SoftRAID 3
QuickStart Guide

Welcome to the SoftRAID 3 QuickStart Guide.

This Guide will take you through the basics of creating SoftRAID volumes with SoftRAID 3. To fully understand SoftRAID 3's features and to optimize your SoftRAID volumes, we suggest you read the SoftRAID 3 Manual located in this folder.

The QuickStart Guide:

Read before you begin:

New SoftRAID volumes can be created on disks **only** after the disks have been initialized by the SoftRAID 3 application, making them recognizable by the SoftRAID 3 driver in the System folder. If the driver is not already present in the System folder of your startup volume, it will be installed automatically when you first launch the SoftRAID application. Once a disk has been initialized with the SoftRAID driver, it will only appear on the desktop of machines with systems containing the SoftRAID driver. If you are using a Mac OS X 10.4 (**Tiger**) or greater, the driver is already installed in the system.

Part 1
A Quick Look at RAID Scenarios

SoftRAID 3 lets you create 3 types of volumes:

1. Non-RAID, or standard volumes, resides on one disk, can be any size up to the size of the disk, unlike standard Apple volumes which always occupy the whole disk;

2. RAID 0, or Stripe volumes, used for high speed data access with video, audio and graphics applications, made of 2 or more disks, can be any size up to a sum of the capacities of all the disks;

3. RAID 1, or Mirror volumes, used for instantaneous backup and offsite archiving, made of 2 or more disks, can be any size up to the full capacity of the smallest disk.

Non-RAID and Mirror volumes can both contain Mac OS X and be used as **startup volumes**. Disks initialized with the SoftRAID driver can contain a combination of Mirror, Stripe and non-RAID volumes. These combinations are described in more detail in **RAID Scenarios** in the SoftRAID 3 manual.

RAID 0 - Stripe Volumes

The key for setting up a RAID 0 volume is to pick similar, fast, reliable disks and only use the first half of the disks for the RAID 0 volumes. The rest of the disks' capacities can be used for non-RAID or Mirror volumes. In general, the more disks used, the faster the reading and writing of the data. The performance of your Stripe volume depends on which buses and disks you use. For more information read **RAID Scenarios** and **Stripe Essential**s in the SoftRAID 3 manual.

RAID 1 - Mirror Volumes

Setting up a RAID 1 volume depends on what type of backup you need.

