"VOS360 ad" User Documentation

Software version x.x

Date: 23 August 2024

Revision A

Notice:

Copyright 2024 Harmonic Inc. All rights reserved. Harmonic, the Harmonic logo, [all other Harmonic products mentioned] are trademarks, registered trademarks or service marks of Harmonic Inc. in the United States and other countries. All other trademarks are the property of their respective owners. All product and application features and specifications are subject to change at Harmonic's sole discretion at any time and without notice.

Disclaimer:

Harmonic reserves the right to alter the product specifications and descriptions in this publication without prior notice. No part of this publication shall be deemed to be part of any contract or warranty unless specifically incorporated by reference into such contract or warranty. The information contained herein is merely descriptive in nature, and does not constitute a binding offer for sale of the product described herein. Harmonic assumes no responsibility or liability arising from the use of the products described herein, except as expressly agreed to in writing by Harmonic. The use and purchase of this product does not convey a license under any patent rights, copyrights, trademark rights, or any intellectual property rights of Harmonic. Nothing hereunder constitutes a representation or warranty that using any product in the manner described herein will not infringe any patents of third parties.

Third-Party Product Trademarks:

Adobe® After Effects®, Photoshop®, Flash® Professional, Premiere® Avid® Media Composer® Jünger Audio™ Apple® QuickTime® Microsoft® Mediaroom® Microsoft® PlayReady® DOCSIS® 3.0 Start Over® TV Dolby is a registered trademark of Dolby Laboratories. Dolby Digital, Dolby Digital Plus, Dolby Plus, aacPlus, AC-3, and Dolby® E are trademarks of Dolby Laboratories. Level Magic and Jünger are trademarks of Jünger Audio Studiotechnik GmbH. MPEG Audio technology licensed from Fraunhofer IIS http://www.iis.fraunhofer.de/amm/ PitchBlue® is a registered trademark of Vigor Systems. QuickTime and the QuickTime logo are trademarks or registered trademarks of Apple Computer, Inc., used under license therefrom.

Third-Party Copyright Notes:

Harmonic software uses version 3.15.4 of the FreeImage open source image library under FreeImage Public License (FIPL). See http://freeimage.sourceforge.net for details. The product may include implementations of AAC and HE-AAC by Fraunhofer IIS; and MPEG Audio technology licensed from Fraunhofer IIS. The software described in this publication may use version 2.8 of FFmpeg open source package under Lesser General Public License (LGPL).

Table of Contents

Outline - DO NOT PUBLISH

Summary of documentation:

What is VOS Ad

- Introduction to Ad-Insertion
    - Concepts
    - List of abbreviations and acronyms
- Description Vod Ad
    - Architecture diagram

Ecosystem integration

- Ingest
    - ICD: 3rd Party EPO DAI ICD (draft)
- Decisioning
    - Pre-integration with most popular ADSs
    - Template Ad request based on VAST & VMAP
    - Default ad, default slate
    - Pre-fetching
    - → (ADS)
- Creative provisioning
    - Ad clips ingest, transcoding, packaging, encryption, delivery
    - → Transcoding/Packaging profiles
- Personalization
    - Pre-roll and Mid-roll
    - Live, Live Event, Timeshift and VOD
    - Standard-Latency, Low-Latency
    - Delta Playlist/Patch Manifest
    - → PMM feature set
- Player Integration
    - Metadata API:
        - Client Side Ad-Tracking: Client-Side Ad Beaconing - ICD
        - Clickable Ad / Companion Ad: Client-Side Ad Beaconing - ICD
        - see: code samples
- Reporting
    - KPI dashboard

Code Samples

- Client Side Ad Tracking demo App for HLS/iOS: https://github.com/harmonicinc-com/client-side-ad-tracking-ios
- Client Side Ad Tracking demo App for DASH/Web (Shaka): https://github.com/harmonicinc-com/client-side-ad-tracking-demo
- Client Side Ad Tracking demo App for DASH/Android (ExoPlayer): TBD

TO DELETE - List of abbreviations and acronyms

Acronyms	Definition	Description
AVOD (SAVOD)	Advertising-based Video on Demand (Subscription AVOD)	Monetization strategy used by video-on-demand platforms. It offers users free access to on-demand content, in exchange for watching ads. This generates ad revenue, which offsets production and hosting costs.
CDP	Customer Data Platform	CDPs are focused on collecting first-party data and PII (personally identifiable information).
CSAI	Client-Side Ad Insertion	
DMP	Data Management Platform	Used by both publishers and advertisers. They are repositories of first, second, and third party data – and used to inform and improve both human and automated decision making processes (typically by segmenting audiences).
SSAI	Server-Side Ad Insertion	
SGAI	Server-Guided Ad Insertion	
SBAI	Server-Based Ad Insertion	

Acronyms	Definition	Description
DAI	Dynamic Ad Insertion	
DSP	Demand Side Platform	It serves as an interface for advertisers to connect to the programmatic advertising ecosystem – and to manage how they purchase advertising media from that ecosystem.
FAST		
GARM	Global Alliance for Responsible Media	Released the "brand safety and suitability" standard. This standard, spreads out 11 categories of content against 4 risk levels (low, medium, high, and floor) and was created to allow brands to have a clear and concise vocabulary to define their particular brand suitability needs. = "ad industry taxonomies", allowing "brand suitability definitions"
OMID		
OMSDK		
SIMID	Secure Interactive Media Interface Definition	https://interactiveadvertisingbureau.github.io/SIMID/
VAST	Video Ad Serving Template	

