

HbbTV tools and activities supporting  
**logos, certification and compliance**  
in various HbbTV regimes

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# Characteristics of Successful HbbTV Deployments



Successful deployments of HbbTV have typically included:

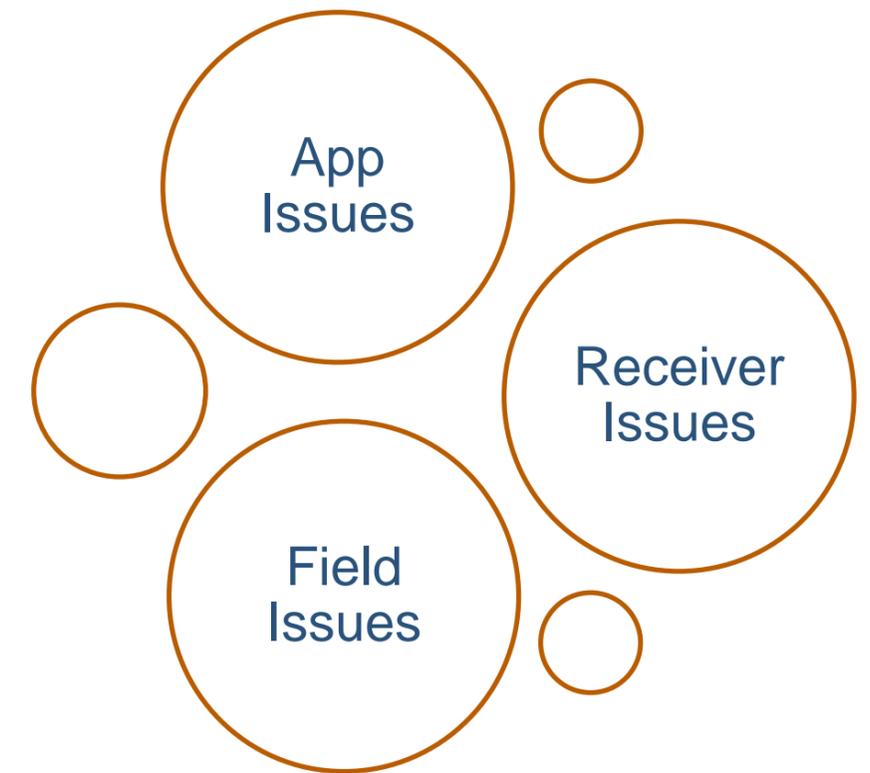
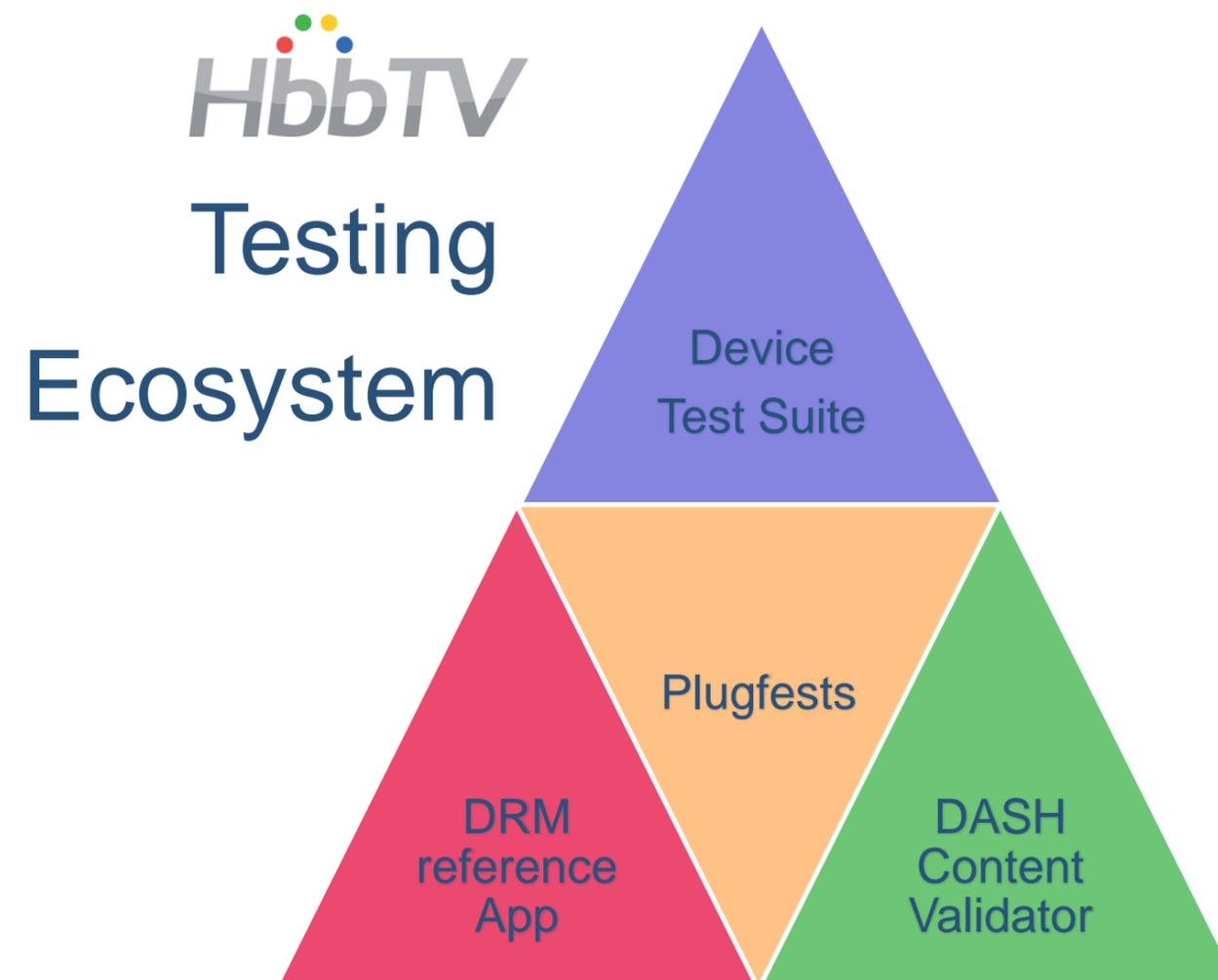
- **Consumer marketing** of the features and services
  - e.g.:
    - <https://vimeo.com/141272035> (Freeview Play, UK)
    - <https://vimeo.com/340234128> (LOVEStv, Spain)
    - <https://vimeo.com/132418985> (Freeview Plus, New Zealand)
- **A consumer logo agreement:**
  - so consumers know what to look out for in the shops
  - manufacturers sign a logo licence agreement
- **A conformance testing regime:**
  - devices are known to meet a minimum set of requirements
  - applications tested on devices
  - consumers can have confidence in the services they receive



