Measuring Video Quality and Its Impact to Your Bottom Line

A Customer Innovation Story
with WUAKI.TV, a Rakuten company

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Delivering Quality Online Video Streaming Impacts the Bottom Line

Whether a company is a broadcaster delivering over-the-top (OTT) services, a pure-play OTT provider, or a telco delivering online video for commercial gain, it is likely finding it increasingly difficult to stand apart from the competition. With little separating one service from another in terms of programming and even pricing, video streaming quality and a stellar user experience on every device are becoming key differentiators. That means the mandate for these businesses is ensuring the best quality video delivery and fast, uninterrupted experiences on all devices anywhere – and doing so cost effectively. As Jordi Miró, CTO for Wuaki.tv explains "We are committed to enabling an exemplary experience every time, on every device: if our video player does not work well and satisfy consumer expectations, customers will not return".

The reality is that experience and quality are first-mover advantages. To that end, most OTT providers prioritize their investments in areas such as delivering high-definition video, stereo sound, and application usability to satisfy consumer expectations. However, in the process, they often underestimate the challenge of delivering quality video, and by doing so, they may be overlooking a prime opportunity to set themselves apart from the competition.

The consumer market has been forgiving to date around issues such as video buffering. Today's mass majority, however, is accustomed to sophisticated multimedia experiences in various formats and venues. As a result, today's consumers do not care about the reasons that the quality of an OTT service is less than optimal – they only care about having an immersive and uninterrupted video streaming experience.

This paper, which has been jointly developed by Akamai and Wuaki.tv — an OTT service provider — covers the importance of satisfying viewer expectations for a broadcast-quality experience by quickly and reliably streaming video online. It explains why it is challenging to do so and outlines best practices for online video delivery. It also explores the option of splitting traffic across multiple content delivery networks (CDNs) versus tightly integrating video player technology with a single CDN in order to improve online video delivery in a strategic manner. Finally, the paper shows how Wuaki.tv chose the latter option and boosted customer retention, customer referrals, and revenues as a result.

Analyst firm Ovum projects worldwide revenues from OTT digital video to reach $20.6 billion by 2019. – Ovum, The Outlook for OTT Digital Video

Video-on-demand traffic is projected to triple by 2015, reaching the equivalent of 3 billion DVDs per month crossing the Internet. – Cisco Visual Networking Index: Forecast and Methodology, 2010-2015

The ubiquity of online video has raised viewer expectations to the point that high-quality video streaming is expected on virtually any device with an Internet connection. This expectation is not limited to certain content: it applies to all content accessed on any device, anywhere, no matter the screen, platform or network connection.

The Value of Quality Video Delivery

Video on demand (VOD) is quickly becoming a key part of our entertainment mix – especially on smart TVs. "…OTT (over-the-top) VOD services are making serious headway as technical rollouts continue and consumer attitudes evolve to embrace IP-delivered content."[1] But as consumers start to pay for access to online video, they expect a broadcast-quality experience. Just as they have long shown little tolerance for poor retail experiences online, they show frustration with poorly designed user interfaces for VOD sites (on any device), slow or sluggish access to online video, and poor quality playback. In fact, research by Accenture shows that 83% of digital consumers get annoyed when experiencing TV interruptions due to poor Internet broadband connections at home.[2] A poor streaming experience in today's hyperconnected world can have devastating effects. With so many options at their fingertips, consumers are quick to abandon a negative viewing experience – minimizing the likelihood that they'll give the service a second chance.

