




ELEMENTAL 

# UNIFYING VIDEO DELIVERY WITH SOFTWARE DEFINED VIDEO AND MPEG-DASH

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# ABR VIDEO PACKAGING FORMATS

Adobe Flash HDS   
Adobe

Microsoft Smooth Streaming 

HLS 



## MPEG-DASH

DASH - **D**ynamic **A**daptive **S**treaming over **H**TTP –  
an ISO standard for the adaptive delivery of segmented content

# MPEG\_DASH FEATURES

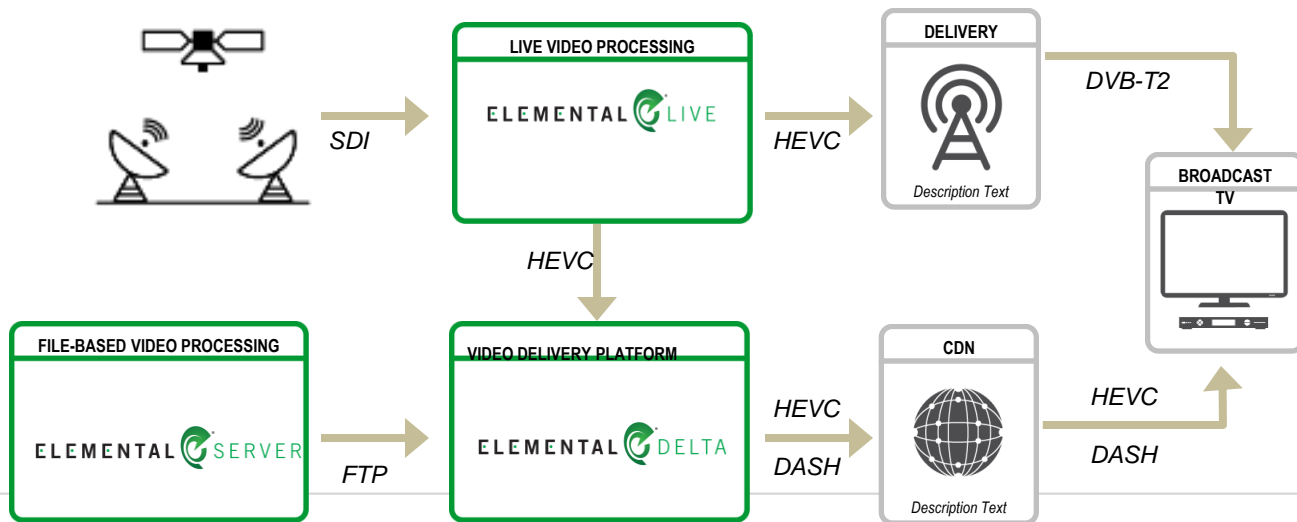
- Efficient use of CDNs
- Independent byte range sizes
- Codec independent
- Seamless track switching
- Full client control
- Trick mode
- Splicing for ad-insertion / mix and match
- Content encryption (CENC)
- Multi-language support – Late-binding audio

# MPEG-DASH APPLICATIONS

- **HbbTV**
- Advertising – Server side
- 4K UHD – HEVC
- Content Protection - CENC
- Mobile - 3GPP
- VoD – Ultraviolet
- Home media
  - DLNA
- Internet Radio
  - IMDA, BBC

- **Hybrid broadcast broadband TV**

- HbbTV 1.5 – CENC with DASH
- HbbTV 2.0 - multi-language features (EBU TT subtitles), second-screen apps with TV/STB, ad insertion



# HBBTV APPLICATIONS

## **Live to VOD**

Catch-up TV, nPVR

## **Live OTT video**

alternative channels, multi-angle viewing.

## **Richer Advertising**

Incorporate the red button feature within television advertising.

## **Targeted Advertising**

Monetize content through targeted advertising, supported with HbbTV 2.0.

