



Update: About Apple RAID Version 1.5

About this update

This update describes new features and capabilities of Apple RAID Software version 1.5, which includes improvements that increase the performance and flexibility of Apple RAID and make it easier to use.

This update describes only the changes and new features of Apple RAID Software. If you are already familiar with earlier versions, you need to read only this update. If you are not familiar with the earlier version of Apple RAID, you should read this update and the *Apple RAID Software Administrator's Guide* to learn how to use Apple RAID.

This update contains the following sections:

- Performance enhancements
- New initialization options
- Increased capacity for volumes
- Resynchronizing mirrored volumes
- Improvements to the Apple RAID window
- Improvements to the Create New Volume dialog box
- New Disk Mode Parameters dialog box

Performance enhancements

Apple RAID version 1.5 provides one of the fastest (as measured by latency time) and most flexible native drivers for disk drives connected to Workgroup servers and Power Macintosh computers, whether the disks are used in RAID arrays or as standard Macintosh hard disks. This version introduces other improvements that increase the flexibility and usefulness of Apple RAID.

- Using Apple RAID, you can create arrays of independent disks with any combination of SCSI buses or SCSI IDs.
- You can use Apple RAID with many PCI SCSI cards and SCSI disk drives. If you're not sure whether the SCSI card or disk drive is compatible with Apple RAID, contact the manufacturer of the device.
- Apple RAID supports Fast SCSI-2, Fast & Wide SCSI-2, and Ultra Wide SCSI-3 PCI cards, and it is compatible with Serial SCSI, which allows up to 128 devices per bus.
- You can install the Apple RAID driver on an existing volume without erasing data on the disk. If the driver requires more space on the disk than the previous driver, Apple RAID attempts to reallocate space on the disk to make room for its driver.

IMPORTANT Always back up data you want to keep before you install a new driver on a disk.

- When you start a server, Apple RAID starts disks automatically that are waiting for a start command.
- You can now use Apple RAID with virtual memory turned on. (Updates information on page 4 of the *Administrator's Guide*.)

Note: Using virtual memory may affect the performance of your server and the server software may require you to turn off virtual memory. For more information about this, see the documentation that came with your server software.

New initialization options

When you initialize a disk using Apple RAID, you can now choose one of two methods:

- Quick Initialize updates the disk's driver, deletes all partitions, and erases the disk's directory.
- Full Initialize completely erases and reformats the disk, which takes more time than the Quick Initialize method.

WARNING After you initialize a disk, you cannot recover data from it. If you want to save the data, be sure to copy it before you initialize the disk.

Increased capacity for volumes

Apple RAID 1.5 allows increased capacity for mirrored and striped volumes. (Updates information on pages 6, 18, and 22 of the *Administrator's Guide*.)

- Volumes can be up to 2 terabytes (TB) in size.
- You can partition a drive into 32 volumes.
- Striped volumes can span 16 disks.
- The default stripe unit size is 128 blocks (64K), which is the optimal size.
- An Apple RAID system can exceed the previous limit of 10 volumes. The actual limit depends on the type of volumes you are creating and the version of the Mac OS you are using. If you try to create more volumes of a particular type than Apple RAID and your system can support, an alert message appears that explains this limitation.

IMPORTANT The version of the Mac OS you are using may limit the number of volumes that are mounted when you start the server. You can choose Mount from the Volume menu to mount additional volumes.

Resynchronizing mirrored volumes

You can now resynchronize a mirrored volume without rebuilding the volume, if you are sure that no data was lost. You may need to resynchronize a mirrored volume after the server has been shut down improperly, such as when a system crash, bus hang, or power failure occurs.

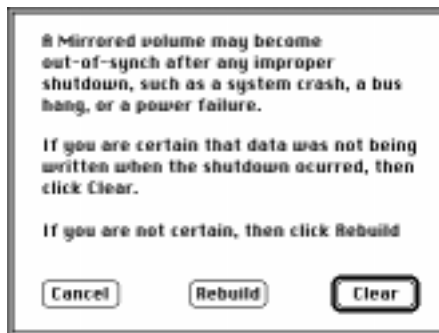
WARNING You should resynchronize a mirrored volume using the method described here only if you are sure that no data was lost. If you are not sure or you know that data was lost, choose Rebuild from the Volume menu instead.

If a mirrored volume is not synchronized properly, the volume's icon in the Apple RAID window flashes. In addition, the status message "Out-of-sync" appears with the volume's information.

To resynchronize a mirrored volume:

- 1** Select the volume in the Apple RAID window.
- 2** Choose Clear Out-of-sync from the Volume menu.

