



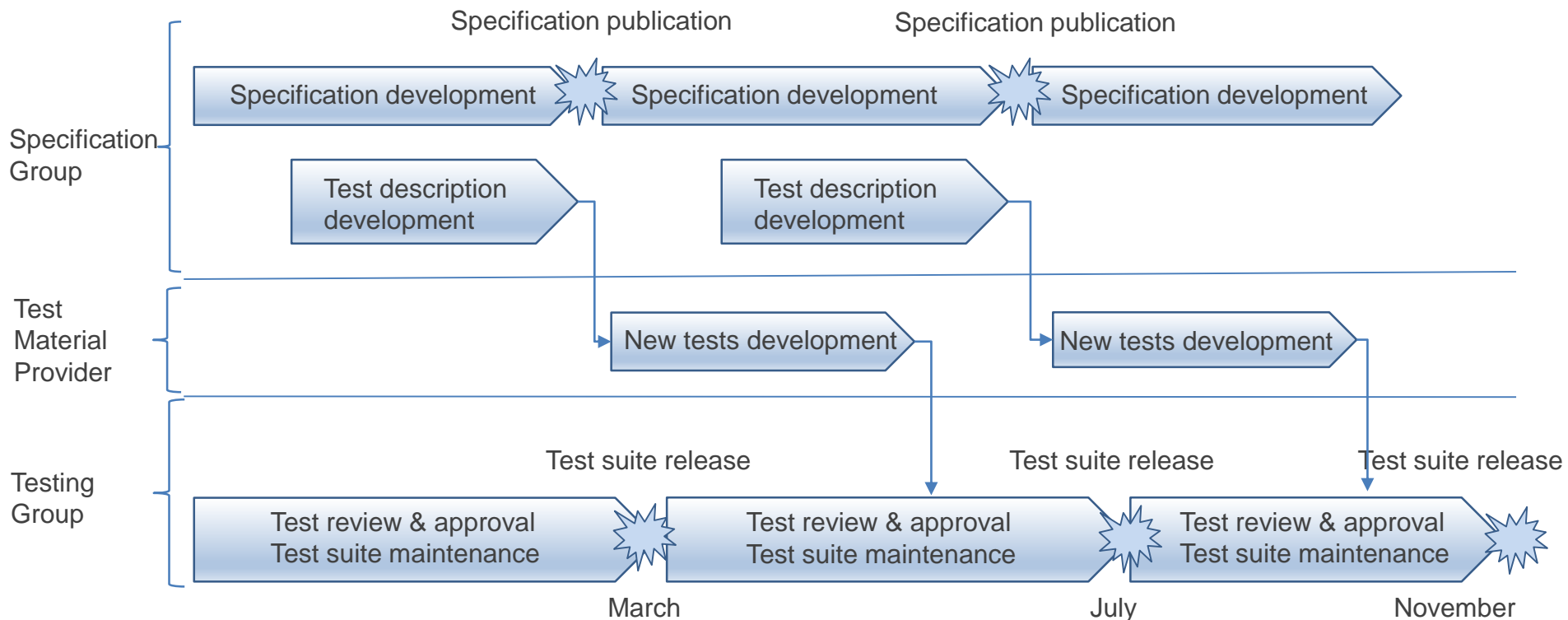
HbbTV Testing and Certification September 2020

Nguyen Thi Thanh Van, Samsung



- Overview of HbbTV Test System.
- HbbTV testing deliverables, processes and policy.
- Device testing and certification from technical aspect.
- Testing Group and contribution to testing activities.

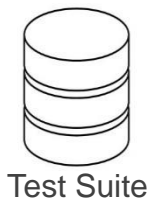
HbbTV testing workflow



HbbTV Test System

An HbbTV Test System consists of:

- 1) A Test Suite
- 2) A Test Environment, including 2 major components:
 - Standard Test Equipment (STE) necessary to store, generate, and play out the tests.
 - Test Harness (TH) which support test execution and report generation.



Test Suite



Test Environment

Test Environment components are not delivered with the HbbTV Test Suite.

