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Foreword

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NOTE: The EBU/ETSI JTC Broadcast was established in 1990 to co-ordinate the drafting of standards in the specific field of broadcasting and related fields. Since 1995 the JTC Broadcast became a tripartite body by including in the Memorandum of Understanding also CENELEC, which is responsible for the standardization of radio and television receivers. The EBU is a professional association of broadcasting organizations whose work includes the co-ordination of its members' activities in the technical, legal, programme-making and programme-exchange domains. The EBU has active members in about 60 countries in the European broadcasting area; its headquarters is in Geneva.

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The DVB Project is an industry-led consortium of broadcasters, manufacturers, network operators, software developers, regulators and others from around the world committed to designing open, interoperable technical specifications for the global delivery of digital media and broadcast services. DVB specifications cover all aspects of digital television from transmission through interfacing, conditional access and interactivity for digital video, audio and data. The consortium came together in 1993.

Modal verbs terminology

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Introduction

The present document specifies an end-to-end Native IP broadcast system for DVB broadcast bearers. It relies as much as possible on existing DVB specifications and complements those where necessary. The Native IP broadcast system is built upon DVB-I for service discovery and program metadata, DVB-AVC and DVB-DASH for source coding and stream formatting and DVB-MABR, DVB-GSE and the physical layer specifications DVB-S2X, DVB-S2 and DVB-T2 for transport. DVB Native IP facilitates the integration of OTT and Broadcast technologies into an efficient and contemporary IP media distribution solution.

The Native IP specification addresses both consumer and professional applications.

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1 Scope

The present document describes a Native IP end-to-end broadcast system based on existing DVB standards.

2 References

2.1 Normative references

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- [1] [ETSI EN 302 307-1](#): "Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications; Part 1: DVB-S2".
- [2] [ETSI EN 302 307-2](#): "Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications; Part 2: DVB-S2 Extensions (DVB-S2X)".
- [3] [ETSI TS 102 755](#): "Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)".
- [4] [ETSI TS 102 606-1](#): "Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE); Part 1: Protocol".
- [5] [ETSI TS 102 606-2](#): "Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE); Part 2: Logical Link Control (LLC)".
- [6] [ETSI TS 102 606-3](#): "Digital Video Broadcasting (DVB); Generic Stream Encapsulation (GSE); Part 3: Robust Header Compression (RoHC) for IP".
- [7] [ETSI EN 301 192](#): "Digital Video Broadcasting (DVB); DVB specification for data broadcasting".
- [8] [ETSI TS 103 769](#): "Digital Video Broadcasting (DVB); Adaptive Media Streaming over IP multicast".
- [9] [ETSI TS 103 770](#): "Digital Video Broadcasting (DVB); Service Discovery and Programme Metadata for DVB-I".
- [10] [ETSI TS 101 154](#): "Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcast and Broadband Applications".
- [11] [ETSI TS 103 285](#): "Digital Video Broadcasting (DVB); MPEG-DASH Profile for Transport of ISO BMFF Based DVB Services over IP Based Networks".
- [12] [ETSI EN 303 560](#): "Digital Video Broadcasting (DVB); TTML Subtitling Systems".
- [13] [DVB Document A179r2](#): "Digital Video Broadcasting (DVB); Service discovery and delivery protocols for a DVB Home Broadcast system".
- [14] [ETSI EN 300 468](#): "Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems".

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- [28] [EN 50585 \(2014\)](#): "Communications protocol to transport satellite delivered signals over IP networks", (produced by CENELEC).
- [29] [IETF RFC 3629](#): "UTF-8, a transformation format of ISO 10646".

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.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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] ISO/IEC 23001-7:2016: "Information technology -- MPEG systems technologies -- Part 7: Common encryption in ISO base media file format files".
- [i.2] W3C® Recommendation: "[XML Schema Definition Language \(XSD\) 1.1 Part 1: Structures](#)".
- [i.3] W3C® Recommendation: "[XML Schema Definition Language \(XSD\) 1.1 Part 2: Datatypes](#)".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

aggregator: any entity in charge of aggregating one or more bouquets of services

asset: any file object directly retrievable by NIP Clients through a URI

bootstrap process: initialization process for broadcast receivers joining a NIP broadcast network and learning about the topology of the network including the availability of channels, streams and services on those streams

bootstrap streams: any NIP stream according to the present document that is involved in the bootstrap or initialization process of receivers joining a NIP network and wanting to learn about the topology of the network

broadcast service: any NIP Service broadcast over a NIP compliant network as opposed to a service provided via OTT

broadcast service list: DVB-I Service List according to ETSI TS 103 770 [9] broadcast over a DVB-NIP Broadcast System and listing services available via broadcast or broadband

broadcast service list entry points: Service List Entry Points file broadcast via a DVB-NIP Broadcast System according to the present document

