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**Intelligent transport systems —  
Communications access for land  
mobiles (CALM) — ITS station  
management —**

Part 5:

**Fast service advertisement protocol  
(FSAP)**

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*Systèmes intelligents de transport — Accès aux communications des  
services mobiles terrestres (CALM) — Gestion des stations ITS -- —*

*Partie 5: Protocole d'avertissement de service rapide (FSAP)*



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ISO 24102-5:2013

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. [www.iso.org/directives](http://www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. [www.iso.org/patents](http://www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

ISO 24102 consists of the following parts, under the general title *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management*:

- Part 1: Local management
- Part 3: Service access points
- Part 4: ITS station-internal management communications
- Part 5: Fast service advertisement protocol (FSAP)

The following parts are under preparation:

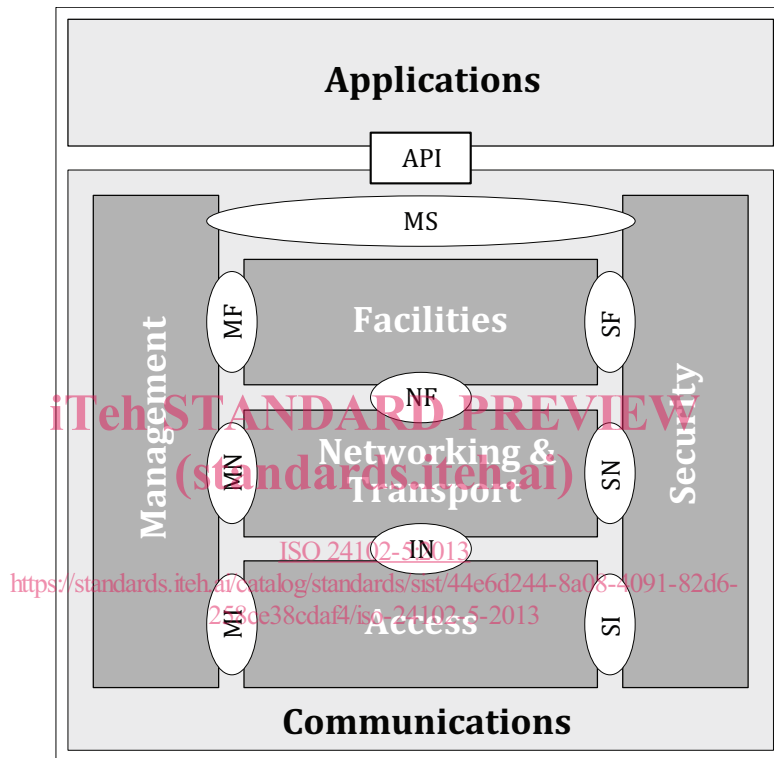
- Part 2: Remote management
- Part 6: Path and flow management

## Introduction

This International Standard is part of a family of International Standards for communications access for land mobiles (CALM). An introduction to the whole set of International Standards is provided in ISO 21217.

This part of ISO 24102 is part 5 of a multipart International Standard which determines the intelligent transport systems (ITS) station management - fast service advertisement protocol.

The ITS station management entity provides functionality related to the management of communication protocol layers and the security entity presented in the ITS station reference architecture specified in ISO 21217 and presented in [Figure 1](#), and in line with the general ITS architecture specified in ISO 21217.



**Figure 1 — ITS station reference architecture with named interfaces**

ITS station management is specified as a distributed process, where no supervisory entity is employed.

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# Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management —

## Part 5: Fast service advertisement protocol (FSAP)

### 1 Scope

This part of ISO 24102 specifies procedures and data elements in the ITS station management entity and the ITS station facilities layer of the ITS station reference architecture for advertisement of locally available ITS services. These procedures and data elements constitute the “Fast Service Advertisement Protocol” (FSAP).

