



RadioDNS Hybrid Radio; Hybrid lookup for radio services

ITeH STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sis/572113-03-0360-4343-ac6b-c25af04cd84/etsi-ts-103-270-v1-3-2019-05>

EBU

Reference

RTS/JTC-052

Keywords

broadcasting, DNS, IP, radio

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

The present document can be downloaded from:
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

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 <https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2019.

© European Broadcasting Union 2019.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M™ logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	7
3 Definition of terms, symbols and abbreviations.....	7
3.1 Terms.....	7
3.2 Symbols.....	7
3.3 Abbreviations	8
4 Introduction	8
5 Authoritative FQDN resolution, and ServiceIdentifier and bearerURI construction for broadcast services	9
5.1 RadioDNS FQDN, ServiceIdentifier and bearerURI construction.....	9
5.1.1 FM with RDS/RBDS	9
5.1.1.1 RDS/RBDS parameters	9
5.1.1.2 Construction of RadioDNS FQDN	10
5.1.1.3 Construction of ServiceIdentifier	10
5.1.1.4 Construction of bearerURI.....	10
5.1.2 Digital Audio Broadcasting (DAB/DAB+).....	11
5.1.2.1 DAB/DAB+ parameters	11
5.1.2.2 Construction of RadioDNS FQDN	11
5.1.2.3 Construction of ServiceIdentifier	11
5.1.2.4 Construction of bearerURI.....	12
5.1.3 Digital Radio Mondiale (DRM).....	12
5.1.3.1 DRM parameters	12
5.1.3.2 Construction of RadioDNS FQDN	12
5.1.3.3 Construction of ServiceIdentifier	13
5.1.3.4 Construction of bearerURI.....	13
5.1.4 AM Signalling System (AMSS).....	13
5.1.4.1 AMSS parameters	13
5.1.4.2 Construction of RadioDNS FQDN	13
5.1.4.3 Construction of ServiceIdentifier	13
5.1.4.4 Construction of bearerURI.....	13
5.1.5 IBOC.....	14
5.1.5.1 IBOC parameters.....	14
5.1.5.2 Construction of RadioDNS FQDN	14
5.1.5.3 Construction of ServiceIdentifier	14
5.1.5.4 Construction of bearerURI.....	14
5.2 Resolution of Authoritative FQDN	15
6 Authoritative FQDN and ServiceIdentifier resolution and bearerURI construction for IP-streamed services	15
6.1 General	15
6.2 Inclusion of parameters into stream metadata	16
6.2.1 Streaming transports	16
6.2.1.1 SHOUTcast.....	16
6.2.1.2 ASF	16
6.2.1.3 Flash Audio	16
6.2.2 Metadata intervals.....	16
6.3 Construction of bearerURI	17
6.4 Construction of ServiceIdentifier	17

7	Authoritative FQDN and ServiceIdentifier resolution from SPI SI	17
8	Implementation requirements	17
8.1	Service provider implementation	17
8.2	Device Implementation	18
9	Client identification	18
9.1	Introduction	18
9.2	Client identifier format	18
9.3	Client Identifier Presentation	18
9.3.1	Introduction	18
9.3.2	Use of TLS	19
9.3.3	Protocol guidance	19
9.4	Service provider reception	20
Annex A (normative): Deriving the GCC for a service.....		21
A.0	Introduction	21
A.1	Deriving the GCC using ECC	21
A.2	Deriving the GCC without ECC	21
Annex B (informative): Bibliography.....		29
History		30

iTeh STANDARD PREVIEW
 (standards.iteh.ai)
 Full standard:
<https://standards.iteh.ai/catalog/standards/sist/57a78dc3-d360-4343-ac6b-c225af04cd84/etsi-ts-103-270-v1.3.1-2019-05>

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables 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 (<https://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.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

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: 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

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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document defines the methodology for discovering an Authoritative FQDN for a radio service, including discovery using DNS queries to radiodns.org, a root domain name server operated by RadioDNS. The present document also defines the construction of a unique ServiceIdentifier parameter and bearerURI for a radio service.

This version includes the addition of client identification.

NOTE: Specifications for applications built upon the RadioDNS methodology can be found at <http://radiodns.org/developers/documentation/>.

