

WHITEPAPER

It's Cloud Time Folks

Accelerating the adoption of the Cloud in media & broadcast industry

Overview

Cloud computing provides broadcast companies the opportunity to have virtually unlimited scalability for meeting peak demands in processing the growing size and complexity of digital content. Broadcast companies can leverage the cloud in addition to their own datacenters for meeting their variable needs. Broadcast companies can address a number of constraints that a traditional IT infrastructure presents to the content management and distribution supply chain by using the cloud for selected digital supply chain processes - transcoding, file transfer, vault services and so forth. By adopting a hybrid approach broadcasters can have an agile IT infrastructure with enhanced processing capability that enables them to server their customers better at reduced costs.

The Cloud in action

Broadcast, studio and entertainment companies are under increasing pressure to automate manual processes and make their digital supply chain more integrated and efficient. The cloud presents an important opportunity for them to do so. Managing the hardware costs to handle and process hundreds of gigabytes of media data is quite a significant challenge. Media files are huge, and the amount of computing power needed to process and distribute these files is variable – characterized by spikes of activity that may be followed by periods of inactivity or lower volume. Even though such peaks may only occur sporadically, the infrastructure must size up to support those peaks leading to a significant cost drain. Unavailability of such resources when needed can be detrimental – a company may not be able to process orders in time, resulting in poor customer service or the inability to make new deals.

The use of cloud computing services enable broadcasters to have virtually unlimited storage capacity and process digital media files on a pay-as-you-go basis, from remote locations using a global network. Though a base set of technologies and processing capabilities continues to reside within a company's datacenter, the cloud allows users to augment in-house capabilities. The cloud provides broadcast companies access to vast technology resources via the Internet thereby giving them the option of instant scalability at a fraction of the cost of buying hardware resources. The cloud can support specific activities such as transcoding, watermarking, content security, metadata and other value-added services by enabling end-to-end processing on an as-needed basis.

Cloud computing can also improve a company's agility and responsiveness. While hardware acquisition can be a lengthy and complex process, the cloud can instantly provide the resources required to deal with spikes in demand. A key success factor for broadcast companies will be identifying processes in the digital supply chain that can leverage the cloud. What's critical for broadcast, studio and entertainment companies is to bear in mind that cloud computing offers the flexibility needed to address their challenges when it comes to variable or ad-hoc spikes

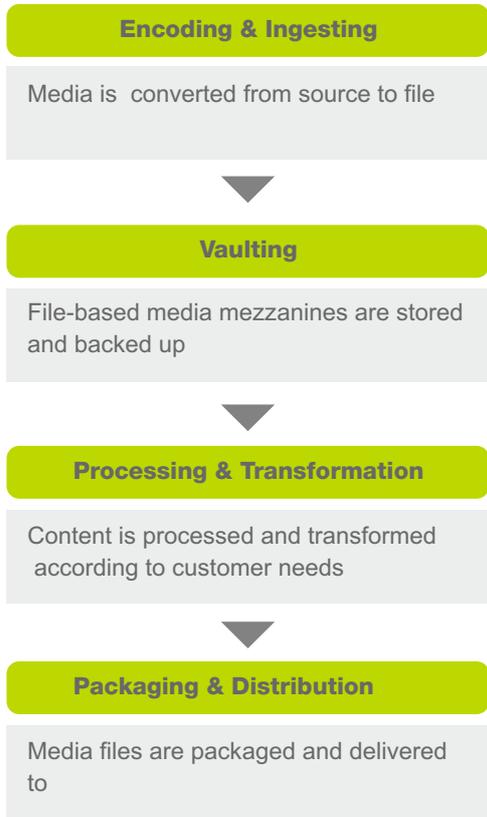
Energizing the digital supply chain

The past few years have brought an explosion in media distribution channels and devices for broadcast, studio and entertainment companies. This proliferation of new channels and devices has made media suppliers relook the way media is created, distributed and consumed. The growth of service-oriented architecture (SOA), as well as advances in network, storage and processing technologies, have given rise to a new kind of supply chain with automated, file-based processes instead of time-consuming and costly manual ones.

Most companies' legacy media processing operations have limited scale efficiencies and can rapidly become overstretched by the increased operational effort needed to deliver tailored digital content. The digital supply chain, by contrast, represents an opportunity to create a highly efficient processing environment, characterized by streamlined steps and processes (see chart below), minimized use of physical media, increased visibility into storing and sharing of content, and a commitment to high quality, from creation through consumption. This digital environment also emphasizes high security and traceability. With a highly efficient digital supply chain, companies can strike superior or even exclusive deals because of their unique ability to serve their customers quickly and efficiently.

