

Fraunhofer FOKUS Institute for Open Communication Systems

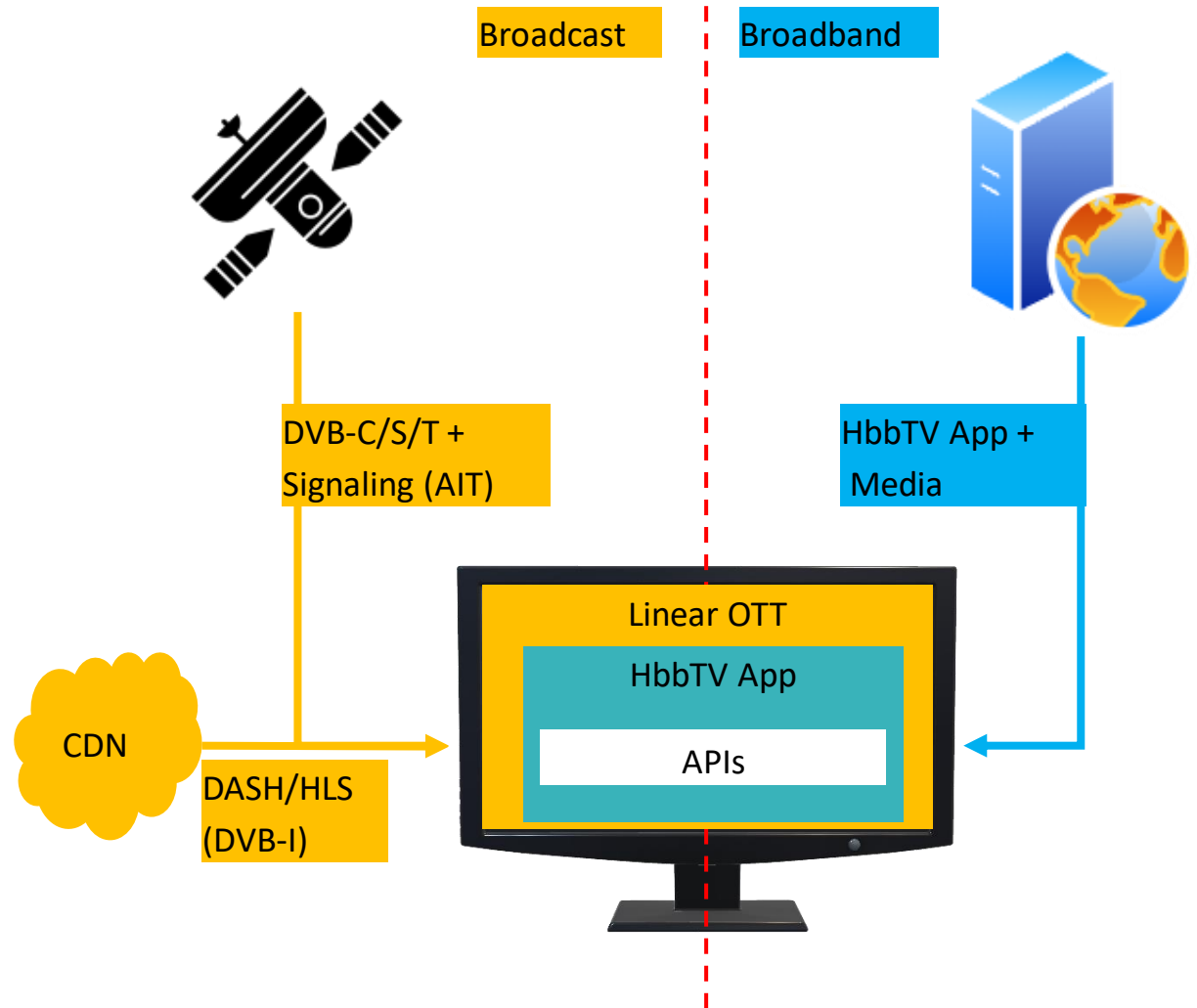
Integrating DVB-I with HbbTV

Dr. Louay Bassbouss | louay.bassbouss@fokus.fraunhofer.de | 10th HbbTV Symposium and Awards | Prague

