DVB-I Reference Tools

latest updates and future plans

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Background

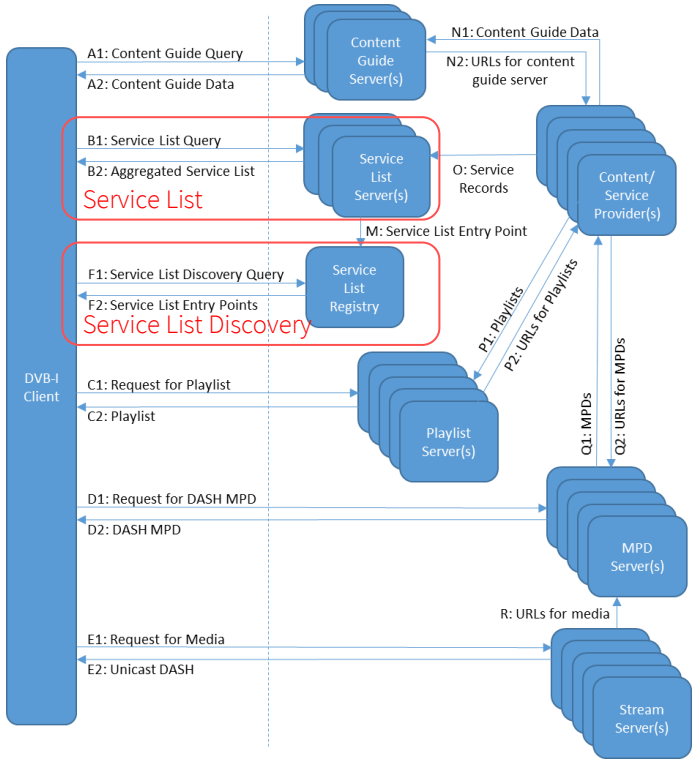
- DVB develops both industry specifications and tools to support market deployment of those specifications
- Tools are an essential component for a DVB Bluebook specification to be promoted to an ETSI standard.
- DVB-I Reference Tools support the development activities and industry operations in a maturing DVB-I based ecosystem

DVB-I Resources

- Relevant specifications
  - A177r5, Service Discovery and Programme Metadata for DVB-I
  - A168r6, DVB MPEG-DASH Profile for Transport of ISO BMFF Based DVB Services over IP Based Networks
  - A184, Implementation Guidelines for DVB-I
- DVB-I website collecting all the available resources to one place
- DVB-I Forum on Discord for informal discussions, feedback and news

