Intelligent Transport Systems (ITS)

ITS Application Identifier (ITS-AID)

Registration Request Template

and

Guidelines

Edition 2019-September-23

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1 Introduction

The European Committee for Standardization (CEN) / International Organization for Standardization (ISO) TS 17419 identifies several identifiers for use in Cooperative Intelligent Transport Systems (C-ITS) that need to be globally unique. One of them is the ITS Application Identifier (ITS-AID), which is used to identify an ITS application object. ITS-AIDs are used e.g. in ITS station units [7] and in WAVE devices [14]. In the IEEE WAVE specifications, ITS-AID is named PSID (Provider Service Identifier).

Assignment of numbers can be requested with the template provided in this document.

2 Abbreviations

BSM	Basic Safety Message
BSME	Bounded Secured Managed Entity
BSMD	Bounded Secured Managed Domain
CAM	Cooperative Awareness Message
CEN	European Committee for Standardization
C-ITS	Cooperative Intelligent Transport Systems
DENM	Decentralized Environmental Notification Message
ETSI	European Telecommunications Standards Institute
FSAP	Fast Service Advertisement Protocol
FSH	Facilities Service Handler
FNTP	Fast Networking and Transport Layer Protocol
IEEE	Institute of Electrical and Electronic Engineers
ISO	International Organisation for Standardization
ITS	Intelligent Transport Systems
ITS-AID	ITS Application Identifier
ITS-PN	ITS Port Number
ITS-S	ITS Station
ITS-SU	ITS Station Unit
LCH	Logical Channel
PSID	Provider Service Identifier
SAE	Society of Automotive Engineers
SDO	Standards Developing Organization

3 Registration of ITS Application Objects

3.1 Purpose

The purpose of ITS-AID, which uniquely identifies an ITS application object, is specified and illustrated in ISO/TS 17419:2014 [3]. Annex B provides a short tutorial with references to other information sources. IEEE 1609.12 [17] defines a Provider Service Identifier (PSID). PSID and ITS-AID share a common number space.

3.2 Applicant, Steward, Registrar

The "ITS-AID steward" is a natural or legal person that is authorized to decide upon a request from an "applicant" to register an ITS application object. The "ITS-AID registrar" is a natural or legal person that is authorized to maintain an ITS-AID registration list and publish assigned ITS-AID values upon request from the ITS-AID steward. The ITS-AID steward and ITS-AID registrar may be the same person.

As result of a successful request, a globally unique ITS-AID value is assigned to the ITS application object by the ITS-AID steward, and the ITS-AID steward will request the ITS-AID registrar to publish the assigned number in the ITS-AID registration list.

3.3 Online registry

A publicly accessible ITS-AID registration list is maintained, for information only, at:

http://registry.its-standards.eu/

It is accessible at no cost. Neither the registrar nor the steward is liable for any misuse of information contained in the online ITS-AID registration list, and for any incorrect presentations in this informative published list.

Number assignments are also presented in IEEE 1609.12 [17] and by the IEEE RA.

3.4 Registration Procedure

Annex A provides a template for an applicant to request a value of ITS-AID / PSID for a new ITS application object specification. The filled and signed template is forwarded to the address of the steward given in the template. The steward evaluates the registration request, which might result in the requested assignment of a number. Then the applicant will be informed of the outcome of the evaluation.

An applicant has to notify the ITS-AID registrar any changes of address or contact information.

Assignments of numbers may be subject to a service fee. Assignment of numbers will be performed only upon payment of applicable service fees.

3.5 Registration Data

Table 1 presents and explains registration data that have to be provided by an applicant.

Table 1: Registration data

Element of Record	Semantics
ITS-AID	Preferred number range (smallest number / largest number)
ITS service (application) name	Name of ITS application object that provides an ITS service
ITS application object type	Type of ITS application object: either • class or • single application

Element of Record	Semantics
Owner of the ITS application object	Owner of the ITS application object: • Type (SDO or natural person / organization) • Name of the organization or the natural person • Postal address • Phone and fax numbers • Universal object identifier of the organization, if existent • Email address of responsible person
Description	Short description of the purpose of the ITS application object together with an indication on relevance for the society, and frequency of transmission of related messages. Requests without description can be treated only as "private ITS services". The status of the ITS-AID allocation will be "private".
Specification(s)	Unique reference to the detailed specification of the ITS application object (e.g., by means of a standards reference number). In case of an ITS application class, reference to the class definition and to the context definition is necessary. If the owner is an SDO, a reference to a standard is expected. Applicable specification(s) do not need to be publicly accessible.

