

# Certification and Improving Interoperability

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# Recipe for HbbTV Success!



Successful deployments of HbbTV have typically included:

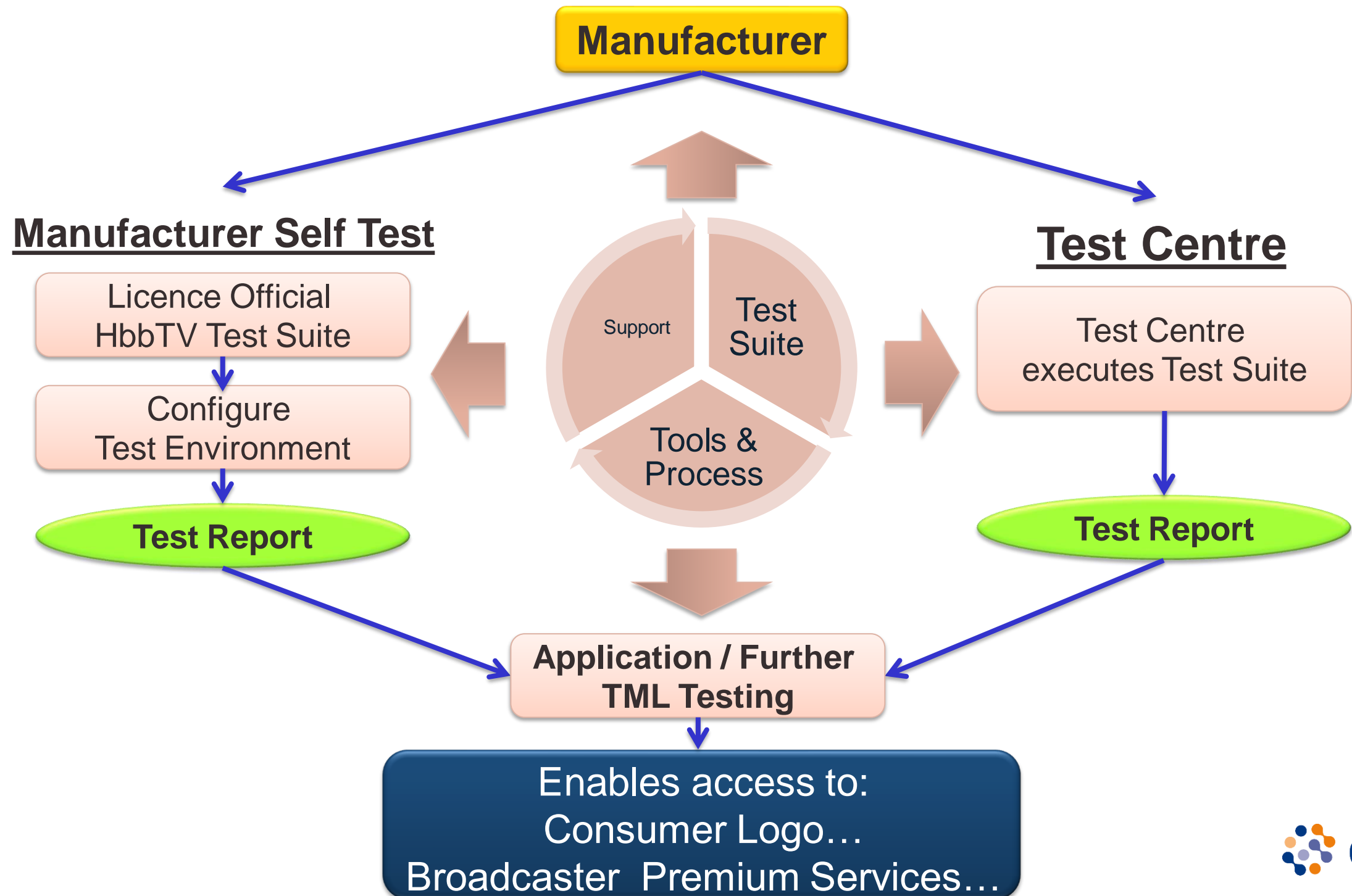
- **Consumer marketing** of the features and services
  - See:
    - <https://vimeo.com/141272035> (Freeview Play, UK)
    - <https://vimeo.com/340234128> (LOVEStv, Spain)
    - <https://vimeo.com/132418985> (Freeview Plus, New Zealand)
- **A consumer logo agreement:**
  - so consumers know what to look out for in the shops
  - manufacturers sign a logo licence agreement
  - forum for discussion about waivers, scope, optional feature support
- **A conformance and interoperability 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



# What is a Certification Regime?



- Objective is to achieve **High Quality, Interoperability, Adoption**
- Leads to use of **Logo** to identify and build confidence in the market
- Particularly important in **horizontal / retail** market, e.g. free-to-air DTT
- Supported with Test Tools, Materials, expertise and resources