Acronyms	Definition	Description
VMAP	Video Multiple Ad Playlists	
CDN		
CTV	Connected TV	
CPM	Cost Per Mille	Cost per 1,000 impressions (was first introduced as a pricing model for ad insertion in 1995)
IAB	Internet Advertising Bureau	
MRC	Media Rating Council	
MVPD vMVPD		
PMM	Personalized Manifest Manipulator	Core component of "VOS360 Ad" wchis is in charge of "ad stitching"

Acronyms	Definition	Description
AA	Asset Acquisition	VOS application dedicated to ingest and transcoding of VOD assets, i.e. "Ad Creative" assets in the case of SSAI.
LAT	Limit ad tracking	Defined by Roku
RIDA	Roku ID for Advertising	
RTB	Real Time Bidding	
SSP	Supply Side Platform Sell Side Platform	It serves as an interface for publishers to connect to the programmatic advertising ecosystem – and to manage how they sell their ad inventory through that ecosystem.
STR	Sales Through Rate	https://www.gourmetads.com/glossary/sell-through-rate/
VST	Video Start-up Time	

Welcome to "VOS360 ad"

VOS®360 Ad SaaS is for broadcasters, service, and content providers ready to take their advertising to the next level. Deliver pinpoint personalized experiences for live, linear, and video-on-demand content for subscribers worldwide.

Maximize your ad inventory and CPMs with dynamic ad insertion. VOS360 Ad is the complete solution that fits your budget and workflow. You can integrate VOS360 Ad with your existing ad decision server, or leverage open API capabilities, meaning no vendor lock-in.

Increase the value of your video content

Attract more advertisers and grow your ad inventory without increasing ad load with built-in dynamic brand insertion.

You can create personalized experiences maximizing your CPM with seamless ad insertion for the viewer. You'll keep advertisers happy thanks to higher viewer engagement.

Drive tailored advertising experiences

VOS Ad allows you to leverage individually addressable advertising to better target your ads to the right audience.

You can customize your viewer's experience down to the user level including demographics, interests and viewer behavior.

Provide flawless content on every screen

Deliver your ads with the same quality as your live, linear and VOD channels. VOS Ad was built to deliver high-quality processing and frame accurate insertion. That means no disruption or misplaced ads for your viewers.

What can I do with VOS360 Ad?

VOS360 Ad leverages Manifest Manipulation to integrate targeted ads into the manifests delivered to each end user.

However, it offers more than just manifest manipulation. VOS360 Ad provides a comprehensive Dynamic Ad Insertion (DAI) workflow for Live, VOD, and Time-Shift services.
This includes all necessary functions to process SCTE35 triggers for ad ingestion, delivery, and tracking, in addition to manifest manipulation.

Furthermore, the VOS360 DAI platform is deployed with geo-redundancy, making it fully suitable for prime-time events with large audiences.

Sports events

Monetize live content with superior video ad quality. Geo-redundancy, targeted addressability, and other advanced features on VOS360 Ad enable seamless ad insertion for live sports events. You can deliver personalized ads reliably and at scale, with low latency.

Linear TV streaming

Empower your video business to enable web-quality personalization to reach new audiences. VOS360 Ad leverages individual addressable advertising down to the user level so that you can provide outstanding linear experiences.

Video on-demand

Use a single solution to fill your ad inventory. VOS360 Ad provides pinpoint personalization leveraging dynamic brand insertion to replace and insert ads for your individual audience segments.

FAST platforms

Ad-supported TV platforms (Samsung TV+, Roku) are generating tremendous revenues around the globe delivering channels to connected TVs and devices. The VOS360 Ad solution for FAST (Free Ad-Supporting Streaming TV) delivers high-quality, fully monetized channels directly from the cloud.

Introduction to Ad insertion

OTT ad insertion involves placing targeted ads into streaming video content delivered over the internet.

It uses Dynamic Ad Insertion (DAI) to deliver relevant ads based on viewer data and preferences.

Ads can be inserted before, during, or after content. Detailed analytics help advertisers optimize campaigns. Challenges include managing ad blocking and ensuring a smooth viewing experience.

Overview and architecture diagram

VOS360 Ad Ecosystem

VOS360 Ad offers flexible interfaces that allow easy integration with various customer ecosystems, including third-party encoders and packagers, different Ad Decision Server products, and various players.
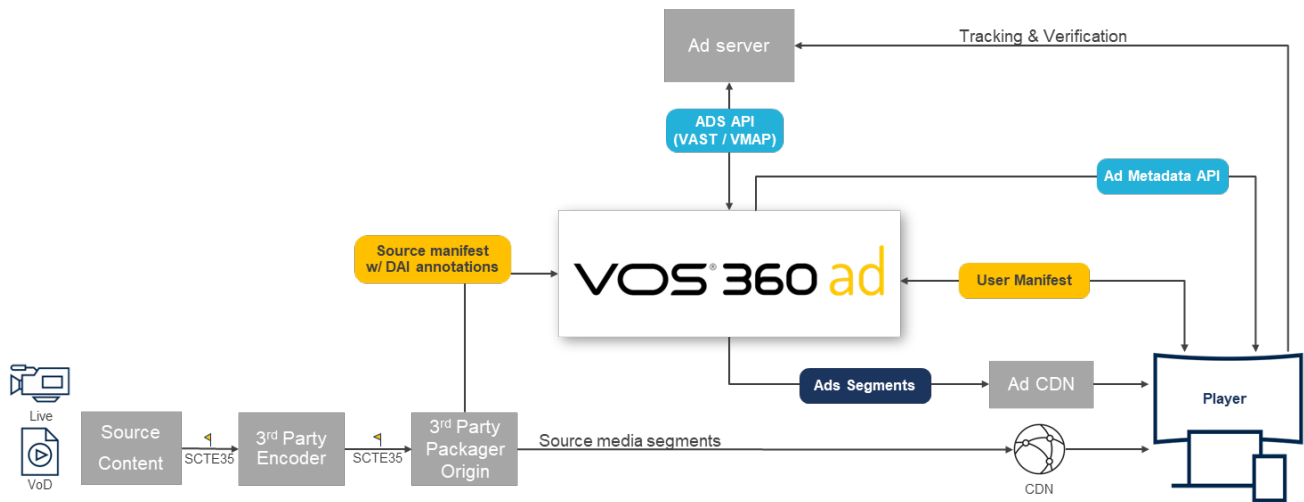
VOS360 Ad concepts, definitions & acronyms

