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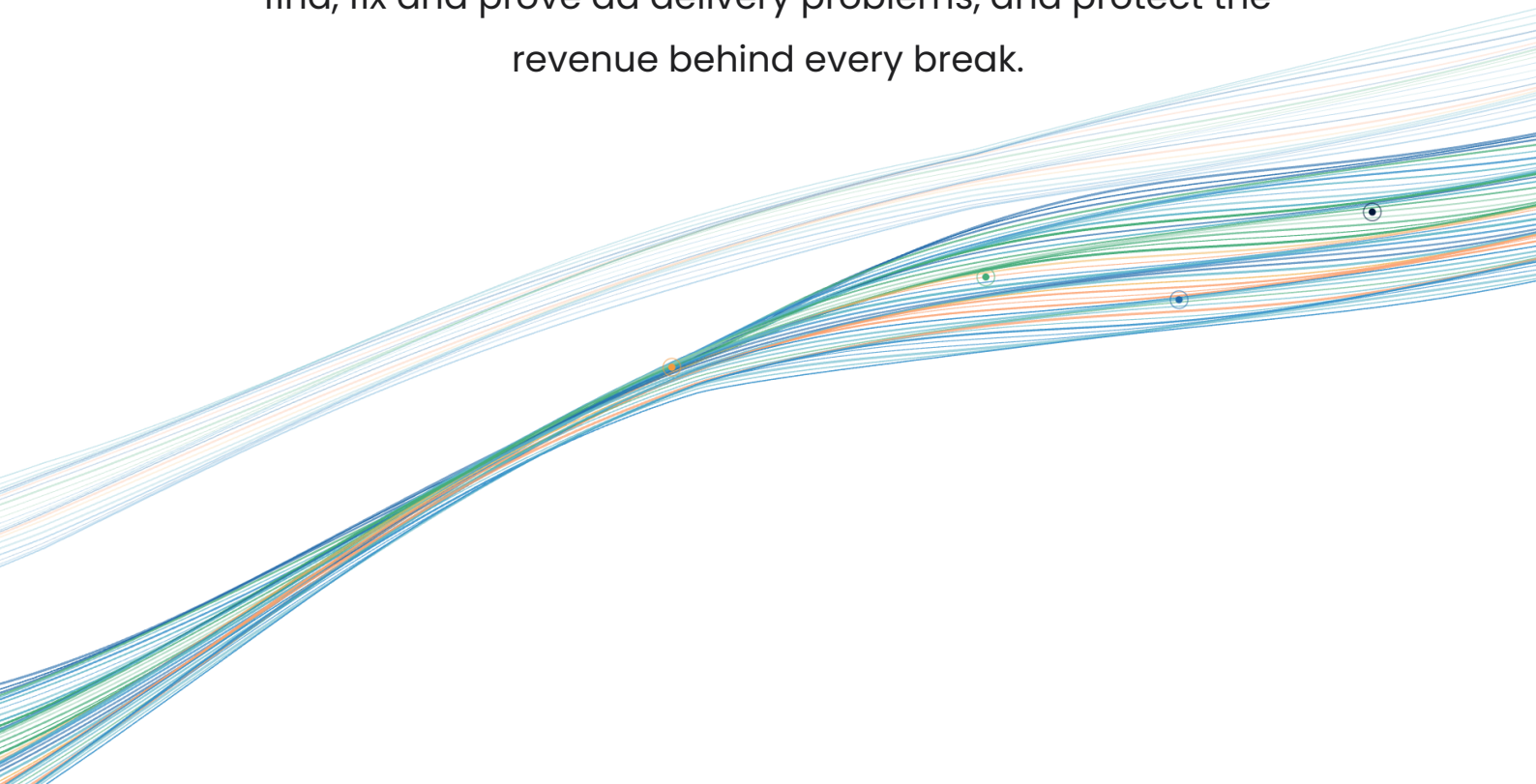
White Paper

Ad Observability & Analytics

Did the ad play?

Connecting the ad delivery chain, from signal to screen

How ad observability helps operators and broadcasters find, fix and prove ad delivery problems, and protect the revenue behind every break.