Integrating DVB-I with HbbTV

Enabling HbbTV for OTT

- HbbTV services like VoD, Catch-up TV, replay TV, start-over, Program Guide, Targeted/Interactive advertising are provided by many broadcasters to enrich broadcast TV with interactive services over broadband
- DVB Broadcast is not the only way to deliver linear TV services. Unicast delivery over OTT is also relevant as well
- Why not to activate HbbTV for OTT, ideally without developing different HbbTV Apps for broadcast and OTT



Integrating DVB-I with HbbTV

HbbTV Lib for Android TV

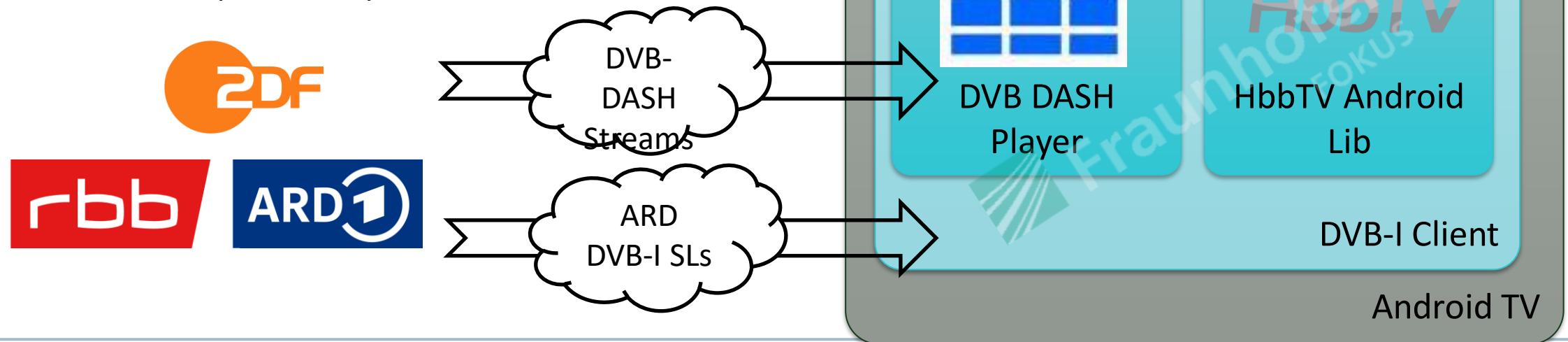
- HbbTV is enabled for DVB Broadcast services but support for OTT linear TV services is still missing/limited
- The HbbTV Android Library by Fraunhofer FOKUS provides a solution to close this gap:
 - Lightweight library built on top Android WebView
 - Support of existing HbbTV Apps without changes
 - Abstracts from underlying streaming formats of OTT channels
 - Support of latest HTML5, CSS features and JavaScript APIs
 - Full control of the lifecycle of HbbTV applications via easy-to-use APIs
 - Highly customizable Remote Control Key Handling and support of virtual/onscreen keys
 - Support of DVB-DASH for live and on-demand. Low Latency DASH is supported as well
 - Already in production by many OTT streaming providers

https://www.fokus.fraunhofer.de/en/solution/fokus/fame/hbbtv_library_2022_03



Connecting HbbTV Lib to DVB-I Services


- The DVB-I standard defines a mechanism to discover Service Lists and retrieve EPG over internet, for any service coming either through broadband (based on DVB-DASH) or broadcast networks.
- Particularly, DVB-I offers a standardized way to signal AIT/HbbTV Applications
- ARD/RBB and Fraunhofer FOKUS demonstrated this capability using ARD/RBB DVB-I ServiceLists which include ServiceInstances with AIT/HbbTV App Signalling
- For this purpose, the HbbTV Android Lib is integrated in the Android DVB-I Client provided by Fraunhofer FOKUS



