

The science of sharing

Which storage solution is right for you?

Acronyms. Our industry is filled with them, and the digital storage arena seems to have more than its fair share.

Whether you need a shared storage solution or digital storage for specific operations, it's important to understand your options.

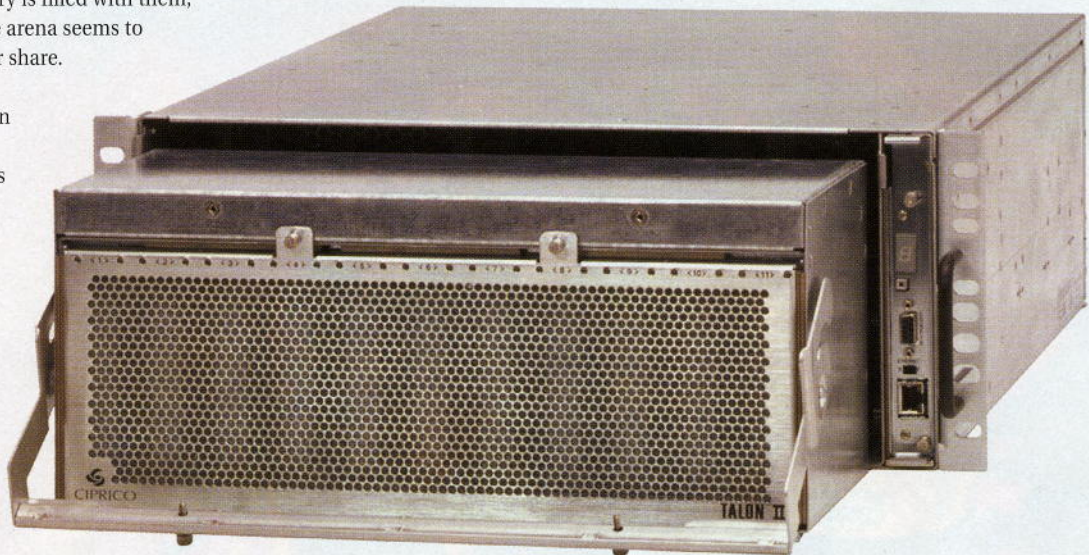
Everyone who's been in the industry for any length of time is familiar with the burdensome process of moving video images around a facility. It not only meant connecting VTRs through some type of routing switcher, but also buying larger hard drives for storage purposes and graphics. When the idea of creating one set of storage that would contain the same media and allow different people to have access at the same time came into play, it was incredibly appealing.

This is where SAN and NAS enter the picture. SAN, or storage area network, is essentially a way to connect storage in such a way that it is networked to multiple systems *without* the use of a server. A person operating in a SAN environment can access storage via direct connection to a computer. This information is delivered over fiber via a networking protocol specifically designed to facilitate storage.

On the flip side, NAS, or network attached storage, requires the use of a server to serve out storage over TCP/IP. In most cases, servers plug into a standard Ethernet LAN (local area network) and then provide files as needed.

Choosing Sides

Just which one of these two storage options is better depends on who you talk to, though most of experts favor either a SAN environment or a combination of SAN and NAS. According to Archion's CTO, Jim Tucci,



SAN is the way to go. "The great thing about SAN is that it *is* the network," he explained. "If you throw a file onto your desktop, it's immediately accessible on another person's computer who is in the same network."

In other words, SAN technology enables different individuals to perform their specific tasks — from cutting a piece of footage, adding titles, or incorporating graphic elements — all on different workstations and all simultaneously. That's just one of the reasons that Martin Bock, president and CEO of Medea, is a SAN proponent as well. "We have found SAN environments to be more applicable because, in most cases, they are much more efficient than NAS," he explained.

Whereas the use of SAN is advised in storage of secured media, NAS is recommended if the intended use is strictly streaming out to the Web, creating content, distance learning scenarios, or other situations in which full resolution is not a tremendously important issue. NAS is criticized, however, for being server-driven and being generally too slow to accommodate simple graphic or audio file storage.

"If you've ever watched video over the Internet, you know it's unreliable, so just imagine trying to edit a video this way," said

The Ciprico Talon 2211, for high bandwidth applications, is being used for aircraft surveillance conducted by the U.S. military.

Tucci. "That's what NAS requires."

SAN, so say its proponents, is extremely efficient because it's in the fiber channel realm and there is no server involved. What this means, in digital storage terminology, is that there is a quality of service: The network talks directly to the storage without interference.

While NAS certainly has its pitfalls, a newer solution provides the benefit of a single point of storage management. Notwithstanding, even critics of the more familiar NAS products admit that the option can be an effective tool when used in conjunction with SAN.

The Avid Unity, for example, doesn't fit into either the SAN or NAS category nicely, according to senior product marketing manager Lesley Glorioso. "While our media network is fiber-based and is like a SAN," she offered, "we do have a NAS element called Port Server Pro, which is essentially a NAS head that attaches to the network for expansion purposes. We offer a series of workgroup service tools that help to connect multiple media networks with a transfer manager, enabling customers to move

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files from one Unity to another.”

The LAN-based Unity system manages storage through GUI-based tools and provides on-the-fly flexibility to users. In addition, an administrator can change the amount of storage allocated to one person in a nondestructive, transparent manner. The Pentagon Channel, a 24/7 broadcast outlet provided by AFRTS to disseminate military news worldwide, uses this setup for its broadcast operations.

Globix' solutions also support both SAN and NAS environments. "For individual customers that have a need for shared storage, we have standard NAS and SAN solutions that can be customized based on specific needs," said Globix spokesperson Kellee Kaplan.