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 8825-2, *Information technology — ASN.1 encoding rules: Specification of Packed Encoding Rules (PER) — Part 2*

ISO 21217, *Intelligent transport systems — Communications access for land mobiles (CALM) — Architecture*

ISO 21218, *Intelligent transport systems — Communications access for land mobiles (CALM) — Access technology support*

ISO 24102-1, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 1: Local management*

ISO 24102-3, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 3: Service access points*

ISO 24102-4, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 4: Station-internal management communications*

ETSI TS 102 797-1, *Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for ITS station management (ISO 24102); Part 1: Protocol Implementation Conformance Statement (PICS) proforma*

ETSI TS 102 797-2, *Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for ITS station management (ISO 24102); Part 2: Test Suite Structure & Test Purposes (TSS&TP)*

ETSI TS 102 797-3, *Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for ITS station management (ISO 24102); Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions in ISO 21217 apply.

## 4 Abbreviated terms

ctx	FSAP message type for service context messages (CTX)
CTX	service context message PDU
FMT-ID	FSAP Message Type Identifier
FSA	fast service advertisement
FSAP	FSAP protocol
REQN	request message PDU, no response message PDU expected
REQRES	request or response message PDU out of the set REQW, REQN, RES
REQW	request message PDU, response message PDU expected
RES	response message PDU, acknowledging a REQW
sam	fast message type for service advertisement message (SAM)
SAM	service advertisement message PDU
SIP	service initialization phase
SOP	service operation phase

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## 5 Requirements

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The ITS station management includes functionality specified in the various parts of this multipart International Standard:

- 1) The functionality of local ITS station management specified in ISO 24102-1.
- 2) The functionality of remote ITS station management specified in ISO 24102-2.
- 3) The functionality of management service access points specified in ISO 24102-3.
- 4) The functionality of ITS station-internal management communications specified in ISO 24102-4.
- 5) The functionality of the “Fast Service Advertisement Protocol” (FSAP) specified in this part of ISO 24102.

The means to secure the access to management functionality need to be specified within the global context of ITS security. Details are outside the scope of this part of ISO 24102.

Detailed mandatory requirements are specified in the following clauses of this part of ISO 24102.

- [Clause 6](#) specifies architectural issues related to FSAP.
- [Clause 7](#) specifies protocol elements of FSAP.
- [Clause 8](#) specifies protocol procedures of FSAP.
- [Clause 9](#) specifies conformance declaration.
- [Clause 10](#) specifies test methods.
- [Annex A](#) specifies the ASN.1 module for FSAP.



## 6 Architecture

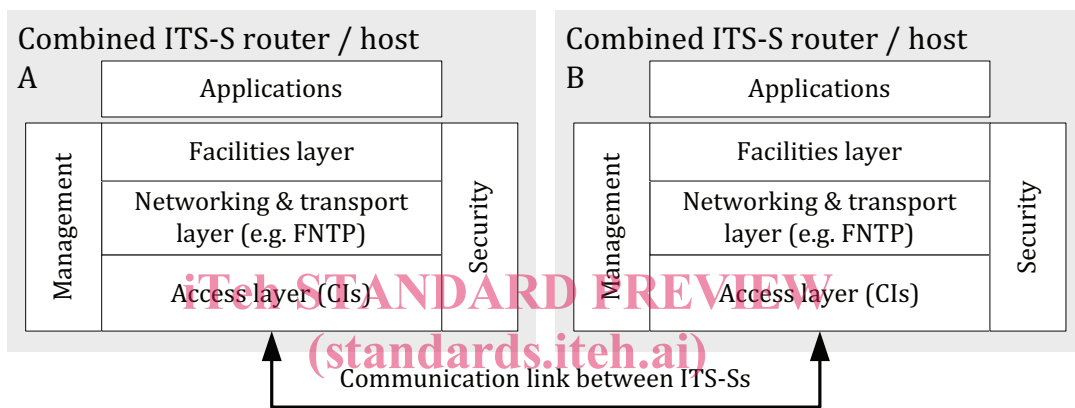
### 6.1 ITS communications architecture

The “Fast Service Advertisement Protocol” (FSAP) is designed in line with the general ITS architecture specified in ISO 21217.

### 6.2 Implementation architecture

The “Fast Service Advertisement Protocol” (FSAP) specified in this part of ISO 24102 may support the implementation architectures introduced in ISO 21217 and illustrated in [Figures 2, 3, and 4](#) with the peer ITS stations A and B.

