



SLOVENSKI STANDARD
SIST EN 301 192 V1.4.1:2005

01-november-2005

Digitalna videoradiodifuzija (DVB) – Specifikacija DVB za podatkovno radiodifuzijo

Digital Video Broadcasting (DVB); DVB specification for data broadcasting

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: **EN 301 192 Version 1.4.1**

SIST EN 301 192 V1.4.1:2005
<https://standards.iteh.ai/catalog/standards/sist/1bc4a7df-6ecc-439c-830b-57fa143a4717/sist-en-301-192-v1-4-1-2005>

ICS:

33.170

Televizijska in radijska
difuzija

Television and radio
broadcasting

SIST EN 301 192 V1.4.1:2005

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 301 192 V1.4.1:2005](https://standards.iteh.ai/catalog/standards/sist/fbc4a7df-6ec8-439c-830b-57fa143a4717/sist-en-301-192-v1-4-1-2005)

<https://standards.iteh.ai/catalog/standards/sist/fbc4a7df-6ec8-439c-830b-57fa143a4717/sist-en-301-192-v1-4-1-2005>

ETSI EN 301 192 V1.4.1 (2004-11)

European Standard (Telecommunications series)

Digital Video Broadcasting (DVB); DVB specification for data broadcasting

iTeh STANDARD PREVIEW
(standards.iteh.ai)

European Broadcasting Union

Union Européenne de Radio-Télévision



SIST EN 301 192 V1.4.1

<https://standards.iteh.ai/catalog/standards/sist/fbc4a7df-6ec8-439c-830b-57fa143a4717/sist-en-301-192-v1-4-1-2005>



ReferenceREN/JTC-DVB-157

Keywords

broadcasting, data, digital, DVB, MPEG, video

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 301 192 V1.4.1:2005

<https://standards.iteh.ai/catalog/standards/sist/fbc4a7df-6ec8-439c-830b-57fa143a4118/sist-en-301-192-v1-4-1-2005>
Important notice

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:

http://portal.etsi.org/chaicor/ETSI_support.asp

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2004.

© European Broadcasting Union 2004.

All rights reserved.

DECT™, **PLUGTESTS™** and **UMTS™** are Trade Marks of ETSI registered for the benefit of its Members.
TIPHON™ and the **TIPHON logo** are Trade Marks currently being registered by ETSI for the benefit of its Members.
3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

Contents

Intellectual Property Rights	6
Foreword.....	6
1 Scope	7
2 References	8
3 Abbreviations	9
4 Data piping	10
4.1 Data transport specification	10
4.2 PSI and SI specifications	10
4.2.1 Data_broadcast_descriptor.....	11
4.2.2 Stream type	11
5 Asynchronous data streaming	11
5.1 Data transport specification	11
5.2 PSI and SI specifications	11
5.2.1 Data_broadcast_descriptor.....	11
5.2.2 Stream type	11
6 Synchronous and synchronized data streaming.....	12
6.1 Data transport specification.....	12
6.2 PSI and SI specifications.....	13
6.2.1 Data_broadcast_descriptor.....	13
6.2.2 Stream type	13
7 Multiprotocol encapsulation.....	14
7.1 Data transport specification.....	14
7.2 MPE PSI and SI specifications.....	16
7.2.1 Data_broadcast_descriptor.....	16
7.2.2 Stream type	17
8 IP/MAC Notification Table signalling for Multiprotocol Encapsulation.....	17
8.1 Definitions, scope and types of services.....	17
8.1.1 Definitions	17
8.1.2 Scope of the IP/MAC Notification Table	18
8.1.3 Types of IP/MAC Notification Services.....	18
8.2 Network (SI) signalling	18
8.2.1 Linkage descriptor for an IP/MAC Notification Table	20
8.2.2 Deferred linkage descriptor for IP/MAC Notification Tables	21
8.3 PSI Signalling.....	22
8.3.1 Data broadcast Id descriptor selector byte definition for <i>IP/MAC Notification Table</i>	22
8.4 IP/MAC Notification Table.....	22
8.4.1 Description.....	22
8.4.2 PSI, SI and related INT signalling	23
8.4.3 Description of the IP/MAC Notification Table.....	24
8.4.4 Semantics of the INT	25
8.4.4.1 Fields description	26
8.4.4.2 platform_descriptor_loop.....	27
8.4.4.3 target_descriptor_loop.....	27
8.4.4.4 operational_descriptor_loop.....	27
8.4.5 INT descriptors	28
8.4.5.1 Descriptor identification and location	28
8.4.5.2 IP/MAC_platform_name_descriptor.....	28
8.4.5.3 IP/MAC_platform_provider_name_descriptor	29
8.4.5.4 target_serial_number_descriptor.....	29
8.4.5.5 target_smartcard_descriptor.....	30
8.4.5.6 target_MAC_address_descriptor.....	30

