

# HbbTV's Unified Approach to Interoperability and Robustness in Next-Gen Devices & Services

- Moderator: **Ranjeet** Kaur, Programme Director, Digital Television Group (**DTG**)
- Nguyen Thi Thanh **Van**, Head of DTV Standardization and Innovation, **Samsung** R&D Poland, Chair of HbbTV Testing Group.
- **Bob** Campbell, Head of Technology, Strategy and Partnerships, Global Conformance and Interoperability, **Resillion**, Chair of HbbTV Improving Interoperability Task Force (IITF).
- **Jon** Piesing, Director, Standardisation, **TP Vision**, Vice-Chair of the HbbTV Association and Chair of the Specification Group.

# Why do we need unified approach in Next-Gen Devices & Services?

Simple!

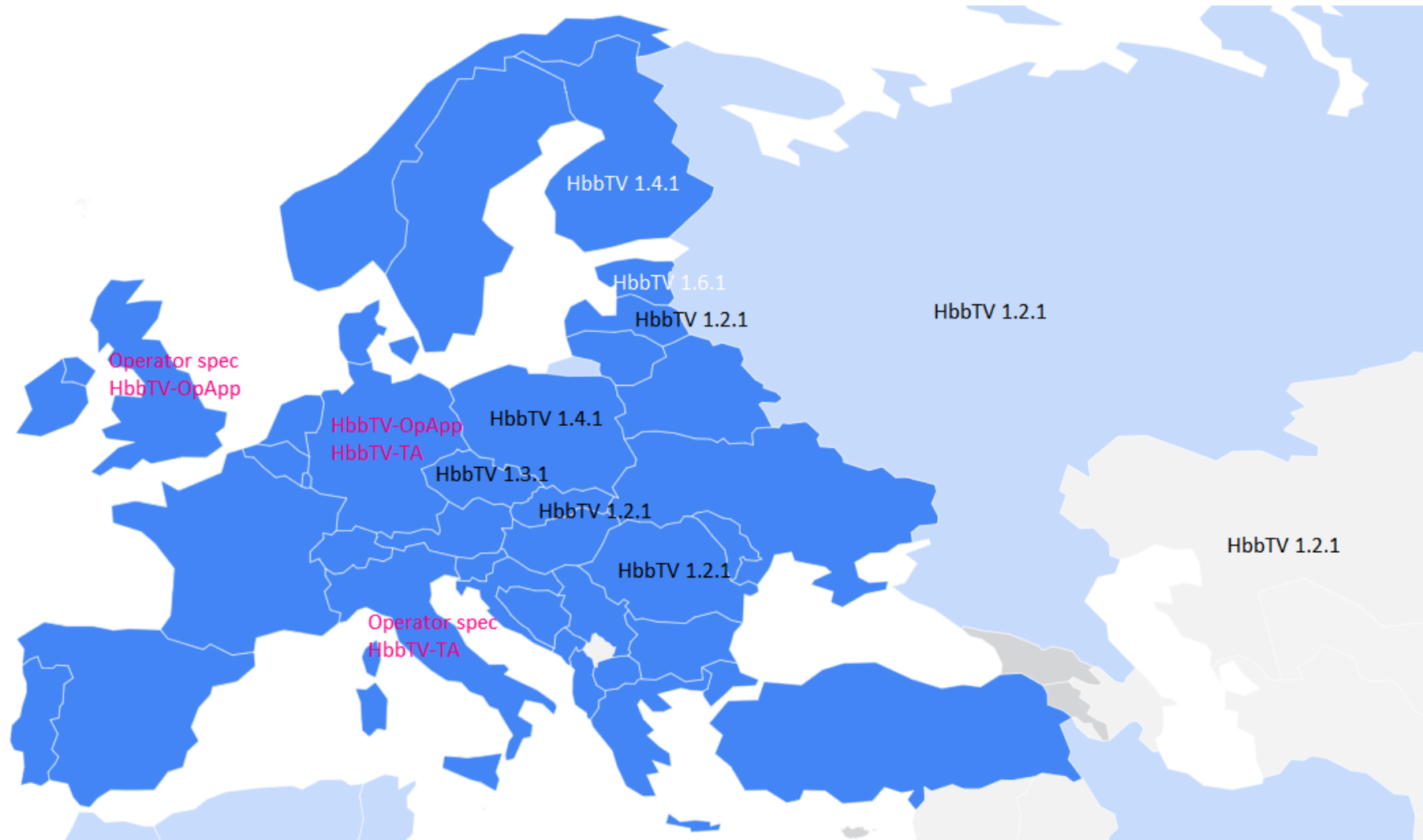
The same reason we needed this approach for current gen of devices & services and the same reason we needed it for previous gen of devices & services.