Concepts

- 'VOS360 Ad' **service** : a service in VOS360 Ad allows the configuration and the definition of ad insertion or ad replacement for one or several channels on a defined origin server.
- VOS Ad **cluster** : An instance of VOS360 Ad in a specific region.
    - 1 cluster = 1 region
- A VOS Ad **system** is defined by 2 or more VOS Ad clusters with a load balancer. Changing a parameter in UI will apply this change on all clusters of the system.
    - 3 systems, 7 clusters

- Instream ad : VOS360 ad specific feature that permits do to server side overplay placement.
- Dashboard360 : Monitoring dashboard to keep up with important metrics.

Definitions

- ADS: Ad Decision Server
- Ad impression: An ad impression refers to the event of an advertisement being fetched and displayed on a user's screen.

- Ad beacon: An ad insertion beacon is a mechanism used in digital advertising to track and report the delivery and performance of advertisements that are dynamically inserted into content (also known as a tracking pixel or tag)
- Ad stitching: Manifest manipulation to replace original ad content per personalized ad content.
- Ad ingest: processes to get a new ad, and to make it available for end users.
- Ad trigger processing: markers detection in the origin manifest.
- Ad scrambler: ?????????????????
- Ad tracking: analyze of the users for billing purpose. It can be server-side or client-side.
- Ad Origin: a web server dedicated to delivering advertising content to websites, apps, and other digital platforms.
- Ad break : Specific points within the video content where ads can be inserted. These points are called ad breaks and can be placed pre-roll (before the video starts), mid-roll (during the video), or post-roll (after the video ends).
- Ad buffet : refers to a variety of advertisements or promotional messages offered to consumers
- Ad CDN delivery: the use of a CDN to deliver advertisements to users efficiently and reliably. A CDN is a distributed network of servers that deliver web content, including ads, to users based on their geographic location.
- Ad verification: tool used by brands to verify their ads are displayed in accordance with their ad campaign contract terms.
- Ad decision (or request) prefetching: ad requests are sent to the ADS in advance
- Ad creative prefetching: ad ingestion in advance for top brand ads and premium events.
- Ad clip transcoding: Ad clips are automatically adapted to match content encoding configuration.
- Ad audio loudness normalization: to have the same program and ad loudness.
- Ad slate: piece of video in loop to fill a gap in underfill stitching.
- Default ad: ad used to fill a gap in underfill stitching. A list of default ads can be played.
- VAST: Video Ad Serving Template for structuring ad tags that serve ads to video players. Using an XML schema, VAST transfers important metadata about an ad from the ad server to a video player.
- Ad pod: An ad pod is a collection of multiple ads served during a single ad break.
- VMAP: The IAB Video Multiple Ad Playlist (VMAP) specification is an XML template that video content owners can use to describe the structure for ad inventory insertion when they don't control the video player or the content distribution outlet.
- Ad preroll: ad insertion at start of program
- Ad midroll: ad replacement
- Manifest upstream cache: VOS360 ad module connected to main and backup origin, independent from 3rd part CDN, to avoid origin errors.
- Query string forwarding: functionality that permits to forward some query string parameters from player request to the origin server.
- PAL SDK: Platform Ad Library Software Development Kit is a set of tools and libraries designed to facilitate the integration and management of advertisements within various platforms and applications.
- IMA SDK: Interactive Media Ads Software Development Kit is a set of tools and libraries provided by Google that enables developers to integrate video and rich media ads into their web, mobile, and OTT applications.
- Underfill stitching management: happens when the total duration of ads to be inserted is shorter than the ad break duration, creating a gap that needs to be managed

- Overfill stitching management: happens when the ADS response provides too many ads or provides ads that are too long for the ad break duration.
- Expired stitching management: an ad break that is in the past when a user starts a new session.
- Partial stitching management: happens when the viewer starts a session in the middle of an ad break.
- HLS interstitial:The Ads to be used during ad breaks are not stitched in the playlist but are provided to each user through a separate path, which makes the playlist common to all users. It relies on 2 parallel player instances on the user device with a frame accurate switch between the 2 player's outputs.
- Clickthrough ad: an ad that can be clicked to open a target webpage to get more information about the product. (typically used with browsers or mobile devices)
- Companion ad : an image or banner ad, overlayed on the video ad, that can be clicked to open a target webpage to get more information about the product.

- Ad Inventory: Ad inventory refers to the structured set of advertising opportunities within a piece of video content. This inventory outlines when and where ads can be inserted during the video playback.
- Ad Request Format : VAST or VMAP
- Ad request template : XML document detailing the ad inventory, including the placement and sequence of ad breaks, the timing of each break, the sources of the ads, and tracking parameters.