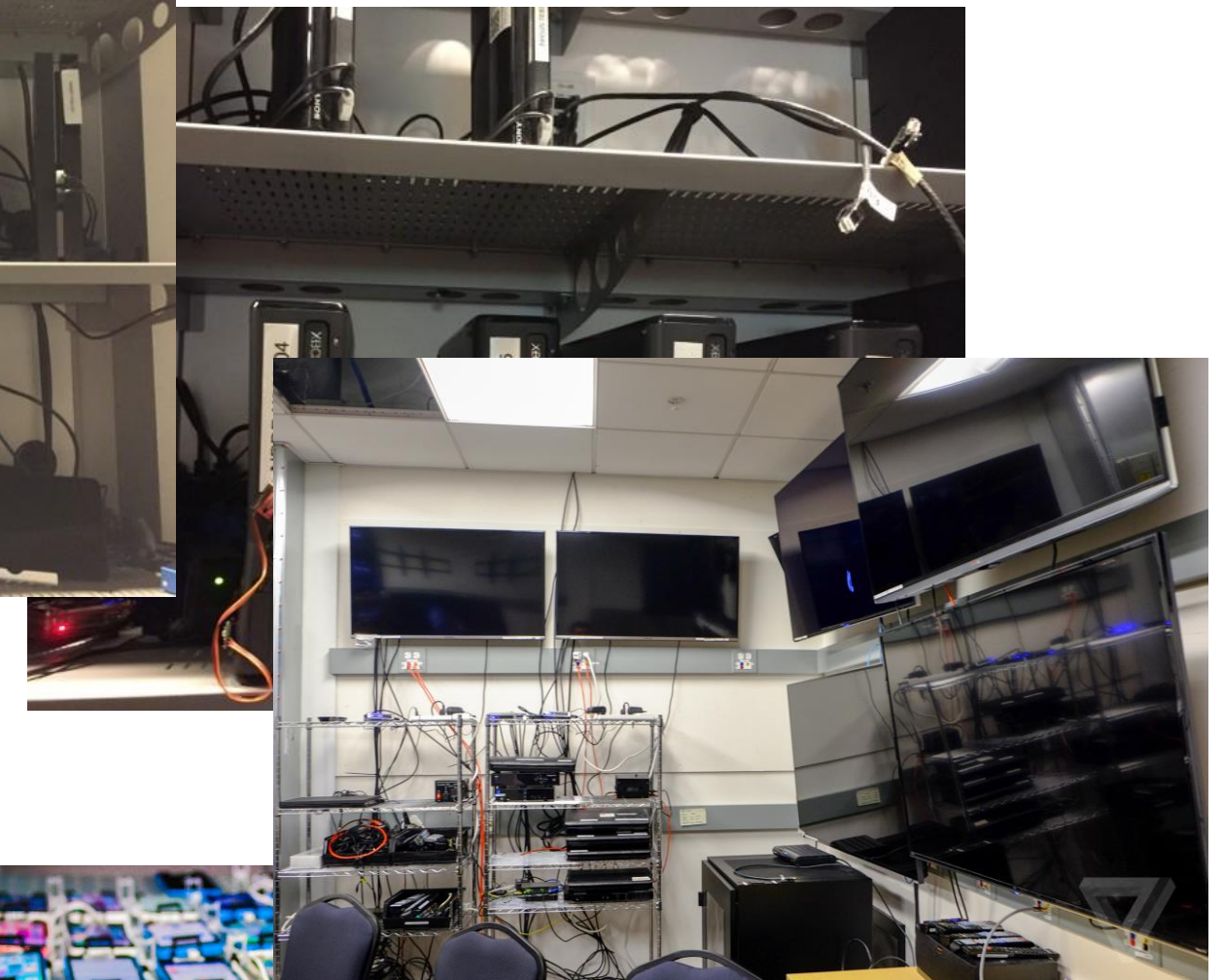


Why is  
HbbTV so  
hard?



- Is it?

NETFLIX



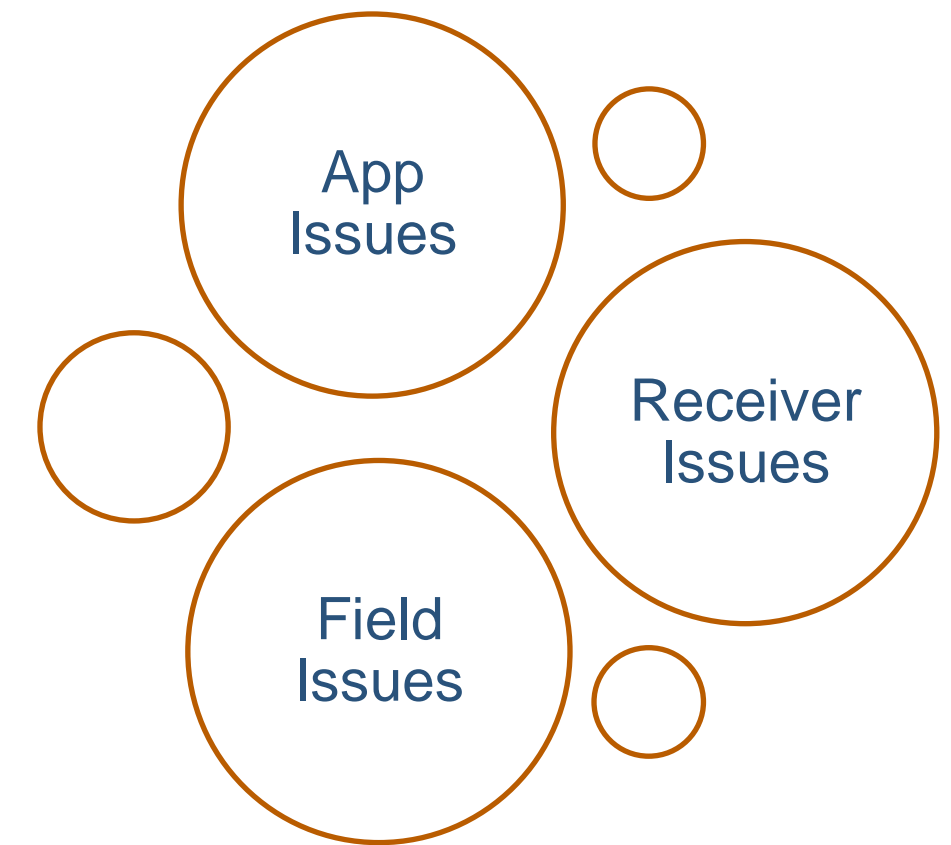
