



CASE STUDY

SanDisk® Enables Legend3D Artists to Work on Virtual Reality in Real Time

Solution Focus

- Media and Entertainment
- CG, 3D and VR content creation and manipulation

Challenge

How to store, access and process massive amounts of digital data without delays and bottlenecks.

Solution Focus

Fusion ioMemory
Lightning 12Gb SAS drives

Key Results

- 150X faster loading data to cache
- Elimination of bottlenecks
- Ability to access large data files without delay
- Increased productivity
- 4 minutes vs. 600 minutes time savings

Summary

An industry leader in 3D conversion and visual effects, Legend3D is now partnering with feature film studios, ad agencies and others to create immersive VR experiences in both 2D and 3D formats. In order to store, access and process the massive amounts of digital data generated, Legend3D used Fusion ioMemory™ and Lightning™ 12Gb SAS drives and achieved 150X faster speed loading data to cache, eliminated bottlenecks, and was able to access large data files without delay; significantly increasing productivity and saving substantial amounts of time.

Background

Since 2001, Legend3D has been pushing creative and technological boundaries. Originally established as a colorization and film distribution company called Legend Films, the company was first known for digitally colorizing black and white Turner Classic films. By 2008, the same patented technology was being used as a basis for developing cutting-edge software that enabled Legend Films to offer higher caliber and more efficient 3D conversion of film than ever before achieved. In 2010, the company's name was changed to Legend3D, and its focus switched to the stereoscopic conversion of feature films and commercials. Today the company is an industry leader in 3D conversion and visual effects, supporting top motion picture studios such as Disney, Sony, Warner Bros., Paramount and DreamWorks, and award-winning content producers such as Zack Snyder, Steven Spielberg, Michael Bay, Martin Scorsese, and Jerry Bruckheimer. Since 2015, Legend's newly established Virtual Reality (VR) division has been partnering with feature film studios, ad agencies and global retail partners to create immersive VR experiences in both 2D and 3D formats.

"The results we got from the SanDisk solution were incredible. We couldn't believe that it was 150x better performance. It's something that makes it possible for our artists to work faster- and faster is an understatement."

**Matt Akey, EVP of Production,
Legend3D**

The Challenge of Working with a Huge Volume of Digital Data

In the world of 3D and VR, image quality is everything. To achieve an acceptable level, film resolution and frame rate need to be high. Matt Akey, Legend3D's EVP of production, explains that, "With VR, when you're working with a 4K or 5K image, you've got 8 to 10 times more than the amount of pixels that you would have with a 2K flat image. And, when you are at 60 frames per second, that's two and a half times as many frames and two and a half times as much data to process." The primary challenge is eliminating the time it typically takes to transport and process this huge amount of digital data so that Legend3D artists and producers can work effectively.

Managing the expectations of high-profile customers is part of the challenge. According to Akey, Legend3D clients "want it fast and want it cheap." With 3D, and especially with VR, delivering such a monumental volume of data into an artist's work station consumes hours of time and can be a frustrating process.

“As an artist, you don’t want to be hindered by technicalities; you want to be able to focus on making a beautiful image, or creating a wonderful animation ... we’ve found a workable, cost-effective solution with the SanDisk products that will help us to maintain our leadership position in 3D and VR.”

