



## CASE STUDY

## Western Digital® and Lenovo Take On Iconic Sci-Fi Blockbuster for Stereo D

### Solution Focus:

- Media and Entertainment
- 3D conversion and VFX

### Challenge:

How to support multiple, concurrent projects with fast and efficient data transfer between several international studio locations.

### Solution:

- Optimus MAX™ SSDs
- Lenovo P900 workstation

### Key Benefits:

- Reduced space requirements by half
- Up to 5GB/sec throughput
- Ability to easily access and transfer massive data files
- Increased speed, efficiency and productivity

### Background

Recognized as one of the “World’s Most Innovative Companies” by Fast Company magazine, Stereo D is a leader in high-quality conversions of 2D theatrical content into stereoscopic 3D imagery. The company was established in 2009, and acquired by Deluxe Entertainment Services Group Inc. in 2011. Working with major motion picture studios, directors, cinematographers, and VFX supervisors to bring their vision of 3D storytelling to the screen, Stereo D has completed work for a countless number of award-winning, box office successes. The company also provides end-to-end 3D production services on feature films, television productions and commercials.

### Converting Award-Winning Cinema into 3D

When one of the film industry’s most iconic cinematic Sci-fi blockbusters is released in China for the first time in the Fall of 2016, it will not only mark the 25th anniversary of the classic film, but also, thanks to Stereo D, it will premiere an updated 3D version of the 1991 classic.

At the core of that state-of-the-art technology is a Lenovo® P900 workstation that was custom-configured to various specs to meet the needs of Stereo D artists and stereographers. The Lenovo workstation is ergonomically designed, offering a tool-less chassis, unique airflow to the CPUs, and an onboard diagnostics system. An IT administrator can use a smart phone that connects to the workstation to receive messages, helping to troubleshoot issues that may arise during production. Using the expansion bays in the workstation, Western Digital equipped the chassis with 8 Optimus MAX™ 4TB drives to provide the massive capacity and enterprise-level performance needed to help enhance the speed and efficiency of the work done at Stereo D. The system is capable of achieving 5GB per second of throughput. Although an external chassis was used in this system, the Lenovo P900 is able to support 8 Optimus MAX drives in its 4 internal bays.

The conversion of this award-winning film from 2D to 3D was no small feat. In addition to the Lenovo P900 and the Optimus MAX drives, an artist workstation software called Pablo was used for color grading and visual effects. “Optimus MAX SSDs achieve an unprecedented level of disk performance in a quiet, compact form factor, using much less power than competing solutions,” said Milton Adamou, Stereo D’s VP of post-production and a 20-year veteran of this industry. “We began with the 4K film scans, complete with 1990s grain! As with previous stereo conversions of classic films, the filmmakers wanted us to work on ‘cleaner’ versions for the stereo conversion, and that involved applying a tasteful amount of degrain and sharpening to the original frames. A single stream of 4K, especially full aperture, still requires a fair number of spindles if using traditional hard disk drives, and since we had access to original B-sides for many of the opticals, we needed to pull in two 4K streams to avoid any I/O bottlenecks.

*"Using SanDisk's solid-state drives, we were able to plug an external array straight into a dedicated workstation and have it up in running in minutes. No long RAID formats, no fiddly configuration settings. No noisy fans. Just a small block of speed!"*

**Milton Adamou,**  
VP Post-Production, Stereo D

*"The Western Digital-Lenovo solution literally allowed us to halve the space we needed. We ended up with a lightweight but powerful, maintenance free solution that kept humming along, day after day, for months on end without a hint of trouble. You cannot ask for anything more!"*

**Milton Adamou,**  
VP Post-Production, Stereo D

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"Using SanDisk-branded SSDs, we were able to connect an external array straight into a dedicated workstation and have it up in running in minutes. No long RAID formats, no fiddly configuration settings. No noisy fans. Just a small block of speed!"

#### More than enough GB per second I/O

Adamou explained that Stereo D is known for taking on one-off challenges that their clients need solved. In most cases, they will custom-build a system around the requirements of the job. "For example, we could be dealing with a problem that requires a huge dataset to be held in RAM, or an algorithm that runs best on the CPU," said Adamou. "With this particular film, we knew we needed an ample amount of disk I/O, at least 3GB per second. Furthermore, the grain removal and sharpening processes needed a good amount of rendering power – the former being optimized for GPU and the latter for CPU. Optimus MAX more than took care of our disk I/O requirements."

One of the biggest challenges to Stereo D has to do with the company's size and its multiple locations. There are three separate studios that employ a variety of artists in three different geographical locations around the world. Typically, work is done on several movies at the same time, and all of the studios contribute to the projects, depending on their capacity and specialty. For that reason, an enormous amount of digital data needs to be transferred back and forth between studios and individual artists and stereographers.

According to Adamou, "Once the data is in the right place, there's a lot of it! We work on thousands of shots per movie – many times the entire movie – and each one goes through multiple iterations and several rounds of notes on its way to the final version. In this respect we're akin to a VFX house, serving up many different asset types that combine to create the final, polished result. We're also like a DI house in that all those iterations are endlessly looping in our theatres around the world for our artists, stereographers and clients. That's multiple streams of stereo 3K and 4K EXR. The equivalent of between 2 to 3GBs, each! Sometimes it can get hairy."

#### The Western Digital Impact: Reducing the need for space

Another major benefit to using the Western Digital-Lenovo combo is how little room is needed to accommodate the system. Keeping in mind that the smaller the space, the less power expended, this factor lowers the cost of ownership. "In previous configurations, we'd typically use a 2U-4U workstation paired with two banks of external spinning disks (4U). So, with a bigger workstation, you're already taking up the bottom end of a rack. The Western Digital-Lenovo solution literally allowed us to halve this space. We ended up with a lightweight but powerful, maintenance free solution that kept humming along, day after day, for months on end without a hint of trouble. You cannot ask for anything more!"

In terms of the future, Adamou recognizes how much things have and will continue to change. "As production and delivery move from the set to the post house to the cloud, we're all facing the same problems: how to store and retrieve this extraordinary avalanche of media in a timely and relevant manner. It's a challenge that requires thinking along the entire chain, from frame in to frame out, as capture, delivery and ultimately consumption become one. In our experience, Western Digital's SanDisk brand Optimus MAX is a prime contender for this space."

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