

DVB-I

Introduction

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DVB-I

- What is DVB-I?
- What can it do and how can it be used
- Current status

What is DVB-I?

- DVB already has **DVB-T** (terrestrial), **DVB-S** (satellite) and **DVB-C** (cable)
- **DVB-I** is a new addition, where the **I** stands for **Internet**
- **DVB-I** enables **discovery** and **delivery** of **TV services** over the Internet to devices with **broadband access**
 - ...meaning “over the top”
 - ...but also over managed networks, with operator support
- **All devices** with Internet access are in scope, not just TVs and STBs

What is DVB-I?

- **DVB-I does for IP services what DVB-T/S/C do for broadcast**
- It offers **equivalent functionality to broadcast...**
 - Linear TV, free and pay services, HbbTV apps, accessibility, integrated service list and content guide, ...
- ...and also supports **IP-specific use cases**
 - Video on Demand, personalised services, ...
- But why do this?

DVB-I: Disadvantages of Apps

- In the receiver:
 - **IP services** are usually delivered to a **dedicated app** for each service provider
 - **DVB-T/C/S** are usually presented by a **native client** which presents **all services** complying with the standard
- Apps have been great at enabling **innovation**, but they bring several disadvantages, for example:
 - Content and metadata is restricted to each app
 - Dedicated apps must be provided for all platforms
 - No single UI is available, hard to get content noticed
- The **standardised approach** has some advantages...
- (Note: DVB-I can also be used with a dedicated app in the receiver)

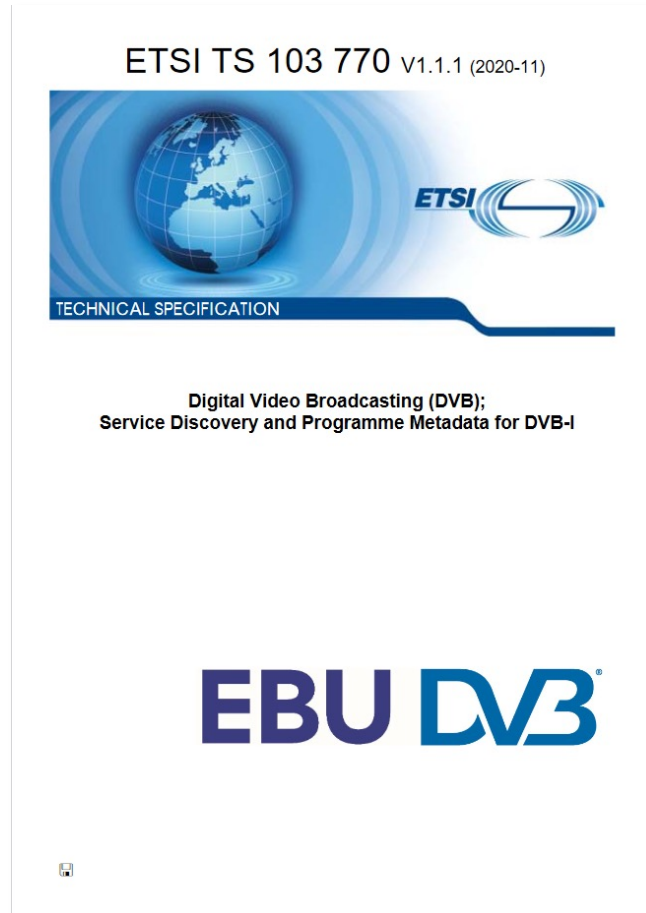
DVB-I: Native UI

- **Service Discovery:** All services in a broadcast network are easily found in a single UI, and most popular channels are given prominence.
- **Navigation:** Channel list, P+/P-, channel numbers and EPG are easy ways to quickly reach a service and find relevant content, or users can “channel surf” to see what is available.
- **Unified Interface:** All services, and information about those services, are available in the same UI. There is no need to install and search through several applications.
- **Content Control:** All channels in a broadcast network are regulated and meet legal standards of taste and decency, and also for accessibility.
- DVB-I enables (but does not mandate) these characteristics for IP services too

