Excelero

DIGITALFILM TREE ACHIEVES BREAKTHROUGH STORYTELLING THROUGH 100X FASTER STORAGE WITH EXCELERO NVMESH®

10X faster render processing, 100x faster storage than previous traditional solution; close to line speed with massive digital dailies transfers, with playback that's "buttery smooth"

CASE STUDY

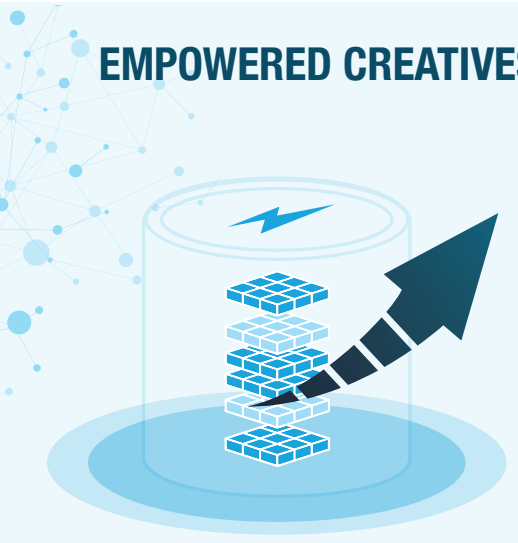
digitalfilm tree

DigitalFilm Tree (DFT) is a creative powerhouse shaping the evolution of storytelling. It goes far beyond the typical post house with an innovation focus that's anything but traditional.

With an educational and future-forward line of sight on serving their fellow creatives, DFT built its reputation by helping the world's leading media, tech, and entertainment companies, as well as first-time filmmakers. Across the company, DFT houses exceptional artists, technologists, post producers, and senior consultants at its state-of-the-art facility in Hollywood. Together they help productions deploy cloud connected remote dailies, color, VFX, and editorial post systems the world over. Moving directly from camera to cloud, DFT saves time by granting productions, post vendors, and marketing departments secure access to any file they need. It gives the collaborative team accelerated access to dailies and media transfers by putting the power of a post house in its hands, anywhere in the world. From pre-visualization services that leverage game engine technology, to secure, cloud-based services that include dailies, VFX, and color science, DFT is democratizing technology through its ability to empower anyone, from any means or corner of the world, to tell meaningful stories.

DFT deployed Excelero's NVMesh as the centerpiece of a new storage architecture and obtained elastic NVMe storage with the low latency, at least 100x greater total aggregate bandwidth, and scalability to meet its most demanding needs.

EMPOWERED CREATIVES THROUGH BETTER STORAGE



Benefits of Elastic NVMe

- **Share NVMe resources across the network**
- **Access remote NVMe at local speed**
- **Exceed the performance and capacity limits of local flash on servers**
- **Datasets can be larger than what can fit inside the server**
- **Zero-CPU storage-target with Excelero's patented Remote Direct Drive Access**

As a firm that helps creative clients use technology to power storytelling, DFT is always enhancing its own multiplatform environment for even higher performance. Its media and entertainment clients depend on DFT for dailies, visual effects (VFX), color correction and delivery of on-location shoot material to secure central resources. Powered by DFT's technology, teams of hundreds can more efficiently work their magic to create dazzling visual content.

The colorization and visual effects work done by DFT and its clients are among the most challenging high performance computing applications. Storage can never run fast enough, and network bandwidth demands are mind-boggling. For example, DFT's systems routinely ingest and deliver of at least 3TB of raw dailies footage for downstream processing within eight hours. Recently, a new client needed 14 TB or more of content to be processed each night – from storage accessed by entire teams of editors, colorists, and effects specialists working simultaneously.

At these extreme volumes, seemingly routine tasks can become bottlenecks. File transfer to SAN alone at such volume was completely impossible without severe workarounds. As content resolutions increase, so that 4K resolution content becomes 8k - and even 16k soon - using the wrong storage had the potential to curb DFT's performance, and without careful thought, could throttle the business.

When a planned infrastructure upgrade to higher performance PCs and Linux-based workstations brought an evaluation of its storage and networking approaches, DFT knew a change was in order. The superior performance and cost-effectiveness of NVMe Flash was a definite, particularly for visual effects teams where complicated imaging sequences require high IOPs that spinning disks can't provide as efficiently. Deploying scalable, high-bandwidth, low latency storage was key to support 4K or better playback without bottlenecks that could make images appear jerky or rasterized.

More importantly, as much as staying within its existing Fibre Channel network may have seemed easier, DFT did enough quick calculations to realize that Fibre Channel was not a path toward the future, bringing sizable cost increases, for minimal if any performance gain.