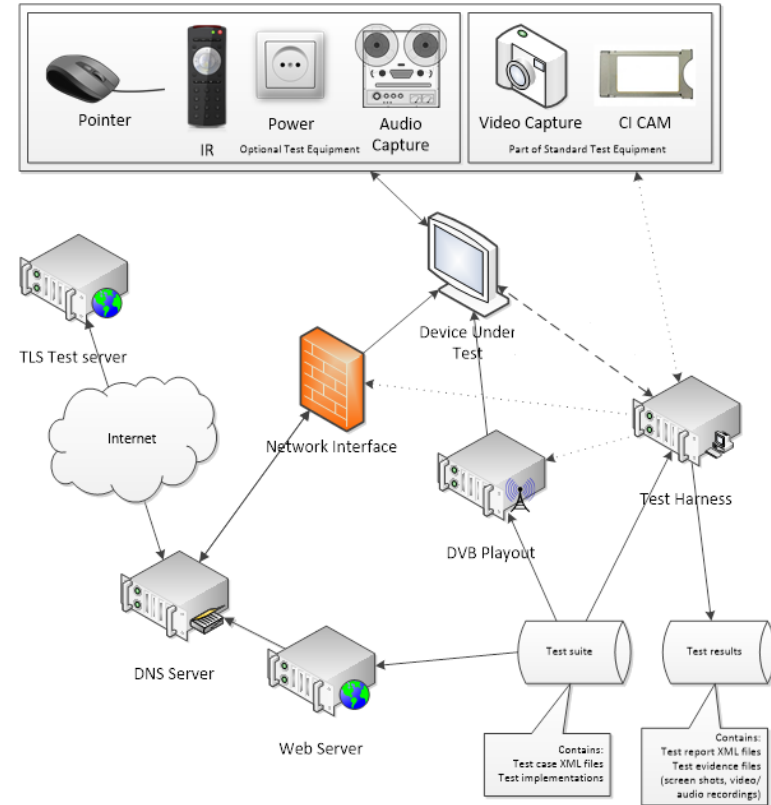
Implementation of STE and TH is an individual decision.

These components may be physically installed on a single piece of HW or on commonly accessible machine, they may be virtualized or integrated into commercially available tools.




Example Test System

A Test Environment consists of:

- Device Under Test (DUT)
- Test Harness (TH) is a system which orchestrates the selection and execution of Test Cases on the DUT, and the gathering of the Test Case Results for the Test Report.
- Standard Test Equipment (STE) is a collection of all “off the shelf” tools, which are needed to store, serve, generate, and play out the Test Cases on the DUT. This includes DVB Playout System. The components of the STE may be provided by commercially available test tools.
- Optional Test Equipment (OTE) which may be used to simplify or allow automation of some Test System tasks.
- RF and IP connections between the DUT and other elements of the Test Environment.
- TLS test server used to provide a server-side environment for execution of some TLS related test cases. This is provided on behalf of the HbbTV Association and does not need to be supplied separately.



Other HbbTV testing publications

Publications	Target groups
 <p>Test Specification: description of the technical process for HbbTV devices verification</p>	<ul style="list-style-type: none">• HbbTV Testing Centers• Quality Assurance Departments• Test Material Providers• Test Reviewers
 <p>Test Assertion Repository: dynamically updated list of approved tests (available soon)</p>	<ul style="list-style-type: none">• HbbTV Testing Centers• Quality Assurance Departments
 <p>Test schemas Test Material Approval Procedure Test Material Challenge Procedure</p>	<ul style="list-style-type: none">• Test Material Providers• Test Reviewers

The HbbTV Test Suite consists of a number of **Test Cases**.

Each **Test Case** is intended to verify a specific requirement of the HbbTV specification.

Approved Test Cases are approved by the HbbTV Testing Group and form part of the requirements for HbbTV compliance.

