

ETSI TS 102 818 V3.5.1 (2023-12)



Hybrid Digital Radio (DAB, DRM, RadioDNS); XML Specification for Service and Programme Information (SPI)

Document Preview

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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.

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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, ETSI EN 300 401 [13], for DAB® (see note) 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 DAB, an organization with members drawn from broadcasting organizations and telecommunication providers together with companies from the professional and consumer electronics industry.

The RadioDNS Project was established in 2010 to standardize the combination of broadcast radio systems with additional applications, content and meta-data delivered over fixed or mobile IP networks. The project produced a specification using DNS to locate the broadcaster's Internet domain which is in use worldwide, and now standardized as ETSI TS 103 270 [18]. RadioDNS operates the authoritative name servers for the radiodns.org domain, and has members drawn from broadcasting organizations, manufacturers and service providers.

NOTE 3: "RadioDNS Hybrid Radio" and the RadioDNS Hybrid Radio logo are registered trademarks of RadioDNS Limited, a not-for-profit company owned by its members.

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 defines the XML schema data model for Service and Programme Information (SPI) and methods for delivery by broadcast digital radio - DAB and DRM - and IP.

This data format may be used both for transmitting service and schedule data to SPI applications on devices and as the basis for exchanging information between broadcasters, service providers, network operators and content providers.

In respect to the previous version of the present document, provision is added for the following:

- creation date for logo objects to improve version control;
- presentation language for services and schedule, programme, programme events and clarification of the use of xml:lang in the SPI.

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 <https://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.

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

- [1] [ETSI TS 102 822-4](#): "Broadcast and On-line Services: Search, select, and rightful use of content on personal storage systems ("TV-Anytime"); Part 4: Phase 1 - Content referencing".
- [2] [ISO 8601](#): "Date and time -- Representations for information interchange".
- [3] [IETF RFC 2616](#): "Hypertext Transfer Protocol -- HTTP/1.1".
- NOTE: Obsoleted by IETF RFC 7230, IETF RFC 7231, IETF RFC 7232, IETF RFC 7233, IETF RFC 7234 and IETF RFC 7235.
- [4] [W3C® Recommendation 26 November 2008](#): "Extensible Markup Language (XML) 1.0 (Fifth Edition)".
- [5] [IETF RFC 2045](#): "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".
- [6] [IETF RFC 5646](#): "Tags for Identifying Languages".
- [7] Void.
- [8] [IETF RFC 3966](#): "The tel URI for Telephone Numbers".
- [9] [IETF RFC 3191](#): "Minimal GSTN address format in Internet Mail".
- [10] [IETF RFC 6068](#): "The 'mailto' URI scheme".
- [11] [IETF RFC 2046](#): "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types".
- [12] [IETF RFC 4289](#): "Multipurpose Internet Mail Extensions (MIME) Part Four: Registration Procedures".

- [13] [ETSI EN 300 401](#): "Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers".
- [14] [ISO/IEC 10646](#): "Information technology -- Universal Coded Character Set (UCS)".
- [15] Void.
- [16] [ETSI TS 102 822-3-1](#): "Broadcast and On-line Services: Search, select, and rightful use of content ("TV-Anytime"); Part 3: Metadata; Sub-part 1: Phase 1 - Metadata schemas".
- [17] [ETSI ES 201 980](#): "Digital Radio Mondiale (DRM); System Specification".
- [18] [ETSI TS 103 270](#): "Radio DNS Hybrid Radio; Hybrid lookup for radio services".
- [19] [ISO 3166-1](#): "Codes for the representation of names of countries and their subdivisions -- Part 1: Country codes".
- [20] Void.
- [21] [ETSI TS 102 371](#) (V3.1.1 and later): "Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); Transportation and Binary Encoding Specification for Service and Programme Information (SPI)".

NOTE: This reference is made to V3.1.1 and possible later versions.

