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## Request for commercial proposals for test material

### HbbTV TEST SUITE DEVELOPMENT

The HbbTV Association invites proposals (the "**Proposals**") from potential suppliers ("**Suppliers**") for the development of test material to be used to validate implementations of HbbTV in TVs and STBs as specified in the attached Request for Proposals (the "**RfP**").

This RfP is a call for Proposals for test material provided under a commercial license. It is being sent to the following companies who responded to the RfI: Comarch, Digital TV Labs, DTG Testing, Otago Software, Rabbit Labs, RT-RK, Testronic, Wipro.

The content and structure of the Proposal shall follow the guidance given in the RfP. Details of how to submit your Proposal and the deadline for submission are given in the RfP.

Suppliers should note the requirement to submit Proposals for test material in the format set out in Annex 1 of the RfP.

Any Supplier appointment shall be subject to the negotiation and completion of at least one HbbTV V2 Test Material Provider and Distribution Agreement (Commercial).

HbbTV reserves the right to appoint any number of Suppliers or may come to the conclusion of appointing no Suppliers at all in respect of this RfP. Where necessary, HbbTV may enter into several agreements with the same Supplier in respect of different test materials or sets of test materials delivered under different terms and conditions.

Dated this 16<sup>th</sup> February 2015

Signed by

Klaus Illgner  
(no signature – electronic delivery)  
For and on behalf of the HbbTV Association  
Attachment: RfP for HbbTV Test Suite Development, Phase 2



**Request for Proposals for Test Material**

**HbbTV TEST SUITE DEVELOPMENT  
Phase 2**

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## **1 Scope of the RfP**

Proposals are invited for the supply of test material corresponding to the test assertions specified in Annex 2 to this RfP.

Proposals shall include:

- the creation and/or update of test implementations to meet the test assertions included in Annex 2, compliant with the HbbTV v2 Specification (available on the HbbTV web site),
- maintenance and support of the delivered test material during test acceptance, during the warranty period and subsequently.

HbbTV Association licenses or distributes the HbbTV Test Suite only to its member companies.

This RfP replaces any previous RfP referring to the same subject.

## **2 Guidance for Submission**

### **2.1 Period of Validity**

The Proposal shall be valid for a period of six months from the date of the Proposal.

### **2.2 Delivery of Proposal**

The deadline for submitting a Proposal shall be at 4pm CET four weeks from the date on the accompanying letter to this RfP.

The Proposal shall be submitted by the deadline by email to the <testmaterialrfp@hbbtv.org> email address. A signed copy of the Proposal shall also be provided by mail as soon after this date as possible to the following address:

HbbTV Association  
L'Ancienne-Route 17A  
CH-1218 Grand-Saconnex  
Suisse

The Proposal shall include as a separate file an Excel spreadsheet schedule indicating what is included in the Proposal, as required by section 3.2 below. The format for the spreadsheet shall be taken from the attached template.

### **2.3 Further Information**

Contract, administrative and technical queries should be sent to the <testmaterialrfp@hbbtv.org> email address.

Queries should be clearly marked as confidential if the Supplier wishes them to be treated as such.

Suppliers are allowed to send in questions related to RfP subjects within the first week from the date on the accompanying letter to this RfP. Anonymized responses to these questions will be provided by HbbTV within 10 working days to all Suppliers.

### **3 Requirements**

The Suppliers and the Proposals must fulfil the following requirements:

#### **3.1 Proposal Structure and Contents**

Proposals shall follow the proposal structure and contents given in Annex 1.

#### **3.2 Pricing**

The preferred model for acquiring the license for the test material is a fixed payment, although HbbTV is open to other payment models as well. As detailed in clause 2.1 “Grant of Rights” of the Test Material Provider Agreement, a non-exclusive license is sufficient to meet the HbbTV Association requirements. However HbbTV Association is open to proposals which additionally offer a price for an exclusive license.

Suppliers shall not charge any fee for test material supplied under an open source license. However, Suppliers shall provide and may charge for coverage for warranty in this case.

Suppliers shall provide all of the following:

- A single price for the entire test suite
- A single price for a test suite consisting only of all packages marked as “Category 1”
- Pricing for all packages individually, so that HbbTV has the option of buying one or more packages from multiple Suppliers
- Pricing for sets of packages where this provides some price advantage for HbbTV.

For each price above, the associated number of man hours required also shall be provided.

Prices quoted shall include coverage for warranty and the staging of Testing Events (see section 3.7).

Suppliers shall provide separate pricing and terms for support and maintenance (see section 3.8).

All pricing must be in Euros including all applicable fees and taxes.

### **3.3 Characteristics of Test Material and Testing Approach Considerations**

The test material, including the updated test definition XML file, shall be compliant with the requirements set out in the HbbTV Test Specification (see Annex 3). It shall be possible to execute the test on a test harness that complies with the HbbTV Test Specification.

Supplier shall describe their approach to the considerations listed in Annex 4 including, but not limited to, any extensions required to the HbbTV Test Specification (see Annex 3). In some cases, this could be a description of how the tests running on the terminal will interact with the test harness and hence the functionality required to be provided by the test harness.

For all areas of testing, if the Supplier believes that the HbbTV Test Specification would need to be modified to enable the tests to be executed, such modifications should be stipulated in the Proposal and must be approved by the HbbTV Testing Group prior to the submission of any affected test material.

### **3.4 Schedule**

HbbTV Association expects groups of packages to be delivered in a staged manner and for all packages to have been delivered within 6 months of the contract date. Packages must not be split across deliveries. The Proposal shall indicate:

- the month of delivery for each package counting from contract signature (more precision will be added during the contract negotiation with the selected supplier(s)), and
- any dependencies between packages.

If the delivery times of the packages would be different depending on whether the Supplier were the only one selected or whether the work was divided between more than one supplier, then the Proposal should state this and explain the differences.

A number of packages actually delivered by the Supplier in accordance with the contract on the same delivery date shall be treated as a group of packages.

HbbTV Association will carry out initial acceptance testing of each delivered package of test material within 8 weeks of the actual date of delivery. If HbbTV rejects any package, it shall notify Supplier of such rejection and Supplier must fix any errors notified to it and re-submit the package which has been rejected. Upon re-submission HbbTV will recommence initial acceptance testing which it will carry out within 8 weeks of the actual date of re-submission. Initial acceptance of any package or group of packages shall be notified to Supplier by HbbTV once HbbTV has completed initial acceptance testing in accordance with the Test Material Approval Process (see Annex 3). In the event that no such notification is made to Supplier within a period expiring 8 weeks following the delivery or re-submission of test material in a package or group of packages, then initial acceptance of that package or group of packages shall be deemed to have taken place. For the avoidance of doubt, where any package contained within a group of packages has been rejected,

then initial acceptance of that group of packages shall not take place until the last rejected package in the group has been re-submitted and initial acceptance testing of that package has been successfully completed.

This paragraph shall apply to the payment to Supplier of any fees including any fee in respect of Supplier's warranty. Upon initial acceptance, Supplier may submit their invoice (minus a retention fee corresponding to 30% of the contracted amount) in respect of the initially accepted test materials. Full acceptance testing will follow the procedure set out in the Test Material Approval Process (see Annex 3). The retention fee may be invoiced upon the earlier of final acceptance of all packages to be delivered by Supplier and the expiry of 6 calendar months following initial acceptance of the last package delivered by Supplier. In the latter case, no retention fee shall be payable unless all test suite errors notified to the Supplier during the 5 month period following initial acceptance of the last package delivered by the Supplier have been fixed to the satisfaction of HbbTV.

### **3.5 General expertise**

Developing tests for a number of the packages will require specialised or scarce expertise. These are listed below:

- MPEG DASH related packages will require expertise in MPEG DASH and the ISO base media (aka MP4) file format.
- The packages for "DRM in a CAM", "CI Plus filesystem" and "launching HbbTV app from module" will require expertise in CI Plus.
- All packages for "non-realtime content delivery" will require expertise in building MPEG-2 transport streams going beyond video and audio.
- Packages for object carousel caching will require expertise in building DSM-CC object carousels.

Proposals shall identify what, if any, expertise the Supplier has related to each of the above. If the Supplier does not yet have the needed expertise, then Proposals shall identify how the Supplier would address this to supply the package(s) concerned (e.g. hire, sub-contract, partner) including the lead time expected to put those arrangements in place.

HbbTV requires that the primary point of contact for project management and technical issues shall be located in Europe. Proposals shall identify the location from which these activities will be carried out and the names of those staff involved. There shall be no requirement for HbbTV (or company members representing HbbTV) to travel outside Europe for the purposes of this contract.

It is important that the Proposals indicate how they will manage continuity of staff and expertise over the period of time covering test material creation, warranty and maintenance.

### **3.6 Warranty**

HbbTV Association requires a warranty period starting from the submission date of the invoice relating to the final delivery of the first package until 12 months following the invoice relating to the final delivery of the last package. During this period, Suppliers shall provide updates to the test material if any test material is found to not satisfy the test assertion or be not in compliance with the HbbTV v2 Specification or otherwise not meet the requirements of the acceptance process, whether discovered during acceptance testing or via the Test Material Challenge Procedure (see Annex 3). During the warranty period Suppliers shall actively participate in any Test Challenges relating to their test material and shall attend HbbTV organised Testing Events which take place on a quarterly basis.

### **3.7 Additional Duties of Suppliers**

Suppliers shall sign the Test Repository Access Agreement (included in Annex 3) and one or more agreements substantially in the form of the template HbbTV V2 Test Material Provider and Distribution Agreement (Commercial) included in Annex 3 and subsequently comply with the terms of the relevant agreements.

All test material shall be submitted electronically directly to the Test Repository (using SVN).

Suppliers shall at their own expense organise in co-ordination with the HbbTV Testing Group the Testing Events where their submitted test material will be validated as part of final acceptance (see the Test Material Approval Procedure for more details). The location of such Testing Events shall be in a venue in Europe that is easily accessible for international travellers. The HbbTV Testing Group will advertise with at least 3 weeks' notice the Testing Events and the test material available for testing to HbbTV members on behalf of the Supplier. If fewer than 3 device manufacturers announce their intention to attend, the Supplier may cancel the event but it shall be deemed to have taken place as far as final acceptance of that test material is concerned. It is the responsibility of the Supplier to provide a means for participants to run the tests on their terminals (TVs and STBs) in a manner consistent with the HbbTV Test Specification.

### **3.8 Maintenance**

HbbTV Association requires the Supplier to provide pricing for annual maintenance for a fixed fee. Suppliers will be expected to provide guaranteed response times for fixing issues found with any test material and otherwise supporting the Test Material Challenge Procedure (see Annex 3) as required. Suppliers will be expected to respond to questions concerning the test material.

### **3.9 Test Harness**

Developing a test harness is outside the scope of this RfP, however it is clear that to fulfil their obligations under this RfP the selected Supplier(s) will require access to a

test harness including the ability to modify it or have it modified. Proposals shall indicate how access to a test harness would be organised if the Proposal was accepted. Specifically:

- a) Supplier already has a test harness with the rights to modify it
- b) Supplier will partner with someone who has a test harness including the rights to modify it
- c) Supplier will buy a test harness and contract the supplier for modifications
- d) Supplier will develop a test harness themselves
- e) other (please explain).

In the case of options c) and d) above, the Proposal shall indicate how the cost of purchasing or developing the test harness is to be funded. Specifically whether the Supplier is intending to fund this themselves (e.g. because they intend to offer a product or service based on it) or if the funding for this is to be paid for by HbbTV, either explicitly as an item in the Proposal or as an overhead on the price of the tests.

#### **4 Appointment Process**

The process of making any appointments of a Supplier or Suppliers is the following:

##### **4.1 Evaluation and Appointment**

Proposals will be opened and reviewed internally at the convenience of HbbTV Association. Within 6 weeks of the submission deadline, HbbTV Association will have completed a comparative assessment of received Proposals in order to make a decision as to which Proposals should be selected for further analysis and negotiation.

At the end of the analysis and negotiation phase, HbbTV Association will make a provisional appointment (the "**Appointment**"), at its entire discretion, of the Supplier or Suppliers who demonstrate the best ability to meet the requirements set out in this RfP to deliver the test material.

Proposals will be subject to a technical review and a commercial/business review:

- The significant factors for the technical review shall be the quality of the Proposal and the effort anticipated to be needed, both from the Supplier and from HbbTV Association, for the test material to pass through the HbbTV test material approval process and be released as part of an approved HbbTV Test Suite.
- The significant factors for the commercial/business review are the perceived ability and track record of the Supplier, the proposed delivery schedule, the price, the maintenance commitments for the test material after it has been released as part of an HbbTV Test Suite and whether the submission is already in use in national markets.

None of these factors is dominant and Proposals which score highly on one factor may be rejected due to scoring badly on another.

HbbTV Association has a budget of €650k for the licensing of test material, excluding maintenance, and expects to be able to purchase licenses for a large number of packages for this amount.

#### **4.2 Clarification of Proposals / Changes to Process**

Notwithstanding any other provision of this RfP, HbbTV Association reserves, at its entire discretion, the right to:

- a) Conduct discussions with any or all potential Suppliers for the purpose of clarification of Proposals;
- b) Waive, or decline to waive, any defect in any Proposal;
- c) Accept, reject, or negotiate any or all Proposals or the terms of any Proposal for the purpose of obtaining the best and final offer;
- d) Cancel or amend this RfP or issue other requests for proposals (and in doing so will endeavor to communicate transparently and in a timely manner with all Suppliers);
- e) Request Suppliers submitting Proposals to resubmit Proposals with the pricing for different grouping of packages;
- f) Provisionally appoint any number of Suppliers and complete more than one agreement with any one Supplier relating to different test materials and to complete agreements at different times for the purpose of expediting the delivery of test materials; and
- g) Select no Proposals at all.

#### **4.3 Negotiation and Execution of Agreements**

Suppliers provisionally appointed shall execute the agreements as set out in section 3.7. In the event that there is negotiation and the appointed Supplier and HbbTV Association are not able to reach agreement and execute such agreements within 30 days of the Appointment, HbbTV Association may declare the Appointment void and may provisionally appoint another Supplier or Suppliers or issue a new RfP.

The list of test materials which HbbTV has definitively agreed to obtain from the Supplier shall be included as a schedule in one or more HbbTV V2 Test Material Provider and Distribution Agreements (Commercial) entered into with the Supplier.

#### **4.4 Not Accepted Proposals**

HbbTV Association has no duty to provide Suppliers with any explanation or justification of its decisions not to accept a Proposal or to accept a Proposal only in part.

## **5 Intellectual Property**

The HbbTV Association retains the immaterial and property rights to all materials accompanying this RfP or materials made available separately by the HbbTV Association for the purpose of preparation of Proposals to this RfP. Nothing in this RfP gives recipients the right to use these materials for any purpose other than preparing Proposals to this RfP.

Suppliers will own all the intellectual property in the test materials and documents developed as part of this project, subject to the provisions of the HbbTV V2 Test Material Provider and Distribution Agreement (Commercial) and the Test Repository Access Agreement (see Annex 3).

If any part of test materials is making use of any third party intellectual property, it must be clearly identified and must follow that third party's intellectual property licensing requirements.

If any test materials contain open source components, this must be disclosed in the Proposal and will be subject to further negotiation.

## **6 Exclusion of liability / Costs**

The test assertions, attached documents and other materials are supplied without any obligation or warranty from HbbTV Association. The HbbTV Association reserves the right to amend the test assertions during the present submission process.

The HbbTV Association has prepared this RfP in good faith with a particular interest for swift and cooperative progress in the development of the test material to be used to validate implementations of HbbTV in TVs and STBs. To the extent permitted by law, the HbbTV Association excludes any liability (whether in contract, tort, negligence or otherwise) for any incorrect or misleading information contained in this RfP.

Any costs or expenses incurred by any Supplier or other person under the present submission process will not be reimbursed by the HbbTV Association and neither the HbbTV Association nor any of its representatives will be liable in any way to any Supplier or other person for any costs, expenses or losses incurred by any Supplier or other person in connection with this RfP.

## **7 Confidentiality**

Sections 1 to 8 of the Proposals may be shared with any member of the HbbTV Association. Sections 9 and 10 will only be shared with members who have been specifically tasked with considering the Proposals and will not be shared more widely.

The documentation as listed in Annex 3 is made available separately by the HbbTV Association as confidential materials under a separate NDA.

## **8 Applicable Law and Dispute Settlement**

This present RfP, as well as subsequent negotiations shall in all respects be governed by and construed in accordance with Swiss law.

The present RfP must be regarded as a modality of a negotiation subject to the general rules of the Swiss Code of Obligations. Swiss law does not subject requests for proposals in the present context to any specific rules, such as e.g. public procurement rules, and HbbTV Association is entirely free to enter into contract with whatever Supplier it considers best suited for the awarded work. As a consequence, no claims can be brought against the HbbTV Association out of the present procedure. For all practical purposes, the following dispute settlement rules shall nevertheless apply:

All disputes arising out of or in connection with the present RfP shall be submitted, in the first instance, to the Dispute Adjudication Board ("**DAB**") in accordance with the Dispute Adjudication Board Rules of the International Chamber of Commerce (the "**DAB Rules**"), which are incorporated herein by reference.

The DAB shall consist of three (3) members to be appointed as follows: when a dispute arises that could not be amicably settled, each of the potential Supplier and HbbTV Association (each a "**Party**", collectively the "**Parties**") may send a written notice to the other Party requesting the establishment of the DAB. Each Party shall then within 10 business days appoint one independent DAB member who must have the following credentials: (i) be demonstrably experienced in the subject matter of the dispute, and (ii) be an employee or representative of a company that is a member of the HbbTV Association. The two appointed DAB members shall appoint, within 10 business days, the third independent DAB member, who shall act as chairman of the DAB.

The DAB procedure shall be purely private, and the parties shall not revert to the ICC Dispute Board Center. Problems arising from not having the support of the ICC Dispute Board Center shall be resolved ad hoc by the DAB.

For any given dispute, the DAB shall issue a decision in accordance with the DAB Rules and within a time period of 2 months. The deadlines for the various steps of the procedure shall be set (and if longer deadlines are mentioned in the DAB Rules be systematically reduced) to allow for a swift rendering of the decision of the DAB within the time limit of 2 months.

If (i) any Party fails to comply with a decision when required to do so pursuant to the DAB Rules, (ii) any Party sends a written notice to the other Party and to the DAB expressing its dissatisfaction with a decision, as provided in the DAB Rules, (iii) the DAB does not issue the decision within the time limit of 2 months, or (iv) if the DAB is

disbanded pursuant to the DAB Rules, the dispute shall be finally resolved by arbitration in accordance with the Swiss Rules of International Arbitration of the Swiss Chambers of Commerce (the "**Swiss Rules**") in force on the date when the notice of arbitration is submitted in accordance with these Swiss Rules. The number of arbitrators shall be one (1). The applicable procedure shall be the expedite procedure under Article 42 para 1 of the Swiss Rules (in particular: award to be made within six months). The seat of the arbitration shall be Geneva and the arbitral proceedings shall be conducted in English.

Each Party hereby: (i) irrevocably consents to the exclusive jurisdiction of such arbitral tribunal for the resolution of such disputes; (ii) irrevocably waives any objection that it may now or hereafter have to the venue of any such action or proceeding in such arbitral tribunal or to the convenience of conducting or pursuing any action or proceeding in such arbitral tribunal; and (iii) irrevocably waives any right to a trial by jury regarding the resolution of any dispute between the Parties hereto.

Neither the DAB procedure, nor the arbitration under the Swiss Rules oblige the HbbTV Association to suspend or abort its work on the submission, assessment and testing of test material.

## Annex 1: Proposal Structure

1. Table of Contents
2. Executive Summary
3. Test Materials to be supplied
  - 3.1. Schedule of packages covered by this Proposal, both embedded within the Proposal and contained in the separate Excel file sent with this RfP
  - 3.2. Clearly identifying which of the tests contain open source materials with an indication of the license terms
  - 3.3. Details of test materials already in use in national markets
  - 3.4. Expected source of any material (eg open source, 3rd party, original)
  - 3.5. Testing Approach Considerations
  - 3.6. Potential location of Testing Events
4. Test Harness and Test Specification
  - 4.1. Modifications to the Test Specification
  - 4.2. Sourcing a Test Harness
5. Deviations from the RfP
  - 5.1. Specific deviations
6. Supplier's Project Personnel
  - 6.1. List of Project Members and contact information
  - 6.2. Background, Experience and Skill Sets of Project Members
  - 6.3. Source of specialised or scarce expertise
7. Schedule for deliverables
8. Supplier Information
  - 8.1. Corporate Information
  - 8.2. References
  - 8.3. Involvement with other test suite developments
  - 8.4. QA processes
  - 8.5. Contact Information
9. Payments and terms & conditions
  - 9.1. Prices and terms & conditions relating to Pricing, Pricing models, warranty
  - 9.2. Support and maintenance prices and terms
  - 9.3. Any other costs
10. Supporting confidential information

Each section should start on a new page.