Bridges between the SAN and NAS worlds are quite common, in fact. "Let's say that the editorial section on a project needs SAN, but the graphics department doesn't," explained Tucci. "The server can connect to SAN while serving storage as a NAS. This scenario happens quite often."

According to Glorioso, companies should opt for making the switch to some type of shared storage any time there is more than one editor working on a given project, since the lightning-fast turnaround requirements in today's industry don't allow the luxury of working consecutively.

The RAID Debate

Another debate in the world of digital storage is the concept of RAID, which stands for redundant array of inexpensive drives (formerly known as redundant array of *independent* drives). Beyond merely taking a certain amount of storage and aggregating it, each individual drive in a RAID storage solution environment has a set speed up to which capacity it can work. While it is now topping out at a 500 GB drive, it will soon move into to terabytes.

Currently, there are five acknowledged RAID levels, with more on the horizon. Once again, those offering digital storage solutions have their own opinions on which is most efficient.

Both Bock and Tucci agree that RAID 0, which Bock refers to as "RAID-not," should not even be considered RAID since it is merely a set of disks striped together. Also not a favorite of either is RAID 1, which relies on mirroring (or striping information together and mirroring the drive).

"The main problem with this level is that it's not in the least bit efficient because whatever information is written to one drive is also written to another, which is extremely inefficient," explained Tucci whose company

sells only RAID products. However, Avid has incorporated mirroring into the Avid Unity.

Medea's government clients, many of whom require ruggedized equipment that is used on military ships or aircraft, are provided with Proprietary RAID 3.4. "Many people are familiar with the real-time performance guarantee of RAID 3," said Bock. "We have incorporated the 4 because it enables us to use different blocks of data size, which essentially provides the flexibility of RAID 5 in addition to the real-time capabilities of RAID 3."

Special Considerations

Of course, not all digital storage is used for sharing assets between NLE suites.

The Ciprico Talon 2211, for example, is being used for aircraft data acquisition in surveillance missions conducted by the U.S. military. The system is designed for high bandwidth storage applications that can benefit from quick removal, transport, and installation of over 1 TB of data.

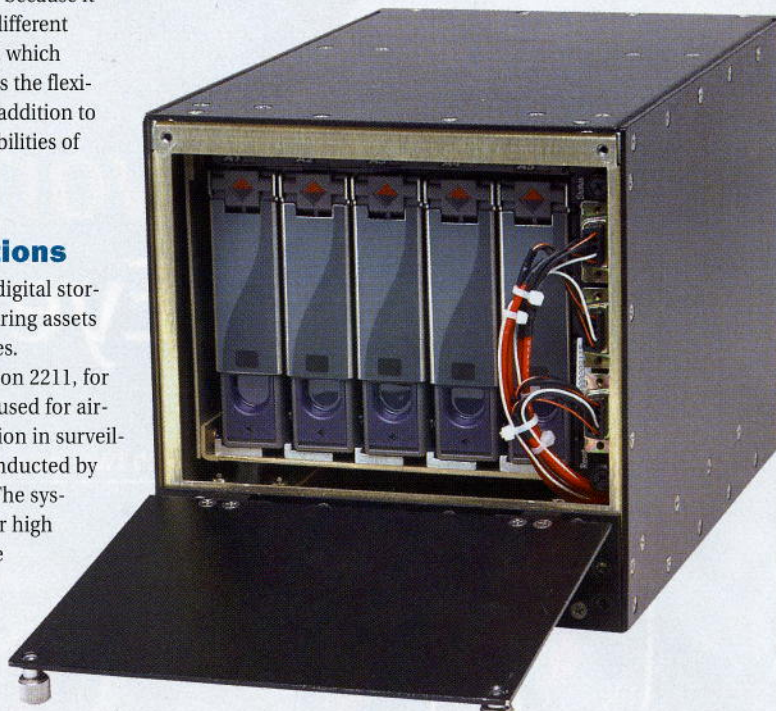
"Our clients are looking for rugged qualities and convenience, such as our removable drive pack, which allows them the ability to transfer data to a ground stations," explained Mike Ascher, Ciprico's vice president of engineering. "Workstations that have disks are set up on aircraft. The data that's collected is stored into one consolidated piece while sensor data is streamed."

Using Ciprico's FibreSTORE 2210 RAID technology, Talon provides a high level of reliability and performance, and is ideal for data-intensive C4ISR (Command, Control, Computers, Communication, Intelligence, Surveillance, and Reconnaissance) applications, such as mission-planning, intelligence-gathering, image processing, and archiving.

Medea's RAID Shuttle is being used in similar missions. "The Shuttle was designed to serve as a rugged, optimized storage array for reconnaissance missions by the U.S. military that provides geospatial imaging applications for land, sea, and air," said Bock. The technology utilizes an ATA drive, which boasts some very attractive features. "The ATA drive requires less power, handles shock and vibration well, has a higher capacity per disk

platform than some of the more expensive drives, consumes less power, and generates lower heat."

The technology has not reached its peak by a long shot. Because of the effects of altitude on disk packs, Ciprico, for example, is building on the Talon to create hermetically-sealed disk packs that would



Medea's RAID Shuttle uses an ATA drive, which generates less heat and uses less power.

protect data that is collected in the event of depressurization on an aircraft.

Medea is also working to bring more value to its storage solutions. "If you look at a SAN environment, you'll see a lot of infrastructure with the storage, connectivity, and the switches," explained Bock. "We are looking at incorporating a number of those layers into storage so that it is even more cost effective."

Eventually, a Serial Port ATA drive will eventually be able to store up to 1 TB of data. "In the video and data acquisition environments, this is extremely important," said Bock. "Just think, if a government agency goes to the effort and trouble of going up in the air to acquire data, it certainly wants to make sure it gets it right the first time around."

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