Which is to ensure device & Services are:

- **Reliable**
- **Sustainable**
- **Work seamlessly together.**

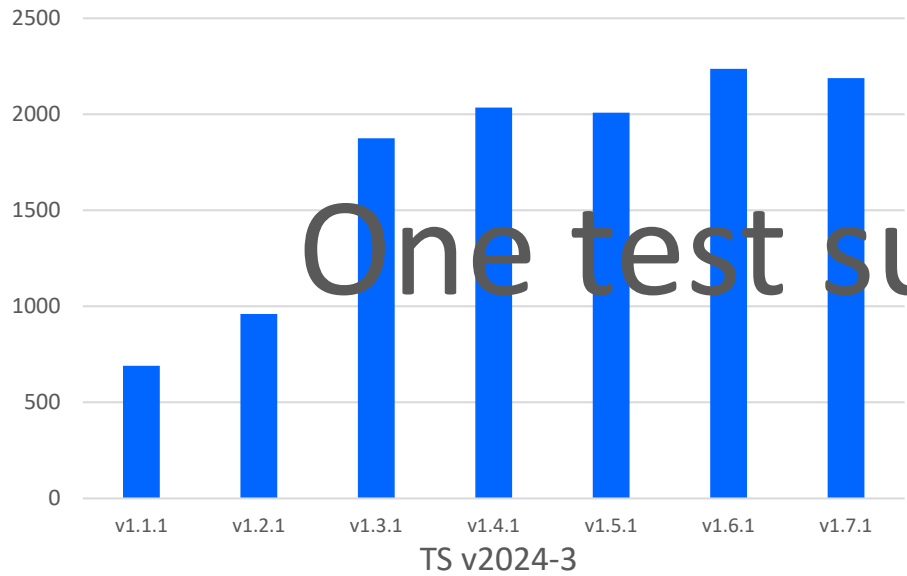
Guaranteeing a frictionless approach to market for manufacturers and providers.