# Typical Testing in a Conformance Regime



- **Receiver** Testing (and **Companion Device** Testing)
- **Interoperability** Testing
- **App** Testing
- **Field** Testing

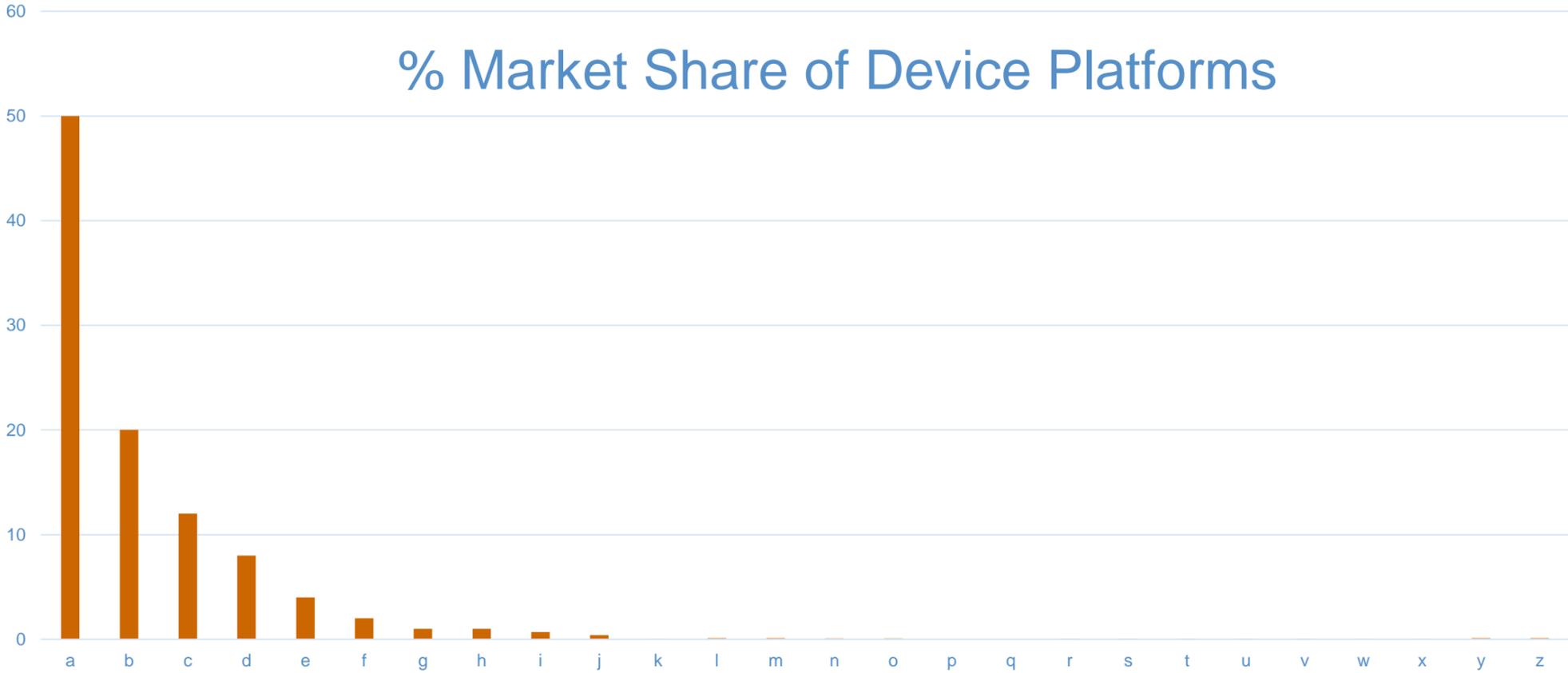


Observed Problems

# CE Interoperability



## TV Manufacturers need to compete but enable the operators



**PHILIPS**    **LG**    **SONY**    **TOSHIBA**    **Panasonic**    **SHARP**  
**Hisense**    **TCL**    **TPV**    **KAON**    **BEKO**    **SAGEM**  
TPV TECHNOLOGY LIMITED  
**Mstar**    **Skyworth**    **STRONG**    **VESTEL**    **CHANGHONG 长虹**  
semiconductor  
**arçelik**    **NOVATEK**    **SAMSUNG**    **REALTEK**    **netgem**  
**HUMAX**    **ARRIS**    **eurofins**

# HbbTV Plugfests



## Run by the HbbTV Association

- sometimes by individual country regimes

