



Request for proposals for the development and validation of HbbTV, MPEG-DASH and DRM reference application and content

The HbbTV Association invites proposals (the "**Proposals**") from potential suppliers ("**Suppliers**") for the development and validation of a reference application and content showing an HbbTV application playing back DRM-protected content delivered via MPEG-DASH as specified in the attached Request for Proposals (the "**RfP**").

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 in the format set out in Annex 1 of the RfP.

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 features or DRM systems.

Dated this 16th January 2017

Signed by

Klaus Illgner

(no signature – electronic delivery)

For and on behalf of the HbbTV Association

Attachment: RfP for Reference Application and Content for HbbTV, MPEG-DASH and DRM



**Request for proposals for the development and validation of
HbbTV, MPEG-DASH and DRM reference application and content**

Phases 1 and 2

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1. Scope of the RfP

Proposals are invited for the supply of a package showing playback by an HbbTV application of DRM-protected content delivered via MPEG-DASH as specified in Annex 2 to this RfP.

Proposals shall include:

- the creation of the reference application or modification of an existing application,
- the packaging of reference content to be played back by the reference application,
- the validation of the reference application and content on both new HbbTV terminals entering the market, on as large a proportion of the installed base of HbbTV terminals as possible and optionally on web browsers on non-TV related devices,
- the creation of documentation showing how HbbTV content providers may reproduce these results using their own content / workflow,
- the creation of documentation showing how HbbTV application developers may reproduce these results by integrating parts of the reference application into their own applications and processes,
- the creation of documentation identifying features of HbbTV, MPEG-DASH and DRM that would be expected to work in theory but do not work in practice (either at all or on enough of the installed base to be commercially viable in applications),
- cross-referencing the features of MPEG-DASH and the HbbTV APIs used by the reference application and content against the HbbTV Test Suite and other test suites for HbbTV+DRM to identify key features of the approach taken by the reference application and content that are not currently covered by those test suites,
- the maintenance and support of the delivered reference application, content and documentation during acceptance, during the warranty period and subsequently.

The proposal includes two phases: phase 1 that is applicable to both HbbTV 1.5 and 2.0 products and phase 2 that is only applicable to HbbTV 2.0 products. It also includes an option to have the application and content work on web browsers supporting W3C MSE and EME.

The reference application and content must be licensed on terms that (i) enable HbbTV Association to make it freely available to any party with an interest in developing applications for HbbTV, and including the members of the HbbTV Association and (ii) enable those parties to freely re-use it in whole or in part.

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

1.1 Deliverables

The package of deliverables shall comprise the following:

Phase 1

An HbbTV application and content according to the phase 1 functional requirements and the non-functional requirements (both of which are set forth in Annex 2) that has been validated to run on as large a proportion of the installed base of HbbTV terminals as possible.

Phase 2

An HbbTV application and content according to the phase 2 functional requirements and the non-functional requirements (both of which are set forth in Annex 2) that has been validated on new HbbTV 2 terminals entering the market.

1.2 Common deliverables for both phases

- a) Documentation and (if needed) tools enabling HbbTV application developers and content providers to apply the techniques used with the reference application and content with their own content and workflow such that their own content will play from their own server or CDN on the same proportion of the installed base of HbbTV terminals as the reference content. While Supplier may offer services to HbbTV application developers and content providers based on these deliverables, the package of deliverables must be sufficiently complete and clear that HbbTV application developers and content providers are able to use these deliverables successfully without any commercial relationship with Supplier.
- b) Documentation identifying features of HbbTV, MPEG-DASH and DRM that would be expected to work in theory but which, during the validation process, were found not to work in practice (either at all or on enough of the installed base to be commercially viable for applications). This documentation provided to HbbTV Association must not explicitly identify particular manufacturer's products or contain information that could in any way serve to identify particular manufacturer's products.
- c) Documentation cross-referencing the features of MPEG-DASH and the HbbTV APIs used by the reference application and content against the HbbTV Test Suite and other test suites for HbbTV+DRM. This documentation shall identify any or all key features of the approach taken by the reference application and content that are not currently covered by these test suites. These gaps shall be reported in sufficient detail to allow new tests to be created.

