The Guide to Best Practices in PREMIUM VIDEO STREAMING

Part 4: Playback
To deliver superior user experiences, the challenges of variations in video attributes, adaptive algorithms, and other business-critical features must all be coordinated.

After addressing media delivery, online content providers have one more hurdle to clear in order to deliver the quality of experience consumers are looking for across all targeted devices. Successful premium over-the-top (OTT) video services must coordinate player software with content delivery network (CDN) intelligence to produce successful outcomes, backed by support teams that can help content providers keep everything on track in a highly fragmented, fast-changing marketplace.

To deliver superior user experiences, the challenges of variations in video attributes, adaptive algorithms, and other business-critical features must all be coordinated. Moreover, performance variations in access—and premises networks—have become a daunting challenge when it comes to achieving TV-caliber low-latency performance with distribution of live and linear 24/7 programming.

This piece examines the requirements for reliable media playback, the challenges of meeting them in different ecosystems and streaming environments, and what to look for when choosing media players.

Let’s explore phase four: PLAYBACK.
The Need for Better Playback

For providers of high-end video content, the transport mechanisms supporting viewing experiences need to match the quality consumers expect from TV. Even when mobile devices and monthly subscriptions are the primary modes for accessing video, providers should adhere to best practices that raise the bar on viewing experience.

A recent Akamai study conducted in association with Eurofins offered insight into the requirements for achieving an optimal viewing experience across different scenarios. Findings showed that delivering complex content such as sports or high action onto a large-screen TV requires a minimum of 6 Mbps to achieve an “excellent” visual rating, while smartphones require 2-3 Mbps.

For less complex content, optimal bit rates are lower; 2-4 Mbps will still deliver an excellent visual rating on large-screen TVs.

The reality is that consumers have less tolerance than ever for subpar performance with any type of video. Some key facts that show this changing tolerance include:

Viewer sensitivity to rebuffering: Consumers are sensitive to buffering delays, with even a 1% increase in buffering time leading to a 14-minute reduction in viewer engagement.¹

Steady video playback requirements: Variations in bitrates during playback can increase abandonment rates by as much as 400%. This applies to streams that shift to lower and higher bitrates.²

¹ Conviva viewer experience report
² Columbia University research
After assuring high-quality video delivery to the CDN edge, the question becomes “How does a content provider ensure there’s no slippage over the last mile?” The answer lies in using CDNs and media players that work together to extend transport mechanisms and maintain media quality all the way to the end user.

Three major transport mechanisms have emerged to support video streaming. Common Media Application Format (CMAF) requires special support from the CDN for chaining chunks and storing fragments, and the player needs to understand this newer format.

The Quick UDP Internet Connections (QUIC) protocol is an enhancement to user datagram protocol (UDP) transport that can increase throughput and utilization of end-user bandwidth. Some playback environments automatically include QUIC support (e.g., web browsers Chrome and Opera), but otherwise, QUIC may require special libraries for native applications.

Another development impacting best practices in last-mile distribution is growing support for Web Real-Time Communications (WebRTC), which works natively in browsers in conjunction with CDN support. This makes it possible to automatically establish peer-to-peer connections for streaming video and other data in real time.
Many factors impact users, ranging from basics, such as resolution and latency, to enhancements, such as closed captioning and dynamic advertising. Meanwhile, innovation and intense competition in an increasingly fragmented device environment have combined to greatly complicate how different functionalities perform on any given device. Players face a major challenge in identifying and orchestrating the capabilities associated with each device and operating system (OS) to produce the desired user experience (UX).

Android is the dominant OS in the mobile market, with global market share of 74%, compared to 20% using Apple iOS, according to Statcounter. However, fragmentation is a major disruption for Android devices, with more than half of them running versions more than two years old, according to Business Insider.

For example, variations in the Android OS dictate which browsers are compatible, whether they support advanced HTML5 video, and whether a common streaming format is supported by default. Even when HTTP Live Streaming (HLS) format is natively supported, playback may suffer from stalls, crashes, or poor rendering.

Complexities of Playback in the Online Video Marketplace
The New Benchmark for Media Players

These complexities can be addressed by using an advanced but lightweight media player that can support high-quality playback regardless of the situation. These players must be able to navigate device, OS, and protocol incompatibilities, as well as mitigate start failures, glitches in playback, and other unexpected behaviors.

In other words, the player must be able to do the following:

- **Determine the correct playback technology based on the codecs, containers, and streaming protocols supported by the device and its software**
- **Select an appropriate stream based on factors such as screen resolution, network speeds, and device capabilities**
- **Support streams utilizing both UDP-based and TCP transport depending on availability**
- **Execute all features of multiple media tracks compiled in manifest files, noting how those features are supported in any given stream across apps, media extensions, or browsers**

Furthermore, a complete player solution should incorporate business-critical requirements into its operation – both monetization and measurement. For monetization, integrated advertising support can span client-side and server-side advertising; pre-rolls, mid-rolls, and post-rolls; interactivity via VPAID; and the access of real-time inventory through header bidding.

For measurement, content providers typically utilize analytics for data capture and reporting: basic analytics that show which assets are being viewed and by whom, audience measurement, and performance analytics that measure quality of service.

Tight integration of both monetization and measurement simplifies deployment of OTT applications and can help ensure consistency in implementation across platforms.

When handling closed captioning (and subtitles), the player should navigate in-band and out-of-band solutions. The player should also support digital rights management (DRM) integrations including “native DRM” – those built into the OS – an emerging alternative to more proprietary approaches.
The Need for Playback Support Services

A prospective player should have a proven record of strong performance in video streaming to mass audiences and be flexible enough to work in virtually any video provider’s workflow. A dedicated support team can help distributors maintain consistent performance in tandem with fast-changing market conditions and technology. The larger challenge comes from solving problems stemming from sources under the control of the third parties—such as playback, monetization, DRM, and measurement—involved in shaping the UX, including ISPs, cloud suppliers of video processing services, and others. A good implementation team can provide successful mitigation to the complexity of the first- and third-party components.

Beyond quality control, distributors also need expert input when it comes to optimizing default settings for the media player in conjunction with different streaming modes, varying protection policies, device capabilities, and many other parameters, all of which are constantly evolving.

While the process of delivering video content from the origin to the end user is important, streaming video providers cannot ignore the impact of the media players on the quality of experience for their viewers. The ability to navigate the needs of users with different requirements is essential to both high-quality video and the full utilization of extra features to support monetization and customization.
Achieving High-Quality Playback in a Highly Fragmented Device Landscape

The Akamai Adaptive Media Player (AMP) is designed to deliver the best viewer experience, every time, on every device. Serving hundreds of millions of viewers monthly, AMP is trusted by many of the world’s top publishers to deliver high-quality, cross-platform video at scale.

In particular, AMP is designed to help publishers accelerate the deployment of video experiences with greater quality and less complexity. As a workflow-neutral playback platform, AMP gives organizations the freedom to assemble an architecture that best fits their needs. The extensible SDK suite provides seamless integration with leading ecosystem providers across playback, delivery, monetization, and measurement capabilities.

By providing a simple, unified solution in web, iOS, and Android environments, publishers can reach the broadest possible audience with coverage for web, mobile, and TV platforms. Additionally, AMP supports the latest requirements, including video header bidding, to help publishers maximize monetization opportunities and low-latency live streaming for high-performance video delivery.