- [22] [IETF RFC 2782 \(2000\)](#): "A DNS RR for specifying the location of services (DNS SRV)".
- [23] [IETF RFC 5724](#): "URI Scheme for Global System for Mobile Communications (GSM) Short Message Service (SMS)".
- [24] [ETSI TS 103 177](#): "Digital Audio Broadcasting (DAB); Filecasting; User application specification".
- [25] [ETSI TS 101 756](#): "Digital Audio Broadcasting (DAB); Registered tables".
- [26] [IETF RFC 4078](#): "The TV-Anytime Content Reference Identifier (CRID)".
- [27] [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".
- [28] [ISO/IEC 13818-3](#): "Information technology -- Generic coding of moving pictures and associated audio information -- Part 3: Audio".
- [29] [IETF RFC 3986](#): "Uniform Resource Identifier (URI): Generic Syntax".

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 102 818 (V1.5.1): "Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); XML Specification for Electronic Programme Guide (EPG)".
- [i.2] ETSI TS 102 371 (V1.3.1): "Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); Transportation and Binary Encoding Specification for Electronic Programme Guide (EPG)".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

bearer: method of carriage of the service

client: a user of the SPI application

service: linear radio service

service provider: provider of the SPI application

3.2 Symbols

Void.

3.3 Abbreviations

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

AAC	Advanced Audio Coding
AF	Alternate Frequency
AM	Amplitude Modulation
AMSS	Amplitude Modulation Signalling System
ASR	Automatic Speech Recognition
CA	Conditional Access
CDATA	Character DATA
CRID	Content Reference ID
CS	Classification Schemes
DAB	Digital Audio Broadcasting
DNS	Domain Name Server
DRM	Digital Radio Mondiale
EBU	European Broadcasting Union
EPG	Electronic Programme Guide
FM	Frequency Modulation
FQDN	Fully Qualified Domain Name
FTP	File Transfer Protocol
geoRSS	geographic Rich Site Summary
GI	Group Information
GPS	Global Positioning System
HE	High Efficiency
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
HTTPS	Hyper Text Transfer Protocol Secure
IANA	Internet Assigned Numbers Authority
IP	Internet Protocol
IPA	International Phonetic Alphabet
ISO	International Organization for Standardization
JPEG	Joint Photographic Experts Group
JTC	Joint Technical Committee
kB	kiloByte
MIME	Multipurpose Internet Mail Extensions
MOT	Multimedia Object Transfer
MPEG	Moving Picture Experts Group
PAD	Programme Associated Data
PI	Programme Information
PNG	Portable Network Graphics

PPI	Pixels Per Inch
RDS	Radio Data System
RFC	Request For Comments
RSS	Rich Site Summary
SI	Service Information
SId	Service Identifier
SMS	Short Messaging Service
SPI	Service and Programme Information
SRV	SeRVice (record)
TCP	Transmission Control Protocol
TLS	Transport Layer Security
TTS	Text-To-Speech
TV	TeleVision
UI	User Interface
URI	Uniform Resource Identifier
URL	Uniform Resource Location
UTC	Co-ordinated Universal Time
UTF	Unicode Transform Format
XML	eXtensible Markup Language
X-SAMPA	eXtended Speech Assessment Methods Phonetic Alphabet
XSD	eXtensible markup language Schema Definition language
XSLT	eXtensible Stylesheet Language Transformation

