



How HbbTV Fills DVB-I Gaps

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- DVB-I tries to be a simple specification
 - Prioritise similar use-cases to traditional free-to-air TV
 - Part of a journey from RF-based broadcast to hybrid broadcast/IP and even to pure IP¹
 - Deliberately does not try to cover all use-cases as integral parts of the spec
- DVB-I includes "linked applications"
 - Allow services to be extended with a linked app for features not integral to the spec
 - "application with media in parallel" enhance video streamed by the DVB-I player
 - "application controlling media presentation" take over streaming from the DVB-I player
- On a TV, linked apps will likely² be HbbTV
 - On a mobile, can be webview³ (HTML5) or native

1 – DVB-I can be used in a pure IP environment to replicate the current linear TV user experience but that's not the exclusive goal

2 – HTML5 can of course be used both on TVs in an HbbTV browser and on mobile in a webview – perhaps even the same HTML+JS

3 – May be some unresolved issues about webview overlaying video streamed by the DVB-I player

- Italian and German trials use DRM on some services
 - License acquisition done by an HbbTV app
- No standard DRM-independent way to request license
 - Typically done by a JavaScript library which can be updated as needed
- Some DRM use-cases may not need a UI, others will need a UI
 - Login
 - Personalisation
 - Subscription
 - Payment
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- Some native DASH players will request licenses based on information in the DASH MPD
 - Details are proprietary & DRM system specific so hard to formally reference
 - May not be stable over time so may be unsafe to build into TV set firmware
- Where a DRM UI is needed, a linked app will certainly be needed

- A number of broadcasters require viewers to login to access their services
 - e.g. BBC iPlayer requires login
 - "We need to understand more about what people are watching to ensure we are providing something for everyone. Up until now we could only tell how many people used BBC iPlayer, but having more data like age, gender and location will ensure we're better serving all our audience."
- A linked application will be needed
 - Show UI, any terms and conditions,
 - Accept input from the user
 - Store the results
 - Allow users to logout / delete their account

- GDPR defines requirements for processing of personal data
 - Most common approach is to obtain user consent
 - Consent must be specific and informed
 - Hard for a TV manufacturer or DVB-I player developer to obtain consent on behalf of broadcaster(s) and neither would likely want this
- Broadcasters wanting consent for processing personal data in DVB-I will need to use a linked app
 - Show UI, terms and conditions (etc)
 - Obtain input from the user
 - Store the results
 - Allow the user to withdraw consent

- Substituting ads in linear OTT TV can be done client-side or server-side
- Client-side ad substitution requires an app
- Server-side ad substitution doesn't directly need an app but ...
 - Reporting (measurement) is important for all forms of ad substitution
 - Server-side ad substitution can use either client-side or server-side reporting
 - Historically client-side reporting has been seen to be more accurate, reliable and/or trustworthy
 - Trust in the measurement mechanism is very important for all involved
 - Server-side ad substitution with client-side reporting may need a JavaScript library
 - See [IAB Open Measurement SDK](#)
- 2 of 3 combinations need an app

- Several possibilities for media transport beyond DVB-DASH
 - HLS
 - Basic HLS for VoD may be built-in to DVB-I player
 - Low latency HLS is much newer & less likely to be built-in
 - New entrants such as [HESP](#)
 - More recent versions of DASH than DVB-DASH or than included in the DVB-I player
- All of these would use a JavaScript library running in a linked application

- Linked apps are important for many DVB-I use-cases
 - Ones needing interaction between service provider and the user
 - Ones using a JavaScript library to implement an interface or technology
 - Ones implementing something that's unstable or dynamic
- HbbTV is the obvious solution for linked apps on connected TVs
- Linked apps also support the usual HbbTV use-cases as well
 - Access to catch-up or restart services
 - Information about the service or programme
 - Non-standard accessibility features
 - ...