Table 2 shows OIDs of some standards developing organizations (SDOs).

Table 2: OIDs of Some SDOs

SDO	OID
CEN	{iso(1) identified-organization(3) cen(162)}
European Telecommunications Standards Institute (ETSI)	{itu-t(0) identified-organization(4) etsi(0)}
IEEE (Institute of Electrical and Electronics Engineers)	{iso(1) identified-organization(3) ieee(3)}
ISO	{iso(1) standard(0)}
Society of Automotive Engineers (SAE)	{iso(1) identified-organization(3) dod(6) internet(1)(4) enterprise(1) 21431}

Annex A

Template for ITS-AID Registration Request

This template is for an applicant to request assignment of a value of ITS-AID for an ITS application object.

Applicant Data:

Name of organization: _____

Family name: _____

Christian name: _____

Title: _____

Address 1: _____

Address 2: _____

ZIP: _____

City: _____

Country: _____

Email: _____

Phone: _____

Fax: _____

Web site URL: _____

ITS-AID Steward Address:

Please send a scanned copy of the signed registration sheet to:

itsaidRegistry@its-standards.info

Page 1 of template

Registration Data

ITS service (application) name: _____

_____

ITS application object type:

(Class) / (Application): _____

Specification(s):

Of class or application: _____

_____

Of context (if applicable): _____

_____

Owner:

Name: _____

_____

Type (SDO) / (Private): _____

OID: _____

ITS-AID

Preferred number range: _____

Please provide (on a maximum of two additional pages) a description of the ITS application process that includes as a minimum the following information:

- the purpose of the ITS application object;
- the relevance of the ITS application object for the society;
- an explanation of the intended usage of the ITS-AID;
- the frequency of messages containing ITS-AID;
- the method how versions of the ITS application object can be distinguished,

Note that multiple ITS-AIDs for the same service (ITS application object) used to distinguish versions of the service must not be assigned; other methods of versioning are required.

Date: _____ Signature and stamp: _____

Annex B

Tutorial on ITS-AID

B.1 General

See also ISO/TS 17419:2014 [3].

ITS applications and ITS application classes are referred to as ITS application objects. An ITS application is an instantiation of an ITS service that involves an association of two or more complementary ITS-S applications [7].

The concept of an ITS application class as introduced in [1] (cf. DSRCApplicationEntity) is based on identifying a set of different protocols that serve the same functional purpose (e.g., Electronic Fee Collection). The various protocols inside an ITS application class are distinguished by a context that can be identified by a context identifier.

An ITS application object is uniquely identified by a registered value of "ITS Application Identifier" (ITS-AID) specified in this technical specification.

ITS-AID is a non-negative Integer number.

B.2 Formats and encodings

Different formats and encodings of ITS-AID may be used dependent on the usage, e.g.

- p-encoding;
- o-encoding.

B.2.1 p-encoding

The term "p-encoding" identifies the ASN.1 type `ITSaid` specification of ITS-AID from ISO/TS 17419 [3] applying unaligned packet encoding rules (UPER):

```
ITSaid::=VarLengthNumber

VarLengthNumber::=CHOICE{
  content  [0] INTEGER(0..127),
  extension [1] Ext1
  }
Ext1::=CHOICE{
  content  [0] INTEGER(128..16511),
  extension [1] Ext2
  }
Ext2::=CHOICE{
  content  [0] INTEGER(16512..2113663),
  extension [1] Ext3
  }
Ext3::=INTEGER(2113664..270549119,...)
```

The p-encoding is used e.g. in ISO 16460 [2], ISO 29281-1 [11], IEEE 1609.3 [16].

B.2.2 o-encoding

The term "o-encoding" identifies the ASN.1 type `Psid` specification of ITS-AID from IEEE 1609.2 [15] applying unaligned packet encoding rules (UPER):

```
Psid::=INTEGER (0..MAX)
```

The o-encoding is used e.g. in IEEE 1609.2 [15].

B.2.3 Encoded numbers

Table B.1 presents the number of octets needed to present an ITS-AID for two different examples of formats and encodings.

