

## Understanding RAID Systems

By Jay Kinghorn

The combination of higher-megapixel cameras and a growing catalog of scores of digital photographs finds many photographers struggling to keep up with their storage and backup needs. One of the most effective backup solutions for small-to-medium sized photo and design studios is a desktop RAID system. Read on to learn the differences between hardware and software RAID systems to help you decide which RAID system is right for you.

### What's A RAID?

A RAID system (Redundant Array of Inexpensive Disks) is a series of separate hard drives connected to one another through a software system or hardware enclosure to appear as, and function like, a single drive on your computer. The primary advantages of using a RAID system are safer backup and increased performance. While backup is the obvious benefit of using a RAID system, the performance benefit may come as a surprise. Writing large large amounts of data across several separate hard drives, instead of one single unit, called striping, is faster than writing the same files to a single hard drive.

### Software vs. Hardware?

A RAID array can be configured using a software application, like Apple's Disk Utility, that "sees" two separate hard drives as a single unit and automatically copies files between the two drives. This can also be a hardware enclosure connecting the two drives. According to Michael Gaskins, International Sales Manager for RAID manufacturer Wiebetech, "hardware RAIDs are more reliable and recover more easily when one drive fails. Recovering from a drive failure with a software RAID often means accessing a command-line interface to retrieve the data." This means that you'll need to get a lot more intimate with your Operating System than you might like to recover from a failed drive.

Hardware RAID systems can recover from a drive failure while the drive is still actively reading or writing files. This makes hardware RAID systems easier to setup, use and maintain. The number of drives used in a hardware RAID is determined by the type of RAID system used.

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## Types of RAID Systems

The type of RAID system you choose will be dependent upon three factors:

- 1) The amount of storage space needed.
- 2) The level of security needed to protect your files.
- 3) Your performance needs for saving and accessing large files.

**RAID 0 (Striping):** A RAID 0 system spans storage across two separate drives. This system does not provide any backup protection, but is an excellent short-term storage option as it takes advantage of the performance benefits associated with striping.

**RAID 1 (Mirroring):** A RAID 1, or mirrored drive, uses two drives of identical size that appear as one drive in your operating system. The contents of both drives are updated continuously. In the event a single drive fails, a new drive can be inserted and the contents copied from the remaining good drive to the new drive.

RAID 1 is an excellent choice for photographers and design studios as it is simple to set up and relatively inexpensive. The disadvantage is your storage space is limited by the capacity of a single drive, 1TB at the time of writing this article.

**RAID 5:** A RAID 5 system requires at least three drives, although four-drive RAID 5 systems are most common. A RAID 5 configuration provides a secure backup against any single drive failure, provides the benefit of striping data across drives and increases the storage capacity.

A RAID 5 system works by storing a percentage of the drive's data on each drive in the system. At any one time, any three drives, (in a four-drive system) will contain all of the information stored on the system. So if one drive fails, all of the files on the system can be recreated with the remaining three drives.

A RAID 5 system is great for studios needing larger storage capacity. At the time of writing, a RAID 5 system using four, 1TB drives will create 3TB of storage.

**RAID 6:** A RAID 6 is similar to a RAID 5 system but has an extra level of protection in case two drives fail. This additional level of protection is advantageous for critical information, but is often excessive for photography and design studios.

Adding a RAID system to your studio can simplify the tangle of external hard drives frequently used for storage and provide a higher degree of security for your valuable files and photos. Additional information on RAID storage and a list of vendors is included on the next page.



Photo Courtesy of Ubbeltech

**RAID 0:** Data is split between multiple drives. Failure of one drive results in a loss of all data.



Photo Courtesy of Ubbeltech

**RAID 1:** Data is copied between multiple drives. Failure of one drive does not result in loss of data.



Photo Courtesy of Ubbeltech

**RAID 5:** Data is split and copied between multiple drives. Similar to RAID 1, but with an increase in performance.

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G-Technology

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Wiebetech

[www.wiebetech.com](http://www.wiebetech.com)

RAID FAQ from Weiebetech

[www.wiebetech.com/products/silversata.php](http://www.wiebetech.com/products/silversata.php)

Wikipedia Entry on RAID Arrays

<http://en.wikipedia.org/wiki/RAID>.

Drive Comparison Testing and Performance Benchmarks

[www.barefeats.com](http://www.barefeats.com)

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