Acronyms

Acronyms	Definition	Description
AVOD (SAVOD)	Advertising-based Video on Demand (Subscription AVOD)	Monetization strategy used by video-on-demand platforms. It offers users free access to on-demand content, in exchange for watching ads. This generates ad revenue, which offsets production and hosting costs.
CDP	Customer Data Platform	CDPs are focused on collecting first-party data and PII (personally identifiable information).

Acronyms	Definition	Description
CSAI	Client-Side Ad Insertion	
DMP	Data Management Platform	Used by both publishers and advertisers. They are repositories of first, second, and third party data – and used to inform and improve both human and automated decision making processes (typically by segmenting audiences).
SSAI	Server-Side Ad Insertion	
SGAI	Server-Guided Ad Insertion	
SBAI	Server-Based Ad Insertion	
DAI	Dynamic Ad Insertion	
DSP	Demand Side Platform	It serves as an interface for advertisers to connect to the programmatic advertising ecosystem – and to manage how they purchase advertising media from that ecosystem.
FAST		
GARM	Global Alliance for Responsible Media	Released the "brand safety and suitability" standard. This standard, spreads out 11 categories of content against 4 risk levels (low, medium, high, and floor) and was created to allow brands to have a clear and concise vocabulary to define their particular brand suitability needs. = "ad industry taxonomies", allowing "brand suitability definitions"

Acronyms	Definition	Description
OMID		
OMSDK		
SIMID	Secure Interactive Media Interface Definition	https://interactiveadvertisingbureau.github.io/SIMID/
VAST	Video Ad Serving Template	
VMAP	Video Multiple Ad Playlists	
CDN		
CTV	Connected TV	
CPM	Cost Per Mille	Cost per 1,000 impressions (was first introduced as a pricing model for ad insertion in 1995)

Acronyms	Definition	Description
IAB	Internet Advertising Bureau	
MRC	Media Rating Council	
MVPD vMVPD		
PMM	Personalized Manifest Manipulator	Core component of "VOS360 Ad" wchis is in charge of "ad stitching"
AA	Asset Acquisition	VOS application dedicated to ingest and transcoding of VOD assets, i.e. "Ad Creative" assets in the case of SSAI.
LAT	Limit ad tracking	Defined by Roku
RIDA	Roku ID for Advertising	
RTB	Real Time Bidding	

Acronyms	Definition	Description
SSP	Supply Side Platform Sell Side Platform	It serves as an interface for publishers to connect to the programmatic advertising ecosystem – and to manage how they sell their ad inventory through that ecosystem.
STR	Sales Through Rate	https://www.gourmetads.com/glossary/sell-through-rate/
VST	Video Start-up Time	

Components and features

- Support of preroll and midroll for Live ad insertion
- Support for preroll and midroll VoD ad insertion
- Manifest upstream cache
- Manifest query string forwarding
- Support of Harmonic VOS Media Origin and several third-party origin solutions
- Ad decision Server interface
  - Configuring Ad request with full flexibility
    - Ad request template configured by Harmonic based on ADS vendor and customer requirements
    - Ad requests typically includes end user data, SCTE35 data, and system parameters.
    - interfaced with Google Ad Manager, Beachfront, Castoola+, Equativ, FreeWheel, Magnite, Seven.One, Viamedia, ...
  - Management of VAST ad pods sequence number to maximize ad revenue
  - Ad decision prefetching to optimize the fill rate
- Ad Stitching
  - Live underfill ad stitching management
  - Live overfill ad stitching management
  - Live expired Ad break management
  - Partial Ad break management
- VOS360 Ad ad creative workflow
  - Ad creative prefetching
  - Ad creative transcoding
  - Ad creative Audio loudness normalization

- Defining Ad slate
- Defining Default Ads
- VOS360 Ad Packaging
  - Long live DVR manifest
  - SSAI with low latency streaming
  - Source timeline preservation by VOS360 Ad
  - HDR passthrough support
  - Manifest Filtering
- VOS360 Ad Metadata API & ad tracking
  - Server Side Ad tracking
  - Client side Ad tracking
  - Clickthrough Ad
  - Companion Ad
  - Ad Transparency icons (AdChoices & WTA)
  - Ad Verification/Open Measurement
- Scalability & Redundancy
  - Geo-redundancy & geo-balancing
  - Scalability
  - Multi-CDN support
- Security
  - Manifest request header authentication
  - Manifest request parameter validation
  - Manifest and segment token authentication

What's new ?

Onboarding

Anything that the customer will need to do before they can access the various VOS360 Ad apps

Ecosystem integration

- VOS Ad Token Authentication - ICD
- VOS Ad to ADS integration - ICD

To keep ? to move ?

Ingest

Decisioning

Creative provisioning

Personalization

Player integration

Reporting

User guide

Configuring & Operating

End to end workflows

Create live ad service. Live preroll and midroll ad insertions.

