



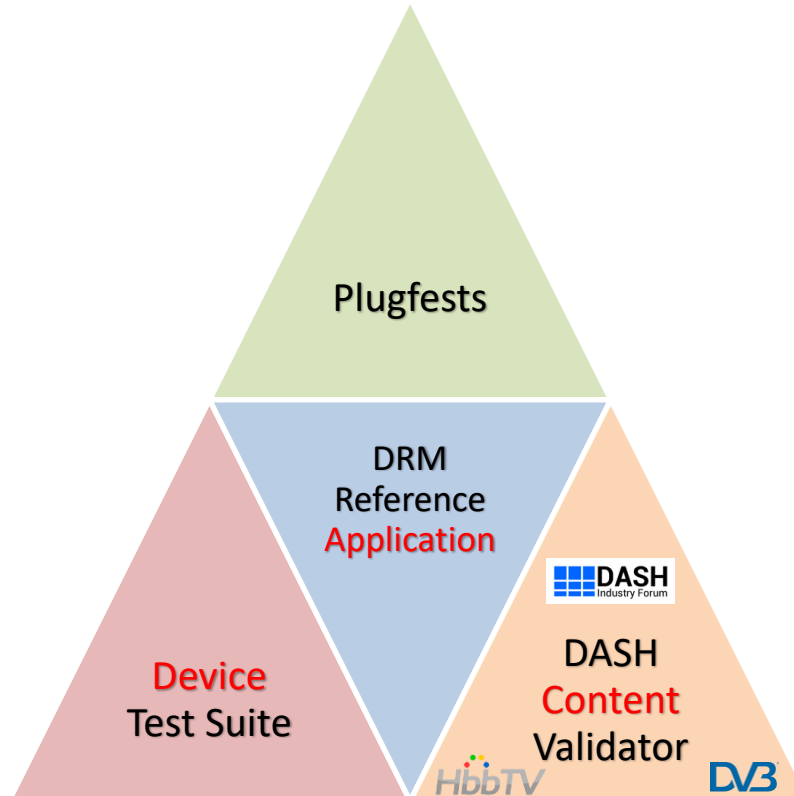
HbbTV's tools for improving interoperability

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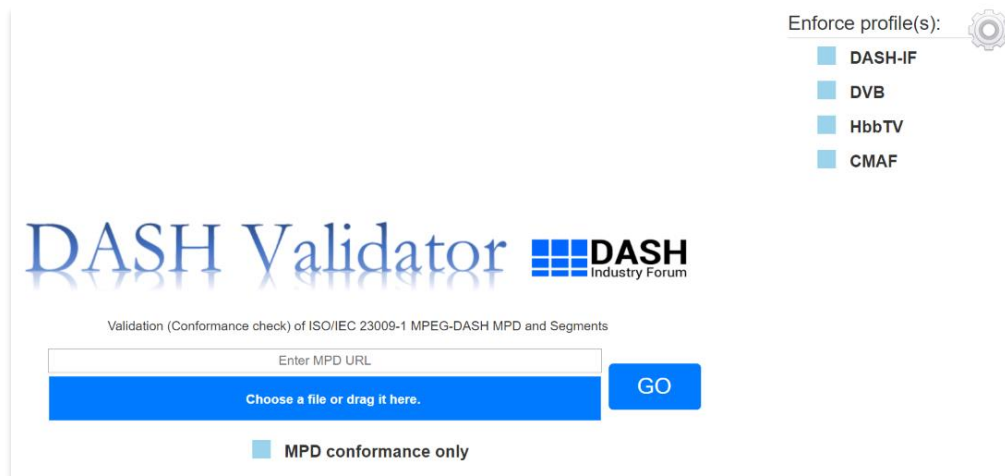
HbbTV: Improving Interoperability



- Designed to provide at least minimum **conformance of devices** entering the market
 - Approximately 2000 tests
 - Covers HbbTV 2.0.1, and tests coming for OpApps and 2.0.2 (HDR, NGA, HFR)
- Additional materials for regional platforms build on this (e.g. Freeview Play, Tivú, DRM Test Suites)
- Not sufficient alone, but the ***foundation*** on which to build interoperability...

