



**sofiadigital**

Powering Smart Screens

**DASH-DRM Reference Application**

HbbTV Symposium, Rome 18<sup>th</sup> October 2017

# Background

- Interoperability concerning different DRM implementations, DASH profiles and video formats has been a long-standing issue in real-world HbbTV implementations and terminals
- IITF recognized this problem and authorized a new project tackling this problem
- A new open source application and tools + instructions along with it would be provided for all interested parties
- Sofia Digital was selected to deliver this application

# Design targets

- Open source (available in GitHub)
- Easy to understand
- Modular
- Adaptive
- Well-documented
- Well-tested and anonymized test results publicly available
  - Manufacturer specific results released individually to each manufacturer
- Support for all existing and future HbbTV Terminals (1.5 – 2.0.1 - beyond)
- Reduce time-to-market for new DASH/DRM/HbbTV apps and avoid solving the same problems over and over again by providing a common platform for anyone to adapt

# Main features

- Adaptive video resolutions from 640x480 to 3840 x 2160 (DASH)
- Playready DRM
- Marlin DRM
- HbbTV 1.5 (OIPF), HbbTV 2.0 (HTML5) and MSE-EME (**Edge**, Xbox, other PC browsers) players
- DataCues, DASH Events, Subtitles both in-band and out-of-band
- Clear User interface and easily adapted to any 3<sup>rd</sup> party project
- Easy configuration using simple JSON format (we have also an editor for this)
- Tools section for creating suitable test materials

# Appearance

The screenshot displays the HbbTV DASH-DRM Reference Application interface. At the top left is the logo for HbbTV DASH-DRM REFERENCE APPLICATION. The top navigation bar includes the following items: **NoDRM** (highlighted with an orange underline), PlayReady, Marlin, and Settings. The main content area is a grid of six options:

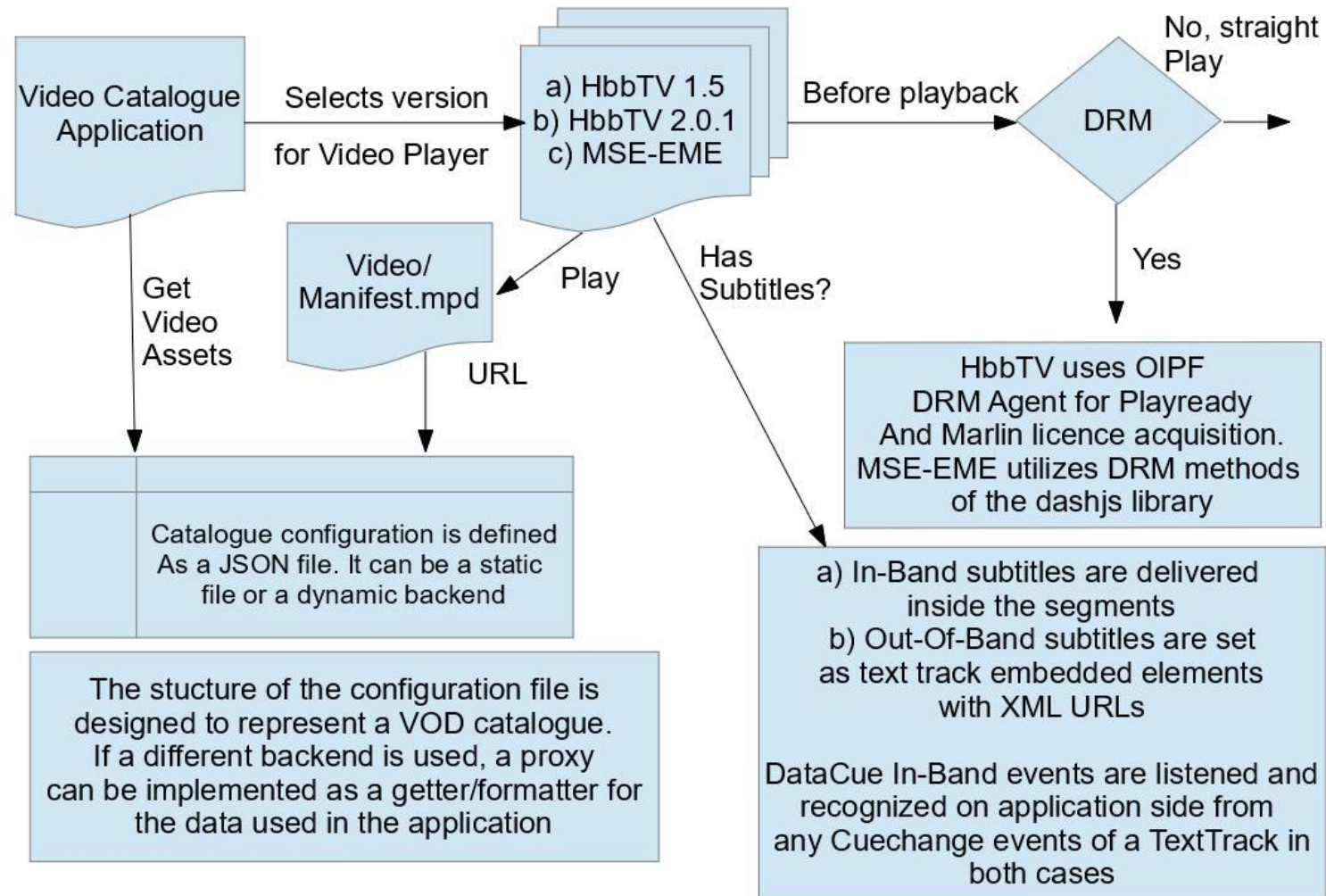
- 1080p**: Tears of Steel AVC 1080p
- VIDEO + SUBTITLE**: In-band subtitles
- 2160p**: Llama Drama HEVC 2160p
- AD**: Linear AD Insertion
- SUBTITLE + VIDEO**: Out of band subtitles
- VIDEO + EVENT** (with a timer **00:12:15**): In-band events

