

It can be confusing and complex, but preserving your digital images is vital to your livelihood.

BY BRYAN LINDEN

Safe storage

MINIMIZE RISK OF DISASTROUS HARD DRIVE FAILURE

There are several things to consider in implementing a storage system, beginning with the needs of your particular studio. For this article, I'll focus on hard drive-based storage over a redundant array of independent disks—RAID—and the related components in the system for a small to medium-size studio. I'll assume you've been making regular backups of your images on high-quality DVDs/CDs for permanent archiving.

Based on interviews with manufacturers, retailers, and photographers who've learned the hard way, we've put together information about how you can prevent or minimize hard drive failure.

ENSURE CONSISTENT POWER

SUPPLY. Energy spikes can cause hard drive failure. Most surge protectors do nothing to help with inconsistent power, brown outs or power failure. I've had drives die this way, and so has Shannon Turner, CPP, of Spectrum

Photography in Clarksville, Va. He was using a mirrored RAID system with battery backup that did not provide protection from power dips, which over time weakened the drives and resulted in data loss. He commented, "I'm going farther than most with protecting my data in using RAID. If problems can happen in a well protected system like mine, then it can most certainly happen to those who don't protect their data."

Don't depend on the newness of your building to protect you from inconsistent power. If your lights dim on occasion, it's a sure sign of a power dip. All photographers who use computers should protect their hard drives, displays and anything you need to plug in to see your images by using an uninterruptible power supply (UPS) and line conditioners. For devices such as printers, graphics tablets and scanners, UPS is not critical, but they should be protected from power surges. Remember that the more



APC Back-UPS RS 1500VA

items plugged into a UPS, the shorter the battery life during an outage.

A UPS provides power for a limited time after a power failure, giving you a chance to properly shut down your computer without a harsh power interruption. Surge protection is generally built into UPS, and many offer software that can shut down your system safely and automatically, 24/7. Make sure the UPS you choose protects against power dips, provides power conditioning, and supplies enough power for the devices plugged into it. I use the Back-UPS RS 1500VA from APC (\$249). Each unit provides six outlets of surge/battery back-up protection and two outlets of surge-only protection (www.apc.com).

SOFTWARE OR HARDWARE RAID

MANAGEMENT? Macintosh OSX and current Windows operating systems come with software to set up and maintain simple RAIDs. Don't use it. The built-in utilities

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don't do a good job on either platform. Users have faced loss due to the program's inability to reliably rebuild broken RAID sets. PPA member Gerard Tomko, M.Photos.Cr., (www.gerardtomkophotography.com) of Hatbora, Pa., recently ponied up \$7,000 to a data recovery service after the failure of the built-in RAID on his OSX. With digital photography replacing film, "It's a whole new ballgame now," says Tomko.

Not one manufacturer or supplier I talked to could recommend a Windows-based software RAID, so if Windows is your platform, you need a hardware-based RAID. For Mac users, SoftRAID 3.5 (\$129), a product I use, is reliable and easy to administer for all Macs, including Intel Macs. In my experience, it reliably rebuilds out-of-sync RAID and easily can split RAID sets at any time. The makers provide excellent support, and will

even recover data lost with other products or without RAID protection for free in most cases, if you're willing to purchase the software.

Drives formatted with SoftRAID can be used on other computers with the SoftRAID driver installed; the driver is loaded by default on any Mac OSX v10.4 and later. Often, hardware RAID's can be connected only to systems with dedicated hardware RAID controllers, and there's a chance of losing a controller if it's proprietary to a company that no longer makes it, leaving the stored data unreadable. Always go with a major brand if possible (www.softraid.com).

RAID ENCLOSURE AND DRIVES.

I prefer RAID enclosures that allow user drive replacement via drive trays to off-the-shelf, completely enclosed units with unserviceable drives. Some makers sell inexpensive pre-

setup mirrored RAID systems in enclosures that prevent the user from replacing a damaged drive. Plug-and-play, all-in-one enclosed RAID's have internal bridge boards to connect drives, and if the bridge goes, it's likely you'll lose access to both drives, leaving data unreadable.