- DVB-HbbTV Conformance Software Tool: “DASH Validator” - extension to DASH-IF Conformance Software, built with DVB’s support
- The tool checks DASH **media** (mpd and segments) conforms to DASH-related media specifications (including now, HbbTV and DVB profiles)
- Thus, it provides crucial information for **content generators and service providers**.
- Open source
- Accesible online via DASH-IF:

<https://conformance.dashif.org>



The screenshot shows the DASH Validator web interface. At the top right, there is a settings gear icon and a section titled "Enforce profile(s):" with four radio button options: DASH-IF, DVB, HbbTV, and CMAF. The main heading is "DASH Validator" with the DASH Industry Forum logo. Below the heading, it says "Validation (Conformance check) of ISO/IEC 23009-1 MPEG-DASH MPD and Segments". There is a text input field labeled "Enter MPD URL" and a blue "GO" button. Below the input field is a blue bar with the text "Choose a file or drag it here." At the bottom, there is a checkbox labeled "MPD conformance only" which is currently checked.

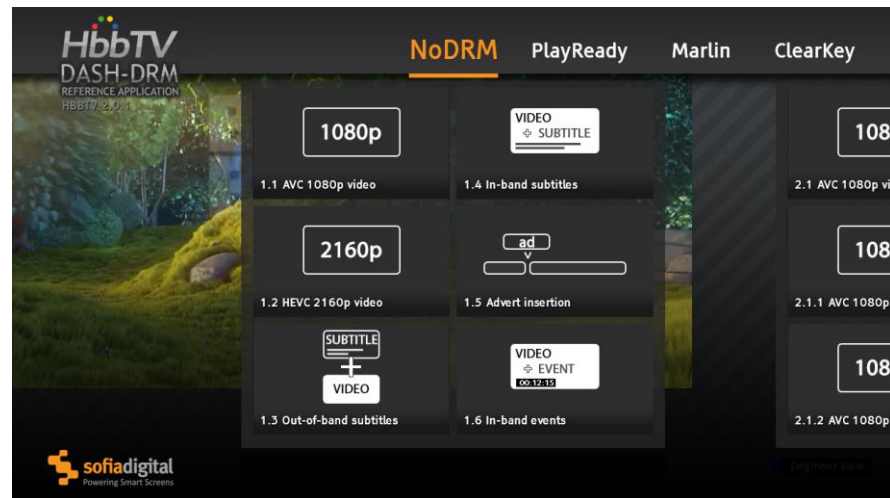
- Docs, code and issue tracking:
 - <https://github.com/Dash-Industry-Forum/Conformance-Software>



- Checks include:
 - MPEG-DASH MPD validation (XML, DASH schema, and MPEG-DASH MPD rules)
 - Segment Validation (ISO BMFF and MPEG-DASH segment rules)
 - Cross-representation validation (MPEG-DASH cross-representation rules)
 - Live MPD segment access validation

Note: The checks are done at the ISO BMFF level (no checks on track media level)

- HbbTV Application and sample DASH content including DRM
- Tested on wide selection of current receivers in the market
- A recipe for **application developers** to use as a reference!
 - Open source licence
 - Workflow and documentation to replicate using common tools



DRM Reference Application - Features

- <http://refapp.hbbtv.org/production>
 - Updated in line with Test Suite, 3 times a year
 - HbbTV 2.0.1 and 1.5 Playready and Marlin DRM streams
 - Also non-DRM streams for reference and including MSE/EME for non HbbTV browsers
 - Subtitle and **audio stream*** selection via color buttons
 - **Live*** and VOD DASH profiles
 - <http://refapp.hbbtv.org/staging>
 - Intended for early access testing of new features
 - **Low latency*** streams with multiple moof/mdat signaling
 - <https://github.com/HbbTV-Association/ReferenceApplication>
 - Docs, code and issue tracking
 - Complete tool chain for re-creating all test assets locally
- * = **New** features now available!

- Run by HbbTV Association
(and others in country)
- Voluntary & Open
(including non-HbbTV members)
- Variety of participants
 - **Manufacturers**
 - **App developers**
 - **Operators/broadcasters**
 - **Service providers**



- The IITF is a forum to raise issues of interoperability,
 - But please note, the HbbTV association must respect antitrust rules, and cannot be party to sharing details of specific implementations.
- IITF will re-direct to the appropriate working group in HbbTV where possible,
 - or consider further appropriate approaches to improving interoperability that have cross industry support.
- See also <https://www.hbbtv.org/resource-library/>
- “HbbTV Tools” Webinar: Wednesday 28th November 5-6pm CET
- Contact: iitf@member.hbbtv.org

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Manual & Automated Application Testing

Device Zoo

Stability, Usability, Performance

Quality of Experience

Security & Compliance



Digital Testing