1.3 Deliverables for MSE-EME option

The application and content delivered in phase 1 and phase 2 should work fully with MSE and EME. Due to HbbTV Association's ongoing cooperation with DASH-IF, HbbTV Association has a mild preference for the reference application to use DASH.js but other DASH JavaScript player libraries can be considered if there are significant benefits. The following documentation deliverables are defined.

- a) If full operation of the reference application and content on MSE+EME cannot be achieved without compromising the proportion of the installed base of HbbTV terminals on which the reference application and content work then Supplier shall document the following;
 - (i) how much of the reference application and content operate with MSE+EME;
 - (ii) which characteristics of the reference application or content that are necessary to maximise the proportion of the installed base of HbbTV terminals on which the reference application and content work conflict with MSE+EME;
 - (iii) how much the proportion of the installed base of HbbTV terminals on which the reference application and content work would be compromised in order to achieve full operation of the application and content with MSE+EME;
 - (iv) Their recommendation for how this situation could be improved in the future (specification changes, test suite changes, fixed bugs, etc.).
- b) If Supplier needs to make any changes to the DASH JavaScript player library they are using then Supplier is responsible for submitting a proposal to the relevant issue tracking system and providing HbbTV Association with a reference to this. If a maintainer of the DASH JavaScript player library constructively engages with Supplier before the end of the contract then supplier shall work with them to get the change (or an equivalent) included in the master / trunk during this period. If Supplier is using DASH.js then HbbTV Association will make reasonable efforts to encourage DASH-IF to constructively engage with Supplier.
- c) If Supplier identifies bugs with a browser's MSE or EME implementation then Supplier is responsible for reporting these to the relevant issue tracking system and providing HbbTV Association with a reference to this. If the browser developer constructively engages with Supplier before the end of the contract then Supplier shall help the browser developer reproduce the bug and test any fix provided during this period.

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 <info@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

2.3 Further information

Contract, administrative and technical queries should be sent to the <info@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 the creation of the reference application, content, tools and documentation is a fixed payment although HbbTV Association is open to other payment models as well.

Supplier shall provide prices for phase 1 only and for both phase 1 and phase 2, both with and without the MSE-EME option, i.e. a total of 4 combinations.

HbbTV Association recognises that there is an element of risk in the validation of the application and content on the installed base of HbbTV terminals. Suppliers should quote both a fixed payment for this and a proposal that shares the risk of this between themselves and HbbTV Association.

Prices quoted shall include coverage for warranty as well as the participation in an HbbTV Association sponsored interop event (see sections 3.6 and 3.7).

Supplier shall provide separate pricing and terms for support and maintenance (see section 3.8 **Error! Reference source not found.**).

Supplier shall provide separate pricing for the recurring element of maintaining and operating DRM license servers (see section 3.9).

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

3.3 Approach to validation of application and content on the installed base

The key value of this package for HbbTV Association is the validation of the reference application and content on the installed base of HbbTV products in the market and the documentation and tools enabling content providers to reproduce this with their own content and applications. Accordingly the means by which Supplier proposes to achieve this and demonstrate that they have achieved it is a critical factor for HbbTV Association.

HbbTV Association will encourage members to test the application and content on receivers as part of the acceptance process for the application; however this is voluntary and may not be relied upon by Supplier. Even where a manufacturer does run the application on their products, they may no longer have examples of some of their initial products in the market that support HbbTV 1.5 and DRM. Supplier shall engage constructively with all manufacturers who engage constructively with them.

Supplier shall document their proposed approach to this validation addressing the following points and any other points that would differentiate them from others, amongst which:

- How Supplier proposes to access examples of the products in the market
- Information concerning products in the market known to the Supplier from previous projects or developments
- Partnerships between the Supplier and other parties who would be able to support Supplier in this validation
- How Supplier proposes to demonstrate that they have achieved the validation.

