



## CASE STUDY



# Jim Henson's Creature Shop™ and SanDisk®: Setting the Stage for High Performance

## Solution Focus

- Media and entertainment post-production
- Proprietary gaming engine
- Centralized data storage

## Summary of Benefits

- 10x reduction in workstation load time\*
- Shared media cache for editing now a reality
- 3x reduction in time to bring video footage online or offline\*
- Reduced footprint and energy requirements for storage system

\* Based on Jim Henson internal testing. Results may vary.

*"Now we have a technological platform that will give us the success we are all looking for, creatively as well as technically. With the right technology partner, SanDisk allows us to be, at the end of the day the most creative company that we can be."*

**Steffen Wild, Visual Effects Supervisor,  
Jim Henson's Creature Shop**

## Summary

Jim Henson's Creature Shop™ creates such iconic children's shows as "Sid the Science Kid," "Doozers," and "Dinosaur Train," along with the late-night comedy "No, You Shut Up." However, when the Company's system infrastructure was straining under the huge post-production workload, this leader in digital puppetry turned to a leader in enterprise flash solutions, SanDisk, to accelerate their digital pipeline. Since implementing a SanDisk solution built on Fusion ioMemory™ products, the Company now benefits from higher video resolution content, simultaneous 4K edits from workstations, and reliable storage bandwidth.

## Background

Headquartered in the heart of Hollywood, The Jim Henson Company has been in the family entertainment business for more than 50 years. Best known as the creators of the much-loved and world-famous Muppets, The Jim Henson Company has received more than 50 Emmy Awards and nine Grammy Awards. In addition to award-winning recording studios, the Company also houses Jim Henson's Creature Shop, an Academy and Emmy Award-winning character-building and visual effects group that services international film, television, theme park, and advertising clients.

The computer-generated shows at Jim Henson's Creature Shop are all developed through the use of a proprietary digital puppetry pipeline system. The system consists of a live-motion-capture stage where actors have their body motion performances captured in real time.

Digital puppetry stations enable voice performers to use complex input devices to drive the vocal and facial performances for the characters. There are typically three camera operators who control virtual cameras to record all of the performances on stage. Backing this up is a bank of high-end workstations providing centralized data storage for virtual sets and environments, characters, and wardrobe.

Also included in the digital pipeline are management systems that synchronize dozens of machines to work as one giant virtual stage. All of this performance data is displayed in a real-time game engine on set, so the cast and crew can receive real-time feedback on the performances.

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*“We used to lose an entire day to uploading new footage, and we had to stagger our shifts because we couldn’t be working on the same footage at the same time. Now there are three of us working on the same thing—seamlessly—together. There’s no slowdown. It’s been incredibly important for us to be able to move forward at that speed.”*

**Ryan Etter, Editor, “No, You Shut Up”  
Television Program on Disney/Fusion**

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*“In our original workflow, it took us about five minutes to load a large scene file onto our workstations. If you load over 20 scenes like that per day, that’s two hours lost loading and unloading files. When we came across the Fusion ioMemory cards, with the PCIe application acceleration, we were able to load that scene in under 30 seconds.”*

**Steffen Wild, Visual Effects Supervisor,  
Jim Henson’s Creature Shop**

## Challenge #1: Accelerate the Pipeline

In 2014, Jim Henson’s Creature Shop was looking to update its digital puppetry pipeline to handle increased demand. The existing pipeline produced only standard-definition television output, with a resolution of 720x486, and was dependent on arrays of spindle-based hard drives. Not only would the revamped pipeline need to be capable of creating higher resolutions to meet new standards for HD, 2K, and 4K content, but also would need to address issues with poor stability and performance.

When changing set props, characters, and wardrobe, it used to be normal to break for 15 minutes to an hour while the technicians loaded the new data sets into the array of workstations that needed local copies of the data. At times they had to bring the whole system down and reboot everything. That was a very costly problem when 25 to 35 on-set cast and crew members were left idle during the data loads.

## Challenge #2: Upgrade Centralized Storage

Another challenge occurred late in 2014 as The Jim Henson Company was ramping up a new TV show *No, You Shut Up* on the Fusion channel (Disney/Univision). After purchasing five new Mac Pro video editing machines, the Company realized they urgently needed a centralized storage solution to streamline production.

“We have four cameras, and it’s a 22-minute show—very heavy on the improv,” said Ryan Etter, Editor for *No, You Shut Up*. “We get lots and lots of footage—a terabyte for each show. With terabytes of footage, we need to be able to access it quickly and have multiple editors working on the same episode. We need to be able to upload new footage while rendering or delivering another episode—without getting bogged down with slow load times.”

