DataDirect NETWORKS

Case Study

Extreme Storage for Microsoft Studios

High Speed, Scalable Encoding for Video, Audio and Gaming Content

Microsoft Studios is charged with aggregating, categorizing, normalizing and encoding digital media to prepare it for distribution from the Zune Marketplace and Xbox Live Marketplace sites. The digital content Microsoft Studios makes available for distribution takes several different forms, including music and music videos, podcasts, episodic television and full-length movies.

Raw content is both pushed and pulled from various sources, including recording labels, television and movie studios in a variety of formats. Microsoft Studios needed to rapidly ingest and normalize content into a common digital format as well as transcode into multiple playback formats.

Encoding is required to provide compatibility with different player types – whether a PC, personal media player, gaming console, etc., each of which supports unique file formats, bit rates and compression. For video, there are also a number of viewing options, including standard definition, high definition or letterbox. Application of Digital Rights Management is another important part of the post production workflow. This controls differing levels of user permissions – whether the user is only authorized to preview a clip, stream content in place on the site – or is permitted to burn a copy – and to which specific addressable devices and how many times they are entitled to replicate the content.

> "The xSTREAMScaler provided high throughput compared to other vendors and has been the best choice for us."
>
> — Kurt Grubaugh,
> Sr. Engineer IT Operations Manager, Microsoft Studios

The Zune and Xbox Marketplaces provide entertainment studios and content creators with a powerful channel to generate revenue by distributing their content to a wider audience. With entertainment's large advertising budgets and awareness campaigns, consumers gravitate toward newly released materials with urgency. Microsoft Studios' ability to get the latest content encoded, posted and available for sale quickly, means attracting and satisfying customer needs. Additionally, their ability to make previously released content available for sale and download translates into incremental revenue and a more enjoyable user experience.

Creating a vast library of digital content is a massive undertaking that requires knowledgeable people, processes and technologies that drive efficiency and accelerate results. Microsoft Studios rose to this challenge by creating a workflow that optimized best-in-class post-production processes and selecting the technologies necessary to meet their time-to-market objectives.

Challenge

Driven by rapid user growth of Microsoft's Zune® and Xbox® platforms, distributing digital content is now a key business objective. Microsoft Studios needed a high performance, cost effective storage system that would align with their workflow, allowing them to rapidly ingest and encode content to enable distribution.

Application

Microsoft Studios aggregates and prepares music, movies, episodic television and video games for download and playback from *Zune Marketplace*® and *Xbox Live Marketplace*® to a wide variety of devices.

Digital content requires encoding to facilitate distribution in a wide variety of file types and formats, such as an MP3 audio track, letterbox television episode or a high definition movie. Additionally, the content needs to be protected through the application of Digital Rights Management metadata.

Solution

Microsoft Studios chose DataDirect Network's S2A Shared San File System Solution (xSTREAM-Scaler), tying together S2A's Performance and Capacity Optimized Storage Systems which are fully integrated with the Quantum's StorNext Data Management software file system to enable Hierarchical Storage Management between high performance and high capacity tiers.

The S2A platform enables high bandwidth performance from a single system for reads and writes, parallel processing for real-time collaborative workflows and a very high capacity in a minimal amount of data center space with lower overall power consumption and heat production.

Kurt Grubaugh is a seasoned post-production veteran who was instrumental in building out 20th Century Fox's first digital animation studio. For the past twelve years, Kurt has been with Microsoft working in the media lab and multimedia spaces and now is Microsoft Studios' Senior Engineer of IT operations. Having observed the industry convergence of IT and post-production, Kurt led the development of architecting the workflow and technology solution.

Microsoft Studios' Storage Requirements and Considerations

Today, Microsoft Studios' environment consists of more than twenty dual processor, dual core encoding stations (moving to 40), Wafian processing and capture stations, and several workstations for preprocessing and rescaling. Source material arrives on tape or via SONET OC-48 fiber network, which is connected to the DataDirect Networks S2A Storage Area Network (SAN). As you might expect, all the clients run Windows.

Kurt needed a file system that allowed for collaborative engagements, so he chose DataDirect Network's xSTREAMScaler featuring Quantum's StorNext File System. On the storage side, he needed low latency-high I/O, high throughput, and a dense high capacity solution, so he chose DataDirect Networks S2A Technology as his storage platform. The S2A addressed the challenge of performing concurrent operations with its parallel architecture. This allowed for real time collaboration among Microsoft Studios' many workstations and multiple workflow stages. Because encoding is a function of time, possessing the ability to achieve high bandwidth out of the dual connected FC encoding machines increased process velocity.

To best utilize his storage budget, Kurt leverages the S2A xSTREAMScaler to automate StorNext Storage Manager-enabled policy-based data migration between his high performance Fibre Channel storage and his economical, high capacity SATA tiers. This also allows him to keep a persistent file structure for the workflow and a valuable Media Asset Management function for the production files -while employing a best-practice of Hierarchical File Management leveraging StorNext Storage Manager.