# Discrepancy in country requirements

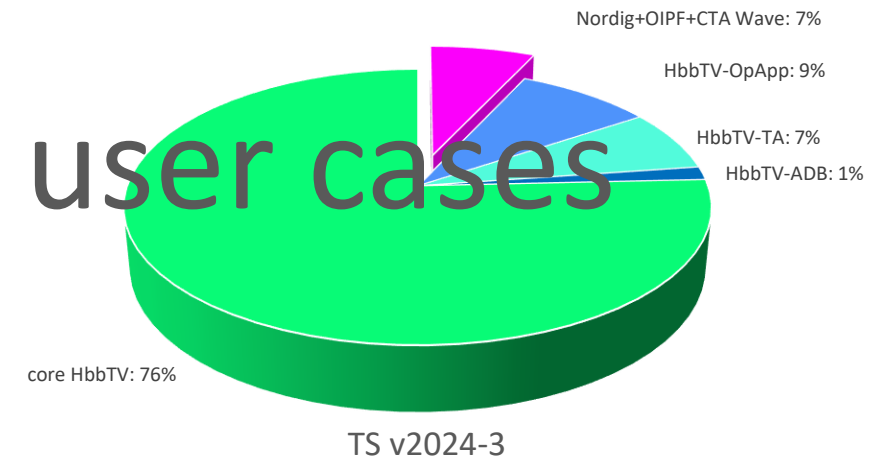


# HbbTV test suite coverage

Tests for all spec versions

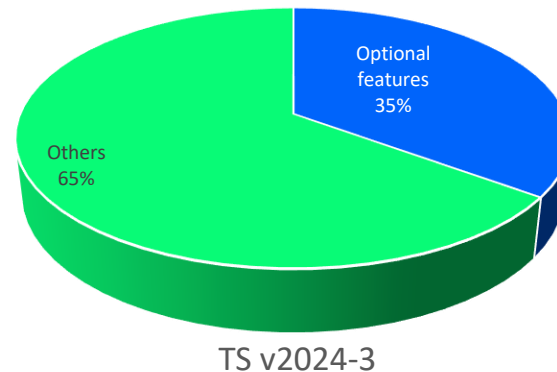


Tests cover advanced features and specific market & platform requirements



One test suite, many user cases

Tests for receivers with difference capacities



# Country and Platform Specific Test Suites



- Over the years, the HbbTV test suite has been supplemented by country and/or platform specific test suites
  - Implementers have to obtain these separately
  - Complexity for implementers that could be avoided
- HbbTV has recently done a review of the Italian (tivù) and UK (Everyone TV) specific test suites
  - Goal is to see what could move into the main HbbTV test suite
  - Conclusion was that much of those test suites was not, in fact, country or platform specific
- Most genuinely country or platform specific tests are historical
  - Checking that a Freeview Play TV correctly identifies the (annual) spec implemented
  - Co-existence between HbbTV and MHP app signalling
  - Wholly or partially no longer relevant
- HbbTV [recently issued an RfP](#) to bring the UK and Italian specific test suites into the main HbbTV test suite

HbbTV members can see more information in [HbbTV-SPEC-01678-001](#).

		Italy	UK	Total
DRM		17	45	52 (*)
Filling gaps in main HbbTV test suite	Initial analysis	12	21	33
	Later analysis	8	3+9 (*)	11+9 (*)
Genuinely country or platform specific	Initial analysis	5	21	26
	Later analysis	1	<9	<10
Total		34	87	111 (*)
(*) 10 DRM tests are identical between Italy and UK				
(*) 9 older UK tests cover HTTP redirects				

- **52** in total
  - 10 DRM tests duplicated between Freely and tivù
  - 35 DRM tests unique to Freely
  - 7 DRM tests unique to tivù
- DRM tests have been reviewed
  - Identified many omissions in the DRM guidelines specification
    - e.g., requirements that failure to decrypt content is correctly reported
  - Only one issue identified with 2 tests
  - To be resolved in the DRM guidelines document
- UK and Italian DRM tests cover what HbbTV previously agreed to test
  - New EME API
  - Selected advanced features from old 'oipfDRMAgent' API
  - Do not cover old API fully – debatable value from including these



