The Importance of Testing and The Way to Conformance

Julius Mong
Eurofins Digital Testing
About Eurofins Digital Testing

• Leading media, device & software testing specialists in:
  • Creation of conformance test suites for validation of devices
  • Consulting on conformance, spec authoring, test lab and testing services
• Work closely with standards organisations, manufacturers, operators, broadcasters, regulators and trade bodies in over 38 countries
• ISO/IEC 17025 accredited test lab for receiver certification
  • Licensed for UK Freeview certification of STB and iDTV
    • Only lab that can provide HbbTV 2.0 certification reports for Freeview Play logo
• Approved test labs for Freeview Australia and New Zealand
• Appointed exclusive test lab by NBC Nigeria for DTT STB
• First approved lab for DTT and HbbTV Receivers for SIRIM (Malaysia)
• Established complete test lab for SABS South Africa for DVB-T2 STB
• Approved test lab for Ghana DTT STB
Official Test Lab for Freeview Australia & Freeview New Zealand

Supplier of TNT 2.0 Test Suite & DRM Services

Supply of TDT Hibrida Test Suite & Test Tools

HbbTV Consultancy Services

OIPF Test Suite & Test Harness

HbbTV Services

Supplier of Official Test Harness

Custom HbbTV/OIPF Test Suite

HbbTV 2.0 & DRM Test Suite

South African STB Conformance & DTT Test Lab
Questions to always ask

• Why care about receiver compliance?
• How to ensure a successful launch / transition?
• How to make sure quality will meet requirements?
• Who can help me get there?
Why care about receiver compliance?
Why compliance?

Ensuring a good consumer experience
• Choice of receivers
• Low cost
• Easy to use
• Supports local languages
• Access expected channels
• Picture and audio quality
• Interactive applications work (e.g. EPG, info services)
• Responsive
• Reliable
• Supports new services & network changes
• Easily upgradeable
Why test receivers?

- Each country’s requirements are different
- Receivers in field will be non-compliant
- Consumer complaints and calls
- DTT Platform brand damage
- Interactive apps and UI – different behaviours
- OAD not supported
- Can’t handle new services / network changes
- Poor RF sensitivity on specific channels
- Poor border behaviour
- EPG not displayed properly
- Interactive interoperability, etc.
The importance of testing

- Service Presentation
- Time
- Audio/Video
- Service Signalling
- RF Front-End
- Input/Output
- Standard CE
- Live Network
- IP Connectivity
- CAS/CI
- Over-Air Download
- EPG
- Interactive Engine
- UI
- Language Support
- Service and Network Update

HbbTV or MHEG Test Suite

Specialist Tools and Processes
How to ensure a successful launch / transition?
How to ensure a successful launch / transition?

- DVB is a toolkit – many different options / country profiles
  - DVB-T2 – huge matrix of transmission parameters
  - PSI / SI (data signalling to receivers) – big variations
  - Considerations for AVC? HEVC? UHD or HD? HE-AAC vs Dolby etc
- Need to have a specification clearly defined to test against
  - Must NOT be a wish / feature list
  - Get it reviewed by the stakeholders
Developing specification

- Conceded effort among stakeholders:
  - Broadcasters, operators, manufacturers, and technology providers
  - Agree on features and jointly draft specifications
- Adopt the Standard RFC 2119 to achieve clear interpretation:
  - Specific keywords: shall, may, should
  - Indicate which end is being referred (e.g. client/server or transmitter/receiver)
  - Avoid ambiguity e.g. “can have” or “latest version”
- Don’t forget specifications for antennas
  - Reception of signal starts with them – often neglected
  - Types of interference to be tested, frequency filters, etc.
  - E.g. Deutsche TV Min Requirements for DVB-T2 Devices – 3.2.2.9. Interference Immunity
- PVR, Physical Interfaces (HDMI, USB), DRM, CAS considerations
- Special UI requirements? OAD?
- Accessibility Requirements - subtitles, languages, etc.
How to make sure receiver quality will meet requirements?
Conformance Models

Option 1: Low Effort

- Do Minimum

Free uncontrolled market

- Receiver issues in field
- Platform brand damage
- Inability to add new services
- Interactive applications impossible to write
- Lots of bad receivers
- Potentially costly

