FROST & SULLIVAN

Hype versus Substance: Getting Smart about Cloud-based Transcoding

Winning strategies for harnessing virtualization to power your OTT business

A Frost & Sullivan White Paper

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INTRODUCTION 3

5 MYTHS OF CLOUD-BASED TRANSCODING SOLUTIONS 4

Myth 1: Throughput and Quality are Mutually Conflicting Goals 4

Myth 2: SaaS is Not Suitable for Broadcast-Quality Workflows 4

Myth 3: All Cloud-Based Transcoders Are Essentially the Same 4

Myth 4: On-Premises Is More Cost-Effective For Larger Service Providers 5

Myth 5: End-To-End Cloud Workflows Impose Vendor Lock-In 5

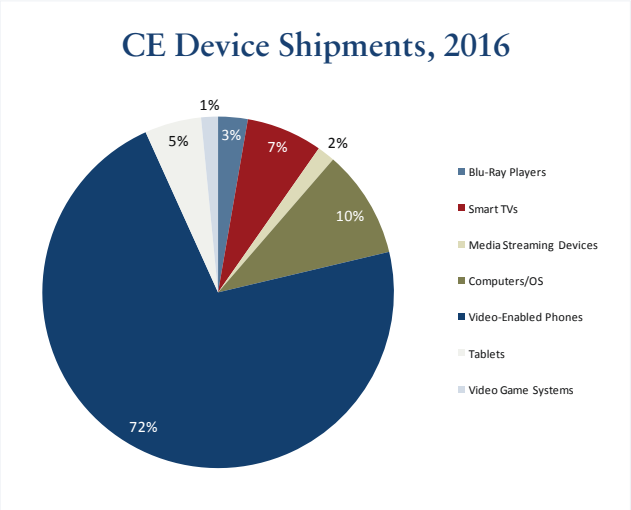
BEST PRACTICES IN CLOUD TRANSCODING VENDOR SELECTION 7

SOLUTION BRIEF: BITMOVIN 8

CONCLUSION 9

INTRODUCTION

Pay TV service operators and broadcasters fully understand that OTT and TVE are the keys to continued user engagement and service/revenue growth. Frost & Sullivan forecasts that SVOD subscriptions will double from more than 500 million accounts in 2015 to over 1 billion by 2021.[1] Over half of US broadband households currently subscribe to at least one online video-on-demand service. OTT-capable consumer device sales will grow from 2.9 billion units in 2016 to 3.5 billion units by 2021, even as set-top box sales hover around the 250 million unit mark . Per-capita online video consumption is growing steadily worldwide by every metric. Adobe's Q1 2016 Digital Video Benchmark Report, for example, showed a 107% year-over-year increase in authenticated video viewing. CDN customers expect traffic to grow 85% in 2016.[2] In high-growth markets like India, OTT revenue is expected to grow at a CAGR of more than 30% over the next five years, as more than 66 million unique connected video viewers begin to buy into paid OTT services that only serve 1.3 million customers today.[3]



The implication of these surging numbers is that the volume of content that will be brought online—across movies, on-demand television, catch-up TV, live linear broadcasts and special events—will correspondingly skyrocket. Growth in video processing volume to serve device-based consumption will far outpace managed workflow growth. Accordingly, all content companies will need to expand their transcoding and streaming workflow capacity to manage more fragmented and complex formats, encompass a wider range of technologies, and accommodate rapidly growing volume while lowering turnaround times to support instant gratification expectations. Adding another dimension to the challenge is growth in DRM-secured video, increasingly using HTML5 with MPEG-DASH and encrypted media extensions.

The need for leveraging cloud-based infrastructure to build out these workflows is well understood. In contrast to in-house deployments, cloud workflows offer benefits like high reliability, easy scalability, rapid spin-up and spin-down, as well as favorable OPEX versus CAPEX tradeoffs. Content companies also benefit from having a partner to help them stay ahead of unpredictable technology curves, so they can focus on their core competencies. On the heels of this widespread acceptance of cloud-based workflows, there is a crowd of vendors rushing to provide solutions. These sound equivalently compelling and comprehensive in theory, but not all cloud-based transcoding companies are created equal. Content companies need to become savvy consumers of modern workflow solutions and the transcoding functionality at their heart. This paper sheds light on common myths and misperceptions regarding cloud-based transcoding solutions, while providing best-practice guidelines to selecting a winning cloud-based solution.