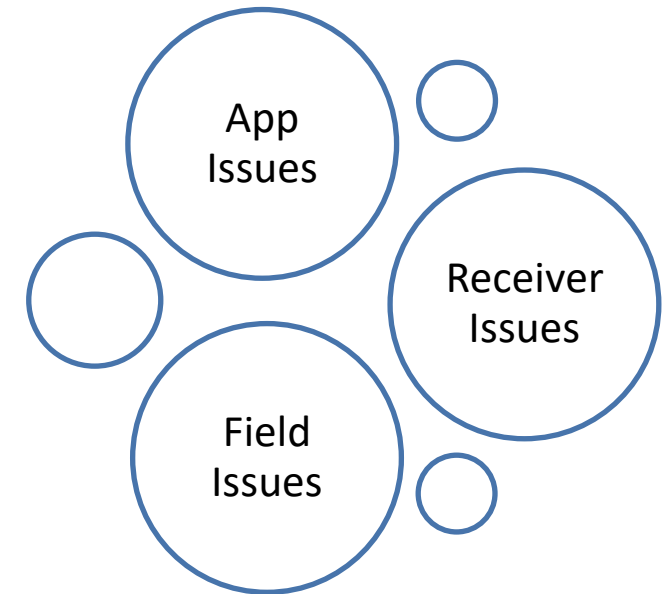
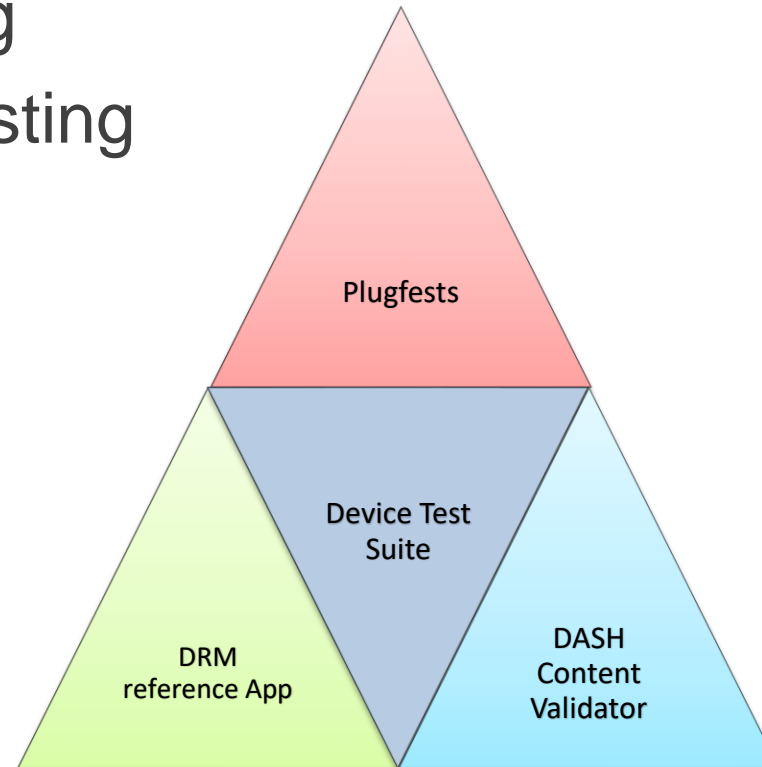
# Improving Interoperability Task Force Tools and Activities to aid deployment



# Success through Testing

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

  
Testing  
Pyramid:



Observed Problems



# DASH-DRM Reference Application

## Links:

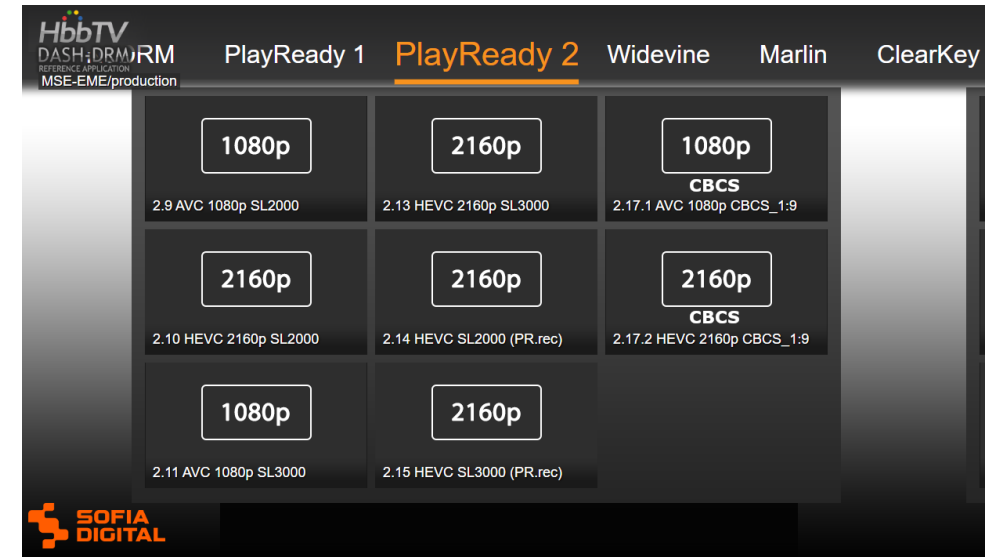
- Production version updated in line with test suite, 3 times a year [Production](#)
- Staging version intended for early access to new features of the app [Staging](#)
- Testing version intended for development and testing new features of the app [Testing](#)
- Production version 2018 [Production 2018](#)