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 EN 300 401: "Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers".
 - [2] ETSI ES 201 980: "Digital Radio Mondiale (DRM); System Specification".
 - [3] ETSI TS 102 386: "Digital Radio Mondiale (DRM); AM signalling system (AMSS)".
 - [4] National Radio Systems Committee NRSC-5-B:2008: "In-band/on-channel Digital Radio Broadcasting Standard".
 - [5] ETSI TS 102 818: "Digital Audio Broadcasting (DAB); Digital Radio Mondiale (DRM); XML Specification for Electronic Programme Guide (EPG)".
 - [6] IETF RFC 1035 (1987): "Domain Names - Implementation and Specification".
 - [7] IETF RFC 3761 (2004): "The E.164 to Uniform Resource Identifiers (URI) Dynamic Delegation Discovery System (DDDS) Application (ENUM)".
 - [8] IEC 62106:2015: "Specification of the Radio Data System (RDS) for VHF/FM sound broadcasting in the frequency range from 87,5 MHz to 108,0 MHz".
 - [9] National Radio Systems Committee NRSC-4-B: "Specification of the radio broadcast data system (RBDS)".
- NOTE: Available at <https://www.nrcsstandards.org/standards-and-guidelines/documents/standards/nrsc-4-b.pdf>
- [10] ISO 3166-1: "Codes for the representation of names of countries and their subdivisions - Part 1: Country codes".
 - [11] Void.
 - [12] ETSI TS 101 756: "Digital Audio Broadcasting (DAB); Registered Tables".
 - [13] IETF RFC 2818: "HTTP over TLS".

- [14] IETF RFC 7235: "Hypertext Transfer Protocol (HTTP/1.1): Authentication".
- [15] SY-IDD-1020s: "HD Radio™ Air Interface Design Description, Station Information, Service Transport".

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.

Not applicable.

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

application: means of enhancing an associated radio service, using an IP connection, with additional content, functionality, or interactivity

authoritative FQDN: internet domain for a service provider

bearer: method of carriage of the service

bearerURI: unique identifier for the service to be used in SPI SI documents

char: single character

client identifier: non-unique identifier sent by a client to a service provider

hexadecimal: representation of a number in base-16 using the characters 0-9, a-f

nibble: four-bit aggregation, or half an octet

RadioDNS FQDN: internet domain constructed only for the purposes of querying DNS

service: radio service or data service

ServiceIdentifier: string that uniquely identifies a radio service within the scope of an Authoritative FQDN

service provider: organization providing RadioDNS Hybrid Radio applications

string: zero or more characters in the range 0-9, a-z

3.2 Symbols

Void.

3.3 Abbreviations

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

AM	Amplitude Modulation
AMSS	Amplitude Modulation Signalling System
ASF	Advanced Systems Format
CNAME	DNS Canonical NAME record
DAB	Digital Audio Broadcasting
DNS	Domain Name System
DRM	Digital Radio Mondiale
ECC	Extended Country Code
EId	Ensemble Identifier
FCC	Federal Communications Commission
FIG	Fast Information Group
FM	Frequency Modulation
FQDN	Fully Qualified Domain Name
GCC	Global Country Code
HTTP	HyperText Transfer Protocol
IBOC	In-Band On-Channel
IP	Internet Protocol
PI	Programme Identification
RBDS	Radio Broadcast Data System
RDS	Radio Data System
SCIdS	Service Component Identifier within a Service
SI	Service Information
SId	Service Identifier
SPI	Service and Programme Information
SPS	Supplemental Program Service
SRV	DNS SeRVice record
TLS	Transport Layer Security
TTL	Time To Live
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
VHF	Very High Frequency

4 Introduction

It is possible to supplement uni-directional radio services with applications that can take advantage of bi-directional communication using the IP protocol. These applications may enhance the radio services with which they are associated with additional content or functionality, or enable interactivity.

Radio devices should be aware of what IP delivered applications are available for each radio service it receives. Standardizing the methodology to locate these applications allows a manufacturer to support IP delivered applications directly on the device.

The present document standardizes the methodology for locating the Authoritative Fully Qualified Domain Name (FQDN) for radio services using the following radio systems: FM with RDS [8] or RBDS [9], DAB/DAB+ [1], DRM [2], AM with AMSS [3], and IBOC [4].

The present document standardizes a methodology to locate applications based upon the existing DNS methodology [6]. A RadioDNS FQDN is created from known broadcast parameters, and DNS is used to resolve this RadioDNS FQDN to a CNAME record containing the Authoritative FQDN for the service provider.

The basis for this methodology broadly follows that used to map E.164 format telephone numbers to domains [7].

The present document also standardizes how to locate the Authoritative FQDN without the use of DNS lookup.

The Authoritative FQDN for a service can be acquired through a series of processes, shown in figure 1.

The present document also standardizes how devices identify themselves when connecting to service providers.