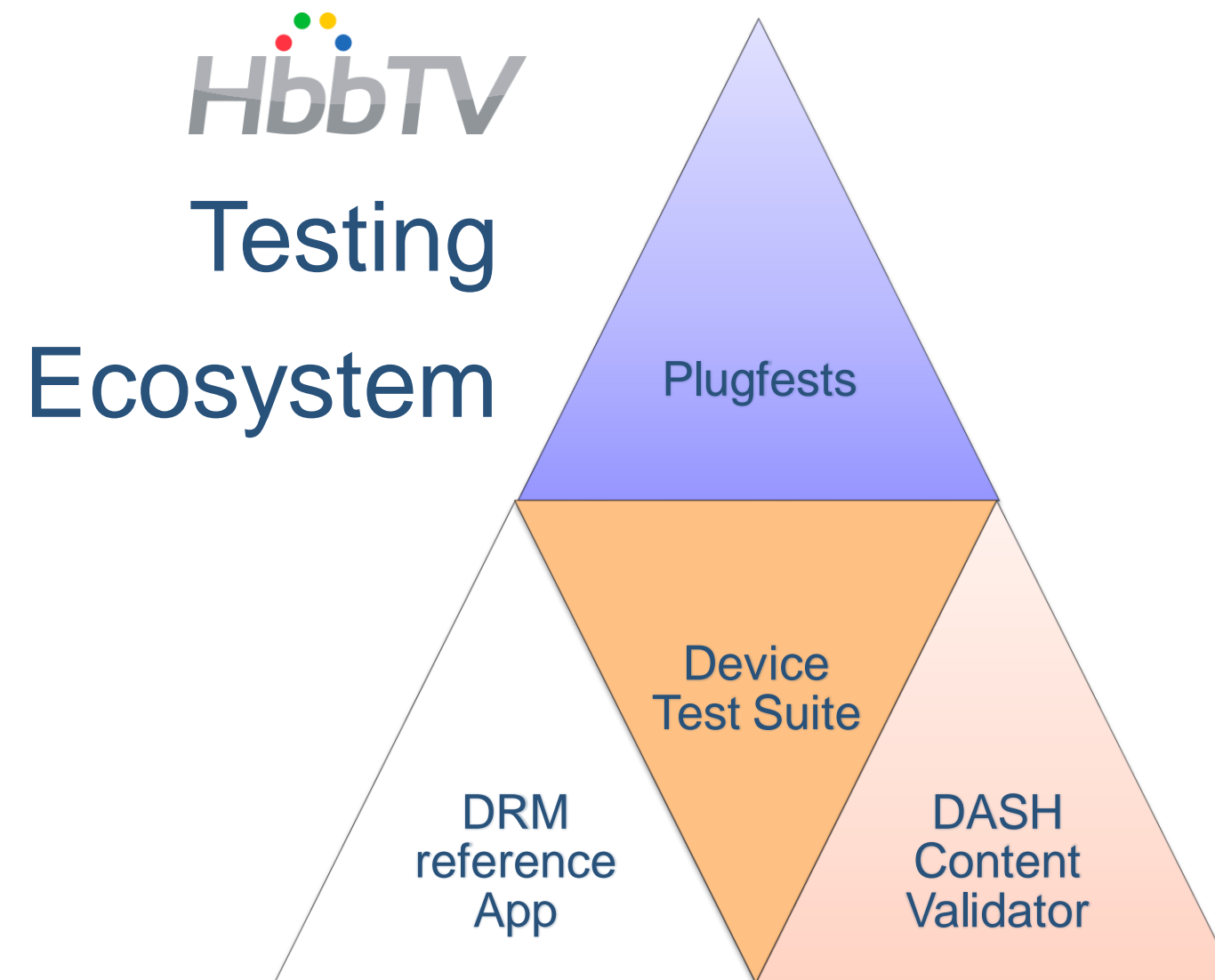
<https://netflixtechblog.com/automated-testing-on-devices-fc5a39f47e24>