8.4.5.7	target_MAC_address_range_descriptor.....	30
8.4.5.8	target_IP_address_descriptor.....	31
8.4.5.9	target_IP_slash_descriptor.....	31
8.4.5.10	target_IP_source_slash_descriptor.....	32
8.4.5.11	target_IPv6_address_descriptor.....	33
8.4.5.12	target_IPv6_slash_descriptor.....	33
8.4.5.13	target_IPv6_source_slash_descriptor.....	33
8.4.5.14	IP/MAC stream_location_descriptor.....	34
8.4.5.15	ISP_access_mode_descriptor.....	35
8.4.5.16	telephone_descriptor (Informative).....	35
8.4.5.17	private_data_specifier_descriptor (informative).....	37
9	Time Slicing and MPE-FEC.....	37
9.1	Definitions.....	37
9.2	Time slicing (informative).....	38
9.2.1	Receiver (informative).....	38
9.2.2	Delta-t method (informative).....	38
9.2.3	Burst sizes and off-times (informative).....	40
9.2.4	Support for switching between transport streams (informative).....	41
9.2.5	Mixing Time Sliced elementary stream into a multiplex (informative).....	42
9.2.6	Time Slicing and PSI/SI (informative).....	43
9.2.7	Time Slicing and CA (informative).....	43
9.3	MPE-FEC.....	44
9.3.1	MPE-FEC frame.....	44
9.3.2	Carriage of MPE-FEC Frame.....	46
9.3.3	RS decoding.....	47
9.3.3.1	Application data padding columns - Code shortening.....	47
9.3.3.2	Discarding RS data columns - Puncturing.....	48
9.4	The Buffer Model for the Receiver (informative).....	48
9.5	Time Slice and FEC identifier descriptor.....	49
9.5.1	Definition of Reed-Solomon RS(255,191,64) code.....	51
9.6	Carriage of application data.....	51
9.7	Carriage of ECMs for time-sliced services.....	52
9.8	Carriage of EMMS for time-sliced services.....	52
9.9	Carriage of RS data.....	53
9.10	Real time parameters.....	54
10	Data carousels.....	56
10.1	Data transport specification.....	56
10.1.1	Structure of DVB data carousel.....	57
10.1.2	DownloadServerInitiate message.....	58
10.1.3	DownloadInfoIndication message.....	59
10.1.4	DownloadDataBlock message.....	60
10.1.5	DownloadCancel.....	60
10.2	Descriptors.....	60
10.2.1	Descriptor identification and location.....	60
10.2.2	Type descriptor.....	61
10.2.3	Name descriptor.....	61
10.2.4	Info descriptor.....	61
10.2.5	Module link descriptor.....	62
10.2.6	CRC32 descriptor.....	62
10.2.7	Location descriptor.....	63
10.2.8	Estimated download time descriptor.....	63
10.2.9	Group link descriptor.....	63
10.2.10	Private descriptor.....	64
10.2.11	Compressed module descriptor.....	64
10.3	PSI and SI specifications.....	65
10.3.1	Data_broadcast_descriptor.....	65
10.3.2	Stream type.....	66
11	Object carousels.....	66
11.1	Scope of the object carousels.....	66
11.2	Data transport specification.....	66