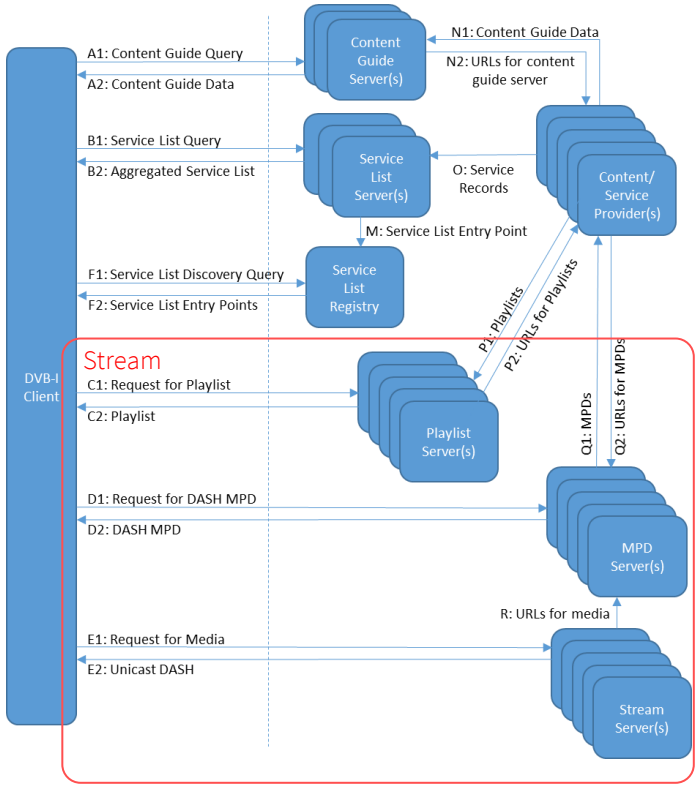
Find…

- Television viewers expect an experience that is easy to use and ‘minimally disruptive’
- DVB-I provides a mechanism in Bluebook A177r5 to permit devices to find IP based television services
  - Services define editorial and delivery characteristics for broadband and broadcast service instances
  - Service lists provide channel lineups and geographic targeting of services
  - Service list registries provide the “first port of call” for devices to discover DVB-I Services



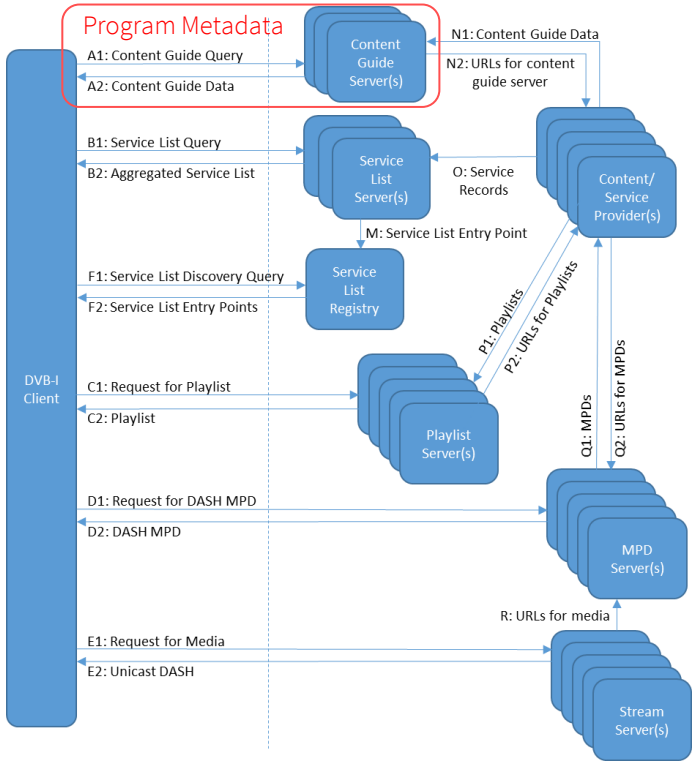
Deliver…

- Television viewers expect high quality video and have no consideration for the delivery mechanism used
- DVB-I Services primarily leverage DVB-DASH (Bluebook A168) for streaming and on-demand content
  - Profiling of MPEG-DASH to support the expectations of broadcast services
- DVB-I Services can signalled with simulcast information to align with broadcast delivery