Akamai's own research shows that viewers will abandon a video stream if startup takes longer than two seconds, and for every additional second of delay, roughly another 6% of the audience leaves. In other words, fast startup time is critical for online video. With a 5-second delay, a service provider may lose a quarter of its audience, and with a 10-second delay, nearly half the audience. This means a few seconds of delay can cost significant amounts of potential revenue, not to mention irreparable harm to the brand. More positively, research from Akamai has shown that the higher the quality of online video, the more viewer engagement increases. Simply increasing video delivery from 2.1Mbps to 2.7Mbps has shown to increase viewer engagement by 30% or more.
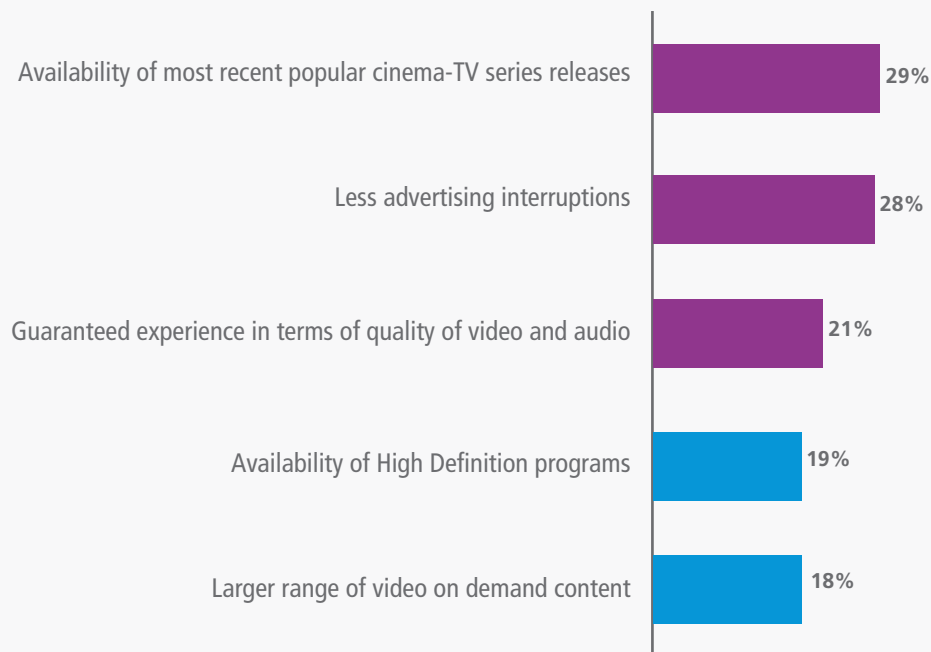
Whether OTT companies offer subscription video on demand (SVOD) or transactional video on demand (TVOD), OTT providers need to deliver high-quality streaming video in order to remain relevant in the new market. This need to deliver broadcast-quality content is spurred by numerous trends, including the propensity to watch premium video on smart TVs and the growth of USB services/connected devices. As OTT services start to replace traditional broadcast subscription services, viewers expect the same level of quality.

That means OTT service providers must ensure that their videos play without fail, starting up quickly and playing without interruption. It's no wonder broadcasters now pay attention to different metrics. "Not long ago, broadcasters were concerned with page views, visits, and app downloads. Now they study viewability, average minutes per audience, and total audience engagement."[3]

In return for their investment in video stream quality, OTT providers can expect lower viewer abandonment, higher viewer engagement, and a greater percentage of repeat viewers, yielding higher revenues.

The 4 P's of future media

- *Push/Pull: Broadcasters need to push their content to every screen, so that viewers can pull what they want easily.*

- *Personalization: Serving targeted content is the future.*

- *Portability: Over-the-top streaming to every device must be a priority now. – source: Adobe Explains the 4 P's of Digital Television and OTT Video, http://www.onlinevideo. net/2015/03/adobe-explains-the-4-ps-of-digital-television-and-ott-video/#ixzz3iWCFWyT4*

Availability of most recent popular cinema-TV series releases	29%
Less advertising interruptions	28%
Guaranteed experience in terms of quality of video and audio	21%
Availability of High Definition programs	19%
Larger range of video on demand content	18%

Source: 2015 Accenture Digital Consumer Survey
Sample base: respondents over 18years old accessing long form video content N=20268

Figure 1: Top 5 facts that will encourage users to pay for a long form video content service ober the Internet

Why It's Difficult to Deliver Premium Content Online

The same Internet delivery challenges that have plagued organizations across industries for years are hampering efforts to consistently deliver broadcast-quality video online. According to an IDC consumer research survey, smooth playback is the single most important attribute for a better online viewing experience. Today, many OTT services are prone to video re-buffering because of the unpredictable nature of the Internet and last-mile bandwidth connectivity to the consumer device. As IP video is poised to drive an unprecedented surge in bandwidth usage by 2018, OTT video providers face even more challenges – and uncertainty.

