The Importance of Testing
and
The Way to Conformance

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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?
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
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

- Concerted effort among stakeholders:
  - Broadcasters, operators, manufacturers and technology providers
- Agree on features and jointly draft specs
- Adopt the Standard RFC2119 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. Deutch 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?
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

Manufacturer Submits Device

Test Lab

Test

Pass

Fail

Fail Report

Debug

Lab Host

Test Suite

Test Lab Approval

Pass Report

Report Audit (Optional)

Regulator

Logo Certification
• 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
What is a Test Suite?

- “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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**Test Suite**

HbbTV_DRM

**Test Version**

3

**HbbTV Test Object**

HbbTVClient/AVCControlObject

**Assertion Text**

The Terminal shall be able to acquire a PlayReady license using "sendDRMMessages" 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

Access Control
• 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
• 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:

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