11.2.1	Carousel NSAP address	66
11.3	Descriptors	67
11.3.1	PSI and SI specifications	67
11.3.2	Data_broadcast_descriptor.....	68
11.3.3	Deferred_association_tags_descriptor	69
11.3.4	Stream type	70
12	Higher protocols based on asynchronous data streams	70
12.1	Data transport specification	70
12.2	PSI and SI specifications	70
12.2.1	Data_broadcast_descriptor.....	70
12.2.2	Stream type	71
13	Decoder models.....	71
Annex A (informative):	Registration of private data broadcast systems	73
Annex B (normative):	Simulcasting of IP/MAC streams	74
Annex C (normative):	Minimum repetition rates for the INT.....	75
Annex D (informative):	IP/MAC Platform ID values:	76
Annex E (informative):	Bibliography.....	77
History		78

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 301 192 V1.4.1:2005](https://standards.iteh.ai/catalog/standards/sist/fbc4a7df-6ec8-439c-830b-57fa143a4717/sist-en-301-192-v1-4-1-2005)

<https://standards.iteh.ai/catalog/standards/sist/fbc4a7df-6ec8-439c-830b-57fa143a4717/sist-en-301-192-v1-4-1-2005>

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://webapp.etsi.org/IPR/home.asp>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This European Standard (Telecommunications series) 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.

European Broadcasting Union
 CH-1218 GRAND SACONNEX (Geneva)
 Switzerland
 Tel: +41 22 717 21 11
 Fax: +41 22 717 24 81

SIST EN 301 192 V1.4.1:2005
standards.iteh.ai/catalog/standards/sist/fbc4a7df-6ec8-439c-830b-57fa143a4717/sist-en-301-192-v1-4-1-2005

Founded in September 1993, the DVB Project is a market-led consortium of public and private sector organizations in the television industry. Its aim is to establish the framework for the introduction of MPEG-2 based digital television services. Now comprising over 200 organizations from more than 25 countries around the world, DVB fosters market-led systems, which meet the real needs, and economic circumstances, of the consumer electronics and the broadcast industry.

National transposition dates

Date of adoption of this EN:	22 October 2004
Date of latest announcement of this EN (doa):	31 January 2005
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 2005
Date of withdrawal of any conflicting National Standard (dow):	31 July 2005

1 Scope

The present document is designed to be used in conjunction with EN 300 468 [2] and TR 101 211 [4]. The DVB System provides a means of delivering MPEG-2 Transport Streams (TS) via a variety of transmission media. These TSs have traditionally been oriented to containing MPEG-2 Video and Audio. Data broadcasting is seen as an important extension of the MPEG-2 based DVB transmission standards. Examples for data broadcasting are the download of software over satellite, cable or terrestrial links, the delivery of Internet services over broadcast channels (IP tunnelling), interactive TV etc. Four different application areas with different requirements for the data transport have been identified. For each application area a data broadcasting profile is specified in the present document. The following is a short description of the application areas and the profiles.

Data piping:

- The data broadcast specification profile for data pipes supports data broadcast services that require a simple, asynchronous, end-to-end delivery of data through DVB compliant broadcast networks. Data broadcast according to the data pipe specification is carried directly in the payloads of MPEG-2 TS packets (see ISO/IEC 13818-1 [1]).

Data streaming:

- The data broadcast specification profile for data streaming supports data broadcast services that require a streaming-oriented, end-to-end delivery of data in either an asynchronous, synchronous or synchronized way through DVB compliant broadcast networks. Data broadcast according to the data streaming specification is carried in Program Elementary Stream (PES) packets which are defined in MPEG-2 Systems (see ISO/IEC 13818-1 [1]).
- Asynchronous data streaming is defined as the streaming of only data without any timing requirements (e.g. RS-232 data).
- Synchronous data streaming is defined as the streaming of data with timing requirements in the sense that the data and clock can be regenerated at the receiver into a synchronous data stream (e.g. E1, T1). Synchronized data streaming is defined as the streaming of data with timing requirements in the sense that the data within the stream can be played back in synchronization with other kinds of data streams (e.g. audio, video).

