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IP-delivered Broadcast Channels and Related Signalling of HbbTV Applications

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Contents

Intellectual Property Rights	4
Foreword.....	4
Modal verbs terminology.....	4
Introduction	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	7
3 Definitions and abbreviations.....	7
3.1 Definitions.....	7
3.2 Abbreviations	7
4 IPTV as the "broadcast"	8
4.1 General principles.....	8
4.2 Application Lifecycle	8
4.3 OIPF DAE Specification Profile	9
4.4 Terminal Capabilities	9
4.5 Access to EIT Schedule Information.....	9
5 Integration of HbbTV and Service Discovery Mechanisms.....	9
5.1 Overview	9
5.2 Service Discovery by HbbTV Application.....	10
5.3 Service Discovery & Selection via SD&S	10
5.3.1 General.....	10
5.3.2 Determining the service discovery location.....	10
5.3.3 Selecting a Service Provider.....	11
5.3.4 Obtaining Service Offerings	11
5.4 DVB OSDT	11
5.5 Others (informative).....	11
6 Integration of HbbTV and Content Delivery Protocols	12
6.1 Multicast IP	12
6.2 MPEG DASH.....	13
6.3 Other Transport Protocols for Delivery of Linear Channels	14
7 Content protection (informative).....	14
Annex A (informative): Change history	15
History	16

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Foreword

This Technical Specification (TS) has been produced by Joint Technical Committee (JTC) Broadcast of the European Broadcasting Union (EBU), Comité Européen de Normalisation ELECTrotechnique (CENELEC) and the European Telecommunications Standards Institute (ETSI).

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Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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Introduction

The present document informs about the possibilities of an IPTV Terminal to make use of HbbTV features.

Clause 4 of the present document contains requirements that are generic to any IPTV system when used in combination with HbbTV. Clause 5 contains requirements that are specific to particular IPTV service discovery technologies.

Clause 6 contains requirements that are specific to particular IPTV content delivery technologies. HbbTV terminals supporting the present document comply with the descriptions given in clause 4, and clauses of 5 and/or 6 depending on the technologies used for service discovery and content delivery.

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1 Scope

The present document describes how IPTV Terminals can make use of HbbTV features. It does not, in any way, describe an IPTV delivery system itself. As such, technologies like fast channel change, retransmission and forward error correction are out-of-scope. Instead it defines how several technologies may be used in combination with HbbTV in a form that can be referenced by markets or organizations that have made choices.

Please note that the scope of the present document only includes channels that use either MPEG-2 Transport Stream or MPEG DASH in the way defined in clause 6.2.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 102 796: "Hybrid Broadcast Broadband TV".
- [2] ETSI TS 102 034 (V2.1.1): "Digital Video Broadcasting (DVB); Transport of MPEG-2 TS Based DVB Services over IP Based Networks".
- [3] ETSI TS 103 205 (V1.1.1): "Digital Video Broadcasting (DVB); Extensions to the CI PlusTM Specification".
- [4] Open IPTV Forum (V1.1 - October 2015): "Implementation Guideline for STB-less IPTV".
- [5] Open IPTV Forum (V1.1 - October 2015): "Feature Package: Additional Features to Support STB-less IPTV".
- [6] Open IPTV Forum Release 2 specification, volume 5 (V2.3): "Declarative Application Environment".
- [7] DVB Document A168: "MPEG-DASH Profile for Transport of ISO BMFF Based DVB Services over IP Based Networks".

NOTE: Available at https://www.dvb.org/resources/public/standards/a168_dvb-dash.pdf.

- [8] ETSI TS 102 539 (V1.3.1): "Digital Video Broadcasting (DVB); Carriage of Broadband Content Guide (BCG) information over Internet Protocol (IP)".
- [9] IETF RFC 2782: "A DNS RR for specifying the location of services (DNS SRV)".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] DASH-IF: DASH-AVC/264 Interoperability Points V3.0: "DRM updates, Improved Live, Ad Insertion, Events, H.265/HEVC support, Trick Modes, CEA608/708".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI TS 102 796 [1] and the following apply:

broadcast: uni-directional MPEG-2 transport stream based on delivery systems such as DVB-T, DVB-S, DVB-C or DVB-IPTV

hybrid IPTV terminal: terminal that has both an IP connection and a classical RF-based broadcast connection

pure IPTV terminal: terminal that has only an IP connection and no classical RF-based broadcast connection

