

ETSI EN 302 890-1 V1.2.1 (2019-07)



Intelligent Transport Systems (ITS); Facilities layer function; Part 1: Services Announcement (SA) specification

iTeh STANDARDS PREVIEW
(standards.iteh.ai)
Full standard/standards.iteh.ai/catalog/standards/sis/50430-2520-4e27-ac21-ceb6187f1186/etsi-en-302-890-1-v1-2-2019-07

ReferenceREN/ITS-002180

Keywordsinteroperability, ITS, service, validation

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.

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	4
Foreword.....	4
Modal verbs terminology.....	4
Introduction	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.....	8
3.3 Abbreviations	8
4 SA functional description	9
4.1 SA functional architecture.....	9
4.2 Interfaces of the SA service.....	10
4.2.1 Interface between Application entity and Management entity.....	10
4.2.2 Interface between Facilities layer and the Management entity	11
4.2.3 Interface between Facilities layer and the Security entity.....	12
4.2.4 Interface between Facilities layer and the Networking & Transport layer	12
5 SAEM format	12
5.1 General	12
5.2 Service info component.....	13
5.3 Channel info component	13
5.4 IPv6 routing advertisement.....	14
6 SAEM dissemination.....	14
6.1 Identification	14
6.2 SA service trigger, update, repetition and termination	14
6.3 SA service communication requirements	14
6.4 SA Application Identifier (AID).....	15
6.5 SA Service Specific Permissions (SSP)	15
Annex A (normative): ASN.1 specification of SAEM	16
Annex B (normative): ASN.1 specification of extensions	17
B.1 General	17
B.2 <i>ChannellInfo</i> extensions	17
B.2.1 <i>ProtocolType</i> extension definition	17
B.2.2 <i>ProtocolType</i> value assignments	17
History	19

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 European Standard (EN) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 1 of a multi-part deliverable covering Intelligent Transport Systems; Facilities layer function, as identified below:

Part 1: "Services Announcement (SA) specification";

Part 2: "Position and time facility specification".

National transposition dates	
Date of adoption of this EN:	17 June 2019
Date of latest announcement of this EN (doa):	30 September 2019
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2020
Date of withdrawal of any conflicting National Standard (dow):	31 March 2020

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.

Introduction

Some of the applications of the Basic Set of Applications (see ETSI TR 102 638 [i.1]) require ITS stations (Service Users) to have knowledge of a certain service of interest that is provided by other ITS stations (Service Providers) via defined communication access technologies.

The C-ITS protocol stack supports push and pull mechanisms in order to allow an ITS station to identify the availability of ITS services. The push mechanism is named "ITS service announcement" which is also known as "ITS service advertisement" (see ETSI EN 302 665 [i.2]). Throughout the present document this service is referred to as service announcement service (SA service).

The ITS SA service is a functionality agnostic to the medium and the announced service that can be used by specific services to provide the push functionality mentioned above. In this sense, each specification of an ITS service will tailor the ITS service announcement to its needs. This means that ITS service definitions (e.g. in other standards or technical specifications) should make use of the provisions of the present document to define its service-specific use of ITS service announcement, i.e. to profile the ITS service announcement appropriately (for example the use of service announcement in a Platooning service). The present document defines therefore a general framework which needs to be followed whenever a specific service is specified. Compliance should be tested according to this service specification that defines the application-specific requirements for the service announcement.

ETSI STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/504dee30-2520-4e27-ac21-ceb6187f1186/etsi-en-302-890-1-v1.2.1-2019-07>

1 Scope

The present document provides the specification of the Services Announcement (SA) service, including its protocol functions, based on ISO/TS 16460 [1].

The definition of the interface between Service Provider and Service Announcer ITS stations (ITS-S) as well as of the communication steps following the service announcement protocol procedure and related protocol details between Service Announcer and Service User ITS-S are application-specific and are not covered by the present document.

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] ISO/TS 16460:2016: "Intelligent transport systems -- Communications access for land mobiles (CALM) -- Communication protocol messages for global usage".
- [2] ETSI TS 102 894-2: "Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer common data dictionary".
- [3] ETSI EN 302 636-4-1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality".
- [4] ETSI TS 103 097: "Intelligent Transport Systems (ITS); Security; Security header and certificate formats".
- [5] ETSI EN 302 931: "Intelligent Transport Systems (ITS); Vehicular Communications; Geographical Area Definition".
- [6] Recommendation ITU-T X.691/ISO/IEC 8825-2 (2015): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
- [7] ETSI TS 102 965: "Intelligent Transport Systems (ITS); Application Object Identifier (ITS-AID); Registration".
- [8] ETSI TS 103 248: "Intelligent Transport Systems (ITS); GeoNetworking; Port Numbers for the Basic Transport Protocol (BTP)".
- [9] IEEE 1609.3™ - 2016: "IEEE Standard for Wireless Access in Vehicular Environments (WAVE) - Networking Services".
- [10] ISO/TS 17423:2018: "Intelligent transport systems -- Cooperative systems -- Application requirements and objectives".
- [11] ETSI EN 302 636-5-1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 5: Transport Protocols; Sub-part 1: Basic Transport Protocol".