DVB-I is not only an alternative to DVB-T/S/C

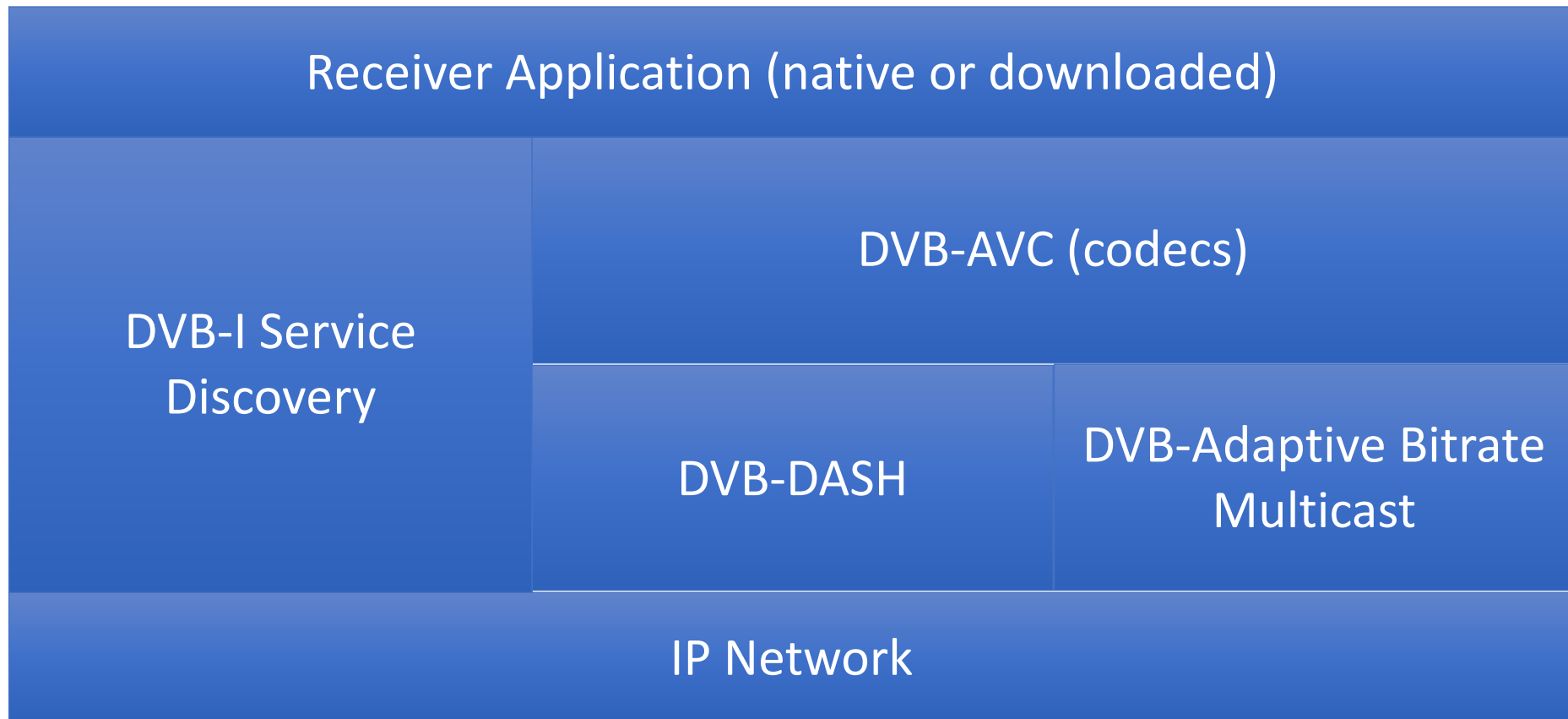
- So **DVB-I** can offer the **same user experience** as DVB-T/S/C
- **DVB-I** can be used **stand alone**...
- And **DVB-I** can be used **with DVB-T/S/C** to create a **hybrid platform** where:
 - Services can be delivered via broadcast, IP or both
 - Users receive each service via whatever route is available or optimal
- For users, it **doesn't matter** whether a service reaches them via broadcast or IP
- Broadcasters can:
 - Offer **additional services via IP, integrated** with the rest of their offering
 - Offer services at **higher quality levels** (e.g. SD -> HD)
 - Offer additional **accessibility features** over IP (e.g. signing)
 - Reach users **who don't have broadcast** access
 - ...