# Success through Testing



- **Receiver Conformance** Testing
- **Application** Testing
- **Interoperability** Testing
- **Field** Testing

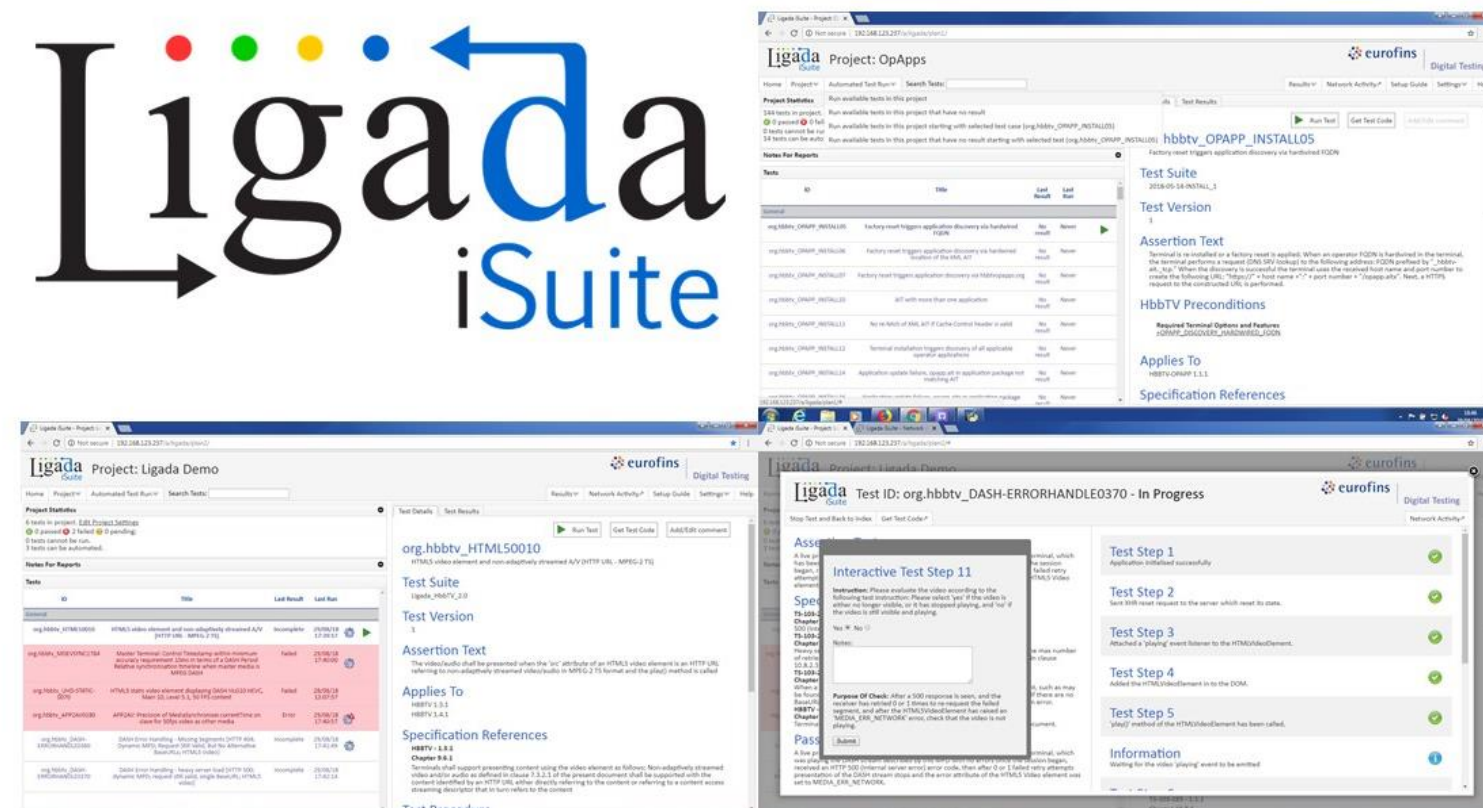


Observed Problems

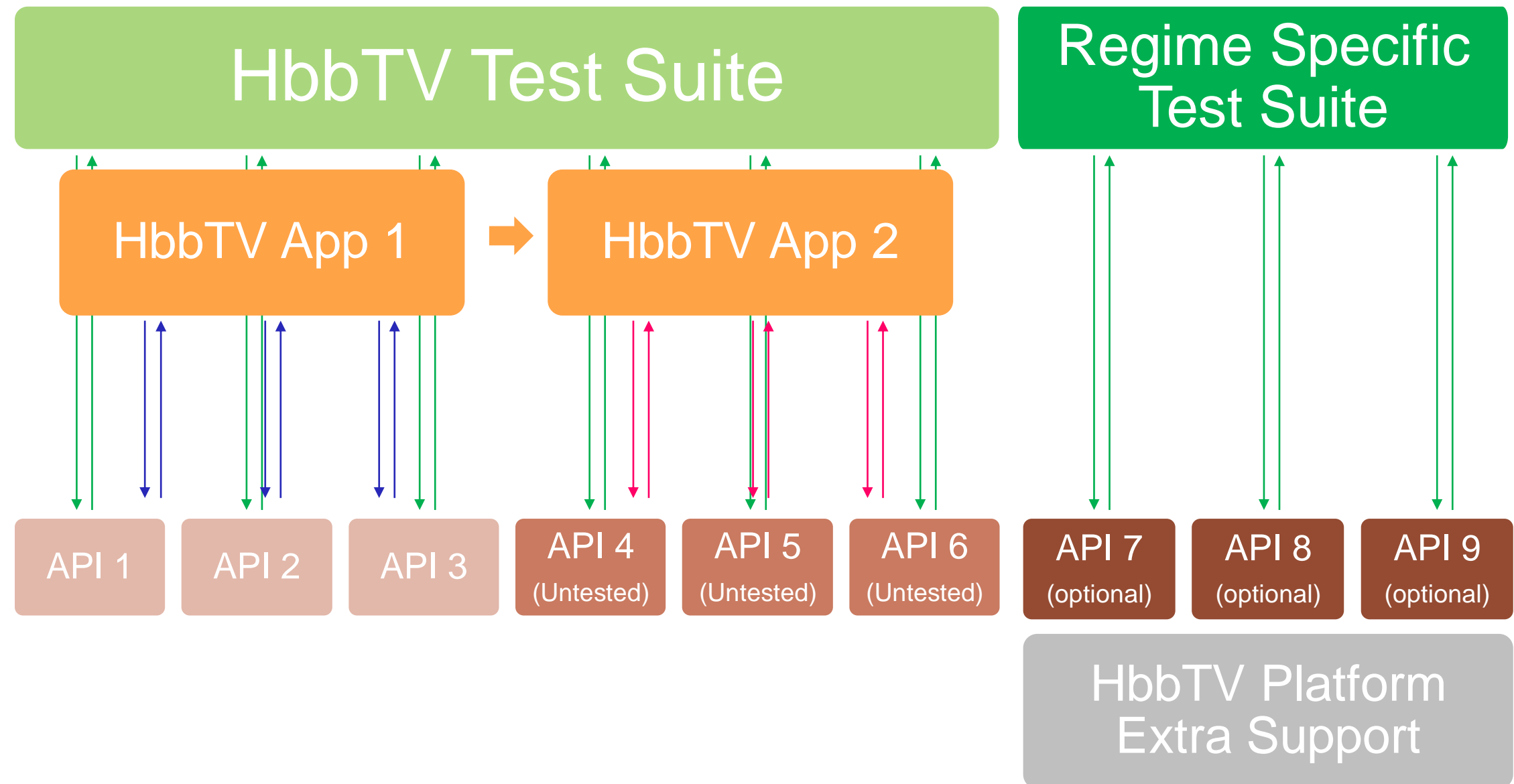
# HbbTV Test Suite



- Designed to provide at least minimum conformance of devices entering the market to a specific version of the Specifications
- Approximately 3000 tests
- Covers HbbTV 2.0.3, and additional tests for Targeted Advertising and Operator Applications
- 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

