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Technical Specification

Digital Audio Broadcasting (DAB);
Data services:
DAB URL

European Broadcasting Union   Union Européenne de Radio-Télévision

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Reference

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Keywords

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Foreword

This Technical Specification (TS) has been produced by the 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.

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Digital Audio Broadcasting (DAB) Eureka Project 147

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. The members of the Eureka Project 147 were drawn from broadcasting organizations and telecommunication providers together with companies from the professional and consumer electronics industry. In 1995, the European DAB Forum (EuroDAB) was established to pursue the introduction of DAB services in a concerted manner world-wide, and it became the World DAB Forum (World DAB) in 1997.

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

Introduction

This specification provides DAB with the ability to address DAB entities such as audio services and MOT data files using a URL[2]. Applications such as DAB-Java [4] or EPG [5] can use DAB-URLs to uniquely identify entities in a multiplex.

Scope

The present document defines URLs to address

- Ensembles

- Services

- Data channels

- User applications

- Data entities within a data channel

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, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

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

[2] RFC1738 Uniform Resource Locators

[3] RFC 1808 Relative Uniform Resource Locators

[4] ETSI TS 101 993 Digital Audio Broadcasting: A virtual Mashine for DAB: DAB Java Specification

[5] ETSI TS 102 818 Digital Audio Broadcasting: XML Specification for DAB Electronic Program Guide

[6] ETSI TR 101 496-2 Digital Audio Broadcasting: Guidelines and rules for implementation and operation; Part 2: System features

Definitions, abbreviations, symbols and conventions

Definitions

For the purposes of the present document, the definitions of EN 300 401[1] apply.

Abbreviations

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

URL Universal Resource Locator

Convention

Unless otherwise stated, the following notation, regarding the order of bits within each step of processing is used:

- in figures, the bit shown in the left hand position is considered to be first;

- in tables, the bit shown in the left hand position is considered to be first;

- in byte fields, the Most Significant bit (MSb) is considered to be first and denoted by the higher number. For example, the MSb of a single byte is denoted "b_7" and the Least Significant bit (LSb) is denoted "b_0";

- in vectors (mathematical expressions), the bit with the lowest index is considered to be first.

NOTE: Due to time-interleaving, this order of bits is not the true transmission order.

Notation

This document uses a BNF-style syntax to define the grammar for valid DAB URLs.

- | (vertical bar) is used to designate alternatives and brackets

- [] (square brackets) are used to denote optional elements.

- "" (quotes) are used to enclose string literals

- <N>* is used to designate n or more repetitions of the following element; n defaults to 0.

1 DAB URL Syntax

1.1 URL Character Encoding

All characters in DAB URLs shall be encoded according to the character encoding rules defined in [2] sub clause 2.2.

1.2 Coding of identifiers

4 bit numerical id	a 4 bit numerical identifier is coded as a 1 digit hexadecimal identifier.
8 bit numerical id	a 8 bit numerical identifier is coded as a 2 digit hexadecimal identifier.
12 bit numerical id	a 12 bit numerical identifier is coded as a 3 digit hexadecimal identifier
16 bit numerical id	a 16 bit numerical identifier is coded as a 4 digit hexadecimal identifier.
32 bit numerical id	a 32 bit numerical identifier is coded as a 8 digit hexadecimal identifier

url	=	see [2] sub clause 5	generic url definition
Digit	=	"0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" | "8" | "9"	digit definition [2]

Hex	=	digit | "A" | "B" | "C" | "D" | "E" | "F" | "a" | "b" | "c" | "d" | "e" | "f"	Hex number definition [2]
Alpha	=	hialpha | lowalpha	Alphanumerical definition [2]
Hialpha	=	"A" | "B" | "C" | "D" | "E" | "F" | "G" | "H" | "I" | "J" | "K" | "L" | "M" | "N" | "O" | "P" | "Q" | "R" | "S" | "T" | "U" | "V" | "W" | "X" | "Y" | "Z"	Uppercase alphanumerical [2]
Lowalpha	=	"a" | "b" | "c" | "d" | "e" | "f" | "g" | "h" | "i" | "j" | "k" | "l" | "m" | "n" | "o" | "p" | "q" | "r" | "s" | "t" | "u" | "v" | "w" | "x" | "y" | "z"	Lowercase alphanumerical [2]

2 Types of URL

There are five types of absolute DAB URLs:

- Ensemble

- Service

- Data channel

- User application

- Data entity

Relative URLs can also be used when one data entity refers to another data entity in the same data channel. The following sections define the syntax of each of these URL types.