DVB-I Specifications

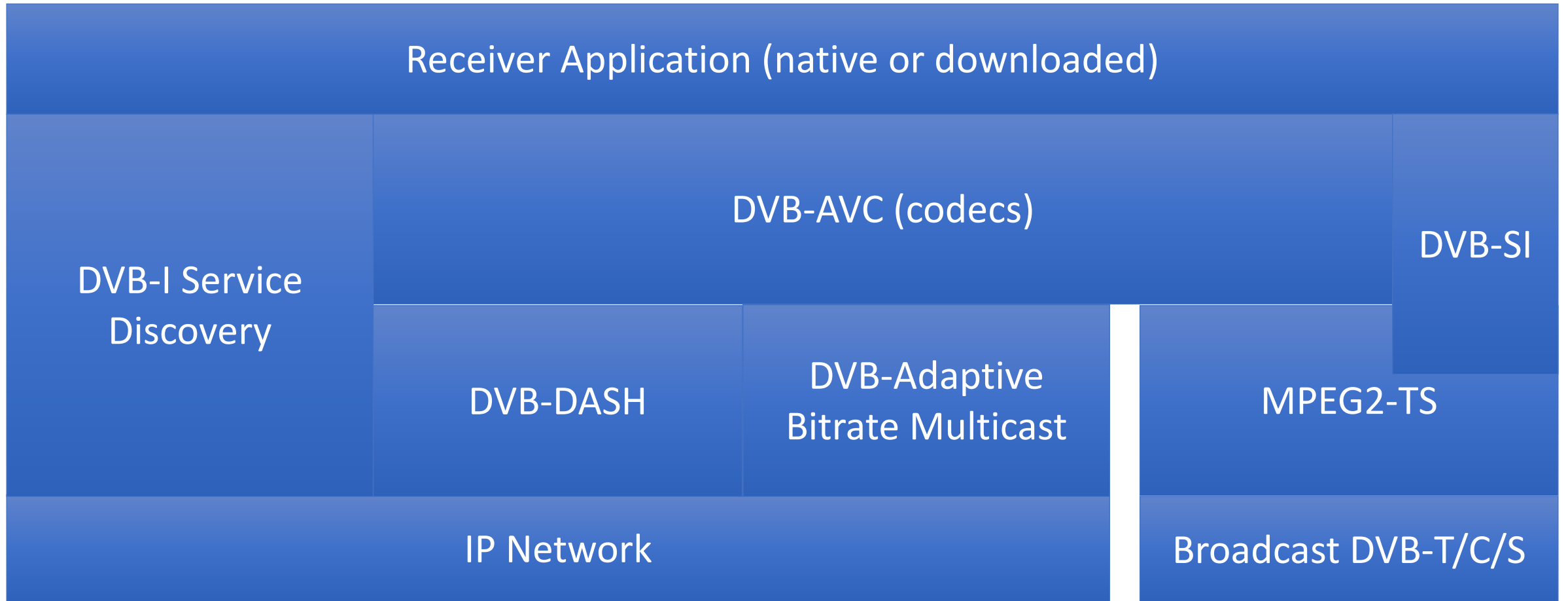


- **DVB-I** covers **Service Discovery and Programme Metadata** (DVB BlueBook A177r3 and ETSI TS 103 770), and **builds on:**
- **DVB-DASH** for content delivery (ETSI TS 103 285)
- Optionally, **DVB-ABR Multicast** for transparent multicast delivery in operator networks (ETSI TS 103 769)
- Other DVB specifications, e.g. **DVB Video and Audio Coding Formats** (ETSI TS 101 154) – supporting up to SD, HD, UHD, SDR, HDR, multichannel audio, NGA, subtitles, ...

