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Digital Video Broadcasting (DVB); Signalling and carriage of interactive applications and services in Hybrid broadcast/broadband environments

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Digital Video
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Reference

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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 Digital Video Broadcasting Project (DVB) is an industry-led consortium of broadcasters, manufacturers, network operators, software developers, regulatory bodies, content owners and others committed to designing global standards for the delivery of digital television and data services. DVB fosters market driven solutions that meet the needs and economic circumstances of broadcast industry stakeholders and consumers. DVB standards 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 to provide global standardization, interoperability and future proof specifications.

The normative XML schemas referenced by the present document are attached as separate files contained in archive `ts_102809v010301p0.zip` which accompanies the present document. The XML schemas included in the present document are informative.

Modal verbs terminology

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1 Scope

The present document defines a framework for the signalling and carriage of interactive applications or services in broadcast and broadband networks. This framework covers:

- Signalling interactive applications or services in both classical broadcast networks and broadband networks.
- Distributing the files of interactive applications or services through either classical broadcast networks or broadband networks.
- Synchronizing interactive applications or services to video or audio content distributed through classical broadcast networks or broadband networks.
- Referencing video, audio or subtitle content distributed through classical broadcast networks or broadband networks from interactive applications or services.

The present document is independent of any particular technology for interactive applications or services. It is intended to be referenced by organizations defining how interactive applications or services are to be deployed and not used as a stand-alone document in its own right. It is expected that those organizations will make a selection appropriate for their market or deployment from among the functionality defined here. The use of "shall", "should" and similar terms in the present document is intended to apply only if the particular feature is used and not to imply that the feature itself is mandatory.

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 EN 300 468: "Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems".
- [2] ETSI EN 301 192 (V1.3.1): "Digital Video Broadcasting (DVB); DVB specification for data broadcasting".
- [3] ISO/IEC 13818-1: "Information technology - Generic coding of moving pictures and associated audio information - Part 1: Systems".
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NOTE: Available at <http://www.w3.org/TR/xmlschema-0/>.

- [18] IETF RFC 1945: "Hypertext Transfer Protocol - HTTP/1.0".
- [19] IETF RFC 2818: "HTTP over TLS".
- [20] ETSI TS 102 851: "Digital Video Broadcasting (DVB); Uniform Resource Identifiers (URI) for DVB Systems".
- [21] IETF RFC 1035: "Domain names - implementation and specification".
- [22] ANSI X9.62: "Public Key Cryptography for the Financial Services Industry, The Elliptic Curve Digital Signature Algorithm (ECDSA)".
- [23] FIPS 180-4: "Secure Hash Standard (SHS)".
- [24] NIST Special Publication 800-107: "Recommendation for Applications Using Approved Hash Algorithms".
- [25] IETF RFC 3447: "Public-Key Cryptography Standards (PKCS) #1: RSA Cryptography Specifications Version 2.1".
- [26] SECG SEC 2: "Recommended Elliptic Curve Domain Parameters".

NOTE: Available at <http://www.secg.org/SEC2-Ver-1.0.pdf>.

- [27] IETF RFC 8032: "Edwards-curve Digital Signature Algorithm (EdDSA)".
- [28] IETF RFC 5912: "New ASN.1 Modules for the Public Key Infrastructure Using X.509 (PKIX)".
- [29] Recommendation ITU-T X.680: "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic Notation".
- [30] Recommendation ITU-T X.690: "Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)".
- [31] draft-josefsson-tls-ed25519-00: "Using EdDSA/Ed25519 in the Internet X.509 Public Key Infrastructure".

NOTE: Available at <https://tools.ietf.org/html/draft-josefsson-tls-ed25519-00>.

- [32] IETF RFC 5280: "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile".
- [33] ETSI TS 102 770: "Digital Video Broadcasting (DVB); System Renewability Messages (SRM) in DVB Systems".

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] ETSI TS 102 727: "Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.2.2".
- [i.2] ETSI TR 101 202 (V1.1.1): "Digital Video Broadcasting (DVB); Implementation guidelines for Data Broadcasting".
- [i.3] IETF RFC 1738: "Uniform Resource Locators (URL)".
- [i.4] IETF RFC 2396: "Uniform Resource Identifiers (URI): Generic Syntax".

3 Definitions and abbreviations

3.1 Definitions

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

abstract service: mechanism to group a set of related unbound applications where some aggregator has taken the responsibility to ensure that the set of related applications work together

NOTE: This is a generalization of a broadcast service to support applications not related to any broadcast TV or radio service. A set of resident applications which a network operator has packaged together (e.g. chat, email, WWW browser) could comprise one abstract service.

application: collection of assets and logic that together provide a self-contained interactive service to the user

application lifecycle: various states in which an application may exist and the transitions between them, including starting and stopping

Application Programming Interface (API): interface between an application and a particular feature, function or resource of the receiver

automatic channel scan: channel scan performed by the receiver that has not been explicitly requested by the user

NOTE: Examples of when these channel scans may be performed include at a fixed time in the middle of the night or sometime after the receiver has been put into standby by the user.

classical broadcast network: network using classical broadcast technologies based on MPEG-2 transport streams carried over a physical layer such as DVB-T, DVB-S or DVB-C

platform specification: document which references the present document and defines which parts of the present document are applicable in a particular market or deployment