Instantaneous Backup

To be protected in the event of catastrophic disk failure, you will want to build a Mirror volume which contains at least two disks. This volume can be your startup volume. In the event that the Primary disk fails, SoftRAID will switch to another disk automatically, designate it as the Primary disk (the disk with the intact data) and allow you to remove the failed disk.
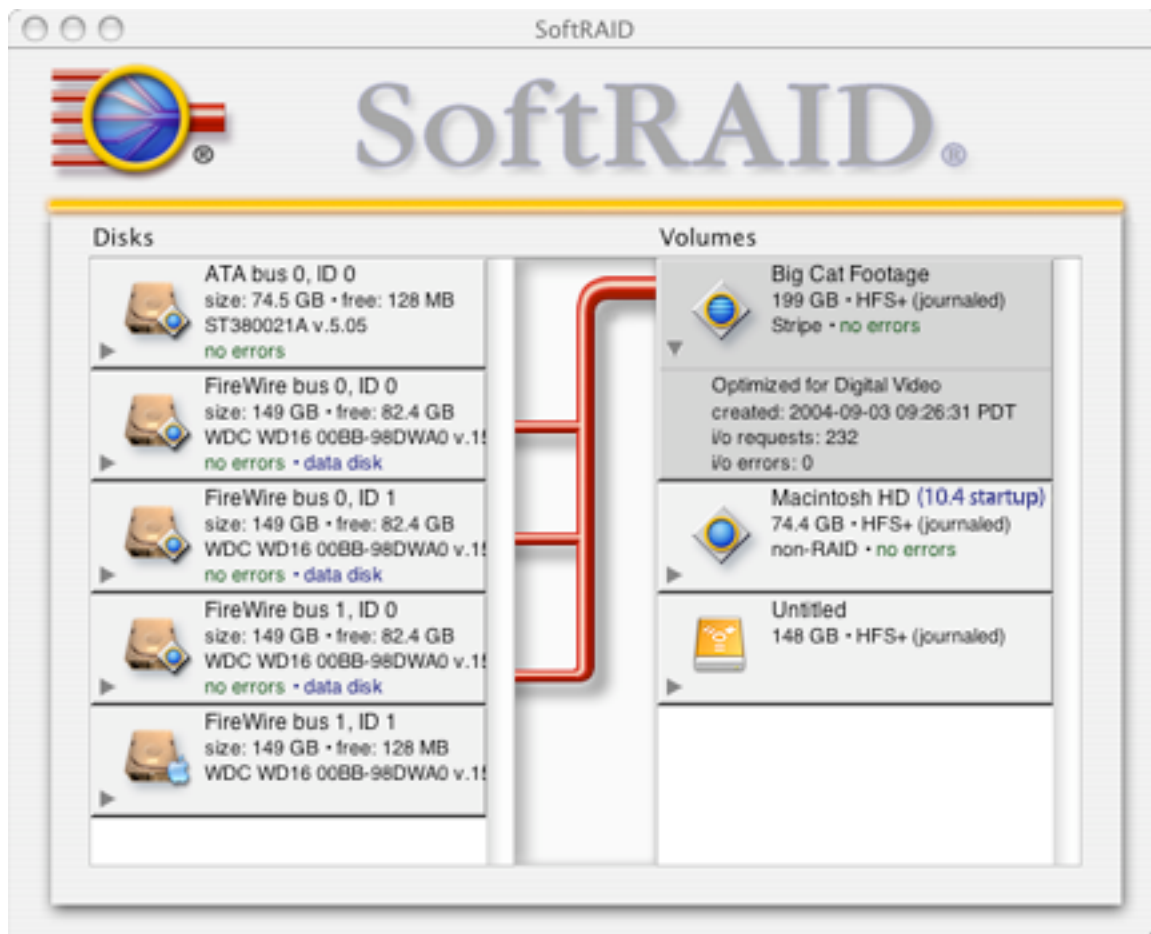
Offsite Backup

If you want to maintain an offsite backup of your volume, you will want to create a Mirror volume with at least three disks. This allows you to store one of the disks offsite in a secure location while the other two are used with the Mac. When you want to update your offsite backup, you can remove the secondary disk from your operating Mirror volume and switch it with the disk which was stored offsite. SoftRAID will then rebuild the disk you just attached, in the background, while you continue to use the Mirror volume. See the **Mirror Essentials** section in the Manual for more information.

Server Archive

If you cannot easily backup your server volume because it needs to be available 24 hours a day and 7 days a week, you can create archives using a SoftRAID Mirror volume. Depending on how many archives you want to store offsite, you can choose disks or tape as your archive medium. See the **Backup Strategies for Mirror volumes** section in the SoftRAID Manual for more information.

Part 2

A Quick Look at the SoftRAID 3 Application Window

The SoftRAID application window has two columns of information tiles: **Disks** and **Volumes. Pipes** show the connections between disks and volumes. These are displayed whenever a single disk or volume is selected. The text on the **Disk tiles** shows size and type information and an icon indicates which driver controls the disk. Icons on the **Volume tiles** show the type of each volume and the text details volume size and the version of any installed system. The window above contains 5 disks (1 controlled by Apple's driver and 4 controlled by SoftRAID) and 3 volumes (a SoftRAID startup volume (non-RAID), an Apple non-RAID volume and a SoftRAID Stripe volume).

The **disk** and **volume** tiles also display information on the state of the disks and volumes. See the **Mirror Essentials** and **Stripe Essentials** sections of the Manual for a discussion of these states.

Even when the Application is not running, SoftRAID monitors the condition of all SoftRAID disks and volumes. The **SoftRAID Monitor** will notify the user of any changes in those states. See the Monitor portion of the **Glossary** in the SoftRAID Manual for a discussion of the Monitor preference settings.

Part 3

The Step-by-Step QuickStart

1. Deciding on Your Volumes

Before you use SoftRAID for the first time you will want to decide how many disks will be in your new SoftRAID volume, how big the volume will be, whether you want to save any of your data from your Apple volumes and whether the new volume will contain a system.

Option A: Start from scratch

If you have non-SoftRAID disks that have data you <u>don't</u> need to save, or new disks which have not been initialized, you will want to *Initialize* the disks according to the directions on page 7 and then create a *New* volume with those disks, as described on page 10.

