HbbTV Performance Test Suite

Introduction

Ligada iSuite for HbbTV is a comprehensive HbbTV Test Harness and set of Test Suites, enabling interoperability, conformance and certification testing for HbbTV hybrid digital TV receivers. The bundled HbbTV test suite includes a group of specialised non-functional tests called the Performance Test Suite.

The Ligada HbbTV Performance Test Suite contains an HbbTV test suite which reports actual measured values enabling operators to parameterise and measure the performance which matters to them.

Does a particular receiver respond annoyingly slowly to repetitious remote zapping? Do images render consistently well under changeable latency or bandwidth conditions? Is the receiver able to robustly deliver excellent image quality even during rapidly changing HTML5 video events? The Eurofins Performance Test Suite can solve these issues.

Context

It's a well-known issue in the industry that app developers are spending a disproportionate time trying to work-around performance issues specifically on low end TVs. Our own tests for example have found a 20:1 difference on DOM performance between two current HbbTV-enabled TV products. App developers can use platform specific optimisation techniques such as DirectFB, but may suffer portability and interoperability problems.

Using a commercial app to attempt to try to measure HbbTV platform is not ideal as it relies on user perception of speed as no performance metrics are generated. Additionally manufacturers may not regard the App as an independent reference and blame poor app design for any performance issues.

Performance Tests

The performance test suite contains a number of tests including:

- **Animation:** Different combinations of smooth Animation using JavaScript while playing DASH Content
- **DOM Performance:** Insertion and removal of 1000 nodes within a target time
- **AVControlObject stability:** Rapid changing of the AVControlObject ensuring events issued are correct, object remains correct, and receiver remains stable
- **Metadata Performance:** Various execution of Metadata search queries within target time

- **Template Tests:** DASH Play → Pause → Stop → Play cycles. Allows user to create robustness test cases
- **HTML5VideoStability:** Rapid changing of the HTMLVideoElement events issued are correct, object remains correct, and receiver remains stable
- **Zapping Tests:** Changing Channel/source frequently over a long time

Benefits

Manufacturers and operators can use the Performance Test Suite as way to provide repeatable performance metrics for a platform.

Operators can test HbbTV platforms with quantifiable performance tests and so guarantee a minimum level of performance and so avoid expensive app optimisation issues. The tests can also be incorporated into the platform operators' certification regime. Where platform operators are sourcing HbbTV set-top-boxes, the tests can be used to generate a performance table from potential vendors.

Often new software updates on the HbbTV device can have potentially unnoticed performance effects. Manufacturers can use the Performance Test Suite as part of their regression testing to ensure each software release has not deprecated platform performance.

Stability and Robustness Tests

Within another of Eurofins test suites called TNT2, there are also a number of related robustness tests:

- **Robustness for Application Opening and Closing**
- **Robustness when application load is interrupted**
- **Robustness when requested file is truncated**
- **Robustness with packet loss**
- **Robustness when application load interrupted by carousel removal**
- **Robustness when attempting to load very large asset**
- **Robustness when application attempts to use more memory than is available**
- **Robustness when application exceptions are not caught**
- **Robustness when application enters an infinite loop**

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