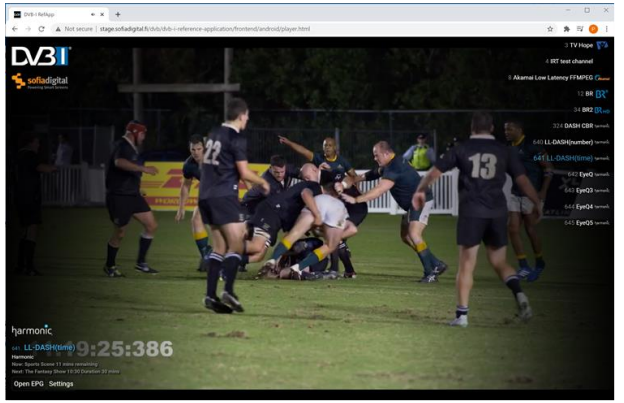


Present…

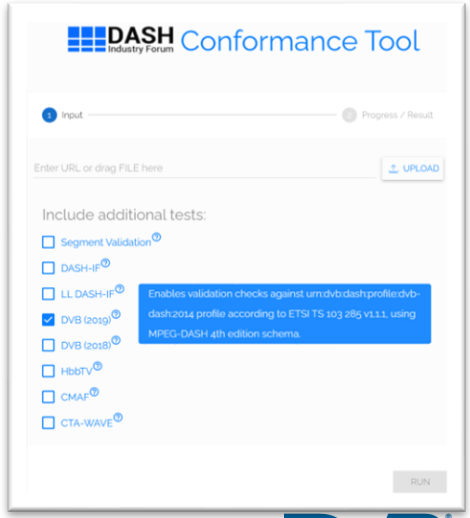
- DVB-I Services can be provisioned with a wide variety of supplementary and supportive information
  - Program Guide metadata
  - Logos and banners
  - Availability intervals
    - Can also support “hybrid transitions”
  - Content protection
  - Audio/Video characteristics for device targeting
  - DVB-I Metadata (service lists and TVA) is also a great choice for “traditional” SmartTV/HbbTV Apps for metadata format