Section 10 should only be used for material that is clearly confidential. Use of section 10 for material that needs to be assessed by the HbbTV Testing Group may damage the chances of the Proposal being accepted.

## Annex 2: List of Tests

This annex includes a list of tests (listed with their test ID and title) which are included in this RfP, broken down by package. The details of each test assertion are included in the zip file, available on request from HbbTV after signing the NDA. Note that the zip file includes additional tests that do not form part of this RfP.

### Package: Pointer\_1 (Category 1)

Test ID	Title
org.hbbtv_PTR00002	To check the pointer capability from HbbTV app when terminal set supports.
org.hbbtv_PTR00004	Testing the "dblclick" event when terminal supports pointer.
org.hbbtv_PTR00007	Testing the "mouseenter" event when terminal supports pointer.
org.hbbtv_PTR00011	Testing the "mousemove" event when terminal supports pointer.
org.hbbtv_PTR00014	Testing the "onclick" DOM 2 event when terminal supports pointer.
org.hbbtv_PTR00020	Testing the "wheel" event when terminal supports pointer.
org.hbbtv_PTR00022	Testing the "deltamode" event when terminal supports pointer it should return one of these values.
org.hbbtv_PTR00023	Testing the "deltaX" event when terminal supports pointer and "deltamode" attribute should be set.

### Package: Pointer\_2

Test ID	Title
org.hbbtv_PTR00001	To check the pointer capability from HbbTV app when terminal do not support it.
org.hbbtv_PTR00003	Testing the "mousemove" event when terminal set supports pointer.
org.hbbtv_PTR00005	Testing the "mousedown" event when terminal supports pointer.
org.hbbtv_PTR00006	Testing the "mouseup" event when terminal supports pointer.
org.hbbtv_PTR00008	Testing the "mouseleave" event when terminal supports pointer.
org.hbbtv_PTR00009	Testing the "mouseout" event when terminal supports pointer.
org.hbbtv_PTR00010	Testing the "mouseover" event when terminal supports pointer.
org.hbbtv_PTR00012	Testing the "mousemove" event when terminal supports pointer and we call removeEventListener().
org.hbbtv_PTR00013	Testing the "click" event when terminal supports pointer.
org.hbbtv_PTR00016	Testing the "onmousedown" DOM 2 event when terminal supports pointer.
org.hbbtv_PTR00017	Testing the "onmouseup" DOM 2 event when terminal supports pointer.
org.hbbtv_PTR00018	Testing the "onmouseover" DOM 2 event when terminal supports pointer.
org.hbbtv_PTR00019	Testing the "onmouseout" DOM 2 event when terminal supports pointer.
org.hbbtv_PTR00021	Testing the "wheel" event when terminal supports pointer and we unregistered the event by using removeEventListener().
org.hbbtv_PTR00024	Testing the "deltaY" event when terminal supports pointer and "deltamode" attribute should be set.
org.hbbtv_PTR00025	Testing the "deltaZ" event when terminal supports pointer and "deltamode" attribute should be set.
org.hbbtv_PTR00026	Testing the "mouseleave" event when pointing device is moved off the boundaries of an element but not outside the boundaries of all of its descendent elements.

### Package: KEYREQCON\_01 (Category 1)

Test ID	Title
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Test ID	Title
org.hbbtv_KEYREQCON0010	Loss of focus
org.hbbtv_KEYREQCON0020	Regaing focus
org.hbbtv_KEYREQCON0120	Back button before activation - broadcast-related present app
org.hbbtv_KEYREQCON0140	Record key before activation - b-i app
org.hbbtv_KEYREQCON0180	Fast forwards and rewind before activation - broadcast-related present app
org.hbbtv_KEYREQCON0300	play, stop, pause keys before activation - broadcast-related autostart app
org.hbbtv_KEYREQCON0320	play, stop, pause keys before activation - broadcast-related present app
org.hbbtv_KEYREQCON0330	play-pause, stop keys before activation - broadcast-related autostart app
org.hbbtv_KEYREQCON0350	play-pause, stop keys before activation - broadcast-related present app
org.hbbtv_KEYREQCON0540	up key activates an autostart broadcast-related application
org.hbbtv_KEYREQCON0550	down key activates an autostart broadcast-related application
org.hbbtv_KEYREQCON0560	left key activates an autostart broadcast-related application
org.hbbtv_KEYREQCON0570	right key activates an autostart broadcast-related application
org.hbbtv_KEYREQCON0580	enter key activates an autostart broadcast-related application
org.hbbtv_KEYREQCON1000	Key events while application has no focus

**Package: KEYREQCON\_02**

Test ID	Title
org.hbbtv_KEYREQCON0100	Back button before activation - broadcast-related autostart app
org.hbbtv_KEYREQCON0110	Back button before activation - b-i app
org.hbbtv_KEYREQCON0130	Record key before activation - broadcast-related autostart app
org.hbbtv_KEYREQCON0150	Record key before activation - broadcast-related present app
org.hbbtv_KEYREQCON0160	Fast forwards and rewind before activation - broadcast-related autostart app
org.hbbtv_KEYREQCON0170	Fast forwards and rewind before activation - b-i app
org.hbbtv_KEYREQCON0310	play, stop, pause keys before activation - broadcast-independent app
org.hbbtv_KEYREQCON0340	play-pause, stop keys before activation - broadcast-independent app

**Package: APP2AV\_01 (Category 1)**

Test ID	Title
org.hbbtv_APP2AV0010	APP2AV: HTML5 currentTime is accurate
org.hbbtv_APP2AV0020	APP2AV: AVO playPosition is accurate
org.hbbtv_APP2AV0030	APP2AV: AVO playPosition correlates with 25fps
org.hbbtv_APP2AV0040	APP2AV: AVO playPosition correlates with 50fps
org.hbbtv_APP2AV0050	APP2AV: AVO playPosition correlates with the audio frame of MPEG1 audio track
org.hbbtv_APP2AV0060	APP2AV: AVO playPosition correlates with audio frame of AAC audio track
org.hbbtv_APP2AV0070	APP2AV: AVO value of playPosition for on-demand
org.hbbtv_APP2AV0080	APP2AV: AVO value of playPosition for DASH
org.hbbtv_APP2AV0110	APP2AV: accuracy of MediaSynchroniser.currentTime with

Test ID	Title
	broadcast TS and MPEG TEMI
org.hbbtv_APP2AV0120	APP2AV: accuracy of MediaSynchroniser.currentTime with DASH
org.hbbtv_APP2AV0130	APP2AV: Precision of MediaSynchroniser.currentTime for 25fps video
org.hbbtv_APP2AV0140	APP2AV: Precision of MediaSynchroniser.currentTime for 50fps video
org.hbbtv_APP2AV0150	APP2AV: Precision of MediaSynchroniser.currentTime for MPEG1L2 audio
org.hbbtv_APP2AV0160	APP2AV: Precision of MediaSynchroniser.currentTime for HEAAC audio
org.hbbtv_APP2AV0170	APP2AV: Value of MediaSynchroniser.currentTime on slave terminal
org.hbbtv_APP2AV0180	APP2AV: Precision of MediaSynchroniser.currentTime on slave for 50fps video as other media
org.hbbtv_APP2AV0190	APP2AV: Precision of MediaSynchroniser.currentTime on slave for MPEG1L2 audio as other media
org.hbbtv_APP2AV0200	APP2AV: Precision of MediaSynchroniser.currentTime on slave with no other media

**Package: NONRTDB\_1 (Category 1)**

Test Case ID	Title
org.hbbtv_NONRTDB004	Downloads flagged for deletion are removed when deletion can provide enough space to store a new content item
org.hbbtv_NONRTDB006	flaggedForDeletion ignored when the download is being played
org.hbbtv_NONRTDB007	Space deemed as free by checkDownloadPossible() when downloads are flagged for deletion
org.hbbtv_NONRTDB010	Successful Register download with registerDownload (several Content Items for same file)
org.hbbtv_NONRTDB018	Download of a single file broadcast via FDP, and reconstructed from 2 different URLs.
org.hbbtv_NONRTDB022	Automatic wake up from Stand by for FDP download
org.hbbtv_NONRTDB023	Parental Control of content downloaded via FDP is checked before playing the content
org.hbbtv_NONRTDB024	Download executes in background even if the application which originated the download is not running
org.hbbtv_NONRTDB026	Download executes in background even after the device has been powered down and restarted
org.hbbtv_NONRTDB069	Download priority management
org.hbbtv_NONRTDB080	Extension of the area reserved for the downloads
org.hbbtv_NONRTDB082	Shrink of the area reserved for the downloads
org.hbbtv_NONRTDB084	Cancelation of a reservation
org.hbbtv_NONRTDB085	reserved area is not shared by applications from different organisations

org.hbbtv_NONRTDB088	check that the hasReserved returns -1 when no reservation exists
org.hbbtv_NONRTDB098	Check free space when a reservation exists and the specified size is smaller or equal to the free space in the reserved area
org.hbbtv_NONRTDB101	Check free space when a reservation exists after a download failure
org.hbbtv_NONRTDB107	Check that the properties of a removed download are set to undefined
org.hbbtv_NONRTDB116	Playback of downloaded content
org.hbbtv_NONRTDB117	unknown elements and attributes in CADD are silently ignored
org.hbbtv_NONRTDB128	File reconstructed from different availability windows
org.hbbtv_NONRTDB130	File reconstructed from the first availability window amongst several
org.hbbtv_NONRTDB139	Incomplete file by FDP, discard_file_on_error_flag = 1
org.hbbtv_NONRTDB148	totalSize property of a download in state queued
org.hbbtv_NONRTDB149	totalSize property of a download in-progress
org.hbbtv_NONRTDB150	transferType element shall be assumed to be full_download.
org.hbbtv_NONRTDB152	createFilteredList returns only the downloads initiated from the FQDN of the calling application when currentDomain is set to true
org.hbbtv_NONRTDB155	Download resumed after a power-down when it occurs between two availability windows
org.hbbtv_NONRTDB156	check the hasReserved returns the size of the reservation when called by application which has make the reservation
org.hbbtv_NONRTDB166	Download bitrate of 5 Mbit/s is supported for a single download
org.hbbtv_NONRTDB167	Cumulated bitrate of 5 Mbit/s is supported for two simultaneous downloads

**Package: NONRTDB\_2**

Test Case ID	Title
org.hbbtv_NONRTDB001	Download of a file via FDP (nominal case)
org.hbbtv_NONRTDB002	Playback of an A/V file downloaded via FDP
org.hbbtv_NONRTDB005	Download removed due to flaggedForDeletion set to true and properties set to undefined
org.hbbtv_NONRTDB008	Successful Register download with registerDownload (base case)
org.hbbtv_NONRTDB009	Successful Register download with registerDownload (several Content Items, different files)
org.hbbtv_NONRTDB015	registerDownload failure if no availability window for an FDP URL
org.hbbtv_NONRTDB016	Registration of a download with a CADD containing several content items pointing to the same file shall create a single download object
org.hbbtv_NONRTDB017	Download of a single file broadcast via FDP at 2 different URLs

org.hbbtv_NONRTDB025	Download executes in background even if another application than the one which originated the download is running
org.hbbtv_NONRTDB036	Call to registerDownload with no downloadStart time
org.hbbtv_NONRTDB037	Call to registerDownload with no priority argument
org.hbbtv_NONRTDB039	Restoration of the download priority with the priority property of the download object
org.hbbtv_NONRTDB040	Restoration of the name passed in the CADD with the name property of the download object
org.hbbtv_NONRTDB041	Modification of the download name with the name property of the download object
org.hbbtv_NONRTDB044	Restoration of the description passed in the CADD with the description property of the download object
org.hbbtv_NONRTDB045	Modification of the download description with the description property of the download object
org.hbbtv_NONRTDB061	contentID set to the value carried in the CADD passed to register an FDP download
org.hbbtv_NONRTDB065	Modification of the Content ID
org.hbbtv_NONRTDB068	metadata property returns the the content of the CADD as an XML document object
org.hbbtv_NONRTDB079	Attempt to reserve a storage area for the downloads larger than the available size
org.hbbtv_NONRTDB081	Attempt to extend the area reserved for the downloads whereas there is no sufficient available space does not change the existing reservation
org.hbbtv_NONRTDB083	Shrink of the area reserved for the downloads to a size smaller than what is needed for the registered downloads
org.hbbtv_NONRTDB086	reserved area is shared by all the applications of a same organisation
org.hbbtv_NONRTDB087	Attempt to use more than the reserved space shall fail
org.hbbtv_NONRTDB089	check that the hasReserved returns the size of the reservation
org.hbbtv_NONRTDB090	check that the hasReserved returns the size of the reservation when called by another application belonging to the same organisation than the one which made the reservation
org.hbbtv_NONRTDB091	Check that the allocated property when a reservation exists but no download is registered
org.hbbtv_NONRTDB093	Check that the allocated property when a reservation exists and some downloads are registered
org.hbbtv_NONRTDB095	Check that the allocated property when a reservation exists and some downloads have been registered by other applications from the same organisation
org.hbbtv_NONRTDB099	Check free space when a reservation was created by another application of the same organisation
org.hbbtv_NONRTDB100	Check free space when a reservation exists and there is no more free space in the reserved area
org.hbbtv_NONRTDB103	Remove a registered download when in state queued
org.hbbtv_NONRTDB104	Remove a registered download when state is in progress
org.hbbtv_NONRTDB105	Remove a registered download when state is completed

org.hbbtv_NONRTDB106	Remove a registered download when state is failed
org.hbbtv_NONRTDB108	Remove an invalid download
org.hbbtv_NONRTDB110	nominal call to createFilteredList when no download is registered
org.hbbtv_NONRTDB115	call to setSource with a Download identifier set the data property to the specified download identifier
org.hbbtv_NONRTDB129	File reconstructed from different availability windows with different FDP URL pointing to the same file
org.hbbtv_NONRTDB133	Wait for a random duration before attempting to get missing file segments via HTTP
org.hbbtv_NONRTDB134	Download state updated at the end of the last availability window when recovery is not or unsuccessfully attempted and discard_file_on_error_flag set to 1
org.hbbtv_NONRTDB138	Erroneous file by FDP, discard_file_on_error_flag = 1
org.hbbtv_NONRTDB140	Erroneous file by FDP, discard_file_on_error_flag = 0
org.hbbtv_NONRTDB141	Incomplete file by FDP, discard_file_on_error_flag = 0
org.hbbtv_NONRTDB157	Download state updated at the end of the last availability window when recovery is not or unsuccessfully attempted and discard_file_on_error_flag set to 0
org.hbbtv_NONRTDB159	Allocated property calculated as the sum of the totalSize properties of all the downloads registered by any application from the organisation of the calling application - case with a reservation
org.hbbtv_NONRTDB161	Allocated property updated when the totalSize property of a download is modified after receiving the first initialisation message - case with a reservation
org.hbbtv_NONRTDB163	Allocated property shall be updated when the totalSize of a download is modified due to download errors and discard_file_on_error_flag set o 1 - case with a reservation
org.hbbtv_NONRTDB165	Allocated property shall be updated due to the removal of a download registered by an application from the same organisation id as the calling application - case with a reservation
org.hbbtv_NONRTDB172	Download state property set to queued after successful registration with registerDownloadURL() and before the download starts
org.hbbtv_NONRTDB173	State property set to download 'in progress' when a download starts
org.hbbtv_NONRTDB176	When a paused download starts receiving FDP message during a new availability window, the state property shall be set to 'download in progress'
org.hbbtv_NONRTDB178	Remove a registered download when state is paused
org.hbbtv_NONRTDB180	Automatic deletion of a download in state 'queued' with flaggedForDeletion property
org.hbbtv_NONRTDB181	Automatic deletion of a download in state 'in progress' with flaggedForDeletion property
org.hbbtv_NONRTDB182	Automatic deletion of a download in state 'paused' with flaggedForDeletion property
org.hbbtv_NONRTDB183	Automatic deletion of a download in state 'completed' with flaggedForDeletion property
org.hbbtv_NONRTDB191	totalSize set to 0 when state is set to failed

Package: NONRTDB\_3

Test Case ID	Title
org.hbbtv_NONRTDB021	Priority to TV viewing over FDP download
org.hbbtv_NONRTDB038	Access to download object via the download id
org.hbbtv_NONRTDB048	Restoration of the content URL passed in the CADD with the contentURL property of the download object
org.hbbtv_NONRTDB049	Restoration of the ParentalRating information passed in the CADD with the parentalRatings function of the download object
org.hbbtv_NONRTDB050	ParentalRatings set to undefined when CADD does not carry this information
org.hbbtv_NONRTDB051	reason property set to undefined when no error has occurred
org.hbbtv_NONRTDB053	drmControl set to undefined when no DRM applies to the contentURL carried in the CADD passed to register an FDP download
org.hbbtv_NONRTDB054	drmControl set to undefined when a DRM applies to the ContentURL s carried in the CADD used to register an FDP download but the CADD does not carry any DRMControlInformation value
org.hbbtv_NONRTDB055	drmControl set to undefined when a DRM applies to the ContentURL carried in the CADD used to register an FDP download but the CADD carries a DRMControlInformation that does not match the DRMSystemID
org.hbbtv_NONRTDB056	drmControl set to the value carried in the CADD passed to register an FDP download
org.hbbtv_NONRTDB058	originSite set to the value carried in the CADD passed to register an FDP download
org.hbbtv_NONRTDB059	originSiteName set to the value carried in the CADD passed to register an FDP download
org.hbbtv_NONRTDB060	originSiteName set to undefined if information is not available in the CADD
org.hbbtv_NONRTDB062	contentID set to undefined when no content ID is available in the CADD
org.hbbtv_NONRTDB066	iconURL set to the value carried in the CADD passed to register an FDP download
org.hbbtv_NONRTDB067	iconURL set to undefined when not present in the CADD
org.hbbtv_NONRTDB072	DownloadStateChange event is generated when a download state changes to 'download has completed' state
org.hbbtv_NONRTDB073	DownloadStateChange event is generated when a download state changes to 'download is in progress' state
org.hbbtv_NONRTDB074	DownloadStateChange event is generated when a download state changes to 'download has been paused' state
org.hbbtv_NONRTDB075	DownloadStateChange event is generated when a download state changes to 'download has failed' state
org.hbbtv_NONRTDB077	Reason for download failed set to "local storage device is full"
org.hbbtv_NONRTDB078	Nominal storage reservation for downloads
org.hbbtv_NONRTDB092	Check that the allocated property when no reservation exists and no download is registered
org.hbbtv_NONRTDB094	Check that the allocated property when no reservation exists and some downloads are registered
org.hbbtv_NONRTDB096	Check that the allocated property when no reservation exists and some downloads have been registered by other applications from the same

	organisation
<b>org.hbbtv_NONRTDB097</b>	Check free space when a mass storage is available but the organisation to which the application belongs has no reservation
<b>org.hbbtv_NONRTDB102</b>	On a terminal which uses an removable HDD to store FDP downloads, check free space when a reservation exists but the HDD has been removed
<b>org.hbbtv_NONRTDB109</b>	Remove a download while it is played cause the notification of an error by the A/V Control object
<b>org.hbbtv_NONRTDB111</b>	nominal call to createFilteredList when some downloads are registered
<b>org.hbbtv_NONRTDB112</b>	createFilteredList returns the list of queued downloads when the state argument is set to 2
<b>org.hbbtv_NONRTDB113</b>	createFilteredList returns the list of failed downloads when the state argument is set to 8
<b>org.hbbtv_NONRTDB114</b>	Notification of an A/V Control error when trying to play a download in progress whose TransferType is set to full_download
<b>org.hbbtv_NONRTDB120</b>	Support of the errorLevel property
<b>org.hbbtv_NONRTDB121</b>	errorLevel contains the percentage of missing segments when a download is completed and some segments have not been downloaded.
<b>org.hbbtv_NONRTDB122</b>	errorLevel set to 0 when a download is in state 'completed' with no missing segments
<b>org.hbbtv_NONRTDB131</b>	Format of a file request for recovery request
<b>org.hbbtv_NONRTDB132</b>	Conditions to perform a file recovery request
<b>org.hbbtv_NONRTDB142</b>	Maximum number of recovery requests
<b>org.hbbtv_NONRTDB143</b>	Minimum duration between recovery requests
<b>org.hbbtv_NONRTDB147</b>	Wrong Protocol version in an FDP Termination message
<b>org.hbbtv_NONRTDB151</b>	downloadStart parameter passed upon registration of a download is ignored
<b>org.hbbtv_NONRTDB158</b>	Allocated property calculated as the sum of the totalSize properties of all the downloads registered by any application from the organisation of the calling application - case with no reservation
<b>org.hbbtv_NONRTDB160</b>	Allocated property updated when the totalSize property of a download is modified after receiving the first initialisation message - case with no reservation
<b>org.hbbtv_NONRTDB162</b>	Allocated property shall be updated when the totalSize of a download is modified due to download errors and discard_file_on_error_flag set o 1 - case with no reservation
<b>org.hbbtv_NONRTDB164</b>	Allocated property shall be updated due to the removal of a download registered by an application from the same organisation id as the calling application - case with no reservation
<b>org.hbbtv_NONRTDB171</b>	Download state property set to queued after successful registration with registerDownload() and before the download starts
<b>org.hbbtv_NONRTDB174</b>	onDownloadState notifies 'download in progress' state when a download starts
<b>org.hbbtv_NONRTDB175</b>	onDownloadState notifies 'download in progress' state when a paused download starts receiving FDP message during a new availability window
<b>org.hbbtv_NONRTDB177</b>	Notification of download state 'paused' if the a download is not completed after an availability window and other availability windows are schedule