Concept

VOS360 Ad supports live preroll and midroll ad insertions. Live preroll involves inserting ads before the live program starts. Live midroll involves replacing ads during an ad break in the live program, as signaled by SCTE35 DAI annotations.
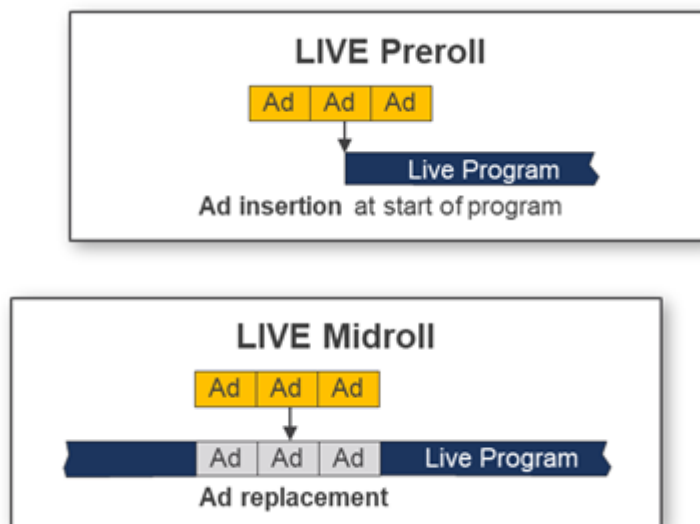
One key aspect of the interoperability with the source manifest provider is the format of DAI annotations. VOS360 Ad supports the following DAI Annotations formats for live:
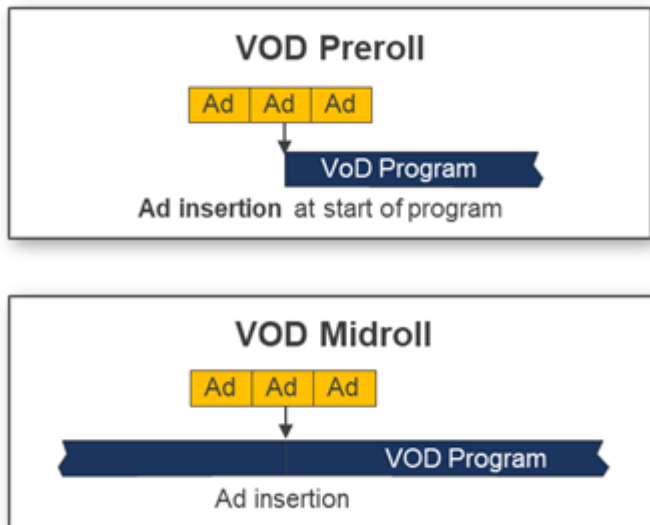
- HLS: EXT-X-CUE-OUT
- HLS: EXT-X-SCTE35 (SCTE35 standard 2019)
- DASH: Base64 encoded binary signal

How to

Create VOD ad service. VoD preroll and VoD midroll.

Concept

VOS360 Ad supports VoD preroll and VoD midroll. VoD preroll involves inserting ads before the VoD content is served. VoD midroll involves inserting ads at certain positions, or cue points, in the VoD timeline.

The VoD source manifest does not require SCTE35 triggers. Instead, the ADS must be preconfigured with the list of cue points for each VoD asset. A cue point is defined by the time offset from the beginning of the VoD asset.

VOS360 Ad can be configured to enable preroll insertion, but it is up to the ADS to decide whether a preroll is to be inserted or not. The ADS VMAP response is set accordingly.
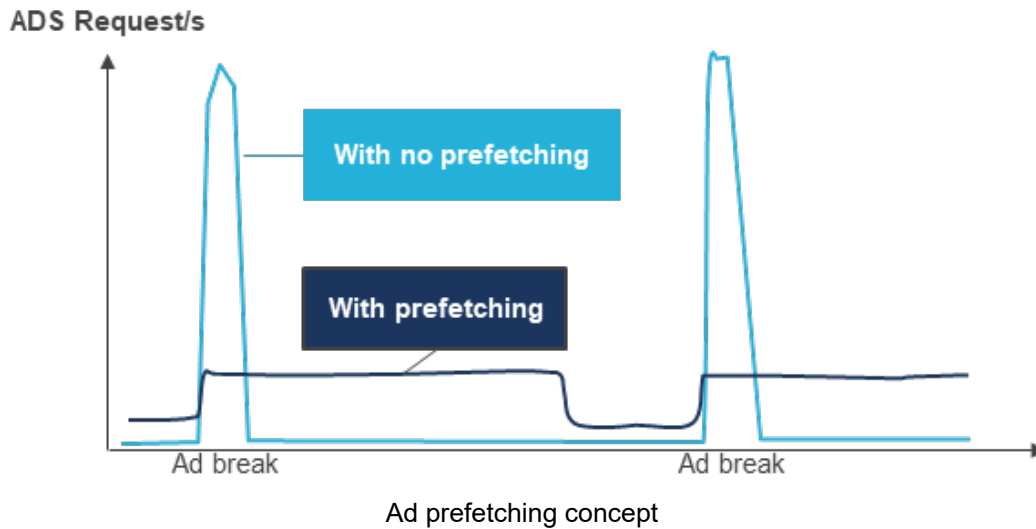
How to

How-to

How to configure ad decision prefetching

Concept

Ad decision prefetching consists of sending ad requests to the Ad Decision Server in advance instead of waiting until the last second to send all requests when the ad break starts.

Ad prefetching concept

As shown above in the graph, instead of having to process a high peak of requests for each ad break, VOS360 Ad processes the ad requests at a reduced rate, in advance.

With ad decision prefetching, the ADS has more time to respond, better fill rates can be achieved, and more relevant ads are served to the viewer.

There is also more time for VOS360 Ad to ingest, or transcode, any new ad creatives, which minimizes the missed opportunity rate.

Overall, ad request prefetching improves SSAI scalability and maximizes ad revenue by optimizing the fill rate. This is currently deployed in operation at several sport streaming customers.

All ad requests are prepared in advance, queued by VOS360 Ad, and then sent to the ADS at a smooth pace. The responses from the ADS are stored by VOS360 Ad and processed when the ad break is reached.

Steps

How to configure ad decision server

Concept

VOS360 Ad provides a very flexible template to configure ad requests to be sent to the ADS. Flexibility is key because there is no standard for ad requests; unlike for ad responses, each ADS API is different, and even two projects with the same ADS vendor may be implemented with slight variations.

