SOLUTION BRIEF

Managing Digital Media Assets in a Hybrid Cloud World

Highlights

- Simplify collaboration across global teams with all content visible and accessible via a single global namespace
- Extreme data durability and integrity helps ensure media assets are protected and highly available through the lifecycle
- Integrates into existing environments using off-the-shelf media management and workflow applications that support standard file and cloud interfaces
- Scale as you grow with an ActiveScale system that helps reduce storage and management overhead cost
- Significant storage and management cost savings with ActiveScale. Helps eliminate costs associated with managing traditional disk and tape storage systems
- Multi-geo data distribution reduces cost and improves accessibility via global namespace and built-in DR

Challenge

- The exponential growth in digital content due to higher resolution and frame rates is pressuring existing storage systems and budgets
- Increase in collaborative workflows that span distance and time require more online storage for working content and archives
- A more flexible infrastructure that can better supports variable postproduction requirements that leverages cloud models is needed
- Better manage the entire lifecycle of content and make it easy and fast to find content for reuse and repurposing
- A better disaster recovery capability

We are in the age of digital information explosion, and managing the expanding digital media data assets has become a serious concern. Storage users and IT managers in the Media and Entertainment industry feel the full weight of the data management burden, as digital movie and TV production workloads demand increasing compute and storage horsepower. The evolution of motion picture and HDTV technologies, including the reality of high-frame-rate (HFR) and 4K/8K, exacerbate data management challenges

Evolving technologies play a large part in driving Hollywood's need for expanded storage capacity. In 1998, a fully CGI-created movie required a mere 10GB of storage to produce. This capacity need grew exponentially—to multi-petabytes—for digitally rendered, effects-heavy blockbuster movies. Systems now must accommodate thousands of simultaneous users across hundreds of compute and storage nodes.

Just as the industry moved from analog tape to digital tape for data preservation, many top studios, both major and indie, are transitioning to scalable object storage to meet growth demands and enhance key asset infrastructure, data durability, and resiliency. Media Asset Managers (MAMs) help manage and orchestrate digital assets. MAMs are available in many flavors for on-premises and/or cloud usage through Amazon S3™ protocols and RESTful APIs. Awareness of and information about assets in the form of metadata allow users to easily determine how to most efficiently use their assets to support specific business strategies.

Content Management

Content management consists of two main categories: Digital Asset Managers (DAM) and Media Asset Managers (MAM). The names are typically used interchangeably throughout the industry, which causes some confusion.

- DAM systems are focused first and foremost on brand assets and image management, and these vendors mostly come out of the print, typesetting, catalog production, and advertising world. The functionality is centered on the upload, management, and transformation of images to various formats, and unique functionality to manage, parse and transformation of images to various formats, and unique functionality to manage, parse and search compound documents.[1]
- MAM systems focus on the specific needs of the broadcast media market, and origins of this technology are from the television and movie industry. The original functionality was centered on the storage, archiving, and later the distribution of high-resolution media assets. Increasingly, the technology focuses on multi-channel scenarios beyond television.[1]

[1] Theresa Regli "DAM vs. MAM – What's the difference?" http://www.realstorygroup.com/Blog/2455-DAM-vs.-MAM-whats-the-difference

Solution

The ActiveScale™ cloud object storage system combined with off-the-shelf media asset and end-to-end workflow management applications enable a modern cloud-scale solution for creative organizations. ActiveScale helps ensure all content is reliably stored and readily accessible to global teams at a lower total cost compared to legacy storage systems.

Digital Workflows

Digital workflows continue to get more complex as technology advances. Consider the workflow example illustrated in Figure 1. From ingest to playout, media content is touched in many steps, creating various intermediate versions of the digital media that must be stored and managed. This workflow can quickly overrun typical local storage systems and the capabilities of basic cloud content storage vendors. Professional digital content providers require large, scalable, object storage systems managed by the latest MAM software that easily integrate with the cloud.

