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Collaborative Workflows Benefit from Cloud Storage

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The changing nature of rich media workflows

Professional media content is growing more complex and richer as stereoscopic and ever higher resolution images come to dominate the processed content. At the same time, budgets for storing and working on this content grow much slower while the turn-around time decreases. The result is an increased interest in leased rather than owned assets for video production as well as collaborative workflows that may span continents or even the world. Cloud storage offers a way to enable cost effective collaborative workflows that can meet many of the needs of the rich media industry.

What is cloud storage?

Remote hardware resources accessed through the internet are often referred to as being in the cloud. These resources can be under the control of a single enterprise with limited access and are then referred to as a private cloud. These hardware resources can also be available to a broader public in which case these assets are said to be in a public cloud. Many cloud implementations are a form of outsourcing where the hardware and most of the asset management software are located in an aggregated datacenter.   These shared resources can also be in an enterprise's own data center and under their direct control and management (many private clouds do this).   Hardware resources that can be shared in a cloud include computer processors, network communication channels and digital storage.

Modern hardware virtualization solutions have driven the growing use of hardware clouds. Hardware virtualization allows more efficient use of hardware assets. In the case of digital storage in the cloud, this virtualization as well as additional features, such as de-duplication, allow better storage system utilization, resulting in cost improvements and provide some performance benefits. These factors reduce the bandwidth demand for operations such as backup and can also reduce the recovery time for backup data. These concepts, developed originally for IT applications, may be ideal for some operations in modern digital workflows. Taken together, remote data centers with well-managed storage systems can achieve cost

efficiencies that are difficult to achieve with locally managed assets and can exhibit performance that may be as good or better as locally managed assets.

The role of cloud storage for collaborative workflows

Cloud storage is getting traction as a cost effective component in modern post-production workflows. While the latency of remote access through the internet may limit the use of cloud storage for direct creative editing, cloud storage can effectively be used for compute intensive operations such as rendering, transcoding, content distribution and working archives. Using out-sourced cloud storage, organizations can keep their media assets in a centralized managed repository and pay for storage capacity and management as the asset library grows. As discussed below, this can result in significant savings in operating costs, capital costs and storage management.

Assuming that the cloud storage provider does a good job of data protection and management—a critical feature for long term media assets-- cloud storage may be a cost effective solution for smaller (or larger) production facilities that cannot or do not want to invest in the complexity of local working archive storage infrastructure. Assets stored in cloud storage also offer advantages for workflows conducted across multiple time zones and locations since the content can be accessed anytime and anywhere. If a working archive is combined with long term storage technology and practices then this could be part of a true long term content archive.

Cloud providers may also offer remote compute services. This combination is very useful for cloud-based rendering as well as conforming and assembling content. Modern rendering requires the latest server, networking and storage devices and these expensive products are generally only needed for a short time during most video production projects. Thus leasing time on a cloud service makes a lot more sense than, for instance, buying and maintaining a state of the art rendering facility. Much of the rendering performed for professional media and entertainment content today is on leased rather than owned resources. Once the rendered content is in the cloud it makes sense to utilize secure web connections for content access and collaboration.

Encoding content and delivering that content is the path to content monetization. Storing and delivering content across the internet is one of the biggest uses of cloud-based storage. Nirvanix, one of the most out-spoken champions for video content in the clouds is used by a major Hollywood studio for their digital master content storage. **Figure 1** shows the relationship of local storage and digital content masters stored in the cloud. Lossless compressed content of over 1.7 petabytes is currently in this system, up from 40 TB a year ago. New content is being added at the rate of about 7 TB/day.

The Storage Delivery Network (SDN) that Nirvanix provides can be used for content access by authenticated parties from anywhere in the world. This allows working on and repurposing these assets for various workflow activities or for local distribution.