Multiprotocol encapsulation:

- The data broadcast specification profile for multiprotocol encapsulation supports data broadcast services that require the transmission of datagrams of communication protocols via DVB compliant broadcast networks. The transmission of datagrams according to the multiprotocol encapsulation specification is done by encapsulating the datagrams in DSM-CC sections (see ISO/IEC 13818-6 [5]), which are compliant with the MPEG-2 private section format (see ISO/IEC 13818-1 [1]).
- The data broadcast specification support a standard mechanism for signalling IP/MAC services deployed within DVB networks and enables the implementation of DVB receivers that are completely self-tuning when accessing IP/MAC streams on one or more transport streams. The signalling mechanism is provided via the IP/MAC Notification Table (INT). The mechanism builds on EN 300 468 [2], TR 101 162 [3] and ISO/IEC 13818-6 [5] for signalling and the current specification for data carriage.

Data carousels:

- The data broadcast specification for data carousels supports data broadcast services that require the periodic transmission of data modules through DVB compliant broadcast networks. The modules are of known sizes and may be updated, added to, or removed from the data carousel in time. Modules can be clustered into a group of modules if required by the service. Likewise, groups can in turn be clustered into SuperGroups.
- Data broadcast according to the data carousel specification is transmitted in a DSM-CC data carousel which is defined in MPEG-2 DSM-CC (see ISO/IEC 13818-6 [5]). The present document defines additional structures and descriptors to be used in DVB compliant networks. The method is such that no explicit references are made to PIDs and timing parameters enabling preparation of the content off-line.

Object carousels:

- The object carousel specification has been added in order to support data broadcast services that require the periodic broadcasting of DSM-CC User-User (U-U) Objects through DVB compliant broadcast networks, specifically as defined by DVB Systems for Interactive Services (SIS) (see ETS 300 802 [10]). Data broadcast according to the DVB object carousel specification is transmitted according to the DSM-CC Object Carousel and DSM-CC Data Carousel specification which are defined in MPEG-2 DSM-CC (see ISO/IEC 13818-6 [5]).

Higher protocols based on asynchronous data streams:

- The data broadcast specification profile for higher protocols based on asynchronous data streams supports the transmission of protocols that require a stream-oriented delivery of asynchronous data through DVB compliant broadcast networks. The data frames of these protocols are carried in Program Elementary Stream (PES) packets which are defined in MPEG-2 Systems (see ISO/IEC 13818-1 [1]).

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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

- STANDARD PREVIEW
(standards.iteh.ai)
- SIST EN 301 192 V1.4.1:2005
https://standards.iteh.ai/catalog/standards/sist/fbc4a7df-6ec8-439c-830b-57d143a17173/sist-en-301-192-v1-4-1-2005
- [1] ISO/IEC 13818-1: "Information technology - Generic coding of moving pictures and associated audio information: Systems".
 - [2] ETSI EN 300 468: "Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems".
 - [3] ETSI TR 101 162: "Digital Video Broadcasting (DVB); Allocation of Service Information (SI) codes for DVB systems".
 - [4] ETSI TR 101 211: "Digital Video Broadcasting (DVB); Guidelines on implementation and usage of Service Information (SI)".
 - [5] ISO/IEC 13818-6: "Information technology - Generic coding of moving pictures and associated audio information - Part 6: Extensions for DSM-CC".
 - [6] ETSI EN 300 472: "Digital Video Broadcasting (DVB); Specification for conveying ITU-R System B Teletext in DVB bitstreams".
 - [7] IETF RFC 1112 (1989): "Host extensions for IP multicasting".
 - [8] IETF RFC 2045 (1996): "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".
 - [9] IETF RFC 2046 (1996): "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types".
 - [10] ETSI ETS 300 802: "Digital Video Broadcasting (DVB); Network-independent protocols for DVB interactive services".
 - [11] ISO/IEC TR 8802-1: "Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 1: Overview of Local Area Network Standards".