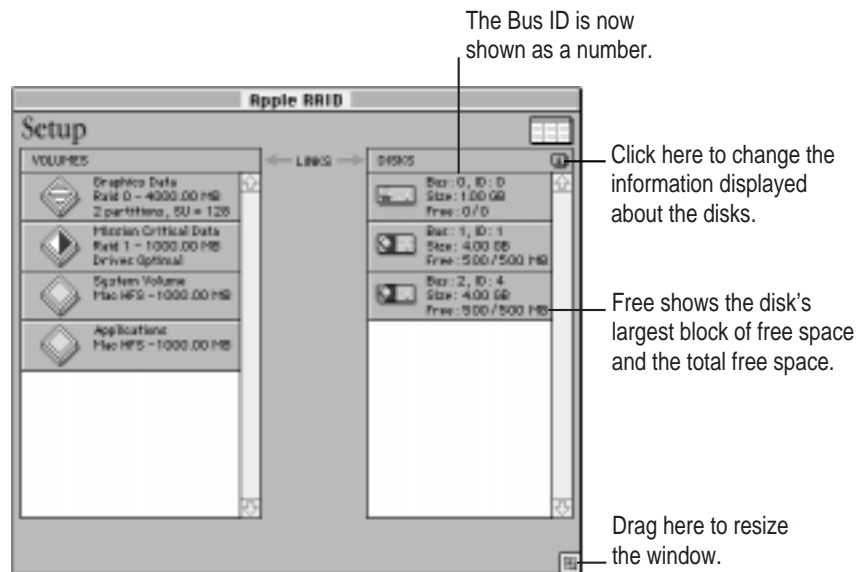
A dialog box appears for you to select how to resynchronize the volume.




- 3** Click an option:
 - Click Clear if you are certain that data was *not* being written to the mirrored volume when the shutdown occurred.
 - Click Rebuild if you are not certain.

Improvements to the Apple RAID window

The Apple RAID window displays the disk drives, volumes, and partitions you are using in your RAID array. Version 1.5 provides a number of new features that make working with the window easier. The window now looks like this:



You can now use the window as follows:

- You can resize the window using the resize box in the lower-right corner.
- Click the  button in the upper-right corner of the Disks column to display additional information about the disks. For each disk, the column shows the owner of the SCSI bus the disk is connected to, the manufacturer of the disk, and the manufacturer's number for the disk. Click the button again to see the standard information.
- SCSI buses in the Disks column are identified with numbers (0, 1, 2) rather than letters (A, B, C).

- The Free information for a disk in the Disks column shows the disk's largest contiguous block of free space and the total free space (largest/total).
- If you drag a single disk to the Volumes column to create a new volume, Standard Macintosh HFS is selected as the Volume Type for the volume in the Create New Volume dialog box. If you drag more than one disk to the Volumes column, "Striped - RAID 0" is selected as the Volume Type.

Improvements to the Create New Volume dialog box

You see the Create New Volume dialog box when you select a disk and choose New from the Volume menu, or drag a disk to the Volumes column. The dialog box now looks like this:



You can do the following with the Create New Volume dialog box:

- You can drag the Create New Volume dialog box by the title bar to move it to a different location on the screen.
- The SCSI bus for each disk is shown as a number (0, 1, 2) rather than a letter.
- The free space on the disk is shown as the largest block of free space (Largest) and the total free space (Total).
- When you click the triangle next to a disk in the dialog box, volume information includes the partition segment number of the volume. (Updates information on page 38 of the *Administrator's Guide*.)
- When you create a new striped volume, the default Stripe Unit Size is 128 blocks (64K), which is the optimal size.

New Drive Mode Parameters dialog box

Apple RAID 1.5 allows you to specify parameters that determine how the system uses the disk's *buffer*—an area of memory where the software temporarily stores data during read or write transactions. When a transaction begins, a drive “disconnects” or gives up control of the SCSI bus. It reconnects later depending on certain conditions:

- During a read, the drive reconnects to the SCSI bus when data fills the buffer to a specified percentage.
- During a write, the drive reconnects to the SCSI bus when the buffer is emptied by a specified percentage.

IMPORTANT In general, you should not change these settings. If you do need to change them, you should write down the default values first.

You change the parameters that control when the drive reconnects to the SCSI bus using the Drive Mode Parameters dialog box. You can also specify whether or not to use part of the buffer during write transactions.

To change the drive mode parameters:

1 Choose Mode Parameters from the Disk menu.

The Drive Mode Parameters dialog box appears.



2 Enter values and select the options you want to use.

- “*Buffer full ratio*”—Enter a value between 0 (the default) and 255 that represents the percentage of the buffer that must be full during a read transaction before the drive reconnects to the SCSI bus. The default (0) allows the SCSI controller to select the best ratio.
- “*Buffer empty ratio*”—Enter a value between 0 (the default) and 255 that represents the percentage of the buffer that must be empty during a write transaction before the drive reconnects to the SCSI bus. The default (0) allows the SCSI controller to select the best ratio.
- “*Write Cache Enable*”—Click to uncheck this option if you do not want to use any part of the buffer for write transactions.
- “*Number of cache segments*”—Enter the number of segments into which you want to divide the write portion of the buffer. Apple RAID selects the optimal number of segments for the disk automatically.

3 Click OK.