

KEEPIXO

by ALLEGRO DVT

HbbTV 2.0 Solutions For Broadband Delivered Content



HbbTV is a global initiative targeted at bridging broadcast and broadband delivery of content and services to allow consumption of content on connected TVs, set-top boxes and mobile devices. Since its release in 2010, the HbbTV standard has gone through two specification updates. The first one took place in November 2012 with the release of version 1.5 which mainly added support for MPEG-DASH Adaptive Streaming on the broadband link. The latest HbbTV 2.0 version, which was published in February 2015, adds major new features including:

- Addition of HEVC as a video codec to support Ultra-HD as well as HD
- Extra MPEG-DASH profiles as defined by DVB to make deployment of MPEG-DASH services easier
- Addition of subtitles for broadband delivered content using EBU profile of W3C TTML
- And many other features such as second screen integration for smartphones and tablets, HTML5, multi-stream synchronization between the broadcast and the broadband links, push VOD, ad-insertion into VOD content and use of DVB-CI 1.4 to enable decryption of broadband delivered content using a CI module.

Keepixo has been actively working to upgrade its product offering to comply with the new additions of HbbTV 2.0. Keepixo's solutions are ideally suitable to implement the HbbTV 2.0 broadband delivery workflow.

Using Keepixo Genova Software suite for HbbTV 2.0

Genova Virtualizable Software provides a unique and comprehensive solution that includes all the components required to build the HbbTV 2.0 broadband delivery workflow. **Genova** comprises 3 key components:

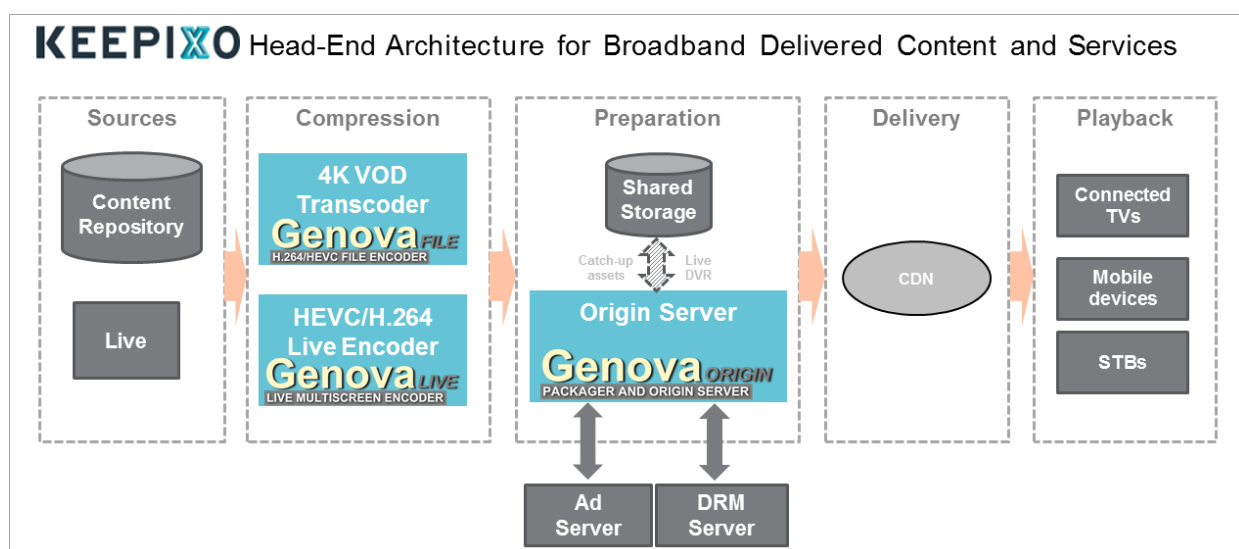
- **Genova Live**, the industry's highest density live encoder achieving an unprecedented density of 18 HD HEVC channels per RU
- **Genova File** multi-rate transcoder for VOD assets up to 4KP60 resolutions with best in-class video quality and compression efficiency
- **Genova Origin** multi-format packager, recorder and origin server

Genova runs on cloud-based resources or on existing data centers as a virtualized software suite. Furthermore, it includes support for various monetization features such as DRM, Ad Insertion and Catchup services.

HbbTV 2.0 DASH Adaptive Streaming Profiles

HbbTV 2.0 extends the single MPEG-DASH HbbTV 1.5 profile ("urn:hbbtv:dash:profile:isoff-live:2012") and adopts the new DVB-DASH profile which was defined in the DVB project in July 2014. The new DVB-DASH profile ("urn:dvb:dash:profile:dvb-dash:2014") is essentially targeted at merging ISO BMFF Live and on demand profiles and allows resolutions up to Ultra-HD (HEVC Main 10 Level 5.1).