NOTE: The Broadcast Service List Entry Points file provides to a DVB-I client the list of all DVB-I Service Lists that are broadcast on a NIP network.

commercial operator: any entity in charge of providing one or more bouquets of services aggregating services and providing these free-to-air or against payment to end-users

connected device: any device, capable of receiving broadcast content and also connected to a terrestrial fixed or mobile broadband network or connected to a satellite network with return channel functionality providing access to the open internet

content preparation platform: all functions involved in the video encoding, encryption, key management and packaging of media assets for broadcast via a NIP compliant network

deployment model: refers to a logical grouping of receiver functions or features for a particular usage scenario

DVB-I Client: implementation of the client side of ETSI TS 103 770 [9]

NOTE: This may be integrated into the User Interface (UI) of a device such as a television or set-top box or part of an app on devices such as mobile phones or tablets.

DVB-NIP Broadcast System: content distribution system compliant with the present document

DVB-TS Broadcast Headend: all functions part of a traditional Transport Stream based DVB Head-end: Linear encoding into PES packets, DVB Multiplexing, DVB Conditional Access, etc.

headend: all functions involved in the editing of services before being broadcast

hybrid service: service consisting of components carried via a) broadcast and b) broadband means

media object: single externally addressable unit of packaged encoded media essence or related metadata to be conveyed via a multicast transport session or via a unicast transport session e.g. a presentation manifest or DASH segment identified by a URI

metadata: all data related to the description of the network: Channels and Streams, Services available on the Network: Service List Entry Points and Service Lists, Content within those services: Content Guide and Content Presentation

multicast gateway: As defined in clause 5.3.5 of ETSI TS 103 769 [8].

multicast rendezvous service: As defined in clause 5.3.9 of ETSI TS 103 769 [8].

multicast server: As defined in clause 5.3.3 of ETSI TS 103 769 [8].

NIP Client: software application, that includes the capability to select, decode, decrypt and display NIP Services

NIP Gateway: device including one or more broadcast reception frontends plus all functions required to interface with DVB-NIP Clients according to the present document

NIP Receiver: generic term for a reception device

NOTE: The NIP Receiver always includes at least one or more physical broadcast tuner/demodulator functions, capable of receiving streams according to the present document. The NIP receiver may additionally include some or all NIP Gateway functions as well as some or all NIP Client functions.

NIP Service: any service which is discovered using the mechanisms defined in the present document, and which is using DVB-DASH (ETSI TS 103 285 [11]) delivery via broadcast or broadband

NIP Service Aggregation Platform: all head-end components, cloud or on-premises, at the Technical Network Operator or at one or more Commercial Operator(s) involved in the compilation of signalling and metadata information for the correct operation of NIP broadcast services

NIP Service Identifier: URL of the NIP Service manifest

NIP Stream: Layer 2 packet stream consisting of a succession of GSE-Lite packets or TS/MPE sections

NIP Wall Clock: UTC time synchronized between head-end and NIP receivers

Over-The-Top (OTT): media service offered directly to viewers via the Internet. OTT bypasses cable, broadcast, and satellite television platforms

provider name: name of the provider of a DVB-I (ETSI TS 103 770 [9]) Service List in a human readable form

regular stream: any NIP Stream that carries NIP Services but does not carry information specifically required during the bootstrap process of receivers

regulator: entity in charge of defining rules for broadcasters and the editing of broadcast programs

NOTE: In the context of the present document, the regulator is considered a key source when defining regionally applicable Service Lists.

reserved_zero_future_use: when used in the clause defining the coded bit stream, indicates that the value may be used in the future for ETSI defined extensions

NOTE: All "reserved_zero_future_use" bits are set to "0".

RF Carrier: modulated radio frequency signal carrying one or more NIP Streams

RF Channel: logical subdivision of the RF broadcast spectrum

NOTE: In the context of satellite transmissions RF Channels are commonly called Transponders.

technical network operator: entity in charge of running the broadcast network

3.2 Symbols

Void.

3.3 Abbreviations

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

ABR	Adaptive Bit Rate
ALC	Asynchronous Layered Coding
API	Application Programming Interface
AV	Audio Visual