- [12] ISO/IEC 8802-2: "Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 2: Logical link control".
- [13] ETSI EN 300 743: "Digital Video Broadcasting (DVB); subtitling systems".
- [14] ISO 8859-1: "Information technology - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1".
- [15] ISO 639-2: "Code for the representation of names of languages - Part 2: Alpha-3 code".
- [16] IETF RFC 1950 (1996): "ZLIB Compressed Data Format Specification version 3.3".
- [17] "RTCM Recommended Standards for Differential GNSS (Global Navigation Satellite Systems) Service", Version 2.2, Radio Technical Commission For Maritime Services, January 1998.
- [18] BPN 027-2: "EBU B/TPEG Transport Protocol Experts Group (TPEG) TPEG specifications - Part 2: Syntax, Semantics and Framing Structure", Version 1.1, June 1999.
- [19] ETSI TS 102 006: "Digital Video Broadcasting (DVB); Specification for System Software Update in DVB Systems".
- [20] IETF RFC 2464 (1998): "Transmission of IPv6 Packets over Ethernet Networks".
- [21] IETF RFC 1661 (1994): "The Point-to-Point Protocol (PPP)".
- [22] ETSI TS 101 197-1: "Digital Video Broadcasting (DVB); DVB SimulCrypt; Part 1: Head-end architecture and synchronization".

iTeh STANDARD PREVIEW

3 Abbreviations(standards.iteh.ai)

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

AFI	Authority and Format Identifier
BAT	Bouquet Association Table
bslbf	bit string, left bit first
CA	Conditional Access
CAT	Conditional Access Table
CRC	Cyclic Redundancy Code
DAVIC	Digital Audio Visual Council
DDB	DownloadDataBlock
dGNSS	differential GNSS
DII	DownloadInfoIndication
DSI	DownloadServerInitiate
DSM-CC	DSM-CC data carousel specification (Digital Storage Media- Command & Control)
DVB	Digital Video Broadcasting
EBU	European Broadcasting Union
EIT	Event Information Table
EMM	Entitlement Management Message
FEC	Forward Error Correction
gi	GroupInfoBytes
GNSS	Global Navigation Satellite Systems
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers (USA)
INT	IP/MAC Notification Table
IP	Internet Protocol
ISDN	International Services Digital Network
ISO	International Organization for Standardization
kbits	kilo bits
LLC	Logical Link Control
MAC	Media Access Control
Mbits	Mega bits

MHP	Multimedia Home Platform
mi	ModuleInfoBytes
mi	ModuleInfoBytes
MIME	Multipurpose Internet Mail Extensions
MPE	Multi-Protocol Encapsulation
MPEG	Moving Pictures Expert Group
ms	millisecond
MSB	Most Significant Bit
NIT	Network Information Table
NSAP	Network Service Access Point
OUI	Organizational Unique Identifier
PCR	Program Clock Reference
PES	Program Elementary Stream
PID	Packet IDentifier
PMT	Program Map Table
PPP	Point to Point Protocol
PSI	Program Specific Information
PSTN	Public Switched Telecommunication Network
PTS	Presentation Time Stamps
RF	Radio Frequency
RFC	Request For Comment
rphof	remainder polynomial coefficients, highest order first
RS	Reed-Solomon
RTCM	Radio Technical Commission For Maritime Services
SDT	Service Description Table
SI	Service Information
SIS	Systems for Interactive Services
SNAP	SubNetwork Attachment Point
SSU	System Software Update
TPEG	Transport Protocol Experts Group
TS	Transport Stream
T-STD	Transport System Target Decoder
uimsbf	unsigned integer most significant bit first
U-U	User-User

4 Data piping

4.1 Data transport specification

The data broadcast service shall insert the data to be broadcast directly in the payload of MPEG-2 TS packets.