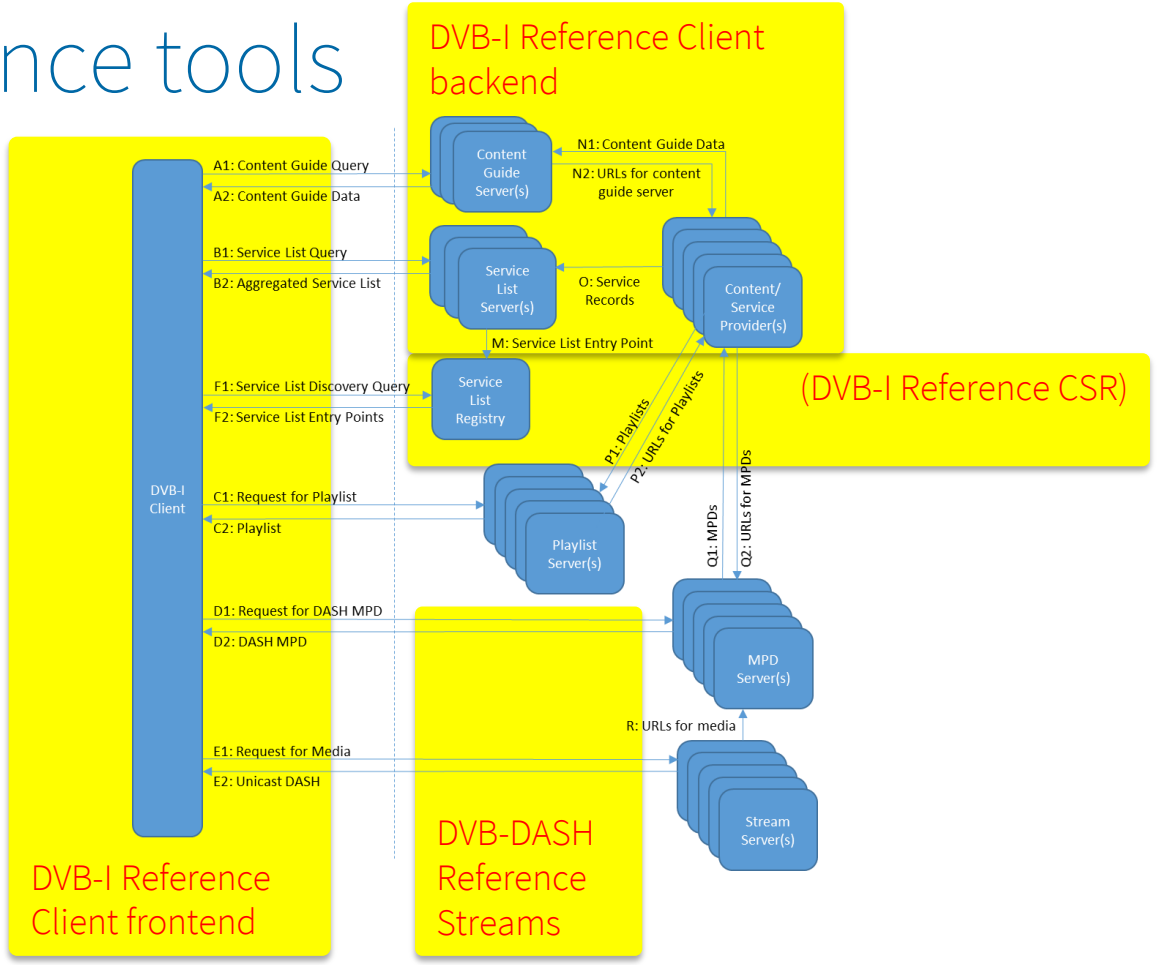
The Ecosystem…



- Beyond specifications, DVB supports the adoption and implementation of its work
- DVB-I Reference Client
  - Android and HbbTV application along with service lists, registries and content guide metadata backends
- DVB-DASH Reference Streams
  - DASH manifests and media compliant with Bluebook A168
- DVB-DASH Validator (new version!)
  - Developed in conjunction with HbbTV. Verifies manifests and media segments against Bluebook A168
- (DVB-I Reference CSR)
  - A lightweight service list registry to allow bootstrapping of horizontal market clients in the service discovery process
  - Did its job – in maintenance mode only for interested parties



