



SOLUTION BRIEF

VOD:

Optimizing Video Delivery For Higher Customer Satisfaction



# A new golden age of content puts the spotlight on quality

## QoE drives revenue

Whether at home or on a mobile device, users have grown to expect instant and smooth video playback at high bitrates. TV has given way to Over The Top (OTT) experiences, and isn't just for the living room anymore. And disruption continues through business models such as advertising-based video-on-demand (AVOD), transactional VOD (TVOD) and subscription VOD (SVOD). With a projected market size of \$120 billion by 2023, the stakes are high.



*Viewers watch 8 less minutes of a 30 minute video if rebuffer ratios exceed 0.2%*

OTT services must adapt their delivery approach to meet customer expectations in this new age of mass content consumption and prepare for 360-degree video, augmented reality, and virtual reality content.

Fast video start times (VST), low video start failures or exits (VSF), reduced rebuffer ratios, and low connection-induced rebuffer ratios (CIRR) and high average bitrates are critical to maximize Quality of Experience (QoE) KPIs; along with high average bitrates, they have the greatest impact on improving user engagement, and reducing churn. But OTT providers face an array of challenges brought on by the fast growing use of mobile devices and the wireless last mile. Slow VSTs drive users away from top-notch content. Rebuffering prevents steady playback. Lowered bitrates render videos unwatchable even when they do start.

Packet loss, packet corruption and jitter have a direct impact on these metrics by increasing latency and decreasing throughput. A connection that experiences as little as 2.5% packet loss can be slowed by over 10x. A mere 0.2% increase in rebuffer ratio is shown to reduce watch time by over 25% (i.e. viewers watch 8 less minutes of a 30 minute video).

Threshold-based server settings and incremental network improvements cannot solve playback problems including those of the wireless last mile. The Zycada Delivery Network is the only AI-powered solution that improves QoE and engagement rates by actively mitigating packet loss in real-time, learning usage behavior to dynamically adjust the network, and applying optimizations on a per-connection basis.

# Viewer experiences that rival reality require a new approach

## The impact of packet loss on video

All connections, wired and wireless, experience some amount of packet loss. But packet loss problems are much more prevalent with cellular and wireless connections. At Zycada, our studies have shown that the average packet loss for a wireless connection over a 24 hour period can be more than 5%, but in some cases (such as riding in a moving vehicle) it can even be significantly higher.



*By using AI to measure and combat packet loss in real-time at the connection level, Zycada keeps buffers full so viewers see more content with less interruptions.*

OTT businesses take the brunt of the blame for poor connection performance. DevOps may use local Points of Presence (PoPs) to bring content closer to users but these do not address packet loss. The reduction in throughput due to packet loss dramatically increases latency for the user, experienced as longer VST, increased rebuffer ratio and buffer-empty events, and lowered average bitrates. Increased latency leads to user churn very quickly. In contrast to a traditional delivery layer, Zycada's AI-powered delivery network successfully mitigates packet loss in real time reducing the potential for churn.

## Keep customers and audiences happy with Zycada Delivery Network

For SVOD providers, disrupting QoE due to slow VST or high rebuffer ratios leads to churn. For AVOD providers, poor VST and rebuffer ratios results in not delivering ad content from sponsors as well as contributing to video abandonment. For TVOD providers, a reputation for poor QoE will send audiences elsewhere, never to engage with the content to begin with. These risks, among others, threaten each type of VOD business, and content providers previously could only watch as audiences heaped blame on them for something completely out of their control. Until now.

The Zycada Delivery Network is built from the ground up to view networking from the point of the client device and not from the server. Instead of a one-size-fits-all approach to configuring the delivery network, Zycada uniquely fingerprints and manages every connection so each user gets the best possible experience for her individual client conditions. No code changes or SDK on either the client or the origin are required.

The wireless last mile experiences the most packet loss, and also experiences the greatest variance in packet loss rates. The transient nature of packet loss ensures predefined connection profiles will never be accurate. Zycada's optimizations, including packet loss mitigation, take place in real-time and span sockets, sessions, and domains from the client to the origin.

From the client to the origin, data travels through an unpredictable number of hops across many networks. Failures along the way contribute to latency, even if they are not caused by packet loss. Generally business attempt to bring content closer to users via Points of Presence (PoPs) to reduce latency. In reality, packet loss, round-trip-times, origin health and load all contribute to latency. Zycada’s multi-dimensional approach to optimization takes into account all variables contributing to latency. In this way, the Zycada Delivery Network offers enhancements to the customer experience that traditional delivery architectures cannot provide.