Option 2: Risky

Self-Cert

Manufacturer certifies they conform to spec

- Relies on honesty
- Marking own homework
- Manufacturers absorb cost of test suite dev
- Audit process
- Non-conformant receivers in the field

Option 3: Full Control

Test Centre

Manufacturer submits receivers to test lab

- Ensure quality
- Interactive apps work
- Platform upgrades
- Good user experience
- Local or “hosted” lab
- Manufacturers absorb costs of test suite dev
- Potential revenue for regime
Typical Regime Layout

1. Manufacturer Submits Device
2. Test Lab
3. Test
   - Pass
   - Fail
4. Fail Report
5. Debug
   - Lab Host
   - Test Suite
6. Pass Report
7. Regulator
   - Report Audit (Optional)
8. Logo Certification
Conformance Testing

- Test process to verify that implementations meet the technology specifications
- Based on use of single, standard set of test procedures covering the specification, and corresponding test materials, which together form a **test suite** – used to certify that implementations are conformant to the standard
- Generally used to validate final, fully integrated devices, same process can be used throughout device development
- Key component to ensure interoperability among devices of different vendors
- Interoperability can be tested further in plug-fests
“Validation” suite:
- Functional test
- Audio/Video
- PSI/SI

Consists of:
- Test plan
- Test cases (data, procedures, scenarios, expected results)
- Test streams (custom or canned ones)
- Pass and fail criteria

Ensures receiver complies with specification
Test coverage for features not testable in live network
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<td>Support of live encrypted streaming with key rotation and static MPD for PlayReady Terminals</td>
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**Test Suite**

**HbbTV_DRM**

**Test Version**

3

**HbbTV Test Object**

HbbTVClient/AVControlObject

**Assertion Text**

The Terminal shall be able to acquire a PlayReady license using `sendDRMMessage` method with PlayReady DRMSystemID

**HbbTV Preconditions**

**Other Preconditions**

No License cached in the terminal
PlayReady DRM supported by the Terminal

**Applies To**

TNT2 1.1

**Specification References**

TNT2 - 1.1

Chapter 6.2
PlayReady is one of the DRMs recommended for TNT 2.0 content protection

OIP-DAE - 1.2

SABS 2267 performs a full frequency scan in less than 5 minutes
Test Suite Considerations

- Good coverage on the specification
  - Everything gets tested
- Test procedures clearly laid out
  - Not left to tester’s interpretation
- Well defined passing criteria
  - Not left to tester’s discretion
- Test streams specific to mechanism being tested
- Regular updates & professional and responsive support
  - On-going and fast, consider the team behind the test suite too as they’ll be the help at hand for a long time coming
  - Specs get updated regularly, so should the tools
    - Don’t get stranded with obsolete test suites
Conformance Considerations

- Author & Publish the receiver specification
  - Keeping up to date with future changes in broadcasting rules of operations and new services being introduced

- Selecting a conformance model
  - Consider *not* just STB’s and iDTV’s

- Develop all test materials to support the conformance regime
  - Test materials for silicon vendors and receiver manufacturers
  - Technical support services for the test material licensees
  - Keep up to date with changes in official receiver specification

- Commission your own or appoint a test laboratory

- Announcing the conformance regime
  - Registration instructions, where for testing services, and certification process

- Guidance to manufacturers interested in the Logo to the test laboratory

- Manage the ongoing development of the conformance regime
  - Developing a concessions policy
  - Police the market
  - Build a receiver zoo
Who can help me get there?
Good QA strategy consultants should be able to provide:
• Receiver conformance strategy and gap analysis
• Broadcast and receiver specification authoring
• Test regime design and setup
• Bespoke test suite development
• Test plans and test cases development
• Functionality and robustness testing of receivers
• Technology & technical knowledge transfer
• Operational and support training
• Supply chain consultancy
• Management consulting on benefits of testing and required governance
• Staffing plans
Feel free to contact us for advice:

JuliusMong@eurofins.com
www.eurofins-digitaltesting.com
@eurofinsdigitaltesting
/company/eurofins digital testing