<b>org.hbbtv_NONRTDB179</b>	onDownloadStateChange notifies 'download failed' at the end of the last availability window when recovery is not or unsuccessfully attempted and discard_file_on_error_flag set to 1
<b>org.hbbtv_NONRTDB184</b>	onDownloadStateChange notifies download state 'completed' when the download previously in state paused is completed after a recovery
<b>org.hbbtv_NONRTDB185</b>	onDownloadStateChange notifies download state 'completed' after the last availability window of the download with discard_file_on_error_flag set to 0 and previously in state paused is passed - case when no FDP recovery is attempt

**Package: NONRTDB\_4**

<b>Test Case ID</b>	<b>Title</b>
<b>org.hbbtv_NONRTDB003</b>	Availability of the flaggedForDeletion property
<b>org.hbbtv_NONRTDB011</b>	Successful Register download with registerDownloadURL (base case)
<b>org.hbbtv_NONRTDB012</b>	Successful Register download with registerDownloadURL (several Content Items, different files)
<b>org.hbbtv_NONRTDB013</b>	Successful Register download with registerDownloadURL (several Content Items for same file)
<b>org.hbbtv_NONRTDB014</b>	registerDownloadURL failure if URL is an FDP URL
<b>org.hbbtv_NONRTDB020</b>	Same domain policy for content download
<b>org.hbbtv_NONRTDB032</b>	Object Factory indicates the support of the application/oipfDownloadManager
<b>org.hbbtv_NONRTDB033</b>	Object Factory indicates the support of the application/oipfDownloadTrigger
<b>org.hbbtv_NONRTDB034</b>	Instantiation of the embedded object application/oipfDownloadManager
<b>org.hbbtv_NONRTDB035</b>	Instantiation of the embedded object application/oipfDownloadTrigger
<b>org.hbbtv_NONRTDB042</b>	Support of the minimum 200 byte size for the name
<b>org.hbbtv_NONRTDB043</b>	name property forced to NULL when trying to set it to a string which is larger than the available size supported by the OIPF
<b>org.hbbtv_NONRTDB046</b>	Support of the minimum 2000 byte size for the description
<b>org.hbbtv_NONRTDB047</b>	description property forced to NULL when the associated string is larger than the available size supported by the OIPF
<b>org.hbbtv_NONRTDB063</b>	Support of the minimum 2000 byte size for the content ID
<b>org.hbbtv_NONRTDB064</b>	ContentID property forced to NULL when trying to set it with a string larger than the available size supported by the OIPF
<b>org.hbbtv_NONRTDB070</b>	amountDownloaded set to 0 when no data has been downloaded
<b>org.hbbtv_NONRTDB071</b>	amountDownloaded increases as a download progresses
<b>org.hbbtv_NONRTDB118</b>	downloadStart parameter passed upon registration of a download is ignored
<b>org.hbbtv_NONRTDB135</b>	Message of unknown type
<b>org.hbbtv_NONRTDB136</b>	Presence of Data messages containing FEC segments shall not prevent the terminal from downloading the data messages carrying the the file segments

<b>org.hbbtv_NONRTDB137</b>	Wrong Protocol version in the FDP initialisation message
<b>org.hbbtv_NONRTDB145</b>	Private data present in the FDP initialization message
<b>org.hbbtv_NONRTDB146</b>	Wrong Protocol version in an FDP Data message
<b>org.hbbtv_NONRTDB169</b>	registerDownloadURL returns a download id when contentType is set to "application/vnd.oipf.ContentAccessDownload+xml"
<b>org.hbbtv_NONRTDB170</b>	download state immediately set to failed when the fetched CADD is not accepted by the Terminal
<b>org.hbbtv_NONRTDB186</b>	timeElapsed set to undefined
<b>org.hbbtv_NONRTDB187</b>	timeRemaining set to undefined
<b>org.hbbtv_NONRTDB188</b>	currentBitRate set to undefined
<b>org.hbbtv_NONRTDB189</b>	startTime set to undefined
<b>org.hbbtv_NONRTDB190</b>	suspendedByTerminal set to true when download state is set to paused

**Package: PMT\_01**

<b>Test ID</b>	<b>Title</b>
org.hbbtv_PMT0005	Notification of change of components - audio removed from video/broadcast object (1 component to 0 components)
org.hbbtv_PMT0006	Notification of change of components - subtitles removed from video/broadcast object (1 component to 0 components)
org.hbbtv_PMT0008	Notification of change of components - audio added to video/broadcast object (0 components to 1 component)
org.hbbtv_PMT0009	Notification of change of components - subtitles added to video/broadcast object (0 components to 1 component)
org.hbbtv_PMT0010	Notification of change of components - multiple components changed in video/broadcast object
org.hbbtv_PMT0012	getComponents - response to PMT change - audio removed (1 component to 0 components)
org.hbbtv_PMT0013	getComponents - response to PMT change - subtitles removed (1 component to 0 components)
org.hbbtv_PMT0015	getComponents - response to PMT change - audio added (0 components to 1 component)
org.hbbtv_PMT0016	getComponents - response to PMT change - subtitles added (0 components to 1 component)
org.hbbtv_PMT0017	getComponents - response to PMT change - multiple components changed
org.hbbtv_PMT0030	Notification of change of components - audio removed from video/broadcast object (2 components to 1 component)
org.hbbtv_PMT0040	Notification of change of components - subtitles removed from video/broadcast object (2 components to 1 component)
org.hbbtv_PMT0050	Notification of change of components - audio added to video/broadcast object (1 component to 2 components)
org.hbbtv_PMT0060	Notification of change of components - subtitles added to video/broadcast object (1 component to 2 components)
org.hbbtv_PMT0070	getComponents - response to PMT change - audio removed (2 components to 1 component)
org.hbbtv_PMT0080	getComponents - response to PMT change - subtitles removed (2 components to 1 component)

Test ID	Title
	component)
org.hbbtv_PMT0090	getComponents - response to PMT change - audio added (1 component to 2 components)
org.hbbtv_PMT0100	getComponents - response to PMT change - subtitles added (1 component to 2 components)

#### Package CSCRNL\_1 (Category 1)

Test_ID	Title
org.hbbtv_CS000002	Discovering a Companion Screen Launcher Application with a valid enum_id
org.hbbtv_CS000003	Responding to the second discoverCSLaunchers() call with the same enum_id for a connected (associated) Companion Screen Launcher Application
org.hbbtv_CS000008	Test to check return value of bool discoverCSLaunchers() in case of no errors
org.hbbtv_CS000010	Test to verify onCSDiscovery() callback fired within 1 sec.
org.hbbtv_CS000011	Test to verify that the onCSDiscovery() callback is fired within one second, or not at all, for any subsequently connected Companion Screen Launcher Application.
org.hbbtv_CS000012	Launching a Native Application
org.hbbtv_CS000013	Launching an HTML Application
org.hbbtv_CS000016	Launching both Native and HTML Applications where the Native Application is available
org.hbbtv_CS000017	Launching both Native and HTML Applications where the Native Application is not available
org.hbbtv_CS000024	Installing a (Native) application from a single source without store name
org.hbbtv_CS000032	Test to check return value of bool launchCSApp() in case of no errors
org.hbbtv_CS000012_IOS	Launching a Native Application (iOS)
org.hbbtv_CS000013_IOS	Launching an HTML Application (iOS)

#### Package CSCRNL\_2

Test_ID	Title
org.hbbtv_CS000001	Test to verify HbbTVCSManager embedded object support with correct MIME type
org.hbbtv_CS000004	Responding to the second discoverCSLaunchers() call with different enum_id for a disconnected (dis-associated) Companion Screen Launcher Application
org.hbbtv_CS000005	Discovering two Companion Screen Launcher Applications with unique enum_ids
org.hbbtv_CS000006	Discovering a Companion Screen Launcher Application with an empty friendly_name string
org.hbbtv_CS000007	Discovering a Companion Screen Launcher Application with a valid CS_OS_id
org.hbbtv_CS000009	Test to check return value of bool discoverCSLaunchers() in case of error
org.hbbtv_CS000013_IOS	Launching an HTML Application (iOS)
org.hbbtv_CS000016_IOS	Launching both Native and HTML Applications where the Native Application is available (iOS)
org.hbbtv_CS000017_IOS	Launching both Native and HTML Applications where the Native Application is not available (iOS)
org.hbbtv_CS000018	Launching a Native Application with invalid JSON data
org.hbbtv_CS000019	Launching an HTML Application with invalid JSON data
org.hbbtv_CS000020	Installing a (Native) Application with invalid JSON data
org.hbbtv_CS000020_IOS	Installing a (Native) Application with invalid JSON data (iOS)
org.hbbtv_CS000021	Launching both Native and HTML Applications with invalid JSON data
org.hbbtv_CS000021_IOS	Launching both Native and HTML Applications with invalid JSON data (iOS)

org.hbbtv_CS000022	Launching an application with JSON data of 65536 bytes
org.hbbtv_CS000022_IOS	Launching an application with JSON data of 65536 bytes (iOS)
org.hbbtv_CS000023	Installing a (Native) application from a single source with store name
org.hbbtv_CS000025	Installing a (Native) application from the first store of multiple sources
org.hbbtv_CS000026	Installing a (Native) application from the last store of multiple sources with store name
org.hbbtv_CS000027	Installing a (Native) application from the default store of multiple sources
org.hbbtv_CS000028	Installing a Native Companion Screen application with the correct enum_id returned
org.hbbtv_CS000028_IOS	Installing a Native Companion Screen application with the correct enum_id returned (iOS)
org.hbbtv_CS000029	Launching a Native Companion Screen application with the correct enum_id returned
org.hbbtv_CS000029_IOS	Launching a Native Companion Screen application with the correct enum_id returned (iOS)
org.hbbtv_CS000030	Launching an HTML Companion Screen application with the correct enum_id returned
org.hbbtv_CS000030_IOS	Launching an HTML Companion Screen application with the correct enum_id returned (iOS)
org.hbbtv_CS000031	Launching a Native and an HTML Companion Screen application with the correct enum_id returned
org.hbbtv_CS000031_IOS	Launching a Native and an HTML Companion Screen application with the correct enum_id returned (iOS)
org.hbbtv_CS000033	Test to check return value of bool launchCSApp() in case of any error

**Package: AppSignalling\_1 (Category 1)**

Test_ID	Title
org.hbbtv_APPSIG0010	Autostart app with micro version greater than supported (v2)
org.hbbtv_APPSIG0020	Autostart app with micro version greater than supported (v1.5)
org.hbbtv_APPSIG0030	Autostart app with micro version greater than supported (v1)
org.hbbtv_APPSIG0040	Autostart app with minor version greater than supported (v2)
org.hbbtv_APPSIG0050	Autostart app with minor version greater than supported (v1.5)
org.hbbtv_APPSIG0060	Autostart app with minor version greater than supported (v1)
org.hbbtv_APPSIG0070	Autostart app with major version greater than supported
org.hbbtv_APPSIG0080	apps requiring A/V content download feature
org.hbbtv_APPSIG0090	apps requiring PVR feature
org.hbbtv_APPSIG0100	Non-supported application types are ignored
org.hbbtv_APPSIG0110	AIT application priority between application types
org.hbbtv_APPSIG0120	MHP application type is ignored when not supported
org.hbbtv_APPSIG0130	HbbTV v1 apps shall be supported
org.hbbtv_APPSIG0140	HbbTV v1.5 apps shall be supported
org.hbbtv_APPSIG0500	Support for AITs with two sections.
org.hbbtv_APPSIG0510	Support for AITs with eight sections.

**Package: CICAM\_01 (Category 1)**

Test ID	Title
org.hbbtv_DIC00004	Invalid license, CICAM DRMRightsError
org.hbbtv_DIC00007	CICAM in the slot, scrambled video, audio and subtitle content
org.hbbtv_DIC00008	DASH scrambled content, no CICAM
org.hbbtv_DIC00012	Profiles list, CICAM in the slot
org.hbbtv_DIC00016	isObjectSupported("application/oipfDrmAgent"), CICAM in the slot

org.hbbtv_DIC00018	hasCapability("+DRM"), CICAM in the slot
org.hbbtv_DIC00019	Content downloaded from broadcast, CICAM in the slot
org.hbbtv_DIC00035	DASH HEVC HD 8bit and audio, CICAM
org.hbbtv_DIC00036	DASH HEVC UHD and audio, CICAM.
org.hbbtv_DIC00037	CICAM with multiple DRM systems
org.hbbtv_DIC00038	DRM in CAM, joining live stream
org.hbbtv_DIC00039	DRM in CAM, DRM metadata in 'pssh' box
org.hbbtv_DIC00040	DRM in CAM, DRM metadata in ContentProtection element of MPD
org.hbbtv_DIC00044	DASH HEVC HD 10bit and audio, CICAM
org.hbbtv_APPFROMCAM010	Priority between CICAM Broadcast App High and Broadcast App Low
org.hbbtv_APPFROMCAM020	Priority between CICAM Broadcast App Low and Broadcast App High
org.hbbtv_APPFROMCAM050	Fallback to Broadcast App when CICAM Aux File System not available
org.hbbtv_APPFROMCAM100	Fallback to Broadcast App when CICAM Broadcast App Initial Object not available
org.hbbtv_APPFROMCAM121	Fallback to CICAM Broadcast App when error accessing the initial page of the broadcast application
org.hbbtv_CAMAUXFS051	Long Path when accessing the CI Aux File System

**Package: CICAM\_02**

Test ID	Title
org.hbbtv_DIC00011	Profiles list, no CICAM in the slot
org.hbbtv_DIC00013	Profiles list, CICAM removed from the slot.
org.hbbtv_DIC00014	Profiles list, 2 CICAM s in 2 slots
org.hbbtv_DIC00015	Profiles list, replaced CICAM
org.hbbtv_APPFROMCAM030	Priority between CICAM Broadcast App High and Broadband App Low
org.hbbtv_APPFROMCAM040	Priority between CICAM Broadcast App Low and Broadband App High
org.hbbtv_APPFROMCAM110	Fallback to CICAM Broadcast App when Broadband application is not available
org.hbbtv_APPFROMCAM120	Fallback to CICAM Broadcast App when error accessing the initial page of the broadband application
org.hbbtv_APPFROMCAM160	CICAM Broadcast Application persistence to user initiated channel change
org.hbbtv_APPFROMCAM170	CICAM Broadcast Application persistence to CAM initiated channel change
org.hbbtv_APPFROMCAM200	AIT update: Replacement of a CICAM App by a Broadcast App
org.hbbtv_APPFROMCAM201	AIT update: Replacement of a Broadcast App by a CICAM App
org.hbbtv_APPFROMCAM202	AIT update: Persistence of a CICAM App

**Package: CICAM\_03**

Test ID	Title
org.hbbtv_DIC00001	Clear content, CICAM
org.hbbtv_DIC00005	Scrambled video content, CICAM card
org.hbbtv_DIC00006	CICAM card in the slot, scrambled video and audio content
org.hbbtv_DIC00017	Http Header (+DRM), CICAM in the slot
org.hbbtv_DIC00020	DASH scrambled content, CICAM present, playback using 'video' HTML5 element
org.hbbtv_DIC00021	DRMRightsError, playback using 'video' HTML5 element
org.hbbtv_DIC00022	Switch adaptation set encrypted-clear, crypted VIDEO
org.hbbtv_DIC00023	adaptation set encrypted-clear, crypted VIDEO + AUDIO
org.hbbtv_DIC00024	Switch adaptation set clear - encrypted, crypted VIDEO
org.hbbtv_DIC00025	Switch adaptation set clear - encrypted, crypted VIDEO + AUDIO
org.hbbtv_DIC00028	Period encrypted- period clear, crypted VIDEO only
org.hbbtv_DIC00029	Period encrypted- period clear, crypted VIDEO and AUDIO

org.hbbtv_DIC00030	Switch between 2 encrypted audio adaptation sets
org.hbbtv_DIC00031	Audio description, crypted audio
org.hbbtv_DIC00032	Audio description, clear audio
org.hbbtv_DIC00033	DASH HEVC HD 8bit, CICAM
org.hbbtv_DIC00034	Content with HEVC UHD codec shall be displayed correctly, crypted video
org.hbbtv_DIC00041	DRM in CAM, DASH inband events in encrypted video representation
org.hbbtv_DIC00042	DRM in CAM, DASH inband events in encrypted audio representation
org.hbbtv_DIC00043	HTML5, DRM in CAM, seeking and scrambled inband events in 'emsg' box
org.hbbtv_CAMAUXFS010	CI Resource opening
org.hbbtv_CAMAUXFS020	CI Aux File System offering
org.hbbtv_CAMAUXFS030	CI resource closing and reopening
org.hbbtv_CAMAUXFS040	Unsupported CI Aux File System offering
org.hbbtv_CAMAUXFS050	Access to CI Aux File System from application with HbbTV domain identifier
org.hbbtv_CAMAUXFS150	XMLHttpRequest with HbbTV domain identifier when accessing the CI Aux File System
org.hbbtv_CAMAUXFS160	Access to CI Aux File System from Broadcast Application
org.hbbtv_CAMAUXFS170	Access to CI Aux File System from Broadband Application

**Package: FSA\_01 (Category 1)**

Test ID	Title
org.hbbtv_FSA0001	Persistence across channel change
org.hbbtv_FSA0002	Persistence across power cycle
org.hbbtv_FSA0003	Groups shared across multiple services
org.hbbtv_FSA0004	Groups shared across multiple transport streams
org.hbbtv_FSA0010	Version update, group reacquisition
org.hbbtv_FSA0013	Multiple group descriptors
org.hbbtv_FSA0014	Multiple groups, one descriptor
org.hbbtv_FSA0016	Group location
org.hbbtv_FSA0024	File count with multiple groups
org.hbbtv_FSA0032	Group priority deletion -HDD
org.hbbtv_FSA0035	Factory reset deletion
org.hbbtv_FSA0038	Scope of file groups

**Package: FSA\_02**

Test ID	Title
org.hbbtv_FSA0005	Minimum storage
org.hbbtv_FSA0006	Application profile
org.hbbtv_FSA0009	Version update, group deletion
org.hbbtv_FSA0017	Group location default
org.hbbtv_FSA0023	File count
org.hbbtv_FSA0026	Descriptor and manifest version mismatch
org.hbbtv_FSA0027	Descriptor and manifest version mismatch timeout
org.hbbtv_FSA0028	Descriptor and manifest version mismatch recovery on version update
org.hbbtv_FSA0029	Descriptor and manifest version mismatch recovery on carousel remount
org.hbbtv_FSA0031	Use from carousel
org.hbbtv_FSA0033	Empty manifest deletion
org.hbbtv_FSA0034	Empty manifest deletion
org.hbbtv_FSA0036	Specification version
org.hbbtv_FSA0037	Minimum storage capabilities