## Voluntary & Open

- including non-HbbTV members

## Variety of participants

- **Manufacturers**
- **App developers**
- **Operators/broadcasters**
- **Service providers**



# DVB – HbbTV DASH Validator



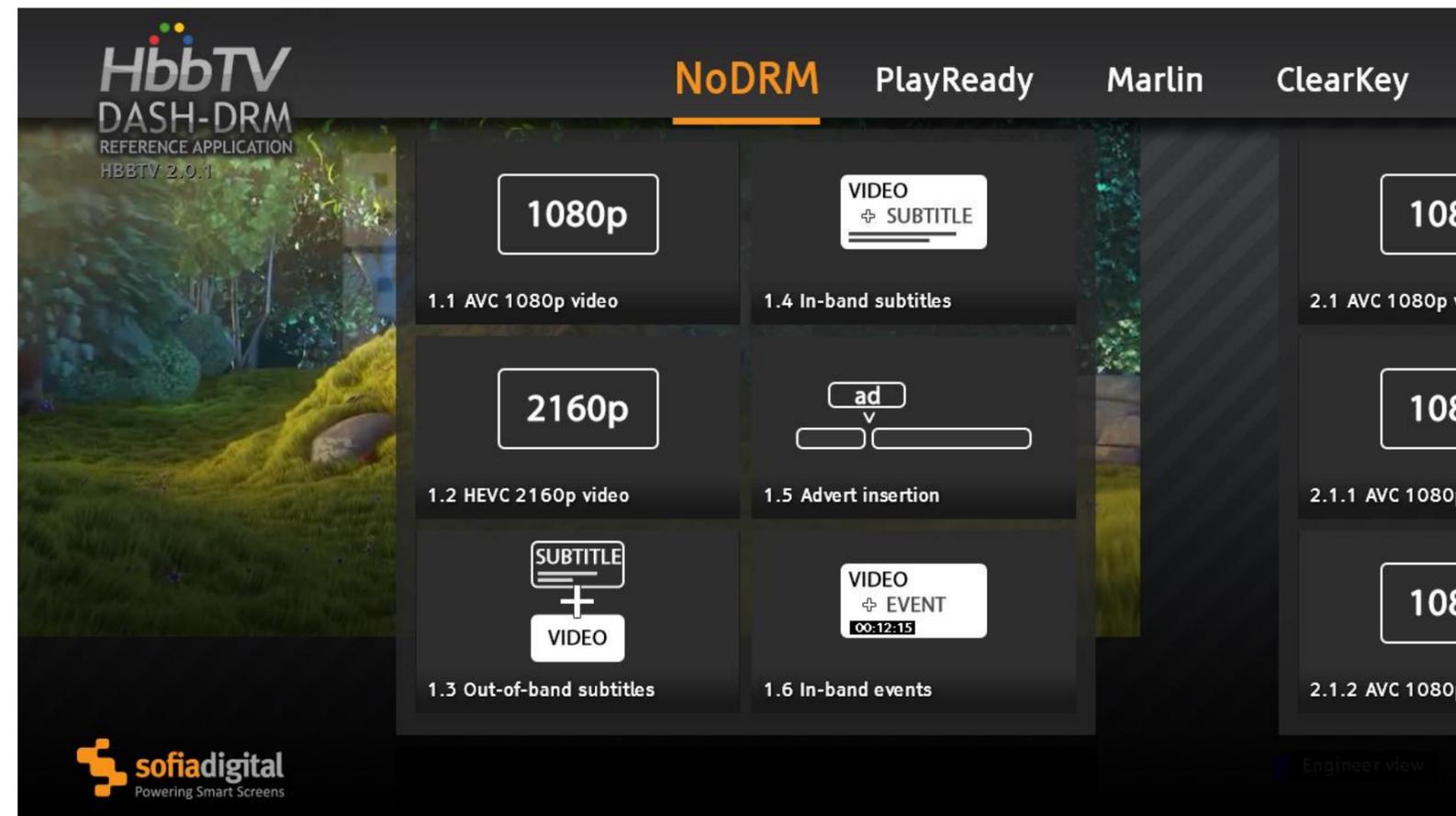
- **DVB-HbbTV Conformance Software Tool: “DASH Validator”**
  - extension to DASH-IF Conformance Software, built with DVB’s support
- The tool checks *DASH media* (mpd and segments) conforms to DASH-related media specifications (including now, HbbTV and DVB profiles)
- Open source & online via DASH-IF: <https://conformance.dashif.org>
- Provides crucial information for **content generators and service providers**