Option B: Convert a standard Apple Disk/Volume which may contain a system

If you have a standard Apple volume which contains data that you want to save, you can convert it to a SoftRAID non-RAID volume and then, if you choose, add more disks to it and make it into a Mirror volume. You will use the *Convert to SoftRAID 3* command to convert the disk and then the *Convert to Mirror...* command to add more disks to the volume. Read pages 7, 8, and 11 for these instructions.

If you are converting your Apple startup or "boot" disk, the Mac must be started from a different startup volume, as described on page 14.

Note: To prepare an Apple disk for adding to a non-RAID or Mirror volume you will want to use the *Initialize* command rather than the *Convert to SoftRAID 3* command. Standard Apple and Apple RAID volumes take up the entire capacity of a disk, even if the data only fills a small amount of that volume. This means that after an Apple disk is converted there is only a small amount (128 MB) available for creating other SoftRAID volumes.
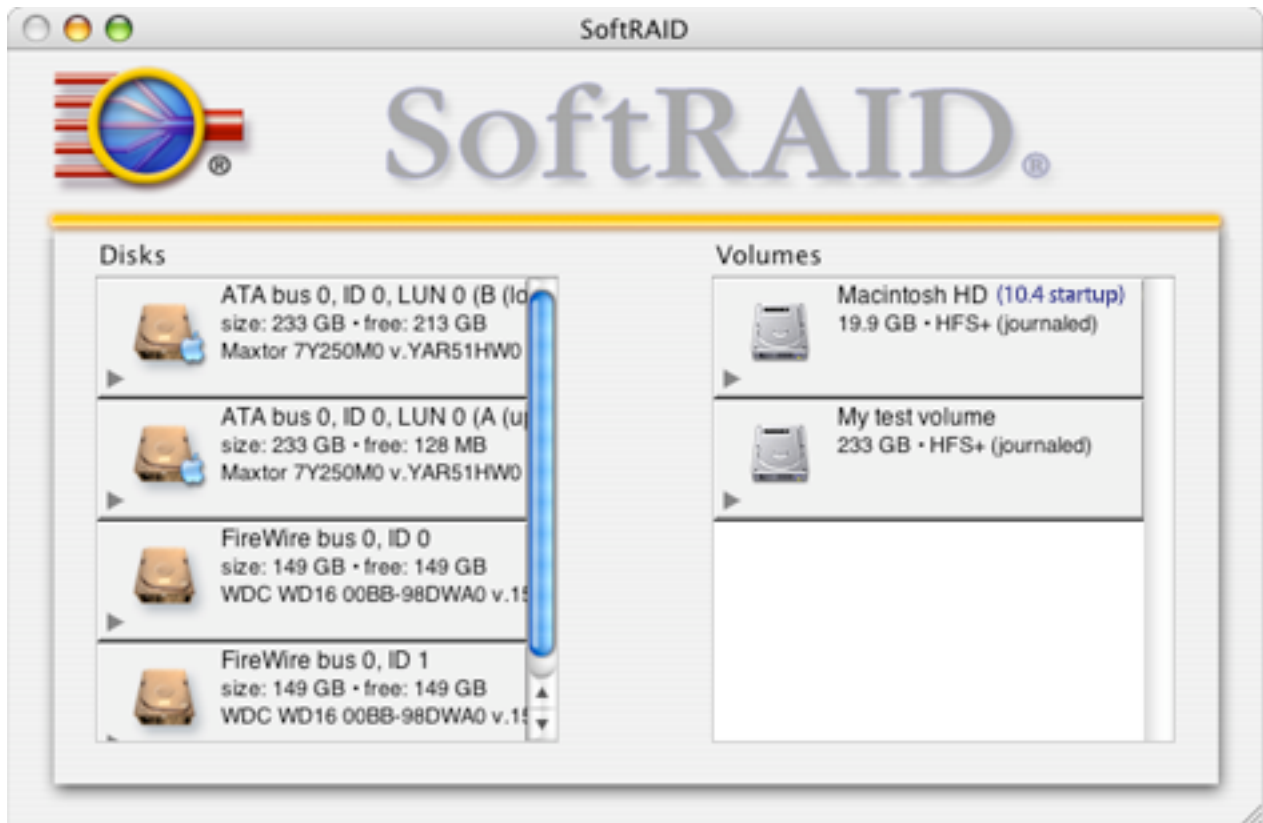
Option C: Convert an Apple RAID volume:

If you have an Apple Mirror or Stripe volume that you want to convert, you will convert each disk of the volume individually with the *Convert to SoftRAID 3* command. When all of the disks are converted, the volume will perform as a SoftRAID volume. These instructions are on pages 8 and 9.