3.4 Schedule

The following major milestones are defined for each phase of the project;

Milestones	Commentary	Initial acceptance period	Payment after initial acceptance
1. Initial delivery of reference application and content before validation against deployed terminals.	A delivery suitable for interested HbbTV members to review including running on both deployed and new terminals.	4 weeks	10%
2. Delivery of reference application and content after validation against deployed terminals	A delivery suitable for wide review by HbbTV members.	8 weeks	30%
3. Delivery of updated reference application, reference content, supporting tools and documentation.	A delivery including the reference application, reference content and all documentation suitable for interested HbbTV members to reproduce the process defined by Supplier with their own content and have it play back on the same proportion of the installed base as achieved by Supplier. The reference application and content should be updated to address feedback received on the delivery of milestone 2.	4 weeks	20%

Supplier should provide a schedule including at least these milestones for both phase 1 and phase 2 as defined in Annex 2. It is preferred that the development of the features required for phase 2 be done in parallel with work on phase 1 and not deferred until phase 1 is completed.

For each of the milestones identified above, HbbTV Association will carry out initial acceptance testing within the initial acceptance period (as indicated in the table above) starting from the actual date of each delivery. If HbbTV Association rejects the delivery, it shall notify Supplier of such rejection and Supplier must fix any errors notified to it and re-submit what was rejected. Upon re-submission HbbTV Association will recommence initial acceptance testing which it will carry out within the initial acceptance period (as indicated in the table above) starting from the actual date of re-submission. Initial acceptance of any delivery shall be notified to Supplier by HbbTV Association once HbbTV Association has completed initial acceptance testing. In the event that no such notification is made to Supplier within the initial

acceptance period (as indicated in the table above) following the delivery or re-submission of the delivery, then initial acceptance of the delivery shall be deemed to have taken place.

The HbbTV Association will carry out full acceptance testing of the milestone 3 delivery for each phase within 12 weeks of the actual date of delivery. If HbbTV Association rejects the delivery, it shall notify Supplier of such rejection and Supplier must fix any errors notified to it and re-submit what was rejected. Upon re-submission HbbTV Association will recommence full acceptance testing which it will carry out within 12 weeks of the actual date of re-submission. Final acceptance of any delivery shall be notified to Supplier by HbbTV Association once HbbTV Association has completed final acceptance testing. In the event that no such notification is made to Supplier within a period expiring 12 weeks following the delivery or re-submission of the delivery, then final acceptance of the delivery shall be deemed to have taken place and Supplier may invoice the remainder.

HbbTV Association reserves the right, as part of the full acceptance testing, to commission an independent application developer to attempt to apply the techniques as documented in the reference application and content and confirm that they can achieve acceptable playback of DRM protected content via DASH from an HbbTV application working on the same proportion of the installed base as Supplier.

3.5 General expertise

Developing this reference demonstration application, content and documentation will require specialised expertise in MPEG-DASH and DRM. Proposals shall identify what, if any, expertise the Supplier has related to these subjects. If the Supplier does not yet have the needed expertise, then Proposals shall identify how the Supplier would address this (e.g. hire, sub-contract, partner) including the lead time expected to put those arrangements in place.

HbbTV Association 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 Association (or company members representing HbbTV Association) 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 application / content creation, warranty and maintenance.

3.6 Warranty

HbbTV Association requires a 12 months warranty period starting from the submission date of the invoice relating to the final delivery. Suppliers shall provide

without delay any updates to the application and/or content and/or documentation if errors are found.

Suppliers shall indicate in their Proposal what is covered by the warranty.

3.7 Additional duties of Suppliers

Any technology or information that needs to be licensed from DRM providers in order to develop the application is the responsibility of Supplier. It is not practical for HbbTV Association to be a party to confidentiality agreements with DRM providers.

The process of validating the reference application and content on the installed base of HbbTV products will result in Supplier identifying issues with those products. Supplier is responsible for discussing these issues directly with the manufacturer of the products concerned. If Supplier is unable to find contact names then HbbTV may be able to assist with this but cannot be a party in the handling of such issues themselves.

