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Digitalna videoradiodifuzija (DVB) - Specifikacija za servisne informacije (SI) v sistemih DVB

Digital Video Broadcasting (DVB) - Specification for Service Information (SI) in DVB systems

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Foreword

This European Standard (EN) 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).

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.

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Date of adoption of this EN:	15 March 2016
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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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1 Scope

The present document specifies the Service Information (SI) data which forms a part of DVB bitstreams, in order that the user can be provided with information to assist in selection of services and/or events within the bitstream, and so that the Integrated Receiver Decoder (IRD) can automatically configure itself for the selected service. SI data for automatic configuration is mostly specified within ISO/IEC 13818-1 [18] as Program Specific Information (PSI).

The present document specifies additional data which complements the PSI by providing data to aid automatic tuning of IRDs, and additional information intended for display to the user. The manner of presentation of the information is not specified in the present document, and IRD manufacturers have freedom to choose appropriate presentation methods.

It is expected that Electronic Programme Guides (EPGs) will be a feature of Digital TV transmissions.

The definition of an EPG is outside the scope of the present document (i.e. the SI specification), but the data contained within the SI specified in the present document may be used as the basis for an EPG.

Rules of operation for the implementation of the present document are specified in ETSI TS 101 211 [i.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.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

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

[1] ETSI EN 300 231: "Television systems; Specification of the domestic video Programme Delivery Control system (PDC)".

[2] ETSI EN 300 401: "Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers".

[3] ETSI EN 300 706: "Enhanced Teletext specification".

[4] ETSI EN 301 192: "Digital Video Broadcasting (DVB); DVB specification for data broadcasting".

[5] ETSI EN 301 210: "Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for Digital Satellite News Gathering (DSNG) and other contribution applications by satellite".

[6] ETSI EN 301 775: "Digital Video Broadcasting (DVB); Specification for the carriage of Vertical Blanking Information (VBI) data in DVB bitstreams".

[7] ETSI EN 301 790: "Digital Video Broadcasting (DVB); Interaction channel for satellite distribution systems".

[8] 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".

[9] ETSI TS 101 154: "Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream".

[10] ETSI TS 102 005: "Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in DVB services delivered directly over IP protocols".

[11] ETSI TS 102 006: "Digital Video Broadcasting (DVB); Specification for System Software Update in DVB Systems".

[12] ETSI TS 102 114: "DTS Coherent Acoustics; Core and Extensions with Additional Profiles".

[13] ETSI TS 102 323: "Digital Video Broadcasting (DVB); Carriage and signalling of TV-Anytime information in DVB transport streams".

[14] ETSI TS 102 366: "Digital Audio Compression (AC-3, Enhanced AC-3) Standard".

[15] ETSI TS 102 812: "Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.1.1".

[16] ISO/IEC 10646: "Information technology -- Universal Coded Character Set (UCS)".

[17] ISO/IEC 11172-3: "Information technology -- Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s -- Part 3: Audio".

[18] ISO/IEC 13818-1: "Information technology -- Generic coding of moving pictures and associated audio information: Systems".

[19] ISO/IEC 13818-2: "Information technology -- Generic coding of moving pictures and associated audio information: Video".

[20] ISO/IEC 13818-3: "Information technology -- Generic coding of moving pictures and associated audio information -- Part 3: Audio".

[21] ISO/IEC 14496-3: "Information technology -- Coding of audio-visual objects -- Part 3: Audio".

[22] ISO/IEC 6937: "Information technology -- Coded graphic character set for text communication -- Latin alphabet".

[23] ISO/IEC 8859-1: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 1: Latin alphabet No. 1".

[24] ISO/IEC 8859-2: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 2: Latin alphabet No. 2".

[25] ISO/IEC 8859-3: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 3: Latin alphabet No. 3".

[26] ISO/IEC 8859-4: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 4: Latin alphabet No. 4".

[27] ISO/IEC 8859-5: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 5: Latin/Cyrillic alphabet".

[28] ISO/IEC 8859-6: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 6: Latin/Arabic alphabet".

[29] ISO/IEC 8859-7: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 7: Latin/Greek alphabet".

[30] ISO/IEC 8859-8: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 8: Latin/Hebrew alphabet".

[31] ISO/IEC 8859-9: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 9: Latin alphabet No. 5".

[32] ISO/IEC 8859-10: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 10: Latin alphabet No. 6".

[33] ISO/IEC 8859-11: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 11: Latin/Thai alphabet".

[34] ISO/IEC 8859-13: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 13: Latin alphabet No. 7".

[35] ISO/IEC 8859-14: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 14: Latin alphabet No. 8 (Celtic)".

[36] ISO/IEC 8859-15: "Information technology -- 8-bit single-byte coded graphic character sets -- Part 15: Latin alphabet No. 9".

[37] CENELEC EN 50221: "Common interface specification for conditional access and other digital video broadcasting decoder applications".