The screenshot shows the DASH Validator web interface. At the top right, there is a section titled "Enforce profile(s):" with a gear icon. Below it, four checkboxes are listed: 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".

# DRM Reference Application



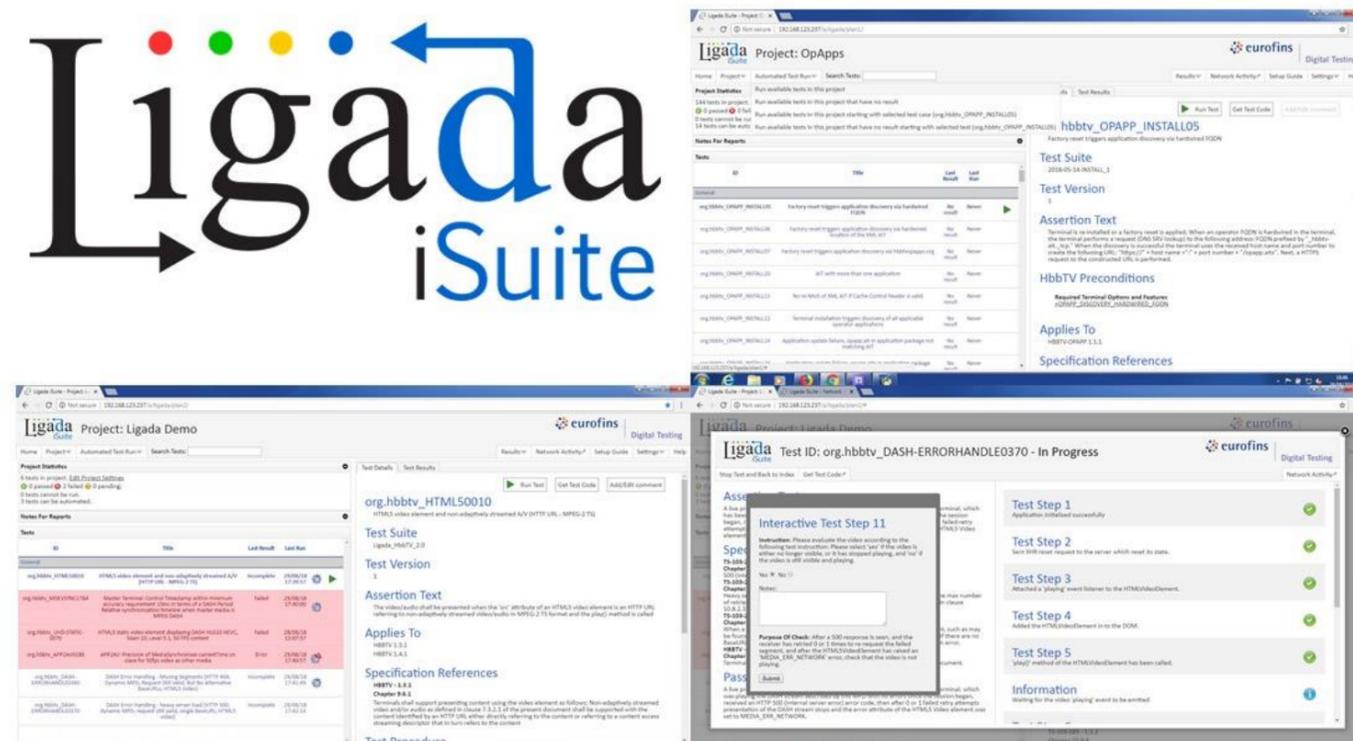
- **HbbTV Application with sample DASH content including DRM**
- <http://refapp.hbbtv.org>
- **Tested on a wide selection of current receivers in the market**
- **A recipe for application developers to use as a reference!**
- **Open source licence**
- **Workflow and documentation to replicate using common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