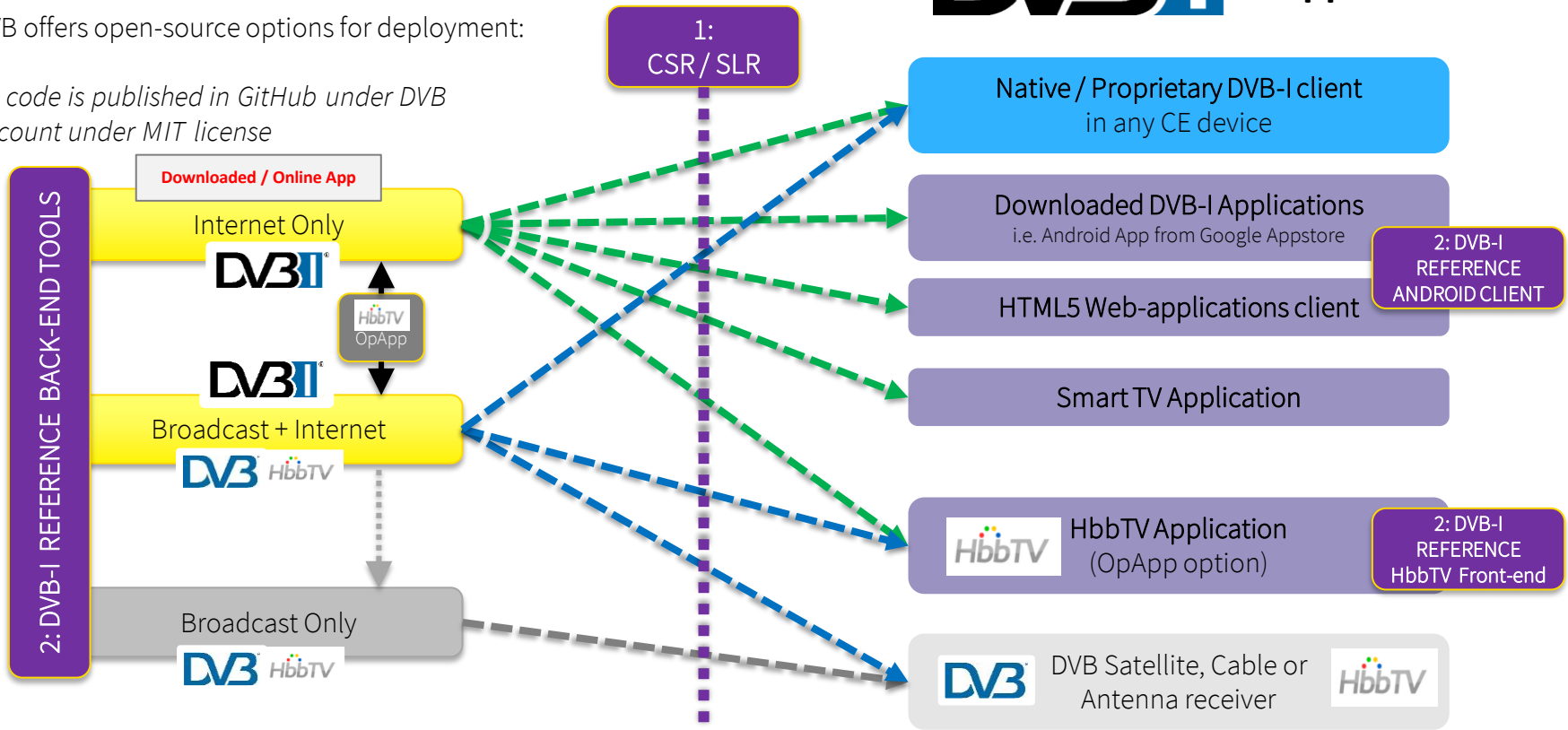
The reference tools



Deployment options of DVB-I

DVB offers open-source options for deployment:

All code is published in GitHub under DVB account under MIT license



DVB-I Open-Source Projects: DVB-I CSR – in maintenance mode

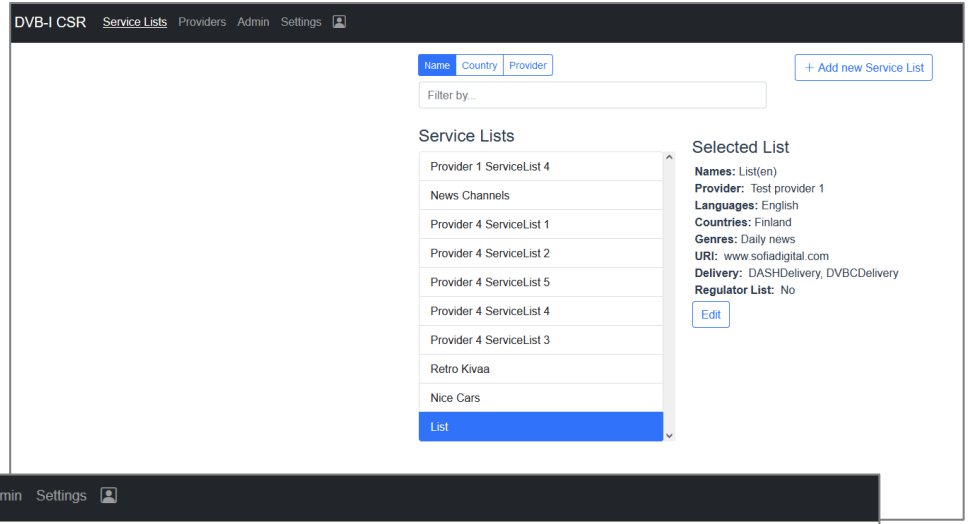
Goal was to test the feasibility and features of a Central Service Registry, providing access to service lists globally, and with an efficient and reliable Query API