> “I wanted optimal workflow for my post-production facilities. Given how fast we’re able to encode a variety of formats, write the output, pre-process, and re-encode – to have all that work done at ‘drive speed’ is a big advantage. With the S2A Technology platform, I am seeing better than real-time encoding performance.”

DataDirect Networks S2A xSTREAMScaler Solution

The S2A xSTREAMScaler features high-performance S2A storage that enables real-time, sustained reads and writes through its hardware-based DirectRAID™ engine. It’s ideal for heterogeneous environments requiring high levels of low-latency data streaming capability and provides broad support for server platforms and operating systems to help eliminate islands of storage and centralize data into an integrated solution.

S2A xSTREAMScaler provides both SAN and LAN client connectivity options. Utilizing a multi-network configuration ensures that high-priority applications get real-time direct (SAN) storage performance and IP-connected (LAN) systems receive access to the global storage environment. Management time and effort is reduced by consolidating multiple storage instances into a single storage volume.

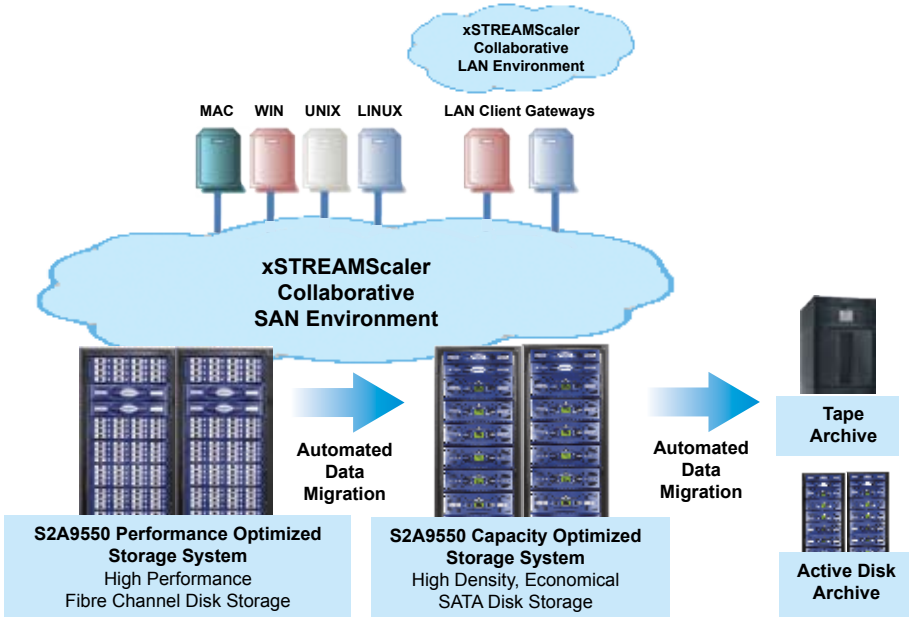
Coupled with an optional, automated tiered data management engine and data deduplication, S2A xSTREAMScaler provides intelligent data migration utilities to further decrease total cost of ownership and management resources.

Microsoft Studios’ xSTREAMScaler configuration consists of: three S2A9550 Appliance couplets that support the low latency concurrent data streaming for rapid ingest and encoding operations and ten 16-bay disk enclosures populated with 100TB of Fibre Channel disk and one S2A9550 Appliance couplet to manage the active archive with ten 48-bay drive enclosures populated with over 100TB of SATA capacity.

In addition, Microsoft Studio’s quality of service and data integrity has been enhanced for highly effective video streaming. This specific solution is capable of reading and writing in excess of 7.5GB/s enabling fast video ingest simultaneously from multiple encoding stations. This means the S2A solution is capable of streaming up to 18 2k or 6 4K streams without dropping a frame.

Microsoft Studios currently has 50 SAN clients that all see the same common storage pool. S2A provides simplified connectivity, allowing any host to access any disk without the need for switches to reside between controllers – reducing the SAN port count and multiple points of management, contention and failure.

As Zune and Xbox Marketplaces’ growth continues, Kurt now has a solution where he can scale capacity and performance independently. “There will be an application layer built on top of our current environment to push tasks through the workflow. I will rely on DataDirect Networks and the S2A xSTREAMScaler to make it happen quickly and with low latency.”



DataDirect Networks, Inc. is the data infrastructure provider for the most extreme, content-intensive environments in the world—including the largest online gaming and music sites, social networking applications developers, photo and video sharing services, high performance computing environments, and more than 400 broadcast and post-production facilities around the globe. With more than 200 petabytes installed worldwide, the company's S2A™ (Silicon Storage Architecture™) technology delivers massive throughput, scalable capacity, consistency, efficiency and data integrity for today's extremely competitive and evolving markets. Founded in 1998, DataDirect Networks serves customers through its global partnerships with Dell, IBM, Sony and other industry leaders; and through its offices in Europe, India, Asia Pacific, Japan and throughout the U.S. For more information, go to www.ddn.com or call +1-800-TERABYTE (837-2298).

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