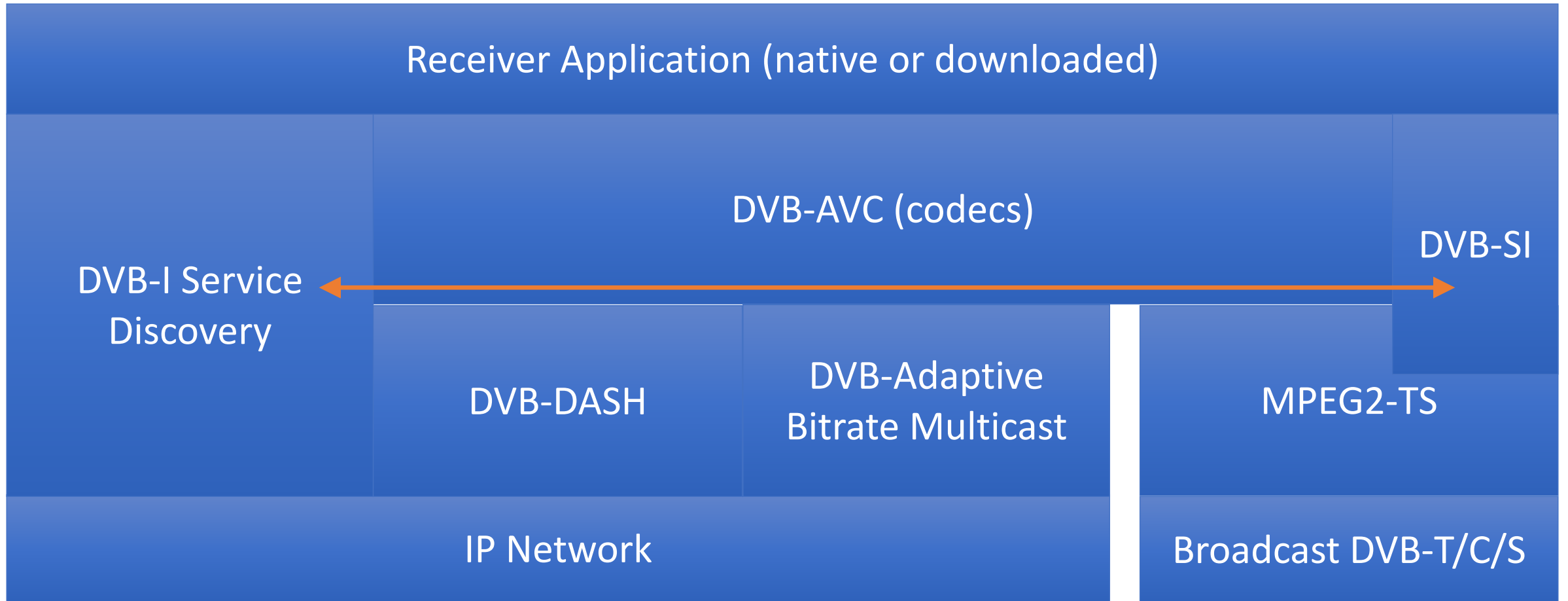
DVB-I Layers – Pure IP Deployment



DVB-I Layers – Hybrid Case

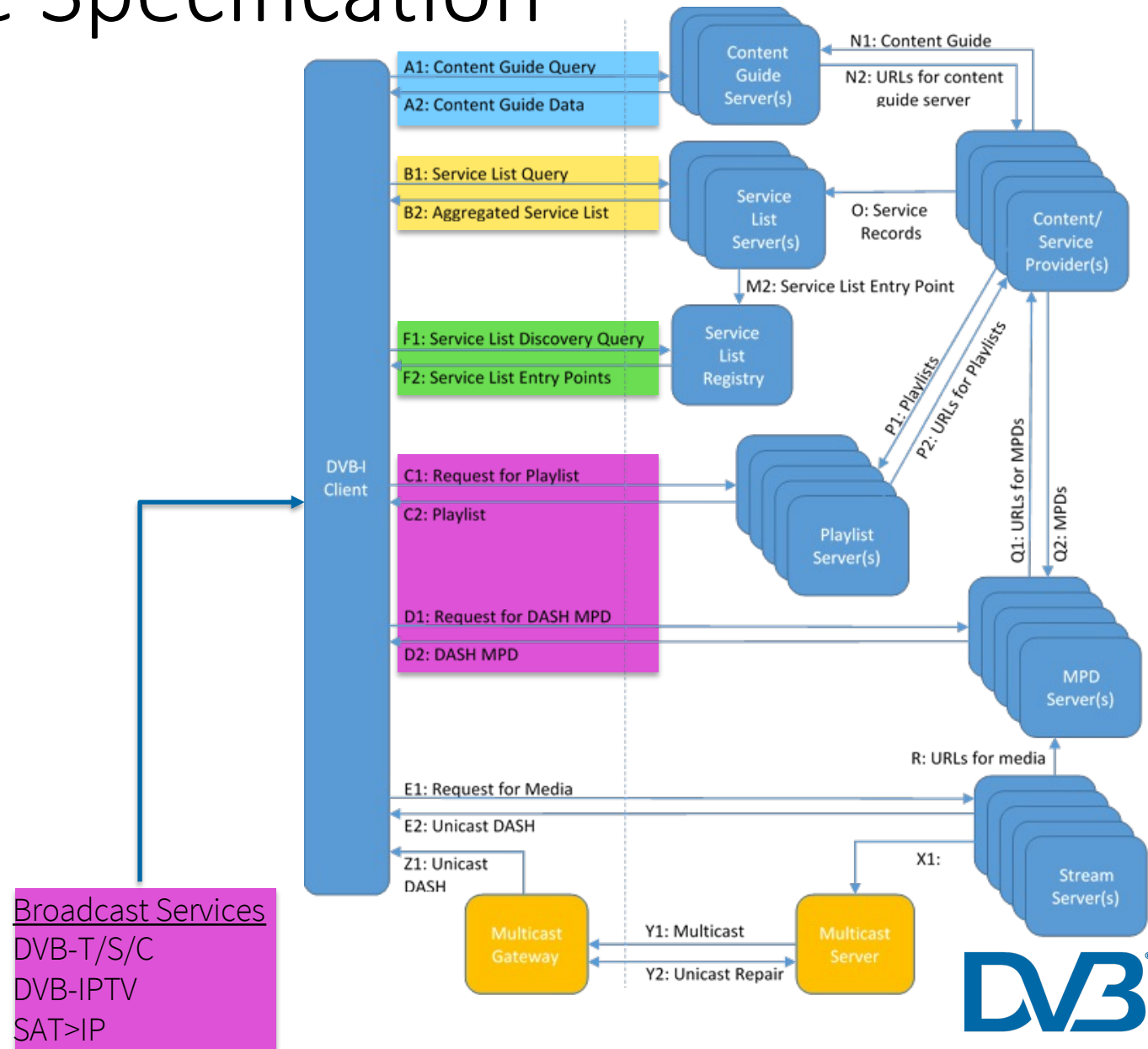


DVB-I Layers – Hybrid Case



DVB-I - Aspects of the Specification

- Service List Discovery
- Service Lists
- Content Metadata
- Media Representations



For reference: DVB-I Specification

- Latest versions:
 - DVB BlueBook A177r3
 - Latest version with new features and bug fixes
 - https://dvb.org/wp-content/uploads/2021/06/A177r3_Service-Discovery-and-Programme-Metadata-for-DVB-I_January-2022.pdf
 - ETSI TS 103 770 v1.1.1
 - Published ETSI standard
 - Plan to update to next BlueBook version later in the year
 - https://www.etsi.org/deliver/etsi_ts/103700_103799/103770/01.01.01_60/ts_103770v010101p.pdf
- See also the DVB-I micro site: <https://dvb-i.tv/>
- ...and the DVB-I reference application