On the right side, there is a vertical list of three content thumbnails:

- Tears of Steel
- Llama Drama H
- Out of band

At the bottom left, the Sofiadigital logo is present with the tagline "Powering Smart Screens".

# Technical diagram



# Content generation tool (dasher)

- <https://github.com/HbbTV-Association/ReferenceApplication/tree/master/tools>
  - Transcodes input file to one or more resolution/bitrate stream
  - Creates DASH init.mp4, segment.m4s and manifest.mpd files (NoDRM)
  - Creates image.jpg thumbnail images
  - Encrypts DASH files (MultiDRM)
- Dasher is internally using widely recognized opensource tools
  - ffmpeg for transcoding and thumbnail image
  - mp4box for encryption and dash packager
- GitHub tools contain also
  - example script for Microsoft DRM test server url
  - example script for Intertrust ExpressPlay DRM server
  - inserter for mp4 EMMSG message object (in-band events)

# How to use and help?

- Check the current live version:  
<http://meridian.sofiadigital.fi/referenceapp/src/catalogue/>
- Get the code and assets: <https://github.com/HbbTV-Association/ReferenceApplication>
- Report issues: <https://github.com/HbbTV-Association/ReferenceApplication/issues>
- Fork or contribute as you please!
- Drop us an email or tweet 😊



# Lessons learned

- Combination of DASH & DRM is surprisingly hard to implement across a wide variety of devices
- DataCue, out-of and in-band subtitles in DASH are still fairly early technologies and specifications can lead to differing implementations
- DASH-IF reference player was of great help in tackling the MSE-EME implementation
- Collaboration between manufacturers and supplier (us) has been productive already, but there is lots to improve and it is still early days for this activity. It is nice to know that this knowledge gained during the exchange of information has been put to general use.
- DASH and DRM packaging should not be a black magic known only by few and be possible with expensive application license deals. Freely available GitHub tools project should be enough.
- And don't forget, we didn't even tackle LIVE DASH yet! 😊



WITH **PASSION AND**  
**PRECISION** FROM  
FINLAND

CODE FROM FINLAND

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