ETSI TS 103 177 V1.1.1 (2013-08)

Digital Audio Broadcasting (DAB); Filecasting; User application specification

European Broadcasting Union — Union Européenne de Radio-Télévision

EBU·UER

DAB Digital Audio Broadcasting

Reference
DTS/JTC-DAB-67

Keywords
audio, broadcasting, coding, DAB, digital

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

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/chaircor/ETSI_support.asp

Contents

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://ipr.etsi.org).

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 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).

NOTE 1: 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

The Eureka Project 147 was established in 1987, with funding from the European Commission, to develop a system for the broadcasting of audio and data to fixed, portable or mobile receivers. Their work resulted in the publication of European Standard, EN 300 401 [1], for DAB (see note 2) which now has worldwide acceptance.

NOTE 2: DAB is a registered trademark owned by one of the Eureka Project 147 partners.

The DAB family of standards is supported by World DMB, an organization with members drawn from broadcasting organizations and telecommunication providers together with companies from the professional and consumer electronics industry.

1 Scope

The present document specifies the Filecasting user application which permits the non-linear delivery of multimedia content using DAB. Whilst the main focus of the present document is the delivery of audio files over a broadcast network, it is also applicable to other media formats too, such as video files and documents which may contain a mixture of formatted text and graphics, for example in pdf format.

Filecasting can be used by broadcasters with existing DAB linear audio services to deliver additional content associated (but not necessarily directly linked) with these audio services. Equally it can be used to create standalone Filecast services. This content could be an entire programme (podcast), additional short-form content relating to a linear radio programme, or news, weather or traffic bulletins.

Whilst Filecasting is defined as a DAB user application, it can equally be carried over Digital Radio Mondiale (DRM), ES 201 980 [i.1].

2 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 reference 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.

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

2.1 Normative references

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

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

[2] ETSI EN 301 234: "Digital Audio Broadcasting (DAB); Multimedia Object Transfer (MOT) Protocol".

[3] ETSI TS 101 756: "Digital Audio Broadcasting (DAB); Registered Tables".

[4] ETSI TS 101 499: "Digital Audio Broadcasting (DAB); MOT SlideShow; User application specification".

[5] ETSI TS 102 371: "Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); Transportation and Binary Encoding Specification for Electronic Programme Guide (EPG)".

[6] ISO EN 62106: "Specification of the radio data system (RDS) for VHF/FM sound broadcasting in the frequency range from 87,5 MHz to 108,0 MHz".

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

[8] ISO 3166-2: "Codes for the representation of names of countries and their subdivisions -- Part 2: Country subdivision code".

[9] IETF RFC 2616 (section 13): "Hypertext Transfer Protocol -- HTTP/1.1".

NOTE: Available at http://tools.ietf.org/html/rfc2616#section-13.

[10] draft-daviel-http-geo-header-01: "Geographic extensions for HTTP transactions".

NOTE: Available http://geotags.com/geo/draft-daviel-http-geo-header-01.html.

2.2 Informative references

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 ES 201 980: "Digital Radio Mondiale (DRM); System Specification".

[i.2] ETSI TS 102 818: "Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); XML Specification for Electronic Programme Guide (EPG)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 401 [1] and the following apply:

dynamic broadcast information: Broadcast information relating to the media files and basic presentational information for receivers that do not support the ability to decode the EPG channel

dynamic content: media file that contains content that is frequently updated (e.g. "Latest News")

NOTE: There will typically be several versions of this media file broadcast, and so it is not always essential that a receiver downloads the latest version.

EPG channel: DAB data stream containing service and schedule information that relates to audio services, Filecast services or both

filecast channel: DAB data stream containing the Dynamic Broadcast Information and media files

filecast service: collection of media files that are all contained within a particular service-brand, whether linked to a linear audio channel (e.g. the "BBC Radio 1 On Demand" Filecast Service contains content related to BBC Radio 1), or not (e.g. the "Daily Telegraph On Demand")

media file: file that contains the actual content

scheduled content: media file that contains a single programme, and is scheduled to be broadcast at some point in the future

NOTE: Typically only one version of this media file will be broadcast.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 401 [1] and the following apply:

CA	Conditional Access
DAB	Digital Audio Broadcasting
EPG	Electronic Programme Guide
FEC	Forward Error Correction
HE AAC	High Efficiency AAC
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
IP	Internet Protocol
MOT	Multimedia Object Transfer
MPEG	Moving Pictures Expert Group
PAD	Programme Associated Data
PDF	Portable Document Format
RDS	Radio Data System
URL	Uniform Resource Locator

4 Introduction

A Filecasting application consists of two components:

1) **Media files:** The content itself.