VOS360 Ad's request builder provides an easy way to configure the list of metadata that need to be forwarded to the ADS. No need for software development or complex integration; the ad request template is simply configured by Harmonic based on ADS vendor and customer requirements.

Data that are typically mapped into the ad request include end user data (device type, browser, IP, zip code, etc.), SCTE35 data (break duration, UPID, program ID, etc.), and system parameters (ADS customer ID, static parameters, system time, etc.).

ADS servers interfaced with VOS360 Ad include Beachfront, Castoola+, Equativ, FreeWheel, Google Ad Manager, Magnite, Seven.One, and Viamedia.

How to

How to configure ad slate and default ad

Concept

With VOS360 Ad, it is possible to define ad slates by assigning HLS and DASH URLs to an ad slate creative. The ad slate manifest may be used to manage ad break underfill situations when, for example, no VAST response was received from the decision server, or it was not received on time. In such cases, the ad break of an incoming live channel may be filled with a looping ad slate.

Ad slate looping to fill an ad break
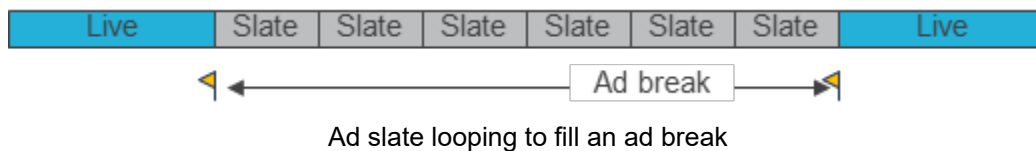
An ad slate can be defined for each channel or for each variant.

It is also possible to define default ads by assigning HLS and DASH URLs to default ad creatives. A list of default ads may be used as an alternative to ad slates to manage underfill situations.

Filling an ad break with a list of default ads

Default ad insertions are managed by VOS360 Ad directly and do not trigger any tracking beacons.

Steps

How to configure ad tracking

Concept

Server Side Ad tracking
VOS360 Ad supports both server-side and client-side ad tracking to adapt to different customer use cases. Server-side ad tracking is recommended for a quick and simple integration for live services. It is based on monitoring manifest requests for each viewing session, with ad tracking beacons sent directly to the ADS from

VOS360 Ad for accurate ad views accounting. The main benefit of server-side ad tracking is that it requires no player integration, making it fully player agnostic, supporting any connected TV.

Client side Ad tracking

Client-side ad tracking (or client-side ad beaconing) involves tracking several events on the player side even though ad stitching is done server-side. It is recommended for VoD, NPVR, or live streaming when advanced tracking is required. To achieve client-side ad tracking, the player must pull additional VAST data from the VOS360 Ad "Ad Metadata API" endpoint.

A beacon is an HTTP GET message sent by the player to the ad tracking events URI provided in the VAST response. These messages allow the ADS to count the total number of beacons for each tracking event with the accuracy required by advertisers. VOS360 Ad retrieves ad tracking events URIs from the VAST response and makes them available on the Ad Metadata API.

The data provided through this API also supports ad verification, clickthrough ads, companion ads, and displaying the Digital Advertising Alliance (DAA) AdChoices icons, also known as "Why This Ad" (WTA) by Google.

Steps

How to configure ClickThrough

Concept

A clickthrough ad is an ad that can be clicked to open a targeted webpage for more information about the product. This is typically used with browsers or mobile devices that support webpage opening.
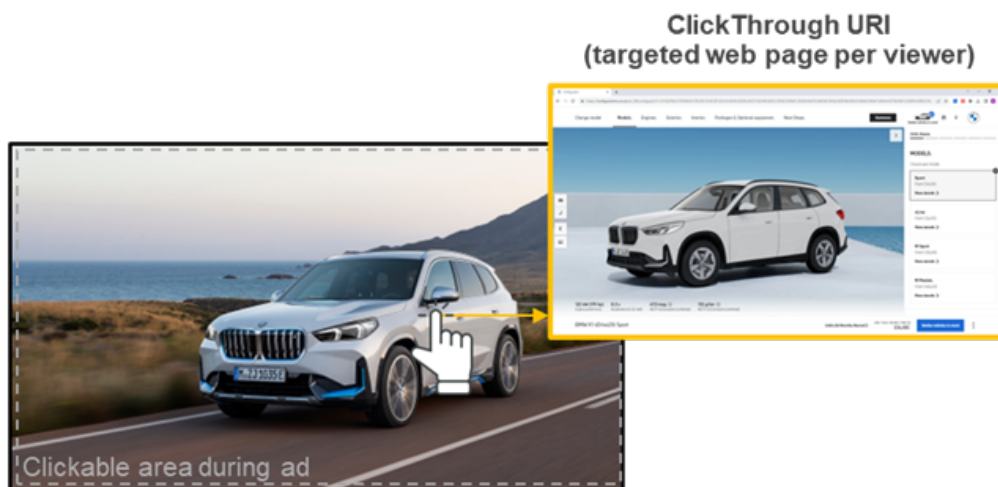

Clickthrough Ad

In order to support clickthrough ads, the player needs additional information such as the ClickThrough URI and ClickTracking URI, which are provided in the VAST response and made available on the Ad Metadata API by VOS360 Ad.