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 TR 102 638: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Definitions".
- [i.2] ETSI EN 302 665 (V1.1.1): "Intelligent Transport Systems (ITS); Communications Architecture".
- [i.3] ETSI TS 102 723-11: "Intelligent Transport Systems (ITS); OSI cross-layer topics; Part 11: Interface between networking and transport layer and facilities layer".
- [i.4] ETSI TS 102 723-5 (V1.1.1): "Intelligent Transport Systems (ITS); OSI cross-layer topics; Part 5: Interface between management entity and facilities layer".
- [i.5] ETSI TS 103 301: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Facilities layer protocols and communication requirements for infrastructure services".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

ITS application: association of two or more complementary ITS-S applications

ITS-S application: fragment of an ITS application available at an ITS-S that uses ITS-S services to connect to one or more other fragments of the same ITS application

ITS-S gateway: gateway functionality based on the ITS-S reference architecture

ITS-S router: routing functionality based on the ITS-S reference architecture

ITS service: service provided by an ITS application to the user of ITS

ITS-S service: communication functionality offered by an ITS-S to an ITS-S application

Minimum Dissemination Area (MDA): parts of the road network where the SAEM can be received by the potentially targeted Service user ITS-S

Services Announcement (SA): provision, via an ITS communication functionality, of information about an ITS service

NOTE: Such information can include the ITS service identity, availability and communication details.

Service announcer ITS-S: ITS-S that announces services on behalf of the service provider ITS-S by transmitting SAEM

Service provider ITS-S: ITS-S that provides remote or local ITS services

Service user ITS-S: consumer of ITS services monitoring SAEM for an announced ITS service opportunity of interest

NOTE: These definitions are in line with ETSI EN 302 665 [i.2].

3.2 Symbols

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

<i>changeCount</i>	Component of <i>samBody</i>
<i>channelIndex</i>	Component of <i>ServiceInfo</i> pointer to <i>ChannelInfo</i>
<i>ChannelInfo</i>	Datatype of <i>channelInfos</i> list entry
<i>channelInfos</i>	Component of <i>samBody</i>
<i>chOptions</i>	Component of <i>ServiceInfo</i>
<i>contentCount</i>	Component of <i>changeCount</i>
<i>defaultGateway</i>	Component of <i>routingAdvertisement</i>
<i>ExtendedChannelInfos</i>	Component of <i>extensions</i> of <i>samBody</i>
<i>extensions</i>	Component of <i>samBody</i>
<i>GatewayMACAddress</i>	Component of <i>routingAdvertisement</i>
<i>IPv6Address</i>	Component of <i>chOptions</i>
<i>ItsPduHeader</i>	Header component of the SAEM
<i>messageID</i>	Component of the <i>ItsPduHeader</i>
<i>ProtocolType</i>	Component of <i>chOptions</i>
<i>protocolVersion</i>	Component of the <i>ItsPduHeader</i>
<i>ProviderMACAddress</i>	Component of <i>chOptions</i>
<i>routingAdvertisement</i>	Component of <i>samBody</i>
<i>saID</i>	Component of <i>changeCount</i>
<i>sam</i>	Component of the SAEM
<i>Sam</i>	Datatype specified in ISO/TS 16460 [1]
<i>samBody</i>	Component of <i>sam</i>
<i>serviceID</i>	Component of <i>ServiceInfo</i>
<i>ServiceInfo</i>	Datatype of <i>serviceInfos</i> list entry
<i>serviceInfos</i>	Component of <i>samBody</i>
<i>serviceProviderPort</i>	Unused component of <i>chOptions</i>
<i>SrvAdvChangeCount</i>	Datatype of <i>changeCount</i>
<i>stationID</i>	Component of the <i>ItsPduHeader</i>
<i>systemService</i>	Unused component of <i>chOptions</i>

3.3 Abbreviations

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

AID	Application Identifier
API	Application Programming Interface
ASN	Abstract Syntax Notation
BTP	Basic Transport Protocol
C-ITS	Cooperative ITS
GN	GeoNetworking
ID	Identifier
IETF	Internet Engineering Task Force
IP	Internet Protocol
IPv6	Internet Protocol Version 6
ISO	International Organization for Standardization
ITS	Intelligent Transport System
ITS-S	ITS Station
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
MAC	Medium Access Control
MA-SAP	Management to Application Service Access Point
MDA	Minimum Dissemination Area
MF	Management to Facilities
MF-SAP	Management to Facilities - Service Access Point
NF	Networking & transport to Facilities
NF-SAP	Networking & transport to Facilities - Service Access Point
PER	Packed Encoding Rules
RX	Reception
SA	Services Announcement

SAEM	Services Announcement Essential Message
SAP	Service Access Point
SSP	Service Specific Permissions
TX	Transmission

4 SA functional description

4.1 SA functional architecture

The Services Announcement (SA) service is a protocol service that is distributed over the facilities layer and the management entity of the ITS-S reference architecture as defined in ETSI EN 302 665 [i.2]. The SA service provides information on available services, applying the Services Announcement protocol with the following functions:

- The SA message processing function of the facility layer is responsible for the periodic transmission and/or reception of SAEM. It shall offer the following functionalities:
 - For the SAEM transmission (TX) service:
 - message encoding;
 - transmission management.
 - For the SAEM reception (RX) service:
 - message decoding;
 - reception management.
- The SA management function of the management entity is responsible for the registration/update/deregistration of applications.

The SAEM is secured as defined in clause 6.3. The secured SAEM is referred to as SAEM in the present document.

The SA service is implemented in a Service Provider, Service Announcer and Service User ITS-S.

Figure 1 presents the SA service in the context of the ITS-S reference architecture and its logical interfaces with other entities and layers.

The SA service supports different configurations with respect of the Service Provider role and the Service Announcer role, such as:

- Service Provider and Service Announcer functionality are implemented in the same ITS-S;
- Service Provider and Service Announcer functionality are implemented in separate ITS-S; and
- other configurations.