



## **DVB-I Technology** Proof of Concept

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### What DVB-I is

- DVB-I, where "I" stands for Internet, is the new standards defined by DVB to complete the set of medium standards for the TV.
   It joins the well-established DVB-T (terrestrial) DVB-S (satellite) and DVB-C (cable)
- DVB-I enables discovery & delivery of TV services over internet to devices with broadband access
- All devices with internet access are in scope, not just TVs and STBs
- DVB-I offers equivalent functionalities to broadcast
  - Linear TV, free and pay services, HbbTV applications, accessibility, unique channel list and content guide
- DVB-I supports IP specific use-cases
  - VoD, personalized services



#### A view on the Standards

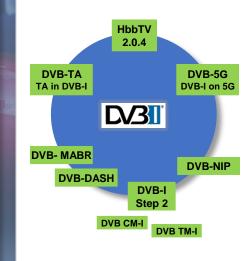
## DVB

- CM/TM-I: DVB-I spec evolution
- CM-I-CSR: implementation aspects of the DVB-I Central Service Registry
- **CM-TA:** Target Advert. in Hybrid context
- **TM-MCAST:** Development, maintenance and V&V for multicast ABR specifications
- **TM-STREAM:** Technical activities related to DVB-DASH (TA implementation)
- **TM-5G:** technical module for DVB-I distribution over 5G networks
- **Native IP:** Defining a system that provides services over native IP format, replacing TS

## HbbTV

• Core 2.0.4: HbbTV will maintain the same User experience in hybrid scenario







### Why DVB-I

#### Why do we need a new standard whereas IP services already exists ?

- DVB-I allow User to access broadband contents with the same user-experience currently used by means of the remote control with support for LCN numbering
- There is no need for any application (e.g., HbbTV, Widget ...) to access DVB-I services, there is no need to swap between applications to reach out all services.
- DVB-I provide a standard means for accessing IP services
- DVB-I allow for accessing linear channels by means of a regulated environment.
- DVB-I is not an alternative approach to DVB-T / S / C, nevertheless it can be used to create a hybrid platform where:
  - Some services are delivered via broadcast and other via broadband networks
  - Some services can be delivered on both medium



### Why DVB-I

#### Which are the benefit for the end-user?

- He can access additional services
- He can access higher quality services, e.g., UHD, HDR, NGA ...
- He can access alternative version of services, e.g., accessibility feature or regional contents
- Household with no DVB-T/S/C reception can use it
- User using alternative devices to TV/STB

### User does not matter where the contents come from



# Mediaset DVB-I Proof of Concept

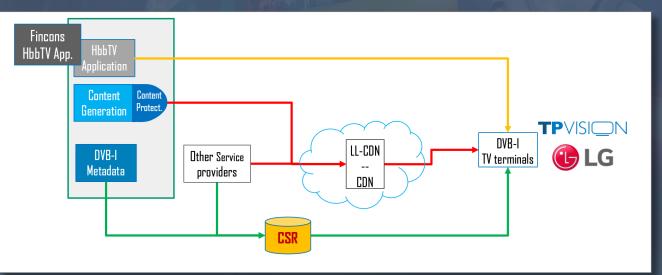






Where we are

#### **DVB-I: Mediaset Proof of Concept – Phase 2 & 3**







#### Implemented use-cases

- **Hybrid & Unique channel list:** the Terminal is able to provide the User a single channel list which contains both RF channel and IP services. Such a list is created during the well-known installation scan process
- Centralized Service Registry: all the information needed to generate the channel list come from a Web-Server which acts as Centralized Service Registry
- Instances priority: each Service in the List could provide more ways to reach the User (service-instance), i.e.
   DVB-T and DVB-I, the Service Owner is able to define the priority by which the service-instance is presented
- Zapping: once the channel list is available the User can navigate through it in the usual way, i.e. P+/P- or channel-number, accessing DVB-T and DVB-I seamless
- **Regionalization:** is it possible to define services subset which are presented based on the Region the User set
- Info banner (minimal): the information presented by the info-banner while an IP service will be as in DVB-T/S/C
- **Fallback mechanism:** if a service provides more service-instances the Terminal is able to switch when the current one is no more available
- **Low-Latency:** DVB-DASH specification provides mechanism to reduce the latency over OTT services.
- Content Protection: Contents delivered over IP could be protected, e.g. for contents rights and contents spilling, PlayReady® provides a mechanism to allow Terminal to manage the protection at native level



Where we are – Phase2

#### The Test-bed

- An open standard approach: an approach to open standards was preferred: the PoC has been developed in agreement to international standard and profiles (e.g., DVB-I, DVB/DASH, UHD-Book 2.0, PlayReady)
- **End to end chain:** to test the complete path, from content generation to User fruition we set up an E2E environment involving partners.
- **TV set Manufacturers:** the collaboration between LG and TPV who made their DVB-I compliant TV sets available was fundamental.
- **P.o.C. open to external parties:** aim to validate the real environment in a complete E2E test-bed on cooperation with third party entities, e.g.:
  - Low-latency CDN provider; CSR provider; Other broadcaster or content owners



#### What's next ? – Phase 3 will require an advanced test-bed

#### Planned use-cases

- HbbTV in DVB-I context: DVB-I and HbbTV 2.0.4 provide mechanism to extend the HbbTV user experience to hybrid scenario, i.e. "Unique & Hybrid channel list"
- **CSR evolution:** updated DVB-I specification provides mechanism to differentiate DTT and DTH scan, for example to manage channels which have different LCN on different medium
- Enrich info banner: current implementation provides very poor information to the User. DVB-I specification
  provides the way to have the same info as DVB-T/S/C
- **Parental control:** DVB-DASH and DVB-I provide mechanism to implement on IP services the same Parental-Rating rules as DVB-T/S/C
- **DVB-T//DVB-I** synchronization: DVB-DASH provides mechanism to align both Services timely & synchronously
- **Multicast-ABR:** DVB M-ABR provides mechanism to implement multicast transmission, either with a M-ABR gateway or with the M-ABR client embedded in the Terminal
- Higher A/V quality & Enhanced Codecs: user will access to higher quality services, e.g. UHD, HDR, NGA ...



The role of HD Forum Italia

- Define the Italian profile for DVB-I (UHD Book 2.x; OTT Observatory), e.g.
  - Specify correct generation and management of Service List
  - Provide common guidelines about device behaviour
- Harmonize rules & policies with National Bodies: Institutions and Regulatory Authority
- Harmonize the work with International Technical Bodies, e.g. DVB, HbbTV, DTG UK, HD Forums, aiming to guarantee full interoperability for receivers..





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# **Back-Up Slides**



#### A long Journey

**The Foreword section of UHD Book 2.0**, has been devoted to DVB-I advent. Nevertheless, it sets out in detail some verifiable conditions that will have to be met for future adoption of DVB-I to take place in Italy, thus confirming the mandatory nature of the specification, while allowing great flexibility for some period to come.





#### Challenges

#### Organizational

- National Authority in charge to provide official DVB-I Service List
  - Un-regulated
  - Nationally coordinated and regulated

#### **Technical**

- DVB-I Service List in a hybrid scenario shall be carefully generated:
  - Consistent, self manage conflicts
  - Priority management

#### Regulatory

- Regulating OTT services is more challenging than for broadcast
- LCN assignment should be maintained
- **DVB-I provides tool-box to signal regulated Service List** (Authority flag)
- User should be presented with a list of linear TV services with appropriate LCN, compliant to national Authority regulation.