STORAGE ARRAY

G-Technology G-RAID2

by Geoff Poister

G-Technology was a pioneer in the development of FireWire-based RAID systems that challenged the performance and price of existing systems. Today, the company makes a wide range of disk storage systems, from simple but efficient low-cost units, to sophisticated Fibre Channel RAID systems offering maximum protection against data loss.

They are still pushing the market toward more affordable storage and have captured the eye of video producers looking for ways to manage HD production without taking out a second mortgage.

This review examines the more affordable end of their product line, the G-RAID2 series. These are RAID 0 systems that do not offer redundant drives and failsafe back-up, but do offer reliable, high-speed performance capable of handling compressed forms of HD post-production content. And they are backed by a two-year warranty that offers some peace of mind.

FEATURES

The G-RAID2 comes in four sizes: 500 GB, 640 GB, 1,000 GB and 1,500 GB. The arrays incorporate two 7,200 rpm SATA II hard drives, each with up to 16 MB of cache and the new Oxford 924 bridge chipset.

The term RAID stands for "redundant array of independent disks." RAIDs are primarily designed to offer greater speed and/or safety than a single drive. But not all RAIDs are created equal. For starters, they can be designed to provide varying levels of safety for data recovery in the event of a drive failure. The higher RAID levels protect data by employing technologies that can withstand one or more disk drive failures and still keep your data intact and online.

RAID 0 is a level that provides very high speed, but does not offer any backup in case a drive should fail. The computer sees the array as one large drive. But if a single drive in the array fails, you lose everything, just as if it were a single drive. RAID systems configured at higher RAID levels use various technologies, such as duplicating data, to ensure recovery if one or more drives should fail.

The G-RAID2 is a level 0 RAID, which means that you do not get the fail-safe protection of higher levels. So why choose it? As with most such decisions, it comes down to a cost and performance balance. In general, RAID 0 drives are faster and less expensive. So, if you are willing to take on some risk, or do your own data backup, you can work with a RAID 0 system, which costs significantly less than a fail-safe system. That, of course, does not mean that RAID 0 drives are not safe. They are designed to last, and G-Technology's two-year warranty indicates the company's confidence in their longevity.

The G-Technology G-RAID2 storage system

The G-RAID2 is designed for speed and versatility. It features a number of connections to match your system's needs.

The back panel has two FireWire 800 ports, one FireWire 400 port and one USB 2.0 port. To take advantage of the maximum speed, though, FireWire 800 is the hands-down choice, as it can reach a theoretical maximum data rate of 800 Mbps (100 MBps). A FireWire 800 cable is included with the RAID.

The FireWire 400 port is a viable alternative if you don't have an 800 port. At 400 Mbps (equal to 50 MBps) you are still within range of DVCPRO HD performance, but below the maximum speed of the RAID. USB 2.0 is the slowest and is better suited for backing up files than achieving real-time video editing performance.

When editing video, especially HD, speed is of paramount importance, and this is something that the G-RAID2 delivers. It will support three real-time streams of DVCPRO HD, four real-time streams of HDV, and seven real-time stream of DV25 when connected through the FireWire 800 port.

The G-RAID2 is housed in a rugged aluminum case with a cooling fan that fends off the heat buildup that can cause damage to hard drives. It is only about 9-by-5-by-3 inches and weighs just 3.85 pounds. It comes preformatted for Mac OS X, but can be quickly reformatted to any other system. If working on both Windows and Mac, there are formats, such as FAT 32, that work on either platform.

IN USE

I connected a G-RAID2 500 MB array via the FireWire 800 port to a Mac Pro with two 2.66 GHz dual-core Intel processors and 3 GB of memory. No driver or software installation was necessary. The G-RAID2 appeared on the desktop as a single drive, ready for use.

I have a number of various FireWire and USB drives that I have accumulated over the last couple of years and I was interested in comparing speed. In particular, I wanted to compare the G-RAID2 performance to another low-cost RAID system that I have.

I don't have any drive testing software for Mac, so to test the drive speeds, I switched to Windows XP using Apple's Boot Camp software that allows Windows to run on Mac. Using a disk drive speed utility I ran tests on all of my drives, including the G-RAID2, and the test was quite illuminating.

First, as a point of reference, it is interesting to note the transfer speed of some standard FireWire drives.

We tend to think of FireWire drives as "fast," but in actuality, the FireWire 400 drives are comparatively slow. They are very good for DV25 level video, and suitable for HDV, but clearly inadequate for the higher data rate demands of HD.

Two of my older FireWire drives showed a sequential read rate of about 6.6 MBps, sequential write of about 5.5 MBps, and random seek + RW of 2.3 MBps. Just looking at the sequential read rate, we can make some basic inferences about the video playback capability.

Standard DV25 needs a data rate of 3.6 MBps. So, a FireWire drive with a 6.6 MBps read rate can easily handle this. In practice, my basic FireWire drives can read and write multiple streams of DV25 with no problem. But if I try DVCPRO HD, it struggles to keep up, stopping and starting like a car running out of gas. (My older FireWire drives are more than half full. Bear in mind when testing drives that they become slower as they fill up. True cross comparisons should be made with empty drives.)

Next, I tested a new "Brand X" 1,000 GB RAID unit containing four drives. The numbers were decidedly better than the FireWire drives—sequential read: 38.5 MBps; sequential write: 13.8 MBps, and random seek + RW: 2.6. This drive is capable of handling DVCPRO HD as long as I don't tax it too heavily with real-time streams.

Now the G-RAID2. Its test results were—sequential read: 68 MBps; sequential write: 42.6 MBps; and random seek + RW: 3.5 MBps. These results show that the G-RAID2 is significantly faster than the Brand X RAID—68 MBps read as opposed to 38.5 MBps for the Brand X. It also shows that not all RAIDs are created equal. The G-RAID is engineered for speed and it achieves it in practice.

To test it further, I loaded some clips recorded on a Panasonic AG-HVX200 P2 camera in the MXF file format. I created two projects in Final Cut Pro, one in 720 24p and one in 1080 60i.

FAST FACTS

Application
Low cost RAID storage

Key Features
High capacity and speed data storage, multiple ports

Price
$399 (500 GB model); $699 (1,000 GB model)

Contact
G-Technology
310-449-4599
www.g-technology.com

The G-RAID2 handled the media effortlessly. I pushed the limits with three layers of video and some effects and found that the drive achieved its claim of handling up to three layers of real-time DVCPRO HD streams. And finally, I did a simple data transfer test for a final comparison between the G-RAID2 and my Brand X RAID. The G-RAID2 transferred a 670 MB file from my C drive in 27 seconds. The same file took 50 seconds to transfer on my Brand X RAID—almost twice as long.

SUMMARY

My test of the G-RAID2 showed that this system is very fast and well suited for the demands of DVCPRO HD editing. It is an outstanding value for the price. I am not aware of another RAID system on the market that offers this kind of speed for a price as low as $699 for a terabyte of storage.

The G-RAID2 is built for speed, and is as reliable as any drive on the market. However, if one is concerned about safety and the ability to recover from a drive failure, it is worth looking at other products in the company's lineup. Several of their products offer RAID 1 through 6 protection. But if one is diligent about backing up critical data, the G-RAID2 can offer the speed to handle HD at a fraction of the cost of fail-safe systems.

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