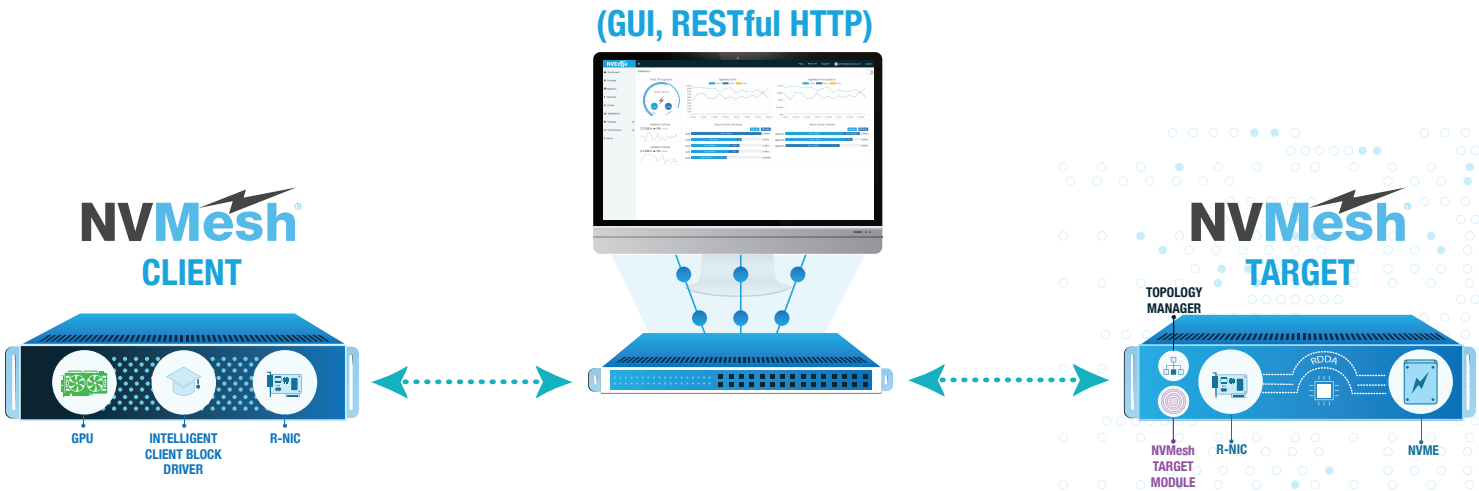
"SO DIFFERENT, IT WAS SHOCKING"

"The first time I saw Excelero's software, it was so different it was shocking," Thomas Galyon, CTO at DFT, said. "After testing and deploying it, I've learned it's even better. Excelero will let us store any file format we throw at it, and run on any server, with 10x faster render processing and at least 100x greater total aggregate bandwidth than our previous software. The added bandwidth lets us send project content out to its clients far faster. NVMesh has become the backbone of our facilities."

The firm deployed Excelero NVMesh on an RDMA network using two SuperMicro Big Twin servers with a total of 16 NVMe drives, deployed across four servers, each with four NVMe drives. Hardware is equipped with NVIDIA Titan GV100 graphics cards. DFT also deployed the Quantum StorNext® file system for sharing resources across different PC and Mac platforms. The Excelero deployment saved rack space, with its 4-node deployment requiring just 2RU, in contrast to DFT's traditional SAN required 4 servers that are 4RU each, or 16RU total.

DFT architected the system based on a 100Gb Ethernet network rollout enterprise-wide to displace Fibre Channel, with immediate deployment of 50GbE connections to storage resources, and 25GbE to specific departments initially.

In testing on DFT's Windows server over 10Gb Ethernet, Excelero NVMesh used in concert with StorNext provided more than 15x greater IOPs per thread, and more than 13x total IOPs.



Windows 10gb ethernet	Traditional San	Excelero (+ StorNext DLC)
IOs per thread	3,050	48,300
Total IOPs	28,976	386,398

Excelero's GPU storage power shined particularly in playing image sequences – "the bane of storage in my world," Galyon said. "With tens of thousands of small files, you could hear the storage whirring trying to access data." Traditionally DFT's former storage solution would deliver 4-5 frames per second (fps) of play-back on a 4K sequence – far from real-time, such that videos appeared jerky.

"With Excelero storage software behind an 8K DPX sequence, we got close to line speed – something I don't even expect – and playback that was buttery smooth. That was the "Aha!" moment. There's currently no file format Excelero couldn't handle efficiently and deliver to our workstations. And that was just in phase 1!"

When the team producing *Prime Rewind: Inside The Boys*, a before show for season 2 of Amazon Prime Video's superhero and vigilante series *The Boys*, DFT's system faced a test to its new Excelero-powered storage solution. The production team needed to process 40 hours of client-uploaded dailies, back them up, make proxies for rapid editing, process and deliver them to their editorial department – in just 10 hours. Even for a business that's used to insane turnarounds, the project was exceptionally tight.

"That's where we saw the real performance difference in Excelero's system," said Galyon. "It was amazing how easily we handled this exceptionally demanding project with Excelero. By turning it around quickly, we afforded everyone more time for quality editorial, on an already tight time frame."

DFT's CTO Galyon also appreciated NVMesh's time saving with load balancing. "With traditional SANs, you usually relegate data to a single server, rather than making LUNs across multiple servers. Someone who is running the data management on each server would "load balance" to define specific projects for each server for space and performance concerns. With Excelero, our combined storage pool makes this job virtually nonexistent," Galyon said.

In its infrastructure upgrade's Phase 2, DFT will deliver 100GbE connections to all client workstations, with only a few systems remaining on 25GbE.

"There's simply nothing we've asked of our Excelero-based storage system that it hasn't been able to handle. With its elastic NVMe capabilities on board, I'm looking forward to a world where frankly I never have to think about storage speeds again," Galyon said.