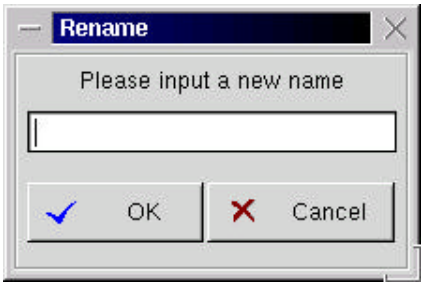


Renaming an Array

You can modify the name of an array after you created it. There are two ways to rename an array.

1 Right click an array on the array tree. Select **Rename** on the pop-up menu.
2 Click the menu **Configuration->Monitoring->Rename**.

Then the **Rename** dialog box appears (see below).



You can input a new name for the selected array. Then click **OK**.

Rescanning Devices

You can rescan all the devices attached to the controller and refresh their status.

There are two ways to rescan the devices.

1 Right click an array on the array tree. Select **Rescan** on the pop-up menu.
2 Click the menu **Configuration->Monitoring->Rescan**.

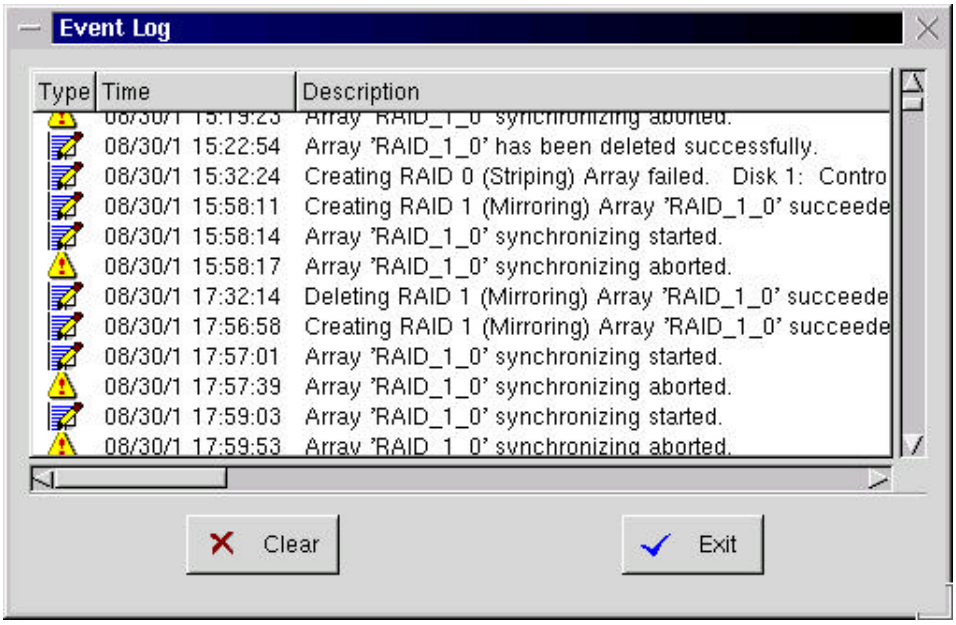
Then the status of the selected device will be refreshed.

Event Log

All the important events are logged. You can view the events to monitor the array status.

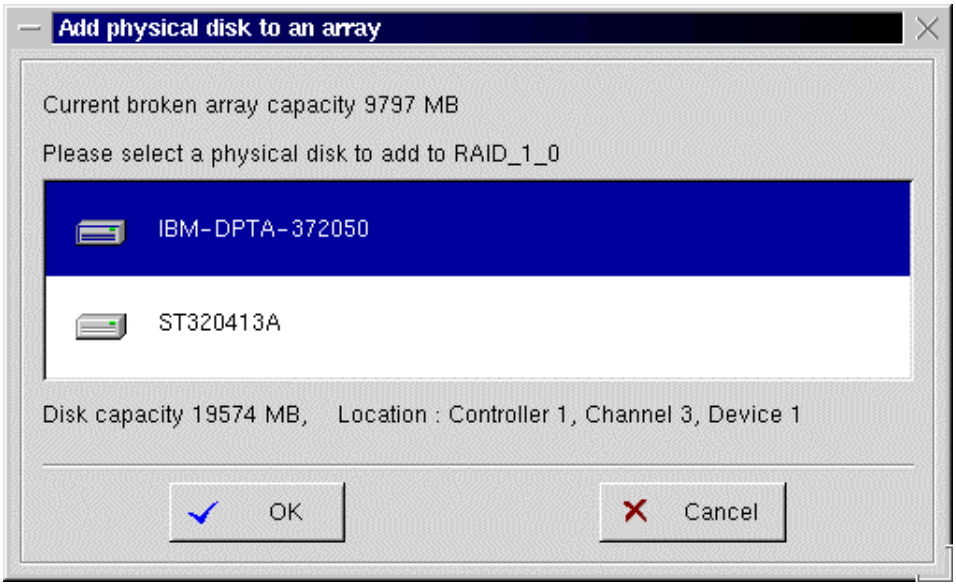
Click the **View Log** button on the toolbar or choose the menu **View->Event Log** to open the **Event Log** dialog box. The type, occurring time and description of the events will be recorded in it.

