

# Insights from the DASH-DRM Reference Application HbbTV Webinar Series 29<sup>th</sup> October 2025

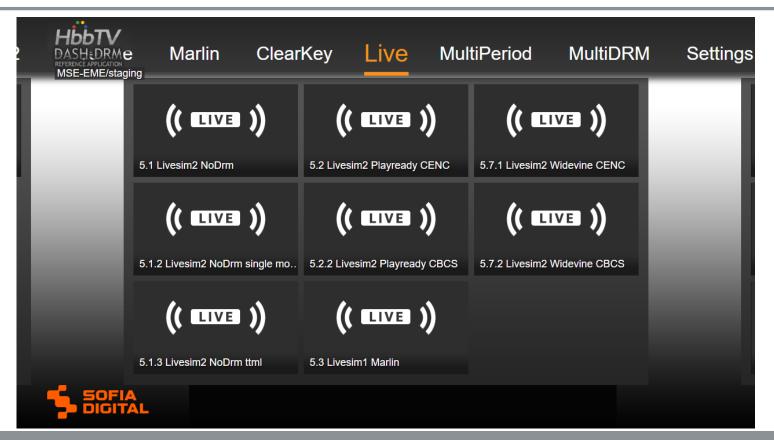






# The familiar user interface of the app





# DASH-DRM Reference Application



#### Development started in 2017

- Funded by HbbTV and managed by the IITF (Improving Interoperability Task Force), main developer is <u>Sofia Digital</u>, <u>Ltd.</u>
- Offers three different modes of operation:
  - OIPF AVObject using the native dash player and OIPF DRM Object
  - HTML5 Video element using the native dash player and OIPF DRM Object
  - MSE mode using the dash.js player (v5) and MSE-EME extension

#### Features are introduced in phases:

- Production version updated in line with test suite, 3 times a year
- Staging version intended for early access to new features of the app
- Testing version intended for development and testing

#### Github project for code and issues:

- https://github.com/HbbTV-Association/ReferenceApplication/
- MIT license

#### 3<sup>rd</sup> party content is welcomed

https://member.hbbtv.org/wg/IITF/document/7173

#### Receivers under test

Year	Amount	Version	Amount
2017	7	1.2.1	13
2018	8	1.3.1	0
2019	9	1.4.1	9
2020	14	1.5.1	40
2021	15	1.6.1	32
2022	13	1.7.1	11
2023	13		
2024	16		
2025	10		

Test Results are collected in an anonymized form and published as an <u>IITF document</u> in the HbbTV Member area.

# Purpose and main features



- To offer a toolbox of tested and proven components enabling implementation of a widely tested and working DASH DRM Player application for HbbTV (but **not** provide unit tests or "certification" of a DRM implementation)
- To test and collect results from devices in the field
- DRM
  - Playready, Widevine, Marlin, Clearkey
  - Expressplay (PR, WV) and Microsoft (PR) test servers used
- Dasher tool and video library
  - For creating new test contents
  - Pre-created clear video content (AVC+HEVC+others as needed) at <a href="https://refapp.hbbtv.org/videos">https://refapp.hbbtv.org/videos</a>

## Available tests



- Full HD playback, 4k playback, very high bitrate playback
- DRM:
  - Playready (cbcs and cenc) Security Level 2000 and 3000 single KID and multi-KID and license persistence
  - Widevine (cbcs and cenc) L1 (HW) and L3 (SW)
  - Clearkey and Marlin

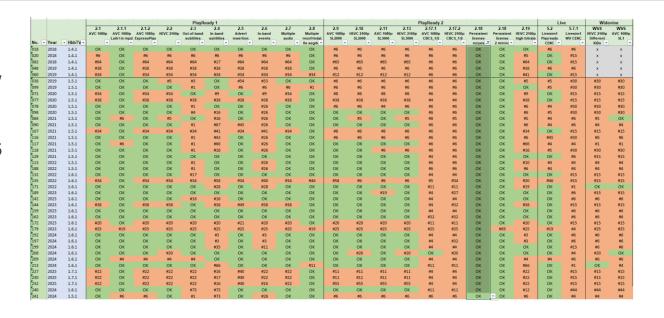
#### Features:

- Multi-Audio
- In-band and out-of-band subtitles
- In-band events
- Traditional ad insertion and static + dynamic multiperiod tests
- Multiple moof/mdat tests
- Live DASH with TTML (using livesim2)
- All with DRM (PR/WV) and without DRM

## Test reports



- DASH DRM Reference App project produces a monthly test report offering a quick overview of current status of device implementations to HbbTV members
- Anonymized list with 105 devices in active testing cycle
- All test cycles include the complete set of test tasks, monitoring also the robustness of old features as well as status of new ones
- Results offer insights to operators about the feasibility of introducing new features to network



# Notable test insights



#### Counting the whole device population:

- TTML subtitles in Live DASH (non-DRM)
  - Native DASH player: ~ 20%
  - Dash.js 4.7.4: ~ 65%
- Playready SL3000
  - OIPF DRM: ~ 50%
  - EME: ~ 50%
- Widevine L1
  - OIPF DRM Object: ~ 15%
  - EME: ~ 43%
- License persistence
  - EME: no real support before 2024
  - OIPF DRM Object: ~ 45%

# Test insights



More details are collected in the <u>DRM</u>
<a href="Integration"><u>Integration</u></a> Specification Annex A

Table D.1: State of DRM features in TS 102 796 implementations

Test	MSE-EME		HTML5 Video object + OIPF DRMAgent	AVObject + OIPF DRMAgent
	2017-2023	2017-2024		
PlayReady™ CENC encryption	41%	64%	92%	92%
PlayReady™ Different KID for A/V	38%	52%	47%	45%
PlayReady™ Security Level 3000	34%	46%	40%	40%
Widevine™ SL1 and SL3	39 %	43%	4 % -> 9%	8%
PlayReady™ CBCS encryption	22%	28%	0%	0%
Widevine™ CBCS scheme	27%	45%	0%	0%
Multiperiod DRM	75%	78%	7%	
Multi-DRM with PR and WV (*)	55%	55%	77%	78%
Persistent Licenses		5%	43%	44%
	Green is >= 67 Yellow is < 679 Red is <= 33% Grey is no data statistically use	% but > 33% a available yet or featu	re not supported on enough de	evices to be

### Conclusion



- Application is under active maintenance and new features are always under consideration
- Development of the application is guided by the industry needs (questionnaires and direct feedback received via several channels)
- Virtually all new devices coming to market are using the tool to verify correct operation
- DRM and DASH examples are used outside of HbbTV context as well ("the only open and wellworking SL3000 example")
- Monthly statistics are collected about the usage (on average 200 Gib/month, ~5000 monthly "visitors")
  - Total for 2024: 92 193 visitors / 2.59 TiB transferred