Supplier shall bring the reference application and content to at least one of the HbbTV Interoperability Workshops held at IRT in Munich. For reference, the dates currently planned for these in 2017 are the following:

29./30.03.2017

19./20.07.2017

22./23.11.2017

Supplier shall attend the 2017 annual HbbTV symposium to present and demonstrate the reference application and content. The Supplier would be responsible for provision of equipment and travel expenses for the demonstration. The symposium will be in a European city in October. This will not give Supplier any privileges provided to Symposium sponsors. Supplier will be free to take up symposium sponsorship packages.

If it becomes apparent either before or during the validation process that reaching as large a proportion of the installed base of HbbTV terminals as possible causes the application or DASH content to exceed the requirements of the HbbTV specification or referenced specifications then this shall be escalated to HbbTV Association at the earliest reasonable opportunity. It is accepted that this may be the only way of achieving the objective of reaching the largest possible number of deployed terminals.

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 the reference application, content and supporting

documentation. Suppliers will be expected to respond to questions concerning the package.

3.9 DRM requirements

In order to fulfil the requirement for the reference application and content to work on as large a proportion of the installed base of HbbTV terminals as possible, the reference application and content must work with the DRM systems referenced in Annex 3.

Regardless of the presence of a particular DRM system in the installed base of terminals, Supplier shall engage constructively with any DRM provider whose system is used with HbbTV and DASH and who is prepared to engage constructively with Supplier. DRM providers that have indicated they will support this activity are listed in Annex 3.

Supplier is responsible for all details related to the installation, configuration and operation of the DRM license servers needed for the reference application. HbbTV Association expects that these are located in the cloud.

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 and validate the reference application.

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,
 - the proposed approach by the Supplier to the validation of the reference application and content on as large a proportion of the installed base of HbbTV terminals as possible.
- The significant factors for the commercial/business review are
 - the perceived ability and track record of the Supplier,

- how the Supplier proposes to manage the risk associated with validating the reference application and content as large a proportion of the installed base of HbbTV terminals as possible.
- the proposed delivery schedule,
- the price and the maintenance commitments for the reference application and content after it has been released.

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

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 a modified scope;
- f) Provisionally appoint any number of Suppliers and complete more than one agreement with any one Supplier relating to different phases and to complete agreements at different times; and
- g) Select no Proposals at all.

4.3 Negotiation and execution of agreements

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.

4.4 Rejected 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 reference application, content and documentation must be licensed on terms that (i) enable HbbTV Association to make them freely available to any party with an interest in developing applications for HbbTV, including to the members of the HbbTV Association, (ii) enable those parties to freely re-use it in whole or in part as part of their commercial activities (including the right to modify it) and (iii) enable HbbTV to modify or have modified any part of it.

If any part of the reference application or content 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 the reference application or related tools contain open source components, this must be disclosed in the Proposal.

Any tools that had to be created for the content encoding / packaging / preparation process must come with source code under a suitable license to permit re-use in whole or in part as appropriate.

6. Exclusion of liability / costs

The HbbTV Association has prepared this RfP in good faith with a particular interest for swift and cooperative progress in the development of the reference application. 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 to 12 will only be shared with members who have been specifically tasked with considering the Proposals and will not be shared more widely.