The data broadcast service may use the `payload_unit_start_indicator` field and the `transport_priority` field of the MPEG-2 Transport Stream packets in a service private way. The use of the `adaptation_field` shall be MPEG-2 compliant.

The delivery of the bits in time through a data pipe is service private and is not specified in the present document.

4.2 PSI and SI specifications

The data broadcast service shall indicate the use of a data pipe by including one or more `data_broadcast_descriptors` in SI (see EN 300 468 [2]). Each descriptor shall be associated with a particular data pipe via a `component_tag` identifier. In particular, the value of the `component_tag` field shall be identical to the value of the `component_tag` field of a `stream_identifier_descriptor` (see EN 300 468 [2]) that may be present in the PSI program map section for the stream that is used as a data pipe.

4.2.1 Data_broadcast_descriptor

The data_broadcast_descriptor is used in the following way:

data_broadcast_id: This field shall be set to 0x0001 to indicate a DVB data pipe (see TR 101 162 [3]).

component_tag: This field shall have the same value as a component_tag field of a stream_identifier_descriptor (if present in the PSI program map section) for the stream that is used as a data pipe.

selector_length: This field shall be set to zero.

selector_byte: This field is not present.

4.2.2 Stream type

The specification of the stream_type in the program map section is not defined in the present document.

5 Asynchronous data streaming

5.1 Data transport specification

The data broadcast service shall insert the data to be broadcast in PES packets as defined by MPEG-2 Systems ISO/IEC 13818-1 [1]. The PES packets shall be of non-zero length. The mapping of the PES packets into MPEG-2 Transport Stream packets is defined in MPEG-2 Systems ISO/IEC 13818-1 [1].

The asynchronous data streaming specification uses the standard PES packet syntax and semantics with the following constraints:

stream_id: This field shall be set to the value of 0xBF (private_stream_2).

PES_packet_length: This is a 16-bit field which shall be set to a non-zero value.

5.2 PSI and SI specifications

The data broadcast service shall indicate the use of an asynchronous data stream by including one of more data broadcast descriptors in SI (see EN 300 468 [2]). Each descriptor shall be associated with a particular stream via a component_tag identifier. In particular, the value of the component_tag field shall be identical to the value of the component_tag field of a stream_identifier_descriptor (see EN 300 468 [2]) that may be present in the PSI program map section for the stream that is used as a data stream.

5.2.1 Data_broadcast_descriptor

The data broadcast descriptor is used in the following way:

data_broadcast_id: This field shall be set to 0x0002 to indicate an asynchronous data stream (see TR 101 162 [3]).

component_tag: This field shall have the same value as a component_tag field of a stream_identifier_descriptor (if present in the PSI program map section) for the stream on which the data is broadcast.

selector_length: This field shall be set to zero.

selector_byte: This field is not present.

5.2.2 Stream type

The presence of an asynchronous data stream in a service shall be indicated in the program map of that service by setting the stream type of that stream to the value of 0x06 or a user private value.

6 Synchronous and synchronized data streaming

6.1 Data transport specification

The data broadcast service shall insert the data to be broadcast in PES packets as defined by MPEG-2 Systems. The PES packets shall be of non-zero length. The mapping of the PES packets into MPEG-2 Transport Stream packets is defined in MPEG-2 Systems ISO/IEC 13818-1 [1].

The synchronous and synchronized data streaming specifications use the standard PES packet syntax and semantics with the following constraints:

stream_id: This field shall be set to the value of 0xBD (private_stream_1) for synchronous and synchronized data streams.

PES_packet_length: This is a 16-bit field which shall be set to a non-zero value.

The data is inserted in PES packets using the PES_data_packet structure. The syntax and semantics of the PES_data_packet structure are defined in table 1.

