



# DVB-I ; (Live) / Linear TV via Broadband and Broadcast

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# TV on the Internet

- The Internet has transformed how we access TV...



Video on  
web sites



**BBC iPlayer**

Catch-up TV



**NETFLIX**

Global VoD services  
as major original  
content producers



**sky go NOW TV**

Super-simple OTT PayTV

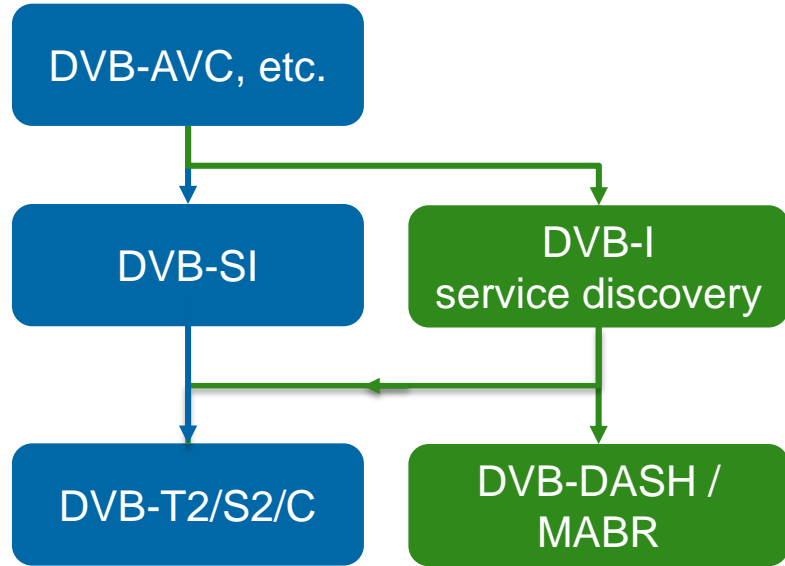


UGC, channels, “stars”

Sky, Sky Go and Now TV are trademarks  
owned by the Sky group of companies.



# What is DVB-I?



Key elements of traditional broadcast are

- audio & video codecs,
- service information and
- content delivery via cable, satellite & terrestrial

Key elements of DVB-I are

- audio and video codecs
- a new broadband-delivered service information layer
- content delivery via broadband (DASH) as well as C/S/T

# The DVB-I Vision

- Services are signalled and distributed in a **standardised** manner, so a **specific app is not required**
- Supports both **broadband** and **broadcast** delivered services
- A receiver can present an **integrated list of services and content**, including broadband and broadcast services
- **Users** don't have to know or care whether a service arrives via broadcast or broadband
  - Can even change over time
- Enable immigrants, expats, (etc) to get linear TV from their original country / culture
  - Also compatible with DRM (etc) for enforcing geo-blocking when needed
- **Broadcasters** can deploy a service once to a wide range of devices
  - Broadband-only devices like phones, tablets, PCs, consoles and
  - **hybrid** devices with both broadcast and broadband like TVs and STBs
- Hybrid device **Manufacturers** can make a single consistent user experience for broadcast and broadband services

# Main Technical Elements of DVB-I

- Service discovery: finding lists of services **DONE**
- Service list: signalling a list of services **DONE**
  - Including hybrid lists of DVB-I and DVB-T/C/S services **DONE**
- Content guide: programme guide data **DONE**
- Content delivery:
  - Internet OTT: Low Latency DASH, DVB-DASH **DONE**
  - Managed networks: Multicast ABR **IN PROGRESS**
- Content formats:
  - DVB codec spec: up to state of the art UHD/HDR/HFR, NGA formats **DONE**



# A Few Highlights

- Set priority between broadcast and broadband instances of the same service / programme
  - Broadcasters can supply a UHD version via broadband when there's no broadcast spectrum available for UHD/HD simulcast
  - Users with a broadband data cap may prefer the broadcast version
- Services can have HbbTV apps linked to them
  - “red button” autostart apps to add value to the linear TV channel
  - An app that takes over video & audio presentation
    - Enabling things not part of a standard DVB-I client

# What Comes Next

- Specifications
  - Minimum requirements on content providers and clients
  - Something around how DVB-I service lists can be discovered
  - Fixing bugs in the spec
  - Start to consider new requirements some time in 2020
- New DVB focus on delivering more than just ‘paper’ specs
  - Low latency DASH
    - DVB and DASH-IF sponsoring extensions to well known open source media tool ‘ffmpeg’ to add support for LL-DASH
  - Open source DVB-I ‘reference’ app
    - HTML and JavaScript running as an HbbTV OpApp and on Android
    - Example services, service lists and content guide data to test the app

# Demonstration Outside

- Android TV app that
  - Reads in a DVB-I service list
  - Adds these to the TV service list using Android “TV Input Framework”
- Single hybrid favourite list
  - P+/P- seamlessly switch between OTT and classic DVB services
- OTT services delivered using DVB-DASH
  - Same DASH player as used by HbbTV on that TV



# Conclusions



DVB-I enables the delivery of (live) linear TV services over the Internet

## Services:

- will reach more users...
- on more devices...
- and users without access to traditional broadcast reception

## Users:

- will be able to access more services
- won't need to know or care whether a service reaches them via broadcast or broadband

## DVB:

- will support its members with new deployment options
- brings opportunities to support new parts of the industry
- extends DVB's relevance outside the traditional broadcast domain

## HbbTV:

- HbbTV and DVB-I are complementary & fit well together