# HbbTV Test Suite



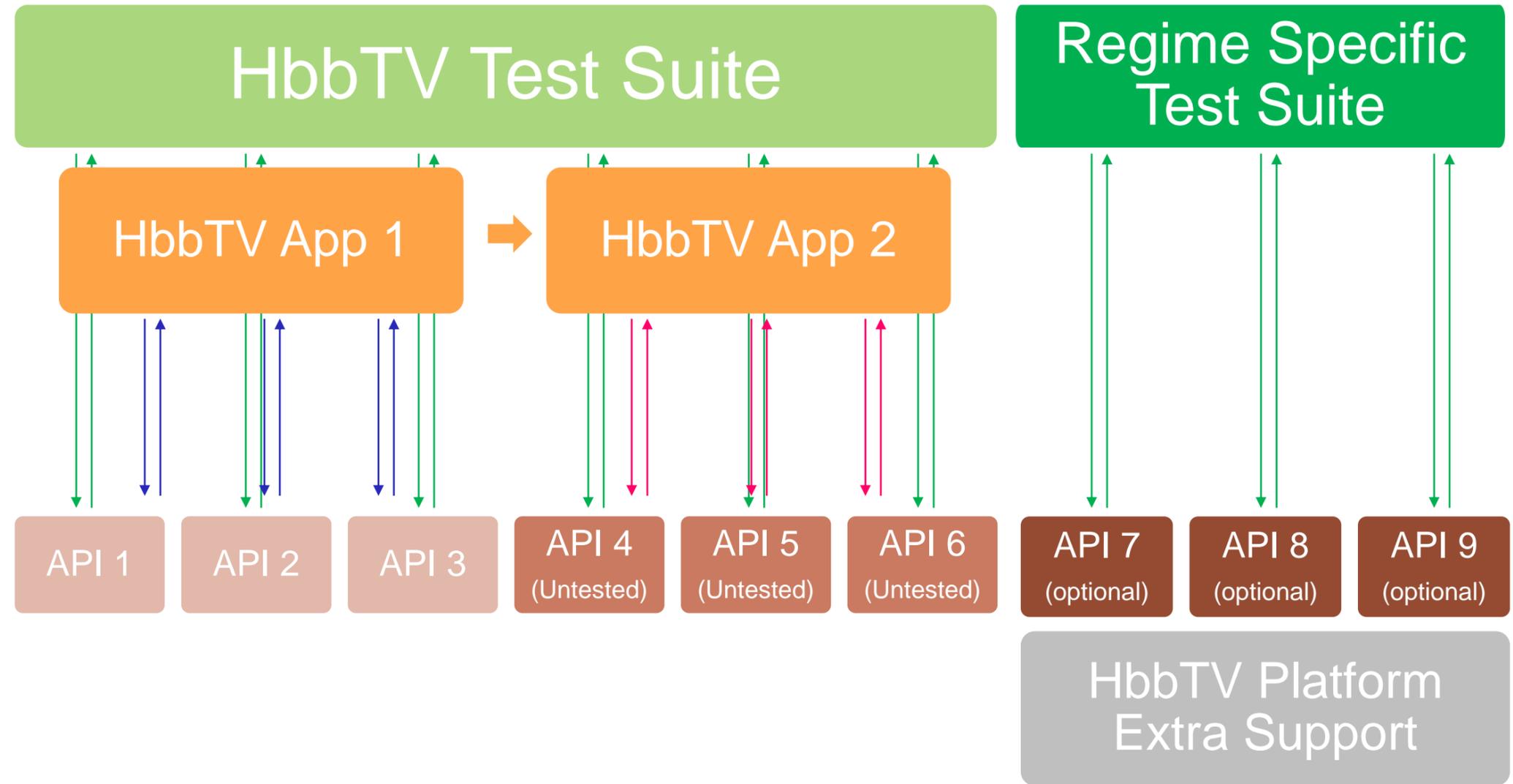
- Designed to provide at least minimum conformance of devices entering the market
- Approximately 2000 tests
- Covers HbbTV 2.0.2, including HDR, NGA, and additional tests for OpApps, Targeted Advertising Independent Specifications
- Additional materials for regional platforms build on this (e.g. Freeview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



# HbbTV Test Suite



## The basis of a Test Suite



- If you have a partially tested HbbTV Platform,
- It may work with some Apps,
- But not all...
  - HbbTV Test Suite covers all of the required features
- But there are also specific regime requirements
- That's why extra test suite is also useful

# Role of Application Testing for Devices

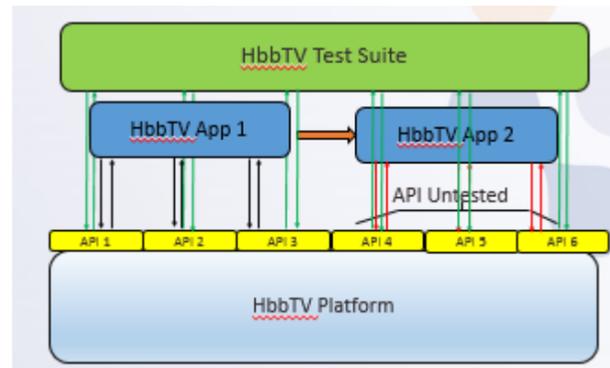


## What is the difference?



HbbTV Ref App

- More representative of “The Real World”?
- Better at covering integration and “state” transitions
- Some app testing is also about performance and look and feel - tricky area for HbbTV Test Suite...
- What does it mean to “pass” the app???