Steps

How to configure live expired ad break

Concept

An expired ad break is an ad break that is in the past when a user starts a new session.
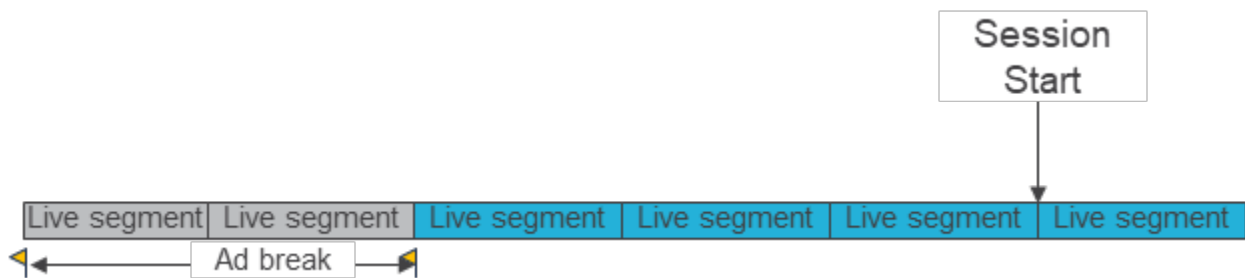

Expired Ad break

Expired ad breaks are not processed by DAI; in other words, they don't trigger an ad request to the ADS. However, it is key to configure the behavior of VOS360 Ad for those expired ad breaks, should the viewer use the DVR capability of their streaming application. The default mode is to fill the expired ad break with the source content, meaning no change is made to the original ad breaks. Other configurations include filling ad breaks with a looping ad slate or with default ads.

Steps

How to configure live underfill/overfill ad stitching

Concept

An underfill situation occurs when the total duration of ads to be inserted is shorter than the ad break duration, creating a gap that needs to be managed.
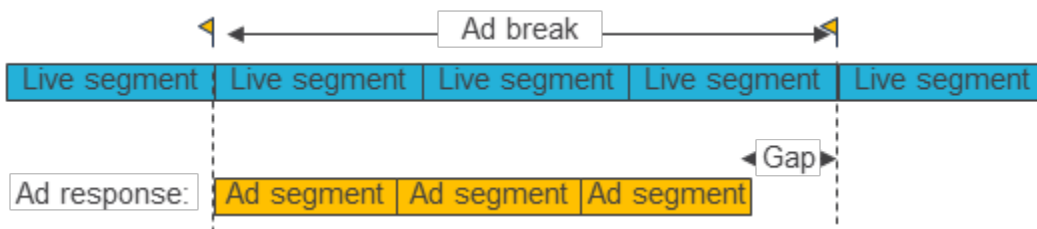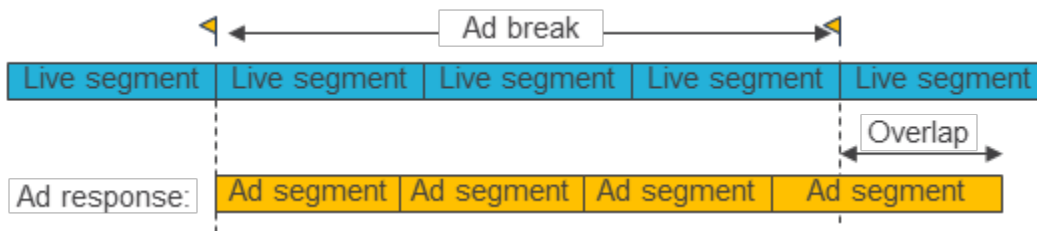
Ad break underfill situation

This can happen if the ADS does not respond or if the response is too short. An underfill situation can also arise when one or several ads in the response are seen for the first time, have not yet been ingested, and are therefore not ready for stitching. Whatever the cause of the gap, VOS360 Ad can be configured through the VOS REST API to manage underfill situations in different ways.

The default configuration is to fill the gap with a predefined Ad Slate, which can be repeated as necessary. The gap can also be filled with default ads. These ads are predefined and can be used as needed by VOS360 Ad. Another solution is to initiate an early return to live.

An overfill situation occurs when the ADS response provides too many ads or provides ads that are too long for the ad break duration.

Ad break overfill situation

This can also happen during live events, for example, when the event schedule changes unexpectedly, forcing the content provider to request an early return to live through a "splice immediate" SCTE35 message. In both cases, too many ads are lined up for the ad break duration, creating an overlap.

One solution for VOS360 Ad is to truncate any overlapping ad segment and return to live. The drawback is that some ads may not be completed, which may not be acceptable for some advertisers. The other solution is to skip the overlapping ads entirely so that any ad displayed is shown in its entirety. This, in turn, may create a gap, which is managed as an underfill situation.

Steps

How to configure manifest header authentication / manifest request parameter validation / token authentication

Concept

Manifest request header authentication
VOS360 Ad can authenticate manifest requests based on the presence of a header in the HTTP request. If the header is present, the request is processed; if not, the request is rejected. This feature prevents unauthorized or malicious access and ensures legitimate ad decision requests are sent to the ADS.

Manifest request parameter validation

VOS360 Ad can validate the presence of expected parameters in the manifest request. If all parameters are present, the request is processed; if any parameter is missing, the request is rejected. Parameter validation helps prevent sending invalid ad decision requests to the ADS, thus avoiding discrepancies between ADS ad request KPIs and ad-tracking KPIs.

Manifest and segment token authentication

Manifest requests from the player to VOS360 Ad can be authenticated using tokens. Requests with a valid token are processed, and a manifest is returned to the player. Requests with invalid tokens are rejected, preventing unauthorized access to the content (e.g., from pirate websites). The same token mechanism is employed to authenticate media segment requests at the CDN edge.