1. Source: Frost & Sullivan internal research
2. Current State of the CDN Market, Dan Rayburn, May 2016
3. http://www.frost.com/c/10107/sublib/display-report.do?id=P93A-01-00-00-00

5 MYTHS OF CLOUD-BASED TRANSCODING SOLUTIONS

Myth 1: Throughput and Quality are Mutually Conflicting Goals

Transcoding appliances have traditionally suffered from computational limitations, which inherently force tradeoffs between latency, throughput and video quality. Maximizing quality while minimizing latency has typically required sophisticated algorithms supported by specialized processors, which increases cost and often reduces density. In the cloud, however, one can intelligently harness CPU cores to overcome this trade-off. Higher quality is no longer tied to slower processing times; workflows can now deliver high-speed, high-quality transcoding at a reasonable cost. Best-in-class cloud vendors are architecting solutions from the ground up to be optimized for the cloud, thereby delivering premium quality video with highly accelerated throughput rates.

Throughput will gain rapidly in importance over the coming year[4] as content volumes increase in three dimensions: more titles and hours of video transcoded, higher resolutions of video, and rise in immersive applications such as virtual reality. At the same time, quality will continue to serve as a competitive differentiator among services with mostly equivalent content libraries. Therefore, achieving the highest possible throughput while maintaining video quality gives content companies definite advantages in delivering best-in-class OTT services.

Myth 2: SaaS is Not Suitable for Broadcast-quality Workflows

In the early days of SaaS transcoding, there was an abundance of low-cost solutions that were primarily intended for use in fault-tolerant applications such as offline batch encoding jobs. Today's applications demand that OTT transcoding workflows achieve parity with traditional live linear broadcast workflows in terms of quality, reliability and uptime. We have found limited confidence from broadcasters and Pay TV service operators that newer, smaller vendors of SaaS solutions can successfully deliver production-grade SLAs and broadcast-quality QoE. In reality, modern SaaS platforms can in fact meet online broadcast application needs, in terms of volume, scalability, quality of experience and reliability.

While low-cost, low-end solutions abound, select vendors are combining cloud engineering expertise and state-of-the-art video processing algorithms to deliver highly competitive cloud-based transcoding solutions. Live and file workflows can both be handled at production-grade quality and reliability in the cloud today. Vendors such as Bitmovin go one step further by way of redundancy and flexibility, diversifying their system across multiple cloud infrastructures and multiple regions. Accordingly, they can offer levels of reliability that exceed on-premises capabilities for most content businesses and with much greater cost efficiency.

Myth 3: All Cloud-based Transcoders are Essentially the Same

On the surface, most cloud-based transcoders seem to be essentially the same. They support AVC video and AAC audio compression from sub-SD to HD resolution; support ABR transcoding and packaging into HLS, HDS and DASH; run on Amazon Web Services; provide handoff interfaces to Akamai and other popular CDNs; and charge based on similar metrics of usage. Many leverage open libraries such as X.264 or FF-MPEG. While this makes all solutions seem equivalent on the surface, there is a big difference between solutions architected from the ground up for the cloud and solutions ported into the cloud on an ad-hoc basis. Moreover, the core codec at the heart of the workflow matters, as it directly determines the quality and performance of the end-to-end solution. While it is quick, cheap and functional to simply take FF-MPEG and throw it on a server, this cannot deliver the performance, reliability or speed of a carefully crafted cloud-based solution.

4. Business Benefits of High-speed Transcoding: https://bitmovin.com/speed-encoder-comparison/

Furthermore, cloud-based workflows need to be scalable into the future. From this perspective, domain expertise of the vendor matters; their technical team must be capable of staying ahead of technical trends, they must know how to process and deliver content to global audiences, and they must serve as trusted partners in meeting anti-piracy requirements as well as ensuring compliance with broadcast regulations. As with all television workflows, the devil is intricately tangled in the details and the smallest glitches can undermine a service. When vendor teams deeply understand the technology and end-to-end ecosystem, they can proactively anticipate and iron out potential issues to ensure the service will run smoothly over time and continue to delight subscribers and viewers.

Myth 4: On-premises is More Cost Effective for Larger Service Providers

The economic argument for cloud-based workflows is often centered on CAPEX versus OPEX considerations. From this narrow perspective, we often see the misperception that long-term cost of ownership is more favorable for virtualized operations in in-house data centers rather than leveraging SaaS options. However, a broader view is necessary to realistically compare costs. Firstly, a private "cloud" is never really infinite. Data center capacity is limited even for the largest operators, and keeping pace with growing content volumes and throughput demands eventually becomes difficult if not impossible. Additionally, even larger programmers or operators find it challenging to acquire, maintain and continuously retrain in-house technical expertise.