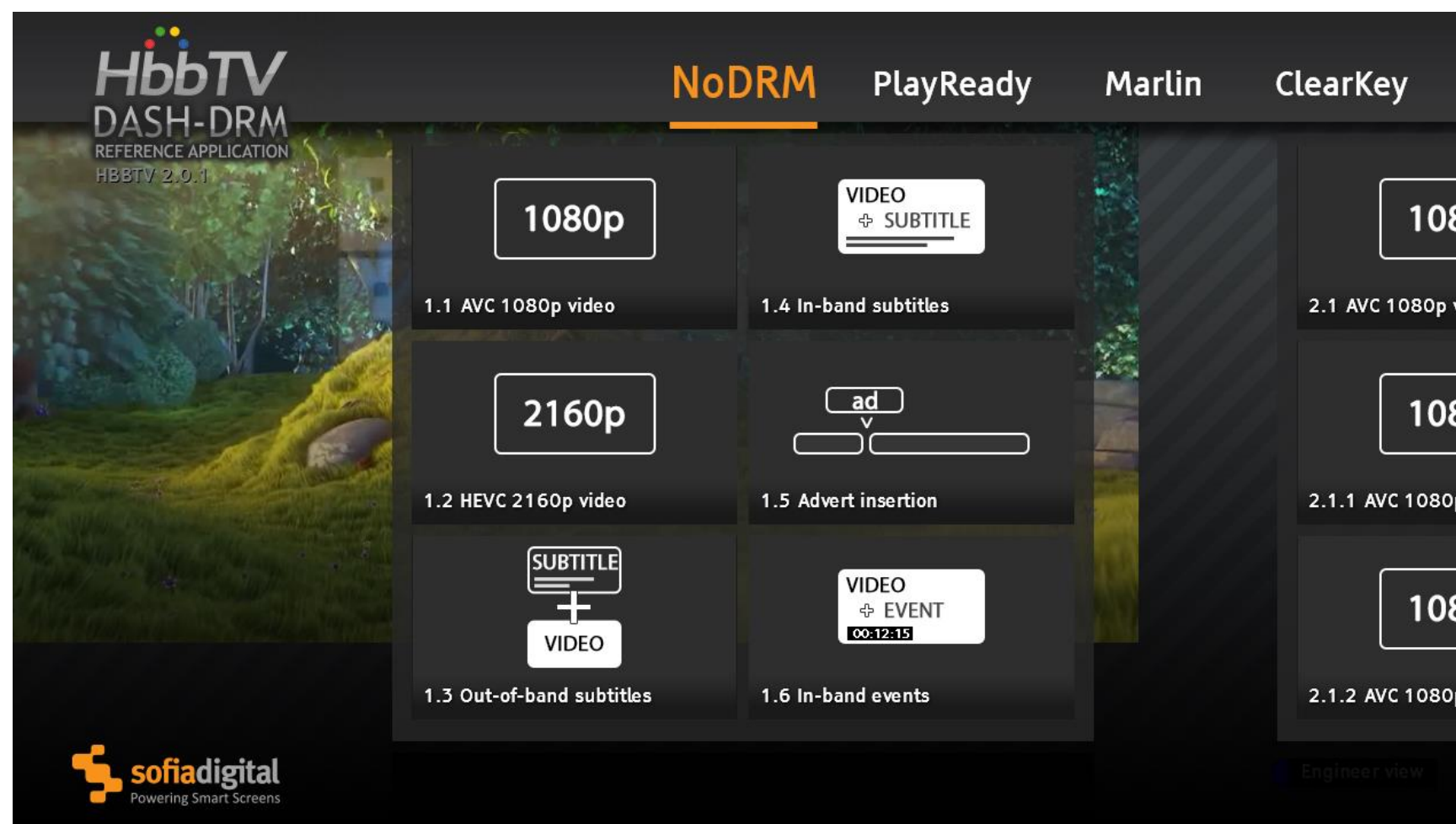


- A partially tested HbbTV Platform may work with some Apps, but not all...
  - HbbTV Test Suite covers all of the required features
- There are also specific regime requirements (HbbTV and DVB):
  - Localisation, Different DRM systems, other Optional Features
  - ..reflecting different commercial objectives and pace of adoption in both devices and applications

# DRM Reference Application



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



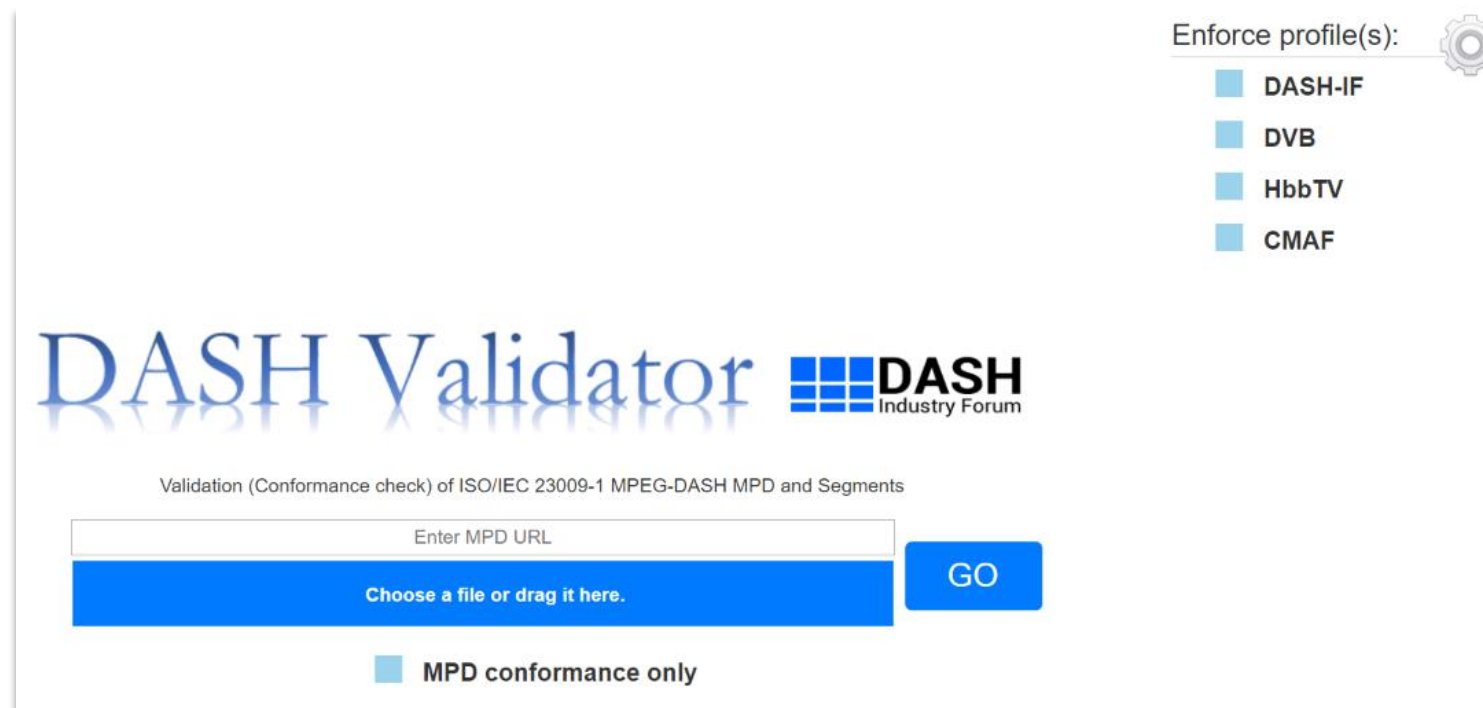


# DVB – HbbTV

## 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

A screenshot of the DASH Validator web interface. At the top right, there is a section titled "Enforce profile(s):" with a gear icon and four checkboxes: DASH-IF, DVB, HbbTV, and CMAF. The main heading "DASH Validator" is displayed in a large, blue, serif font, with the DASH Industry Forum logo to its right. Below the heading, a subtitle reads "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 button labeled "GO". 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".