**Package: FSA\_03**

Test ID	Title
org.hbbtv_FSA0007	DSM-CC Module Structure
org.hbbtv_FSA0008	DSM-CC File Order Independence
org.hbbtv_FSA0011	Version update, files added to group
org.hbbtv_FSA0012	Version update, partial group update
org.hbbtv_FSA0015	Use from carousel
org.hbbtv_FSA0018	Malformed manifest
org.hbbtv_FSA0019	Manifest version inconsistent
org.hbbtv_FSA0020	Manifest size inconsistent
org.hbbtv_FSA0021	Invalid file location source
org.hbbtv_FSA0022	Invalid file location directory reference
org.hbbtv_FSA0025	Undefined manifest fields
org.hbbtv_FSA0030	Manifest self reference
org.hbbtv_FSA0039	Group priority deletion +HDD

**Package: APP2APP\_01 (Category 1)**

Test ID	Title
org.hbbtv_APP2APP0070	App2App - Pairing clients with maximum app end-point
org.hbbtv_APP2APP0071	App2App - Don't pairing clients with different maximum app end-points
org.hbbtv_APP2APP0130	App2App - Max concurrent connections
org.hbbtv_APP2APP0170	App2App - Ignore origin header
org.hbbtv_APP2APP0220	App2App - Waiting connection
org.hbbtv_APP2APP0315	App2App - Discard data frames of local client in waiting state
org.hbbtv_APP2APP0360	App2App - Unfragmented data frame with maximum size.
org.hbbtv_APP2APP0370	App2App - Fragmented data frames with maximum size.
org.hbbtv_APP2APP0372	App2App - Single Pairing - 10 large messages in 10 sec to remote end-point
org.hbbtv_APP2APP0376	App2App - 10 pairings - 5 large messages per pairing in 10 sec to remote end-point
org.hbbtv_APP2APP0377	App2App - 10 pairings - 25 small messages per pairing in 10 sec to local end-point
org.hbbtv_APP2APP0386	App2App - Application disconnects paired connection: Application stopped by terminal
org.hbbtv_APP2APP0395	App2App - Initiating disconnection of clients (disconnect)

**Package: APP2APP\_02**

Test ID	Title
org.hbbtv_APP2APP0010	App2App - HbbTV app connects to local end-point
org.hbbtv_APP2APP0020	App2App - CS app connects to a remote end-point
org.hbbtv_APP2APP0180	App2App - Rejecting requests with Sec-WebSocketExtensions
org.hbbtv_APP2APP0316	App2App - Discard data frames of remote client in waiting state
org.hbbtv_APP2APP0365	App2App - maximum message size from local client.
org.hbbtv_APP2APP0371	App2App - Single Pairing - 10 large messages in 10 sec sent to local end-point
org.hbbtv_APP2APP0373	App2App - Single Pairing - 200 small messages in 10sec to local end-point
org.hbbtv_APP2APP0374	App2App - Single Pairing - 200 small messages in 10sec to remote end-point
org.hbbtv_APP2APP0375	App2App - 10 pairings - 5 large messages per pairing in 10 sec to local end-point
org.hbbtv_APP2APP0378	App2App - 10 pairings - 25 small messages per pairing in 10 sec to remote end-point
org.hbbtv_APP2APP0380	App2App - Answering client's ping request
org.hbbtv_APP2APP0385	App2App - Application disconnects paired connection
org.hbbtv_APP2APP0390	App2App - Initiating disconnection of clients (sending a close frame)

**Package: DISCOVERY\_01 (Category 1)**

Test ID	Title
org.hbbtv_DISCOVERY0010	Discovery - MSearch response
org.hbbtv_DISCOVERY0020	Discovery - Device description response (1)
org.hbbtv_DISCOVERY0030	Discovery - Device description response (2)
org.hbbtv_DISCOVERY0040	Discovery - Device description response (3)
org.hbbtv_DISCOVERY0080	Discovery - Cross Origin request

**Package: RLNCH\_01 (Category 1)**

Test ID	Title
org.hbbtv_RLNCH0040	REMOTE LAUNCH: successful launching HbbTV app with user approval
org.hbbtv_RLNCH0041	REMOTE LAUNCH: successful launching HbbTV app with pre-approval
org.hbbtv_RLNCH0050	REMOTE LAUNCH: App not found - user approval
org.hbbtv_RLNCH0051	REMOTE LAUNCH: App not found - pre-approval
org.hbbtv_RLNCH0060	REMOTE LAUNCH: Response Code SERVICE_UNAVAILABLE
org.hbbtv_RLNCH0070	REMOTE LAUNCH: Launch denied by user
org.hbbtv_RLNCH0071	REMOTE LAUNCH: Launch denied by terminal
org.hbbtv_RLNCH0090	REMOTE LAUNCH: URL check fails - user re-approval
org.hbbtv_RLNCH0091	REMOTE LAUNCH: URL check fails - request denied
org.hbbtv_RLNCH0120	REMOTE LAUNCH: Options method
org.hbbtv_RLNCH0130	REMOTE LAUNCH: Cross-origin-response - user approved
org.hbbtv_RLNCH0131	REMOTE LAUNCH: Cross-origin-response - pre-approved

**Package: Privacy\_1 (Category 1)**

Test ID	Title
org.hbbtv_PRIV0001	Do Not Track factory default behaviour
org.hbbtv_PRIV0002	Do Not Track factory default behaviour
org.hbbtv_PRIV0004	Do Not Track HTTP header
org.hbbtv_PRIV0005	Do Not Track - unset
org.hbbtv_PRIV0006	Do Not Track - no tracking
org.hbbtv_PRIV0007	Do Not Track - tracking allowed
org.hbbtv_PRIV0008	Third party cookies
org.hbbtv_PRIV0009	Blocking tracking websites
org.hbbtv_PRIV0011	Third party cookies

**Package: Errata\_1 (Category 1)**

Test ID	Title
org.hbbtv_V15E20010	descriptorTagExtension
org.hbbtv_V15E20020	channel.nid
org.hbbtv_V15E20030	change of app transport protocol from broadband to broadcast
org.hbbtv_V15E20040	change of app transport protocol from broadcast to broadband
org.hbbtv_V15E20090	PlaySpeedChanged

**Package: APPLAUNCH\_01 (Category 1)**

Test ID	Title
org.hbbtv_BR_APPLAUNCH0010	Broadcast-related application launching another from same service - URL with triplet
org.hbbtv_BR_APPLAUNCH0020	Broadcast-related application launching another from same service - URL with current.ait
org.hbbtv_BR_APPLAUNCH0030	Broadcast-related application launching another from different service - failure by DOM0 event
org.hbbtv_BR_APPLAUNCH0035	Broadcast-related application launching another from different service - failure by DOM2 event
org.hbbtv_BR_APPLAUNCH0040	Broadcast-related application changing channel and then launching - DVB triplet
org.hbbtv_BR_APPLAUNCH0050	Broadcast-related application changing channel and then launching - current.ait
org.hbbtv_BR_APPLAUNCH0060	Broadcast-independent application becomes broadcast-related and then launches app on current service - DVB triplet
org.hbbtv_BR_APPLAUNCH0070	Broadcast-independent application becomes broadcast-related and then launches app on current service - current.ait
org.hbbtv_BR_APPLAUNCH0080	Broadcast-independent application becomes broadcast-related , changes channel and then launches app on current service - DVB triplet
org.hbbtv_BR_APPLAUNCH0090	Broadcast-independent application becomes broadcast-related, changes channel and then launches app on current service - current.ait
org.hbbtv_BR_APPLAUNCH0100	Broadcast-related application becomes broadcast-independent , back to broadcast-related on a different channel and then launches app on current service - DVB triplet

Test ID	Title
org.hbbtv_BR_APPLAUNCH0110	Broadcast-related application becomes broadcast-independent , back to broadcast-related on a different channel and then launches app on current service - current.ait

**Package: TLS\_01 (Category 1)**

Test ID	Title
org.hbbtv_TLS0010	TLS handshake - version 1.0 or greater indicated - HbbTV 1.2.1
org.hbbtv_TLS0020	TLS handshake - renegotiation indication extension indicated
org.hbbtv_TLS0030	TLS handshake - required cipher suites present - HbbTV 1.2.1
org.hbbtv_TLS0040	TLS handshake - forbidden cipher suites not present - HbbTV 1.2.1
org.hbbtv_TLS0100	TLS server authentication success - TLS 1.x server, valid cert, CA in trust list, SHA-1, exact match on subjectAltName - HbbTV 1.2.1
org.hbbtv_TLS0110	TLS server authentication success - TLS 1.x server, valid cert, CA in trust list, SHA-256, exact match on subjectAltName, no match on CN - HbbTV 1.2.1
org.hbbtv_TLS0120	TLS server authentication success - valid cert, CA in trust list, wildcard match on subjectAltName
org.hbbtv_TLS0130	TLS server authentication success - valid cert, CA in trust list, IP address match on subjectAltName
org.hbbtv_TLS0140	TLS server authentication success - all testable trusted roots - HbbTV 1.2.1
org.hbbtv_TLS0200	TLS server authentication failure - host name mismatch
org.hbbtv_TLS0201	TLS server authentication failure - IP address mismatch
org.hbbtv_TLS0210	TLS server authentication failure - server certificate expired
org.hbbtv_TLS0220	TLS server authentication failure - server cert signature invalid (hash mismatch)
org.hbbtv_TLS0230	TLS server authentication failure - server cert signature invalid (signature error)
org.hbbtv_TLS0240	TLS server authentication failure - intermediate cert signature invalid (hash mismatch)
org.hbbtv_TLS0250	TLS server authentication failure - intermediate cert signature invalid (signature error)
org.hbbtv_TLS0260	TLS server authentication failure - intermediate cert is not a CA
org.hbbtv_TLS0270	TLS server authentication failure - server certificate is self signed
org.hbbtv_TLS0290	TLS server authentication failure - root certificate formerly in trust list but has 1024-bit key
org.hbbtv_TLS0400	TLS handshake integrity failure - handshake message from server modified
org.hbbtv_TLS1010	TLS handshake - version 1.2 or greater indicated
org.hbbtv_TLS1030	TLS handshake - required cipher suites present

org.hbbtv_TLS1040	TLS handshake - forbidden cipher suites not present
org.hbbtv_TLS1050	TLS handshake - server name indication present and containing correct host name
org.hbbtv_TLS1060	TLS handshake - supported elliptic curves extension present and listing required curves
org.hbbtv_TLS1070	TLS handshake - supported signature algorithms present and listing required algorithms but no forbidden algorithms - tested before 31/12/2016
org.hbbtv_TLS1071	TLS handshake - supported signature algorithms present and listing required algorithms but no forbidden algorithms - tested after 31/12/2016
org.hbbtv_TLS1080	TLS handshake - no compression methods offered
org.hbbtv_TLS1100	TLS server authentication success - TLS 1.2 server, valid cert, CA in trust list, SHA-1, exact match on subjectAltName - tested before 31/12/2016
org.hbbtv_TLS1110	TLS server authentication success - TLS 1.2 server, valid cert, CA in trust list, SHA-256, exact match on subjectAltName, no match on CN
org.hbbtv_TLS1140	TLS server authentication success - all testable trusted roots
org.hbbtv_TLS1300	TLS server authentication failure - TLS 1.2 server, valid cert, CA in trust list, SHA-1, exact match on subjectAltName - tested after 31/12/2016

**Package: Small Incremental Improvements (Category 1)**

Test ID	Title
org.hbbtv_SMALL_INC0010	majorChannel property
org.hbbtv_SMALL_INC0020	terminalChannel property
org.hbbtv_SMALL_INC0030	DVB-SI descriptors with private data specifier
org.hbbtv_SMALL_INC0035	DVB-SI descriptors with incorrect private data specifier
org.hbbtv_SMALL_INC0100	parental rating for b-i apps - granted
org.hbbtv_SMALL_INC0110	parental rating for b-i apps - denied
org.hbbtv_SMALL_INC0120	parental rating for autostart b-r apps - granted
org.hbbtv_SMALL_INC0130	parental rating for present b-r apps - granted
org.hbbtv_SMALL_INC0140	parental rating for autostart b-r apps - refused
org.hbbtv_SMALL_INC0150	parental rating for present b-r apps - refused
org.hbbtv_SMALL_INC0160	parental rating for b-r apps - changes ignored

**Package: SUBTITLES\_01 (Category 1)**

Test ID	Title
org.hbbtv_SUB0024	EBUTTD: in-band within live DASH stream
org.hbbtv_SUB0026	EBUTTD: Compressed DASH delivery
org.hbbtv_SUB0028	EBUTTD: DASH delivery - timing not aligned with samples 1
org.hbbtv_SUB0029	EBUTTD: DASH delivery - timing not aligned with samples 2
org.hbbtv_SUB0350	EBUTTD: MPD SupplementalProperty
org.hbbtv_SUB0370	EBUTTD: MPD SupplementalProperty download failure
org.hbbtv_SUB0010	EBUTTD: 8 concurrent regions
org.hbbtv_SUB0020	EBUTTD: UTF-8 encoding
org.hbbtv_SUB0080	EBUTTD: out-of-band with A/V content over progressive ISOBMFF
org.hbbtv_SUB0110	EBUTTD: out-of-band with non-live DASH.

org.hbbtv_SUB0120	EBUTTD: single document with 512 kByte.
org.hbbtv_SUB0130	EBUTTD: Select out-of-band ST with HTML5
org.hbbtv_SUB0140	EBUTTD: Unselect out-of-band ST with HTML5
org.hbbtv_SUB0150	EBUTTD: Select in-band DASH ST with HTML5
org.hbbtv_SUB0160	EBUTTD: Unselect in-band DASH ST with HTML5
org.hbbtv_SUB0190	EBUTTD: Select out-of-band ST with AV Control object
org.hbbtv_SUB0210	EBUTTD: Select inband DASH ST with AV Control object
org.hbbtv_SUB0220	EBUTTD: Unselect inband DASH ST with AV Control object
org.hbbtv_SUB0280	EBUTTD: Font matching "default"
org.hbbtv_SUB0290	EBUTTD: Font matching "sansSerif"
org.hbbtv_SUB0390	EBUTTD: CASD download font
org.hbbtv_SUB0420	EBUTTD: CASD download failure for non-essential font
org.hbbtv_SUB0600	EBUTTD: DASH with single subtitle segment
org.hbbtv_SUB0610	EBUTTD: DASH with larger subtitle segments
org.hbbtv_SUB0620	EBUTTD: Enable subtitles via UI for DASH stream presented by HTML5 media object
org.hbbtv_SUB0630	EBUTTD: Enable subtitles via UI for ISOBMFF stream presented by AV Control object
org.hbbtv_SUB1001	tt:br in tt:p
org.hbbtv_SUB1002	Multiple Div
org.hbbtv_SUB1004	tt:br in tt:span
org.hbbtv_SUB1005	cellResolution and fontSize
org.hbbtv_SUB1006	tts:backgroundColor applied to a tt:span
org.hbbtv_SUB1007	tts:color using a RGB color triple
org.hbbtv_SUB1008	Styling Test - Color - 003
org.hbbtv_SUB1009	Styling Test - Color - 008
org.hbbtv_SUB1014	tts:displayAlign set to "before"
org.hbbtv_SUB1015	tts:displayAlign set to "after"
org.hbbtv_SUB1016	tts:displayAlign set to "center"
org.hbbtv_SUB1017	tts:extent
org.hbbtv_SUB1019	tts:fontStyle with the value "italic"
org.hbbtv_SUB1021	tts:fontWeight with the value "bold"
org.hbbtv_SUB1022	tts:origin
org.hbbtv_SUB1026	tts:padding with four values
org.hbbtv_SUB1029	Style Inheritance
org.hbbtv_SUB1030	tts:textAlign set to right
org.hbbtv_SUB1032	tts:textAlign set to center
org.hbbtv_SUB1033	tts:textAlign set to start
org.hbbtv_SUB1034	tts:textAlign set to end
org.hbbtv_SUB1037	tts:wrapOption set to noWrap
org.hbbtv_SUB1041	tts:writingMode set to tblr
org.hbbtv_SUB1045	begin and end attribute on a tt:p
org.hbbtv_SUB1046	begin and end attribute on a tt:span
org.hbbtv_SUB1047	Initial value Test - cellResolution
org.hbbtv_SUB1050	Initial value Test - fontSize
org.hbbtv_SUB1051	Initial value Test - lineHeight
org.hbbtv_SUB1057	Initial value Test - wrapOption
org.hbbtv_SUB1058	Initial value Test - displayAlign
org.hbbtv_SUB1071	Test textAlign center, multiRowAlign start
org.hbbtv_SUB1072	Test textAlign center, multiRowAlign end
org.hbbtv_SUB1078	Test linePadding and cellResolution
org.hbbtv_SUB2017	Subtitle timing is synchronised relative to correct syncbase

Test ID	Title
org.hbbtv_DASH-SUB0002	DASH - downloadable font - missing mandatory attribute (fontFamily) - essential
org.hbbtv_DASH-SUB0003	DASH - downloadable font - missing mandatory attribute (fontFamily) - not essential
org.hbbtv_DASH-SUB0004	DASH - downloadable font - missing mandatory attribute (mimeType) - essential
org.hbbtv_DASH-SUB0005	DASH - downloadable font - missing mandatory attribute (mimeType) - not essential
org.hbbtv_SUB0027	EBUTTD: DASH delivery - max segment size
org.hbbtv_SUB0340	EBUTTD: MPD EssentialProperty
org.hbbtv_SUB0360	EBUTTD: MPD EssentialProperty failure
org.hbbtv_SUB0375	EBUTTD: MPD SupplementalProperty font failure
org.hbbtv_SUB0380	EBUTTD: font referenced relatively to BaseURL in DASH
org.hbbtv_SUB0385	EBUTTD: font referenced absolutely in DASH
org.hbbtv_SUB0040	EBUTTD: HTTP Download content, embedded in ISOBMFF
org.hbbtv_SUB0050	EBUTTD: FDP (PUSHVOD) DOWNLOAD content, embedded in ISOBMFF
org.hbbtv_SUB0060	EBUTTD: XML capabilities
org.hbbtv_SUB0070	EBUTTD: out-of-band with A/V content over progressive TS
org.hbbtv_SUB0100	EBUTTD: out-of-band with progressive audio-only ISOBMFF content.
org.hbbtv_SUB0200	EBUTTD: Unselect out-of-band ST with AV Control object
org.hbbtv_SUB0250	EBUTTD: Downloadable Font Support ISO/IEC 14496-22
org.hbbtv_SUB0260	EBUTTD: Downloadable Font Support WOFF
org.hbbtv_SUB0300	EBUTTD: Font matching "proportionalSansSerif"
org.hbbtv_SUB0310	EBUTTD: Font matching "monospace"
org.hbbtv_SUB0320	EBUTTD: Font matching "monospaceSansSerif"
org.hbbtv_SUB0400	EBUTTD: CADD download font
org.hbbtv_SUB0410	EBUTTD: CASD download failure for essential font
org.hbbtv_SUB0500	EBUTTD: AVObj - name attribute is subtitles
org.hbbtv_SUB0510	EBUTTD: AVObj - name attribute is captions
org.hbbtv_SUB0530	EBUTTD: AVObj - AVSubtitleComponent srlang property
org.hbbtv_SUB1010	tts:unicodeBidi with "bidiOverride" and tts:direction with "ltr" applied to a tt:span.
org.hbbtv_SUB1011	tts:unicodeBidi with "bidiOverride" and tts:direction with "rtl" applied to a tt:span.
org.hbbtv_SUB1012	tts:unicodeBidi with "embed" and tts:direction with "ltr" applied to a tt:span.
org.hbbtv_SUB1013	tts:unicodeBidi with "embed" and tts:direction with "rtl" applied to a tt:span.
org.hbbtv_SUB1018	tts:fontStyle with the value "normal"
org.hbbtv_SUB1020	tts:fontWeight with the value "normal"
org.hbbtv_SUB1023	tts:padding with one value
org.hbbtv_SUB1024	tts:padding with two values
org.hbbtv_SUB1025	tts:padding with three values
org.hbbtv_SUB1028	tts:showBackground with the value whenActive
org.hbbtv_SUB1031	tts:textAlign set to left
org.hbbtv_SUB1038	tts:writingMode set to lrtb
org.hbbtv_SUB1039	tts:writingMode set to rtlb
org.hbbtv_SUB1048	Initial value Test - direction
org.hbbtv_SUB1049	Initial value test - tts:fontFamily