Source: PWC IT Outsourcing and Cloud Computing Survey

How does a digital supply chain work?



The digital supply chain consists of the following steps:

Encoding and ingesting

The first step in the digital supply chain is encoding and ingesting. Media is encoded from myriad sources to a high-resolution, file-based copy. The automation of the encoding process is a challenging task, as human intervention is required to transfer physical media into the encoding workstation. Once the media has been converted to a file, it is enhanced with metadata and ingested in a digital vault.

Vaulting

The second step in the digital supply chain is vaulting. In this, the digital source copy is transferred from the encoding facility to a digital vault, which is measured in many petabytes of data. This large storage area is usually architected as a tiered storage pool from which files are retrieved for servicing customers. Industry analysts believe that such data load is bound to increase in future.

Content processing and transformation

The third step in the digital supply chain is content processing and transformation. Typical content processing and transformation may involve transcoding, watermarking, cropping, overlays or any other content transformation operations that can be automated from digital source material.

Packaging and distribution

The last step is packaging & distribution. The final media file is packaged with the appropriate metadata for delivery to the customer. Delivery takes place over a network with business customers typically spread across the globe.

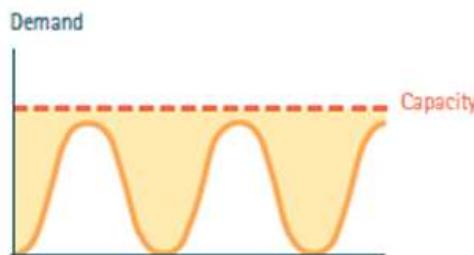
Challenges faced by Broadcasters

Both content transformation and distribution steps within the digital supply chain are driven by customer demand that tends to be volatile and difficult to predict. On a slow day an average of 100 gigabytes of data may be processed; on busy days, a company may need to deal with as much as 20 times that amount. Content transformation relies heavily on processing resources to perform operations such as transcoding, watermarking and content processing. The distribution step requires storage and network bandwidth to stage and serve customers orders over the network.

Bandwidth requirements too are highly variable. There may be periods where utilization is low followed by spikes of high activity. For example, content processing may sit idle for several hours while the system is waiting for orders to come in. When a big order arrives, a large pool of processing resources is required within a matter of minutes. (See figure below)

Underutilization of Resources

Peaks and valleys pose a financial challenge to the digital supply chain. The system needs



to be scaled for peak load in order to support the business. (See Figure) For a broadcaster who is managing its digital media infrastructure internally, these IT constraints may translate directly into large capital expenditures for resources that may remain underutilized during periods of inaction. These fluctuations in demand caused by orders that are larger than anticipated, may place the business at significant risk. The business may lose credibility (and money) when orders

cannot be processed on time due to slower and inefficient manual processes.

**Production collaboration in the cloud –
The Shrek saga**

One exciting example of cloud computing’s potential for content production is its use in the development of the box-office smash animated feature “Shrek the Third.” DreamWorks Animation essentially created the film “in the cloud” using HP’s Halo Collaboration Studio offering.

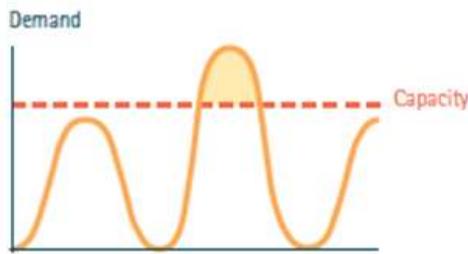
DreamWorks Animation used the cloud to connect “Shrek the Third” teams in Glendale and Redwood City, Calif., as well as international team members, enabling them to review computer-generated characters. The innovative technologies made available through the cloud allowed DreamWorks Animation teams to work more collaboratively, while saving time and travel costs, helping DreamWorks achieve its goal of producing two animated films per year.

Enabling Digital freedom through the cloud

In the broadcast, studio and entertainment industry consumer need is a clear driver for cloud adoption. As the viewing habits change from month to month, the delivery methods have to constantly maintain the pace. With new distribution methods forming the primary source of future revenue growth, business leaders in the broadcast industry are keen to explore new and innovative ways of delivering content.