4 Introduction

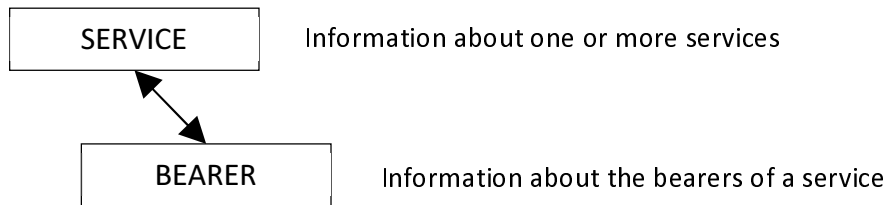
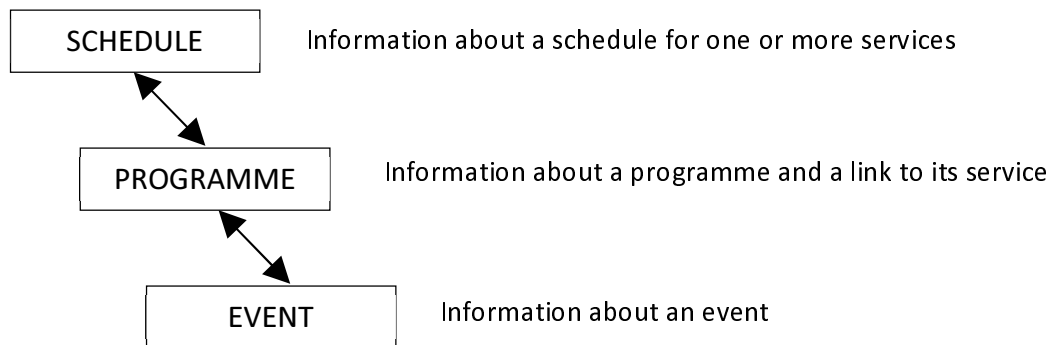
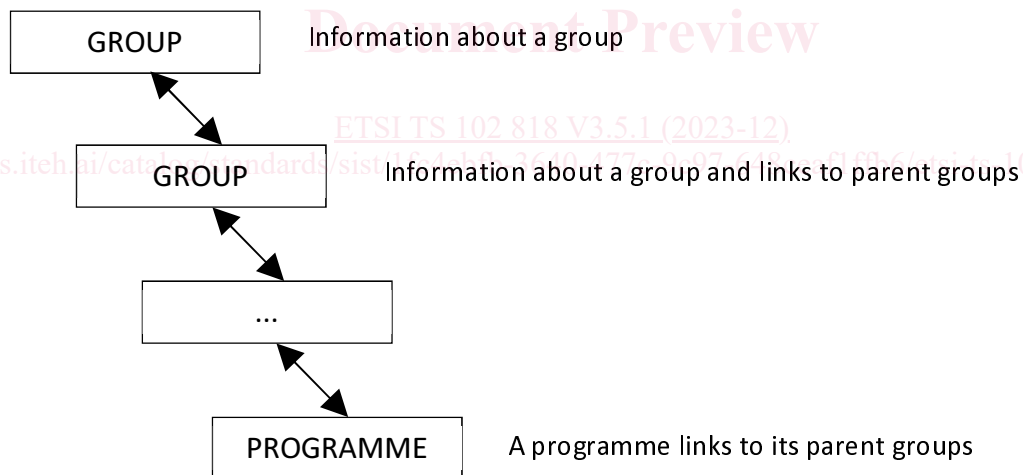
It is intended that service providers will use the present document to provide service information and programme listings information for audio services, whether delivered by analogue or digital broadcast systems or via IP, and that device manufacturers will use this metadata to provide a mechanism for the user to select services, programmes and related content for live or on-demand listening.

The present document allows rich metadata to be added to service descriptions, permitting attractive visualizations for user interfaces. Programme listings may be forward and backward in time, and on-demand content, whether part of the linear schedule or stand-alone content, may be described; again with rich metadata.

A key requirement is that the metadata is suited to a range of devices with differing display capabilities, resources and back-channel capabilities. To achieve this, a flexible structure has been defined, as shown in figure 1.

The SPI data is broken down into Service Information (services) and Programme Information (schedules, programmes and programme events). Additionally programmes and programme events can be linked together into groups (e.g. for grouping programmes together into serials or series), which may have additional Group Information.

The SPI data is designed to be extensible, allowing it to be used as a core set of metadata that may be augmented with additional information within specific namespaces for third party applications, as further explained in Annex H.

Service information*Programme information**Group information***Figure 1: Structure of SPI metadata**

The present document is split into three parts:

- Service Information (SI);
- Programme Information (PI);
- Group Information (GI).

The present document defines common data types in clause 5, service information in clause 6, programme information in clause 7 and group information in clause 8.

Many elements have an optional `xml:lang` attribute [4], or language attribute, which allows the same element to be provided multiple times but with content tailored to users who prefer to use a different language. The attribute allows the device to select the correct instance of the element. If an `xml:lang` attribute is not specified, the element inherits the `xml:lang` of its parent element.

NOTE: These attributes are different to the `presentationLanguage` element used to describe the languages of the audio content of a service, schedule, programme or programme event.

To support correct implementation, annex B provides a schema which may be used to validate the XML documents. Validation will be successful for properly constructed XML documents provided that child elements are sequenced in the order specified within each parent element and all required elements and attributes are provided.