In an attempt to overcome these challenges, some OTT providers choose to split their traffic delivery amongst multiple telecom carriers. But as the example of Netflix illustrates, this approach does not necessarily guarantee quality streaming video delivery. Even after Netflix contracted with both Comcast and Verizon for higher network performance, "many Netflix users in the U.S. and around the world noticed a steady decline in streaming video quality." Some subscribers experienced video that constantly buffered and was heavily pixelated.In essence, Netflix had "outgrown its allotted bandwidth, and… [its] traffic… [was] being throttled by ISPs and core network operators."[5]

Online video will be the fastest growing residential Internet service, with a CAGR of 10% from 2013-2018, growing from 1.2 billion users to 1.9 billion users by 2018…
IP video will be 79% of all IP traffic by 2018, up from 66% in 2013[4].
- Rapid TV News, Content and engineering: the driving force behind Internet video.

A Media Workflow Gatepoint Research survey found that improving the consumer video experience was rated the top priority by content owners.

This type of arrangement could ultimately lead to dire consequences for an OTT provider. After all, Akamai research shows that viewers who experience a streaming video failure are significantly less likely to return to a site. Specifically, only 8.2% of viewers will return to a site within the first day after experiencing a video failure, compared to 11.2% who return after a normal, non-failure visit.

Some OTT providers also try to address online video delivery challenges by using analytics to identify and fix delivery issues. They may also control traffic delivery based on consumer viewing habits and trends. However, most *video analytics* tools do not deliver insight into the factors that drive viewer engagement and cause abandonment. As a result, these businesses are making strategic decisions based on faulty assumptions.

Others try to optimize the preparation of their assets in hopes of optimizing online video delivery. However, this measure cannot address inherent Internet issues. Moreover, it's virtually impossible for any single OTT provider to keep pace with the variety of existing and new devices and platforms being used by customers.

How an OTT Distributor Improved Quality – and Boosted Business

Wuaki.tv, a market-leading provider of on-demand media, effectively addressed the challenge of delivering quality video streaming online by working strategically and collaboratively with Akamai. Wuaki.tv sources content across a range of major content distributors – from Hollywood studios to local players – enabling it to offer one of the largest catalogs of relevant, engaging video content across Europe.

As Jordi explains,"offering the best possible content and new services for our target audience on a well-designed, high-performing platform is essential to business success. But none of these matter if the quality isn't there."

To that end, Wuaki.tv established a quality metric for its OTT service and is now able to directly link improvements in online video quality to business and commercial success. Historically, Wuaki.tv had implemented a multi-CDN strategy. It hosted its own origin and used multiple CDNs for delivery to ensure a level of autonomy and business continuity. As they analyzed the contributing factors to poor KPI metrics, it found the interdependencies and inconsistencies between different suppliers to be a primary factor and so turned to Akamai for help.

Akamai's Professional Services organization reviewed the delivery workflow with Wuaki.tv and identified a number of areas impacting performance variables such as startup time, video re-buffering, and average throughput. Moreover, by creating a tight coupling between delivery and Wuaki's player, Akamai was ultimately able to significantly improve the quality of video streams. This was accomplished through numerous optimizations, including:

1. **Implementing Akamai NetStorage for origin storage.** Wuaki.tv has a large catalogue with a long tail of assets. Akamai and Wuaki.tv found that requests for content by viewers were often heading back to Wuaki.tv's S3 origin and that the round-trip time (RTT) was causing inconsistent performance for end users.

> ***Adaptive bitrate streaming*** *enables end users to experience faster video startup times and reduced or eliminated rebuffering delays while enjoying the highest-quality video viewing experience possible. In essence, each viewer's video stream bitrate adapts in real time to performance conditions like network latency, available bandwidth, and even local device processing capability.*

Akamai's NetStorage environment is designed specifically to be widely distributed and better connected for video delivery. As such, when requests for content are made they are fulfilled more quickly, which reduces the RTT. Akamai also put in place an optimized tiered distribution configuration designed to ensure that more content would sit on an Akamai edge server, reducing the number of requests back to origin and further reducing the RTT for requests that had to be made.