2) **Dynamic broadcast information:** This provides signalling information that aids a receiver in downloading specific media files, as well as basic presentational information.

When broadcast on a DAB multiplex, the media files and dynamic broadcast information are transported within the same data stream, called the "Filecast channel". Additionally more detailed schedule and presentational information may be transported within an EPG channel, using the DAB EPG standard [i.2]. However the specification of this enhanced schedule and presentational information is out of the scope of the present document. Figure 1 shows an example multiplex configuration, where the DAB Multiplex contains multiple audio services, a Filecast service transported within PAD, a Filecast Service within a packet mode data sub-channel and an additional EPG Service.

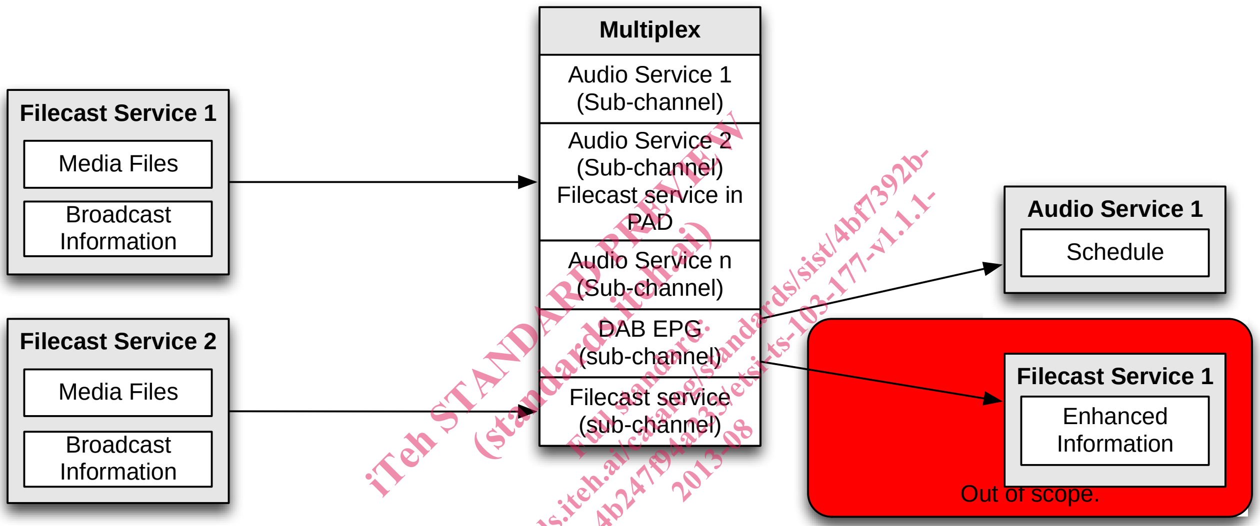

Figure 1

There are two target categories of Filecast receiver:

1) **Basic Filecast Receiver:** This receiver is only able to decode the Filecast channel. It uses the basic information within the Dynamic Broadcast Information object to allow a user to select content which they wish to store. It cannot decode the additional information contained within the EPG channel. Consequently it will only be able to present limited information about the individual media files.

2) **Full Filecast Receiver:** This receiver can also decode the additional information contained within the EPG channel, and provide a richer, enhanced user experience.

NOTE 1: The transfer of files is identical for both types of receiver.

The Filecasting specification allows for two different configurations of Filecasting-related channels on a single multiplex. The following configurations are valid:

1) Filecast channel only, transported within a packet mode data sub-channel.

2) Filecast channel only, transported within PAD.

Where a Filecast channel contains content that is linked to an existing audio service on the multiplex, and is not transported in that audio channel's PAD capacity, the Filecast channel is signalled as a secondary component of the audio channel.

NOTE 2: It is possible for a single multiplex to contain multiple Filecast channels.

5 Filecast channel

5.1 Transport mechanism

The Filecast channel may be transported in either a packet mode sub-channel with FEC applied or in the PAD of an audio subchannel.

MOT in Directory Mode [2] shall be used to transport the Filecast channels. The MOT Directory within the Filecast channel can be compressed.

For any carousels containing Filecasting objects, the data rate for MOT transported in packet mode is limited to a maximum of 256 kbps. For packet mode transport, the overall size of the subchannel including the Filecast channel is limited to a maximum of 384 kbps.