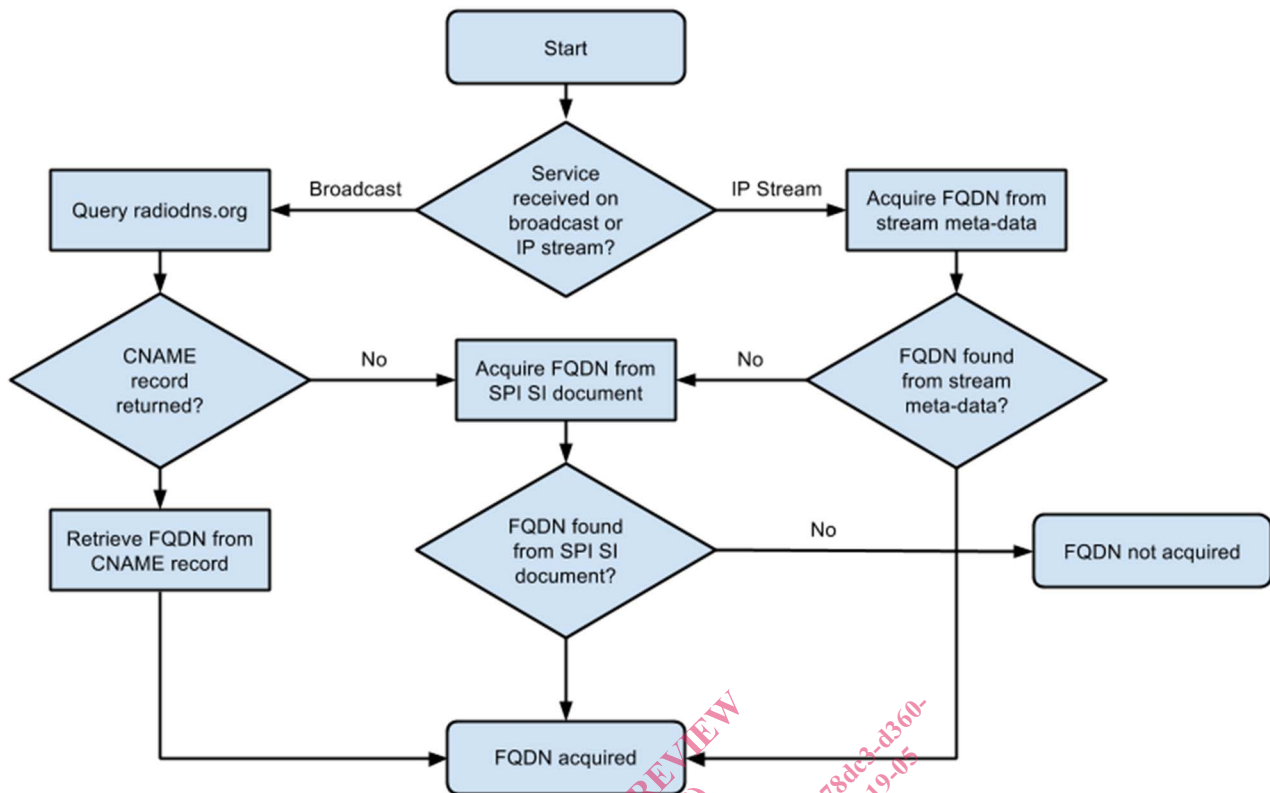


Figure 1: Process to acquire Authoritative FQDN for a service

The service is also given a ServiceIdentifier parameter, which is unique within the scope of an Authoritative FQDN.

The service may also be given a bearerURI parameter, which allows location of the service when placed in an SPI SI document.

Clause 5 describes how to resolve the Authoritative FQDN and construct the ServiceIdentifier and bearerURI for broadcast radio services.

Clause 6 describes how to resolve the Authoritative FQDN and ServiceIdentifier and construct the bearerURI for streaming radio services.

Clause 7 describes how to resolve the Authoritative FQDN and ServiceIdentifier from an SPI SI document.

Methods for discovery of the SPI SI document are defined in ETSI TS 102 818 [5].

5 Authoritative FQDN resolution, and ServiceIdentifier and bearerURI construction for broadcast services

5.1 RadioDNS FQDN, ServiceIdentifier and bearerURI construction

5.1.1 FM with RDS/RBDS

5.1.1.1 RDS/RBDS parameters

The FM system supports identification of a radio service through transmission of meta-data by using RDS [8] or RBDS [9].

The parameters are defined in table 1.

