Media management in the cloud

Media companies' increasing use of cloud storage and software services threatens to create bandwidth bottlenecks, but a new breed of super-fast internet file transfer can help. Stephen Cousins reports

Conventional licensed software is evolving into cloud-based delivery over the Internet, driven by the popularity of applications such as Software as a Service (SaaS), Platform as a Service and Infrastructure as a Service and accessed via on-cloud service platforms like Amazon Web Services, Microsoft Azure and Google Cloud Compute.

As data-intensive sectors like Media and Entertainment increasingly migrate to off-premises solutions, data ingest becomes a significant challenge because large files must be relayed, often from multiple locations worldwide for use in time-sensitive applications, but conventional internet file transfer can be slow and unreliable.

Latency and packet loss are a major obstacle to long distance file transfers over conventional internet protocols. As a result, many businesses have chosen to adopt UDP (User Datagram Protocol)-based solutions that operates outside the traditional network overhead to significantly ramp up file transfer speeds.

The cutting edge UDP-based software technology FASP was developed by IBM Aspera to cut through broadband bottlenecks and achieve transfer speeds up to hundreds of times faster than traditional FTP.

The technology provides the foundation for the Aspera on Cloud platform, making it possible to shift large volumes of data regardless of file size, transfer distance and network conditions. Video processing company Encoding.com uses Aspera's solution to migrate high-volume production video workflows from media companies to its AWS-based cloud platform and back out again.

Jeff Malkin, president of cloud media processing service Encoding.com, told CSI: "We process and deliver files to CDNs, cable head-ends and other syndicated video hosting platforms. Moving large and valuable video assets through the public internet can be very slow and has security risks. Using Aspera, customers can deliver valuable video content fast and securely to our platform. The speed of overall video workflow, including file ingest, queue times, processing time and egress is critical for many large media and entertainment companies."

Other media and entertainment companies working with IBM Aspera include Netflix, Universal Pictures, BT, Channel 4, Deluxe Digital Solutions, Australian Broadcasting Corporation, and Media Corp.

Overcoming latency and packet loss

Multiple shifting dynamics in the media and entertainment industry are driving the need for faster file transfer over the internet. Video files continue to increase in size as content producers and distributors promote higher quality formats, using High Dynamic Range and larger frame sizes such as 4k and UHD.

The transition towards a highly decentralised and distributed model has resulted in a dramatic increase in the locations where content is produced, processed and distributed, increasing uptake of more readily available cloud-based storage and processing.

Jay Migliaccio, offering manager, Aspera on Cloud at IBM Aspera told CSI: "There are multiple trends at play, including the switch from physical to digital distribution and production, the dramatic increase in firms that are able to produce, thanks to the internet, and the globalisation of production. Those trends are firmly in place so more horsepower is needed to move files around."

Files transfers over the internet have traditionally relied on popular TCP-based protocols, including FTP/S, SFTP and HTTP/S, which facilitate communication between a web server and an operating system to organise how files are moved up or down stream.

TCP was introduced in the 1970s and has proved ideal for applications, such as email or web surfing, but when large file sizes are being sent longer distances a fundamental flaw is exposed. If the TCP layer in the OS (responsible for ensuring the reliable delivery of packets of data) detects that a packet has not arrived, a bespoke algorithm causes it to 'throttle back', retransmitting packets at a much slower rate, before slowly increasing that rate.

In the highly congested conditions of today's Internet, where busy routers and multiple network stages increase latency and packet loss, TCP retransmission can dramatically slowdown transfers.

"Packet loss and congestion are a reality in the public internet today, but we shouldn't have to let that slow down transfer rates. Aspera created FASP as a fool-proof high speed communications protocol to move bytes across the internet," says Migliaccio.

Aspera's FASP protocol harnesses UDP to send packets at high speeds, however it cannot confirm if packets arrive safely. To do that, an extra layer of authentication and security is added to guarantee the timely delivery of every packet.

Aspera On Cloud has been a game changer for film distribution company Bitcine, which embedded the solution into its products used to move files into and out of AWS S3 storage. Colin Carter, Founder and CEO of Bitcine told CSI:"We deal with files that are hundreds of gigabytes in size, so conventional transfer options aren't even a viable option. Key advantages are the increase in transfer speed, auto-resume functions, and resiliency to poor quality connections."

Another satisfied customer is Silver Trak Digital, which aggregates content for many large SVOD/OTT platforms. According to company COO Christian Christiansen, the ability to increase bandwidth during peak demand times using Aspera on Cloud is critical: "We operate a Mobile Application Management SaaS in the cloud where the bandwidth requirements are decided by how many files clients upload, download, and/or deliver. The ability to spin up Aspera On Cloud instances to meet demand is essential in providing a good service," he says

Media use cases

Use of Aspera on Cloud is mostly being driven by media customers via three key use cases. Content producers send video content back and forth for editing; content distributors, often with massive libraries, transfer licensed content to customers in markets worldwide. The third batch of users are SaaS vendors that QA and transform video into different formats, for example transcoding a master format into a format suitable for TV or OTT broadcast in different countries, or other asset management tools.

Cloud transfer offerings have had to evolve in recent years from the simple movement of files from a PC to a virtual machine, to enable files to interface with a plethora of services currently exploited by media users.

Aspera on Cloud is based on a versatile software-based architecture that can be installed on any standard operating system. It is able to connect to users' on-premises servers and those of all major cloud storage services and SaaS providers. The platform supports the full gamut of rich metadata available in object-based cloud storage and is constantly updated to reflect new additions.

Innovation at the core of FASP has enabled Aspera to expand into new transfer territory, says Migliaccio: "This year our focus is on adding automation to the platform, most of our customers have been asking how to automate different aspects to add efficiencies into their workflows. This is something we have included in our on-premises software stack for a while, so extending that concept up into the cloud is a natural progression."

The Cloud offers opportunities to use different events as triggers to automate tasks. For example, when a file is uploaded to cloud storage, the start of the transfer can be an event that triggers the next stage in the file's journey, such as delivery to its final destination, or communication with a SaaS application that will review or process it. An event could trigger an API call to any third party service to process the content.

Encoding.com is already providing support for this handy feature. Content owners with an Aspera High-Speed Transfer Server can utilise the Encoding.com API to automate the transfer of files from the source location to the firms processing centers, as well as deliver encoded content to specific destinations.

Aspera is injecting innovation into the live streaming space, which faces similar challenges in terms of guaranteeing speed and performance over long distances. Production teams require fast turnarounds to send live video, monitor, edit, and QA it and then re-publish the content for consumption by a downstream consumer audience. Dedicated fiber or satellite connections are a fast, but expensive option, FASP streaming over the public internet could offer a cheaper and more effective alternative.

Aspera's first major live streaming test case saw FOX Sports stream live footage from the World Cup in Russia to editors in LA to live edit clips then re-publish as highlights on news channels. The production was so successful the broadcaster is looking to expand its use in future live events.

"Live streaming opens up numerous opportunities for major broadcasters," says Migliaccio. "It goes back to the subject of decentralised production and the ability to cover live events anywhere in the world without need to license expensive transmission technologies. Although people aren't likely to switch off satellites that have worked fine for the past 10 years, there will definitely be more tests in this exciting area."

As the cloud continues to evolve and media companies seek to take advantage of its scalable and cost-effective services, fast file transfer will play an increasingly vital role in supporting its future success. **csi**