As middle ground, licensing a virtualized platform for in-house deployment under a dev-ops model is a viable option for some operators. In the long run, however, considerations such as media storage space, cross-company and remote-team collaboration, data ingest/egress charges and peak load management all provide compelling reasons to move all processing into the cloud. Additional benefits include higher agility, lower service expansion costs and ease of global content delivery.

Myth 5: End-to-end Cloud Workflows Impose Vendor Lock-in

In speaking with operators, we often hear the concern that using end-to-end virtualized workflows from a third-party vendor will result in lock-in and lack of flexibility in the long term. Operators are also concerned that operating expenses may increase over time, with pricing power in the hands of vendors who are deeply embedded into company operations and are difficult to dislodge. This fear is reasonable, since lock-in resulting from proprietary interfaces has been an issue in broadcast engineering.

However, vendors of modern cloud-based solutions now incorporate open APIs and enable mix-and-match of individual components from various vendors across an end-to-end workflow. Going one step further, a growing number of cloud workflow providers are now compatible with multiple public cloud infrastructure-as-a-service offerings such as Amazon Web Services, Microsoft Azure and Google Cloud, so operators are not even locked into a particular cloud provider. Moreover, serious transcoding SaaS vendors will offer reliable handoff to all major CDNs and can typically offer preferred pricing for most CDNs. This discounted pricing is especially valuable to smaller operators or content providers who would not have the power to negotiate such discounts on their own.

CASE STUDY

The Customer

Flimmit is an Austrian VOD service, first established in 2007. In the spring of 2015, Austrian public broadcaster ORF relaunched the service with an expanded content line-up and a refreshed user experience.

The Customer

Flimmit had been using a home-grown cloud solution based on FF-MPEG and running on AWS for its existing service. Assets were stored on S3 and content was delivered using RTMPe and HTTPS. For the next generation of the service, the company would need to transcode nearly 4000 titles. The company also wanted to transition to HTTP-based streaming using HLS and MPEG-DASH.

The Choices

Flimmit had to choose between continuing to develop and maintain its home-grown solution or to partner with a commercial solution provider. Intensifying competition, content quality and long-term agility were important requirements. The need for a longer-term partner, to help the service stay ahead of changing streaming technologies and device platforms, was also clear. Flimmit also needed to choose one among several potential vendors. When making its choice, the company prioritized throughput, richness of APIs, and technology competence of the vendor's team. Bitmovin's easy-to-use API combined with extended encoding settings, quick-start API for easy use, simple user interface, broad format support and fast transcoding speed all contributed to its selection as Flimmit's vendor of choice.

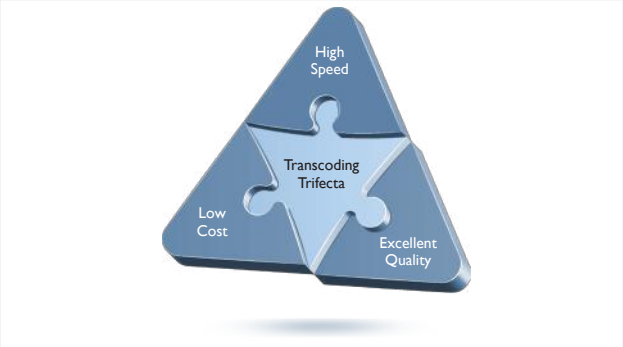
The Solution

Flimmit chose to control Bitmovin's Cloud Encoding service via APIs; Bitmovin's simple yet powerful APIs allowed the Flimmit team to create its interface very quickly. Bitmovin's packaging, encryption and manifest generation features eliminated the need for an origin server or JIT packager, further reducing costs and increasing speed. Owing to Bitmovin's ultra-fast transcoding, all 4000 titles were transcoded into MPEG-DASH and HLS within a few weeks, with excellent video quality. Thus, the new service was up and running quickly. Bitmovin provided the handoff to Akamai, one of its CDN partners. Bitmovin's Adaptive Streaming HTML5 player ensured seamless playback on all devices; the player's skin generator allowed Flimmit to customize style and controls to match its brand and user interface requirements.

BEST PRACTICES IN CLOUD TRANSCODING VENDOR SELECTION

As cloud becomes a buzzword and OTT video volumes soar, the industry is chock full of commoditized solutions. Self-styled as end-to-end TVE solutions, most of these simplistically combine a virtualized transcoder, support for mainstream codecs and streaming formats, some configuration features and handoff to major CDNs. While these solutions aim to pass for the sum total of a professional transcoding solution, these features are in fact just table stakes for any OTT transcoding application.