DVB-I Reference Application



The screenshot displays a DVB-I Reference Application interface. The main area is a video player showing a scene from the movie 'Tears of Steel' with a character in a plaid jacket. The video player includes a logo for 'DVB-I' and 'sofiadigital' with the tagline 'Powering Smart Screens'. Technical specifications for the video are shown as '2200k 1680x750 avc1 cfhd'. A list of content items is visible on the right side, including '1 Live 'cbcs'', '2 ToS Live Clear subtitles', '3 Live 'cbcs' with ads', '4 ToS Live Clear subtitles, ads', '7 Live clear, ads inserted', '8 Live 'cbcs', ads inserted', '11 Live clear,ads via AWS MT', '21 DASH-IF livesim LL', '22 Harmonic LL test', '23 Akamai LL test', '24 Unified Streaming LL test', '31 Dolby HDR DM', '32 Philips HDR DM', '33 SES HDR DM using SL-HDR2 SEI messages', '34 SES HDR DM using 2094-10 SEI messages', '41 Tears of steel HEVC', '42 Tears of steel, ttml/mp4 subtitles', '43 Tears of steel,vtt/mp4 subtitles', and '100 Live Clear'. At the bottom left, there is a section for 'MPEG' with the text 'Now: Tears of steel DASH with vtt + mp4 subtitles 211 mins remaining' and 'Next: Tears of steel DASH with vtt + mp4 subtitles 14:00 Duration 720 mins'. Below this, there are three buttons: 'Open EPG', 'Settings', and 'Pause'.

DVB-I
sofiadigital
Powering Smart Screens

2200k 1680x750 avc1 cfhd

- 1 Live 'cbcs'
- 2 ToS Live Clear subtitles
- 3 Live 'cbcs' with ads
- 4 ToS Live Clear subtitles, ads
- 7 Live clear, ads inserted
- 8 Live 'cbcs', ads inserted
- 11 Live clear,ads via AWS MT
- 21 DASH-IF livesim LL
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- 31 Dolby HDR DM
- 32 Philips HDR DM
- 33 SES HDR DM using SL-HDR2 SEI messages
- 34 SES HDR DM using 2094-10 SEI messages
- 41 Tears of steel HEVC
- 42 Tears of steel, ttml/mp4 subtitles
- 43 Tears of steel,vtt/mp4 subtitles
- 100 Live Clear

43. Tears of steel,vtt/mp4 subtitles

MPEG
Now: Tears of steel DASH with vtt + mp4 subtitles 211 mins remaining
Next: Tears of steel DASH with vtt + mp4 subtitles 14:00 Duration 720 mins

Open EPG Settings Pause

New features: DVB-I for 5G

- Extend DVB-I to support signalling of services delivered via 5G
- Will enable use of DVB-I in 5G networks for service discovery and metadata delivery
- Important point of co-operation and commonality between “broadcast” and “mobile” industries
- Status:
 - Commercial requirements agreed last year in DVB
 - Technical work underway in joint working group with 5G-MAG

New features: Targeted Advertising

- DVB is extending its targeted advertising specification ETSI TS 103 752 to support DVB-I and DVB-DASH services
- First specification updates will be published in Q3
- Will enable both server side and client side ad insertion
- Forms the basis of HbbTV Targeted Advertising solution

Conclusions

- **DVB-I** is now **published** and **ready for use**
- **Platform operators, broadcasters** and **manufacturers** in Europe and beyond are deploying or making plans to use **DVB-I**
- **DVB** is adding support for **new use cases**, and **optimising** and **filling gaps** in the specifications to make sure they **fulfil all requirements for deployments**
- **DVB-I is coming!**
- **Your involvement is very important!**