Figure 1. Cloud-based Media Asset Management System at a Major Hollywood Studio
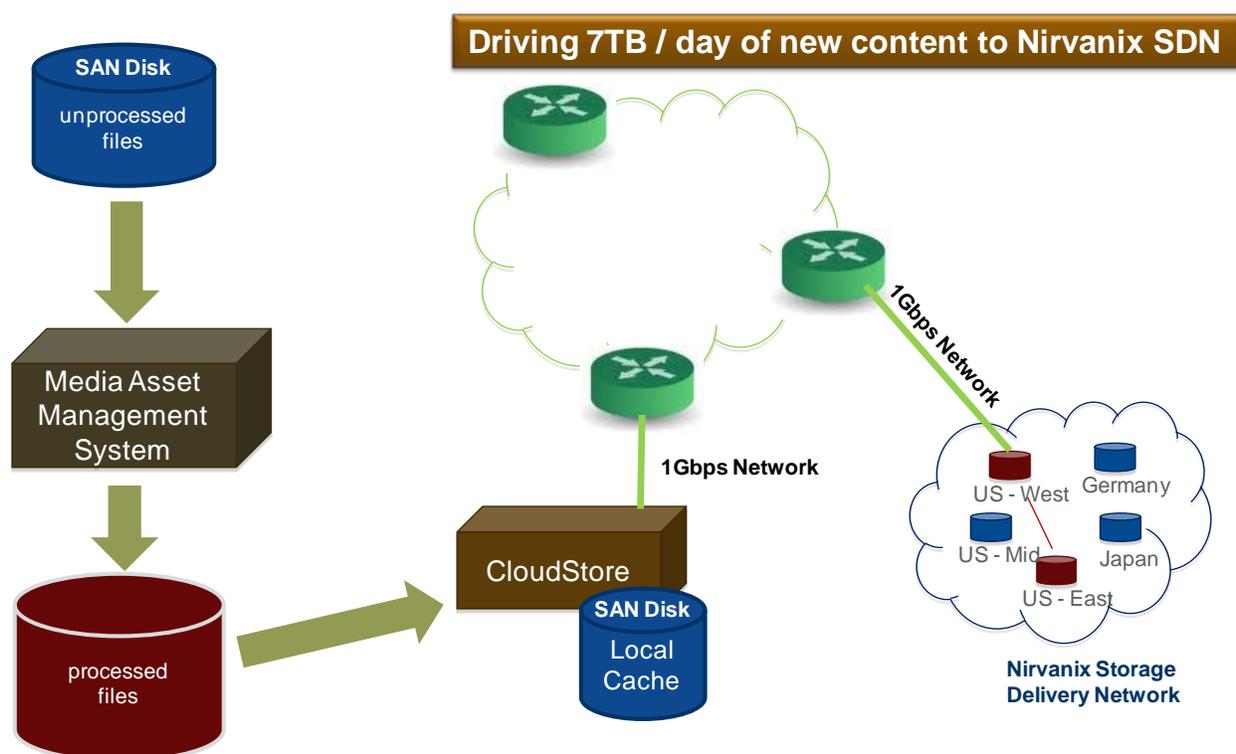
Savings in collaborative workflows using cloud assets

As discussed earlier there are many ways that leased digital storage in the cloud can be used to improve production performance and reduce the costs of modern video workflows. Maintaining a local storage infrastructure means paying the costs of those assets even when they aren't being used, as well as upgrading these assets on a regular basis. **Table 1** gives some comparisons of leased cloud based vs. local owned storage assets.

The costs of cloud storage today can be in the range of $0.14-$0.15/GB per month (depending upon performance and uptime requirements). This includes all the costs of maintaining this storage including content deduplication or compression (if desired). The cost of cloud storage can be less than the costs of buying and maintaining a local storage infrastructure for modern digital workflows.

In addition having digital assets available on-line in cloud storage makes the use of these assets in collaborative workflows (say reviewing of rendered content between Hollywood and London, much faster than shipping Blu-ray discs through Fedex). By speeding up secure access and deployment of media assets, content owners can speed up their workflows as well as content processing for monetization. Thus direct cost and opportunity cost advantages may be achieved by the use of cloud storage assets

Table 1. Comparison of Cloud Storage vs. Local Owned Storage

	Local Owned Storage	Leased Cloud Storage
Maintenance of storage (operating costs and capital spending)	Studio responsibility	Leased company responsibility
Rendering and other high performance applications	High maintenance and capital costs to meet evolving needs of HD stereoscopic content	Pay for use of rendering and other high performance resources when needed
Collaborative sharing of content	Physical distribution of tapes, discs or HDDs	Electronic access and same day download of content
Disaster recovery and production insurance bonding	Requires multiple physical media in remote locations	Could be one use of a cloud storage facility (combined with local copies)
Working archive for content distribution and monetization	Requires owning and maintaining the archive and content distribution assets	Could be an element of a cloud storage solution—feeds into a CDN

Conclusions

Richer and more complex stereoscopic content is becoming the norm in modern digital video workflows. At the same time production schedules are compressed and costs tightly controlled. The use of leased remote storage assets may offer several ways of improving critical elements of the digital workflow while providing cost effective solutions that help speed content development through collaborative processes and easy and secure access and repurposing of content. This results in savings during production as well as new opportunities for rapid content monetization.

About the author

Tom Coughlin, President, Coughlin Associates is a widely respected storage analyst and consultant. He has over 30 years in the data storage industry with multiple engineering and management positions at high profile companies.

Dr. Coughlin has many publications and six patents to his credit. Tom is also the author of **Digital Storage in Consumer Electronics: The Essential Guide**, which was published by Newnes Press in March 2008. Coughlin Associates provides market and technology analysis (including reports on several digital storage technologies and applications and a newsletter) as well as Digital Storage Technical Consulting services. He is the author of the much quoted ***Digital Storage for Media and Entertainment Report***.

Tom is active with SMPTE, IDEMA, SNIA, the IEEE Magnetics Society, IEEE CE Society, and other professional organizations. Tom is the founder and organizer of the annual Storage Visions Conference (www.storagevisions.com), a partner to the annual Consumer Electronics Show as well as the annual Creative Storage Conference (www.creativestorage.org). Tom is also the chairman of the annual Flash Memory Summit. He is a Leader in the Gerson Lehrman Group Councils of Advisors and a member of the Consultants Network of Silicon Valley (CNSV). For more information go to www.tomcoughlin.com.