Test Case App

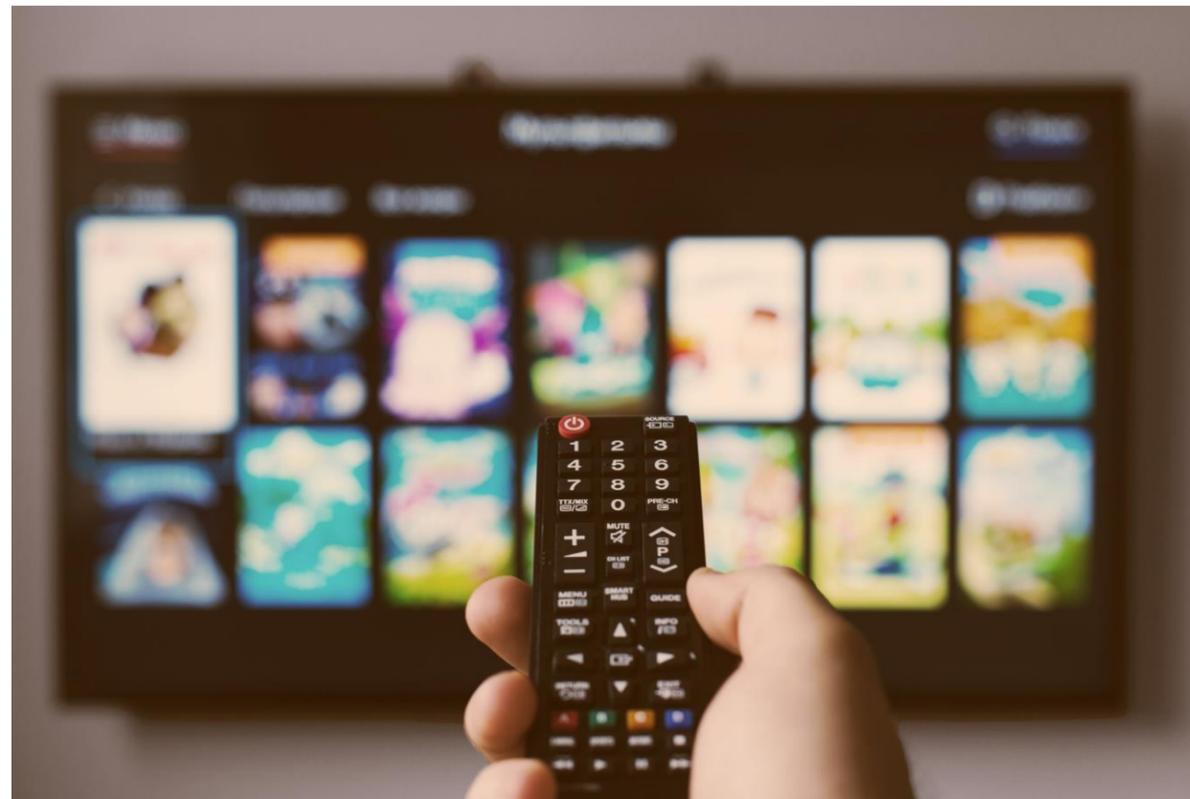
- More unit coverage of the Spec (maybe too much!)
- Assertion, Spec Reference, Test Procedure, Pass Criteria
  - All very important when dealing with Logo programs
- Formal Review – tests follow spec!
- Suitable for use in commercial sensitive 3<sup>rd</sup> party Certification..

**Conclusion: Both are important!**

# Application Testing



- Application developers obviously test their app thoroughly...
- Need to check on devices, no fully representative HbbTV emulators exist
- HbbTV devices are sometimes constrained by resources and/or browser platform support
- Application testing on devices can be automated and can be facilitated through use of device Zoo's



# IITF



- **HbbTV Association formed an “Improving Interoperability Task Force”**
- **Scopes and manages updates to DRM Reference App, DASH Validator**
- **Co-ordinates Plug-fest/Interoperability Testing Events**
- **Solicits feedback from industry on interoperability issues affecting platforms:**
  - **On more than one device: can’t address individual manufacturers due to anti-trust rules...**
  - **Can put provide contacts and feedback or pass on to the appropriate HbbTV Working Group...**
- **See also:**
  - **<https://www.hbbtv.org/resource-library/>**