As described above, converted Apple RAID volumes will use all of a disk's capacity regardless of the amount of data in the volume. To use the data in an existing Mirror or Stripe volume but alter the size of the volume, copy the data to another disk, initialize the disks with SoftRAID and then create the new volumes in the size you wish. Mirror, Stripe and non-RAID volumes can share the same disks in SoftRAID.

2. Launch the SoftRAID Application

You will be prompted to enter the user password for your Mac.
Once the password is verified, the SoftRAID application window will appear showing the disks which are connected to your Mac:

The Mac depicted above has two internal ATA disks, each containing an Apple volume, and two external FireWire disks which haven't yet been formatted.

3. Install the SoftRAID Driver on the Mac (for OS X 10.3.x and below)

The following alert will appear. Click on **Install**.

Mac OS X 10.4 users will get an alert asking to upgrade the driver if the version of SoftRAID which they are running has a newer version than what was included with the System.

4. Initialize a Disk/Convert a Disk

All disks used to create SoftRAID 3 volumes need to be initialized with the SoftRAID 3 Application.

Existing **Apple RAID, non-RAID**, and **SoftRAID 2.x** volumes can retain their data and be initialized with SoftRAID 3 using the *Convert to SoftRAID 3* menu item. Converting a startup or "boot" volume requires that the Mac be started from a different startup volume. See Part 4 of this Guide for details.

To Initialize a Disk:

If the disk has not been initialized or you **do not** need to keep any existing data on the disk, choose **Initialize** under the **Disk** menu. **This operation deletes any access to any data on the disk.** You will be asked for your system password.

1. Select a disk by clicking on its Disk tile.

2. Choose **Initialize** in the **Disk** menu. The following window appears:

3. Select **Initialize.** You may be asked to enter your system password to proceed. You will see the disk tile change to a disk with the SoftRAID 3 icon on it.

4. Proceed to the **Create a New Volume** section on page 10 of this guide.

To Convert an Apple Disk Utility or SoftRAID 2.x volume:

If the disk has been initialized with Apple Disk Utility or SoftRAID 2.x and you want to keep the data intact and maintain its existing volumes, you can use the *Convert to SoftRAID 3* command under the **Disk** menu. Each disk which is part of the volume will need to be converted. The converted volume will only be available with SoftRAID 3 running on Mac OS X. **If you are converting your startup volume, please read Part 4 of this Guide.**

Converting <u>non-RAID</u> Volumes

All converted non-RAID volumes will contain the same data as was on the Apple or SoftRAID 2.x volume and will be the same size as they were before conversion. Apple volumes typically take up all of the space on the disk so even if your data only fills 1/3 of the disk capacity, your volume will still be the size of the entire disk. If you wish to make a smaller SoftRAID volume you will need to start from an empty or newly initialized disk and copy your data onto the new SoftRAID volume.

1. Back up all the data on the disk you are about to convert.

2. Make sure that Apple Disk Utility is not running.

3. Highlight the disk you wish to convert in the Disk column of the Application window.

4. Select the menu item *Convert to SoftRAID 3* under the **Disk** menu. The following dialog box appears:

Convert Disk to SoftRAID 3 Format

Do you really want to convert this disk to SoftRAID 3 format? After converting this disk, you must use SoftRAID 3 to create and delete volumes on it. Please make sure volumes on this disk are backed up before you proceed.