# HbbTV Plugfests



**Run by various entities around Europe**

- Sometimes limited to local parties, sometimes open to all

**Variety of participants**

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



# HbbTV Developer Portal

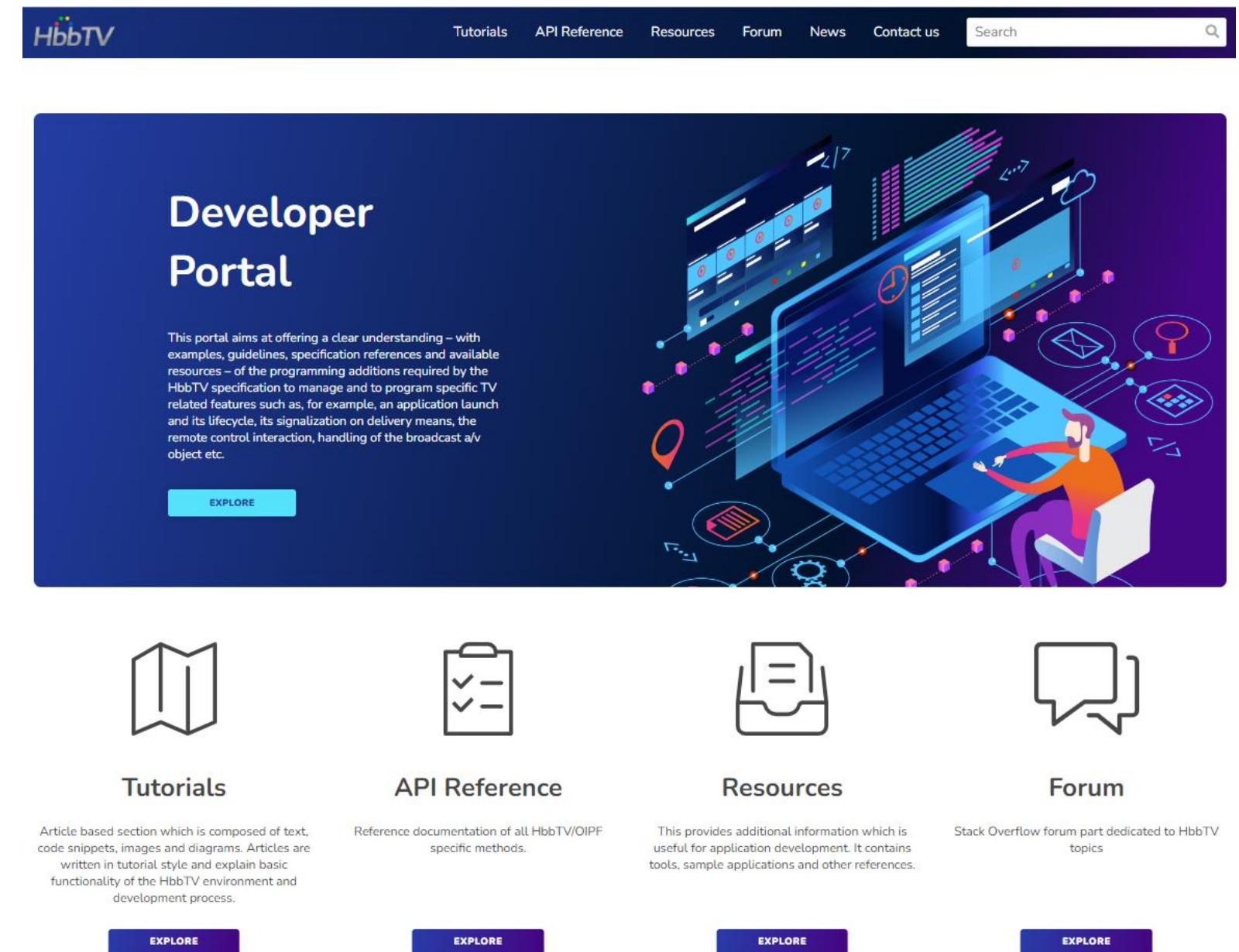


## Developed by the HbbTV Association

- Contributions from all stakeholders welcome, especially app developers!
- <https://developer.hbbtv.org/>

## Lots of content:

- Tutorials, including
  - “hello world” example
  - things to avoid
- API Reference
- Resources
- Forum
- News



# HbbTV Website



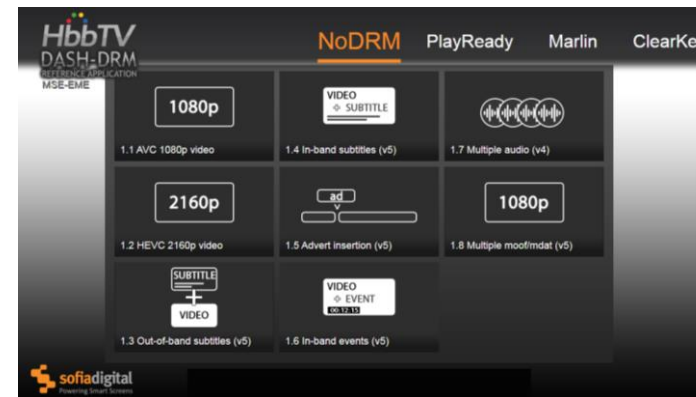
- **Why isn't feature x enabled in my market?**
- **Why isn't HbbTV enabled in my market?**
  - See HbbTV website Q&As <https://www.hbbtv.org/overview/#overview-faqs>
  - Commercial as well as technical reasons
- <https://www.hbbtv.org/resource-library/>
  - Specifications
  - Explanations of features
  - List of tests in the test suite
  - Webinars, Whitepapers and other resources
  - Contact information
- **Join the Improving Interoperability Task Force!**



# Testing Devices with Applications

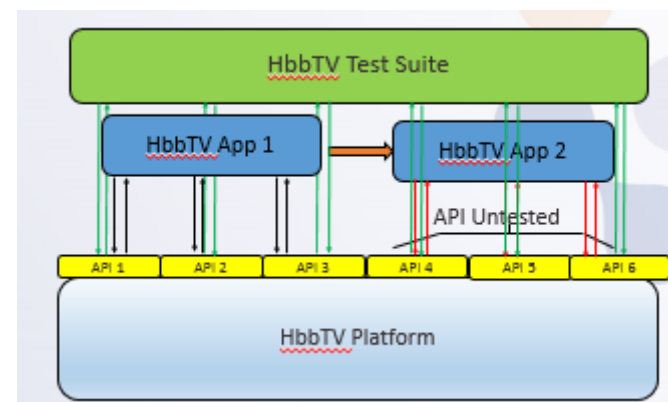


## What is the difference?



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???