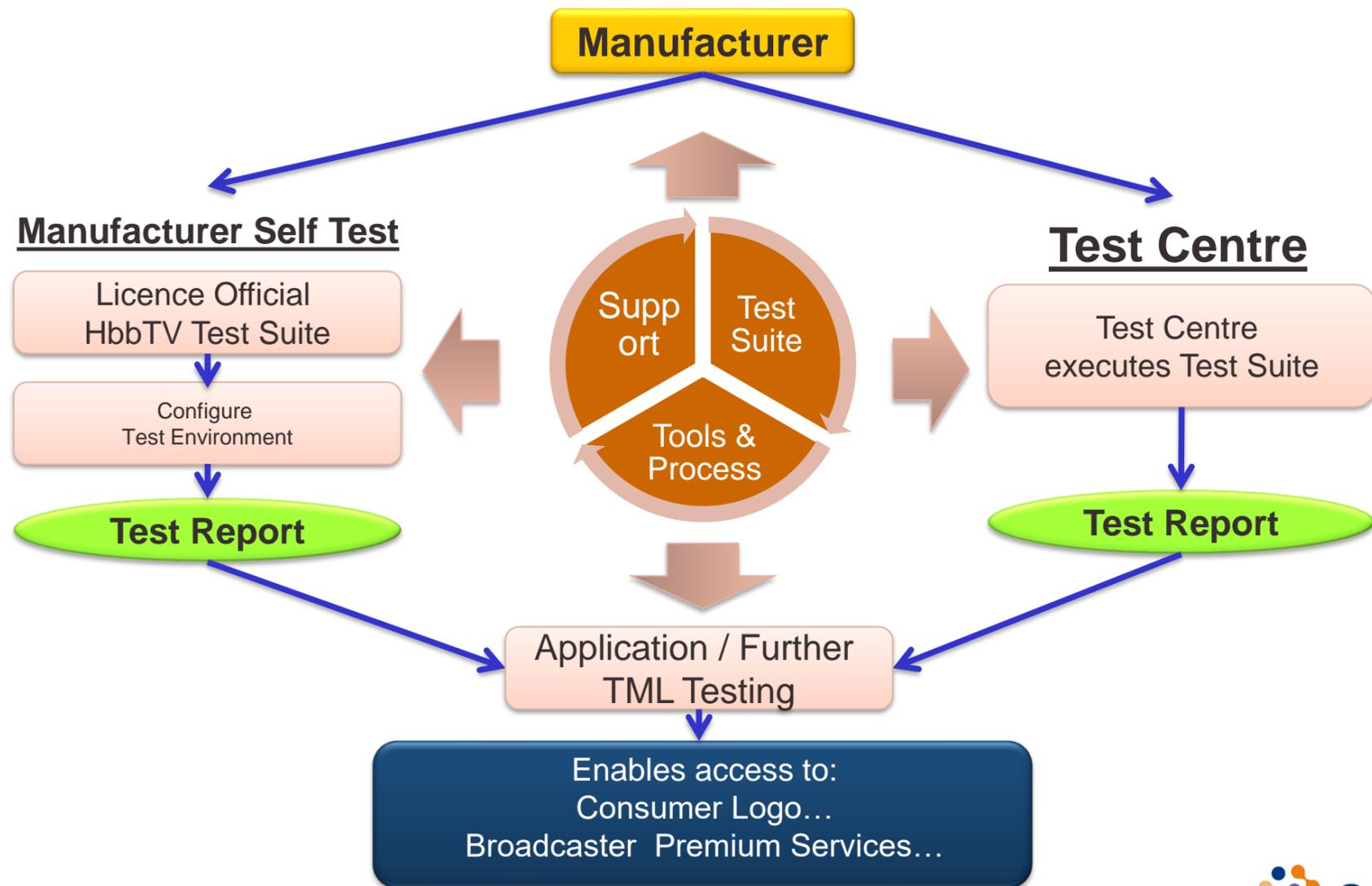


# Overview of Certification in HbbTV regimes

# What is a Certification or Conformance Regime?



- Objective is to achieve **High Quality**
- Manage and foster **Adoption** of the technology
- Use of “**Logo**” to identify and build confidence in the market.
- Particularly important in **horizontal / retail** market, e.g. free-to-air DTT,
- Manufacturers using Tools, Test Suit and Support to pass regime





Italy



## Case Study

### Tivù

Services:

- Tivu (DTT)
- Tivusat (DTH)
- Tivuon (for premium OTT content)

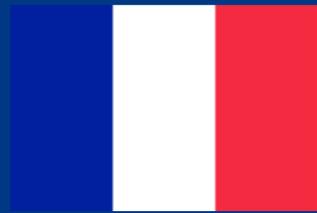
Test Suites:

- DTT/DTH tests (DGTVi and Tivùsat streams)
- HbbTV tests (Tivù test suite and HbbTV 2.0.2 / 1.5.1)
- DRM tests (Tivùon! test suite)

Some Regime Specific Tests:

- Coexistence of MHP/HbbTV (with HbbTV prioritised)
- Launching resident apps (e.g. receiver menu) does not kill HbbTV apps
- RCU tests (e.g. can close HbbTV app by 'exit', can change channels while app is running – to prevent HbbTV apps from blocking normal usage)
- H264 and HEVC DASH streaming
- [Tivùon!] Marlin and PlayReady DRM (HTML5)





France



Case Study

## France HbbTV



### Testing

- One of the earliest HbbTV adopters, with no mandatory conformance.
- HD Forum procured the TNT2.0 test suite, including DASH and PlayReady / Marlin DRM tests
  - Various French specific tests – e.g. robustness

### Certification

- Original plans for a TNT2.0 logo and trademark license agreement were dropped
- Consumers couldn't distinguish between TVs that support HbbTV 1.1 and HbbTV 1.5