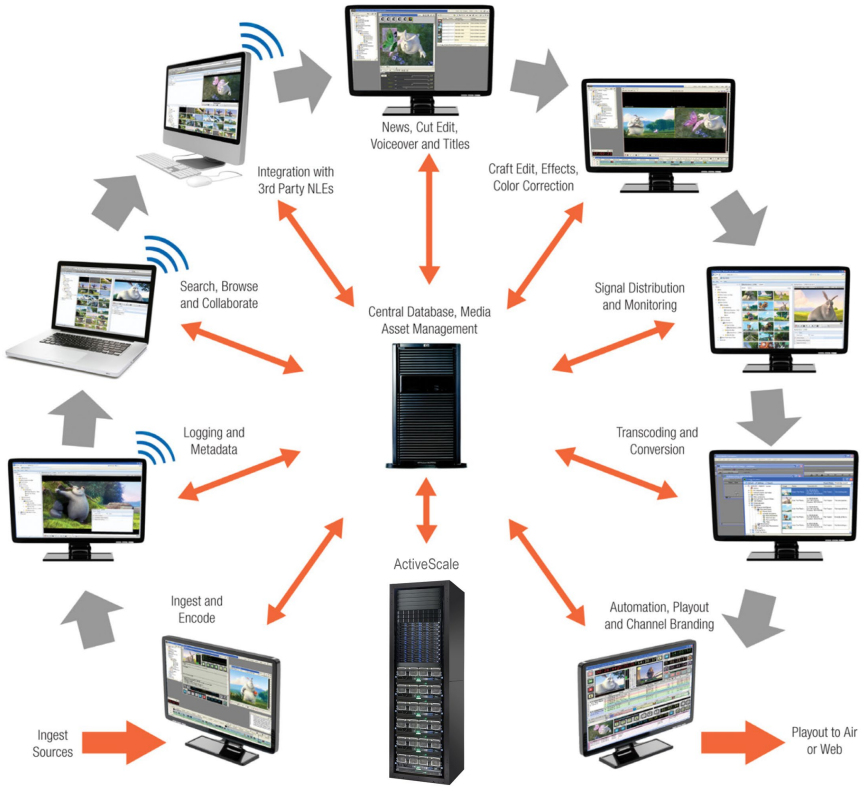

Figure 1 – Object storage within a digital post-production workflow

Hybrid Cloud Workflow

You need the right tools and infrastructure to take advantage of the move to the cloud. All businesses, including digital content creators within the Media and Entertainment industry, are moving to or considering a move to the cloud. When considering storage systems and MAM software, both need to be cloud compatible.

The ActiveScale system is fully cloud-optimized and supports the AWS S3 API, which allows the system to plug easily into an on-premises private cloud configuration or a hybrid-cloud design, as shown in Figure 2. The hybrid design allows for efficient ingest and post-production activities, and provides an onsite content archive for all media. You can then use the public cloud to provide compute power to transcode and efficiently distribute the final product.

A hybrid cloud allows you to keep your most precious assets, the raw content, close and available on your high-speed internal network while taking advantage of the cloud provider's connection to the internet for distributing final content. A cloud compatible MAM can manage all your data, metadata, workflows, and distribution in a single application, and ActiveScale systems can provide all the scalable storage required by a cloud compatible environment.