## Issues:

- <https://github.com/HbbTV-Association/ReferenceApplication/issues>

## Adding extra 3<sup>rd</sup> party content:

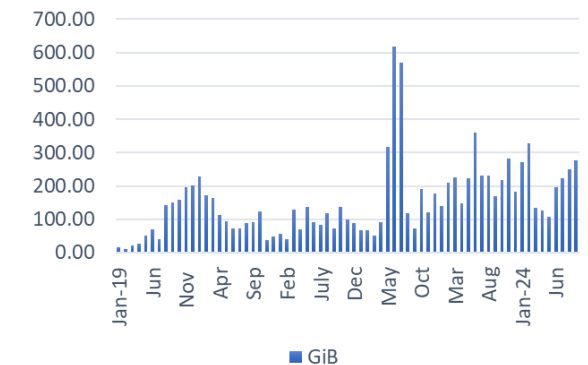
- See <https://member.hbbtv.org/wg/IITF/document/7173>



Visitors



Tx (GiB)



# DASH-DRM Reference Application

Test Results against devices in the market:

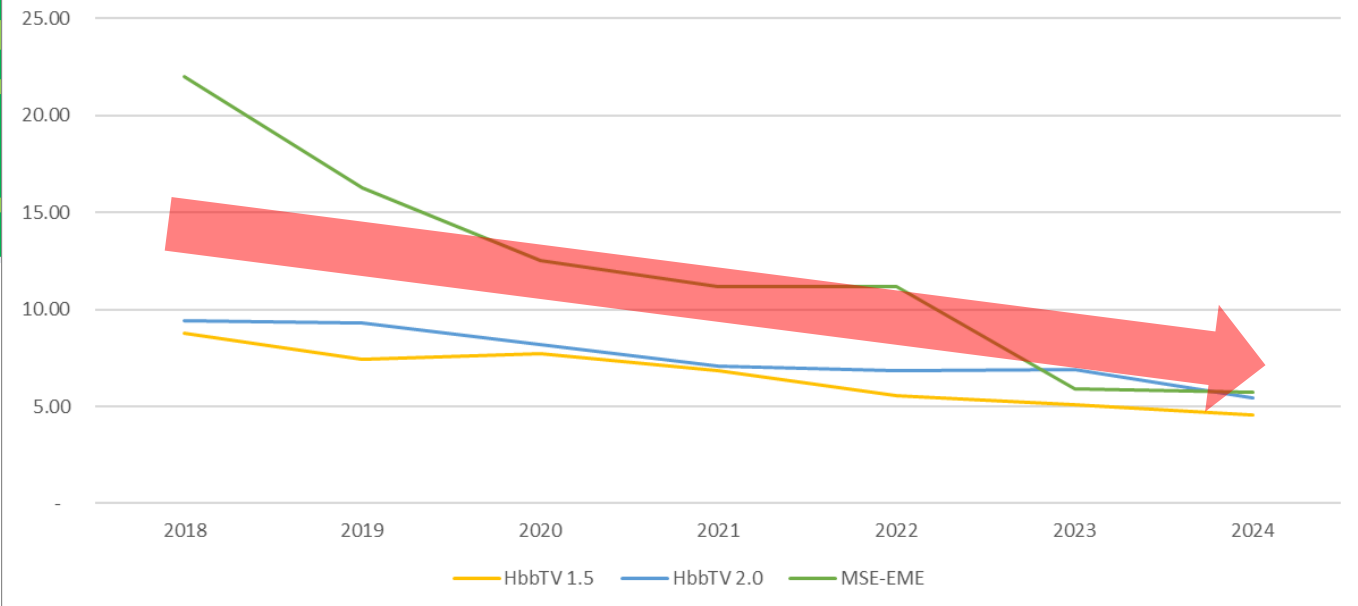
- [HbbTV-IITF-01520-003-RefApp-Results-Anonymized.xlsx](#) (As of 30th May 2024)