Convert   Cancel

5. Select the **Convert** button. You may be asked for your password before SoftRAID will complete the operation.

Converting <u>Mirror</u> Volumes:

1. Back up all the data on the disks you are about to convert.

2. Select the *Preferences* item under the **SoftRAID** menu.

3. Go to the Driver tab and change the "Mirror volume Secondary disk time-out" Preference to 2 minutes. Since the disks of AppleRAID and SoftRAID 2.x volumes are converted individually, and the SoftRAID driver looks for those disks to appear in a certain amount of time, (See **Mirror Essentials** in the

Manual for more details), this procedure allows you enough time to convert the entire volume. **It is also important not to use the volume until all of the disks in that volume are converted.**

4. Make sure that Apple Disk Utility is not running.

5. Highlight the first disk you wish to convert in the Disk column of the Application window.

6. Select the menu item *Convert to SoftRAID 3* under the **Disk** menu.
The following dialog box appears:

> **Convert Disk to SoftRAID 3 Format**
>
> Do you really want to convert this disk to SoftRAID 3 format? After converting this disk, you must use SoftRAID 3 to create and delete volumes on it. Please make sure volumes on this disk are backed up before you proceed.
>
> (Convert)   (Cancel)

7. Select the **Convert** button. You may be asked for your password before SoftRAID will complete the operation. SoftRAID will show a new volume in the Volume column and a progress indicator. You will need to convert all of the disks before this indicator disappears. If you are not sure which disks to convert, highlight the Apple RAID volume in the Volume column and the pipes will show you which disks are still part of that volume.

8. Highlight the next disk of the volume you wish to convert and select the *Convert to SoftRAID 3* menu item.

When all of the disks have been converted, the Apple volume icon will disappear and you will be able to use your new SoftRAID Mirror volume.

Note: SoftRAID will not convert an AppleRAID Mirror volume which has failed. To fix the failed state you must correct it in AppleRAID. You can either rebuild the disks in AppleRAID or disconnect the failed disk and convert just the working disk. To detect which disk has failed, you can try copying a large file to or from the volume and seeing which disk is blinking (working) and which disk isn't (failed).

Converting Stripe Volumes:

1. Back up all the data on the disks you are about to convert.

2. Make sure that Apple Disk Utility is not running.

3. Highlight the first disk you wish to convert in the Disk column of the Application window.

4. Select the menu item *Convert to SoftRAID 3* under the **Disk** menu. The following dialog box appears:

5. Select the **Convert** button. You may be asked for your password before SoftRAID will complete the operation.

6. Repeat the previous step until all of the disks have been converted. If you are not sure which disks to convert, highlight the Apple RAID volume in the Volume column and the pipes will show you which disks are still part of that volume.

After converting or initializing disks
After restarting, Mac OS X may display a dialog saying that it cannot recognize your volumes. If this appears, select the Ignore button.
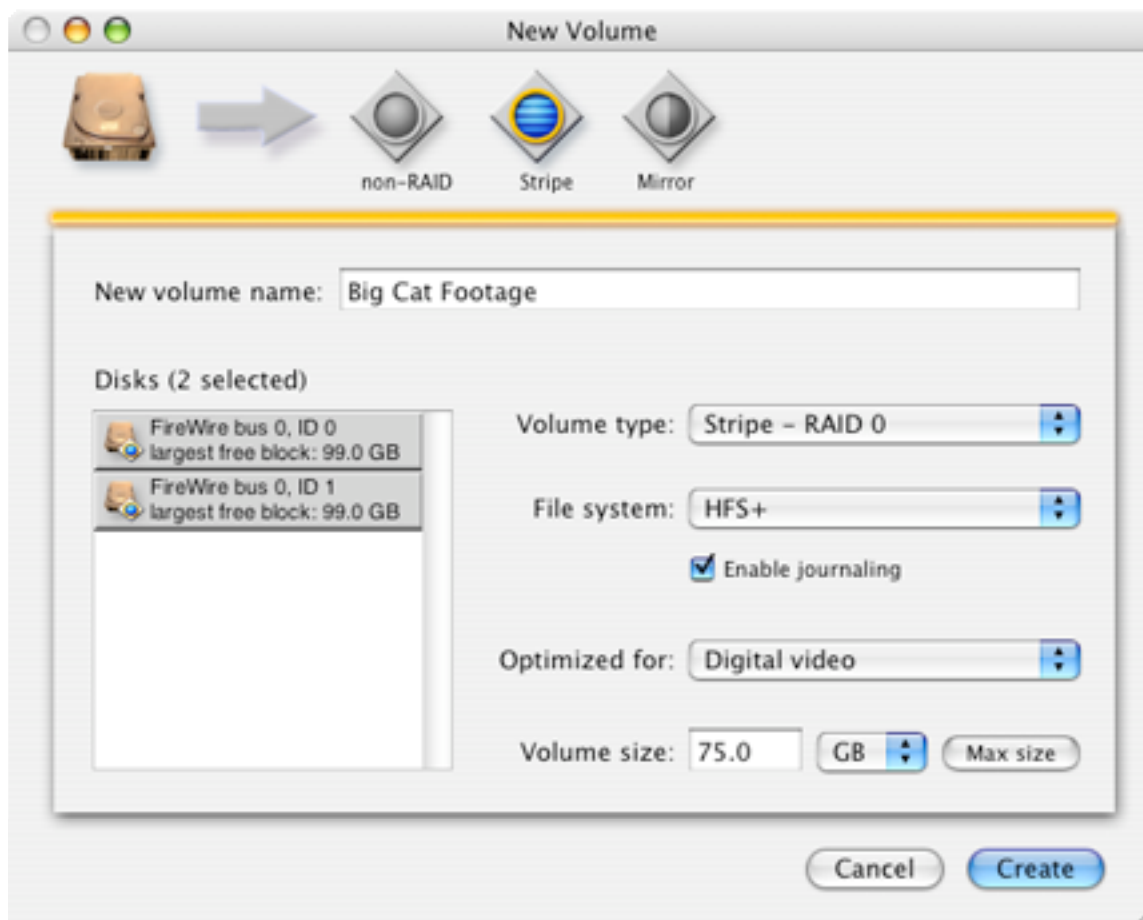