Table B.1: Encoded numbers - required space in octets

ITS-AID (decimal value)	Size in octets	
	p-encoding	o-encoding
0 - 127	1 octet	2 octets
128 - 255	2 octets	
256 - 16.511	2 octets	3 octets
16.512 - 65.535	3 octets	
65.536 - 2.113.663	3 octets	4 octets
2.113.664 - 16.777.215	4 octets	
16.777.216 - 270.549.119	4 octets	5 octets
270.549.120 - 4.294.967.295	possible, but not recommended, as the required field is not octet-aligned. 6 octets	5 octets
> 4.294.967.295	possible, but not recommended, as the required field is not octet-aligned.	possible > 5 octets

As ITS-AID may be used in messages transmitted over narrowband channels, assignment of a number from a specific number range depends on the relevance of the respective ITS application object for the society, and the frequency of transmission of related messages.

B.3 Examples of usage of ITS-AID

B.3.1 Secure installation of an ITS-S application in a BSME

ITS-AID together with a certificate is used for secure installation of an ITS-S application in a Bounded Secured Managed Entity (BSME)—i.e., an ITS-SU operated as a Bounded Secured Managed Domain (BSMD) [7].

NOTE: In an ITS-SU, there may be more than one instantiation of an ITS application object process of the same ITS-AID.

B.3.2 Real-time operation of an ITS-S application in a BSME

ITS-AID is used for real-time operation of an ITS-S application in a BSME. Together with the ITS-AID, access rights of the ITS-S application (what to do in the BSME) - named "Service Specific Permissions" (SSP) in IEEE 1609, and the certificate of the ITS-S application are used to get real-time certificates for communications. Such real-time certificates are used to authenticate senders of messages and, by this, to secure such messages.

B.3.3 Service advertisement

ITS-AID is used to advertise services (cf. the service advertisement specified in [10] and [16]).

B.3.4 Broadcast of messages

ITS-AID is used in transport layer protocols to identify an endpoint in broadcast communications (cf. the messaging format specified in [2] and used in the protocols [11] and [16]).

B.3.5 Other usage

There may be other usage of ITS-AID not described in this annex.

References

[1] ISO 15628:2012, *Intelligent transport systems – Dedicated short range communication (DSRC) – DSRC application layer*

[2] ISO 16460:2016, *Intelligent Transport Systems – Communications access for land mobiles (CALM) – Communications protocol messages for global usage*

[3] EN ISO 17419:2018, *Intelligent transport systems – Cooperative systems – Globally unique identifiers*

[4] EN ISO 17423:2018, *Intelligent transport systems – Cooperative systems – Application requirements and objectives*

[5] ISO/TS 17429:2017, *Intelligent transport systems – Cooperative systems – ITS station facilities for the transfer of information between ITS stations*

[6] ISO/TS 19091:2017, *Intelligent transport systems – Cooperative ITS – Using V2I and I2V Communications for Applications Related to Signalized Intersections*

[7] ISO 21217:2014, *Intelligent Transport Systems – Communications access for land mobiles (CALM) – Architecture*

[8] ISO 24102-2:2018, *Intelligent Transport Systems –ITS station management – Part 2: Remote management of ITS-SCUs*

[9] ISO 24102-4:2018 *Intelligent Transport Systems – ITS station management – Part 4: Station-internal management communications*

[10] ISO 22418:2018, *Intelligent Transport Systems – Fast service announcement protocol (FSAP)*

[11] ISO 29281-1:2018, *Intelligent transport systems – Localized communications – Part 1: Fast networking & transport layer protocol (FNTP)*

[12] ETSI EN 302 637-2, *Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service*

[13] ETSI EN 302 637-3, *Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service*

[14] IEEE Std 1609.0™, *IEEE Standard for Wireless Access in Vehicular Environments (WAVE) – Architecture*

[15] IEEE Std 1609.2™, *IEEE Standard for Wireless Access in Vehicular Environments (WAVE) – Security Services for Applications and Management Messages*

[16] IEEE Std 1609.3™, *IEEE Standard for Wireless Access in Vehicular Environments (WAVE) – Networking Services*

[17] IEEE Std 1609.12™, *IEEE Standard for Wireless Access in Vehicular Environments (WAVE) – Identifier Allocations*

[18] SAE J2735, *Dedicated Short Range Communications (DSRC) Message Set Dictionary*