Year	Model Count
2017	7
2018	8
2019	10
2020	12
2021	15
2022	13
2023	13
2024	8*

Legend		PlayReady 1												PlayReady 2						Live		Widevine				
No.	Year	AVC 1080p	AVC 1080p Lvl1 in mpd	AVC 1080p ExpressPlay	HEVC 2160p	Out-of-band subtitles	In-band subtitles	Advert insertion	In-band events	Multiple audio	Multiple moof/mdat 8s seg/dt	AVC 1080p SL 2000	HEVC 2160p SL 2000	AVC 1080p SL 3000	HEVC 2160p SL 3000	AVC 1080p CENC 1.0	HEVC 2160p CENC 1.0	Persistent license noyes	Persistent license 15 min/1	HEVC 2160p high bitrate	LiveSim1 Playready CENC	LiveSim1 WV CENC	WV4 Different KIDs	WV6 AVC 1080p SL1		
6	014	#42	#6	#42	#42	#16	#16	OK	#53	#42	OK	#6	#6	#6	#6	#5	#5	#70	N/A	#16	OK	#6	#6	x	x	
7	012	OK	OK	OK	OK	#17	#16	#60	#53	OK	OK	#6	#6	#6	#6	#6	#6	#58	N/A	#31	OK	#30	#30	x	x	
8	018	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	#6	#6	#6	#6	#6	#6	OK	OK	OK	OK	#6	#6	x	x	
9	020	#6	OK	#6	#6	#6	#6	#6	#6	#6	OK	#6	#6	#6	#6	#6	#6	OK	OK	#5	OK	#13	#13	x	x	
10	047	OK	OK	OK	#39	OK	OK	#50	#5	#39	OK	#6	#6	#6	#6	#6	#6	#62	N/A	#5	OK	#30	#30	x	x	
11	082	#54	OK	#54	#54	#54	#17	#54	#54	#54	OK	#54	#54	#54	#54	#54	#54	OK	OK	#54	OK	#54	#54	x	x	
12	202	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x	
13	048	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x	
14	060	#34	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
15	108	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
16	038	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
17	070	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
18	099	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
19	121	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
20	067	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
21	068	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
22	071	#34	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
23	077	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
24	078	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
25	081	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
26	089	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
27	098	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
28	133	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
29	181	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
30	211	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
31	084	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
32	090	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
33	095	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
34	107	#34	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
35	109	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x
36	112	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	x	x



HbbTV DASH DRM Ref App Device Zoo Testing  
Average number of "Fatal" issues per device over time



# Interop events

## Interoperability plug-fests:

- Enable developers of apps, and new services, to be tested against the latest devices before they reach the market...

## Test events:

- Co-located, they exercise new test material against devices to validate and approve for release in the next Test Suite update

## 2024 Calendar:

- Q1: DTG/DTVP @ DTG, London, Feb/March
  - 44 participants representing 26 companies
- Q2: Kinton @ Kinton, Milan, June
  - 33 attendees
- Q3: DTVP/DTG @ Fraunhofer Fokus, Berlin, October
  - 26 companies represented

## 2025 Calendar

- to be announced shortly!



Plugfest participants



Plugfest infrastructure: Conference Room



Plugfest infrastructure: Meeting Room 1 & 2

# Developer Portal



HbbTV developer portal

Developer Guide API Reference Resources News & Blog Contributors Forums Search

**EVENT**  
**HbbTV Symposium and Awards 2024**  
The 12th annual HbbTV Symposium and Awards will take place on the 14th and 15th November 2024 in London, UK, co-hosted with Everyone TV (BBC/ITV/Channel 4/Channel 5) at Church House in Westminster.