5. Create a New Volume

SoftRAID can create Mirror, Stripe or non-RAID Volumes on a variety of disks. For more information on making these selections, please consult the SoftRAID 3 Manual. If you are creating, deleting or converting volumes on the disk which contains your startup volume,

you will need to boot off of another system located on another hard disk or a **SoftRAID Startup CD-ROM or DVD.** Part 4 of this Guide contains instructions on creating this CD-ROM or DVD.

To Create a New Volume:

1. Select *New...* This command is located under the **Volume** menu. The **New Volume** window will appear:

2. Select the Disks - Disks can be chosen from the New Volume window or from within the Application window before the *New..* command is selected. If chosen from the Application window, they will appear highlighted in the New Volume window. Disks can be selected by clicking, shift-clicking, command-clicking, or dragging through the list of disks. If a disk appears in the Application window but not in the New volume window, it may have no available free space, may not be initialized with SoftRAID 3 or may be a part of a startup volume.
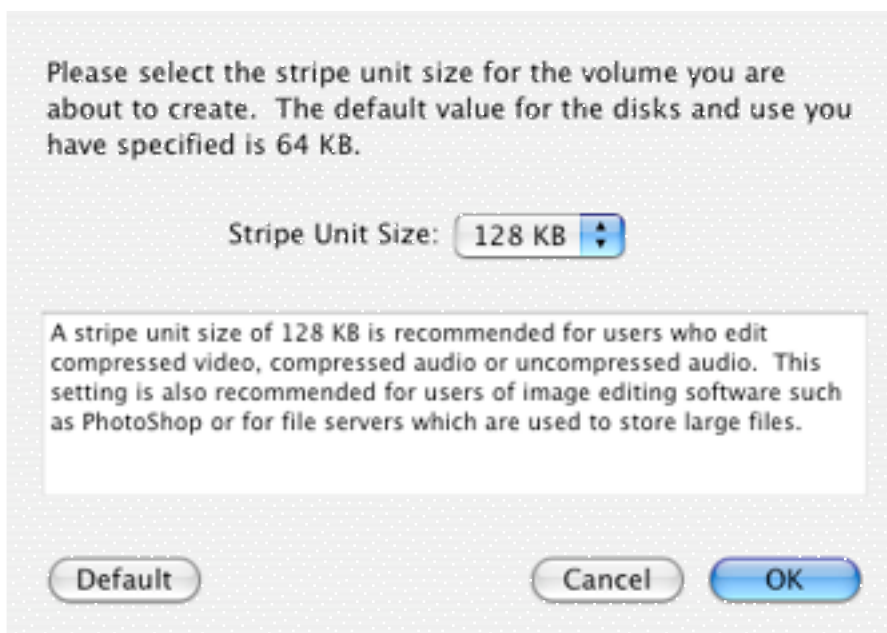
3. Select the Volume type - Volume types can be chosen from the pull-down menu or by clicking the icons at the top of the window.