When using PAD for filecast object delivery it is important for service providers to be able to continue to deliver SlideShow and Dynamic Label in a timely manner. If the Filecast channel is transported in PAD a mixture of file objects in Directory Mode and other Header mode objects shall be able to be received. Ideally the PAD server will intersperse the header mode objects within the larger Filecast objects.

The service provider should choose a segmentation size for the filecast objects which allow appropriate time granularity dependant on the capacity of the PAD channel to ensure timely delivery of other PAD objects.

5.2 Filecast MOT carousel

The media files are broadcast as MOT objects within the Filecast channel. They are referenced from the MOT Directory. The MOT Directory is also used as a means of transporting the Dynamic Broadcast Information that is required by the Basic Filecast receiver.

The scope of the MOT Directory is set by the service provider, but it is recommended that it includes all media files that are currently being broadcast and planned to be broadcast within that MOT carousel for several days into the future. This is due to the reason that a Basic Filecast Receiver will only be able to decode and display listings information from the MOT Directory, and not the EPG. Providing information within the MOT Directory only on the currently transmitted files will restrict the selection choice of media files for users of these receivers.

The following extensions and restrictions apply for the Filecast channel:

- The MOT Directory shall be transmitted at a minimum repetition rate of once per 60 seconds.
- Compression of the MOT Directory is permitted (as defined in the MOT specification [2]).
- As a minimum, the MOT Directory shall list the file or files currently in the MOT carousel. It may also list files that are planned to be broadcast, for a service provider-defined period of time into the future.
- The directory entries of the MOT Directory shall be sorted in ascending order of the ContentName parameter at the service provider side, using the SortedHeaderInformation parameter (as defined in the MOT specification [2]).
- The MOT Directory shall have a maximum uncompressed size of 16 kbytes (16 384 bytes).

MOT parameters that are to be applied to individual MOT objects are carried within the MOT header information of each directory entry in the MOT Directory. A summary of the MOT parameters for individual objects that apply to the Filecast application are given in table 1, and are specified in detail by the following clauses. The MOT parameters detailed in the table below will be used to identify the content of the individual objects.

NOTE: Any parameters that are encountered that are not understood by a given receiver will be ignored.

Table 1: MOT parameters for Filecast application

Parameter	Parameter ID	Specified in	Usage mandatory for service provider	Usage mandatory for receiver	Occurrence
PermitOutdatedVersions	0x01	MOT [2]	No (if the DefaultPermitOutdatedVersions parameter has been set)	Yes	Single
Expiration	0x09	MOT [2]	No (if a suitable value is set with the DefaultExpiration parameter)	Yes	Single
ContentName	0x0c	MOT [2]	Yes	Yes	Single
CompressionType	0x11	MOT [2]	No (but the parameter shall be used for all objects on MOT transport level)	Yes	Single
UniqueBodyVersion	0x0d	MOT [2]	Yes	Yes	Single
CAInfo	0x23	MOT [2]	No (but the parameter shall be used for all objects encrypted on MOT level)	Yes (non CA capable receivers shall discard encrypted objects)	Single
ContentDescription	0x25	The present document	Yes	Yes (for basic Filecasting receivers)	Single
ContentCategory	0x26	The present document	No	Yes (for basic Filecasting receivers)	Multiple
ClickTroughURL	0x27	SlideShow [4]	No	No	Single
AlternativeLocationURL	0x28	SlideShow [4]	No	No	Single
ParentService	0x29	The present document	No (but the parameter shall be used for all objects that link to an audio service on that multiplex)	Yes (for basic Filecasting receivers)	Multiple
AvailabilityStart	0x2a	The present document	No (but the parameter shall be used for all media files that are listed within the Directory, but which are not contained within the currently broadcast carousel)	Yes	Single
PresentationPriority	0x2b	The present document	No	Yes	Single
MemberOf	0x2c	The present document	No	Yes (yes for receivers supporting DAB EPG)	Single
Location	0x2d	The present document	No	No	Single

5.2.1 MOT header core

The ContentType and ContentSubType parameters shall be set according to the MOT specification [2].

5.2.2 ContentName

This mandatory MOT parameter uniquely identifies the object within the MOT carousel The ContentName parameter is used as specified in the MOT specification [2].

To permit receiver interoperability, the character set for the ContentName of Filecast objects shall be ISO Latin Alphabet No 1, see TS 101 756 [3]. The permitted characters are restricted to a subset of this character set as follows: the lowercase Latin letters, the digits, the hyphen, the forward slash and the underscore ("a".."z", "0".."9", "-", "/", "_").

5.2.3 CompressionType

The CompressionType parameter is used as specified in the MOT specification [2].