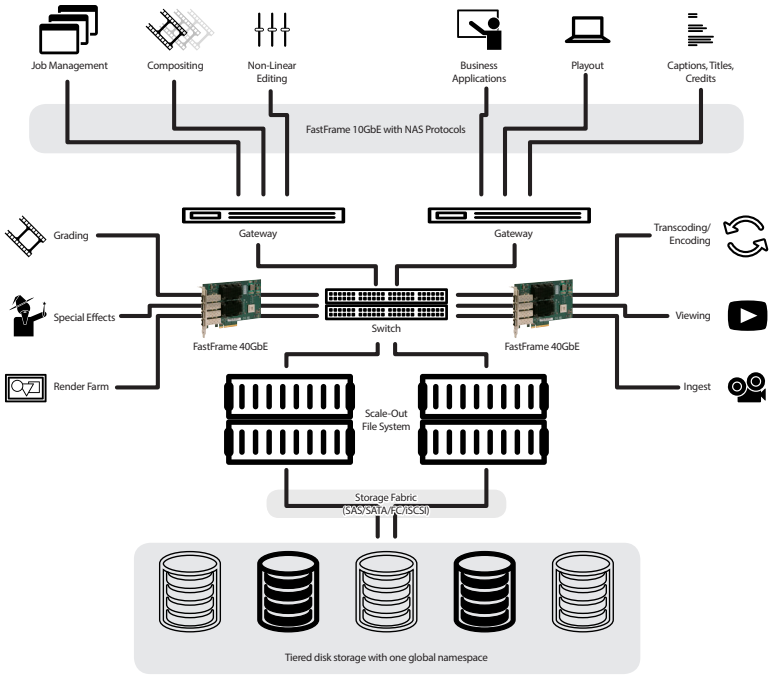
ATTO TECHNOLOGY
SOLUTION BRIEF

FastFrame 40GbE NICs Accelerate 4k and 8k Video Workflows

Challenge

The new 4k and 8k video formats being adopted by the film/television industry for production and post-production come with new requirements to support those workflows. 10GbE technology paved the way for Ethernet in the media and entertainment space by providing the necessary throughput for HD video. It also addressed technical issues such as high latency and packet loss that had prevented the otherwise widely-used transport mechanism from being deployed in post-production environments. Now the move to new formats, along with the proliferation of animation and special effects in everything from TV shows to blockbuster movies, is driving a need for studio infrastructure that supports multiple high-resolution streams.



ATTO 10GbE and 40GbE FastFrame NICs in a demanding 4k video environment utilizing NAS storage. This scale-out file system allows shared RDMA access to media storage, with support for one 4K/24fps stream for each workstation using RDMA. Areas in the workflow that don't require real-time uncompressed streaming utilize the gateway to access media files.

The Solution

The industry-leading latency and throughput provided by ATTO's FastFrame 40GbE NIC makes it suitable for uncompressed 4k and 8k applications. A single stream of 16-bit 8K EXR video at 24fps requires 28.2Gb/s of bandwidth. While that need can be met by multiple ports on a 10GbE NIC, using a single port on a FastFrame 40GbE NIC provides a more cost-effective and power-efficient solution. It's also important to note that FastFrame achieves near-line rates on 40GbE, while most competing NICs on the market perform at less than 30Gb/s.

FastFrame's near-line speed throughput is enabled by careful latency management and its implementation of Remote Direct Memory Access (RDMA) over Converged Ethernet (RoCE). This feature uses zero copy data transfers to permit more efficient data movement between servers and storage, freeing up the host's CPU for editing, compositing and rendering. RoCE is already a standard in latency-sensitive markets such as high performance computing clusters (HPCC), and is seeing increased adoption in editing workflows due to its latency and CPU utilization benefits.

Scale-out Network Design with 40GbE and 10GbE

While the need for 40GbE bandwidth is being driven by transcoding/encoding, rendering and effects, 10GbE still has a place in these workflows for related tasks with lesser performance requirements such as business applications and playout.

NAS storage is often used in editing environments due to the homogeneity of the protocols used (NFS RDMA, SMB Direct, etc.). Scale-out versions of NAS allow for easy expansion of that storage—necessary as higher resolution video eats up more and more storage space.