4. Select the File System - Choose **HFS+** unless the application you plan to use on the volume specifies **UFS** (Unix File System) or **Case Sensitive HFS+** (in OS X v.10.3 and later) in its documentation.

5. Enable Journaling - This should remain enabled unless the application you plan to use specifies that journaling should be turned off.

6. Select the Optimization - SoftRAID 3 gives four choices for optimization: Workstation, Server, Digital Video and Digital Audio. Choose the type which best describes what the volume will be used for. This selection adjusts transfer parameters for Digital Audio, Digital Video and Workstation. If you are unsure about your use, choose Workstation.

7. Select the Volume Size - This box will, by default, display the Maximum size volume which you can create with the disks you have selected. Type in the desired volume size. If after selecting a volume size you wish to change to the Maximum size again, use the **Max size** button.

8. Type in the New volume name - This name will appear in a Volume tile in the Application window and under the Volume icon on the desktop. Volumes names should be less than 28 characters and cannot include colon (:) or forward slash (/).

9. Click the Create Button - For Stripe and Mirror volumes, one more step of customization is required:
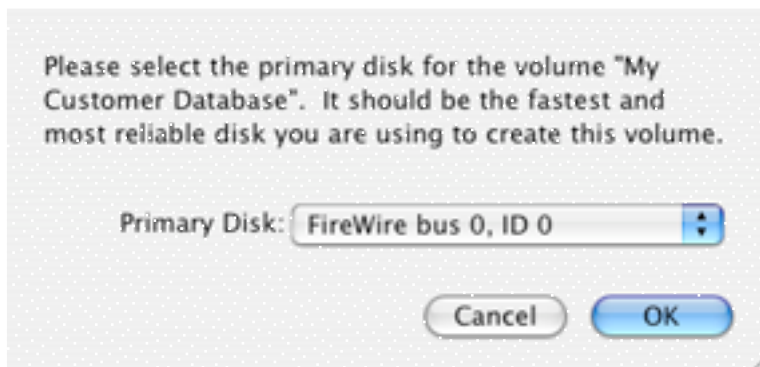
> **For Stripe volumes:**
>
> The **Stripe Unit Size** dialog box will appear. SoftRAID 3 creates a Stripe volume by segmenting data into chunks and sending them to each subsequent disk in the array. The size of the chunk is called the stripe unit size.

> **For Mirror volumes:**
>
> The **Primary Disk** dialog box will appear. When you create a new Mirror volume, SoftRAID asks which disk you prefer as your Primary disk and then

designates all others in the volume as secondary disks. The Primary disk should be the fastest and most reliable disk used to create the Mirror volume. The Primary which appears as the first selection is the one which SoftRAID suggests based on its analysis of the buses of the possible Primary disks. In creating a Mirror volume, SoftRAID makes all of the secondary disks identical to the Primary disk.

9. **Click OK on the desired customization.** SoftRAID will complete the volume creation and will display the new Volume tile in the Application Window. A new volume icon will also appear on the Desktop.

10. Quit the SoftRAID Application. The Application does not need to be running for the volumes to work. The volumes can now be used like any other volume on the desktop. If any changes occur in the state of the volumes, the SoftRAID Monitor will inform you with a dialog box. If you need to respond to a state change, launch the Application from the desktop or dialog box and you will be presented with the Application window.

6. Convert a Non-RAID Volume to a Mirror Volume

If you have a SoftRAID non-RAID volume that you want to make into a Mirror volume, you can use the SoftRAID *Convert to Mirror...* command in the **Volume** menu. If the volume is your startup volume or shares a disk with the startup volume, you will need to be started from a different startup volume such as one on a FireWire disk or a SoftRAID Startup CD.

To Convert a Non-RAID volume:

1. Highlight the volume in the Application window which you will be converting to a Mirror.

2. Select the *Convert to Mirror...* menu item in the **Volume** menu. SoftRAID will display the available disks which can be added to the volume. If a disk which you want to use does not appear, it is because it does not have enough available space, is part of another startup volume, or has not yet been initialized with the SoftRAID driver. If the disk is a converted Apple disk, it will show only 128 MB of available space, even if there is no data in the volume. **You must reinitialize this disk with SoftRAID if you want to add it to a SoftRAID volume with a capacity of more than 128 MB.**

3. Select a disk and click the **Convert** button. You will see a progress indicator appear which tracks the rebuild process.