**Package: SUBTITLES\_03**

Test ID	Title
org.hbbtv_DASH-SUB0001	DASH - downloadable font - choice of format by mime type
org.hbbtv_SUB0025	EBUTTD: Uncompressed DASH delivery
org.hbbtv_SUB0031	EBUTTD: DASH delivery - timing exactly aligned with samples
org.hbbtv_SUB0090	EBUTTD: out-of-band with progressive audio-only MPEG1L3.
org.hbbtv_SUB0105	EBUTTD: out-of-band with progressive audio-only TS content.

org.hbbtv_SUB0270	EBUTTD: Downloadable Fonts have preference
org.hbbtv_SUB0520	EBUTTD: AVObj - AVSubtitleComponent encoding property
org.hbbtv_SUB0560	EBUTTD: AVObj - AVSubtitleComponent label property
org.hbbtv_SUB1035	tts:textDecoration with the value "none"
org.hbbtv_SUB1040	tts:writingMode set to tbrl

**Package: DASH\_01 (Category 1)**

Test ID	Title
org.hbbtv_DASH-ERRORHANDLE0013	DASH Error Handling - missing segments [HTTP 410; dynamic MPD; timing present; request no longer valid]
org.hbbtv_DASH-ERRORHANDLE0018	DASH Error Handling - missing segments [HTTP 416; dynamic MPD; request still valid]
org.hbbtv_DASH-ERRORHANDLE0100	DASH Error Handling - heavy server load [dynamic MPD; HTTP 500]
org.hbbtv_DASH-ERRORHANDLE0110	DASH Error Handling - heavy server load [dynamic MPD; HTTP 503]
org.hbbtv_DASH-ERRORHANDLE0120	DASH Error Handling - heavy server load [dynamic MPD; HTTP 504]
org.hbbtv_DASH-ERRORREP0001	DASH Errors - becoming a reporting client when probability=1000
org.hbbtv_DASH-ERRORREP0002	DASH Errors - becoming a reporting client with probability=700
org.hbbtv_DASH-ERRORREP0003	DASH Errors - becoming a reporting client with probability=1
org.hbbtv_DASH-ERRORREP0006	DASH Errors - reporting an unreachable host
org.hbbtv_DASH-ERRORREP0012	DASH Errors - reporting HTTP error codes - 404 Not Found
org.hbbtv_DASH-ERRORREP0022	DASH Errors - ceasing being a reporting client after errors - unable to reach reporting server
org.hbbtv_DASH-EVENT0040	DASH - Events - Do not download Representations solely to access InbandEventStream
org.hbbtv_DASH-EVENT0050	DASH - Events - Do not create TextTrack for MPEG DASH-specific InbandEventStreams
org.hbbtv_DASH-EVENT0150	DASH - Events - Mapping of MPD EventStreams to TextTrack objects
org.hbbtv_DASH-EVENT0160	DASH - Events - Mapping of InbandEventStreams to TextTrack objects
org.hbbtv_DASH-EVENT0180	DASH - Events - Raise cuechange event for any DataCue with duration of at least 250ms
org.hbbtv_DASH-EVENT0210	DASH - Events - TextTrack cues contents for InbandEventStreams
org.hbbtv_DASH-EVENT0280	DASH - Events - Signalling cuechange events

org.hbbtv_DASH-SE0031	DASH - avc3 sample entry in ISO BMFF segments (parameter set changes in samples, common init segment)
org.hbbtv_DASH-ISOBMFF0010	DASH stream scenarios - negative composition time offsets
org.hbbtv_DASH-ISOBMFF0020	DASH stream scenarios - version 1 tfdt boxes
org.hbbtv_DASH-ISOBMFF0030	DASH stream scenarios - no styp or sidx with live profile
org.hbbtv_DASH-ISOBMFF0060	DASH stream scenarios - styp and sidx with live profile
org.hbbtv_DASH-VRESHD024D	Scaling video down, MPEG DASH, HTML5 media object, 1024x576p@50, AVC_25
org.hbbtv_DASH-VRESHD029	MPEG DASH, HTML5 media object, 704x396p@50, AVC_25
org.hbbtv_DASH-VRESHD031U	Scaling video up, MPEG DASH, HTML5 media object, 512x288p@50, AVC_25
org.hbbtv_DASH-VRESHD1001	MPEG DASH, 1920x1080p@25, AVC_25
org.hbbtv_DASH-VRESHD1016	MPEG DASH, 1920x1080i@25, AVC_25
org.hbbtv_DASH-TIMELINE0010	DASH on demand stream using live profile and segment template with fixed segment duration - seek works
org.hbbtv_DASH-TIMELINE0050	DASH on demand stream using live profile, segment template and segment timeline with short first and last segments - seek works
org.hbbtv_DASH-TIMELINE0140	DASH live stream using live profile and segment template with different segment duration between audio and video and with AvailabilityStartTime more than 20 years ago - seek works

**Package: DASH\_02 (Category 1)**

Test ID	Title
org.hbbtv_DASH-ERRORHANDLE0027	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 414]
org.hbbtv_DASH-ERRORHANDLE0035	DASH Error Handling - authentication errors [static MPD; HTTP 403]
org.hbbtv_DASH-ERRORHANDLE0044	DASH Error Handling - changing BaseURL [blacklisting matching priorities and serviceLocations; single result]
org.hbbtv_DASH-ERRORHANDLE0050	DASH Error Handling - blacklist retained after MPD reload
org.hbbtv_DASH-ERRORHANDLE0130	DASH Error Handling - configuration errors [dynamic MPD; HTTP 502]
org.hbbtv_DASH-ERRORHANDLE0350	DASH Error Handling - changing BaseURL [blacklisting matching serviceLocations and priorities; empty result; HTML5 Video]
org.hbbtv_DASH-ERRORREP0009	DASH Errors - reporting a change of Base URL after an error
org.hbbtv_DASH-ERRORREP0017	DASH Errors - reporting HTTP error codes - 503 Service Unavailable

org.hbbtv_DASH-ERRORREP0018	DASH Errors - reporting HTTP error codes - 504 Gateway Timeout
org.hbbtv_DASH-ERRORREP0021	DASH Errors - ceasing being a reporting client after errors - incorrect HTTP status code from reporting server
org.hbbtv_DASH-ERRORREP0023	DASH Errors - using an HTTPS reporting server - reporting to a working TLS server
org.hbbtv_DASH-ERRORREP0030	DASH Errors - player maintains status as a reporting player with dynamic MPD after refresh period
org.hbbtv_DASH-EVENT0170	DASH - Events - Constrain minimum duration of DataCue
org.hbbtv_DASH-EVENT0240	DASH - Events - Detecting and handling repeated events
org.hbbtv_DASH-EVENT0260	DASH - Events - Minimum concurrent events handled per event stream
org.hbbtv_DASH-SE0004	DASH - hev1 sample entry in ISO BMFF segments (static parameter sets in samples)
org.hbbtv_DASH-SE0005	DASH - hev1 sample entry in ISO BMFF segments (parameter sets in sample entry)
org.hbbtv_DASH-SE0006	DASH - hev1 sample entry in ISO BMFF segments (parameter set changes in samples)
org.hbbtv_DASH-VRESHD225D	Scaling video down, MPEG DASH, HTML5 media object, 960x540p@50, HEVC, 10bit
org.hbbtv_DASH-VRESHD229U	Scaling video up, MPEG DASH, HTML5 media object, 704x396p@50, HEVC, 10bit
org.hbbtv_DASH-VRESHD1240	MPEG DASH, HTML5 media object, 3840x2160p@50, HEVC, 10bit
org.hbbtv_DASH-VRESHD1241	MPEG DASH, HTML5 media object, 1920x1080p@50, HEVC, 10bit
org.hbbtv_DASH-XLINK0005	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0012	Test for DASH MPD using xlink
org.hbbtv_DASH-TIMELINE0020	DASH on demand stream using live profile and segment template with fixed segment duration - terminal does not request non-existent segments at end of stream
org.hbbtv_DASH-TIMELINE0070	DASH on demand stream using live profile, segment template and segment timeline with short first and last segments - terminal reports correct play position
org.hbbtv_DASH-TIMELINE0080	DASH on demand stream using live profile and segment template with fixed segment duration - terminal plays with correct A/V sync when the audio timeline starts slightly later
org.hbbtv_DASH-TIMELINE0130	DASH live stream using live profile and segment template with different segment duration between audio and video and with AvailabilityStartTime more than 20 years ago - stream plays
org.hbbtv_DASH-TIMELINE0160	DASH on demand stream using live profile and segment template with same presentationTimeOffset on both components - stream plays
org.hbbtv_DASH-ONDEMAND001	Test for DASH On Demand Profile

Package: DASH\_03

Test ID	Title
org.hbbtv_DASH-ERRORHANDLE0001	DASH Error Handling - heavy server load [static MPD; failed DNS resolution]
org.hbbtv_DASH-ERRORHANDLE0002	DASH Error Handling - heavy server load [static MPD; host unreachable]
org.hbbtv_DASH-ERRORHANDLE0003	DASH Error Handling - heavy server load [static MPD; connection refused]
org.hbbtv_DASH-ERRORHANDLE0005	DASH Error Handling - heavy server load [static MPD; HTTP 503]
org.hbbtv_DASH-ERRORHANDLE0006	DASH Error Handling - heavy server load [static MPD; HTTP 504]
org.hbbtv_DASH-ERRORHANDLE0070	DASH Error Handling - heavy server load [dynamic MPD; failed DNS resolution]
org.hbbtv_DASH-ERRORHANDLE0080	DASH Error Handling - heavy server load [dynamic MPD; host unreachable]
org.hbbtv_DASH-ERRORHANDLE0090	DASH Error Handling - heavy server load [dynamic MPD; connection refused]
org.hbbtv_DASH-ERRORREP0004	DASH Errors - not becoming a reporting client when probability attribute missing
org.hbbtv_DASH-ERRORREP0005	DASH Errors - reporting a DNS lookup failure
org.hbbtv_DASH-ERRORREP0007	DASH Errors - reporting a connection refused
org.hbbtv_DASH-ERRORREP0008	DASH Errors - reporting corrupt media
org.hbbtv_DASH-ERRORREP0010	DASH Errors - reporting HTTP error codes - 401 Unauthorized
org.hbbtv_DASH-ERRORREP0011	DASH Errors - reporting HTTP error codes - 403 Forbidden
org.hbbtv_DASH-ERRORREP0013	DASH Errors - reporting HTTP error codes - 410 Gone
org.hbbtv_DASH-ERRORREP0014	DASH Errors - reporting HTTP error codes - 500 Internal Server Error
org.hbbtv_DASH-ERRORREP0015	DASH Errors - reporting HTTP error codes - 501 Not Implemented
org.hbbtv_DASH-ERRORREP0016	DASH Errors - reporting HTTP error codes - 502 Bad Gateway
org.hbbtv_DASH-ERRORREP0019	DASH Errors - reporting unrecognised HTTP status codes - in error range - 418 I'm A Teapot
org.hbbtv_DASH-ERRORREP0020	DASH Errors - reporting unrecognised HTTP status codes - undefined range - 750 Wibble
org.hbbtv_DASH-ERRORREP0024	DASH Errors - using an HTTPS reporting server - not reporting to an untrusted server
org.hbbtv_DASH-ERRORREP0025	DASH Errors - using an HTTPS reporting server - not reporting to a server with an expired certificate

org.hbbtv_DASH-ERRORREP0026	DASH Errors - using an HTTPS reporting server - not reporting to a server whose certificate does not match the host name
org.hbbtv_DASH-ERRORREP0027	DASH Errors - downloadable fonts - unreachable server
org.hbbtv_DASH-ERRORREP0028	DASH Errors - downloadable fonts - 404 not found
org.hbbtv_DASH-ERRORREP0029	DASH Errors - downloadable fonts - invalid file format
org.hbbtv_DASH-ERRORREP0031	DASH Errors - player maintains status as a reporting player with dynamic MPD after an MPD update event message
org.hbbtv_DASH-ERRORREP0032	DASH Errors - player reports missing segments in an audio only stream

**Package: DASH\_04**

Test ID	Title
org.hbbtv_DASH-VRESHD002	MPEG DASH, 1600x900p@25, AVC_25
org.hbbtv_DASH-VRESHD006	MPEG DASH, 852x480p@25, AVC_25
org.hbbtv_DASH-VRESHD022	MPEG DASH, HTML5 media object, 1600x900p@50, AVC_25
org.hbbtv_DASH-VRESHD026	MPEG DASH, HTML5 media object, 852x480p@50, AVC_25
org.hbbtv_DASH-VRESHD032	MPEG DASH, HTML5 media object, 480x270p@50, AVC_25
org.hbbtv_DASH-VRESHD104	MPEG DASH, A/V control object, 1024x576p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD107	MPEG DASH, A/V control object, 768x432p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD110	MPEG DASH, A/V control object, 640x360p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD113	MPEG DASH, A/V control object, 384x216p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD119	MPEG DASH, A/V control object, 352x288i@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD120	MPEG DASH, A/V control object, 720x576i@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD124	MPEG DASH, HTML5 media object, 1024x576p@50, HEVC, 8bit
org.hbbtv_DASH-VRESHD127	MPEG DASH, HTML5 media object, 768x432p@50, HEVC, 8bit
org.hbbtv_DASH-VRESHD130	MPEG DASH, HTML5 media object, 640x360p@50, HEVC, 8bit
org.hbbtv_DASH-VRESHD133	MPEG DASH, HTML5 media object, 384x216p@50, HEVC, 8bit

**Package: DASH\_05**

Test ID	Title
org.hbbtv_DASH-EVENT0060	DASH - Events - Do not create TextTrack for DVB DASH-specific InbandEventStreams
org.hbbtv_DASH-EVENT0070	DASH - Events - Do not create TextTrack for MPEG DASH-specific EventStreams

org.hbbtv_DASH-EVENT0080	DASH - Events - Do not create TextTrack for DVB DASH-specific EventStreams
org.hbbtv_DASH-EVENT0090	DASH - Events - Handling InbandEventStreams with identical @schemeIdUri and @value in multiple AdaptationSets
org.hbbtv_DASH-EVENT0100	DASH - Events - Handling InbandEventStreams and EventStreams with identical @schemeIdUri and @value
org.hbbtv_DASH-EVENT0110	DASH - Events - Signalling removal of event streams from MPD
org.hbbtv_DASH-EVENT0120	DASH - Events - Signalling addition of event streams from MPD
org.hbbtv_DASH-EVENT0130	DASH - Events - Signalling removal of event streams when selecting a different representation
org.hbbtv_DASH-EVENT0140	DASH - Events - Signalling addition of event streams when selecting a different representation
org.hbbtv_DASH-EVENT0270	DASH - Events - Handling InbandEventStreams in every decoded Representation
org.hbbtv_DASH-XLINK0001	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0002	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0003	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0004	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0006	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0007	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0008	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0009	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0010	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0011	Test for DASH MPD using xlink
org.hbbtv_DASH-XLINK0013	Test for DASH MPD using xlink

**Package: DASH\_06**

Test ID	Title
org.hbbtv_DASH-ERRORHANDLE0011	DASH Error Handling - missing segments [HTTP 410; static MPD]
org.hbbtv_DASH-ERRORHANDLE0012	DASH Error Handling - missing segments [HTTP 410; dynamic MPD; no timing; request no longer valid]
org.hbbtv_DASH-ERRORHANDLE0014	DASH Error Handling - missing segments [HTTP 410; dynamic MPD; request still valid]
org.hbbtv_DASH-ERRORHANDLE0015	DASH Error Handling - missing segments [HTTP 416; static MPD]
org.hbbtv_DASH-ERRORHANDLE0016	DASH Error Handling - missing segments [HTTP 416; dynamic MPD; no timing; request no longer valid]
org.hbbtv_DASH-ERRORHANDLE0017	DASH Error Handling - missing segments [HTTP 416; dynamic MPD; timing present; request no longer valid]

org.hbbtv_DASH-ERRORHANDLE0019	DASH Error Handling - configuration errors [static MPD; HTTP 502]
org.hbbtv_DASH-ERRORHANDLE0033	DASH Error Handling - authentication errors [static MPD; HTTP 401]
org.hbbtv_DASH-ERRORHANDLE0034	DASH Error Handling - authentication errors [static MPD; HTTP 402]
org.hbbtv_DASH-ERRORHANDLE0038	DASH Error Handling - changing BaseURL [blacklisting matching serviceLocations; empty result; A/V Control]
org.hbbtv_DASH-ERRORHANDLE0039	DASH Error Handling - changing BaseURL [blacklisting matching priorities; empty result; A/V Control]
org.hbbtv_DASH-ERRORHANDLE0040	DASH Error Handling - changing BaseURL [blacklisting matching serviceLocations and priorities; empty result; A/V Control]
org.hbbtv_DASH-ERRORHANDLE0041	DASH Error Handling - changing BaseURL [blacklisting matching serviceLocations; single result]
org.hbbtv_DASH-ERRORHANDLE0042	DASH Error Handling - changing BaseURL [blacklisting matching priorities; single result]
org.hbbtv_DASH-ERRORHANDLE0270	DASH Error Handling - authentication errors [dynamic MPD; HTTP 401]
org.hbbtv_DASH-ERRORHANDLE0280	DASH Error Handling - authentication errors [dynamic MPD; HTTP 402]
org.hbbtv_DASH-ERRORHANDLE0290	DASH Error Handling - authentication errors [dynamic MPD; HTTP 403]
org.hbbtv_DASH-ERRORHANDLE0310	DASH Error Handling - missing segments [HTTP 410; dynamic MPD; no timing; request still valid]
org.hbbtv_DASH-ERRORHANDLE0320	DASH Error Handling - missing segments [HTTP 416; dynamic MPD; no timing; request still valid]
org.hbbtv_DASH-ERRORHANDLE0330	DASH Error Handling - changing BaseURL [blacklisting matching serviceLocations; empty result; HTML5 Video]
org.hbbtv_DASH-ERRORHANDLE0340	DASH Error Handling - changing BaseURL [blacklisting matching priorities; empty result; HTML5 Video]

**Package: DASH\_07**

Test ID	Title
org.hbbtv_DASH-VRESHD004D	Scaling video down, MPEG DASH, 1024x576p@25, AVC_25
org.hbbtv_DASH-VRESHD007D	Scaling video down, MPEG DASH, 768x432p@25, AVC_25
org.hbbtv_DASH-VRESHD008U	Scaling video up, MPEG DASH, 720x404p@25, AVC_25
org.hbbtv_DASH-VRESHD012U	Scaling video up, MPEG DASH, 480x270p@25, AVC_25
org.hbbtv_DASH-VRESHD017U	Scaling video up, MPEG DASH, 704x576i@25, AVC_25
org.hbbtv_DASH-VRESHD020D	Scaling video down, MPEG DASH, 720x576i@25, AVC_25
org.hbbtv_DASH-VRESHD027D	Scaling video down, MPEG DASH, HTML5 media object, 768x432p@50, AVC_25

org.hbbtv_DASH-VRESHD028U	Scaling video up, MPEG DASH, HTML5 media object, 720x404p@50, AVC_25
org.hbbtv_DASH-VRESHD030D	Scaling video down, MPEG DASH, HTML5 media object, 640x360p@50, AVC_25
org.hbbtv_DASH-VRESHD033D	Scaling video down, MPEG DASH, HTML5 media object, 384x216p@50, AVC_25
org.hbbtv_DASH-VRESHD105D	Scaling video down, A/V control object, MPEG DASH, 960x540p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD106U	Scaling video up, A/V control object, MPEG DASH, 852x480p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD108D	Scaling video down, A/V control object, MPEG DASH, 720x404p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD109U	Scaling video up, A/V control object, MPEG DASH, 704x396p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD111D	Scaling video down, A/V control object, MPEG DASH, 512x288p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD112U	Scaling video up, A/V control object, MPEG DASH, 480x270p@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD118U	Scaling video up, A/V control object, MPEG DASH, 544x576i@25, HEVC, 8bit
org.hbbtv_DASH-VRESHD125D	Scaling video down, MPEG DASH, HTML5 media object, 960x540p@50, HEVC, 8bit
org.hbbtv_DASH-VRESHD126U	Scaling video up, MPEG DASH, HTML5 media object, 852x480p@50, HEVC, 8bit
org.hbbtv_DASH-VRESHD128D	Scaling video down, MPEG DASH, HTML5 media object, 720x404p@50, HEVC, 8bit
org.hbbtv_DASH-VRESHD129U	Scaling video up, MPEG DASH, HTML5 media object, 704x396p@50, HEVC, 8bit
org.hbbtv_DASH-VRESHD131D	Scaling video down, MPEG DASH, HTML5 media object, 512x288p@50, HEVC, 8bit
org.hbbtv_DASH-VRESHD132U	Scaling video up, MPEG DASH, HTML5 media object, 480x270p@50, HEVC, 8bit

**Package: DASH\_08**

Test ID	Title
org.hbbtv_DASH-ERRORHANDLE0020	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 405]
org.hbbtv_DASH-ERRORHANDLE0021	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 406]
org.hbbtv_DASH-ERRORHANDLE0022	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 407]
org.hbbtv_DASH-ERRORHANDLE0023	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 409]

org.hbbtv_DASH-ERRORHANDLE0024	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 411]
org.hbbtv_DASH-ERRORHANDLE0025	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 412]
org.hbbtv_DASH-ERRORHANDLE0026	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 413]
org.hbbtv_DASH-ERRORHANDLE0028	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 415]
org.hbbtv_DASH-ERRORHANDLE0029	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 417]
org.hbbtv_DASH-ERRORHANDLE0030	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 408]
org.hbbtv_DASH-ERRORHANDLE0031	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 501]
org.hbbtv_DASH-ERRORHANDLE0032	DASH Error Handling - miscellaneous request errors [static MPD; HTTP 505]
org.hbbtv_DASH-ERRORHANDLE0140	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 405]
org.hbbtv_DASH-ERRORHANDLE0150	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 406]
org.hbbtv_DASH-ERRORHANDLE0160	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 407]
org.hbbtv_DASH-ERRORHANDLE0170	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 409]
org.hbbtv_DASH-ERRORHANDLE0180	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 411]
org.hbbtv_DASH-ERRORHANDLE0190	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 412]
org.hbbtv_DASH-ERRORHANDLE0200	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 413]
org.hbbtv_DASH-ERRORHANDLE0210	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 414]
org.hbbtv_DASH-ERRORHANDLE0220	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 415]
org.hbbtv_DASH-ERRORHANDLE0230	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 417]
org.hbbtv_DASH-ERRORHANDLE0240	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 408]
org.hbbtv_DASH-ERRORHANDLE0250	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 501]
org.hbbtv_DASH-ERRORHANDLE0260	DASH Error Handling - miscellaneous request errors [dynamic MPD; HTTP 505]
org.hbbtv_DASH-ISOBMFF0040	DASH stream scenarios - styp with live profile

org.hbbtv_DASH-ISOBMFF0050	DASH stream scenarios - sidx with live profile
org.hbbtv_DASH-TIMELINE0150	DASH live stream using live profile and segment template with different segment duration between audio and video and with AvailabilityStartTime more than 20 years ago - terminal reports correct play position.