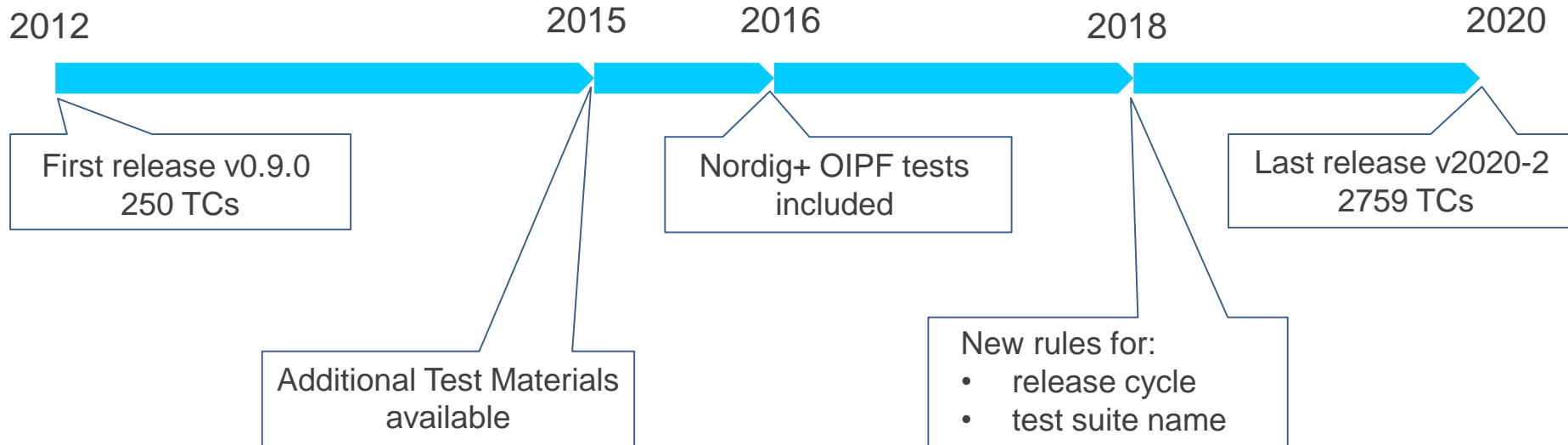
Additional Test Cases are not approved by the HbbTV Testing Group for compliance. They are distributed because they may be of use to developers.

Test cases may be changed from Additional to Approved.