Part 4

Making SoftRAID Startup Volumes

SoftRAID 3 allows you to create a non-RAID or Mirror volume which has Mac OS X installed on it. This volume can be used as your startup (or "boot") volume. This section tells you how to make your SoftRAID volumes bootable and what you need to do to change them.

Creating or changing Startup Volumes

When creating, converting or deleting a volume, SoftRAID needs to unmount the volume to perform its operations. A startup volume, by its very nature, cannot be unmounted. In order to perform these functions on a startup volume or on any volumes which share disks with a startup volume, you will need to startup your Mac from a different startup volume. This can be a either a **separate FireWire system disk** or can be a **SoftRAID Startup CD-ROM or DVD.**

Creating a Startup volume requires 3 steps:

1. Start up the Mac from a volume which does **not** share a disk with the intended SoftRAID volume.

2. Create a new SoftRAID volume or convert an existing Apple volume (see Part 3 of this QuickStart Guide).

3. Add a System to the volume if it is not already present.

To perform these three steps you may need to create at least one of the 2 CD-ROMs or DVDs described below. You will need to create these **before** you create the startup volume.

To Start up from a different volume
A **SoftRAID Startup CD-ROM or DVD** is required in Step 1 if you want to create a new SoftRAID startup volume on a Mac which has no other startup volumes, or if you don't have a separate FireWire disk with a Mac OS X to start up from.

To Install a non-Tiger System
A **Modified Mac OS X Install CD-ROM or DVD** is necessary in Step 3 if you want to install Mac OS X 10.3.x or earlier onto a newly created or existing SoftRAID volume. This install CD-ROM or DVD has the SoftRAID driver in the system which will be installed on your new volume. **Mac OS X 10.4 Install CDs and DVDs do not need modification.**

To create either CD (or DVD) you will need your original Mac OS X Install CDs or DVD and a blank CD-R, CD-RW, DVD-R or DVD-RW.

Creating SoftRAID CDs and DVDs

The CDs and DVDs described in this section can only be created from Mac OS X Install CDs or DVDs, version 10.3 or later, on a Mac started up from a Mac OS X system, version 10.3 or later.

If you are running an older Mac OS X system, and you want to perform operations to a startup volume, or a volume sharing disks with that volume, you will need to create your own separate startup volume on a separate disk, such as a FireWire disk. If you have a **SoftRAID Startup CD-ROM or DVD** created on a Mac running Mac OS 10.3.x, you can start up from that disk as well.

Creating a SoftRAID Startup CD-ROM or DVD:

1. Launch SoftRAID 3.

2. Select the *Create SoftRAID Startup CD-ROM or DVD* command in the **Utilities** menu. You will be directed through the process of creating and burning a new CD. You will need a blank CD-R, CD-RW, DVD-R, or DVD-RW and the Mac OS X Install CDs or DVDs, version 10.3 or later.

3. Restart your Mac with your new CD or DVD as your startup volume. To do this, you will need to hold down the "c" key as you restart your Mac. You will then be able to use SoftRAID 3 to create, delete or convert your volumes. After you have finished your changes, you can quit SoftRAID which will then restart your Mac. For more details, see pages 32 and 33 of the SoftRAID Manual.

Creating a Modified Mac OS X Install CD-ROM or DVD:

1. Launch SoftRAID 3.

2. Select the *Modify Mac OS X Install CD-ROM or DVD* command located in the **Utilities** menu. You will be directed through the process of creating and burning a new CD. You will need a blank, minimum 700 MB capacity CD-R, CD-RW, DVD-R, or DVD-RW and the Mac OS X Install CDs or DVDs (version 10.3.x).

3. Restart your Mac with your new CD or DVD while holding down the "c" key and select the volume(s) you wish to install the system on. The Mac OS X install CDs or DVDs have been modified so they now recognize SoftRAID volumes.

4. Follow all the installation instructions from the Install CDs or DVDs.

For more information, see page 34 of the SoftRAID Manual.

The creation of either of the CDs or DVDs described can take as much as 45 minutes to an hour and can be performed with the SoftRAID application running in the background.