[38] IEC 61883 (parts 1 and 4): "Consumer audio/video equipment -- Digital interface".

[39] IEEE™ 1394.1: "IEEE™ Standard for High Performance Serial Bus Bridges".

[40] ISO 8601: "Data elements and interchange formats -- Information interchange -- Representation of dates and times".

[41] ISO 3166 (all parts): "Codes for the representation of names of countries and their subdivisions".

[42] ISO 639-2: "Codes for the representation of names of languages -- Part 2: Alpha-3 code".

[43] Recommendation ITU-R BS.1196 (appendix 3): "Audio coding for digital broadcasting".

NOTE: Appendix 3 contains additional information on the AC-3 audio encoding algorithm and decoding requirements, relevant to the present document.

[44] KSX1001: "Code for Information Interchange (Hangeul and Hanja)", Korean Agency for Technology and Standards, Ref. No. KSX 1001-2004.

NOTE: Available at http://unicode.org/Public//MAPPINGS/OBSOLETE/EASTASIA/KSC/KSX1001.TXT.

[45] ETSI ES 201 812: "Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.0.3".

[46] ETSI TS 102 825 (parts 1 to 5, 7, 9 and 10): "Digital Video Broadcasting (DVB); Content Protection and Copy Management (DVB-CPCM)".

[47] ETSI EN 302 755: "Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)".

[48] Void.

[49] ETSI TS 102 770: "Digital Video Broadcasting (DVB); System Renewability Messages (SRM) in DVB Systems".

[50] ETSI EN 302 583: "Digital Video Broadcasting (DVB); Framing Structure, channel coding and modulation for Satellite Services to Handheld devices (SH) below 3 GHz".

[51] ETSI TS 102 772: "Digital Video Broadcasting (DVB); Specification of Multi-Protocol Encapsulation - inter-burst Forward Error Correction (MPE-iFEC)".

[52] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

[53] ETSI EN 302 769: "Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital transmission system for cable systems (DVB-C2)".

[54] ETSI TS 101 547-2: "Digital Video Broadcasting (DVB); Plano-stereoscopic 3DTV; Part 2: Frame Compatible Plano-stereoscopic 3DTV".

[55] ETSI TS 101 547-3: "Digital Video Broadcasting (DVB); Plano-stereoscopic 3DTV; Part 3: HDTV Service Compatible Plano-stereoscopic 3DTV".

[56] ETSI TS 102 809: "Digital Video Broadcasting (DVB); Signalling and carriage of interactive applications and services in Hybrid Broadcast/Broadband environments".

[57] ETSI TS 102 773: "Digital Video Broadcasting (DVB); Modulator Interface (T2-MI) for a second generation digital terrestrial television broadcasting system (DVB-T2)".

[58] GB2312-1980: "Code of Chinese graphic character set for information interchange, primary set".

[59] IETF RFC 3986: "Uniform Resource Identifiers (URI): Generic Syntax".

[60] ETSI TS 102 034: "Digital Video Broadcasting (DVB); Transport of MPEG-2 TS Based DVB Services over IP Based Networks".

[61] ETSI TS 103 190 (V1.1.1): "Digital Audio Compression (AC-4) Standard".

[62] ETSI TS 101 547-4: "Digital Video Broadcasting (DVB); Plano-stereoscopic 3DTV; Part 4: Service frame compatible Plano-stereoscopic 3DTV for HEVC coded services".

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 101 162: "Digital Video Broadcasting (DVB); Allocation of identifiers and codes for Digital Video Broadcasting (DVB) systems".

[i.2] ETSI TS 101 211: "Digital Video Broadcasting (DVB); Guidelines on implementation and usage of Service Information (SI)".

[i.3] ETSI TS 102 727: "Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.2.2".

[i.4] ETSI TR 102 825 (parts 6, 8, 11 to 13): "Digital Video Broadcasting (DVB); Content Protection and Copy Management (DVB-CPCM)".

[i.5] ETSI TS 102 201: "Digital Video Broadcasting (DVB); Interfaces for DVB Integrated Receiver Decoder (DVB-IRD)".

[i.6] ETSI EN 300 429: "Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for cable systems".

[i.7] ETSI EN 300 421: "Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for 11/12 GHz satellite services".

[i.8] ETSI EN 300 744: "Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television".

[i.9] DVB BlueBook A165: "Digital Video Broadcasting (DVB); Extensions to the CI Plus Specification".

[i.10] DVB BlueBook A167-2: "Digital Video Broadcasting (DVB); Companion Screens and Streams; Part 2: Content Identification and Media Synchronisation".

[i.11] ISO/IEC 14496-10: "Information technology -- Coding of audio-visual objects -- Part 10: Advanced Video Coding".