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Executive summary

Every live ad break depends on a chain of systems. An SCTE-35 cue marks the opportunity at the headend, the packager carries it into HLS or DASH, and the player requests and plays the ad.

A failure anywhere in that chain can cost an ad opportunity that cannot be recovered later. Operations has stream logs, Commercial has impression reports, and Product has device data. Each sees only part of the break, so a failure can go unnoticed until the next day's reports or a viewer complaint.

Agama connects stream signaling, delivery metrics and playback data from individual sessions. Teams can check whether an ad played and narrow the investigation to signaling, ad decisioning or playback before more breaks are affected.

The hidden cost of a missed break

For ad-supported video services, a missed live break is an opportunity that cannot be recovered later. Signal loss before the packager, delayed ad delivery or playback stalls can disrupt viewing and reduce advertising revenue.

These failures are hard to see because the ad delivery chain is shared between many systems, and often between several vendors. A break that fails at one stage can look perfectly normal one stage earlier, so the encoder may show a valid cue while the packager's output carries none. In the same way, ad-platform reporting describes what was decided and served, but whether the viewer actually saw the ad can only be confirmed with data from the player itself.

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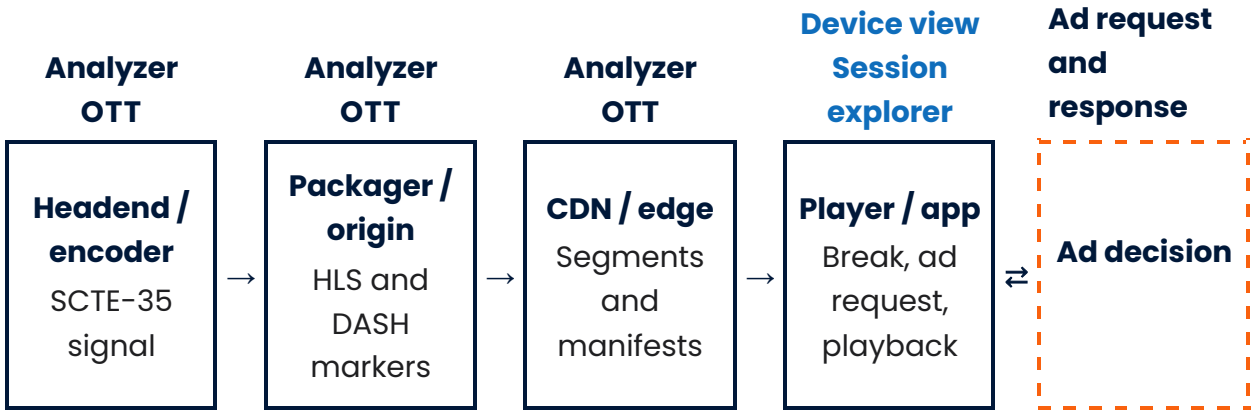
How an ad reaches the viewer

Each ad break begins with a signal, typically an SCTE-35 marker at the headend that indicates when an ad break should occur and how long it should last.

As the stream moves through the delivery chain, the packager translates this signaling into HLS playlists or DASH manifests, which are then delivered to viewers through the CDN. In client-side ad insertion (CSAI), the player identifies the ad break, requests an ad from the ad decision server and plays the selected ad before returning to the main content.

Missing markers can prevent insertion; incorrect timing or duration can end a break early or overlap content. Even with correct signaling, ad request timeouts or device playback failures can prevent delivery. Both signaling and playback therefore need monitoring.



Ads Dashboard
Impressions, ad breaks, fill rate and completion across devices and platforms, next to the signaling chain

Figure 1: Probes inspect monitored outputs; instrumented apps report ad events. The ad decision server is observed through its effects, not monitored directly

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Connecting the chain

Agama's Ad Observability and Analytics solution connects four views of ad delivery for service-wide analysis and individual investigations.