DISCOVER



## Developer Guide

HbbTV application developer guide, with articles and tutorials.

EXPLORE



## API Reference

Reference documentation of all HbbTV/OIPF specific methods.

EXPLORE



## Resources

This provides additional information which is useful for application development. It contains tools, sample applications and other references.

EXPLORE



## Forums

Developer forums dedicated to HbbTV topics including a Slack, GitHub and Stack Overflow.

EXPLORE

→ News & Blog

HbbTV developer portal

Developer Guide API Reference Resources News & Blog Contributors Forums Search

→ Application Developer Guide

INTRODUCTION  
GETTING STARTED  
LAUNCHING HBBTV APPLICATIONS FROM A BROADCAST CHANNEL  
BROADCAST VIDEO CONTROL  
STREAMING VIDEO  
HBBTV SECURITY  
STREAM EVENTS  
MEDIA SWITCHER (HBBTV-TA)

## Application Developer Guide

Welcome to the HbbTV Application Developer Guide. This guide is designed to provide you with a comprehensive Broadcast Broadband TV (HbbTV) platform. HbbTV is an open standard that harmonizes the delivery of broadcast top boxes, enabling a seamless integration of traditional TV services with rich interactive content delivered over IP.

Developer Guide API Reference Resources News & Blog Contributors Forums Search

→ Programming Reference > Application Management APIs > The application/oipfApplicationManager embedded object

APPLICATION MANAGEMENT APIS

- The application/oipfApplicationManager embedded object
- The Application class
- The ApplicationPrivateData class
- The Keystore class
- Examples

CONFIGURATION AND SETTING APIS

CONTENT DOWNLOAD APIS

## application/oipfApplicationManager embedded object

Previous

Support in HbbTV  
Available since: HbbTV 1.0 (ETSI TS 102 796 V1.1.1, OIPF DAE V1.1)

HbbTV developer portal

Developer Guide API Reference Resources News & Blog Contributors Forums Search

→ Resources

Feel free to offer additional useful resources to [developer@hbbtv.org](mailto:developer@hbbtv.org)

to manage their lifecycle, launch other applications. The exact criteria determining when

- HbbTV FAQ**  
An overview over HbbTV, the specifications, tools, frequently asked questions, the HbbTV Association and membership. [VISIT](#)
- HbbTV specification**  
Full HbbTV specifications documents for every version. [VISIT](#)
- API reference**  
Online API reference in this portal site. [VISIT](#)
- Application registry**  
A registry of real world and test applications to support greater interoperability, performance and robustness in HbbTV implementations. [VISIT](#)
- HbbTV zoo directory**  
This is a comprehensive listing of testing centres, they provide HbbTV application developers with essential knowledge and easy access to HbbTV device zoo resources worldwide, both remotely and in person. [VISIT](#)
- Google sample app for linear addressable advertising**  
A HbbTV sample application showcasing linear addressable TV capabilities, with comprehensive developer documentation. [VISIT](#)

- TTML Subtitles issues in Live DASH raised by a member
  - joint SDO call on Nov 26<sup>th</sup> 14:00 UK / 15:00 CET
- Monitoring Joint Conformance Project (JCCP) DASH stream validation tool:
  - <https://beta.conformance.dashif.org/>
- Registry of Applications
  - Problem: how can device developers improve results if they can't access the apps they are expected to support!
  - Issues: geo blocking, being swamped by queries, what does “pass” look like?
  - Solution: build a registry, enable HbbTV Test Centres/Zoos with access
  - Submit here: [Application registry – HbbTV Developer Portal](#)
- **Get Involved! Next Meeting:**
  - 28<sup>th</sup> November: 9:30 – 10:00 UK / 10:30 – 11:00 CET