These basic solutions are fine for experimental or low-volume deployments, but they are not suitable to handle full-fledged, broadcast-quality, multi-screen applications. The key question for such applications is not just whether the solutions support these features, but how it supports them and at what cost. An ideal OTT transcoding solution must simultaneously deliver low-cost, high-speed and agile scalability. Any OTT service provider should consider the following aspects when selecting a cloud transcoding vendor.



Speed and Throughput: Achieving the fastest possible encoding and transcoding is arguably the most game-changing requirement for video services today, as operators struggle to minimize latency in between broadcast and catch-up availability. Managing ever-expanding content libraries amidst ever-growing format fragmentation is also heavily reliant on increased transcoding throughput. Service providers such as the BBC and the New York Times have published case studies on the challenges of bringing the latest news and live broadcasts to the Web as quickly as possible—transcoding speed within existing infrastructure is the most important factor in meeting this challenge.[5] Transcoding speed is important in maximizing quality and minimizing costs for file and live applications alike; it is also important when expanding an existing library to support a new format or resolution.

Transcoding Quality: Too often, operators need to sacrifice visual quality in order to meet throughput or latency targets. As services become more competitive, it is no longer possible to compromise on visual quality. Fortunately, state-of-the-art solutions today deliver excellent visual quality alongside fast throughput and production-grade workflow reliability.

Match Core Competencies to Your Application Needs: For any transcoding applications, the devil is inevitably in the details. Small glitches or tiny inefficiencies can make or break a service. Not all vendors are equally adept at all use cases and applications. When evaluating vendor core competencies, pay close attention to support for file versus live workflows; local versus global delivery; SVOD, TVOD or AVOD models; DRM protection requirements; and so forth.

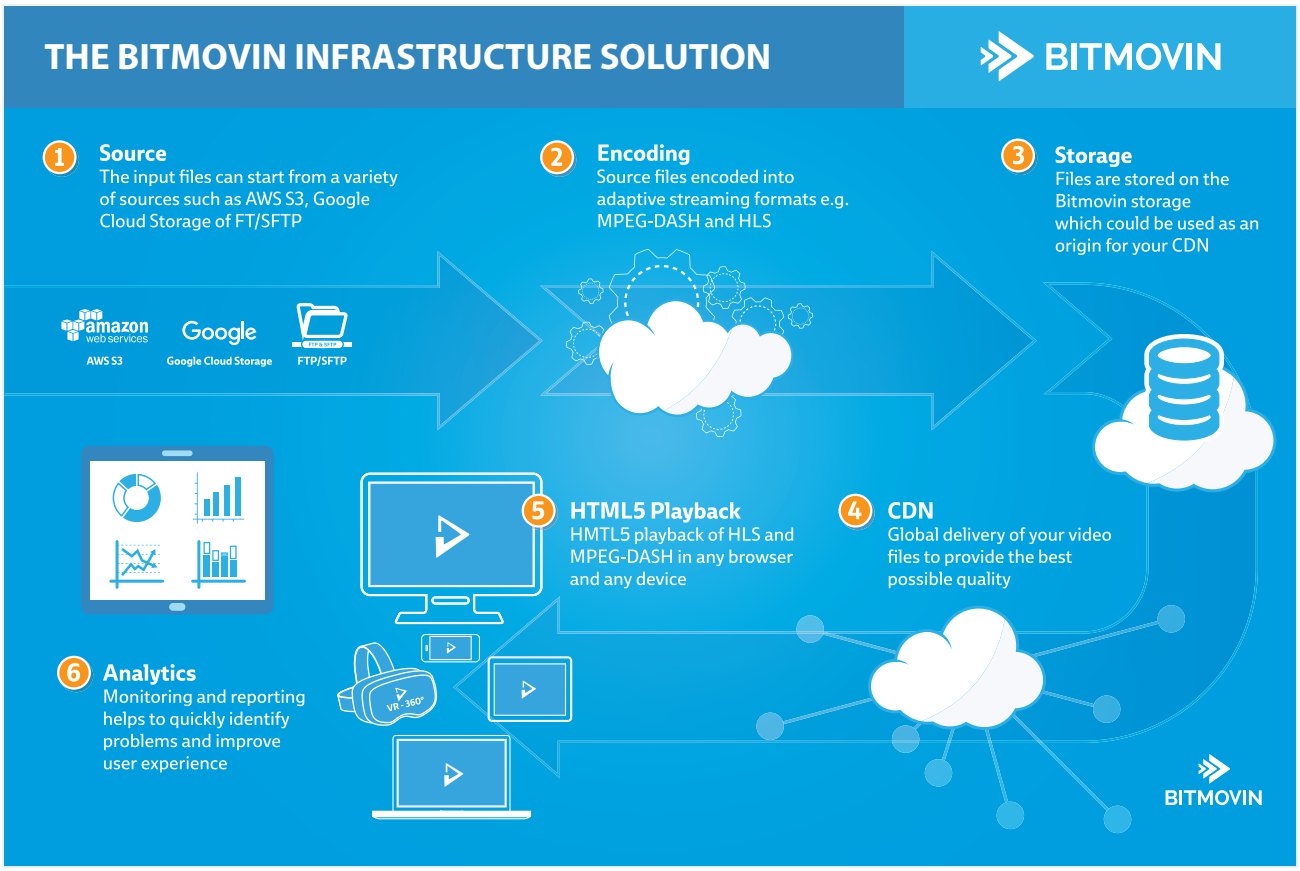
As services transition away from legacy technologies like Flash and SmoothStreaming toward MPEG-DASH, your vendor should be able to work with you to figure out specifics and provide guidance. Solution flexibility is also important, as every content company has a particular way of managing its content and service. The workflow solution should gel with your in-house way of doing things and should be flexible enough to adapt to your business, not the other way around.