**Package: Media Player (Category 1)**

Test ID	Title
org.hbbtv_MEDIAPLAYER0010	Seek while paused (not played previously) then call play
org.hbbtv_MEDIAPLAYER0020	Seek while paused (played previously) then call play
org.hbbtv_MEDIAPLAYER0030	Seek while stopped - not played previously
org.hbbtv_MEDIAPLAYER0040	Seek while stopped -played previously
org.hbbtv_MEDIAPLAYER0050	Video decoder transfer, MPEG-2 TS to ISOBMFF - different A/V control object
org.hbbtv_MEDIAPLAYER0060	Video decoder transfer, MPEG-2 TS to DASH - different A/V control object
org.hbbtv_MEDIAPLAYER0070	Video decoder transfer, ISOBMFF to MPEG-2 TS - different A/V control object
org.hbbtv_MEDIAPLAYER0080	Video decoder transfer, ISOBMFF to MPEG-DASH - different A/V control object
org.hbbtv_MEDIAPLAYER0090	Video decoder transfer, MPEG-DASH to MPEG-2 TS - different A/V control object
org.hbbtv_MEDIAPLAYER0100	Video decoder transfer, MPEG-DASH to ISOBMFF- different A/V control object
org.hbbtv_MEDIAPLAYER0110	Video decoder transfer, MPEG-2 TS to ISOBMFF - same A/V control object
org.hbbtv_MEDIAPLAYER0120	Video decoder transfer, MPEG-2 TS to DASH - same A/V control object
org.hbbtv_MEDIAPLAYER0130	Video decoder transfer, ISOBMFF to MPEG-2 TS - same A/V control object
org.hbbtv_MEDIAPLAYER0140	Video decoder transfer, ISOBMFF to MPEG-DASH - same A/V control object
org.hbbtv_MEDIAPLAYER0150	Video decoder transfer, MPEG-DASH to MPEG-2 TS - same A/V control object
org.hbbtv_MEDIAPLAYER0160	Video decoder transfer, MPEG-DASH to ISOBMFF- same A/V control object
org.hbbtv_MEDIAPLAYER0170	No video presented when a newly created A/V control object goes straight to paused - DASH
org.hbbtv_MEDIAPLAYER0180	No video presented when a newly created A/V control object goes straight to paused - non-adaptive HTTP streaming - ISOBMFF
org.hbbtv_MEDIAPLAYER0190	No video presented when a newly created A/V control object goes straight to paused - non-adaptive HTTP streaming - MPEG-2 transport stream

**Package: MDEVSYNC\_1 (Category 1)**

Test Case ID	Title
org.hbbtv_MDEVSYNC018.xml	Synchronisation timeline requested by CSA is DASH p-r and becomes available
org.hbbtv_MDEVSYNC032.xml	Master terminal refusing a CSS-TS connection when the CSS-TS service endpoint is unavailable
org.hbbtv_MDEVSYNC071.xml	The master terminal does not accept a number of sessions of the CSS-TS protocol higher than its supported limit
org.hbbtv_MDEVSYNC080.xml	MSAS ignoring Origin header
org.hbbtv_MDEVSYNC090.xml	Master terminal ceasing to be a master due to call to disableInterDevSync method

org.hbbtv_MDEVSYNC101.xml	Synchronisation timeline requested by the CSA is TEMI and is available
org.hbbtv_MDEVSYNC103.xml	Synchronisation timeline requested by the CSA is DASH p-r and is available
org.hbbtv_MDEVSYNC180.xml	timelineSpeedMultiplier value when playback paused
org.hbbtv_MDEVSYNC205.xml	timelineSpeedMultiplier value when playback moving at rate X for a broadband DASH HD stream (HEVC and E-AC3 codecs)
org.hbbtv_MDEVSYNC1003.xml	Master Terminal: Allows connection until limit is reached.
org.hbbtv_MDEVSYNC1004.xml	Master Terminal: Ignores Origin header
org.hbbtv_MDEVSYNC1011.xml	Master Terminal: presentationStatus derived as okay for a video/broadcast object in presenting state
org.hbbtv_MDEVSYNC1012.xml	Master Terminal: presentationStatus derived as transitioning for a previously not played AV control object in a buffering state
org.hbbtv_MDEVSYNC1014.xml	Master Terminal: presentationStatus derived as okay for a previously played AV control object in a buffering state
org.hbbtv_MDEVSYNC1016.xml	Master Terminal: presentationStatus derived as okay for a previously played AV control object in a playing state
org.hbbtv_MDEVSYNC1018.xml	Master Terminal: presentationStatus derived as okay for a HTML5 media element >= HAVE_CURRENT_DATA
org.hbbtv_MDEVSYNC1033.xml	Master Terminal: CSS-CII: TV Device shall include properties defined in 5.6 of [47] in CSS message first time it is sent
org.hbbtv_MDEVSYNC1036.xml	Master Terminal: CSS-CII: TV Device shall send a new CII message if presentationStatus changes - video/broadcast object
org.hbbtv_MDEVSYNC1057.xml	Master terminal: timeline information sent in the CII message is correct (MPEG-TS PTS: Presentation Time Stamp)
org.hbbtv_MDEVSYNC1058.xml	Master terminal: timeline information sent in the CII message is correct (ISOBMFF: composition time)
org.hbbtv_MDEVSYNC1059.xml	Master terminal: timeline information sent in the CII message is correct (TEMI)
org.hbbtv_MDEVSYNC1061.xml	Master Terminal: timelines provided, listing Media Synchroniser timeline (MPEG DASH : Period relative Timeline) with period-id
org.hbbtv_MDEVSYNC1504.xml	Master Terminal: CSS-WC endpoint can service 25 requests per second
org.hbbtv_MDEVSYNC1531.xml	Master Terminal: CSS-CII mrsUrl derived from DVB broadcast URI_linkage_descriptor
org.hbbtv_MDEVSYNC1538.xml	Master Terminal: CSS-CII mrsUrl derived from MPD
org.hbbtv_MDEVSYNC1550.xml	Master Terminal: CSS-CII "broadcast" contentId begins "dvh"
org.hbbtv_MDEVSYNC1551.xml	Master Terminal: CSS-CII "broadcast" contentId net path
org.hbbtv_MDEVSYNC1552.xml	Master Terminal: CSS-CII "broadcast" contentId event constraint present
org.hbbtv_MDEVSYNC1553.xml	Master Terminal: CSS-CII "broadcast" contentID event constraint with tva_id
org.hbbtv_MDEVSYNC1556.xml	Master Terminal: CSS-CII "broadcast" contentId episode CRID
org.hbbtv_MDEVSYNC1563.xml	Master Terminal: CSS-CII "broadcast" contentId reaches "final" form on channel change
org.hbbtv_MDEVSYNC1564.xml	Master Terminal: CSS-CII "broadcast" contentId updated and still final on SI event change
org.hbbtv_MDEVSYNC1565.xml	Master Terminal: CSS-CII "DASH" contentId is an absolute URL matching the MPD location
org.hbbtv_MDEVSYNC1567.xml	Master Terminal: CSS-CII "DASH" contentId fragment period parameter

org.hbbtv_MDEVSYNC1580.xml	Master Terminal: CSS-CII "ISOBMFF" via broadband contentID
org.hbbtv_MDEVSYNC1581.xml	Master Terminal: CSS-CII "MPEG2TS" via broadband contentID
org.hbbtv_MDEVSYNC1780.xml	Master Terminal: Control Timestamp within minimum accuracy requirement 10ms in terms of a PTS synchronisation timeline when master media is a broadcast MPEG TS
org.hbbtv_MDEVSYNC1782.xml	Master Terminal: Control Timestamp within minimum accuracy requirement 10ms in terms of a CT synchronisation timeline when master media is ISOBMFF
org.hbbtv_MDEVSYNC1783.xml	Master Terminal: Control Timestamp within minimum accuracy requirement 10ms in terms of a TEMI synchronisation timeline when master media is broadcast MPEG TS
org.hbbtv_MDEVSYNC1784.xml	Master Terminal: Control Timestamp within minimum accuracy requirement 10ms in terms of a DASH Period Relative synchronisation timeline when master media is MPEG DASH
org.hbbtv_MDEVSYNC1794.xml	Slave Terminal: Presentation timing within accuracy requirement of 10ms for an MPEG DASH stream with DASH Period Relative timeline as other media

**Package: MDEVSYNC\_2**

*NOTE: This intentionally includes for tests whose ID includes "SYNCAPI".*

Test Case ID	Title
org.hbbtv_MDEVSYNC016.xml	Synchronisation timeline requested by CSA is TEMI and becomes available
org.hbbtv_MDEVSYNC017.xml	Synchronisation timeline from a DVB service requested by CSA is MPEG-TS PTS timeline that becomes available
org.hbbtv_MDEVSYNC020.xml	Synchronisation timeline requested by CSA is DASH p-r and becomes unavailable
org.hbbtv_MDEVSYNC029.xml	Synchronisation timeline functionality becoming unavailable because the master terminal is no longer presenting Timed Content
org.hbbtv_MDEVSYNC035.xml	Master terminal tearing down a CSS-TS session terminated by the CSA
org.hbbtv_MDEVSYNC036.xml	Master terminal gracefully closing a CSS-TS session with a CSA when the CSA closes the TCP connection after receiving the master's close control frame
org.hbbtv_MDEVSYNC037.xml	Master terminal gracefully closing a CSS-TS session with a CSA in the event of TCP socket connection timeout after receiving the master's close control frame
org.hbbtv_MDEVSYNC038.xml	Master terminal gracefully closing a CSS-TS session with a CSA when the CSA closes the TCP connection suddenly
org.hbbtv_MDEVSYNC039.xml	Master terminal gracefully closing a CSS-TS session with a CSA in the event of a sudden TCP socket connection timeout
org.hbbtv_MDEVSYNC091.xml	Master terminal ceasing to be a master due to destruction of the MediaSynchroniser object
org.hbbtv_MDEVSYNC092.xml	Master terminal ceasing to be a master due to replacement of the MediaSynchroniser object
org.hbbtv_MDEVSYNC100.xml	Synchronisation timeline requested by the CSA is PTS and is available
org.hbbtv_MDEVSYNC102.xml	Synchronisation timeline requested by the CSA is CT and is available
org.hbbtv_MDEVSYNC1032.xml	Master Terminal: CSS-CII: TV Device shall send CII message first time a CSA connects
org.hbbtv_MDEVSYNC1039.xml	Master Terminal: CSS-CII: TV Device shall send a new CII message if timeline changes (TEMI)
org.hbbtv_MDEVSYNC1043.xml	Master Terminal: CSS-CII: TV Device shall cleanly close the underlying TCP connection when disconnecting

org.hbbtv_MDEVSYNC1044.xml	Master Terminal: CSS-CII: TV Device shall provide status code in a close frame when closing connection due to a client "going away"
org.hbbtv_MDEVSYNC1047.xml	Master Terminal: CSS-CII: TV Device shall cope if CSA disconnects CSS-CII without sending a Close frame
org.hbbtv_MDEVSYNC1048.xml	Master Terminal: CSS-CII: presentationStatus in CII is primary aspect followed by optional extended aspects
org.hbbtv_MDEVSYNC1054.xml	Master Terminal: CSS-CII: protocolVersion in CII shall never be null
org.hbbtv_MDEVSYNC1500.xml	Master Terminal: Wall Clock protocol response message reported measurement precision
org.hbbtv_MDEVSYNC1501.xml	Master Terminal: Wall Clock protocol response message reported max frequency error
org.hbbtv_MDEVSYNC1519.xml	Master Terminal: CSS-WC message sent by master has correct reserved bits
org.hbbtv_MDEVSYNC1522.xml	Master Terminal: CSS-WC response includes originate_timevalue from request, where nanos field is greater than 999 999 999
org.hbbtv_SYNCAP1360.xml	sync API: check interDeviceSyncDispersion for a master terminal with no slave capability
org.hbbtv_SYNCAP1520.xml	sync API: a call to enableInterDeviceSync for a MediaSynchroniser not yet initialised causes an error to be thrown
org.hbbtv_SYNCAP1521.xml	sync API: a call to enableInterDeviceSync for a MediaSynchroniser in permanent error state causes an error to be thrown
org.hbbtv_SYNCAP1541.xml	sync API: check that, after the terminal has ceased being a master due to a call to disableInterDeviceSync, both its CSS-TS and CSS-CII endpoints have been disabled
org.hbbtv_SYNCAP1590.xml	sync API: a call to disableInterDeviceSync for a MediaSynchroniser not yet initialised causes an error to be thrown
org.hbbtv_SYNCAP1591.xml	sync API: a call to disableInterDeviceSync for a MediaSynchroniser that has since being replaced causes an error to be thrown

**Package: MDEVSYNC\_3**

*NOTE: This intentionally includes for tests whose ID includes "SYNCAP1".*

Test Case ID	Title
org.hbbtv_MDEVSYNC1022.xml	Slave Terminal: CSS-CII: Connect to CSS-CII when becomes slave
org.hbbtv_MDEVSYNC1024.xml	Slave Terminal: CSS-CII: Fail error 6 if connection unreachable/unresponsive
org.hbbtv_MDEVSYNC1029.xml	Slave Terminal: CSS-CII: Fail error 10 if no tsUrl in first CII
org.hbbtv_MDEVSYNC1506.xml	Slave Terminal: Commences Wall Clock synchronisation
org.hbbtv_MDEVSYNC1512.xml	Slave Terminal: Continues to send wall clock protocol request messages if responses take more than 1000ms
org.hbbtv_MDEVSYNC1518.xml	Slave Terminal: CSS-WC message sent by slave has correct message_type
org.hbbtv_MDEVSYNC1529.xml	Slave Terminal: CSS-WC messages sent by slave as UDP
org.hbbtv_MDEVSYNC1790.xml	Slave Terminal: Presentation timing within accuracy requirement of 10ms for a broadcast MPEG TS with PTS timeline as other media
org.hbbtv_MDEVSYNC1793.xml	Slave Terminal: Presentation timing within accuracy requirement of 10ms for a broadcast MPEG TS with TEM1 timeline as other media
org.hbbtv_SYNCAP1006.xml	MediaSynchroniser - Error event 5 - addMediaObject called with null CorrelationTimestamp
org.hbbtv_SYNCAP1007.xml	MediaSynchroniser - Error event 7 - updateCorrelationTimestamp called on uninitialised MediaSynchroniser
org.hbbtv_SYNCAP1330.xml	sync API: check interDeviceSyncEnabled for a slave terminal
org.hbbtv_SYNCAP1350.xml	sync API: check interDeviceSyncDispersion for a master terminal with slave capability

org.hbbtv_SYNC_API420.xml	sync API: checking the value of the currentTime property before the first control-timestamp is received
org.hbbtv_SYNC_API430.xml	sync API: check that error is thrown in initSlaveMediaSynchroniser if the CSS-CII endpoint is not available

**Package: MDEVSYNC\_4**

Test Case ID	Title
org.hbbtv_MDEVSYNC110.xml	Timing of the Control Timestamp message sent out by a master terminal
org.hbbtv_MDEVSYNC170.xml	timelineSpeedMultiplier value under normal playback
org.hbbtv_MDEVSYNC200.xml	timelineSpeedMultiplier value when playback moving at rate X for a MPEG-TS SD stream)
org.hbbtv_MDEVSYNC201.xml	timelineSpeedMultiplier value when playback moving at rate X for a MPEG-TS HD stream)
org.hbbtv_MDEVSYNC202.xml	timelineSpeedMultiplier value when playback moving at rate X for a MPEG-TS 4K UHD 60fps stream)
org.hbbtv_MDEVSYNC203.xml	timelineSpeedMultiplier value when playback moving at rate X for a broadcast stream (MPEG2 and HEAAC codecs)
org.hbbtv_MDEVSYNC204.xml	timelineSpeedMultiplier value when playback moving at rate X for a broadband DASH SD stream (AVC and HEAAC codecs)
org.hbbtv_MDEVSYNC206.xml	timelineSpeedMultiplier value when playback moving at rate X for a broadband DASH HD stream (AVC and HEAAC codecs)
org.hbbtv_MDEVSYNC1007.xml	presentationStatus is for master media
org.hbbtv_MDEVSYNC1013.xml	Master Terminal: presentationStatus derived as transitioning for a previously not played AV control object in a paused state
org.hbbtv_MDEVSYNC1015.xml	Master Terminal: presentationStatus derived as okay for a previously played AV control object in a paused state
org.hbbtv_MDEVSYNC1017.xml	Master Terminal: presentationStatus derived as transitioning for a HTML5 media element < HAVE_CURRENT_DATA
org.hbbtv_MDEVSYNC1055.xml	Master Terminal: CSS-CII: protocolVersion in CII shall never change
org.hbbtv_MDEVSYNC1060.xml	Master Terminal: timelines provided, listing Media Synchroniser timeline (MPEG DASH : Period relative Timeline)
org.hbbtv_MDEVSYNC1062.xml	Master Terminal: presentationStatus derived as transitioning for a video/broadcast object in connecting state after bind
org.hbbtv_MDEVSYNC1063.xml	Master Terminal: presentationStatus derived as transitioning for a AV control object in a connecting state
org.hbbtv_MDEVSYNC1064.xml	Master Terminal: CSS-CII: TV Device shall send a new CII message if presentationStatus changes - AV control object
org.hbbtv_MDEVSYNC1542.xml	Master Terminal: CSS-CII ci status for DASH service is immediately final because CI is known
org.hbbtv_MDEVSYNC1543.xml	Master Terminal: CSS-CII ci status for MPEG2 TS progressive download is immediately final because CI is known
org.hbbtv_MDEVSYNC1544.xml	Master Terminal: CSS-CII ci status for ISO BMFF progressive download is immediately final because CI is known
org.hbbtv_MDEVSYNC1566.xml	Master Terminal: CSS-CII "DASH" contentId fragment part is correctly formatted
org.hbbtv_MDEVSYNC1568.xml	Master Terminal: CSS-CII "DASH" contentId fragment conveys mpd ancillary data
org.hbbtv_MDEVSYNC1569.xml	Master Terminal: CSS-CII "DASH" contentId fragment conveys period ancillary data for currently presenting period
org.hbbtv_MDEVSYNC1570.xml	Master Terminal: CSS-CII "DASH" contentId fragment does not convey

	period ancillary data for a period not currently being presented
org.hbbtv_MDEVSYNC1571.xml	Master Terminal: CSS-CII "DASH" contentId MPD URL does not change when MPD is updated