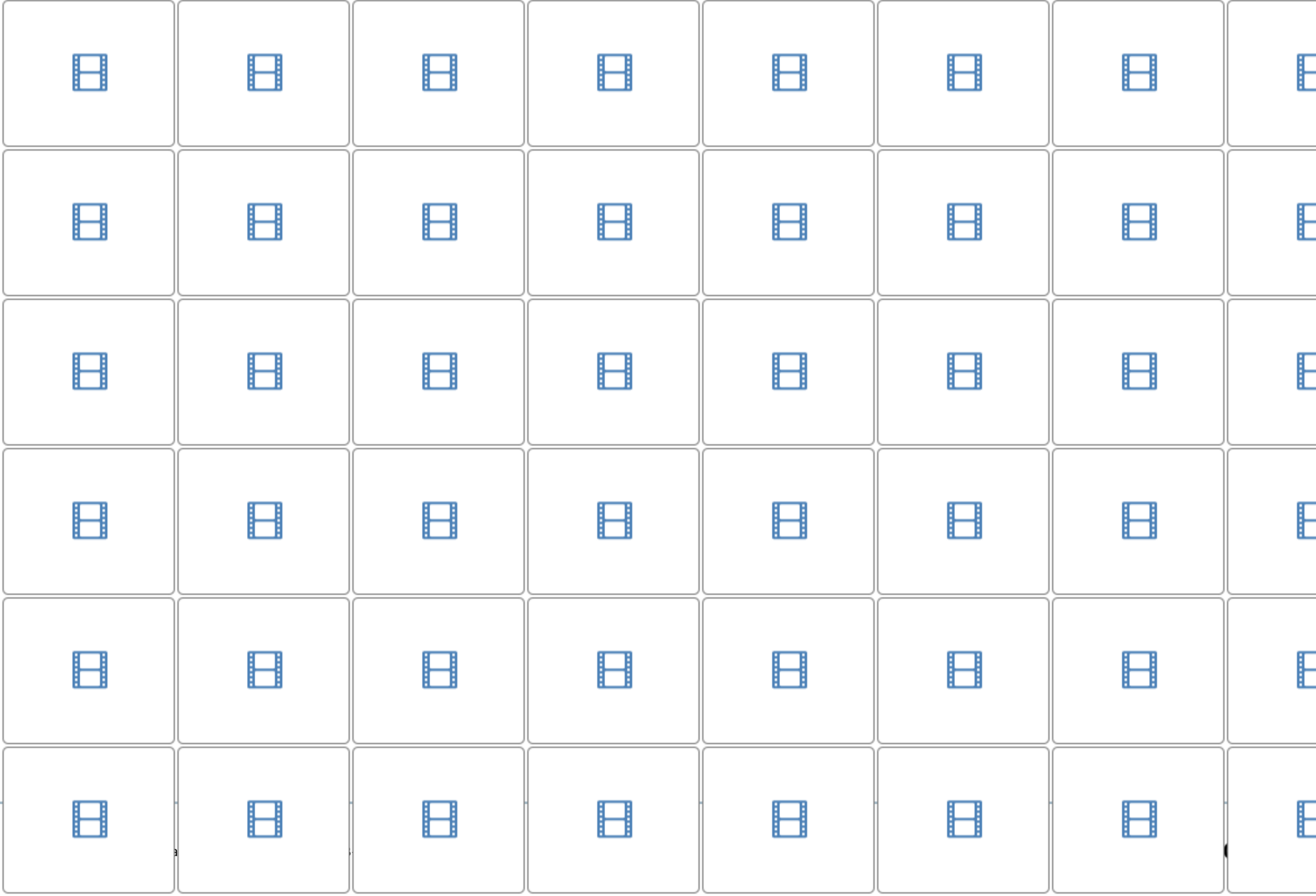
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Example DVB-I Service with AIT/HbbTV App Signaling

```
-<Service version="1">
  <UniqueIdentifier>tag.mitxp.com,2021:1.1019.10302</UniqueIdentifier>
  -<ServiceInstance priority="1">
    -<DASHDeliveryParameters>
      -<UriBasedLocation contentType="application/dash+xml">
        -<URI>
          https://arteliveext.akamaized.net/dash/live/2031004/artelive_de/dash.mpd
        </URI>
      </UriBasedLocation>
    </DASHDeliveryParameters>
  </ServiceInstance>
  -<ServiceInstance priority="2">
    -<DVBSDeliveryParameters>
      <DVBTriplet origNetId="1" serviceId="10302" tsId="1019"/>
    </DVBSDeliveryParameters>
  </ServiceInstance>
  <ServiceName>arte HD</ServiceName>
  <ProviderName>ARD</ProviderName>
  -<RelatedMaterial>
    <HowRelated href="urn:dvb:metadata:cs:HowRelatedCS:2020:1001.2"/>
    -<MediaLocator>
      <tva:MediaUri contentType="image/png">http://itv.ard.de/ardstart/img/services/28724.png</tva:MediaUri>
    </MediaLocator>
  </RelatedMaterial>
  -<RelatedMaterial>
    <HowRelated href="urn:dvb:metadata:cs:LinkedApplicationCS:2019:1.1"/>
    -<MediaLocator>
      <tva:MediaUri contentType="application/vnd.dvb.ait+xml">https://itv-api.ard.de/xml.aitx?sid=28724</tva:MediaUri>
    </MediaLocator>
  </RelatedMaterial>
  <ServiceType href="urn:dvb:metadata:cs:ServiceTypeCS:2019:linear"/>
  <ContentGuideSourceRef>iSIMS</ContentGuideSourceRef>
  <ContentGuideServiceRef>eit1.1019.10302</ContentGuideServiceRef>
</Service>
```