5. https://bitmovin.com/speed-encoder-comparison/

Tactical and Strategic: Operators should look not only for the best price/performance value proposition today, but for a team that will keep you ahead in the game in the long run. Vendors should be able to demonstrate a proven track record of successful deployments that have scaled and evolved well over time. Feature richness when it comes to new formats such as MPEG-DASH, HLS, CMAF, EME and WAVE, as well as state-of-the-art support for new codecs, is an important long-term concern. Solutions that can evolve to support new formats and codecs without the need for additional origin servers or just-in-time packages offer better future-proof scalability and agility than more rigid, fixed-function solutions.

SOLUTION BRIEF: BITMOVIN

Bitmovin was founded in 2013 by the co-creators of the MPEG-DASH video streaming standard. The company exemplifies the best practices advocated above for a successful video encoding and delivery solution. The company's end-to-end video infrastructure API simplifies the development and delivery of web-based video, including live, VOD, 360, and virtual reality. The solution boasts extremely fast video transcoding, together with integrations into various storage and content delivery network (CDN) providers. Bitmovin combines every component in the adaptive streaming video encoding and playback workflow—encoding, playback, analytics, storage and content delivery—into one single management interface, but does not lock users into a one-size-fits-all solution.



Content providers, broadcasters, integrators and developers can combine any part of the new Bitmovin API, or utilize the whole Bitmovin offering, with their existing video infrastructure. Major online video providers such as Ooyala, RTL and Technicolor already use this API in their production environments. The solution supports a rich variety of input formats and key ABR formats, including HLS and MPEG-DASH.

CONCLUSION

- Cloud and virtualized are buzzwords, and many vendors are jumping on that bandwagon. However, not all solutions are equivalent, and misinformed decisions can result in operational challenges and customer dissatisfaction.

- Choices are made harder by lack of clarity around changing requirements, which is in stark contrast to the stable predictability of traditional broadcast workflows. The tech landscape for streaming video can seem like a confusing alphabet soup of acronyms, such as HLS, DASH, CMAF, WAVE, EME, HTML5, DRM, CENC, AVC and HEVC.

- In this environment of buzzword bingo, all available solutions sound like they are providing more or less the same thing. Getting smart about evaluating and choosing solutions, not just for the short term but for the long term, is essential. A good solution will reduce complexity, reduce time to market, increase agility and provide future-proof protection as customers move toward DRM-secured workflows of premium, high-resolution content.

- Cloud solutions excel when they combine excellence in video technology, expertise in streaming to devices, and virtualized-first design paradigm. The best vendors of cloud-based solutions are companies that architect components and design solutions from the ground up to run optimally in the cloud.

- The magic of the cloud is that when harnessed effectively, it can simultaneously deliver high speed, high quality and high reliability—along with agility and massive scalability. Although this is easier said than done, select vendors in the market today are delivering this ideal mix, and OTT service providers stand to benefit significantly from their solutions.

NEXT STEPS

Schedule a meeting with our global team to experience our thought leadership and to integrate your ideas, opportunities and challenges into the discussion.

Interested in learning more about the topics covered in this white paper? Call us at 877.GoFrost and reference the paper you're interested in. We'll have an analyst get in touch with you.

Attend one of our **Growth Innovation & Leadership (GIL)** events to unearth hidden growth opportunities.

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