



Uncovering the Full Potential of Avid Unity MediaNetworks™

***REALIZING GREATER REWARDS
WITHOUT THE TRADITIONAL RISKS***

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Overview

Over the past decade, we have seen Storage Area Network (SAN) solutions change the way post production and content creation organizations collaborate. The requirements involved more than copying and retrieving files among multiple systems. Rather, the needs were to support a productive and creative work environment. Today, there is little doubt that film and video workflows demand a real time system of shared storage that is dynamic, keeps track of media, and protects the assets.

There are several SAN and NAS solutions in the market and they are not all created equal when it comes to video and audio editing. One such SAN is Avid Technology's Unity™. There are very good reasons for the popularity with Unity™. It is a very flexible SAN and utilizes the best networking protocol for media workflows – Fibre Channel. However, in order to protect your media without the high cost of mirroring, the combination of hardware RAID and the proven Vdisk™ engine must be a part of the solution.

An Inside Look at Avid Unity™

To address the collaboration of editors, Avid introduced Avid Unity™. Unity™ was one of the first SAN systems designed expressly for the production of media and is still used by thousands of facilities worldwide. It is unique in that it was designed to support Avid Non-Linear Editing (NLE) systems directly. Unity™ is tightly integrated with the Avid NLE systems so as to allow not only tracking of media but tracking of projects and users. This enables multiple editors to edit the same project.

Flexible storage was the key goal for Unity™ and the software achieved it. They virtualized the file system allowing not only the number of drives to

scale, but also allowing the “workspace” size to change as needed without the formatting or the copying of media. To do this they created a data set of all the drives on the Unity™ system (in other words, a “big stripe”). This data set can be as small as 8 drives and as large as 128 drives. All storage to be used for media must be in this “Big Stripe” including spare drives. The data set is then further organized into allocation groups that isolate groups of drives for specific tasks. Allocation groups work exactly as a stripe set.

It is in the allocation group that we finally create a volume or “workspace” that can be mounted on the desktop of an editing system. These workspaces are “virtual” and can be created, expanded, or destroyed without restarting the Unity™ system or the clients. Simply add 200GB to a workspace in the management tool and immediately it is 200GB bigger on all the machines that are mounting it.

Media Protection at What Cost?

Avid Unity™ is a very flexible system for the post production environment. However, protection from media loss was not available on the first releases of Unity™. The data set was, and still is (as will be discussed), completely vulnerable to immediate media loss if only one drive set failed. Avid realized that this complete lack of data protection was not acceptable and they introduced a software solution, “UnityRAID™”, to protect the media. This is a partial mirroring protection method.

RAID stands for Redundant Array of Independent Disks and has great significance for anyone storing valuable data. It is available in several levels that deliver various forms of protection in an effort to prevent data loss in the case of a system failure. If you have the UnityRAID™ protection option on, you can enable mirroring on an individual workspace level. This will cause the media on that workspace to be copied to another drive. In the

event that a drive fails only **those** mirrored workspaces will be protected from media loss.

When it comes to Avid Unity™, protecting your media and avoiding the hassle and wasted time of redigitizing media requires you to buy twice the amount of storage you need for your project. Of course this may seem like a wise investment if you have no other protection option. But clearly, no business owner wants to double their expense unless there is no other option. Additionally, in today's HD file based editing workflows, editor's need all the storage they can get and are hard pressed to give up 50 percent of their storage for any reason.

The everyday reality for editors is that the need for storage capacity is so great they end up running Unity™ without mirroring their media, putting these valuable assets at risk. While they may miss the performance benefit associated with mirroring, the advantage is not significant enough for the editors to feel the need to be concerned with it. The lack of media protection is the real concern.

Evaluating the Risk of Media Loss

We just described a widely recognized weak link with Avid Unity's™ network. The brilliance of the software virtualization, of the file system, which allows for flexible storage capability, unfortunately, does not allow for a parity RAID protection scheme for the data. Again, the UnityRAID™ only protects and decreases latency on those workspaces for which you activate it. Therefore, if you don't use Unity RAID™ to protect the media, how do you properly evaluate your media loss?

One clear way to evaluate this risk of media loss is to consider the probability of a drive failing. Reliability experts use what is known as MTBF (Mean Time Between Failure) to predict the reliability of hard drives. It is measured by the

number of hours before a device fails. Since it only takes one drive to cause data loss we can easily calculate MTTDL (Mean Time To Data Loss) of the data set.