Steps

How to configure manifest query string forwarding

Concept

In many cases, the upstream origin may require metadata from the player to calculate the manifest. Blackout management is one example where the origin may need zip-code information, but there are several other use cases that may require metadata from the player.
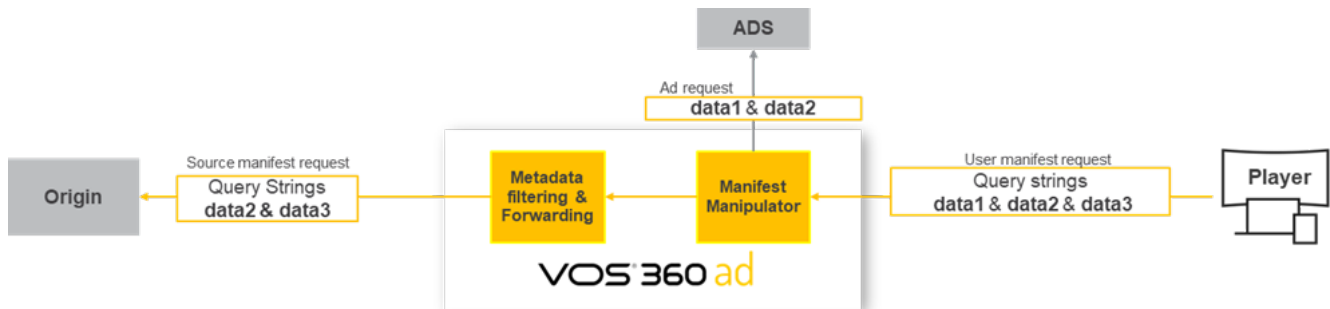

With VOS360 Ad, it is possible to configure forwarding rules for the metadata coming from the player as query strings. The configuration is very flexible and allows filtering all metadata that need to be forwarded to the origin as query strings in the source manifest request.

How to

How to configure VAST ad pods

Concept

Ad position in an ad pod drives different levels of attention from the viewer, and therefore different levels of CPM pricing. The VAST sequence number was introduced to allow advertisers to optimize their spending and the efficiency of their campaigns. VOS360 Ad has full support for VAST sequence numbers; all ads in a pod are stitched in the order requested by the VAST response.

Ad pod sequence number
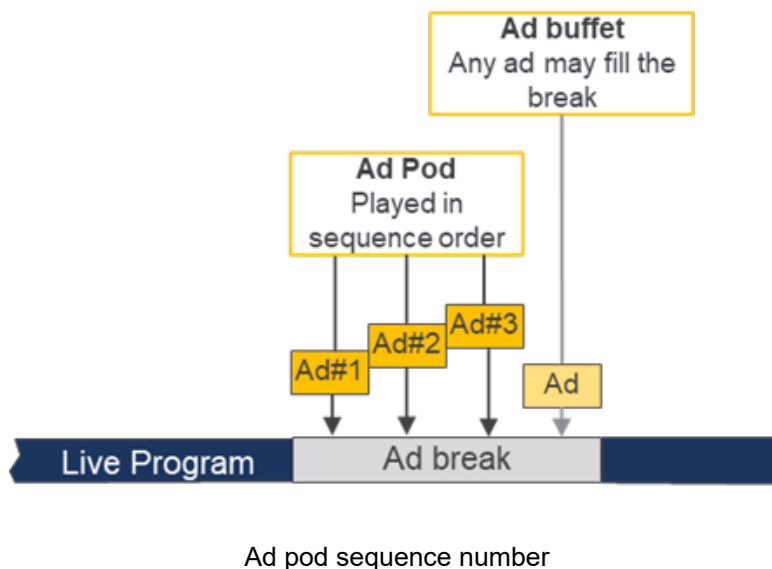
Thanks to this feature, the fill rate is optimized. Any VAST ad-buffet ad may be used to fill an ad break if the ad pod is shorter than the ad break, or if one of the sequence ads cannot be inserted for any reason.

How to

How to configure VOS360 ad with Google ad manager

Concept

VOS360 Ad is fully integrated with the Google Ad Manager (GAM) Programmatic Access Library (PAL) SDK, which resides on the client-side player. The PAL SDK integration with Harmonic's SSAI solution enables customers to access the full universe of Google ad demand, including Google Ads, the premium ad demand service highly desirable for TV-grade streaming services.

One key benefit for the customer is that the PAL SDK is an open architecture ecosystem (not a walled garden approach). The PAL SDK solution provides access to the same demand as the IMA SDK but allows customers to

stay in control of the SSAI solution. In other words, with PAL SDK, the customer is free to combine the Harmonic scalable SSAI service with the full ad tech stack from GAM.

Having access to the full AdTech stack from GAM potentially enables a significant increase in ad revenues. This is due to an increase in demand, which subsequently drives up the fill rate and CPM overall, leading to an increase in ad revenues.

Steps

UI parameters

Configure ad services

Schedule live events

Dashboard360 ?

Monitoring & Analytics

Dashboard360

VOS360 ad

Troubleshooting

Tools

Use cases

API reference

Start with VOS360 ad API

What are the basic steps before any API call to VOS ad (authentication, etc)

API commands

Code samples

- Client-Side Ad Tracking demo App for HLS/iOS
- Client-Side Ad Tracking demo App for DASH/Web (Shaka)
- Client-Side Ad Tracking demo App for DASH/Android (ExoPlayer)

Client-Side Ad Tracking demo App for HLS/iOS

Client-Side Ad Tracking demo App for DASH/Web (Shaka)

Client-Side Ad Tracking demo App for DASH/Android (ExoPlayer)