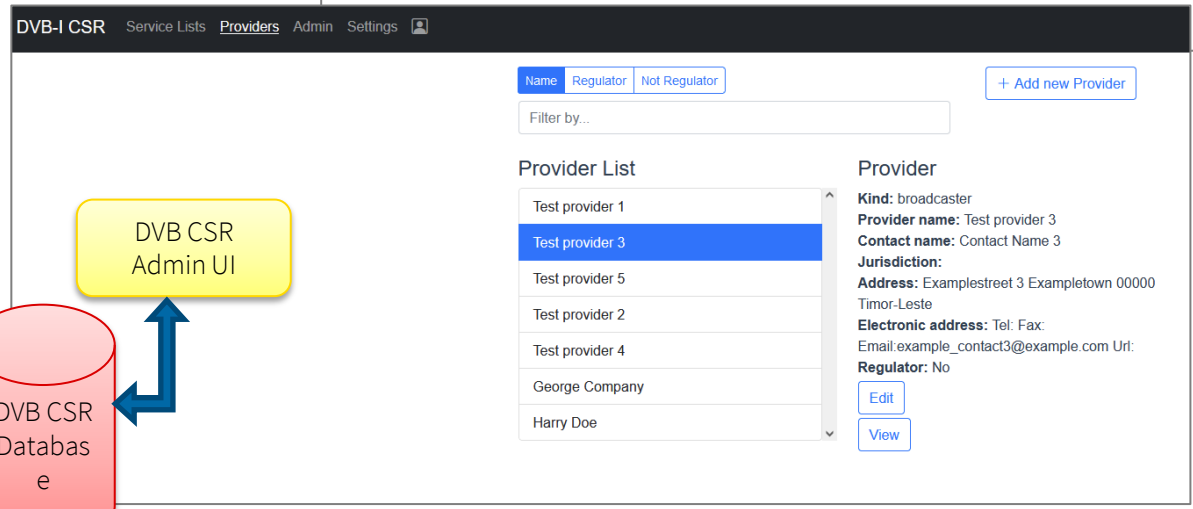
- Sofia Digital made the implementation together with a small group of DVB members
- First release was made 3rd November, “Phase 1 complete” since 18th March (skeleton size with complete DVB-I CSR related functionalities)
- Current status: supporting remaining test users, commercial and regional SLR/CSR implementations are available

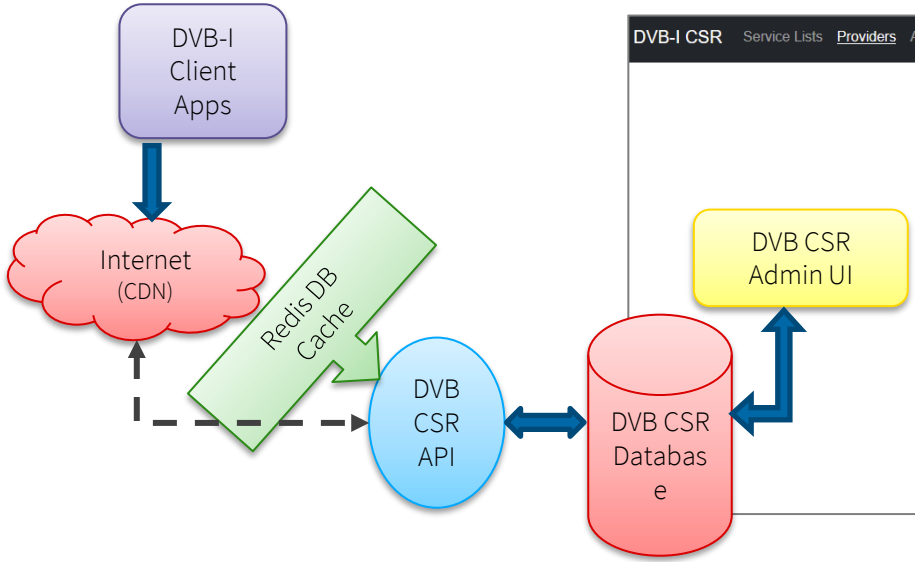
More info at https://github.com/DVBProject/DVB-I-Reference-CSR