Each of the Unity™ drives is rated at an MTBF of 1,200,000 hours per drive. At first glance, this does not appear too bad. However, this MTBF is for each individual drive. In order to evaluate the true risk, we need to calculate the MTBF for the entire data set. Using a 32 drive (two chassis) scenario, the formula is as follows: $MTTDL = MTBF / \# \text{ of hard drives}$, or in our case, $MTTDL = 1,200,000 / 32$ or $MTTDL = 37,500$ hrs. One can therefore expect a drive failure at some time within every 37,500 hours of use. That sounds pretty good, doesn't it? Well if you consider that there are about 8,765 hours in one year, that would mean that every year you would have a 24% chance of a drive failing. That is pretty high odds and it only gets worse as you scale up the system.

By the time you reach Unity™ systems maximum number of drives (128 TB for Unity™ 5.1.3) the odds of a drive failure in a year are drastically higher. This is significant considering there's 128 TB of data that could be lost. Even more, with the current research on the use of MTBF of hard drives for predicting drive failure, this is an optimistic calculation. Real world data shows that drive failure is significantly worse than MTBF predicts.

Beyond the Acceptance of Data Loss

We have established that drives are going to fail in Avid Unity™ and that without mirroring, the risk is high. But it's not just the non mirrored drives that need to be evaluated. What happens when a drive fails in Unity™?

The drive failure scenario on Unity™ depends on the version of Unity™ software or hardware. If the version is 3.5 – 4.2.6, and you had a spare

drive in the system and turned auto rebuild on, the system could kick all the clients off the SAN and start the rebuild. During this time no one could log into Unity™ until the rebuild is complete. Of course any workspaces that do not have mirroring turned on may or may not have lost everything. The way Unity™ lays down the blocks it is hard to tell what is going to go missing. If you have no spares everyone is kicked off until you rebuild the system.

If you have the latest hardware and software (Unity™ 5.1.3), the drive will automatically rebuild and none of the clients will get kicked off. However, it is important to note that, if you are not logged on, you cannot log on till the drive rebuild is done, plus, you have lost data on workspaces that are not mirrored. If you have no spares, everyone needs to log off to start the rebuild. Either way you have downtime and loss of media.

Hardware Parity RAID and its Global Acceptance

RAID protection is not the complete duplication of media as in the UnityRAID™, but rather, parity RAID protection. Parity RAID is a form of protection that uses the data being written to create a code that can be used to recreate the data on a missing or failed disk.

This code is much smaller than mirroring of the media. Typical code will only use up 10-20% of the storage space to protect all of the data. For example, an 8TB RAID 5 protected storage system will end up with about 7TB of usable storage and all of that storage will be available and usable even if a drive fails.

The manner in which the code is written to the RAID set defines what is known as the RAID level.

Common parity RAID levels are RAID 3, RAID 5, and RAID 6. In RAID 3, the parity code is written to a dedicated drive. In RAID 5 the parity code is in a section across all the drives and RAID 6 is just like 5, but, two sets of parity are written.

Today, parity RAID, especially RAID 5, is prominent in just about every industry. Virtually all new storage manufacturers deliver parity RAID and it is delivered in two ways, software or hardware. We bring this up because doing the RAID in software is typically way too slow for real time storage. Therefore, what is truly required is a dedicated, high performance, intelligent hardware RAID controller in a robust storage chassis.

Uncover the Full Potential of Avid Unity™

Unity™ delivers great networking functionality for Avid users. It has most of the features that users of a SAN for digital media need, and its tight integration with Avid NLE systems allow it to track media and projects with a high degree of sophistication.

However, Unity™ can clearly be enhanced with a greater protection method. As presented (above), there is no global Unity™ hardware to fully protect the data from a single drive failure other than wasteful mirroring. Even when the storage is fully mirrored the recovery from a single failed drive is, at best, annoying downtime, and at worst, catastrophic.

Vdisk™, the Dynamic Storage Engine

The good news is that there is a way to provide hardware parity RAID in a seamless manner without changing the Unity™ workflow. This can only be accomplished by using the combination of a high performance and sophisticated hardware

RAID controller and, most importantly, the award winning Vdisk™ technology.

Vdisk™ is Archion's patent pending technology that enables the only "dynamic" storage in the industry. This inherent intelligence establishes the compatibility between the hardware RAID protection and the Unity™ environment. Archion Synergy™, powered by Vdisk™, is a family of storage that has been designed to enhance the Asset protection of Unity™, and at the same time work within its flexible storage and Avid NLE integrated workflow. It solves the problem of protecting the media on Unity™'s drives without having to mirror and, at the same time, takes away the catastrophic nature of a single drive failure.