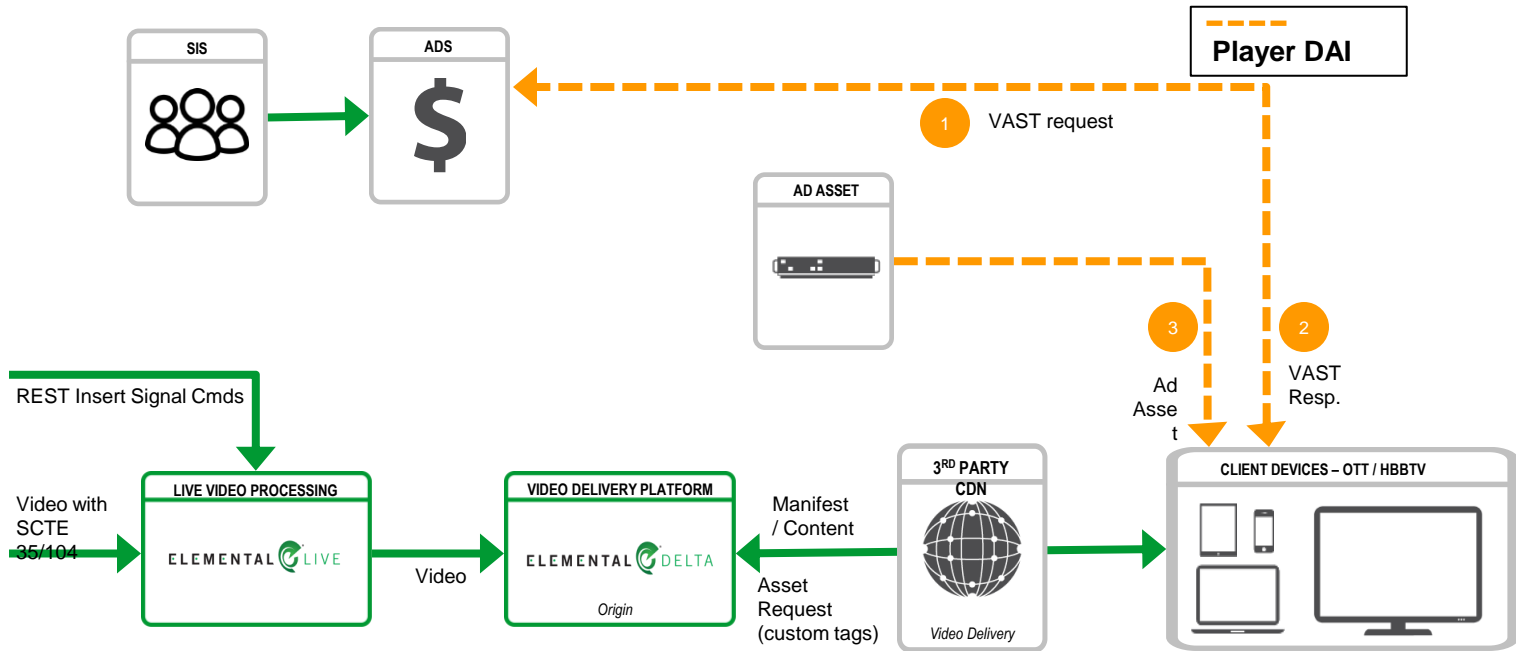
## **Second screen applications**

Interaction between primary STB and connected TV apps with second screens.

## **Multilingual features**

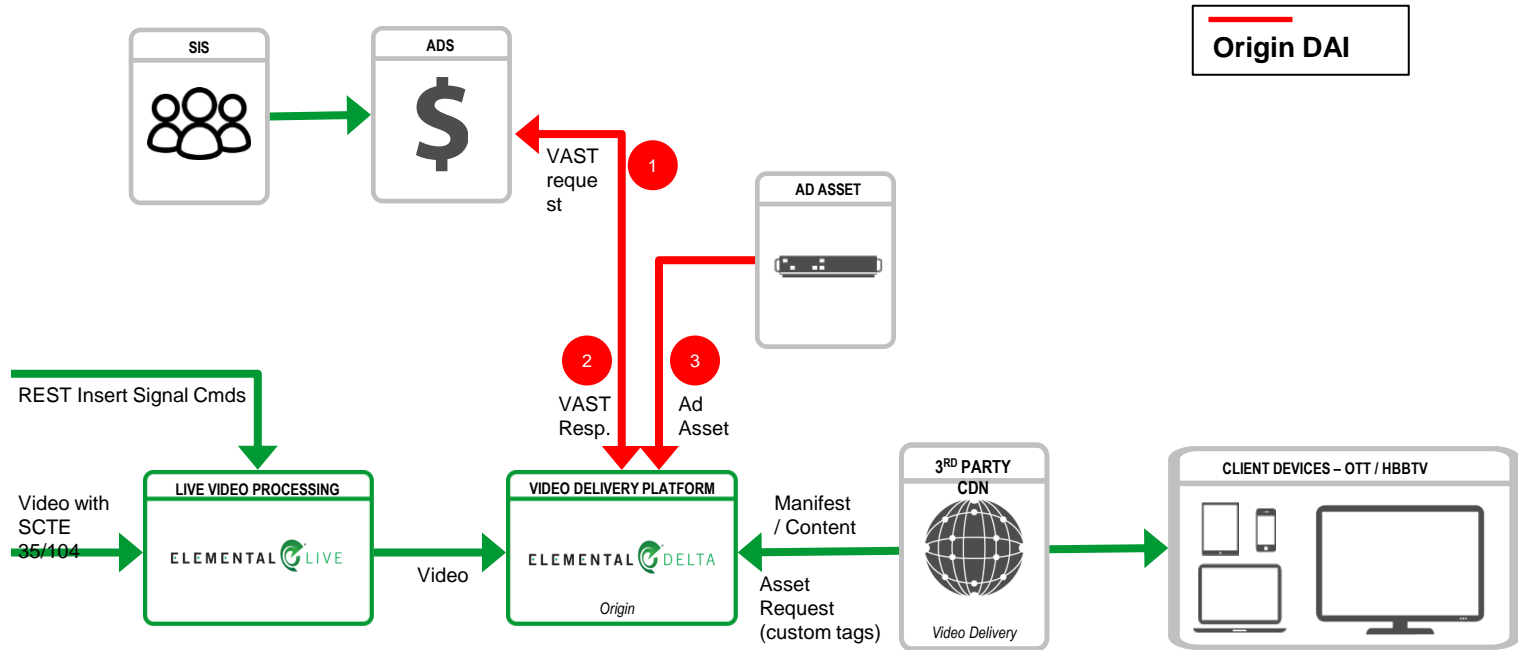
OTT content can include multilingual subtitles using the EBU W3C TTML standard. Alternative audio tracks can also be delivered via an OTT stream and be synchronized with live linear content.