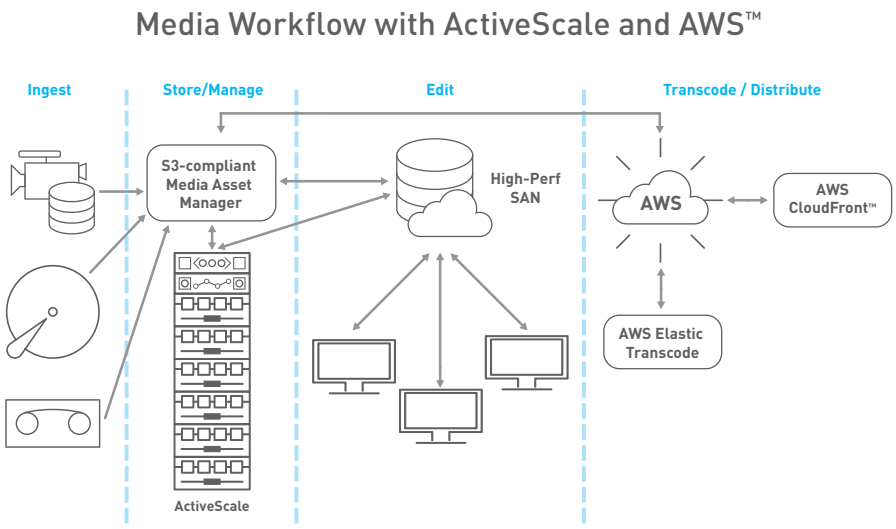

Figure 2 – Hybrid Cloud Workflow with ActiveScale

Most MAM software providers still focus on file-base workflows that can limit the adoption of cloud-based production. Many of the MAM providers try to solve this problem by patching or adding customized connectors to their solutions with varying degrees of success.

Another alternative is to install a hybrid cloud-NAS solution to translate file-based storage requests to cloud-based requests. Inserting such a solution could automatically upgrade your workflow to take advantage of hybrid cloud capabilities as well as extend the life of older, file-based storage.

Avere Systems provides a hybrid cloud NAS that integrates file-based production workflows with the cloud, whether on-premises, a hybrid model, or 100% cloud-based (Figure 3)

The Content Explosion

Anyone familiar with the media and entertainment industry knows that not only is the sheer volume of content exploding, but the size of the content is increasing, as well. As video formats change with each new resolution jump, files sizes increase dramatically. The move from SD to HD, then 4K, then 8K video formats cause large file size increases for the same video content.

For example, a typical 30-minute television show in the United States (NTSC format) averages about 22 minutes of produced content, but the file size for a raw, uncompressed, RGB 3x16 bit file varies greatly by format. As Figure 4 shows, each step up in resolution (more pixel density on the x and y-axis) creates a 4x increase in density and file size.

Going one step further, if we look at storage requirements for a movie with a typical runtime of 130 minutes, the numbers become far more staggering. An 8K format version of a movie would use up 46.5TB