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. Reference application to be supplied
 - 3.1. Features included within the reference application
 - 3.2. Expected source of the application (e.g. open source, 3rd party, created by Supplier for the purpose of this RfP, re-use of existing application) with details.
 - 3.3. License(s) to be used for reference application
 - 3.4. MSE-EME option
DASH JavaScript player library to be used
4. Content preparation, packaging and serving
 - 4.1. Tools that the Supplier intends to use for content preparation and packaging
 - 4.2. Tools that the Supplier expects to need to create for the purposes of this RfP
 - 4.3. Video and audio and subtitle content to be used by the reference application
 - 4.4. Any necessary tools or utilities not mentioned elsewhere that are not widely and generally available in the industry
 - 4.5. License(s) to be used for any tools or utilities that would be needed by a content provider to re-use the reference application and which are not widely and generally available in the industry
5. DRM
 - 5.1. Listing of DRM systems that Supplier has already worked with and/or has necessary agreements in place to be able to work with
 - 5.2. Proposal for how DRM license servers are to be provided and maintained
 - 5.3. MSE-EME option
DRM system(s) to be used with EME
6. Validation
 - 6.1. Description of how Supplier proposes to validate that the reference application and content works on new HbbTV terminals entering the market
 - 6.2. Description of how Supplier proposes to validate that the reference application and content works on as large a proportion of the installed base of HbbTV terminals as reasonably possible
 - 6.3. Description of how Supplier proposes to demonstrate that they have achieved 6.2.

7. Deviations from the RfP
 - 7.1. Specific deviations
8. Supplier's Project Personnel
 - 8.1. List of Project Members and contact information
 - 8.2. Background, Experience and Skill Sets of Project Members
 - 8.3. Source of specialised or scarce expertise
9. Schedule for deliverables
10. Supplier Information
 - 10.1. Corporate Information
 - 10.2. References
 - 10.3. Other relevant involvement – HbbTV applications, MPEG-DASH, OTT video with DRM
 - 10.4. QA processes
 - 10.5. Contact Information
11. Payments and terms & conditions
 - 11.1. Prices and terms & conditions relating to Pricing, Pricing models, warranty
 - 11.2. Support and maintenance prices and terms
 - 11.3. Any other costs
12. Supporting confidential information

Each section should start on a new page.

Section 122 should only be used for material that is clearly confidential. Use of section 122 for material that needs to be assessed by the HbbTV membership outside the small group of volunteers evaluating the responses may damage the chances of the Proposal being accepted.

Annex 2: Reference application and content requirements

Phase 1 Functional Requirements

The application must contain the features expected of a real-world catch-up or VoD application. As an example of this, please consider the Smart TV Alliance sample application - <https://developers.smarttv-alliance.org/sdk-documentation-and-sample-code> (download “Smart TV Alliance SDK Sample Application v1.0”).

The reference application shall:

- Present a list of content items to the user, annotated whether the content can be played and/or recorded according to the associated APIs.
 - At least one reference content item shall fall into each category.
- Allow the user to play the reference content with each supported DRM.
 - The A/V Control object shall be used on HbbTV terminals supporting up to HbbTV v1.5 and the HTML5 video element shall be used on terminals supporting HbbTV v2.0 or higher.
- Include content items with several different license terms.
- Provide simple trick mode controls (play/pause and seek).
- Be easy to extend with additional reference content and/or additional DRMs.
- Clearly annotate those sections which deviate from standard HbbTV where required by terminals already in the market or by specific DRMs.
 - This is to allow application authors to decide whether or not to include them in their own application.
- Be written in such a way to allow an application author to determine the structure and purpose of each functional area allowing them to easily understand the code and to “pick & choose” which parts of the application to copy.

The reference MPEG-DASH content shall:

- Be encrypted once using MPEG common encryption with a documented key such that it can be decrypted by multiple DRM solutions.
- Focus on video and audio codecs that are mandatory in HbbTV terminals but also include one stream that is HEVC-UHD accepting that this will only work on a small proportion of the installed base.

Phase 2 Functional Requirements

When run on an HbbTV 2.0.1 terminal, the reference application must exercise the following:

- the advert insertion mechanisms defined in HbbTV 2.0.1. The adverts must be unencrypted.
- TTML subtitles delivered “in-band” (see clause 7.3.1.5.1 of HbbTV and clause 7.1.1 of DVB-DASH) and their synchronisation to encrypted video and audio
- TTML subtitles delivered “out of band” (see clause 7.3.1.5.1 of HbbTV) and their synchronisation to encrypted video and audio

- Delivery of DataCue (as defined in clause 9.3.2.2 of HbbTV) corresponding to event streams included in encrypted Representations using an InbandEventStream (see clauses 9.1.3 of DVB-DASH and 5.10.3 of MPEG DASH).