The **Event Log** dialog box shows as follows:



Adding a Physical Disk into a Broken Array

When the HighPoint ATA RAID Management Software starts up, it will auto-detect if there are any critical arrays, such as a RAID 1 array only with an original disk, a RAID 0/1 array having a broken RAID 0 array, etc. If a critical array is detected and there are some physical disks available, you will be prompted to select a physical disk to rebuild the critical array.



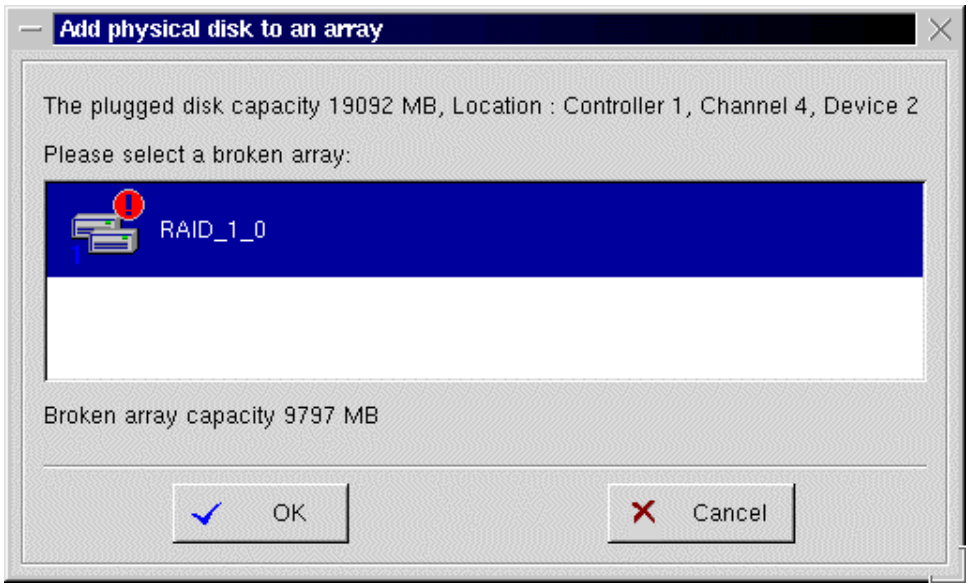
Select a physical disk from the **Available Disk** list box and click the **Add** button to add the selected disk to the **Operational Disk** list box and click **OK**.

Note:

1 A bootable disk cannot be added to an array.

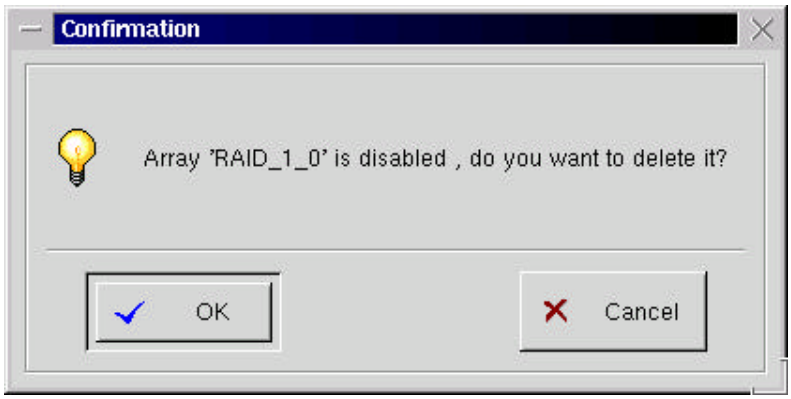
2 You can only add a disk to a broken RAID 1 or RAID 0/1 array. A RAID 0 and JBOD array cannot be rebuilt.

If a disk is plugged and there is one or more broken RAID 1 or RAID 0/1 array, you will be prompted to select an array and add the disk into it. (See below)


Add physical disk to an array
The plugged disk capacity 19092 MB, Location : Controller 1, Channel 4, Device 2
Please select a broken array:
RAID_1_0
Broken array capacity 9797 MB
OK
Cancel

Deleting Unavailable Arrays

When the HighPoint ATA RAID Management Software starts up, if it detects a disabled RAID array, it will prompt users to delete it.



Click **OK** to delete or **Cancel** to abort.