### Deployment

- Most current French HbbTV services only used HbbTV 1.1

### Result

- France almost abandoned HbbTV altogether!
- But.. SALTO is coming... Watch this space!...

salto



UK



## Case Study

# Freeview Play

Services:

- **FreeviewPlay (DTT)**

Test Suites:

- Freeview HD (D-Book, HbbTV 2.0.2/1.5.1, HbbTV Transition)
- Platform Technology Testing (HbbTV Platform Specific tests inc. DRM)
- Player Testing (BBC iPlayer + all other players)
- Metadata (interaction with MDS and presentation on screen)
- App Testing

Some Regime Specific Tests:

- Coexistence HbbTV/MHEG5
- AD insertion tests (HTML5)
- Audio description tests via DASH
- PlayReady tests (HTML5)
- HTTP connection tests (e.g. minimal 2 connections, can follow redirects, etc)
- Robustness tests (e.g. app opened and closed, download disrupted, large file, etc)
- User-agent / Capabilities / TLS etc (Just need FVP specific strings & TLS license registered to DUK)





Spain



## Case Study

### TDT Hibrida



Services:

- **TDT Hibrida (DTT)**

Test Suites:

- HbbTV 1.5/1.2.1
- DRM and DASH

Some Regime Specific Tests:

- Transcoding to DTS (to S/PDIF as compressed audio) from EAC-3/AC3/HEAAC
- Broadband teletext/subtitles in broadband TS
- UI requirement (No loading graphing displayed while downloading or waiting for server response / no scrollbars in HTML / No 'x' when the image URL is dead)
- Default configuration of device (HbbTV enabled / Subtitles disabled / cookies enabled)
- TLS certificate (authentication to TDT server – to confirm that it has been registered at TDT)

LOVEStv Application Testing  
Interoperability lab



Germany



Case Study

## Germany DTT



### Testing

- DVB-T2 logo did not mandate HbbTV.
- Commercial suppliers mandated HbbTV v2 (FreenetTV)
- Recently published HbbTV 2 “Minimum Requirements” defined by DTVP
- Some tests “to be provided by broadcasters”

### Certification

- DVB-T2 logo is self certified.
  - Consumers can't tell the difference between HbbTV versions supported...
  - Applications have to be written to work on everything from HbbTV 1, 1.5, 2



Germany



Case Study

## Freenet TV

freenet TV

MEDIA  
BROADCAST

Services:

- Media Broadcast (DTT)

Test Suites:

- DTT (RF, SIPSI, HEVC)
- HbbTV (plus platform specific HbbTV tests)

Some Regime Specific Tests:

- AV Sync - MPEGDASH (This is a Nordig requirement used by MB)
- Zapping time (HbbTV streaming apps on two services)
- RCU tests (e.g. can close HbbTV app by 'exit', can change channels while app is running – to prevent HbbTV apps from blocking normal usage)
- User-agent / Capabilities (MB specific strings, and check that +PVR +DL are not supported)
- Performance tests / robustness tests (No A/V glitch when loading large assets, remains stable when download interrupted etc)
- Authenticate with MB DRM system (Irdeto)



Australia



Case Study

## Freeview Plus

Services:

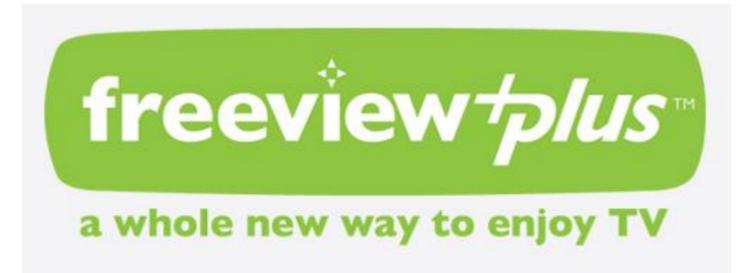
- **Freeview Plus (DTT)**

Test Suites:

- AS4933.1-2015 (SIPSI and Functionality)
- HbbTV 1.5 (2.0.1 for 2018 models)

Some Regime Specific Tests:

- DRM (PlayReady)
- HbbTV turned on by default
- Application auto-start turned on by default
- Robustness tests
- 4K UHD HDR
- PVR





New Zealand



Case Study

## Freeview New Zealand

Services:

- Freeview Plus (DTT)

Test Suites:

- RF
- SIPSI
- HbbTV 1.5 (2.0.1 for 2018 models)

Some Regime Specific Tests:

- DRM (PlayReady and Marlin)
- HbbTV turned on by default
- Application auto-start turned on by default
- Robustness tests
- 4K UHD HDR
- PVR



# The Future for HbbTV Testing Regimes



1. HbbTV interoperability remains challenging, involving broadcast, broadband, content, apps, multi-devices
2. Multiple approaches to test and certification drive quality and are increasingly adopted in the market
  - Use the Official Test Suite
  - Use a country specific certification regime
  - App testing &
  - Interoperability testing
3. Regime specific conformance regimes will continue to be important to broadcasters to address their needs, and evolve new features.