Requirements for MSE-EME option

As well as running on HbbTV 1.5 and 2.0.1 terminals, the reference application should be able to run in web browsers supporting W3C MSE and EME and present the same reference content. All features of the reference application should work.

For the DRM system to use with EME, HbbTV is prepared to consider both options that add extra costs for DRM license server(s) and options that do not add such costs but are less commercially relevant.

Non-functional requirements

The application must be suitable for broadcasters and application developers to use as a starting point for commercial applications and services. HbbTV Association requires a functional, working application and is not interested in UI design and development.

The application must be structured so that content providers who already have an HTML VoD application can easily extract the logic related to DASH and DRM for use in those pre-existing applications.

The reference content from the package shall be suitable for users of the package to install on a server under their own control. Supplier may provide a hosted version of the reference content but use of this shall not be required in order to review or use the package.

Potential future requirements

The following are potential future requirements. When designing and implementing the application, Supplier should make reasonable best efforts to avoid design or implementation choices that would mean significant re-working should HbbTV Association choose to commission a phase 3 including some or all of these requirements.

- The application must be scalable to add additional DRM systems in the future.
- MSE-EME (if HbbTV Association does not opt to take the MSE-EME option in this RfP)
- The application acting as the master for inter-device synchronisation as defined in clause 13.2.3 of HbbTV

Annex 3: DRM Systems

DRM systems publicly known to be deployed with DASH in the installed base of HbbTV Terminals

Microsoft PlayReady as referenced in the following publicly available documents:

- “TNT 2.0 Terminal Specification July 9th, 2012 Version 1.1” and other national specifications.
NOTE: available at <http://www.hdforum.fr/sites/default/files/tnt-2-0-terminal-specification-v1-1.pdf>
- Foro Técnico de la televisión digital Especificación de receptores de televisión digital terrestre para aplicaciones interactivas. Versión 1.1.0
NOTE: available at http://www.televisiondigital.gob.es/TDT/ForoTecnico/GrupoReceptores/ReceptoresTDT_interactivos.pdf
- HbbTV Forum Nederland “Specification for use of HbbTV in the Netherlands” Version 1.0
NOTE: available at http://hbbtv.nu/wp-content/uploads/2013/06/130501_Approved_HbbNL_Spec_1.0.pdf
- Unified Requirements of DVB-C and DVB-T2 digital receivers for the Finnish market Version 4.0 2016-10-28
NOTE: available at http://www.testatutlaitteet.fi/linked/fi/Finnish_Unified_IRD_Specifications_Ver_4.0.pdf
- Freeview Play — Technical Specification 2017 Profile Version: 2.1.2
NOTE: available at http://www.digitaluk.co.uk/_data/assets/pdf_file/0007/88774/Freeview_Play_Technical_Specification_v2-1-2_web.pdf

Marlin as referenced in the following publicly available documents;

- “TNT 2.0 Terminal Specification July 9th, 2012 Version 1.1” and other national specifications.
NOTE: available at <http://www.hdforum.fr/sites/default/files/tnt-2-0-terminal-specification-v1-1.pdf>
- Foro Técnico de la televisión digital Especificación de receptores de televisión digital terrestre para aplicaciones interactivas. Versión 1.1.0
NOTE: available at http://www.televisiondigital.gob.es/TDT/ForoTecnico/GrupoReceptores/ReceptoresTDT_interactivos.pdf
- HbbTV Forum Nederland “Specification for use of HbbTV in the Netherlands” Version 1.0
NOTE: available at http://hbbtv.nu/wp-content/uploads/2013/06/130501_Approved_HbbNL_Spec_1.0.pdf

DRM Systems where the provider has indicated support for this activity

The following DRM system providers have indicated support for this activity.



- Intertrust
- Nagra for “NAGRA PRM”

HbbTV Association can relay questions to these DRM system providers if needed to prepare a response to this RfP.