2. **Reconfiguring HTTP Dynamic Streaming traffic to ensure a tight coupling between Wuaki's player and Akamai's content delivery network**. Wuaki.tv end users experienced playback failures for content longer than 4 hours. This was caused by the way video content was being dynamically packaged and the size of the manifest file.

Wuaki.tv changed its output files to a flat, unsegmented container and installed Akamai's player plugin to ensure the regeneration of a segmented manifest on the Edge server. This optimization enabled Akamai to pre-fetch video segments before they were requested, further improving the quality of the video stream.

The Akamai flash plug-in is an extension of its media player framework and integrates Akamai software into a video player. This significantly improves the server to client connection and video playback. Like most CDN's, Akamai supports a standards-based approach for resolving and responding to content requests. The AMP plug-in, however, is optimized to improve actions such as time to connect and enables pre-fetching of content into the local cache. Using client software allows Akamai to significantly improve the quality and consistency of the video playback session.

Wuaki.tv also measured the key online video quality criteria tracked by Akamai – startup time, video buffering, video processing ratio, and video start failures – to develop business KPIs around quality of service and experience. The company tracks these KPIs across devices on a daily basis, benchmarking against industry standards in seven regions across Europe.

The optimizations implemented by Wuaki.tv and Akamai improved its quality KPIs by over 60%. As Jordi explains, "after delivering its OTT video via Akamai's *video CDN*, Wuaki.tv experienced a 60% improvement in these KPIs, yielding a 25% increase in customer satisfaction and a 30% increase in revenues. Moreover, the company has seen a rise in customer advocacy around its services."

Committed to continually improving its OTT service, Wuaki.tv worked with *Akamai Professional Services* to further configure its origin infrastructure, Digital Rights Management, and transcoding. Professional Services also helped Wuaki.tv package, process, and validate content to optimize delivery for different platforms and devices.

"By engaging Akamai's experienced consultants and tightly integrating with a single content delivery network, we were able to dramatically improve our online video quality and ensure the best playback for customers," says Jordi.

Conclusion: High-Quality Video – A Differentiator Today, A Must-Have Tomorrow

As the OTT market matures — and with higher quality online video formats becoming the norm (for example, 4K and UltraHD) — the industry needs to rethink how it operates. Quality streaming video delivery has a direct impact on repeat business, revenues, and consumer advocacy. While the stakes are high, so too are the challenges — namely Internet congestion and latency along with delivery to multiple devices and platforms.

Today delivering a high-quality online video experience is a differentiator, but it will eventually become table stakes.

While multiple factors influence online video delivery, close and strategic integration with a select CDN provider can generate the most significant and positive impact, as demonstrated by the experience of Wuaki.tv. As Jordi explains, "Only through a highly strategic and tight integration and coupling of our video assets and our player technology with the Akamai Intelligent PlatformTM have we been able to considerably improve our video quality. This in turn has enabled us to satisfy viewers' demands and delight our customers."

Akamai is now looking to the future of online video streaming and is continuing to develop its hybrid technology for improving quality delivery. Its media client SDK facilitates accelerated delivery by intelligently using different protocols and techniques such as UDP, Multicast, Peer Assisted delivery, and Pre-Positioning. As these technologies are implemented, Akamai expects to further improve key metrics such startup time, rebuffering rates, average throughput, and an overall improvement in the quality of video experience.

By partnering with *Akamai for media and delivery solutions*, OTT providers are empowered to:

- Store and deliver online video over varying connection speeds and network quality and scale instantly to accommodate traffic for large events or occasions.
- Adapt video streams to multiple devices and formats without sacrificing quality.
- Protect online video content to ensure access by only the desired audience.
- Connect online video globally with audiences or target a specific segment.
- Monitor the quality of the video streams and user engagement.

In turn, they can ensure they are delivering the highest quality video streaming experience across all platforms and devices.

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