Over time, shows became more complex and more graphics-heavy. The post-production team needed to finish more content, put more polish into every cut, and get it all out the door on time. It was time for a new direction.

## Digital Pipeline Solution

Jim Henson’s Creature Shop contacted SanDisk, well-known for industry-leading storage technologies, for a solution. Mark Noland, Sr. Applications Solutions Architect at SanDisk, worked with the team to define the optimal hardware for a next-generation digital pipeline. To ensure top performance, a Fusion ioMemory™ device was placed in each workstation. This minimized the time required to change sets and characters out for new scenes. The HP Z820 was chosen as the best “bang-for-the-buck” workstation, and the HP ZBook was selected for the individual puppet stations. Infiniband networking was chosen to tie the central systems together and provide reliable performance. These systems are housed in mobile travel rack cases so they can be shipped from stage to storage.

“Now we have a technological platform that will give us the success we are all looking for, creatively as well as technically,” said Steffen Wild, Visual Effects Supervisor for Jim Henson’s Creature Shop. “With the right technology and technology partner available, SanDisk allows us to be, at the end of the day the most creative company that we can be.”

## Centralized Storage Solution

A proof of concept unit was built, using the following components:

- A spare HP Z820 workstation
- Connection to a 10Gb Brocade switch with a dual 40Gb uplink
- 10Gb Thunderbolt expansion adapters on each edit bay

This configuration provided enough bandwidth for each edit bay to be able to edit in 4K over the network.

To provide the central storage, four Fusion ioMemory 1.65TB devices were striped together in a RAID 0 array. This provided 6TB of storage at 6GB/s—more than enough bandwidth to feed the five 10Gb connections per bay.

*“There’s a ton of footage. There’s a ton of bandwidth. There’s no way we’d be able to do this without the Fusion ioMemory PCIe card. With our new systems, I don’t have to worry about the technological workflow. I can just edit without having to worry about watching the hourglass spinning all the time. And I love it.”*

**Ryan Etter, Editor, “No, You Shut Up”  
Television Program on Disney/Fusion**



Fusion ioMemory — ioFX®

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## Results: Digital Pipeline

In the original workflow, it took the pipeline about five minutes to load a large scene—up to a few terabytes in size—onto workstations. With Fusion ioMemory devices, a scene of that size could be loaded in under 30 seconds. The time needed to bring footage online and offline dropped from multiple hours to under one hour, enabling data to be moved from the stage to the editorial process in a more effective and efficient way.

Since building out the new digital puppetry pipeline, Jim Henson’s Creature Shop has had zero down-time related to loading datasets while changing out character, stage, props, or other assets. According to Steffen Wild, there are even more benefits to the new pipeline. “An additional advantage that we were finding was that by using Fusion ioMemory cards, it reduces the footprint of our storage units—and not only the footprint, but also the energy requirements for the storage. And so, it’s a win-win situation on multiple fronts. Space requirements go down. Energy requirements go down. Overall, the process becomes faster and more reliable. So definitely it’s something we will expand on in the future.”

## Results: Centralized Storage

Based on the successful proof of concept, Jim Henson decided to order ten Fusion ioMemory 1.65TB drives to create a 16TB storage pool for TV production. Purchasing plans are now being made to buy two more systems to be able to accommodate upcoming television and feature film projects.

Jim Henson’s Creature Shop now has a shared media cache for the first time, running on Fusion ioMemory devices, so it can share all the render files. The exports have been lightning fast because of that.

## Outlook

Referring to the future of the digital pipeline for Jim Henson’s Creature Shop, Steffen Wild remarked, “We will either combine multiple servers together or we will find motherboards that will support ten, 12, or even more PCIe slots. Then we can add more cards at a price point that becomes affordable to an independent production. At that point, the sky’s the limit, in terms of what can be done.”

Now that they have seen the light when it comes to the performance gains of Fusion ioMemory products, they are also looking to see about accelerating their 3D-rendering pipeline which is used to create the final rendering output for many of their projects. Another creative endeavor could include moving into areas of feature film that they haven’t yet explored, with elements of traditional puppetry, animatronics, and digital puppetry, all combined in one.

Wild concluded, “The name ‘Jim Henson’ not only stands for wonderful traditional puppetry, and characters that make you smile when you see them; the name also stands for innovation. And innovation for us means to move into the digital realm and to express the creativity of the company in brand new fields that we have yet to explore. By using the best technology, we now have a canvas we can paint on and create something we can surprise everyone with. With Fusion ioMemory PCIe cards, we can.”