Consumers frequently access content via networks. This translates into an increase in IP usage that requires greater hardware access. In fact, as broadband connectivity at home becomes a standard, consumers are calling for more flexibility in concurrent viewing options. People want content available on multiple platforms and through any device – watching television in one room, gaming in another, and listening to online radio in another demands a centralized system and an upgrade in IP-based processing that can only be efficiently achieved with cloud technology.

Unexpected peak in demand



Planning for peak demand becomes further complicated by the fact that new customers constantly enter the market and technology evolves quickly. This variable nature of demand makes it extremely difficult for broadcasters to forecast how much capacity will be required to process media orders in the future. The situation leads to either under or over allocation of infrastructure resources.

With the demand for digital media continuing to grow at a rapid pace, broadcasting companies will need to expand their IT infrastructure with constant upgrades to their existing infrastructure.

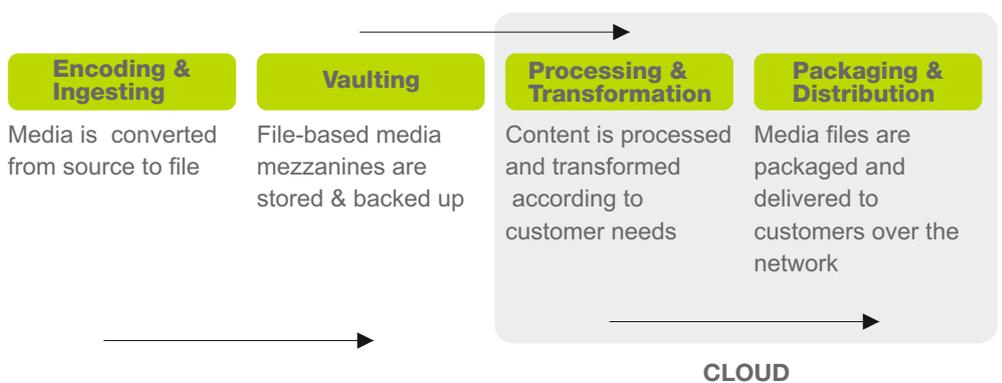
The digital supply chain requires IT capabilities that depend on complex technologies with high acquisition costs. The typical supply chain infrastructure consists of a tiered storage infrastructure with storage area network (SAN) and tape libraries, large storage pools, fast outbound and inbound network connections, and multiple processing servers. The high costs associated with setting up an in-house infrastructure often prevent many broadcasters from effectively transitioning to a digital supply chain. Here is where the cloud can provide the much-needed agility and a cost effective proposition to the broadcasting companies.

Hopping on to the Cloud

The digital supply chain continues to be an important step forward in optimizing processes and reducing costs for broadcast, studio and entertainment companies. Maintaining an in-house digital media infrastructure can however prove to be an expensive way forward with ineffective IT utilization, increased business risk and high costs.

Broadcasters should, therefore, seriously look at cloud computing as the way to augment selected processing capabilities during peak periods. (See Figure below) Using cloud computing on an on-demand basis has the potential to deliver a host of important potential benefits:

Opportunities for leveraging the cloud for selected digital supply chain processes



Content Syndication through the Cloud

With digital demand that rises and falls in unpredictable cycles, distribution demands are surpassing realistic hardware capacity. This is particularly evident in the case of User Generated Content – especially video – whose storage requirements dwarf professionally produced content. At the same time, the task of reformatting content, whether from analog to digital or for a new digital distribution channel, is a time consuming manual task that could be automated with the right amount of on-demand computing power. Content syndication options can have a profound effect on a broadcaster’s ability to serve its audience. If a ‘local’ news item suddenly goes national or international, then the ability to serve an unexpected global audience quickly is something a broadcaster needs to provision for.

Social networking and online events are yet another area that battle against bandwidth during processing and bandwidth peak usage. Online audience engagement mechanisms can have a similar effect; voting for reality shows and web-based interactive audience participation has an ability to cause audience spikes and corresponding digital data spikes. Cloud computing is uniquely suited to address these challenges and meet demand for increased computing power during these periods.