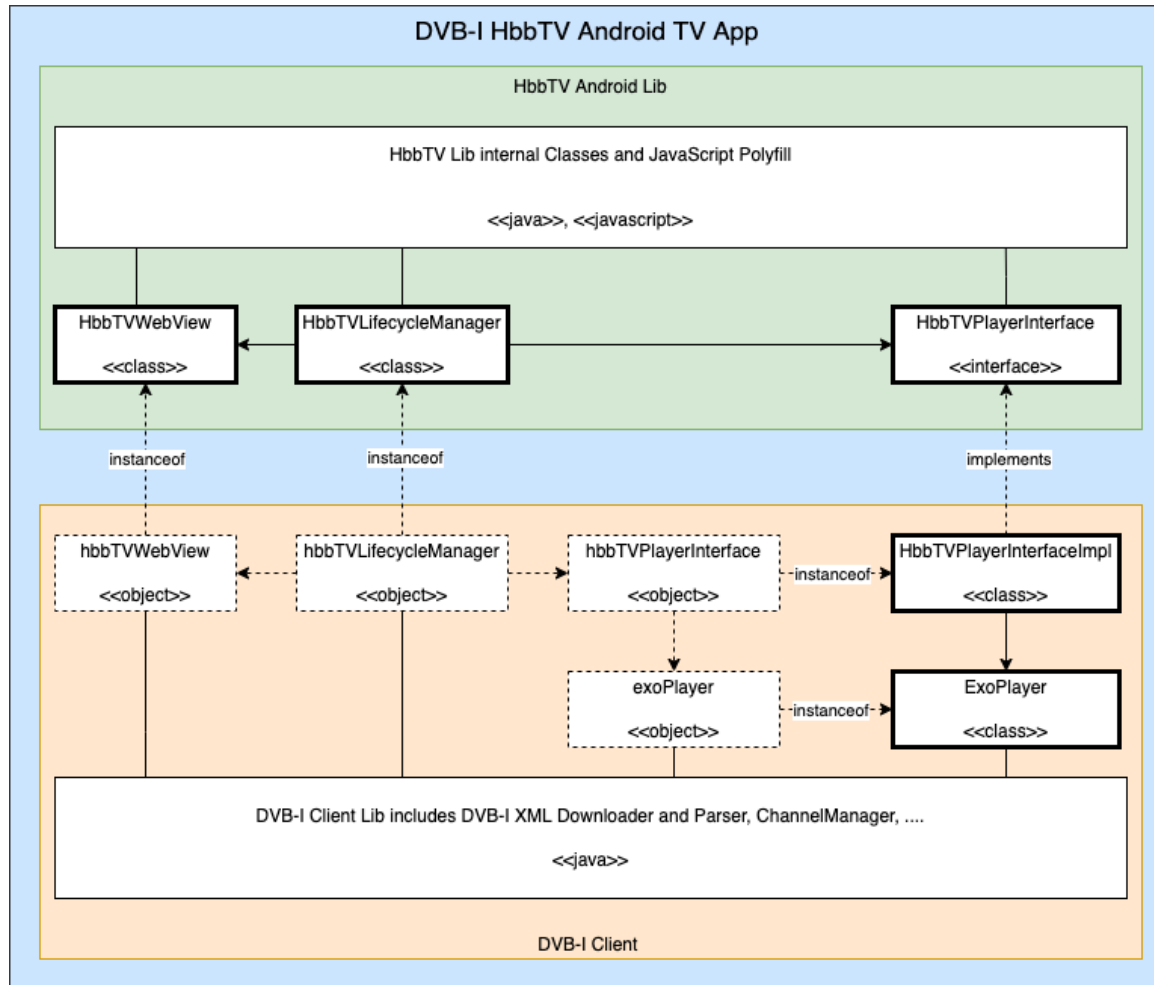


```
-<mhp:Application>
  <mhp:appName Language="deu">ARD Startleiste</mhp:appName>
  -<mhp:applicationIdentifier>
    <mhp:orgId>19</mhp:orgId>
    <mhp:appId>1</mhp:appId>
  </mhp:applicationIdentifier>
  -<mhp:applicationDescriptor>
    -<mhp:type>
      <mhp:OtherApp>application/vnd.hbbtv.xhtml+xml</mhp:OtherApp>
    </mhp:type>
    <mhp:controlCode>AUTOSTART</mhp:controlCode>
    <mhp:visibility>VISIBLE_ALL</mhp:visibility>
    <mhp:serviceBound>true</mhp:serviceBound>
    <mhp:priority>5</mhp:priority>
    <mhp:version>00</mhp:version>
  </mhp:applicationDescriptor>
  -<mhp:mhpVersion>
    <mhp:profile>0</mhp:profile>
    <mhp:versionMajor>1</mhp:versionMajor>
    <mhp:versionMinor>1</mhp:versionMinor>
    <mhp:versionMicro>1</mhp:versionMicro>
  </mhp:mhpVersion>
  </mhp:applicationDescriptor>
  -<mhp:applicationTransport xsi:type="mhp:HTTPTransportType">
    <mhp:URLBase>http://itv.ard.de/ardstart/</mhp:URLBase>
  </mhp:applicationTransport>
  <mhp:applicationLocation>index.php?overridech=1.1051.28724&sevent=1</mhp:applicationLocation>
</mhp:Application>
```