(DVB-I CSR Tool – demo URL and screenshots)

- Service list management UI is available at https://csr.dtv.fi/
- Service list discovery API is available at https://csr.dtv.fi/api/query
- User accounts are created on request (refer to github repo)







DVB-I Open-Source Projects: DVB-I Reference Client 1/2

Project consists of a backend and of a frontend:

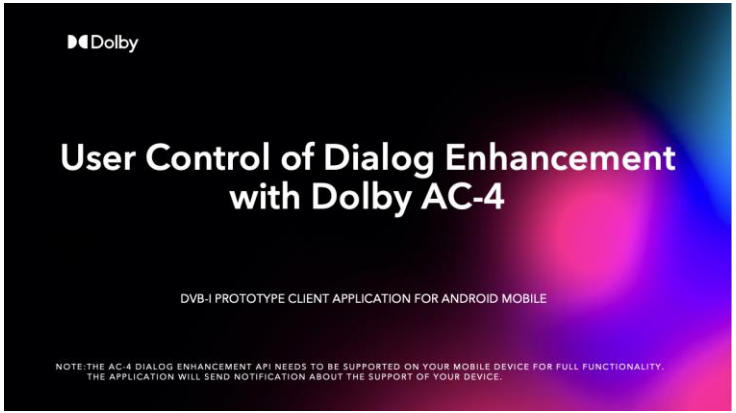
- Backend allows generation and editing of DVB-I service lists
  - TV-guide (TV-A EPG data) management is not included into the reference app backend.
  - TV-guide data generator populates the EPG with sample mock-up schedule.
- The DVB-I app frontend has 2 versions
  - HbbTV OpApp implementation of a DVB-I compatible Client. It offers Service list navigation, selection/tuning of services, info banner and a simple EPG. Native or dash.js player can be used for service playback
  - HTML5 client for PC and Android devices. Android client is a PWA application, offering roughly the same functionality.
- General information
  - Project was managed by Sofia Digital and DVB project, with bi-weekly calls and feature tracking sheet
  - First release under the MIT license was made 31st January 2020
- More info and demos at https://github.com/DVBproject/DVB-I-Reference-Client

Examples based on DVB-I Reference Client Design:

DVB-I DOLBY AC4 with NGA Dialog Enhancement

Key points

- UI based on DVB-I ref-app client
- Application converted as Native Android App
  - Using common modules in Android SDK
  - WebView HTML5 chrome engine
  - ExoPlayer to use native playback engine
- Works in Android devices with Dolby AC4 codecs
- Android SDK standard ExoPlayer with extensions by Dolby Laboratories



DVB-I adaptations

Based on Reference Client Design

In Germany

- rbb service list validated with the DVB-I Reference application
- Channel logos and XML AIT service
  - Including app only service!
- Complete TVA-EPG data with preview pictures
- Worked as a starting point for the German Pilot

POC with MyTV Broadcasting Malaysia

- UI based on DVB-I ref-app client
- Application converted as Native Android App
- Use available / existing MPEG-DASH OTT streams
- Utilize DVB-I Metadata coming from Sofia Backstage backend (a commercial product)

DVB-I Reference Client also tested in Cambodia, Iran, Ireland, Finland, Spain, and more…

Future work

- Maintenance agreed for 2023/2024 (see issue list from the above)
  - New DNS entry pointing to a dvb.org domain
  - Support for A177r5 and upcoming versions in 2024
  - Other additions to the client from the specification for V&V
    - Accessibility, Parental control, more query options, etc.
- Future lies in supporting related efforts, for example:
  - Support for DVB-NIP mDNS and DNS-SD GW discovery
  - Support for 5G broadcast service discovery
  - These require converting bits of the existing Android App to native code

Onwards

- The current DVB-I reference tools have been used as a base for several industry trials
- DVB members have contributed to updating and improving these tools
  - Contributions and considerations are always welcomed

THANK YOU!