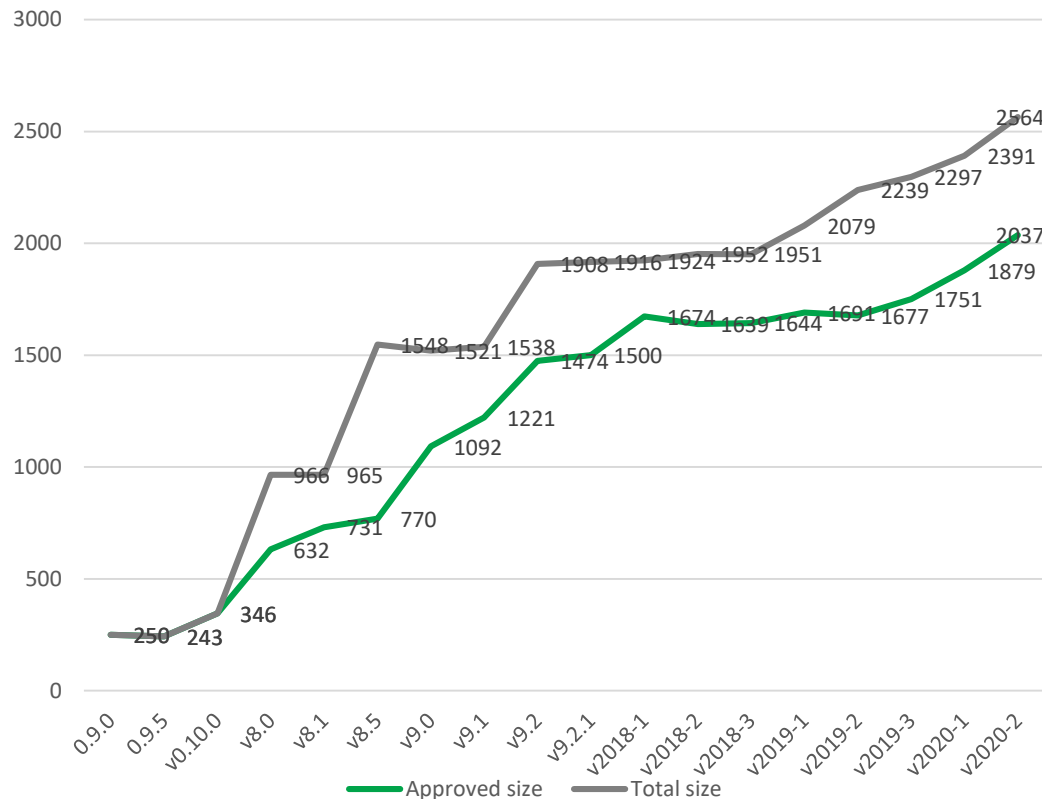
Example test cases

Test suite history

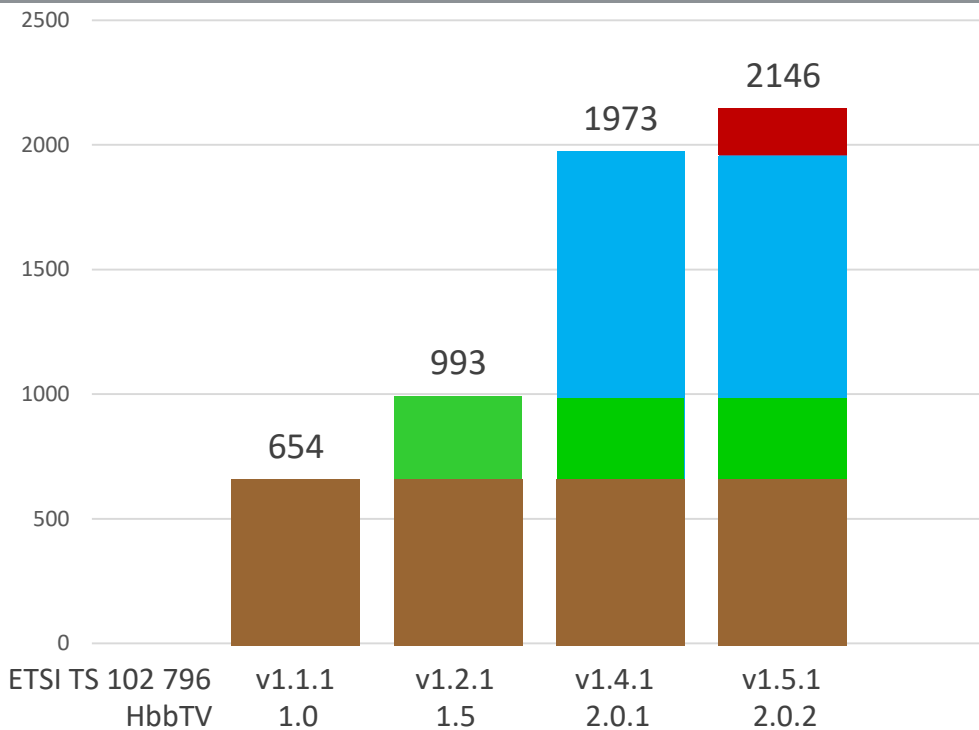
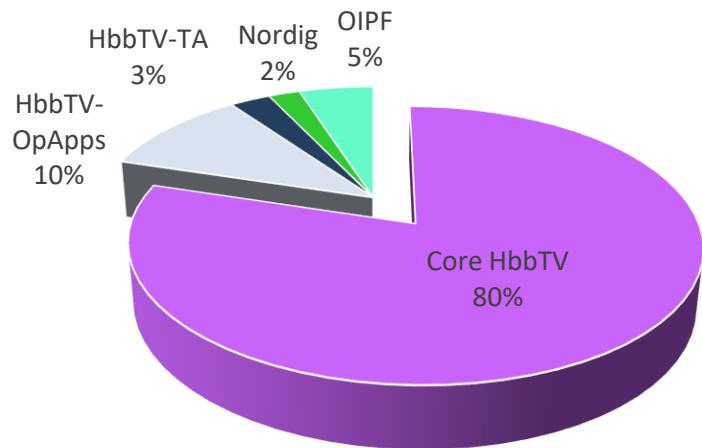


Test suite progress

Name	Approved size	% approved	Total size	Total size with Nordig & OIPF B	Date
V0.9.0	250	100%	250	250	10.05.2012
V0.9.5	243	100%	243	243	28.02.2014
v0.10.0	346	100%	346	346	12.01.2015
v8.0	632	65%	966	966	31.07.2015
v8.1	731	76%	965	965	11.02.2016
v8.5	770	50%	1548	1548	31.08.2016
v9.0	1092	72%	1521	1715	31.10.2016
v9.1	1221	79%	1538	1791	16.01.2017
v9.2	1474	77%	1908	2102	20.07.2017
v9.2.1	1500	78%	1916	2110	17.11.2017
v2018-1	1674	87%	1924	2118	23.03.2018
v2018-2	1639	84%	1952	2146	04.07.2018
v2018-3	1644	84%	1951	2146	11.11.2018
v2019-1	1691	81%	2079	2274	15.03.2019
v2019-2	1677	75%	2239	2434	23.07.2019
v2019-3	1751	76%	2297	2492	12.11.2019
v2020-1	1879	79%	2391	2586	11.03.2020
V2020-2	2037	79%	2564	2759	13.07.2020