**Package: MDEVSYNC\_5**

*NOTE: This intentionally includes for tests whose ID includes "SYNCAPI".*

Test Case ID	Title
org.hbbtv_MDEVSYNC1023.xml	Slave Terminal: CSS-CII: Fail error 6 if connection refused
org.hbbtv_MDEVSYNC1025.xml	Slave Terminal: CSS-CII: Fail error 6 if master closes connection
org.hbbtv_MDEVSYNC1026.xml	Slave Terminal: CSS-CII: Fail error 10 if no wcUrl in first CII
org.hbbtv_MDEVSYNC1030.xml	Slave Terminal: CSS-CII: Fail error 6 if presentationStatus not "okay" or "transitioning"
org.hbbtv_MDEVSYNC1065.xml	Slave Terminal: CSS-CII: Fail error 10 if wcUrl in first CII is null
org.hbbtv_MDEVSYNC1066.xml	Slave Terminal: CSS-CII: Fail error 10 if wcUrl in any CII is null
org.hbbtv_MDEVSYNC1067.xml	Slave Terminal: CSS-CII: Fail error 10 if tsUrl in first CII is null
org.hbbtv_MDEVSYNC1068.xml	Slave Terminal: CSS-CII: Fail error 10 if tsUrl in any CII is null
org.hbbtv_MDEVSYNC1507.xml	Slave Terminal: Sends wall clock protocol messages to correct destination
org.hbbtv_MDEVSYNC1508.xml	Slave Terminal: Sends wall clock protocol messages 200ms or more apart
org.hbbtv_MDEVSYNC1509.xml	Slave Terminal: Limits to 30 wall clock protocol request messages per 60 seconds
org.hbbtv_MDEVSYNC1510.xml	Slave Terminal: Accepts wall clock responses within 1000ms
org.hbbtv_MDEVSYNC1513.xml	Slave Terminal: Initial dispersion value at slave terminal is Number.POSITIVE_INFINITY
org.hbbtv_MDEVSYNC1516.xml	Slave Terminal: CSS-WC message sent by slave has correct version
org.hbbtv_MDEVSYNC1520.xml	Slave Terminal: CSS-WC message sent by slave has correct reserved bits
org.hbbtv_MDEVSYNC1791.xml	Slave Terminal: Presentation timing within accuracy requirement of 10ms for a broadband SPTS with PTS timeline as other media
org.hbbtv_MDEVSYNC1792.xml	Slave Terminal: Presentation timing within accuracy requirement of 10ms for a broadband ISOBMFF with CT timeline as other media
org.hbbtv_SYNCAPI290.xml	sync API: check nrOfSlaves property for a slave terminal
org.hbbtv_SYNCAPI340.xml	sync API: check interDeviceSyncEnabled for a slave terminal that has not yet enabled inter-device sync

**Package: MDEVSYNC\_6**

*NOTE: This intentionally includes for tests whose ID includes "SYNCAPI".*

Test Case ID	Title
org.hbbtv_MDEVSYNC011.xml	The master terminal allows multiple CSS-TS connections from the same CSA
org.hbbtv_MDEVSYNC030.xml	Master terminal implementing server side of websocket protocol for the CSS-TS endpoint
org.hbbtv_MDEVSYNC031.xml	Messages from the CSS-TS protocol are websocket data frames with text payload
org.hbbtv_MDEVSYNC050.xml	The CSS-TS service end point of the MSAS is provided on the broadband interface.
org.hbbtv_MDEVSYNC060.xml	The master terminal supports at least 10 simultaneous sessions of the CSS-TS protocol
org.hbbtv_MDEVSYNC070.xml	The master terminal accepts simultaneous sessions of the CSS-TS protocol until its supported limit

org.hbbtv_MDEVSYNC130.xml	The master terminal handles 2 Actual, Earliest and Latest Presentation timestamps received with 0.5s distance
org.hbbtv_MDEVSYNC131.xml	The master terminal handles 2 Actual, Earliest and Latest Presentation timestamps received with 0.9s distance
org.hbbtv_MDEVSYNC1000.xml	Master Terminal: Implements CSS-CII endpoint on the broadband interface
org.hbbtv_MDEVSYNC1001.xml	Master Terminal: Implements CSS-CII endpoint
org.hbbtv_MDEVSYNC1002.xml	Master Terminal: Supports >5 concurrent connections to CSS-CII service endpoint
org.hbbtv_MDEVSYNC1020.xml	Master Terminal: tsUrl provided
org.hbbtv_MDEVSYNC1056.xml	Master Terminal: CSS-CII: presentationStatus in CII shall never be null
org.hbbtv_MDEVSYNC1502.xml	Master Terminal: Implements CSS-WC endpoint on broadband interface
org.hbbtv_MDEVSYNC1503.xml	Master Terminal: CSS-WC endpoint is advertised through CSS-CII
org.hbbtv_MDEVSYNC1514.xml	Master Terminal: CSS-WC message nanosecond values within allowed range.
org.hbbtv_MDEVSYNC1515.xml	Master Terminal: CSS-WC message sent by master has correct version
org.hbbtv_MDEVSYNC1517.xml	Master Terminal: CSS-WC message sent by master has correct message_type
org.hbbtv_MDEVSYNC1521.xml	Master Terminal: CSS-WC response includes originate_timevalue from request
org.hbbtv_MDEVSYNC1523.xml	Master Terminal: CSS-WC response has set receive_timevalue field
org.hbbtv_MDEVSYNC1524.xml	Master Terminal: CSS-WC response has set transmit_timevalue field
org.hbbtv_MDEVSYNC1525.xml	Master Terminal: CSS-WC follow-up response has specific fields unchanged.
org.hbbtv_MDEVSYNC1526.xml	Master Terminal: CSS-WC response sent in response to correctly formed request
org.hbbtv_MDEVSYNC1527.xml	Master Terminal: CSS-WC follow-up response sent if a message_type 2 response is sent
org.hbbtv_MDEVSYNC1528.xml	Master Terminal: CSS-WC messages sent by master as UDP
org.hbbtv_MDEVSYNC1530.xml	Master Terminal: CSS-WC response messages sent to where the request came from
org.hbbtv_SYNCAPI270.xml	sync API: check nrOfSlaves property for 0 connected slaves
org.hbbtv_SYNCAPI280.xml	sync API: check nrOfSlaves property for a terminal that has not yet enabled inter-device sync

**Package: MDEVSYNC\_7**

*NOTE: This intentionally includes for tests whose ID includes "SYNCAPI".*

Test Case ID	Title
org.hbbtv_MDEVSYNC1009.xml	Master Terminal: presentationStatus derived as transitioning for a video/broadcast object in connecting state after channel change
org.hbbtv_MDEVSYNC1010.xml	Master Terminal: presentationStatus derived as okay for a video/broadcast object in connecting state after a transient error
org.hbbtv_MDEVSYNC1532.xml	Master Terminal: CSS-CII mrsUrl derived from DVB broadcast URI_linkage_descriptor in NIT first loop when applying scoping rules.
org.hbbtv_MDEVSYNC1533.xml	Master Terminal: CSS-CII mrsUrl derived from DVB broadcast URI_linkage_descriptor in BAT first loop when applying scoping rules.
org.hbbtv_MDEVSYNC1534.xml	Master Terminal: CSS-CII mrsUrl derived from DVB broadcast URI_linkage_descriptor in NIT TS loop when applying scoping rules.
org.hbbtv_MDEVSYNC1535.xml	Master Terminal: CSS-CII mrsUrl derived from DVB broadcast URI_linkage_descriptor in BAT TS loop when applying scoping rules.
org.hbbtv_MDEVSYNC1536.xml	Master Terminal: CSS-CII mrsUrl derived from DVB broadcast URI_linkage_descriptor in SDT when applying scoping rules.

org.hbbtv_MDEVSYNC1537.xml	Master Terminal: CSS-CII mrsUrl derived from DVB broadcast URI_linkage_descriptor in EIT when applying scoping rules.
org.hbbtv_MDEVSYNC1539.xml	Master Terminal: CSS-CII ci status for broadcast
org.hbbtv_MDEVSYNC1540.xml	Master Terminal: CSS-CII ci status during broadcast service change
org.hbbtv_MDEVSYNC1541.xml	Master Terminal: CSS-CII ci status during broadcast EIT p/f change
org.hbbtv_MDEVSYNC1554.xml	Master Terminal: CSS-CII "broadcast" contentId with no event constraint
org.hbbtv_MDEVSYNC1555.xml	Master Terminal: CSS-CII "broadcast" contentId no query part
org.hbbtv_MDEVSYNC1557.xml	Master Terminal: CSS-CII "broadcast" contentId EIT ancillary data
org.hbbtv_MDEVSYNC1558.xml	Master Terminal: CSS-CII "broadcast" contentId SDT ancillary data
org.hbbtv_MDEVSYNC1559.xml	Master Terminal: CSS-CII "broadcast" contentId BAT ancillary data
org.hbbtv_MDEVSYNC1560.xml	Master Terminal: CSS-CII "broadcast" contentId NIT ancillary data
org.hbbtv_MDEVSYNC1561.xml	Master Terminal: CSS-CII "broadcast" query part key order
org.hbbtv_MDEVSYNC1562.xml	Master Terminal: CSS-CII "broadcast" contentId reaches "final" form on init
org.hbbtv_MDEVSYNC1781.xml	Master Terminal: Control Timestamp within minimum accuracy requirement 10ms in terms of a PTS synchronisation timeline when master media is a broadband SPTS
org.hbbtv_SYNCAPI002.xml	initMediaSynchroniser() with MPEG-2 TS (TEMI) video/broadcast object
org.hbbtv_SYNCAPI003.xml	MediaSynchroniser - Error event 4 raised when addMediaObject called with previously added mediaObject
org.hbbtv_SYNCAPI004.xml	MediaSynchroniser - Error event 7 - addMediaObject called on uninitialised MediaSynchroniser
org.hbbtv_SYNCAPI005.xml	MediaSynchroniser - Error event 9 - initMediaSynchroniser called with video/broadcast in UNREALIZED state

**Package: MSTRSYNC\_1 (Category 1)**

Test Case ID	Title
org.hbbtv_MSTRSYNC0010.xml	MSTRSYNC deactivate broadcast audio in favor of broadband audio
org.hbbtv_MSTRSYNC0020.xml	MSTRSYNC deactivate broadcast subtitles in favor of broadband subtitles
org.hbbtv_MSTRSYNC0100.xml	MSTRSYNC of BC-TS/TEMI V with DASH A - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0110.xml	MSTRSYNC of BC-TS/TEMI V with DASH A and oob EBUTTD ST - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0130.xml	MSTRSYNC of BC-TS/TEMI V/ST with DASH A - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0150.xml	MSTRSYNC of BC-TS/TEMI A/V with DASH V - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0650.xml	Synchronised presentation of broadcast MP2TS AVC (TEMI) video (master) with DASH E-AC-3 (DASH-PR) audio
org.hbbtv_MSTRSYNC0730.xml	Synchronised presentation of broadcast MP2TS AVC (TEMI) video (master) with DASH E-AC-3 (DASH-PR) audio and DASH (DASH-PR) subtitles
org.hbbtv_MSTRSYNC1723.xml	MSTRSYNC of BC-TS/TEMI V/A with DASH ST - DASH not available in time, tolerance of 2 sec.
org.hbbtv_MSTRSYNC1751.xml	MSTRSYNC of BC-TS/TEMI V with DASH A - gen-locked timelines, TEMI tickrate 50, correlationTimestamp present
org.hbbtv_MSTRSYNC1752.xml	MSTRSYNC of BC-TS/TEMI V with DASH A and oob EBUTTD ST - TEMI tickrate 50, drifting timelines.
org.hbbtv_MSTRSYNC1753.xml	MSTRSYNC of BC-TS/TEMI A/V with DASH ST - TEMI tickrate 25, drifting timelines.

org.hbbtv_MSTRSYNC1754.xml	MSTRSYNC of BC-TS/TEMI V/ST with DASH A - TEMI tickrate 50, drifting timelines.
org.hbbtv_MSTRSYNC1755.xml	MSTRSYNC of BC-TS/TEMI V with DASH A/ST - TEMI tickrate 25, drifting timelines.
org.hbbtv_MSTRSYNC1855.xml	MSTRSYNC of BC-TS/TEMI V with DASH A/ST - DASH not available in time

**Package: MSTRSYNC\_2**

Test Case ID	Title
org.hbbtv_MSTRSYNC0115.xml	MSTRSYNC of BC-TS/TEMI A/V with oob EBUTTD ST - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0120.xml	MSTRSYNC of BC-TS/TEMI A/V with DASH ST - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0140.xml	MSTRSYNC of BC-TS/TEMI V with DASH A/ST - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0160.xml	MSTRSYNC of BC-TS/TEMI V with DASH A/V - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0170.xml	MSTRSYNC of BC-TS/PTS V with BB-TS/PTS A gen-locked - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0180.xml	MSTRSYNC of BC-TS/PTS V with BB-TS/PTS A/ST gen-locked - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0190.xml	MSTRSYNC of BC-TS/PTS A/V with BB-TS/PTS ST gen-locked - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0200.xml	MSTRSYNC of BC-TS/PTS A/V with BB-TS/PTS V gen-locked - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0210.xml	MSTRSYNC of BC-TS/PTS V with BB-TS/PTS A/V gen-locked - no tolerance, no correlation timestamps needed
org.hbbtv_MSTRSYNC0600.xml	Synchronised presentation of broadcast MP2TS AVC (TEMI) video (master) with DASH E-AC-3 (DASH-PR) audio when adding Out of Band HTML5 EBU-TT-D (EBU-TT-D) subtitles
org.hbbtv_MSTRSYNC0620.xml	MediaSynchroniser buffer - StreamEvent firing unaffected by buffer
org.hbbtv_MSTRSYNC0640.xml	Synchronised presentation of broadcast MP2TS AVC (TEMI) video (master) with DASH (DASH-PR) audio
org.hbbtv_MSTRSYNC0680.xml	Synchronised presentation of broadcast MP2TS AVC (TEMI) video (master) with Out of Band HTML5 EBU-TT-D (EBU-TT-D) subtitles when adding DASH E-AC-3 (DASH-PR) audio
org.hbbtv_MSTRSYNC0710.xml	Synchronised presentation of broadcast MP2TS AVC (TEMI) video (master) with broadcast DVB (TEMI) subtitles and DASH EAC-3 (DASH-PR) audio
org.hbbtv_MSTRSYNC1721.xml	MSTRSYNC of BC-TS/TEMI V with DASH A - DASH not available in time, tolerance of 2 sec.
org.hbbtv_MSTRSYNC1726.xml	MSTRSYNC of BC-TS/TEMI A/V with DASH V - DASH not available in time, tolerance of 4 sec.
org.hbbtv_MSTRSYNC1728.xml	MSTRSYNC of BC-TS/PTS V with BB-TS/PTS A gen-locked - BB-TS not available in time, tolerance of 2 sec.
org.hbbtv_MSTRSYNC1730.xml	MSTRSYNC of BC-TS/PTS A/V with BB-TS/PTS ST gen-locked - BB-TS not available in time, tolerance of 2 sec.
org.hbbtv_MSTRSYNC1732.xml	MSTRSYNC of BC-TS/PTS V with BB-TS/PTS A/V gen-locked - BB-TS not available in time, tolerance of 4 sec.
org.hbbtv_MSTRSYNC1756.xml	MSTRSYNC of BC-TS/TEMI V/A with DASH V - TEMI tickrate 50, DASH PR 25, drifting timelines.
org.hbbtv_MSTRSYNC1757.xml	MSTRSYNC of BC-TS/TEMI V with DASH V/A - TEMI tickrate 50, DASH PR 50, drifting timelines.

org.hbbtv_MSTRSYNC1758.xml	MSTRSYNC of BC-TS/PTS V with BB-TS/PTS A - non gen-locked
org.hbbtv_MSTRSYNC1759.xml	MSTRSYNC of BC-TS/PTS V with BB-TS/PTS A/ST - non gen-locked
org.hbbtv_MSTRSYNC1760.xml	MSTRSYNC of BC-TS/PTS A/V with BB-TS/PTS ST - non gen-locked
org.hbbtv_MSTRSYNC1761.xml	MSTRSYNC of BC-TS/PTS A/V with BB-TS/PTS V - non gen-locked
org.hbbtv_MSTRSYNC1762.xml	MSTRSYNC of BC-TS/PTS V with BB-TS/PTS A/V - non gen-locked
org.hbbtv_MSTRSYNC1851.xml	MSTRSYNC of BC-TS/TEMI V with DASH A - DASH not available in time
org.hbbtv_MSTRSYNC1853.xml	MSTRSYNC of BC-TS/TEMI V with DASH ST - DASH not available in time
org.hbbtv_MSTRSYNC1857.xml	MSTRSYNC of BC-TS/TEMI V with DASH A/V - DASH not available in time

**Package: MSTRSYNC\_3**

*NOTE: This intentionally includes for tests whose ID includes "SYNCAPI".*

Test Case ID	Title
org.hbbtv_SYNCAPI1560.xml	MediaSynchroniser - synchronisation resumes after video/broadcast object (master media) was in CONNECTING state
org.hbbtv_SYNCAPI1561.xml	MediaSynchroniser - synchronisation resumes after video/broadcast object (master media) was in non normal play speed
org.hbbtv_SYNCAPI1570.xml	MediaSynchroniser - video/broadcast (master media) - setChannel
org.hbbtv_SYNCAPI1571.xml	MediaSynchroniser - video/broadcast (master media) - prevChannel
org.hbbtv_SYNCAPI1572.xml	MediaSynchroniser - video/broadcast (master media) - nextChannel
org.hbbtv_SYNCAPI1573.xml	MediaSynchroniser - video/broadcast (master media) - pause
org.hbbtv_SYNCAPI1574.xml	MediaSynchroniser - video/broadcast (master media) - resume
org.hbbtv_SYNCAPI1575.xml	MediaSynchroniser - video/broadcast (master media) - setSpeed
org.hbbtv_SYNCAPI1576.xml	MediaSynchroniser - video/broadcast (master media) - seek
org.hbbtv_SYNCAPI1577.xml	MediaSynchroniser - video/broadcast (master media) - stopTimeshift
org.hbbtv_SYNCAPI1660.xml	MediaSynchroniser - synchronisation resumes after HTML5 video element (master media) was stalled
org.hbbtv_SYNCAPI1661.xml	MediaSynchroniser - synchronisation resumes after HTML5 video element (master media) was at effectivePlayspeed X that is not 0 (paused) or 1 (normal)
org.hbbtv_SYNCAPI1670.xml	MediaSynchroniser - synchronisation resumes after HTML5 video element (other media) was stalled
org.hbbtv_SYNCAPI1681.xml	MediaSynchroniser - HTML5 video element (master media) set playbackRate is reflected in timestamps sent via CSS-TS
org.hbbtv_SYNCAPI1682.xml	MediaSynchroniser - HTML5 video element (master media) - play() is reflected in timestamps sent via CSS-TS
org.hbbtv_SYNCAPI1761.xml	MediaSynchroniser - synchronisation resumes after AV Control object (master media) enters BUFFERING state
org.hbbtv_SYNCAPI1762.xml	MediaSynchroniser - synchronisation resumes after AV Control object (master media) playing non-normal speed
org.hbbtv_SYNCAPI1782.xml	MediaSynchroniser - AV Control Object (master media) - play()
org.hbbtv_SYNCAPI1783.xml	MediaSynchroniser - AV Control Object (master media) - seek()