Each Synergy™ product provides maximum protection with maximum available storage. There are multiple RAID sets inside the storage and each one can protect the data in case of a drive failure. Because it takes two drives to fail with Synergy™ RAID sets to potentially lead to data loss, the Mean Time to Data Loss (MTTDL) is 151 years. Based on our previous evaluation of data loss risk, it is obvious which situation is more conducive to costly film, broadcasting, and new media projects. (See figure 1 below for an MTTDL comparison between Avid and Archion.)

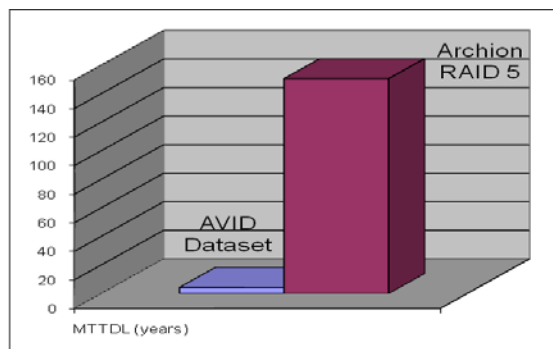


Figure 1. MTTDL Comparison between Avid JBOD and Parity RAID (level 5)

Consider the significance of the following: The chance of data loss in a 32 drive Archion data set is .004% per year compared to nearly a 24% chance with straight Avid JBOD storage.

“By choosing Synergy, we added much more fully protected storage to our Unity than if we went with Avid storage. The Synergy was a wonderful solution at less than a third of the cost, yet maintained our high standards of quality, performance, and data protection.”

- Jason Saro, Senior Avid Editor and Unity MediaNetwork Administrator, Nancy Glass Productions

Archion's Vdisk™ technology also makes using Synergy storage seamless in the Unity™ environment. Workflows and Unity™ operation do not change with one important exception- hard drive failure is not a crisis situation. When a hard drive fails, the hardware RAID controller automatically rebuilds the spare drive. Unity™ does not know or need to know about the rebuild. Clients continue working and the drive rebuilds. All the operator has to do is pull the bad drive out and put the new one in. This becomes the new hot spare.

There is no longer a reason to mirror workspaces and waste valuable drive space. The storage that Archion presents to Unity™ appears the same. (yet recognized as Synergy drives) in the set up manager, it is connected and used the same way. Once this simple install is complete, you are ready to enjoy the added protection and security of parity RAID.

Archion Protects your Investment!

The full potential of Unity™ is fulfilled thanks to the Synergy family of storage for Unity™. Archion

has been delivering hardware RAID based storage area network solutions to the media and entertainment industry since 1999. With the rapid growth of Avid NLE solutions in years past and the exuberance to Avid's media sharing solution, post professionals expressed their need for reliable storage that was protected with hardware RAID and seamless to use with Unity™. In just over 18 months from their request, Archion introduced the patent pending Vdisk™ technology and thus, the first of the Synergy models (Synergy Plus) was announced in 2007. Since then, hundreds of Synergy systems have been sold throughout the world, primarily through a network of top tier Avid Unity™ resellers.

The value is compelling. Today, with Archion's new Synergy XTR, 32TB's (24TB's RAID 5 protected) are available in a single chassis. The cost per Terabyte can be as much as 70% less in a protected environment. There is a spare drive built into the chassis for automatic failover, and a drive failure has minimal impact on the productivity of Unity™ users, unlike the case with Avid storage. There is a web based GUI for easy (and remote) access to chassis data and to set up email notifications. The Synergy models are compatible with all the Unity™ versions from 3.5x-5.1x as well as some LAN share™ models. (We have seen numerous customers take their Archion from 4.1 to 4.2x and now to 5.1x) How is that for investment protection?

Archion is also well known for its focus on customer service. Support is available 24/7 and parts can be advance replaced for next day delivery. In addition, several regions have local spares for same day delivery. With Avid experienced technicians on staff, we find our engineers spending more time supporting Unity™ than Archion storage.

Thousands of Unity™ users, including large media enterprises like CBS, COX Broadcasting, Fox Sports, Paramount, Sony, Turner Broadcast, and Twentieth Century Fox have turned to the Synergy™ family of RAID add-on storage for their Unity™ networks.

To learn more about how to significantly enhance your Unity™ with Archion's Synergy™ add-on storage products, please call us at (888) 655-8555