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AIT	Application Information Table
A/V	Audio/Visual
DAE	Declarative Application Environment
DASH	Dynamic Adaptive Streaming over HTTP
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
DSM-CC	Digital Storage Media - Command and Control
DVB	Digital Video Broadcasting
DVB-SI	DVB Service Information
EIT	Event Information Table
EPG	Electronic Program Guide
HbbTV	Hybrid broadcast broadband TV
HEVC	High Efficiency Video Coding
HTTP	Hypertext Transfer Protocol
IP	Internet Protocol
IPTV	Internet Protocol Television
MPD	Media Presentation Description
MPEG	Motion Picture Experts Group
OIPF	Open IPTV Forum
OSDT	Online SDT
PMT	Program Map Table
RTP	Real-time Transport Protocol
RTSP	Real Time Streaming Protocol
SD&S	Service Discovery and Selection
SDT	Service Description Table
SRV	Service

TLS	Transport Layer Security
TV	Television
UDP	User Datagram Protocol
UI	User Interface
URL	Uniform Resource Locator
XML	eXtensible Markup Language

4 IPTV as the "broadcast"

4.1 General principles

All definitions and requirements of the Hybrid Broadcast Broadband TV specification [1] shall also apply for usage in an IPTV service except for the changes explicitly listed in this clause. Specifically, unless explicitly stated otherwise below:

- All relevant signalling and transport (PMT entries, AITs, DSM-CC carousels, etc.) which can be used in the MPEG2-TS of a conventional DVB broadcast signal shall be supported in the same way for an MPEG2-TS which is carried via IP in an IPTV system as they would be in a conventional broadcast signal.
- Selecting a broadcast channel by creating a Channel object using a DVB triplet and then selecting that channel using the `setChannel()` method on the video/broadcast object shall work as specified in the OIPF DAE specification [6] with the DVB triplet being resolved by the service discovery mechanism (for example one of the mechanisms addressed in clause 5 of the present document).
- The requirements on starting broadcast-related applications defined in clause 6.2.2.8 of ETSI TS 102 796 [1] are applicable to channels delivered according to the present document.

4.2 Application Lifecycle

The exceptional rules for the application lifecycle related to services without an SDT entry (in clause 6.2.2.2 of ETSI TS 102 796 [1]) shall also apply for IPTV streams without an entry in the Service Discovery Mechanism (SD&S, OSDT or other).

4.3 OIPF DAE Specification Profile

For the following clauses of annex A of ETSI TS 102 796 [1] the changes in table 1 shall apply.

Table 1: Changed sections in the profile of the OIPF DAE specification

Section, sub-section	Reference in DAE (see clause A.1 of [1])	Status in Hybrid Broadcast Broadband TV	Notes	Security
Metadata APIs				
The application/oipfSearchManager embedded object	7.12.1	M (*)	Optional for pure IPTV terminals	Broadcast-related
The MetadataSearch class	7.12.2	M (*)	Optional for pure IPTV terminals	Broadcast-related
The Query class	7.12.3	M (*)	Optional for pure IPTV terminals	Broadcast-related
The SearchResults class	7.12.4	M (*)	Optional for pure IPTV terminals	Broadcast-related
Scheduled content and hybrid tuner APIs				
video/broadcast embedded object	7.13.1	M	Support for the method <code>Channel createChannelObject(Integer idType, String dsd, Integer sid)</code> is optional on pure IPTV terminals, but support for the method <code>createChannelObject(Integer idType, Integer onid, Integer tsid, Integer sid, Integer sourceID, String ipBroadcastID)</code> is mandatory.	
NOTE: In IPTV networks, objects marked with (*) are expected to be fed with service-specific data via broadband connections for EPG purposes.				

4.4 Terminal Capabilities

The requirement in clause 10.2.4 of ETSI TS 102 796 [1] for terminals to include the client metadata element with type "dvb-si" set to true in their xmlCapabilities does not apply for pure IPTV terminals.

4.5 Access to EIT Schedule Information

The requirement in clause A.2.9 of ETSI TS 102 796 [1] to allow access to DVB-SI EIT event schedule information does not apply at all for pure IPTV terminals. For hybrid IPTV terminals, it is not required to access DVB-SI EIT event schedule information of services delivered via IPTV.

5 Integration of HbbTV and Service Discovery Mechanisms

5.1 Overview

The present document defines how HbbTV can be integrated with three different mechanisms for service discovery. Table 2 lists these three mechanisms and indicates how support for each mechanism shall be indicated in the XML device capabilities of the HbbTV terminal.