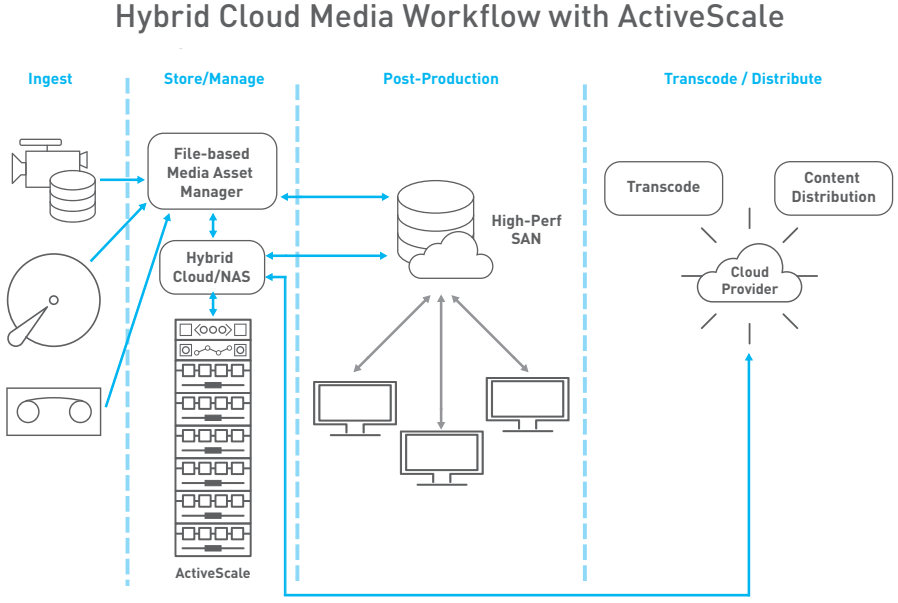

Figure 3 – Object storage architecture example for post-production workflow

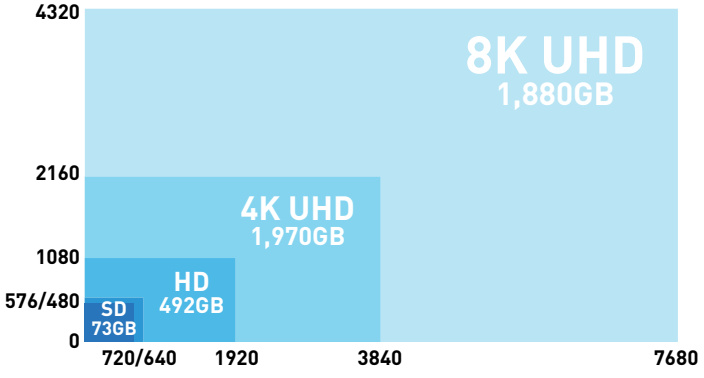

Figure 4 – Video Format Relative Resolution (pixels) and File Size

of storage capacity. Then when adding the multiple transcoded formats for each movie for different screen sizes and distribution methods, the amount of storage for the content of a single movie could easily exceed 100TB.

Data and Metadata

Not only must you manage content or data with the MAM, but also the metadata, the data that describes the data itself. If you compare data to a family photograph, the metadata is the information written on the back of the photograph to describe where and when the photo was taken, who is in the photo, relationships, and so on. This information can be as important as the photo itself. Without the context of the metadata, the importance of the original photograph is lost over time.

The same is true for digital content creation. You must know the details of all steps of the content workflow, from ingest to editing and transcoding to final playout. You also need to provide information giving context to the content.

There are two general metadata categories: automatically created, and manually created. On the automated side, today's cameras provide a tremendous amount of data about the video or images they create. Aperture, frame rate, shutter speed, and so on are all automatically captured. Non-Linear Editing (NLE) software also provides a tremendous amount of automated metadata that is captured by MAM systems.

Manually creating descriptive metadata provides the opportunity to gather detailed information about what is occurring onscreen, as opposed to technical or operational metadata. This detail can include information about characters, onscreen actions, and scene breaks. For example, if you want to know which actors take part in a fast-paced car chase or who utters a poignant phrase of dialog in a dramatic scene, you would need to create the descriptive metadata manually.

A robust MAM can capture all this metadata, automatic and manual, and provide tools for searching and research, product development, and analytics that distributors, movie houses, cable companies, and viewers can use to enhance their viewing experience.

Increased metadata creation puts pressure on the storage infrastructure as much as—or even more than—the actual content itself. Having a scalable, object-oriented storage system with a powerful MAM is critical for modern digital content creation.

Conclusion

The ever-growing explosion of data in the Media and Entertainment industry puts stress on existing production and storage infrastructures, requiring a MAM to track all content, data, and metadata generated at every step of the workflow. One answer to the problem is to use a cloud-compatible MAM, which allows a hybrid cloud solution with local, on-premises storage managing raw content and content in mid-production. This critical component keeps content close and accessible so that you can reduce production times and improve workflow efficiency.

Integrating with external cloud providers, like AWS, provides the efficiency of finalizing any content for various methods of consumption and distribution, and a hybrid cloud solution relieves the stress by implementing the ActiveScale system in conjunction with a cloud-compliant media asset manager.

The ActiveScale system delivers excellent TCO with a high density, lower power footprint, compared to legacy systems. The system is easy to deploy and has near limitless scale that allows for increased capacity and performance in line with data growth. Finally, the ActiveScale system is extremely resilient with up to 19 nines of data durability, with the ability to survive an entire data center outage.

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