The SPI and any supporting files may be delivered by two methods:

- DAB/DRM broadcasting systems (see clause 9);
- IP (see clause 10).

There are several use cases for service providers using the present document:

- 1) The service provider has analogue broadcasting platforms only (e.g. FM with RDS, AM with AMSS) or has no broadcast platforms (internet only).
- 2) The service provider has digital broadcasting platforms only (e.g. DAB and/or DRM).
- 3) The service provider has both analogue and digital broadcasting platforms.

In case 1, all the XML documents are accessed via IP.

In case 2, the service provider may provide all the XML documents over the broadcast platform only; or he may provide all the documents in parallel via the broadcast platform and IP to additionally support connected devices; or he may provide the Service Information (SI) document over the broadcast platform and the remaining documents via IP; or some other combination.

In case 3, the service provider may provide all the XML documents over the broadcast platform to support his digital platforms independently of a IP connection, and in parallel via IP to support his analogue platforms and all connected devices; or some other combination.

In order to support these three cases, a common set of XML documents are generated.

5 Common data types, groups and elements

5.1 Basics

5.1.1 Character encoding

The ISO/IEC 10646 [14] character set using UTF-8 character encoding shall be used in all XML documents defined in the present document.

NOTE: The ISO/IEC 10646 [14] character set contains all characters of the "Complete EBU Latin based repertoire".

5.1.2 Text

Any text sections in attributes or elements should be careful to avoid using any of the reserved XML characters:

& < > " ' "

These characters should be encoded using the predefined entity references (`&`; `<`; `>`; `"`; `'`) or enclosed in a CDATA section (e.g. `<![CDATA[Some text including an &]]>`).

5.2 Schema types

5.2.1 CRID type

A unique identifier for a **programme**, **programmeEvent**, **programmeGroup** or **memberOf** in the format of a Content Reference ID (CRID) as defined in the TV-Anytime specification [1].

This shall be in the following form:

```
crid://<authority>/<data>
```

Where **authority** is a registered Internet domain name that the CRID author has permission to use and is case insensitive. The **data** is a free format string (URI compliant and case insensitive) that is meaningful to the given authority and should uniquely identify the content within that authority [26].

EXAMPLE 1: `crid://www.example.com/4472/1148985`

EXAMPLE 2: `crid://www.example.co.uk/breakfast`

5.2.2 shortCRID type

A complementary identifier to the CRID type, used with the same elements.

The shortCRID is a 24-bit integer, expressed as a decimal value within the element content, with a range of 0 to 16 777 215 inclusive. The following rules shall be applied whenever shortCRIDs are used:

- The shortCRID shall only be unique within a single SPI service (see note), therefore a device shall process it in some way on decoding to ensure that it is globally unique.
- The shortCRID shall not be re-used within that SPI service for a minimum of six months.

NOTE: An "SPI service" is defined as SPI data for one or more services, provided from a single source. This could be SPI data from a particular FQDN, or from a broadcast MOT carousel.

5.2.3 MIME type

This indicates the MIME [5] of contained data or links and shall be used where it is applicable. The registered list of MIME types is available from the IANA list of Mime Types (IETF RFC 2046 [11] and IETF RFC 4289 [12]).

However, an application is permitted to use values not in this list as long as they conform to the requirements set out in IETF RFC 2046 [11].

EXAMPLE 1: `audio/mpeg`

EXAMPLE 2: `text/html`

EXAMPLE 3: `image/png`

EXAMPLE 4: `application/x-myapplication`

EXAMPLE 5: `application/xml+pi`

5.2.4 timepoint type

This is a time field in **local time**. It is based on the ISO 8601 [2] extended format: *YYYY-MM-DDThh:mm:ss* where "YYYY" is the year, "MM" the month and "DD" the date. The letter "T" is the date/time separator and "hh", "mm" and "ss" represent the hour, minute and second respectively. To indicate the time zone, i.e. the difference between the local time and UTC, the difference immediately follows the time and consists of a sign, "+" or "-", followed by hh:mm. If the difference between local time and UTC is 0, then a "Z" may be used in place of "+00:00".

EXAMPLE 1: `2013-06-07T15:05:00+01:00`