# CLIENT-SIDE VS SERVER-SIDE ARCHITECTURE



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# SERVER-SIDE ARCHITECTURE





# THE SSAI OPPORTUNITY

- More opportunities to monetize content
  - Supporting the ever increasing number of devices
  - More opportunities with live content, VOD, catch-up TV, start-over, nPVR...
- HLS + DASH are the leading OTT protocols for SSAI
  - These two standards enable personalized SSAI on the two protocols
  - Trend to merge towards: HLS support for fMP4, CMAF, multiple DRM through CENC
- Just in Time Packaging (JITP) and SSAI means video streams and adverts supports multiple standards and devices...
  - Software-defined solutions are future-proof with new devices added through JITP



# MPEG-DASH 4K UHD BROADCASTS

- HEVC over MPEG-DASH for delivering 4K UHD content to Samsung Smart TVs

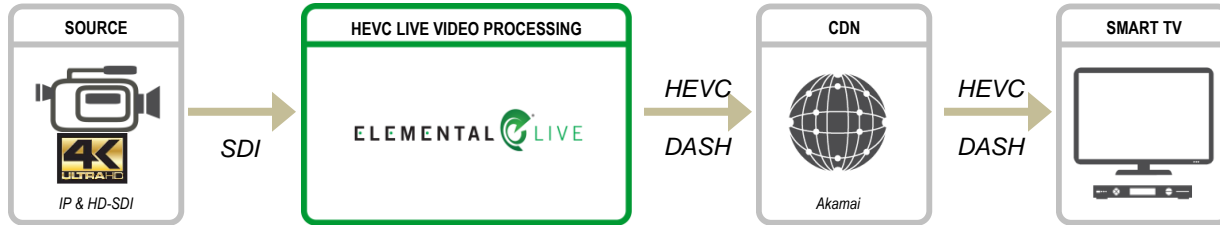


WIENER STAATSOOPER

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LIVESTREAMING

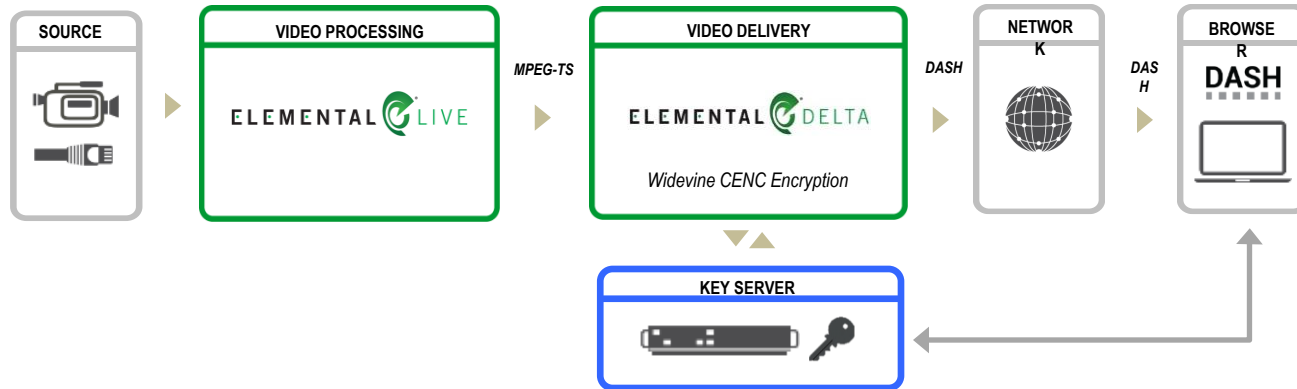
## Vienna Opera



# CENC

Common **ENC**ryption supported by MPEG-DASH for supporting multiple DRM through a common encryption

Use case: Encrypted delivery with Widevine DRM to Chrome browsers



Elemental Delta supports Just-in-time packaging and just-in-time DRM encryption to DASH + CENC

Confidential

# CASE STUDY – ARD/ZDF GAMES LIVE HBBTV





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## ANY QUESTIONS?

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