HbbTV TS v2020-2 content



HbbTV test approval process

Developed test packages



Initial Acceptance

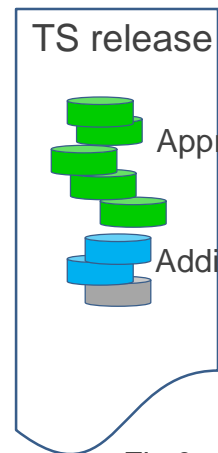
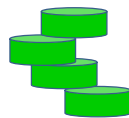
50% tests in the package passed review



Final Approval

Approved tests:

- Passed review and
- Passed in at least one device or have no issue raised for 4 months



Challenge



Fix & re-approval



Testing Events

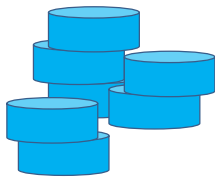
An event organized by the Testing Group where test materials are verified on one or more device implementations before test final approval.

An opportunity:

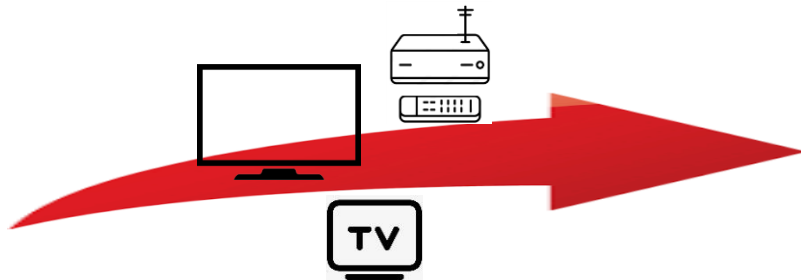
- for Test Material Providers to validate test on not typically available devices.
- for HbbTV implementers to analyze device implementation issues

Three times a year before every TS release. Next Testing Event: October 2020.

