

ADVANCED OTT

Strategies and Technologies

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content creators,
publishers, and
carriers need to
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End-to-End Monitoring is Critical to Support Dynamic Ad Insertion for OTT

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As OTT video consumption surges, service providers and broadcasters are focused on finding a profitable video streaming business model. Subscription, pay-per-view, and advertising are common revenue models for OTT. But ad-based models in particular are increasingly popular due to their potential to generate high revenues.

In the OTT environment, dynamic ad insertion (DAI) technology has emerged as a key enabler of OTT monetization. DAI enables broadcasters to insert ads that are specifically targeted to end users into the content, on the fly. By delivering more relevant ads on an impression-by-impression basis, service providers can increase viewer engagement. However, DAI introduces additional complexity into an already complex OTT workflow, making it critical to have an advanced, end-to-end monitoring system.

DAI CHALLENGES IN AN OTT WORKFLOW

Multiplatform and multiscreen delivery is complex. OTT content is packaged in multiple formats, such as HTTP Live Streaming and MPEG-DASH, for delivery to consumers. Beyond packaging content into different formats, the ads for insertion also need to be available in and comply with different formats to support multiplatform playback. The Common Media Application Format (CMAF) helps to reduce complexity by providing a single format for encoding and packaging segmented media objects for delivery and decoding on devices in adaptive multimedia presentations.

Preparing and delivering the ads for multiscreen consumption is another cumbersome task. OTT services are transcoded in different profiles to satisfy a wide range of viewers watching content on mobile devices and smart TVs. Each ad is also be transcoded into different profiles before it is available for insertion.

Ensuring seamless ad insertion at segment boundaries can be a challenge. Smooth playback requires each segment of content to be independently decodable so that whenever a switch from one profile to another takes place, no jerk in playback is observed. Each content and ad segment should start with a keyframe. This will guarantee a smooth transition from content to ad and from ad to content. Splicing can be a complicated for OTT, as the segments around the out

and in points may not satisfy segment duration boundary conditions. (See **Figure 1.**)

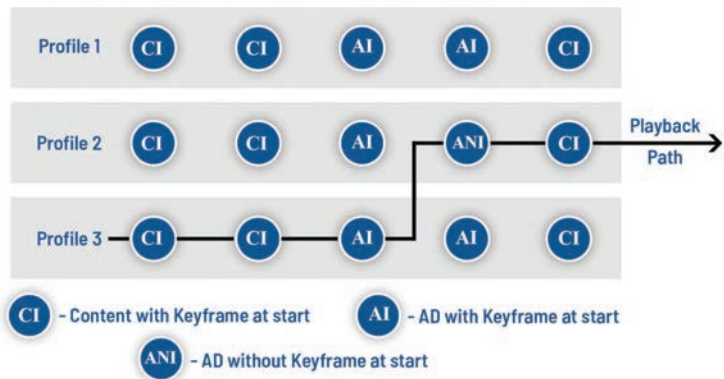


Figure 1. Seamless ad insertion example

Figure 1 shows that one of the ad segments in profile 2 does not start with keyframe. Either the keyframe was not properly encoded or its keyframe is in the previous segment due to improper segmentation. When the playback path switches to profile 2 during playback of the ad, the player will not be able to properly decode and play the segment since the keyframe is not found. A jerk in the playback will be observed.

Ensuring that the ad markers are aligned across all profiles and variants can also be an issue with OTT DAI. The manifest ad markers must be properly aligned across all profiles. If an ad is about to start in one profile, the other profile should also be marked with the same ad start time. If this does not occur and there is a switch to a profile where the marker is not present, an ad playback opportunity is lost.

It's also important to maintain ad insertion consistency throughout the entire end-to-end OTT workflow. When a live broadcast containing SCTE-35 ad markers is being transcoded into different profiles for OTT delivery, the markers need to be converted to ad markers in the manifest indicating ad placement opportunity. Ensuring that each ad marker in the linear stream is inserted correctly, at the right place in ABR outputs, can be challenging.

The accuracy of ad insertion is another issue faced by service providers. The ad shown to consumers must be the actual intended ad. Additionally, service providers need to ensure that the ads are inserted at the correct position (i.e., at logical breaks) without disrupting the continuity of the content.

HOW CONTENT MONITORING RESOLVES DAI CHALLENGES

A major opportunity of video streaming is the potential to generate revenue from ads. In a stream, there are ad markers indicating where to insert the ad in a stream, how long the duration should be, and other vital details.

Using an advanced monitoring system, OTT service providers can look for these ad markers across all streams. The monitoring system should alert service providers if no ads were present in a specified time duration. For example, if a service provider wants to run one ad every 20 minutes and that doesn't happen, that is a problem. Service providers also need to do a sync check for ads to make sure ads start at the same point across all variants. The monitoring system can be utilized to check on whether ads are inserted consistently across all variants of a channel, as well as whether ads are inserted at the right place and at the right time.

The aim of monitoring OTT content is to guarantee a superior quality of service and quality of experience. Running a monitoring system 24/7, OTT service providers can examine the complete end-to-end workflow, starting with linear streams and extending to content being watched by end consumers in any format. (See **Figure 2.**)

The monitoring system provides accurate, meaningful alarms in real time, along with the location of where the issue occurred in the chain. This helps service providers to quickly resolve the issue before it impacts viewers. It is essential to monitor for a wide range of issues, including

over-compression, frame misalignment across profiles, syntax errors, and compliance slips. All of these issues can negatively impact the overall user experience.

Monitoring the transition of ad markers from linear to OTT delivery is also critical in an end-to-end workflow, as it will ensure all ad opportunities are properly utilized. Ad markers need to be properly aligned, correspond to ads of same duration across all profiles, and checked to ensure ads start with key frames.

CONCLUSION

The video streaming market is growing and evolving. While there are many opportunities for broadcasters and video content providers, there are challenges too. Not only is it difficult to deliver a seamless OTT experience with good quality, but monetization is also an issue. The quality of OTT services can be ensured by implementing content monitoring at each phase of workflow and monetized by delivering relevant ads to individual viewers via DAI.

To successfully perform DAI and make it a seamless experience for viewers, service providers must assure correct ad insertion at a precise time, as well as compliance with different OTT content formats and profiles. By monitoring content at each point of the workflow, service providers and broadcasters can deliver a high-quality streaming experience with individualized ads, gaining a competitive edge in the marketplace.

ABOUT INTERRA SYSTEMS, INC.

Interra Systems is a global provider of enterprise-class solutions that streamline the classification, quality control (QC) process, and monitoring of media content across the entire creation and distribution chain. Relying on Interra Systems' comprehensive video insights, media businesses can deliver video with high quality of experience, address new market trends, and improve monetization.

