Why DVB-I?

To retain their competitive position and access new markets and demographics, traditional television broadcasters are increasingly looking to exploit the internet as a delivery mechanism for their services.

DVB’s members are thus collaborating on specifications to ensure that linear television over the internet is as user-friendly and robust as traditional broadcast television. DVB-I will support any device with a suitable internet connection and media player, including TV sets, smartphones, tablets and media streaming devices.

With DVB-I, linear television services on the internet will be signalled and distributed in a standardized manner – individual services will not require specific apps or integration.

EVOLUTION OF MEDIA DISTRIBUTION

In developing an internet-centric solution for linear television services, DVB anticipates a future where viewers who only have access to the internet can enjoy services previously only available via broadcast platforms.

Where both broadband and broadcast connections are available, devices will be able to present an integrated list of services and content, combining both streamed and broadcast services – users won’t have to know or care whether a service arrives via broadband or broadcast.

- **Broadcasters and other content providers** will be able to deploy common services across a wide range of devices.
- **Manufacturers** will be able make a single consistent user experience for all video services.

THE DVB-I ECOSYSTEM

While DVB-I refers in particular to the forthcoming specifications for service discovery and programme information, the ecosystem extends to other DVB specifications. DVB-DASH was recently updated to include a low latency mode, while a specification for Multicast Adaptive Bit Rate streaming will be finalized in early 2020. Both are key to achieving scalable, efficient delivery of linear content over broadband networks.
At IBC2019, we’re delivering several linear services, some over broadcast (DVB-T2), some via broadband (DVB-DASH), and some via both broadband and broadcast.

**DVB-I Service List**
The DVB-I Service List, compiled by SES, contains information about the broadband and broadcast services. This is used by the DVB-I clients to present the available services (based on time of day, geographic location, defined preferences or other characteristics) to the user.

Three prototype DVB-I clients are shown:
- **TPV Technology**, based on Android TV
- **Kineton**, based on HbbTV
- **Viaccess-Orca**, based on Android (TV and mobile)

Each has implemented the DVB-I Service List with a user interface that allows selection of the available services for a given device. Depending on the capabilities of the receiver, the service will be delivered with either broadcast or DVB-DASH, the latter with low latency where supported. Encoding/multiplexing (for DVB-T2) and encoding/packaging/origin functions (for DVB-DASH) are provided by Harmonic Inc, using on premise equipment for Services 1-3 and a cloud-based solution for Service 7; for Service 8, encoding is by ATEME, with packaging and origin functions by Broadpeak.

The completed DVB-I specification, in its first phase, will include the necessary support for programme guide metadata, however this aspect of the specification was not sufficiently mature to allow implementation at IBC2019.

**DVB-DASH**
Low latency mode in DVB-DASH breaks the streamed segments into smaller chunks, which are then delivered as soon as they are available at the encoder. So instead of outputting entire segments at one time, the encoder splits the segments into groups of frames – the chunks – where none of the frames in a group requires a frame from a later group to enable decoding.

The demonstration allows you to observe the differing latencies between traditional broadcast, regular DVB-DASH and DVB-DASH with low latency.

**DVB-mABR**
Multicast technology is leveraged when the same content needs to be delivered over broadband to multiple receivers simultaneously, which is the case with linear services. In order to support the mass market scalability of internet-delivered linear television, Multicast ABR reduces the overall network load.

For our demonstration of DVB-mABR, two handheld devices connect to the DVB-DASH (with low latency) service using unicast delivery. When multicast is activated, the DVB-mABR Server (from Broadpeak or ENENSYS Technologies) will construct a multicast instance of that service and trigger the two handheld devices to obtain the media chunks from their respective DVB-mABR Gateway, requiring half the bandwidth.

Specifically for linear services, using multicast instead of unicast in the network will reduce the amount of traffic. DVB-mABR will be transparent to current clients and does not require any changes to the actual set of receivers.
DVB-I Showcase at IBC2019

- **Playout Server**
- **DVB-T2 Modulator**
- **Services 1, 2, 3**
- **Encoder**
- **Packager / Origin**
- **Network Switch**
- **Internet**
- **Service 7**
- **Playout Server**
- **Encoder**
- **Packager / Origin**
- **DVB-I Service List Server**
- **DVB-mABR Server**
- **DVB-mABR Gateway**
- **Android Handheld Devices**
- **Android Handheld with DVB-I Client**
- **STB with Android DVB-I Client**
- **TV with HbbTV DVB-I Client**
- **TV with Android DVB-I Client**

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- **IP traffic, including DVB-DASH (with low latency)**
- **MPEG-2 Transport Stream**
DVB demonstration partners for IBC2019

ATEME
Encoding of Service 8.
> ateme.com

Broadpeak
Multicast ABR server, gateway and clients; packaging of Service 8.
> broadpeak.tv

ENENSYS Technologies
Multicast ABR server, gateway and clients.
> enensys.com

Harmonic Inc
Cloud-based and on premise video encoding, packaging and origin functions for DVB-DASH streams; terrestrial multiplexing.
> harmonicinc.com

ITV
Content for Service 7.
> itv.com

Kineton
DVB-I client based on HbbTV.
> kineton.it

Newtec
DVB-S2 receiver.
> newtec.eu

Rai
Facilities and support for the integration of the demonstration at its facility in Turin, Italy.
> rai.it

Rohde & Schwarz
DVB-T2 modulator.
> rohde-schwarz.com

SES
DVB-S2 contribution for Services 1, 2 and 3; compilation of the DVB-I Service List.
> ses.com

TPV Technology
DVB-I client based on Android TV; smart TVs from TP Vision.
> tpv-tech.com

Viaccess-Orca
DVB-I client based on Android TV.
> viaccess-orca.com

As DVB Members, our demo partners can all follow and contribute to the development of the DVB-I specifications. And so can you!

See: dvb.org/join