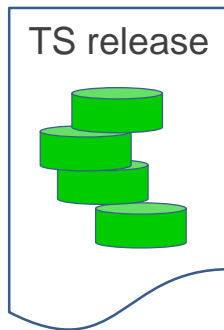
Reviewed test materials



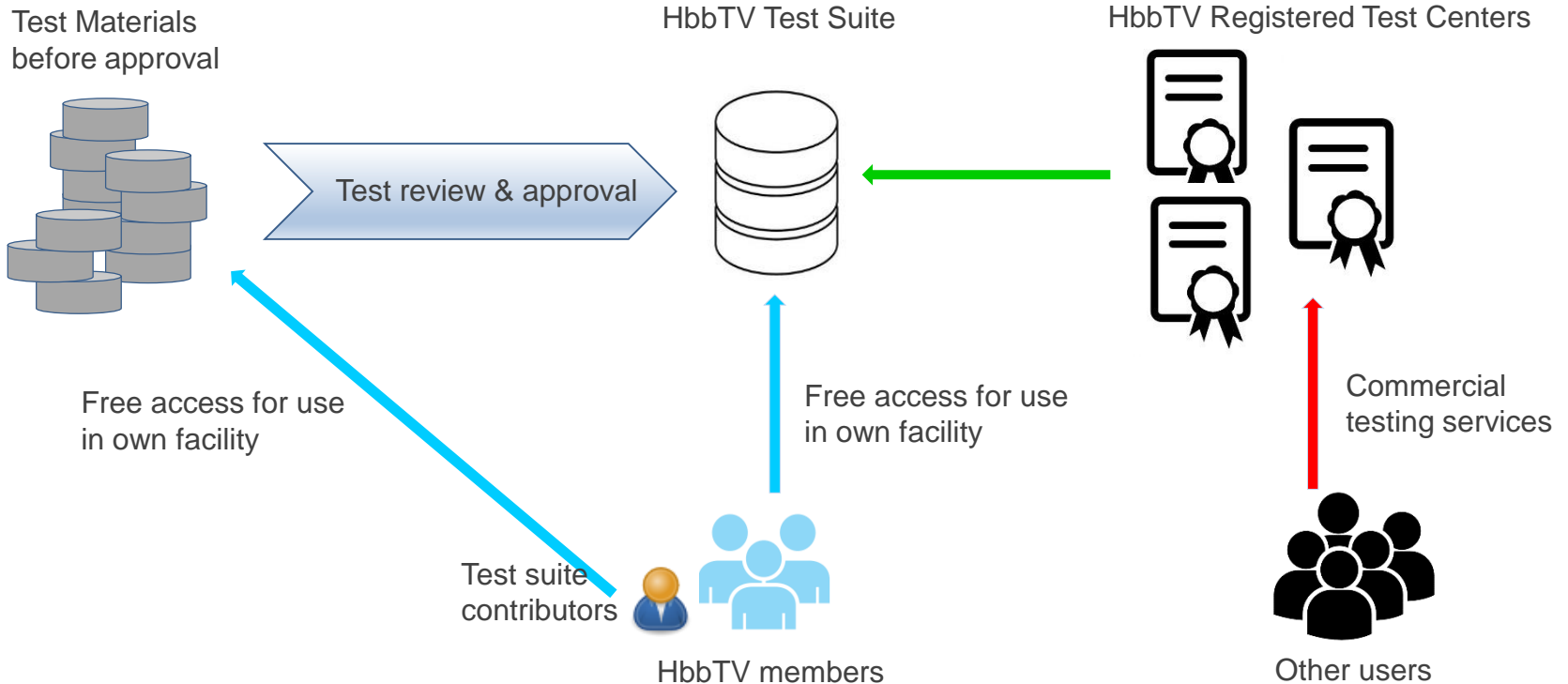
Testing Event



TS release



Access to HbbTV Test Suite



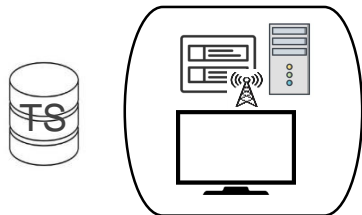
HbbTV test suite has been designed with three main scenarios in mind:

1. Self-certification by a manufacturer who either runs the test suite in-house or has a test centre run the test suite on their behalf.
2. Part of certification with a (national) trademark where the manufacturer delivers the results of running the test suite to the trademark administrator.
3. Manufacturers submitting their product for testing to a test centre appointed by a trademark administrator.

“While the HbbTV test suite is designed to be as clear, complete and comprehensive as possible and constitutes a major goal of HbbTV, it is not possible to guarantee that the test suite has a complete coverage of the specification.

The test suite alone does not provide a definitive measure of receiver compliance and makes no provision for testing application compliance.” *

[*https://www.hbbtv.org/overview/#how-it-works](https://www.hbbtv.org/overview/#how-it-works)



TS licence + set up Test Environment

or



HbbTV Registered Test Centers

Select tests for certification:

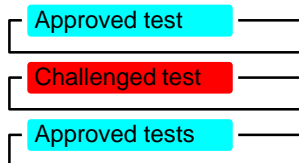
- There is no dedicated TS release for every version of spec
- Applications do not use all features defined in spec

Adding specific tests may be required because TS may not cover 100% spec requirements.



Manage waiver process:

- Tests can be challenged after release publication



Important

Device certification alone does not guarantee the success of HbbTV implementation in the market.

Interoperability issues can be caused by non-compliant applications.

Broadcasters and manufacturers should work together to elaborate a system to ensure devices and apps interoperability

The HbbTV Testing Group is an owner of test suite releases and other HbbTV testing publications.

The group is responsible for:

- Test approval and challenge process
- Test suite and other testing publications maintenance.
- Being a technical arbitration between test material providers and test suite users.
- Supporting test suite licenses and test material providers.

Contribution to testing activities

Why contribute:

- To ensure that company products meet requirements before it is published.
- To be ready for product launch when new version of the standard is published.
- To meet other leaders from the industries, share and learn from their experiences.
- To influent on HbbTV development strategy.

How to contribute:

- Develop/fund test descriptions/ implementation.
- Contribute to test review.
- Support Test Material Providers on test validation.

Thank you