**Package: SYNCAPI\_1 (Category 1)**

Test Case ID	Title
org.hbbtv_SYNCAPI001.xml	MediaSynchroniser 'minSyncBufferSize' property - implemented
org.hbbtv_SYNCAPI008.xml	MediaSynchroniser 'minSyncBufferSize' property - not implemented
org.hbbtv_SYNCAPI260.xml	sync API: check nrOfSlaves property for 3 connected slaves

org.hbbtv_SYNCAP1300.xml	sync API: check interDeviceSyncEnabled for a master terminal
org.hbbtv_SYNCAP1310.xml	sync API: check interDeviceSyncEnabled for a terminal that has not yet enabled inter-device sync
org.hbbtv_SYNCAP1320.xml	sync API: check interDeviceSyncEnabled for a a terminal that is in permanent error
org.hbbtv_SYNCAP1440.xml	sync API: call to initSlaveMediaSynchroniser for a terminal without slave capability results in error
org.hbbtv_SYNCAP1540.xml	sync API: check that, after the terminal has ceased being a master due to a call to disableInterDeviceSync, its CSS-TS endpoint has been disabled
org.hbbtv_SYNCAP1400.xml	MediaSynchroniser - Error event 14 - Parental Rating block for video/broadcast object (master media)
org.hbbtv_SYNCAP1421.xml	MediaSynchroniser - Error event 2 - Parental Rating block for A/V control object (other media)
org.hbbtv_SYNCAP1520.xml	MediaSynchroniser - Error event 14 - video/broadcast object (master media) has permanent error
org.hbbtv_SYNCAP1540.xml	MediaSynchroniser - Error event 16 - video/broadcast object (master media) transitions to UNREALIZED state
org.hbbtv_SYNCAP1565.xml	MediaSynchroniser - synchronisation resumes after video/broadcast object (other media) experiences temporary signal loss
org.hbbtv_SYNCAP1620.xml	MediaSynchroniser - Error event 14 - HTML5 video element (master media) has error while fetching data
org.hbbtv_SYNCAP1630.xml	MediaSynchroniser - Error event 2 - HTML5 video element (other media) has error while fetching data
org.hbbtv_SYNCAP1680.xml	MediaSynchroniser - HTML5 video element (master media) set currentTime
org.hbbtv_SYNCAP1683.xml	MediaSynchroniser - HTML5 video element (master media) - pause()
org.hbbtv_SYNCAP1730.xml	MediaSynchroniser - Error event 2 - AV Control Object (other media) enters ERROR state
org.hbbtv_SYNCAP1740.xml	MediaSynchroniser - Error event 16 - AV Control Object (master media) enters FINISHED state
org.hbbtv_SYNCAP1771.xml	MediaSynchroniser - synchronisation resumes after AV Control object (other media) was in BUFFERING state
org.hbbtv_SYNCAP12001.xml	removeMediaObject: remove synched audio stream and then continue playing with broadcast audio
org.hbbtv_SYNCAP12002.xml	removeMediaObject: remove synched subtitles and continue with broadcast subtitles.
org.hbbtv_SYNCAP12023.xml	errorHandling 11: TEMI with DASH, where the terminal does not support buffering and the DASH is not available in time
org.hbbtv_SYNCAP12021.xml	errorHandling 15: 1: No TEMI timeline found on selected component

**Package: SYNCAP1\_2**

Test Case ID	Title
org.hbbtv_SYNCAP1410.xml	MediaSynchroniser - Error event 14 - Parental Rating block for HTML5 media element (master media)
org.hbbtv_SYNCAP1420.xml	MediaSynchroniser - Error event 14 - Parental Rating block for A/V control object (master media)
org.hbbtv_SYNCAP1500.xml	MediaSynchroniser - Error event 16 - initMediaSynchroniser called with video/broadcast object in STOPPED state
org.hbbtv_SYNCAP1600.xml	MediaSynchroniser - Error event 16 - initMediaSynchroniser called with HTML5 video element object when readyState < HAVE_CURRENT_DATA
org.hbbtv_SYNCAP1601.xml	MediaSynchroniser - Error event 16 - initMediaSynchroniser called with HTML5 video element playback already ended

org.hbbtv_SYNCAP1602.xml	MediaSynchroniser - Error event 16 - initMediaSynchroniser called with HTML5 video element stopped due to non fatal errors
org.hbbtv_SYNCAP1603.xml	MediaSynchroniser - Error event 16 - initMediaSynchroniser called with HTML5 video element controller property defined and not null
org.hbbtv_SYNCAP1640.xml	MediaSynchroniser - Error event 16 - HTML5 video element (master media) source reloaded
org.hbbtv_SYNCAP1641.xml	MediaSynchroniser - Error event 16 - HTML5 video element (master media) Media Controller set
org.hbbtv_SYNCAP1700.xml	MediaSynchroniser - Error event 16 - initMediaSynchroniser called with AV Control object in STOPPED state
org.hbbtv_SYNCAP1701.xml	MediaSynchroniser - Error event 16 - initMediaSynchroniser called with AV Control object in FINISHED state
org.hbbtv_SYNCAP1702.xml	MediaSynchroniser - Error event 16 - initMediaSynchroniser called with AV Control object in ERROR state
org.hbbtv_SYNCAP1720.xml	MediaSynchroniser - Error event 14 - AV Control object (master media) enters ERROR state
org.hbbtv_SYNCAP1741.xml	MediaSynchroniser - Error event 16 - AV Control Object (master media) enters STOPPED state
org.hbbtv_SYNCAP2022.xml	errorHandling 15: 2: No TEMI timeline found with selected ID

**Package: SYNCAP1\_3**

Test Case ID	Title
org.hbbtv_SYNCAP1401.xml	MediaSynchroniser - Error event 2 - Parental Rating block for video/broadcast object (other media)
org.hbbtv_SYNCAP1411.xml	MediaSynchroniser - Error event 2 - Parental Rating block for HTML5 media element object (other media)
org.hbbtv_SYNCAP1510.xml	MediaSynchroniser - Error event 9 - addMediaObject called with video/broadcast object in UNREALIZED state
org.hbbtv_SYNCAP1511.xml	MediaSynchroniser - Error event 9 - addMediaObject called with video/broadcast object in STOPPED state
org.hbbtv_SYNCAP1530.xml	MediaSynchroniser - Error event 2 - video/broadcast object (other media) has permanent error
org.hbbtv_SYNCAP1550.xml	MediaSynchroniser - Error event 9 - video/broadcast object (other media) transitions to UNREALIZED state
org.hbbtv_SYNCAP1580.xml	MediaSynchroniser - video/broadcast (other media) - setChannel
org.hbbtv_SYNCAP1581.xml	MediaSynchroniser - video/broadcast (other media) - prevChannel
org.hbbtv_SYNCAP1582.xml	MediaSynchroniser - video/broadcast (other media) - nextChannel
org.hbbtv_SYNCAP1583.xml	MediaSynchroniser - video/broadcast (other media) - pause
org.hbbtv_SYNCAP1584.xml	MediaSynchroniser - video/broadcast (other media) - resume
org.hbbtv_SYNCAP1585.xml	MediaSynchroniser - video/broadcast (other media) - setSpeed
org.hbbtv_SYNCAP1586.xml	MediaSynchroniser - video/broadcast (other media) - seek
org.hbbtv_SYNCAP1587.xml	MediaSynchroniser - video/broadcast (other media) - stopTimeshift
org.hbbtv_SYNCAP1610.xml	MediaSynchroniser - Error event 9 - addMediaObject called with HTML5 video element object when readyState < HAVE_CURRENT_DATA
org.hbbtv_SYNCAP1611.xml	MediaSynchroniser - Error event 9 - addMediaObject called with HTML5 video element playback already ended
org.hbbtv_SYNCAP1612.xml	MediaSynchroniser - Error event 9 - addMediaObject called with HTML5 video element stopped due to non fatal errors
org.hbbtv_SYNCAP1613.xml	MediaSynchroniser - Error event 9 - addMediaObject called with HTML5 video element controller property defined and not null

org.hbbtv_SYNCAP11650.xml	MediaSynchroniser - Error event 9 - HTML5 video element (other media) source reloaded
org.hbbtv_SYNCAP11651.xml	MediaSynchroniser - Error event 9 - HTML5 video element (other media) Media Controller set
org.hbbtv_SYNCAP11690.xml	MediaSynchroniser - HTML5 video element (other media) set currentTime
org.hbbtv_SYNCAP11691.xml	MediaSynchroniser - HTML5 video element (other media) set playbackRate
org.hbbtv_SYNCAP11692.xml	MediaSynchroniser - HTML5 video element (other media) - play()
org.hbbtv_SYNCAP11693.xml	MediaSynchroniser - HTML5 video element (other media) - pause()
org.hbbtv_SYNCAP11710.xml	MediaSynchroniser - Error event 9 - addMediaObject called with AV Control object in STOPPED state
org.hbbtv_SYNCAP11711.xml	MediaSynchroniser - Error event 9 - addMediaObject called with AV Control object in FINISHED state
org.hbbtv_SYNCAP11712.xml	MediaSynchroniser - Error event 9 - addMediaObject called with AV Control object in ERROR state
org.hbbtv_SYNCAP11750.xml	MediaSynchroniser - Error event 9 - AV Control Object (other media) enters FINISHED state
org.hbbtv_SYNCAP11751.xml	MediaSynchroniser - Error event 9 - AV Control Object (other media) enters STOPPED state
org.hbbtv_SYNCAP11792.xml	MediaSynchroniser - AV Control Object (other media) - play()
org.hbbtv_SYNCAP11793.xml	MediaSynchroniser - AV Control Object (other media) - seek()

**Package: HTML5\_1 (Category 1)**

Test ID	Title
org.hbbtv_HTML50110	HTML5 video element and parental access control
org.hbbtv_HTML50190	HTML5 video element always behaves as full screen mode false - same aspect ratio, no cropping
org.hbbtv_HTML50200	HTML5 video element always behaves as full screen mode false - different aspect ratio, no cropping
org.hbbtv_HTML50400	AudioTrack.id with MPEG-2 TS
org.hbbtv_HTML50440	AudioTrack.language with MPEG2-TS - no supplementary_audio_descriptor
org.hbbtv_HTML50500	AudioTrack.id with ISOBMFF
org.hbbtv_HTML50510	AudioTrack.language with ISOBMFF
org.hbbtv_HTML50700	VideoTrack.id with MPEG-2 TS
org.hbbtv_HTML50710	VideoTrack.id with ISOBMFF
org.hbbtv_HTML50720	VideoTrack.id with MPEG DASH
org.hbbtv_HTML50750	VideoTrack.kind with MPEG DASH - main
org.hbbtv_HTML50810	TextTrack.kind with MPEG-2 TS - subtitles
org.hbbtv_HTML50940	TextTrack.id with MPEG DASH
org.hbbtv_HTML50950	TextTrack.kind with MPEG DASH
org.hbbtv_HTML51000	Graphics Performance 1 - Frame/background-color
org.hbbtv_HTML51010	Graphics Performance 1 - Frame/background-color, opacity
org.hbbtv_HTML51020	Graphics Performance 1 - Frame/left,top
org.hbbtv_HTML51030	Graphics Performance 1 - Frame/opacity
org.hbbtv_HTML51040	Graphics Performance 1 - Frame/transform: scale
org.hbbtv_HTML51050	Graphics Performance 1 - Frame/border-radius
org.hbbtv_HTML51060	Graphics Performance 1 - Frame/width,height
org.hbbtv_HTML51070	Graphics Performance 1 - Frame/linear-gradient
org.hbbtv_HTML51080	Graphics Performance 1 - Image/left,top
org.hbbtv_HTML51090	Graphics Performance 1 - Image/opacity
org.hbbtv_HTML51100	Graphics Performance 1 - Image/transform:scale

org.hbbtv_HTML51110	Graphics Performance 1 - Text/left,top
org.hbbtv_HTML51120	Graphics Performance 1 - Text/opacity
org.hbbtv_HTML51130	Graphics Performance 1 - Text/transform: scale
org.hbbtv_HTML51240	Graphics Performance 2 - Frame/transform: rotate
org.hbbtv_HTML51260	Graphics Performance 2 - Frame/transform: skew
org.hbbtv_HTML51270	Graphics Performance 2 - Frame/transform: matrix
org.hbbtv_HTML51330	Graphics Performance 2 - Image/transform:rotate
org.hbbtv_HTML51350	Graphics Performance 2 - Image/transform:skew
org.hbbtv_HTML51360	Graphics Performance 2 - Image/transform:matrix
org.hbbtv_ADINS015	HTML5 mid-roll advert insertion, DASH HEAAC/AVC_HD_25 and MP4 HEAAC/AVC_HD_25 with in-band EBU-TT-D subtitles
org.hbbtv_HTML52090	HTML5 media element seek using Content-range header

**Package: HTML5\_2**

Test ID	Title
org.hbbtv_HTML50055	HTML5 video element and adaptively streamed A/V - CASD
org.hbbtv_HTML50120	HTML5 video element and playable_download content - registerDownloadURL
org.hbbtv_HTML50130	HTML5 video element and playable_download content - CADD
org.hbbtv_HTML50140	HTML5 video element and full_download content
org.hbbtv_HTML50250	HTML5 in XML capabilities
org.hbbtv_HTML50410	AudioTrack.kind with MPEG-2 TS - iso_639_language_descriptor
org.hbbtv_HTML50420	AudioTrack.kind with MPEG-2 TS - supplementary_audio_descriptor
org.hbbtv_HTML50430	AudioTrack.kind with MPEG-2 TS - e-ac3 audio descriptor
org.hbbtv_HTML50450	AudioTrack.language with MPEG2-TS - supplementary_audio_descriptor
org.hbbtv_HTML50615	AudioTrack.kind with MPEG DASH - captions
org.hbbtv_HTML50625	AudioTrack.kind with MPEG DASH - descriptions
org.hbbtv_HTML50635	AudioTrack.kind with MPEG DASH - main-desc
org.hbbtv_HTML50645	AudioTrack.kind with MPEG DASH - subtitles
org.hbbtv_HTML50730	VideoTrack.kind with MPEG DASH - alternative
org.hbbtv_HTML50740	VideoTrack.kind with MPEG DASH - captions
org.hbbtv_HTML50760	VideoTrack.kind with MPEG DASH - subtitle
org.hbbtv_HTML50800	TextTrack.id with MPEG-2 TS
org.hbbtv_HTML50840	TextTrack.language with MPEG-2 TS - teletext_descriptor

**Package: HTML5\_3**

Test ID	Title
org.hbbtv_HTML50060	HTML5 video element and downloaded content
org.hbbtv_HTML50070	HTML5 video and recorded content
org.hbbtv_HTML50170	enabling audio and video tracks as selected by the media player - preferred audio track in a downloaded media file
org.hbbtv_HTML50180	enabling audio and video tracks as selected by the media player - preferred audio track in a recording
org.hbbtv_HTML50230	HTML5 video element and downloaded content blocked by parental access control
org.hbbtv_HTML50240	HTML5 video element and recorded content blocked by parental access control
org.hbbtv_HTML51200	Graphics Performance 2 - Frame/background-color
org.hbbtv_HTML51210	Graphics Performance 2 - Frame/background-color, opacity
org.hbbtv_HTML51220	Graphics Performance 2 - Frame/left,top
org.hbbtv_HTML51230	Graphics Performance 2 - Frame/opacity
org.hbbtv_HTML51250	Graphics Performance 2 - Frame/transform: scale
org.hbbtv_HTML51280	Graphics Performance 2 - Frame/border-radius

org.hbbtv_HTML51290	Graphics Performance 2 - Frame/width,height
org.hbbtv_HTML51300	Graphics Performance 2 - Frame/linear-gradient
org.hbbtv_HTML51310	Graphics Performance 2 - Image/left,top
org.hbbtv_HTML51320	Graphics Performance 2 - Image/opacity
org.hbbtv_HTML51340	Graphics Performance 2 - Image/transform:scale
org.hbbtv_HTML51370	Graphics Performance 2 - Text/left,top
org.hbbtv_HTML51380	Graphics Performance 2 - Text/opacity
org.hbbtv_HTML51390	Graphics Performance 2 - Text/transform: rotate
org.hbbtv_HTML51400	Graphics Performance 2 - Text/transform: scale
org.hbbtv_HTML51410	Graphics Performance 2 - Text/transform: skew
org.hbbtv_HTML52000	Existence within DOM of one playing HTML5 media element together with two paused HTML5 media elements
org.hbbtv_HTML52010	Forced transition of HTML5 media element to paused state by another HTML5 media element
org.hbbtv_HTML52020	Deferred playing state of HTML5 media element when forcing transition of another HTML5 media element to paused state
org.hbbtv_HTML52030	HTML5 media element pause event and attribute when forced into paused state
org.hbbtv_HTML52090	HTML5 media element seek using Content-range header

### Annex 3: Documentation Provided

The following supporting documentation is relevant to all organisations considering responding to this RfP. HbbTV members may request this documentation immediately (this documentation is covered by the confidentiality clause in the Membership Agreement); non-members must first sign an NDA before the documentation will be made available.

- 1 Test Material Challenge Procedure V2
- 2 Test Specification for HbbTV Specification Version 1.3.1, V1.0
- 3 V2 Test Assertions (zip file)
- 4 HbbTV V2 Test Material Provider Agreement (Commercial)
- 5 Test Repository Access Agreement V2.0
- 6 Pricing Template spreadsheet
- 7 HbbTV Test Suite Distribution and License Agreement v2.1
- 8 Letter from Quadrille
- 9 Letter from BBC

## Annex 4: Testing Approach Considerations

This annex contains information on some of the issues involved with testing specific functional areas which may impact the approach taken by Suppliers when authoring the Test Materials.

### HTML5 and Associated Technologies

The graphics performance language in the HbbTV Specification is reverse engineered from a set of performance benchmark tests made available to the Open IPTV Forum by Orange. These can be found at <https://github.com/Orange-OpenSource/orangemark>. These benchmark programs are licensed under the following license:

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

It is up to the Supplier whether they re-use these benchmark programs to any extent.

### DRM in a CAM

The HbbTV Test Specification includes a requirement for a CI plus CAM. The module must be able to be programmed to signal a DRM mechanism.

### Access to CI+ File System

The HbbTV Test Specification includes a requirement for a CI plus CAM. The module must be able to be programmed to expose its file system.

### HbbTV app from CICAM

The HbbTV Test Specification includes a requirement for a CI plus CAM. The module must be able to be programmed to expose a number of different applications via its file system.

### Application and Content Synchronisation

The requirements in the HbbTV Specification relate to the timing of the point at which the video is composed with the graphics internally within the terminal and not the time of presentation to the viewer. Additionally there are no requirements on application performance so the time taken for the application to present the timing information to an external agent is undefined. The test cases will have to find a way to characterise or compensate for these latencies and clearly define how this relates to pass or fail conditions.

### TLS

The test cases for TLS will require use of a range of certificates from a range of certificate providers. Some of these have test servers available on the public internet. Some of these do not have test servers available and require someone to obtain a certificate from the certificate authority concerned. In the latter case, this may be the Supplier, the test harness provider, the test harness user or the HbbTV Association. The license conditions from some certificate authorities may preclude some of the above options. Suppliers are advised to propose more than one approach particularly if they propose one that entails a recurring fee paid either by the HbbTV Association or directly by HbbTV members.

Proposals may require the test harness to be extended to enable access to any public servers. Other extensions may be required for test cases requiring test conditions not available with these servers.

#### Launching a CS application

The test cases must cater for installing and launching companion applications on both iOS and Android platforms from the appropriate app store.

#### Application-to-Application Communications

Some test cases require the test harness to emulate up to 10 companion screen devices by making WebSocket connections to the terminal.

#### Remote launch of HbbTV apps

Some test cases require the test harness to be extended to communicate with the DIAL server in the terminal.

#### Discovery

Some test cases require the test harness to be extended to communicate with the DIAL server in the terminal.

#### Media Synchronisation – Inter-device

Some test cases require the test harness to be extended to implement the inter-device synchronisation protocols as defined by DVB by acting in the role of master or slave terminal. The test harness must be able to measure precise timing information regarding the presentation of audio and video by the terminal and relate this to the timing information provided by the network protocols. Network latency will affect how accurately this can be done. The test cases will have to find a way to characterise or compensate for these latencies and clearly define how this relates to pass or fail conditions.

#### Media Synchronisation – Multi-stream

Some test cases require the test harness to be extended to measure precise timing information regarding the presentation of audio, video and subtitles by the terminal.