Table 1: RDS/RBDS parameter description

Parameter	Description	Value	Status
gcc	The Global Country Code (GCC) of the country of origin of the service (see annex A).	3-char hexadecimal	mandatory
pi	Received RDS/RBDS Programme Identification (PI) code.	4-char hexadecimal	mandatory
frequency	Frequency on which the service broadcast is received, formatted to 5 characters in units of 100 KHz. Frequencies below 100 MHz shall be supplied with a leading zero, for example 95,8 MHz would be represented as "09580", 104,9 MHz as "10490".	5-char string	mandatory

NOTE: During the development of RadioDNS, it was permitted to compile the RadioDNS FQDN using the ISO 3166-1 [10] alpha-2 country code as an alternative to the GCC. However, since the GCC can be derived from location information and the PI code, only the GCC has been standardized.

5.1.1.2 Construction of RadioDNS FQDN

The RadioDNS FQDN for a VHF/FM service is compiled as follows:

```
<frequency>.<pi>.<gcc>.fm.radiodns.org
```

Some examples of RadioDNS FQDNs constructed from broadcast parameters are shown in table 2.

Table 2: Example of RadioDNS FQDN construction for RDS/RBDS

GCC	PI	Frequency (MHz)	RadioDNS FQDN
ce1	c586	95,8	09580.c586.ce1.fm.radiodns.org
de0	d1e0	103,9	10390.d1e0.de0.fm.radiodns.org

5.1.1.3 Construction of ServiceIdentifier

The ServiceIdentifier for a VHF/FM service is compiled as follows:

```
fm/<gcc>/<pi>/<frequency>
```

Some examples of ServiceIdentifiers constructed from broadcast parameters are shown in table 3.

Table 3: Example of RadioDNS ServiceIdentifier construction for RDS/RBDS

GCC	PI	Frequency (MHz)	RadioDNS ServiceIdentifier
ce1	c586	95,8	fm/ce1/c586/09580
de0	d1e0	103,9	fm/de0/d1e0/10390

5.1.1.4 Construction of bearerURI

The bearerURI for a VHF/FM service is compiled as follows:

```
fm:<gcc>.<pi>.<frequency>
```

The <frequency> element may be replaced by the asterisk ("*") character to signify any frequency. In this case the PI code alone shall be used by the device to locate the source.

Some examples of FM bearerURIs constructed from broadcast parameters are shown in table 4.

Table 4: Example of RadioDNS bearerURI construction for RDS/RBDS

GCC	PI	Frequency (MHz)	RadioDNS bearerURI
ce1	c586	95,8	fm:ce1.c586.09580
de0	d1e0	103,9	fm:de0.d1e0.10390
ce1	c201	many	fm:ce1.c201.*

5.1.2 Digital Audio Broadcasting (DAB/DAB+)

5.1.2.1 DAB/DAB+ parameters

The parameters are defined in table 5.

Table 5: DAB parameter description

Parameters	Description	Value	Status
gcc	The Global Country Code (GCC) of the country of origin of the service (see annex A)	3-char hexadecimal	mandatory
eid	The Ensemble Identifier (Eid) of the service	4-char hexadecimal	mandatory
sid	The Service Identifier (Sid) of the service	4- or 8-char hexadecimal	mandatory
scids	The Service Component Identifier within the Service (SCIdS) of the service component	1-char hexadecimal	mandatory
uatype	The User Application Type (UATYPE) of the data component	3-char hexadecimal	mandatory for data components, otherwise omitted

For data services (or data components of audio services) the **uatype** parameter is also mandatory.

5.1.2.2 Construction of RadioDNS FQDN

The RadioDNS FQDN for a DAB/DAB+ service is compiled as follows:

```
[<uatype>.<scids>.<sid>.<eid>.<gcc>].dab.radiodns.org
```

Some examples of RadioDNS FQDNs constructed from broadcast parameters are shown in table 6.

Table 6: Example of RadioDNS FQDN construction for DAB

GCC	Eid	Sid	SCIdS	UATYPE	RadioDNS FQDN
de0	100c	d220	0		0.d220.100c.de0.dab.radiodns.org
ce1	c18c	cc86	0		0.cc86.c18c.ce1.dab.radiodns.org
ce1	c185	e1c00098	0	004	004.0.e1c00098.c185.ce1.dab.radiodns.org

5.1.2.3 Construction of ServiceIdentifier

The ServiceIdentifier for a DAB/DAB+ service is compiled as follows:

```
dab/<gcc>/<eid>/<sid>/<scids>[/<uatype>]
```

The **<separator>** element is application specific. The inclusion of **<uatype>** is mandatory for data services or data components of audio services.

Some examples of ServiceIdentifiers constructed from broadcast parameters are shown in table 7.