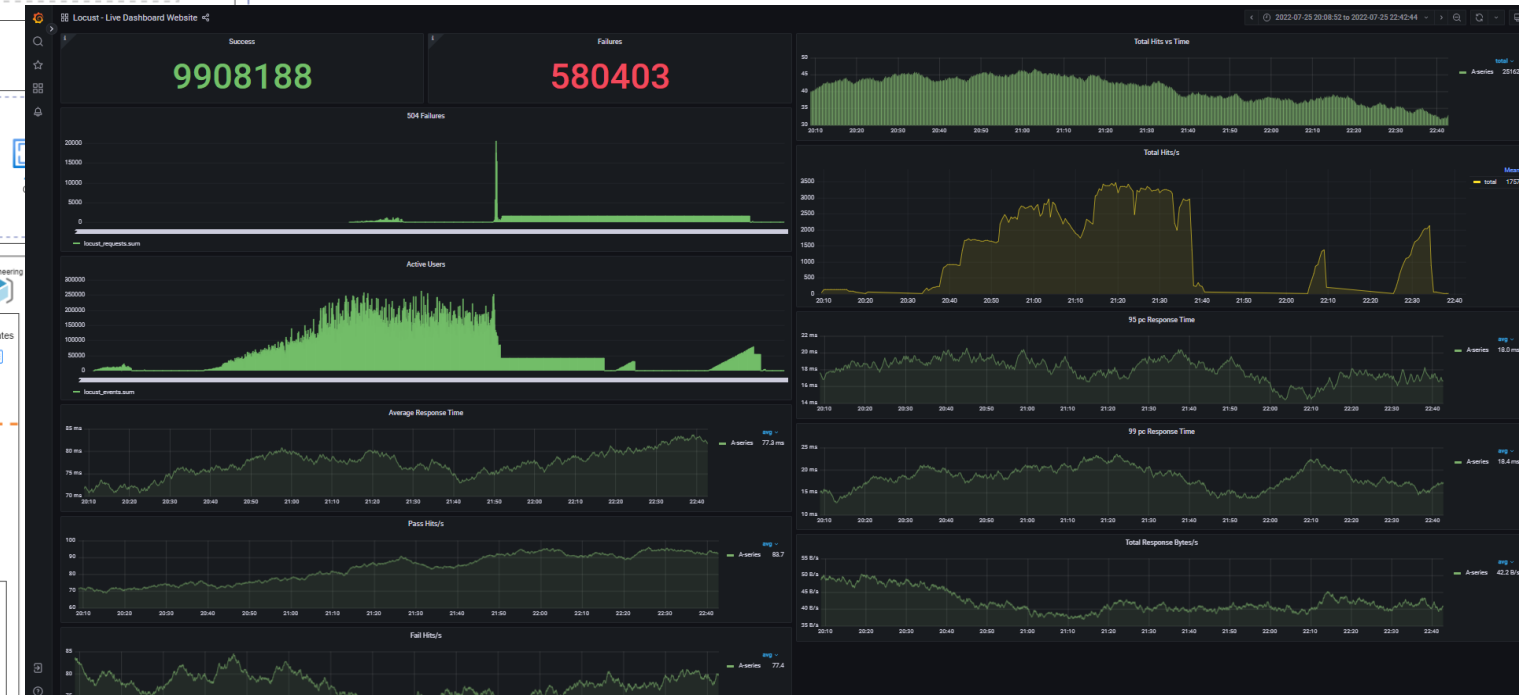
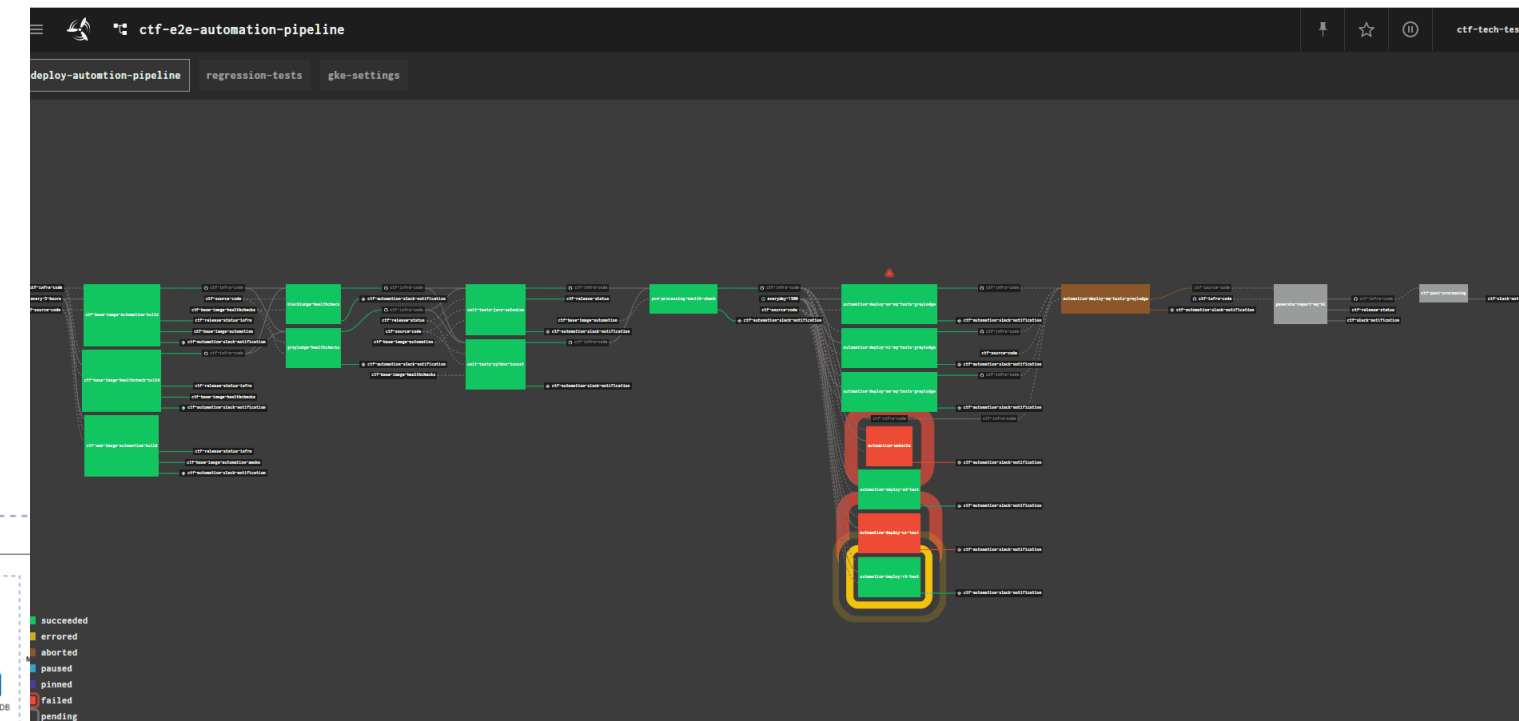
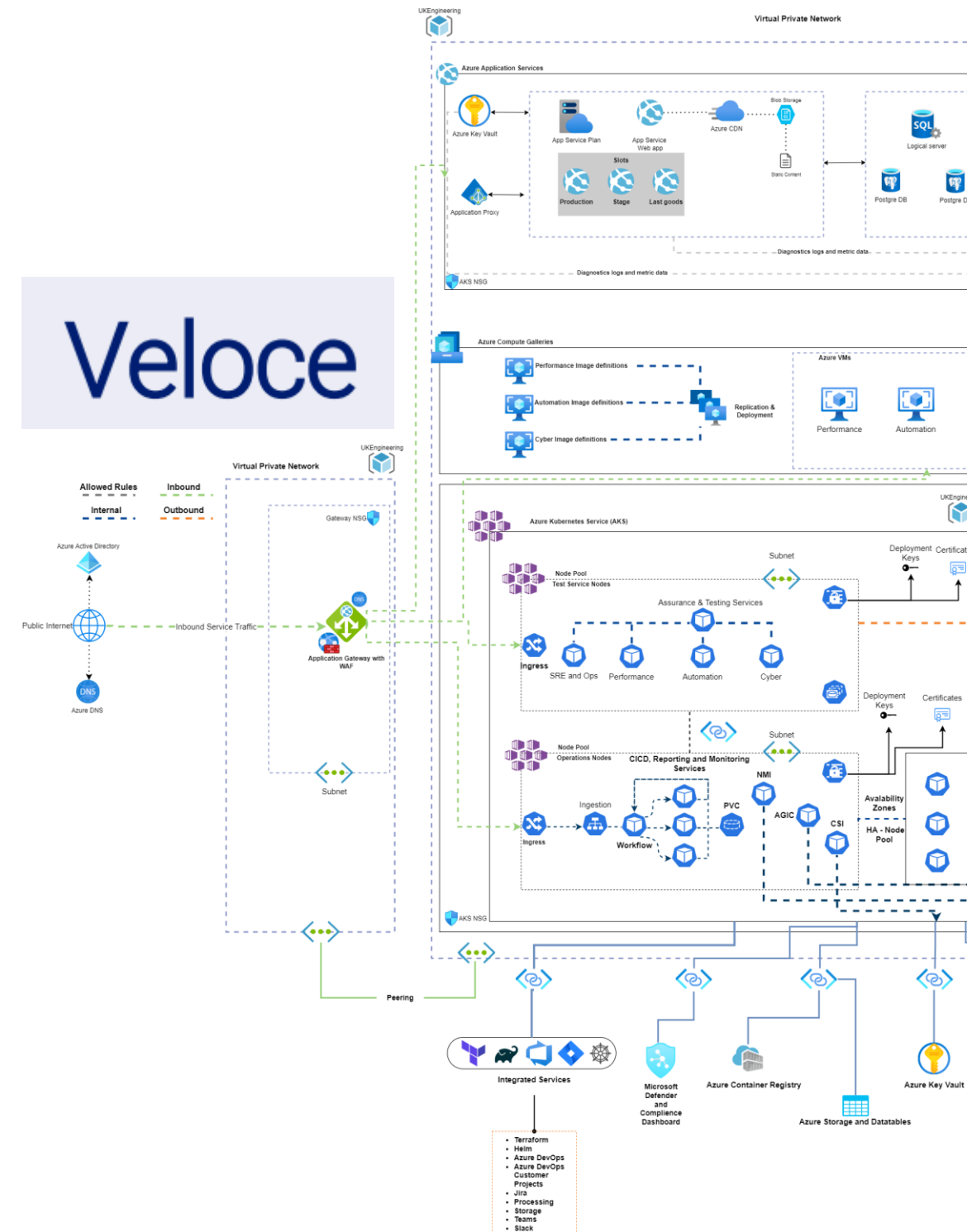


Test Suite

- Tests normally comprise a “mini app” executing a single requirement in the Specification
- More like “unit-test” coverage
- 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!**

## Veloce



# What can I do?



- Even without the budget and marketing of regimes with a platform logo or organisation behind them, lots:
  - Ask for the **HbbTV Test Report** from manufacturers; either available through self test or **registered HbbTV Test Centres**
  - Create a local forum for sharing issues and discussing timelines for service launches with manufacturer representatives
  - Make applications available to device manufacturers pre launch
    - (often geo blocked outside region)
  - Attend and run interoperability events or a device zoo
  - Get help from independent test experts
  - Operate “Allow-lists” of devices verified to work with your app
  - Offer joint marketing with manufacturers who have verified with your app
  - Test, Test, Test!

# 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
  - Also do additional Application & Interoperability testing
3. Regime specific conformance regimes continue to be important to broadcasters to address their local needs, and evolve new features in step with application deployment and device feature availability