



HbbTV Specifications and Related Activities 2019

Consolidating HbbTV Technology



2019 - A Year of Consolidation for HbbTV Specification Activities

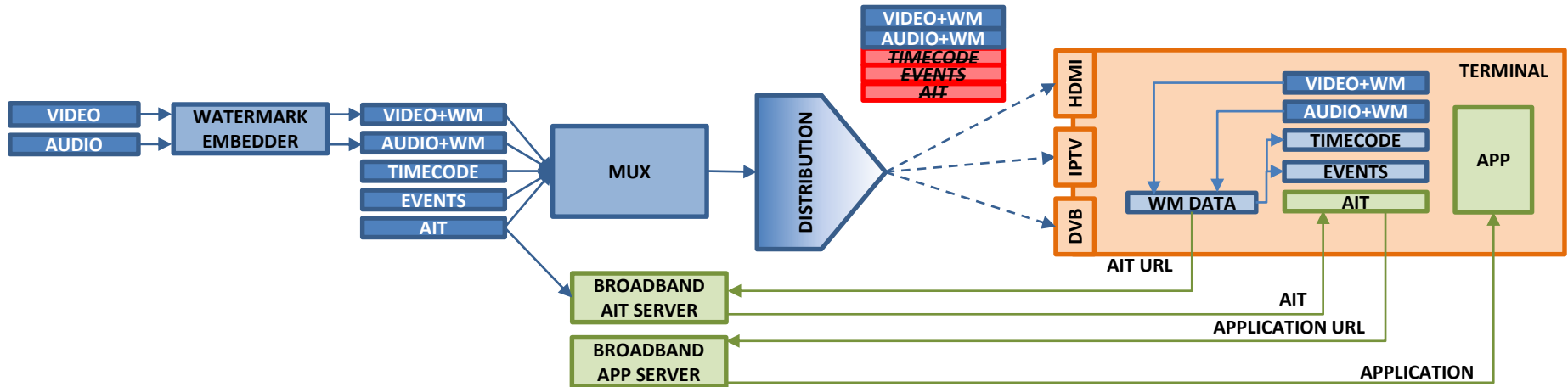


- HbbTV 2.0.2 published in Sept. 2018
 - No core specification update in 2019
- 4 independent specifications
 - Application Discovery over Broadband
 - Phase #1 published September 2016
 - *Phase #2 added in September 2019*
 - IPTV services and signalling published August 2017
 - No update in 2019
 - Operator apps spec published May 2018
 - No update in 2019
 - Targeted Advertising
 - *Stable draft developed in 2019 but not yet published*

- HbbTV 2.0.2 published in Sept. 2018
 - Stable in 2019
- Main focus in 2019 has been the test suite
 - Adding tests for HbbTV 2.0.2
 - HDR video, HFR video, AC-4 audio, MPEG-H audio, other
 - Fixing tests where someone found a problem
 - Catching up on 2.0/2.0.1 backlogs ..
 - Tests which are delivered but not yet approved
 - Tests which haven't been ordered yet

Application Discovery over Broadband Phase 2 ; Watermarks

- Enables HbbTV apps linked to services received by HDMI & other non-DVB interfaces
 - Also supports synchronisation to a timeline and stream events
- For more details see <https://www.hbbtv.org/wp-content/uploads/2019/09/HbbTV-SPEC-00446-000-Application-Discovery-over-Broadband-Explained-2019-09-09.pdf>



- Operator apps spec published May 2018
 - Stable in 2019
- Focus in 2019 has been the test suite
 - 300 test cases delivered from the suppliers
 - About half have been reviewed so far
- For more information
 - <https://www.hbbtv.org/wp-content/uploads/2017/12/HbbTV-SPEC-00200-003-Operator-Applications-Explained.pdf>
 - and
 - the panel on "The HbbTV value for Operators" later today

Why Develop a TA Spec?