Table 1: Syntax for PES_data_packet structure

Syntax	Number of bits	Mnemonic
PES_data_packet () {		
data_identifier	8	uimsbf
sub_stream_id	8	uimsbf
PTS_extension_flag	1	bslbf
output_data_rate_flag	1	bslbf
Reserved	2	bslbf
PES_data_packet_header_length	4	uimsbf
if (PTS_extension_flag=="1") {		
Reserved	7	bslbf
PTS_extension	9	bslbf
}		
if (output_data_rate_flag=="1") {		
Reserved	4	bslbf
output_data_rate	28	uimsbf
}		
for (i=0;i<N1;i++) {		
PES_data_private_data_byte	8	bslbf
}		
for (i=0;i<N2;i++) {		
PES_data_byte	8	bslbf
}		
}		

The semantics of the PES_data_packet are as follows:

data_identifier: This 8-bit field identifies the type of data carried in the PES data packet. It is coded as in table 2 (see also TR 101 162 [3] and EN 300 472 [6]).

Table 2: Coding for data_identifier field

data_identifier	value
0x00 to 0x0F	reserved for future use
0x10 to 0x1F	reserved for EBU data (see EN 300 472 [6])
0x20	DVB subtitling (see EN 300 743 [13])
0x21	DVB synchronous data stream
0x22	DVB synchronized data stream
0x23 to 0x7F	reserved for future use
0x80 to 0xFF	user defined

The `data_identifier` field shall be set to the same value for each PES packet conveying data in the same data stream.

sub_stream_id: This is an 8-bit field. Its use is user private.

PTS_extension_flag: This is a 1-bit field. It shall be set to "1" for synchronous data streams. For synchronized data streams a value of "1" indicates the presence of the `PTS_extension` field in the `PES_data_packet`. If the `PTS_extension` field is not present for synchronized data streams, this flag shall be set to "0".

output_data_rate_flag: This is a 1-bit field. It shall be set to "0" for synchronized data streams. For synchronous data streams a value of "1" indicates the presence of the `output_rate` field in the `PES_data_packet`. If the `output_rate` field is not present for synchronous data streams, this flag shall be set to "0".

PES_data_packet_header_length: This is a 4-bit field. It shall specify the length of the optional fields in the packet header including the `PES_data_private_data_bytes`.

PTS_extension: This is a 9-bit field. This field extends the PTS conveyed in the PES header of this PES packet. This field contains the 9-bit Program Clock Reference (PCR) extension as defined in MPEG-2 Systems (see ISO/IEC 13818-1 [1]) that extends the time resolution of data PTS's (synchronous or synchronized) from the MPEG-2 standard resolution of 11,1 μ s (90 kHz) to 37 ns (27 MHz).

output_data_rate: This is a 28-bit field that shall indicate the bit rate of the regenerated signal for a synchronous data stream. The output data rate is encoded as a 28-bit positive integer.

PES_data_private_data_byte: The use of these bytes is service specific. DVB compliant receivers may skip over these bytes if present.

PES_data_byte: These bytes convey the data to be broadcast.

6.2 PSI and SI specifications

The data broadcast service shall indicate the use of a synchronous or synchronized data stream by including one of more `data_broadcast_descriptors` in SI (see EN 300 468 [2]). Each descriptor shall be associated with a particular stream via a `component_tag` identifier. In particular, the value of the `component_tag` field shall be identical to the value of the `component_tag` field of a `stream_identifier_descriptor` (see EN 300 468 [2]) that may be present in the PSI program map section for the stream that is used as a data stream.

6.2.1 Data_broadcast_descriptor

The data broadcast descriptor is used in the following way:

data_broadcast_id: This field shall be set to 0x0003 to indicate a synchronous data stream and to 0x0004 for synchronized data streams (see TR 101 162 [3]).

component_tag: This field shall have the same value as a `component_tag` field of a `stream_identifier_descriptor` (if present in the PSI program map section) for the stream on which the data is broadcast.

selector_length: This field shall be set to zero.

selector_byte: This field is not present.

6.2.2 Stream type

The presence of a synchronous data stream or a synchronized data stream in a service shall be indicated in the program map section of that service by setting the stream type of that stream to the value of 0x06 or a user defined value.