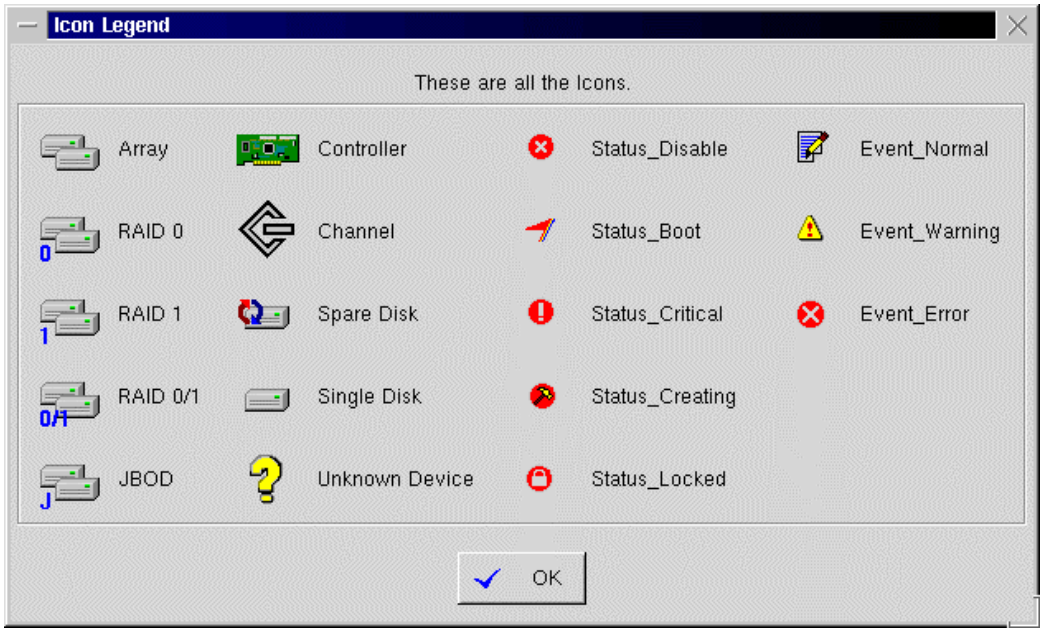
Note:

1 A bootable array cannot be deleted.

2 Only disabled RAID 0 and JBOD array can be deleted.

Icon Legend

The Icon legend window shows a list of icons used in HighPoint ATA RAID Management Software. Click on the menu **Help -> Icon Legend** to open the **Icon Legend** window (see below):



3 Glossary

Controller: A system may include the RAID controllers. They provide RAID 0, RAID 1, RAID 0/1, JBOD, Spare and Hot-Swap functions.

Channel: The channel provides connections between controller and device (array or physical disk). Each channel can attach a master device and a slave device.

Array: As used in RAID, an array consists of one or more hard disks, which are logically combined to form a single storage disk. Arrays are categorized by the method in which they are accessed to logically organize data on them for purposes of performance enhancement, capacity augmentation, and /or data redundancy protection. The different types of array include RAID 0 (Striping), RAID 1(Mirroring), RAID 0/1 (Mirrored Striping), RAID 5, etc.

RAID 0 (Striping): RAID 0 is typically defined as a group of striped disks without parity or data redundancy. RAID 0 arrays can be configured with large stripes for multi-user environments or small stripes for single-user systems that access long sequential records. RAID 0 arrays deliver the best data storage efficiency and performance of any array type. The disadvantage is that if one drive in a RAID 0 array fails, the entire array fails.

RAID 0 provides much speed because the data are scattered in all the disks. When reading or writing, all disks work at the same time. If thereis more than one single physical disk (not member of an array and not an ATAPI device or a removable disk), you can create a RAID 0 array.

RAID 1 (Mirroring): RAID 1, also known as disk mirroring, is simply a pair of disk drives that store duplicate data but appear to the computer as a single drive. Although striping is not used within a single mirrored drive pair, multiple RAID 1 arrays can be striped together to create a single large array consisting of pairs of mirrored drives. All writes must go to both drives of a mirrored pair so that the information on the drives is kept identical. However, each individual drive can perform simultaneous, independent read operations. Mirroring thus doubles the read performance of a single non-mirrored drive and while the write performance is unchanged. RAID 1 delivers the best performance of any redundant array type. In addition, there is less performance degradation during drive failure than in RAID 5 arrays. RAID 1 array can provide much security because the mirror disk can replace the original disk when original disk is fault. If there are 2 physical disks (not a member of an array and not an ATAPI device or a removable disk), you can create RAID 1 array.

JBOD (Volume): JBOD is an acronym for Just a Bunch of Disks. It is used to refer to hard disks that aren't configured according to RAID -- a subsystem of disk drives that improves performance and fault tolerance. JBOD provides much

more capacity (the sum of all the disks). If there is more than one single physical disk (not a member of an array and not an ATAPI device or a removable disk), you can create a JBOD array.

RAID 0 /1 (Mirrored Striping): RAID 0/1 can provide much speed and security. Only when at least four single physical disks are available, you can create a RAID 0/1 array.