- TA with HbbTV 1.5 is good enough to start an ecosystem but not good enough to sustain one
 - Some advertisers want a **100%** guarantee that ad playback will **only** start if it's **certain** that it play to the end without stalling, buffering or cutting back to the broadcast ad
 - Can only be achieved if the ad is loaded into RAM & played without any network access
 - TA stresses parts of HbbTV 1.5 that haven't been stressed before
 - Can be variable between different implementations
 - Requires white-listing or at least black-listing
 - On many TVs
 - does not meet user expectations on transitions from broadcast to broadband and (particularly) back to broadcast
 - Does not comply with traditional broadcast quality standards
 - "Landing period" requirements limit where & how often HbbTV 1.5 TA can be used
 - Not possible and/or acceptable to include several seconds of black or sacrificial content everywhere it might be desirable to substitute an ad or to do it several times per hour

- Replace a single 30s ad in the broadcast
 - Either at the end of an ad break
 - Or in at the start / middle of an ad break
 - More opportunity for a "landing period" at the end of an ad break so timing requirements are more relaxed
- Also variations where replacing consecutive ads is done by combining the replacements into a single stream
 - Can be combined into a single stream in the cloud
 - Can be combined into a single stream by the HbbTV app running in the terminal
 - In both of these only one switch from broadcast to broadband and one switch back again

1. Broadcaster sends message to app announcing that 'placement opportunity' is near
 - Existing HbbTV mechanisms can be used
 - Some additional testing / clarifications required for reliability
 - Perhaps new mechanism based on SCTE-35
2. App asks ad server for an add that could be played
 - Response uses existing web advertising standards ("VAST")
3. App preloads ad
 - Preload may be 100% if there's enough RAM / depending on broadcaster / advertiser requirements
 - 100% preload uses Web "Media Source Extensions" API – new in HbbTV TA spec
4. App tells TV /STB when to switch from broadcast to ad
 - New "fast media switch API" in the TA spec
5. App reports back on playback of ad
 - Critical otherwise nobody gets paid
6. App switches back from ad to broadcast
 - Also using new "fast media switch API"

2 TA Profiles for Switching Performance



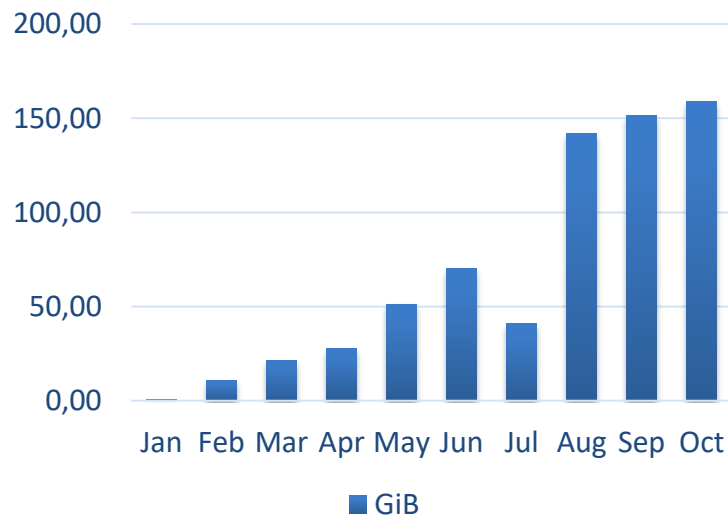
	Profile #1	Profile #2
Target implementation	Single decoder	Dual decoder
Target use-case	Replace ad(s) at the end of an ad break	Replace ad(s) anywhere in an ad break
Broadcast to broadband switching duration	$\leq 240\text{ms}$	$\leq 120\text{ms}$
Broadband to broadcast switching duration	$\leq 240\text{ms}$	$\leq 120\text{ms}$
Switching accuracy	40ms	40ms
Decoding broadcast while ad is playing	No	Yes
Typical landing period(with 1.5s GOP in the broadcast)	$2.06\text{s} = 1.5\text{s} + 2 * (240\text{ms} + 40\text{ms})$	$320\text{ms} = 2 * (120 + 40)$