While mitigating packet loss, Zycada also enhances every step of the user flow to improve QoE compared to standard delivery architectures..

## Accelerate Video Start Times

With Zycada, streams start faster no matter how users are consuming the content. Zycada’s individual connection profiles combine with AI-powered real-time packet loss mitigation to minimize video start times and keep viewers engaged.

## Reduce Rebuffer Ratios

A mere 0.2% increase in rebuffer ratio is shown to reduce watch time by over 25%. Zycada proactively mitigates the underlying causes for buffer-empty events. By using AI to measure and combat packet loss in real-time at the connection level, Zycada keeps buffers full so viewers have higher engagement and improved QoE.

## Reduce Video Start Failures (VSF) and Exits Before Video Start (EBVS)

Worldwide, in Q2 2018 16% of all video stream attempts -- 3.1 billion streaming attempts -- resulted in a VSF or EBVS. Impacts of this magnitude directly influence revenue as well as QoE. It’s hard to please sponsors when significant numbers of viewers leave streams before they start. By reducing VST and EBVS, Zycada helps provide a high-quality service to customers.

## Increase Average Video Bitrate

Zycada goes beyond Adaptive Bitrate Streaming by utilizing AI-based, real-time characterization to immediately provide the best-possible bitrate stream to viewers. (ABS requires the video player to cycle through available bitrates until it reaches the highest the user can support.)

With Zycada, OTT services guarantee that viewers get the highest possible fidelity as quickly as possible.

Viewer user flow steps	With Zycada Delivery Network	Without Zycada Delivery Network
Visit the site or connect to the content provider’s app	The user connects through the optimal route and benefits from packet loss mitigation immediately so the page loads faster.	The delivery layer serves the initial page / loads content with no optimizations for packet loss.

Viewer user flow steps	With Zycada Delivery Network	Without Zycada Delivery Network
Select a video for playback	Zycada Stream Optimizer fingerprints the connection to the individual user, and computes the right bitrate and buffer length as the video streams. This enables Zycada to measure the end user bandwidth and find the optimal bit rate for the end user without the video player running a "greedy strategy." Zycada Stream Optimizer quickly achieves the optimal bitrate, decreasing VST.	The client uses a "greedy" strategy to attempt to deliver the best quality streaming video. The video player on the client looks for the best possible bitrate by starting from the highest bit rate, shifting down to lower bitrates as needed. In the process, it measures playback metrics after the video starts playing and then attempts to adjust parameters. During this entire time, the user experience is impacted.
Start watching, or if already watching: Use Play, Pause, Resume and Stop functions in the video player	Zycada characterizes connection parameters so that when the end user resumes, the content plays smoothly as fast as possible to reduce video start time and reduce or eliminate re-buffering events. Zycada continues to monitor the connection in real-time to ensure highest possible content quality is delivered for playback.	The delivery architecture just sends the content that is requested by the player without understanding the network constraints like packet-loss occurrence, bandwidth limitations etc. This can potentially result in delayed video start and increased rebuffer ratios/rebuffering events.
Search for a new show, or leave	Zycada processes the API responses, and proactively delivers them to the end user device.	The delivery layer can only consult its cache to speed up search results.

With Zycada, OTT providers have a detailed view of how network conditions impact latency and QoE. Performance data is delivered in real-time to the Zycada Management Console.

Additionally, Zycada's real-time metrics don't require any client side instrumentation and don't increase app size. This makes metrics collection immune to the user's device conditions; so if a phone loses its connection or the OTT app crashes, app developers will still receive the metrics. In contrast, DevOps are traditionally forced to rely on an in-app SDK or library to collect metrics.

With the Zycada Delivery Network, OTT viewers receive the best possible QoE, while app developers get more visibility into network performance than ever before. Ultimately this translates to less churn and hence more revenue for VOD businesses, especially those emphasizing mobile experiences, and future-proofs OTT services for new content formats.

## Next Steps:

Experience the Zycada difference for yourself. Zycada trials are quick and easy. [Or schedule a live demo](#). For more information, contact us at [info@zycada.com](mailto:info@zycada.com).