Andrew Jerez, VFX Supervisor at Legend3D

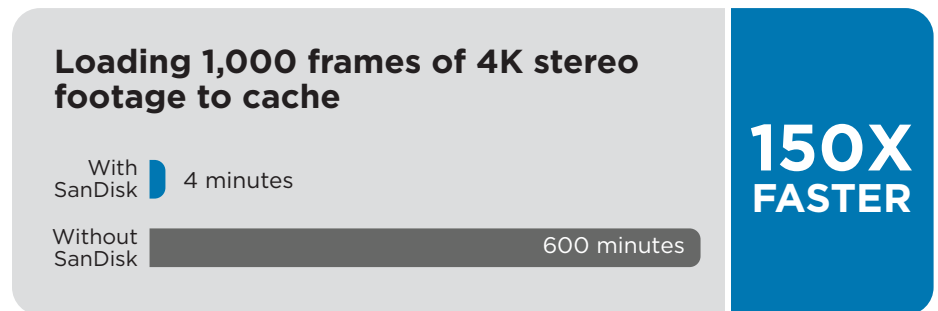
“As an artist, you don’t want to be hindered by technicalities; you want to be able to focus on making a beautiful image, or creating a wonderful animation,” said Andrew Jerez, VFX Supervisor at Legend3D. “When there’s a cluster of artists who are all working with huge data files, they need to be able to transfer those quickly and keep them from clogging up the rest of the network, so that artists doing other tasks can work in real time.”

The main bottleneck occurs when artists try to retrieve data files from where the data is stored, through the network and to their workstations. Because of the limitations of the technology they had been using, it took Legend3D artists an inordinate amount of time to load and play back the footage at the frame rate with which it needed to be viewed. “We would have to guess, then send it to get rendered, then wait for it, no matter how long the rendering took, and then finally we could view it at the proper speed,” said Jerez.

Today, with the increasing demand for high-quality VR content, Legend3D’s phone is “ringing off the hook.” But, to take on more projects, they realize they need a solution to help them improve the speed and efficiency of their work, and reduce the bottlenecks in the network.

Finding a Real Solution for Virtual Reality Data Files

In their attempt to find a better, more time and cost-efficient way to streamline their processes, the Legend3D team decided to test the SanDisk solution. The results were astounding. Typically, taking 1,000 frames of footage shot in 4K stereo and loading it to cache would have taken somewhere around 600 minutes to accomplish when using the company’s standard “ISILON over Ethernet” method. The SanDisk difference? When they tested the Fusion ioMemory with the same 1,000 frames, it took only 4 minutes. That is, the SanDisk solution was 150 times faster.



“This is something that makes it possible for our artists to work faster – and faster is an understatement,” said Akey. “The SanDisk solution enables the artist to actually watch the work as it is being done, at speed, as opposed to only seeing a single frame. With VR, you can only get a good sense of it when you watch it in motion.” This 150X improvement in performance would not only help Legend3D artists to be more productive and reduce their project costs, but also to make their clients happy as the turnaround time on projects would potentially be reduced.

Andrew Jerez agrees. “The content needs to be accessible all across the network, for Legend3D artists to be able to do their jobs well. Right now, because we have so many artists pulling information from one spot, there’s bottlenecking. And that bottlenecking leads to slowly-loading files, bad playback, and all sorts of other issues.” The SanDisk solution removes these technological bottlenecks and empowers artists to focus more of their time on creative activities.

The SanDisk Impact

Legend3D customers have come to expect and depend on the very highest quality 3D, effects and VR content, but accomplishing that means staying ahead of the curve when it comes to time and cost savings. Matt Akey shared a real world situation in which he felt that the SanDisk solution would have had a significant overall impact on a project: “We worked on the Crimson Peak VR Experience for

Guillermo del Toro last year. It was all computer generated in 4K stereo so really 8K, when you add it up. Getting that through our pipeline took forever. If we had the SanDisk solution, it would have cut our time in half. It's a game changer."

In the rapidly evolving world of 3D and VR, preparing for the unknown is key. "We're branching off into different kinds of content creation and it seems that every project presents a new technical hurdle. You want to future-proof as much as you can. Having a way to greatly reduce the steps and the time that is required to finish a project is central to that preparation," said Akey.

By using the SanDisk solution, Legend3D is reducing the amount of network and storage load on their central storage. They are creating what they call a "push/pull" work flow, where active data is put on the SanDisk solution and any archival data is moved to their ISILON storage. Per Andrew Jerez, "We've found a workable, cost-effective solution in the SanDisk products that will help us to maintain our leadership position in 3D and VR."

More than 25 Years of Storage Innovation

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