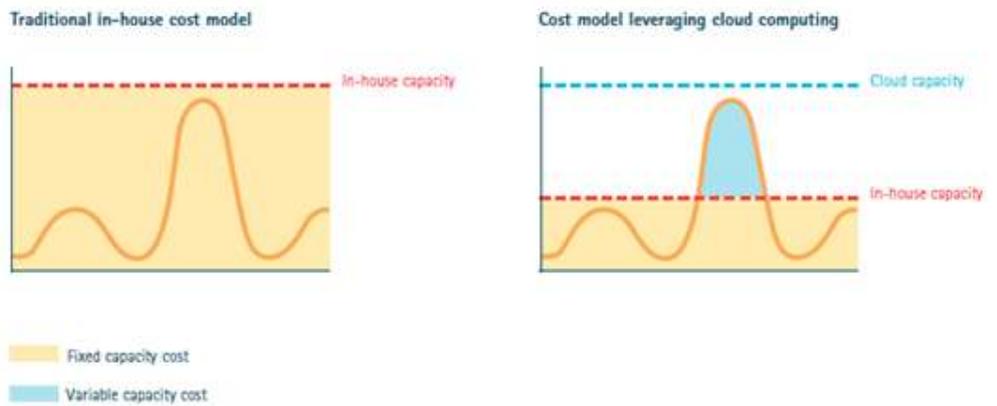
The governing principles of cloud computing specify that flexibility, manageability and control are brought to the frontline of IT services delivery. As media becomes increasingly digital in both upstream (technologies used by the broadcaster) and downstream (technologies used by consumers) areas, the most efficient way to build agility and controllability into the IT back end is to employ virtualized, cloud-based hosted technology power.

Instant and unlimited access to a virtual infrastructure

The cloud provides virtually unlimited amount of computing resources on a moment’s notice – procuring and decommissioning infrastructure resources in a variable manner. Cloud computing with its “pay-as-you-use” model allows broadcasters to simply add or subtract server units from their account; in times of peak activity they need only to ramp up their cloud space to meet demand for computing power.

The impact on cost is significant. For example, a company can decide to launch 100 servers with 8 CPUs for two hours and only pay for 200 hours of computing time. For the equivalent cost of running a single server on the company’s own site, a company can run 100 servers on the cloud.

Comparison of traditional in-house approaches vs. hybrid cloud models



Broadcast, studio and entertainment companies need to fulfill peak demand quickly and efficiently. The cloud provides a way to meet that need quickly and at less cost, while simultaneously providing the organization with greater flexibility to support growth.

Greater agility

The cloud makes the availability of computing resources much faster than the traditional hardware procurement cycle. For example, the time needed to procure and configure the hardware needed to process peak data loads is regularly measured in months. In the cloud, such capacity can be acquired in minutes. The availability of nearly unlimited infrastructure resources means that a digital supply chain infrastructure can adapt much faster to changes in demand.

Decreased operational burden

A cloud computing platform abstracts the lower level infrastructure resources away from the customer by providing access to a virtualized environment that runs on top of a physical environment operated by the cloud service provider. These virtualized computing resources are managed directly by the customer through Webservices. The customer does not deal directly with the platform’s hardware environment and thus does not need to worry about lower-level concerns such as hardware maintenance and upgrades, datacenter expansion or any other overhead that comes with running a datacenter. This kind of abstraction not only hides complexity, but also shifts both the operational and risk burden away from the customer to the cloud provider. (See Figure below)

The Cloud gives a boost to animation and post production activities

The color and imagery of leading-edge animation dazzle audiences, especially in high-definition and emerging 3D formats. However, these formats require increased processing power, the costs for which can be substantial.

Cloud computing-based animation solutions offer an alternative to the significant capital investment that studios have to make in animation gear. Post production processes offer similar opportunities. Review of a typical booking sheet in a post house is likely to reveal that some technologies are used consistently, while other items are needed specifically because a particular production wants them.

The use of pay-as-you-go and the service-based nature of cloud solutions can be an attractive proposition for both animation and post production. Cloud solutions have the ability to reduce traditional capital investment headaches for post companies. Establishing a cloud environment can allow producers to focus more on drawing in creative talent, when it's needed. It may also allow them to invest more in assembling a higher-quality creative team. They can also focus on optimizing processes and workflow to deliver creative result rapidly and cost-effectively, without having to worry about or compromise around the technology investment that sits behind it.

The Cloud can help in storage and distribution
Cloud computing provides a powerful platform for content storage and distribution and can help with disaster recovery. Keeping a broadcast on air in the event of a disaster can be challenging. With cloud based disaster recovery services, the broadcaster can keep backup far enough away to be safe from the original incident, yet close enough for staff to access it easily. The resiliency provided by the cloud can make the difference in keeping an outage from disappointing and driving off viewers and affecting the business adversely.