Integrating DVB-I with HbbTV

HbbTV + DVB-I Architecture



DVB-I HbbTV Android App Components:

- **DVB-I Client:** handles DVB-I Service Discovery, Downloading and parsing DVB-I ServiceLists, ServiceInstances, and fetching AIT XML including HbbTV App signalling information
- **DASH Player:** player for DVB-I DASH Services using ExoPlayer
- **HbbTV Lib:** launches HbbTV Apps of DVB-I Channels with AIT/HbbTV App Signalling information

Integrating DVB-I with HbbTV

We are part of the German DVB-I Project/Pilot

- 19 organizations from the media industry, including broadcasters, device manufacturers, software providers and research companies are participating in the pilot. → Goal to evaluate DVB-I on a national scale.
- Fraunhofer FOKUS participation focuses on Integrating DVB-I with HbbTV.



→ More details about the German DVB-I project will be provided by Rainer Biehn in the HbbTV Services Review panel (tomorrow 10:10 - 11:15)

Source: <https://dvb.org/news/major-pilot-of-dvb-i-launched-in-germany/>

Integrating DVB-I with HbbTV

Challenges

- Most OTT streaming boxes offer a remote control with limited buttons (navigation buttons, Ok, Back), while most HbbTV apps rely on a remote control with a full key set, especially the colour keys including the red button.
- OTT streaming apps offer features such as time shift, replay, pause of the linear stream that may conflict with the functionalities implemented in HbbTV App. This can be confusing for the consumer.
- Mapping of signalling in OTT Streaming and Broadcast (e.g. DVB StreamEvents vs. DASH EventStreams).



Contact



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