- DASH content validator - <https://github.com/Dash-Industry-Forum/Conformance-Software>
 - For more details, see https://www.hbbtv.org/wp-content/uploads/2018/11/DVB-HbbTV-DASH-Validation-Tool_explained_v1.0.pdf
- HbbTV-DASH-DRM reference app
 - Created in 2018 to address concerns about lack of HbbTV+DASH+DRM examples & reports of inter-op problems
 - <https://github.com/HbbTV-Association/ReferenceApplication>
 - For more details see <https://www.hbbtv.org/wp-content/uploads/2018/11/HbbTV-MG-00472-002-DRM-Reference-Application-Explained.pdf>
 - 2019 focus on consolidation
 - Small functional extensions
 - Multiple audio tracks
 - A first small step towards low-latency DASH
 - More formal & stable
 - Separate production and staging instances
 - Checked against a receiver zoo
 - Basic DASH+DRM works almost everywhere

DASH-DRM Reference Application



Tx (GiB)



Visitors



- 2 HbbTV sponsored interop events this year
 - #33: July 1st+2nd
 - #34: October 30-31
- Also a number of national interop events
 - Spain
 - UK
 - ...
- These events enable face to face discussions between app / tool providers and device implementers
 - Problems often get more attention during an interop event
- HbbTV open to sponsor national interop events if they are opened to everyone
 - Reduce the number of events to attend

- Work is just starting on two specification updates:
 - HbbTV 2.0.3, (what will be proposed to ETSI as TS 102 796 V1.6.1).
 - The main new element of this update is removing unused features (“spring cleaning”)
 - No big new features – just updates to existing features
 - Update basic web standards from 2013 to 2018
 - W3C Media Source Extensions incl. support for low-latency DASH via dash.js or similar
 - Update OTT streaming to include CMAF and indicating if Apple ‘cbcs’ encryption
 - An update to the OpApp spec
 - Fix bugs
 - A few new requirements incl. adding support for loading an OpApp from a CI+ module
- There is a backlog of activities that will only happen when there are enough contributors:
 - Test assertions to fill gaps and check that errata are implemented
 - Investigation of how DVB-I and HbbTV could fit together.
 - Identification of which parts of the HbbTV 1.0/5 A/V control object could be replaced by a web "polyfill" and if those that could not be replaced in this way could be deprecated or dropped.

- Candidates to be dropped immediately
 - CI+ host player mode aka "DRM in a CAM"
 - HbbTV app launching an app on a companion screen
 - Teletext Subtitles in OTT content
 - 3 aspects of media sync
 - Optional SYNC_SLAVE mode
 - Optional sync buffer
 - Use of A/V control object in media sync
- Candidates to move to the OpApp spec
 - Push VoD incl. download manager
 - CI+ CICAM player mode
- Re-consider in next requirements cycle
 - PVR
- Candidates to be dropped at some time in the future
 - DOM-0 events / event listeners
 - A/V Control Object
 - OIPF DRM Object

As these are used by apps today, plenty of notice will need to be given!

Also stop growing these features or rewind additions made in HbbTV 2

- TA
 - Create and reviewing unit test descriptions
 - After publication, in parallel;
 - Develop early receiver implementations
 - Develop unit tests
 - Run unit tests on early receiver implementations
 - Iteratively improve both
- OpApps
 - Now updating spec
 - Integrating improvements from early experiences & bug fixes
 - One new feature – launching OpApp from CI+ module
 - Simplify the “bilateral agreement” process

- Testing
 - Further improving the coverage of the 2.0.1/2 specification
 - Further reducing the 2.0/2.0.1 backlog
 - Reducing the backlog of OpApp tests to be approved
 - Tests for HbbTV 2.0.3
 - Tests for independent specs (tbc) – TA, ADB #2
- DASH validator
 - Perhaps co-operate with DVB and DASH-IF to address what's new - low latency? HDR dynamic mapping?
- DASH DRM reference app
 - Simulate results of server-side ad insertion – multiple periods

Opportunities for Contributors