2.1 Ensemble URLs

The URL to address an ensemble is defined as:

EnsembleURL	=	EnsembleScheme "://" EnsembleAddress	URL to address ensemble
EnsembleScheme	=	"dab.ens"	ensemble scheme
EnsembleAddress	=	Freq | EId "." EnsembleECC	ensemble address
Freq	=	Digit Digit Digit Digit Digit Digit [Digit]	Frequency in kHz
Eid	=	Hex Hex Hex Hex	16 bit Ensemble Identifier (see [1] sub clause 6.4)
EnsembleECC	=	Hex Hex	8 bit Extended Country Code for Ensemble (see [1] sub clause 8.1.3.2)

2.2 Service URLs

The URL to address a service is defined as:

ServiceURL	=	ServiceScheme "://" ServiceAddress	Service URL
ServiceScheme	=	"dab.srv"	Service scheme

ServiceSddress	=	ProgrammeServiceAddress | DataServiceAddress	Service address
ProgrammeServiceAddress	=	SId "." ECC [":" EnsembleAddress]	Service address if the service is a programme service
DataServiceAddress	=	SId [":" EnsembleAddress]	Service address if the service is a data service
SId	=	Hex Hex Hex Hex [Hex Hex Hex Hex]	16 bit service identifier in case of a programme service or 32 bit numerical service identifier in case of a data service (see [1] sub clause 6.3.1)
ECC	=	Hex Hex	8 bit extended country code identifier for service (see [1] sub clause 8.1.3.2)

What does it mean if the ensemble address is missing?

2.3 Data channel URLs

The URL to address a data channel defined as:

DataChannelURL	=	DataChannelScheme "://" DataChannelAddress	Data channel URL
DataChannelScheme	=	"dab.chn"	Data channel scheme
DataChannelAddress	=	[XPADApplicationType "@"] SCIdS "." DataServiceAddress	Data channel address
XPADApplicationType	=	Hex Hex	8 bit User Application Type Identifier. The three MSbs are always set to 0 (see [1] sub clause 7.4.3).
SCIdS	=	Hex	4 bit numerical id for Service Component Id within Service (see [1] sub clause 6.3.6)

NOTE:

The SCIdS must always be present in the URL even for a primary service.

2.4 User application URLs

The URL to address a user application is defined as:

UserApplicationURL	=	UserApplicationScheme "://" DataChannelAddress	User Application URL
UserApplicationScheme	=	*"dab.userapp.bws" |" dab.userapp.dl" | "dab.userapp.sls" | "dab.userapp.tpeg" | "dab.userapp.audio" | "dab.userapp.java" | "dab.userapp.tmc" | "dab.userapp.dgps"*	User Application Scheme

2.5 Data entity URLs

The URL that to address single data entities within a data channel is defined as:

DataURL	=	DataScheme ”://” DataChannelAddress ["/" ProtocolSpecific]
DataScheme	=	*"dab.dta.mot.dir" | " dab.dta.mot.hdr" | " dab.dta.tdc.dg" | "dab.dta.tdc.str" | "dab.dta.d"l | "dab.dta.ip"*
ProtocolSpecific	=	Address data entity i.e. name of file within a file system

2.6 Relative URLs

If one DAB data entity contains a URL reference to another DAB data entity then it may be able to use a shortened 'relative' URL [3] to reference the other entity provided that both URLs have the same base URL. The base and relative parts of a DAB data entity URL are defined as:

BaseURL	=	DataScheme ”://” DataChannelAddress
RelativeURL	=	ProtocolSpecific
AbsoluteURL	=	BaseURL "/" RelativeURL

The absolute URL for a data entity can be obtained by concatenating the base URL of the referring entity along with the relative URL of the entity it is referring to. See section A.6 for an example

History

Document history		
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Appendix A Example URLs

This Appendix contains examples of DAB URLs for each of the URL types.