Stream signaling and break outcomes

Analyzer OTT continuously monitors OTT streams at the headend, origin or CDN, tracking SCTE-35 ad markers and break windows alongside stream quality and availability. This helps teams understand how many ad opportunities are signaled in each stream and verify that signaling remains consistent across formats such as HLS and DASH. For further investigation, teams can inspect individual events, including their payloads, timestamps and visual snapshots, to identify signaling gaps or unexpected timing changes that could affect ad insertion.

When a channel is monitored at multiple points in the delivery chain, the Dynamic Ad Insertion app brings together information about each ad break, showing its status at every monitored stage, along with the frames around each splice and supporting data. This makes it easier to identify where signaling issues occur and investigate their cause.

Delivery across the service

The Ads Dashboard provides an overview of ad delivery and playback performance across devices and platforms, tracking key metrics such as impressions, ad breaks, fill rate and completion rates. By comparing performance with previous periods, Operations and Commercial teams can identify trends, including declining fill rates or fewer impressions, and investigate potential issues.

As shown in Figure 2, the dashboard can also display information from the ad break monitor alongside delivery metrics, allowing teams to compare signaling and playback results in one view. This helps them understand whether ad breaks were correctly signaled and whether ads were successfully delivered to viewers.

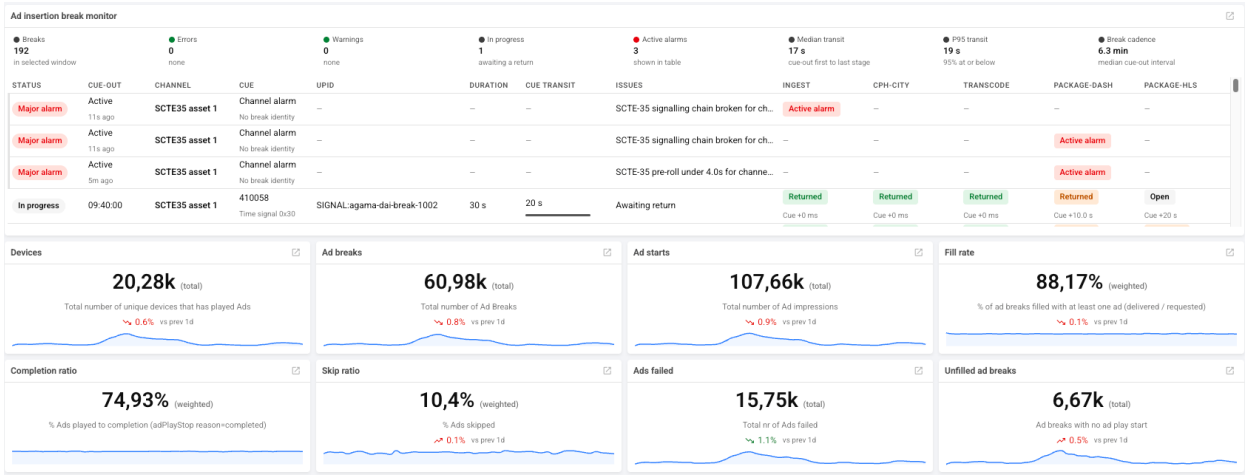

Figure 2: Signaling-chain monitoring alongside player delivery metrics. Fill rate denotes breaks with observed ad playback

Device and session investigation

The Device View provides insight into the viewer's playback experience, including buffering, startup delays and bitrate changes that may affect ad viewing. When impressions drop, it helps teams investigate whether playback issues before or after an ad break contributed to the decline, providing context that stream monitoring alone cannot offer.

Session Explorer provides a detailed view of ad-related events within individual playback sessions, showing when a device enters an ad break, whether ads start, complete or are interrupted, and relevant metadata such as creative ID, campaign and duration. By comparing these events with ad opportunities detected in the stream, teams can identify where delivery or playback issues occurred. The data is collected through Agama Client Device Monitoring (CDM), providing an independent view of ad playback on the device that operators can compare with ad platform reports and use when troubleshooting with partners.

Investigating a drop in fill rate

During a busy weekday evening, the Ads Dashboard shows a decline in fill rate and impressions for one service, prompting Commercial and Operations teams to investigate whether the issue is related to ad opportunities or delivery performance.