3 Definitions and abbreviations

3.1 Definitions

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

AC-3: refers to the coding of audio using the Dolby AC-3 audio compression method defined by ETSI TS 102 366 [14]

NOTE: The Service Information requirements for AC-3 streams carried in DVB systems are described in annex D. The carriage of AC-3 elementary streams as private data within MPEG systems is described in clause 6.2 of ETSI TS 101 154 [9].

AC-4: refers to the coding of audio using the Dolby AC-4 audio compression method defined by ETSI TS 103 190 [61]

NOTE: The Service Information requirements for AC-4 streams carried in DVB systems are described in annex D. The carriage of AC-4 elementary streams as private data within MPEG systems is described in clause 6.5 of ETSI TS 101 154 [9].

bouquet: collection of services marketed as a single entity

broadcaster (SERVICE Provider): organization which assembles a sequence of events or data streams to be delivered to the viewer; the delivery can be based upon a schedule

cell: geographical area that is covered with DVB-T signals delivering one or more particular transport streams throughout the area by means of one or more transmitters

NOTE: The cell may in addition contain repeaters. Two neighbouring cells may be intersecting or fully overlapping. The cell_id that is used to uniquely identify a cell is unique within each original_network_id. For hand-over purposes it is more convenient if the transport streams associated with the cell cover exactly the same area, or only one transport stream per cell is used.

component (ELEMENTARY Stream): one or more entities which together make up an event

EXAMPLE: Video, audio, teletext.

Conditional Access (CA) system: system to control subscriber access to services, data streams and events

EXAMPLE: Videoguard, Eurocrypt.

delivery system: physical medium by which one or more DVB transport streams are transmitted

EXAMPLE: Satellite system, wide-band coaxial cable, fibre optics, terrestrial channel of one emitting point.

dependent stream: a stream or component which relies on another stream or component in order to be rendered as intended

EXAMPLE: A dependent view of a 3D video, or a receiver-mix audio description stream.

DTS®: refers to the first generation audio coding system by DTS, Inc. defined by ETSI TS 102 114 [12] version 1.2.1

NOTE: The service information requirements for DTS® are found in annex G.

DTS-HD®: refers to the enhanced DTS® audio coding system by DTS, Inc. defined by ETSI TS 102 114 [12] version 1.3.1 and later. Note that DTS-HD® is a superset of DTS®

NOTE: The service information requirements for DTS-HD® are found in annex G.

DVB transport stream: an MPEG-2 transport stream [18] containing the mandatory DVB-SI signalling as defined in the present document

NOTE: It is recommended that the DVB-SI implementation guidelines [i.2] should be followed in addition. They define additional requirements for the signalling to help improve the quality of experience for viewers.

event: grouping of elementary broadcast data streams with a defined start time and duration belonging to a common service

EXAMPLE: First half of a football match, News Flash, first part of an entertainment show.

forbidden: when used in the clauses defining the coded bit stream, indicates that the value is never used

MPEG-2: See ISO/IEC 13818 [18].

NOTE: Systems coding is defined in part 1 [18]. Video coding is defined in part 2 [19]. Audio coding is defined in part 3 [20].

network: managed and navigable collection of DVB transport streams transmitted on one or more delivery systems generally based on the same physical medium

NOTE 1: It is possible to operate both, first and second generation delivery systems in the same network (e.g. DVB-T and DVB-T2).

NOTE 2: A network is identified by its network_id. It might be composed of one or more emitting sites.

n PSK: n-valued Phase Shift Keying (other than quaternary)

original_network_id: unique identifier of a broadcast platform operator

NOTE: This value is assigned by DVB.

repeater: equipment which allows reception of a terrestrial signal and to re-transmit it unchanged

NOTE: Hence it does not support changing of the cell_id.

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

NOTE: Unless otherwise specified within the present document all "reserved" bits are set to "1".

reserved_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: Unless otherwise specified within the present document all "reserved_future_use" bits are set to "1".

section: syntactic structure used for mapping all service information defined in the present document into ISO/IEC 13818-1 [18] TS packets

service: a grouping (usually defined by a PMT) of one or more data streams which are offered as a whole to the user

service_id: unique identifier of a service within a DVB transport stream

NOTE: In areas where ETSI TS 101 211 [i.2] is applicable in addition to the present document, a service_id is also unique within the scope of an original_network_id.

Service Information (SI): describes the delivery system, and the content and scheduling/timing of services and events

NOTE: It includes MPEG-2 Program Specific Information (PSI) together with DVB-defined extensions.

subcell: geographical area that is part of the cells coverage area and that is covered with DVB-T signals by means of a transposer

NOTE: In conjunction with the cell_id the cell_id_extension is used to uniquely identify a subcell.

sub_table: collection of sections with the same value of table_id and:

- for a NIT: the same table_id_extension (network_id) and version_number;
- for a BAT: the same table_id_extension (bouquet_id) and version_number;
- for a SDT: the same table_id_extension (transport_stream_id), the same original_network_id and version_number;