Large, global production companies can benefit from the cloud by "virtualizing" their production space. These companies can transfer their production resources to the cloud and transmit them to different play-out centers, as and when required.

In-house operations vs. cloud operations

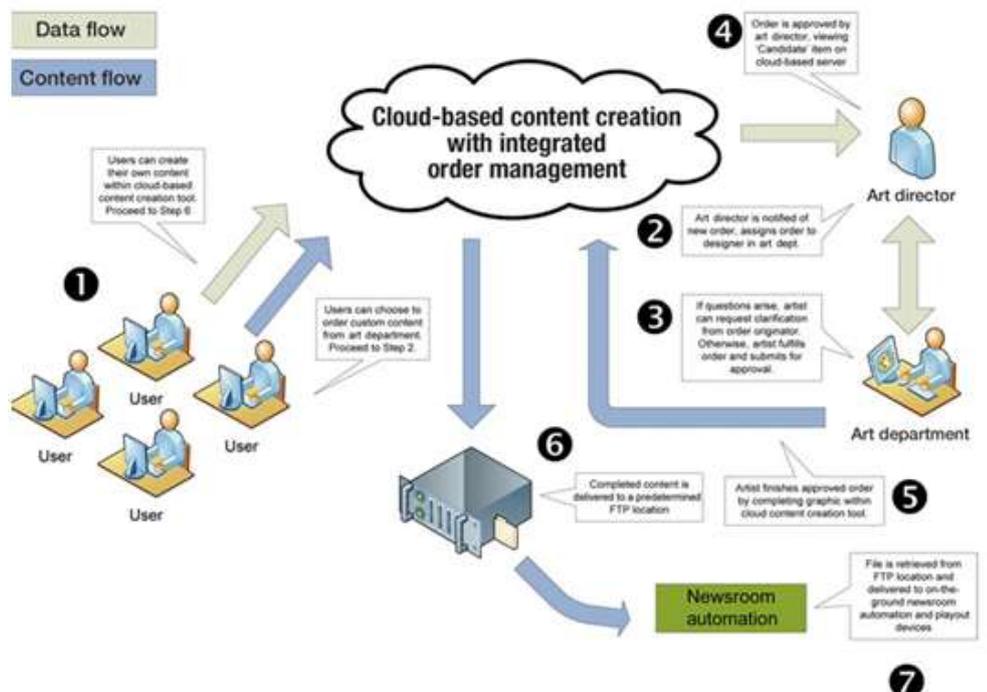


Other Benefits

Enhance creative collaboration and workflow integration

The cloud helps enhance creative collaboration and use of creative talent. Entertainment companies can make the cloud the focal point for creative collaboration, allowing them to more easily schedule, organize, and assemble teams of freelance talent.

Workflow integration through the cloud



The workflow diagram above illustrates how users at different locations can join forces effectively, working simultaneously and in parallel to fulfill an order or complete a project. In this case, media companies can maximize the value and efficiency of their staff by applying the right talent to the right job. Or, when staff at one location is stressed, the company can prevent bottlenecks by bringing personnel from other sites onboard. Tracking of media, metadata, users and projects from beginning to end, regardless of their location, helps to ensure that content is finished and taken to air on schedule. These capabilities aren't unique to the cloud, but it can be very difficult to achieve this agility with "on-the-ground" software.

Epilogue

For the broadcast, studio and entertainment companies, cloud computing can prove to be a boon as it enables the next generation of the digital supply chain. With an elastic digital media infrastructure that can expand or contract as needed, cloud computing in a digital media environment can help companies scale whenever needed to meet peak demands. The cloud can also dramatically lower their costs, improve process speeds and provide a differentiated capability that can help them grow their market share. The media industry stands to benefit from the agility and flexibility that the cloud offers and can adapt to the ever-changing market conditions faster.

Companies that intend to stay ahead of their competition need to consider the possible constraints of their traditional, in-house digital media infrastructure – which may not effectively deal with unforeseen demand peaks, nor with future growth and technology change. Cloud computing has the potential to address many of these companies' ongoing needs.

Even though challenges exist, cloud computing is an important part of the foundation for future digital supply chain platforms. The cloud can help broadcasters to capitalize on this powerful technology resource to reengineer their operations and launch new business models.

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