Analyzer OTT confirms that ad breaks were signaled as expected in both HLS and DASH, while the Device View shows no unusual buffering or startup delays around the breaks. Session Explorer provides further details, showing that affected devices entered the ad breaks but received an ad error without starting playback. This suggests that the opportunities were available, but the ads were not delivered in time, directing the investigation toward the ad decisioning process. With evidence from both the stream and the devices, teams can work with the ad platform to investigate the issue and identify its cause.

A break that never returned

For a live program, a break is correctly signaled at the headend, but its end signal is missing from the packager's output. The break fails to end as expected. Without monitoring there, complaints or next-day reports may reveal the issue only after the affected opportunity has passed.

The Dynamic Ad Insertion app shows the break across monitored stages, with splice frames and recordings where configured. Teams can locate the lost signaling and export decoded identifiers for comparison with the sales house's as-run log. Exports include break times and outcomes.

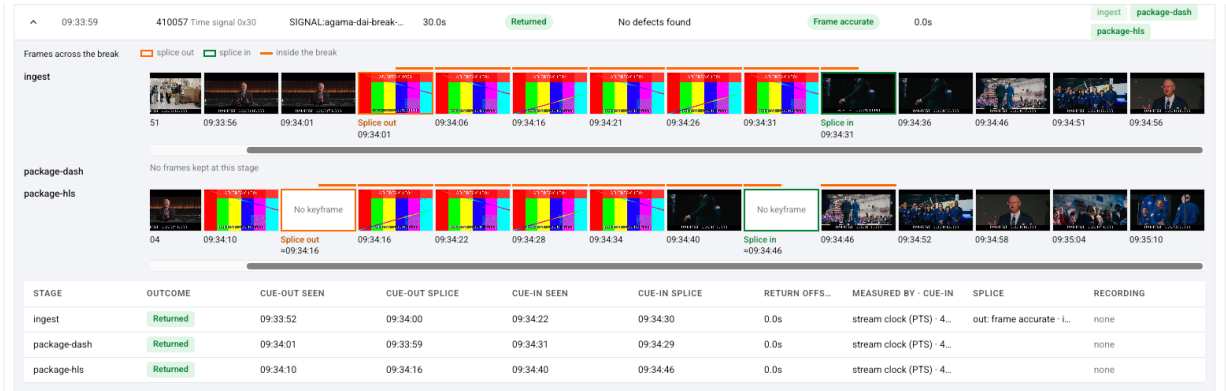

Figure 3: This example shows a correctly returned break

Integration requirements and getting started

Stream monitoring needs access to the outputs selected for inspection, with the channel's analyzer locations arranged as stages in the signaling chain. SCTE-35 analysis, timing expectations and alarms are configured for the

monitored inputs; splice thumbnails and triggered recordings require the corresponding probe settings. The initial scope should reflect the parts of the delivery chain the operator can observe.

On the app side, the ad module must report events through Agama Client Device Monitoring, including planned breaks, break starts and stops, ad starts and stops, and ad errors. Identifiers link ads to their breaks, while stop events provide the duration played, completion percentage and reason playback ended. Campaign, creative and ad server metadata support additional breakdowns when available, and operator-defined events and metrics can use the same API, with their meaning agreed with Agama. This measurement approach does not require an ad-server API integration.

A working session can start with one channel and one instrumented app to compare signaling with reported playback during real ad breaks. Monitoring points, required events, evidence retention and timing are agreed before expanding coverage to additional channels or devices.

Conclusion

Ad delivery data is spread across headend systems, CDNs, ad platforms and viewing devices. Separate reports make it difficult to locate failures and understand their effect.

Agama connects stream signaling, delivery metrics and device-side playback data to help operators and broadcasters investigate ad performance. Operations, Product and Commercial teams can assess whether an ad played and where to investigate when it did not.

About Agama

Agama is a specialist in video observability and analytics, providing an end-to-end platform for video service providers. The solution brings together insights from video creation, network delivery and viewer consumption, helping Operations, Customer Care, Product and Management teams understand service performance, investigate issues and make better use of video service data.