A.1 Ensemble

dab.ens://232345	identifies ensemble at frequency 232345 kHz
dab.ens://12a	identifies ensemble in channel "12a"
dab.ens://1234.ab	identifies ensemble with ensemble id 1234

A.2 Service

dab.srv://1234.fe	programme service with service id 1234 for extended country code "fe"
dab.srv://12345678:12a	data service with service id 12345678 located in frequency channel "12a"
dab.srv://234567af:1452384	data service with service id 234567af located at "1452384" kHz

A.3 Data channels

dab.chn://5.23456789:12a	Data channel of service component "5" of data service "23456789" in frequency channel "12a"
dab.chn://1.23456789	Data channel of service component "1" of data service "23456789"
dab.chn://0c@0.1234.fe	PAD data channel with X-PAD application type "12" (MOT-datagroup) of service component "0" of programme service "1234" with extended country code "fe"
dab.chn://02@0.1234.fe	PAD data channel with X-PAD application type "02" (dynamic label) of service component "0" of programme service "1234" with extended country code "fe"

A.4 User applications

dab.userapp.bws://0c@0.1234.fe	User application "Broadcast Website" in service component "0" of programme service "1234" with extended country code "fe"
dab.userapp.dl://02@5.23456789:12a	User application "Dynamic Label" in service component "5" in data service "234567" in frequency channel "12a"
dab.userapp.audio://0.1234.fe	User application "Audio" in service component "0" of programme service "1234" with extended country code "fe"
dab.userapp.sls://0a@0.1234.fe	PAD User application "Slide Show" in service component "0" of programme service "1234" with extended country code "fe"
dab.userapp.tmc://17@0.1234.fe	PAD User application "TMC" in service component "0" of programme service "1234" with extended country code "fe"

A.5 Data Entities within a data channel

dab.dta.mot.hdr://0c@0.1234.fe:12a	next slide coming up in the slideshow in PAD of service component "0" of programme service "1234" with extended country code "fe" in frequency channel "12a"
dab.dta.mot.hdr://0c@0.1234:12a/slide.jpg	Slide "slide.jpg" coming up in the slideshow in PAD of service component "0" of programme service "1234" with extended country code "fe" in frequency channel "12a"
Dab.dta.mot.hdr://5.12345678:123456	next slide coming up in the slideshow of service component "5" of data service "12345678" at "123456"kHz frequency
dab.dta.mot.dir://0c@0.1234.fe:12c/logo.jpg	file "logo.jpg" in PAD of service component "0" of programme service "1234" with extended country code "fe" in frequency channel "12c"
dab.dta.tdc.dg://3.2345.fe	"Data groups" of "Transparent Data Channel" of service component "3" of programme service "2345" with extended country code "fe"
dab.dta.tdc.str://4.2345.fe	Stream of "Transparent Data Channel" of service component "3" of programme service "2345" with extended country code "fe".
dab.dta.dl://02@0.4567.fe	„Dynamic labels" of service component „0" of programme service "4567" with extended country code "fe".
dab.dta.ip://5.6789abcd	Stream of "IP packets" of service component "5" within data service "6789abcd"

	service "6789abcd"
dab.dta.audio://0.1234.fe	Stream of "Audio frames" of service component "0" of service "1234" with extended country code "fe"
dab.dta.stream://7.5432.ed	stream mode frames of service component "7" of programme service "5432" with extended country code "ed"

A.6 Relative URLs

dab.dta.mot.dir://2.cafe.d0:12c/EpgContent.bin	URL of a file in an EPG MOT carousel whose contents refer to other data entities
Station_logo.png	URL used inside the EpgContent.bin file referring to an entity "station_logo.png" in the same user application. The absolute URL to this file would be dab.dta.mot.dir://2.cafe.d0:12c/station_logo.png