One truth about hard drives: At some point, they will fail. That's precisely why drive makers rate their products by MTBF (mean time between failures). With a ready-built enclosed product, you usually don't know what company made the hard drive inside. A tray-based system gives you control over the components going into your RAID, and the flexibility to add components as your needs grow.

Many people I know have had rotten luck with particular manufacturers. My problems with Maxtor drives led me to seek recommendations from contact enclosure makers, drive

THE GOODS: STORAGE



FirmTek SeriTek/2eEn4 Four-Bay Hot-Swap SATA Enclosure

resellers, disk utility makers and others. Seagate Serial ATA (SATA) drives were the most highly recommended, having cooler running temperatures, a five-year warranty, and fewer support and return calls. Since switching to Seagate about a year ago, I've had no problems.

I use and recommend the FirmTek SeriTek/2EN2 Dual-Bay Hot-Swap SATA Enclosures and the FirmTek SeriTek/2eEN4 Four-Bay Hot-Swap SATA Enclosures. I prefer SATA to FireWire and USB because of the ultra-fast SATA bus. FireWire units carry power through the FireWire cabling, and I've heard of drives frying due to having other peripherals on the FireWire bus. I have no problem with using external FireWire drives on a system, but I won't use them for my main data.

FirmTek products use backplane design, which means there are no internal cables connecting the drive to the back of the case. The connector at the back of these units is the actual drive connection, so you get a one-to-one connection between the drive and the computer, all but eliminating connection problems. They run almost silently and remain cool to the touch, even though my system runs constantly. Excess

heat is a huge contributor to drive failure.

The two-bay FirmTek enclosures are \$169; four-bay enclosures \$499. You'll need a SATA card, and I recommend FirmTek's card for Mac users with SoftRAID, and a HighPoint RocketRAID 2224 (\$295) for PC or Mac users with hardware RAID. All of these solutions are available from Other World Computing, which can also help you put together larger rack mount RAID systems for a Mac or PC. (www.macsales.com).

SETTING UP A RAID ARRAY. For image storage, I recommend a simple mirrored RAID with an extra FireWire or USB drive that's regularly synced with the mirrored RAID. Any data written to one drive in a mirror is simultaneously written to the other, so if you introduce data corruption to one drive, you corrupt both. But if you're using your RAID with applications or as your operating system, having a synced drive can give you a nice safety net when it comes to application and OS upgrades.

Just set up a mirrored RAID and configure a sync utility to perform bi-directional syncing every week or two, and manually sync if you've used the drive on any other system. The added sync drive gives your RAID protection similar to a parity drive, and also serves as a useful part of your workflow. My setup comprises two FirmTek two-bay enclosures; four 400GB Seagate SATA drives; one four-port FirmTek PCI SATA card; and two 400GB NewerTech MiniStack Hard Drives, all from Other World Computing. It provides a 400GB Mirrored RAID for my working images with a transportable, regularly synced backup when I'm on the road. I use one enclosure for a single striped 800GB drive configured for speed to use with video and temporary storage. The remaining MiniStack synchronizes with my main internal hard drive, which contains my

OS and applications. Since it's synced only when necessary, I always have a working backup of my operating system and applications ready at any time. The MiniStack (FireWire or USB) is a great external drive, with a built-in three-port USB 2.0 hub and two-port FireWire hub that comes in handy on the road.

It might sound like overkill to use three drives to back up the data of one drive, but just one crucial drive failure will make you see the light, and drive prices are dropping all the time.

Check out ChronoSync (Macintosh), \$30, <http://www.econtechologies.com> and Vice Versa Pro (Windows), \$60, www.tgrmn.com, for your synchronization/backup utility needs. There are many other options for both platforms. ChronoSync works great for me, and Vice Versa is highly recommended by Windows users. As with any purchase of this kind, you should evaluate your needs and research your options. It's time to accept that safe storage and backup are a critical part of your business. ■

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