Keepixo has updated the MPEG-DASH packaging features of **Genova** to fully support the new DVB-DASH profile as defined in **ETSI TS 103 285** ("Digital Video Broadcasting (DVB); MPEG-DASH Profile for Transport of ISO BMFF Based DVB Services over IP Based Networks").



HbbTV 2.0 Subtitles for Broadband delivered content (EBU-TT-D)

HbbTV 2.0 introduces the possibility to add subtitles for broadband delivered content as per EBU-TT-D specification. Keepixo has joined force with other leading technology and content providers to make reference streams available with EBU-TT-D subtitles. This coordinated effort represents a reference implementation of an end-to-end delivery of MPEG-DASH content with EBU-TT-D subtitles which will help the industry with migration towards HbbTV 2.0.

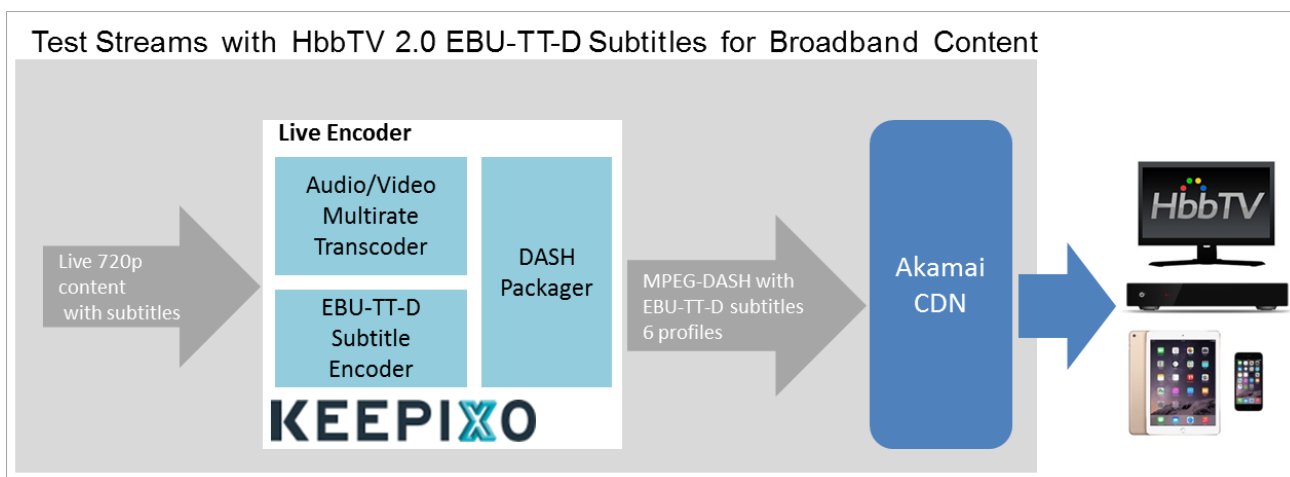
Content for the reference streams is provided by German broadcasters Bayerischer Rundfunk (BR) and Das Erste. Keepixo encoder carries out EBU-TT-D subtitle conversion and insertion, transcoding into 6 video profiles and packaging into MPEG-DASH. Content is pushed to Akamai CDN for delivery. The Institut für Rundfunktechnik (IRT) checked the conformance of the streams against the EBU-TT-D standard and coordinated the efforts.

Conclusions

HbbTV has become the key standard for interactive TV in many European countries. It has achieved significant traction around the globe with active services in Africa, Middle-East and APAC. Furthermore, the upcoming ATSC 3.0 next generation broadcast television standard in the U.S will include support for HbbTV 2.0 with first deployments expected in 2017.

Keepixo has been heavily involved in HbbTV 1.5 through early implementation of the MPEG-DASH adaptive streaming protocol and active participation into plugfests to ensure full interoperability of its MPEG-DASH packager with HbbTV 1.5 specific profiles.

Keepixo has upgraded its professional encoders and packagers product lines to ensure full compatibility with HbbTV 2.0. The latest version of Keepixo's **Genova** cloud-ready software suite features full support for HbbTV 2.0 including HEVC/Ultra-HD encoding, latest MPEG-DASH Adaptive Streaming profiles, DRM and subtitles for broadband delivered content as per EBU-TT-D specification.



About Keepixo

Keepixo, the spin-off of Allegro DVT's broadcast business, is a leading provider of software-based and cloud-ready head-end solutions for IPTV & OTT. Keepixo offers live encoders, file-based video transcoders and delivery solutions featuring advanced functions such as Catch-Up, Start-Over and nPVR. Keepixo solutions are used by more than 150 customers including 40 tier-1 operators worldwide.

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