NOTE [Figures 2, 3, and 4](#) show the “Fast Network & Transport Protocol” (FNTP) as an example of a suitable protocol in the networking and transport layer.



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**Figure 2 — Implementation architecture I**

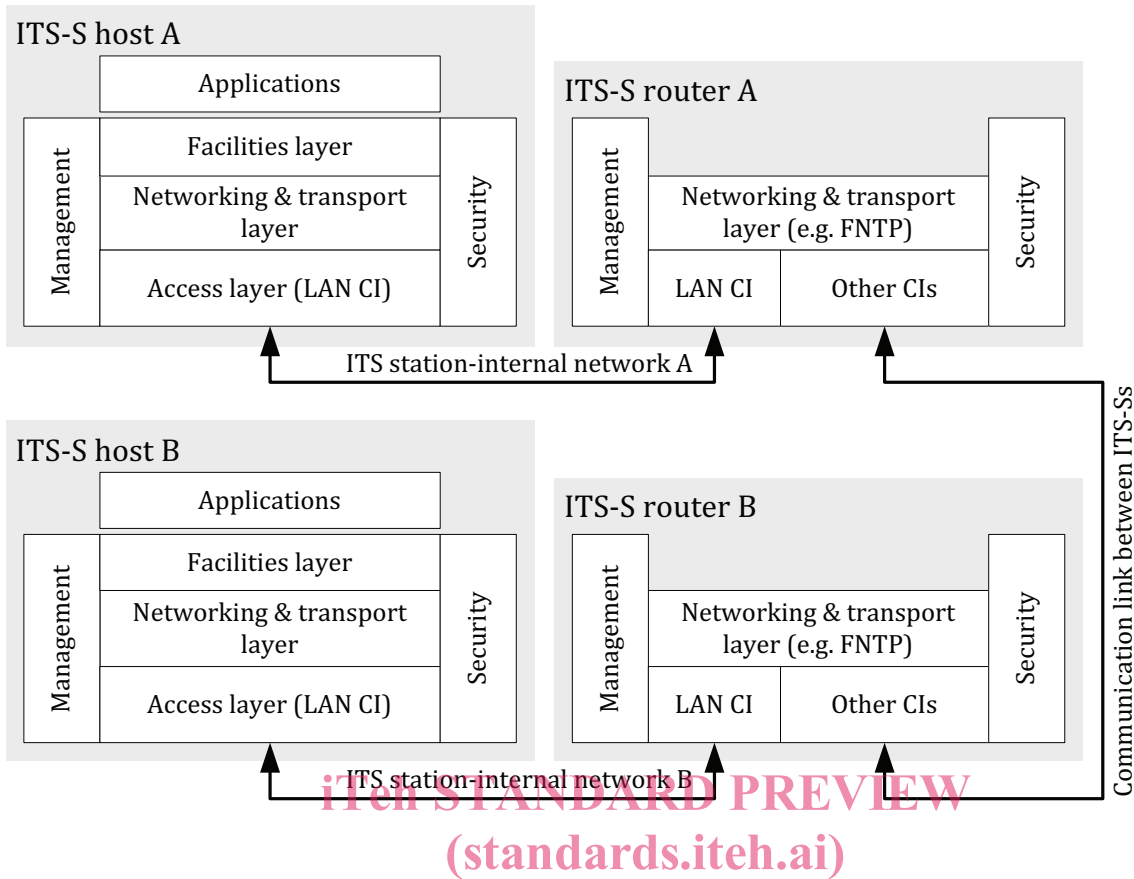


Figure 3 — Implementation architecture II

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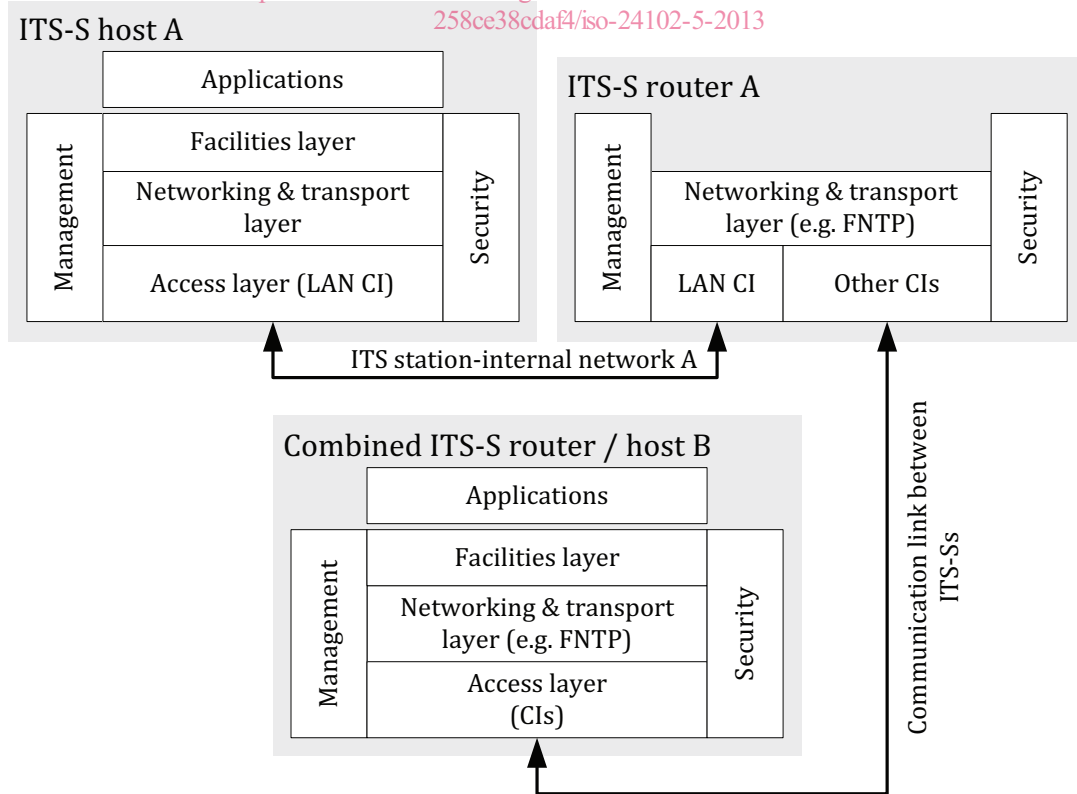


Figure 4 — Implementation architecture III

### 6.3 Communication entities

The “Fast Service Advertisement Protocol” (FSAP) distinguishes

- service provider ITS stations, and
- service user ITS stations.

An implementation of an ITS station may simultaneously or sequentially act as a service provider ITS station and as a service user ITS station.

An instance of any kind of ITS station identified in ISO 21217 may implement the FSAP.

### 6.4 Communication phases

#### 6.4.1 Overview

In order to allow an instance of an ITS station to offer an ITS service to another instance of an ITS station by means of an application session, a service initialization phase (SIP) is performed by the FSAP, where the SIP is based on single-hop ad hoc communication, e.g. applying the FNTP networking and transport layer protocol specified in [5].

After initialization, the application session is performed during the service operation phase (SOP), where the SOP may be based on either single-hop ad hoc communication or e.g. IPv6 communication over any kind of access technology.

During SIP, handover to another access technology and IPv6 may be demanded.

The real-time SIP procedures shall be implemented in an ITS-S router.

SOP communications are between peer ITS-S hosts. Dependent on the implementation, this may require ITS station-internal forwarding of SOP packets between ITS-S router and ITS-S host.

NOTE The specification of SOP is outside the scope of this part of ISO 24102.

#### 6.4.2 Service initialization phase

The purpose of SIP is to invite a peer ITS station unit by means of a service advertisement message (SAM) to use an ITS service which is uniquely identified by an ITS application object ID (ITS-AID) specified in [4].

Acceptance of such an invitation finally results in a session where the two peer ITS-S applications exchange data.

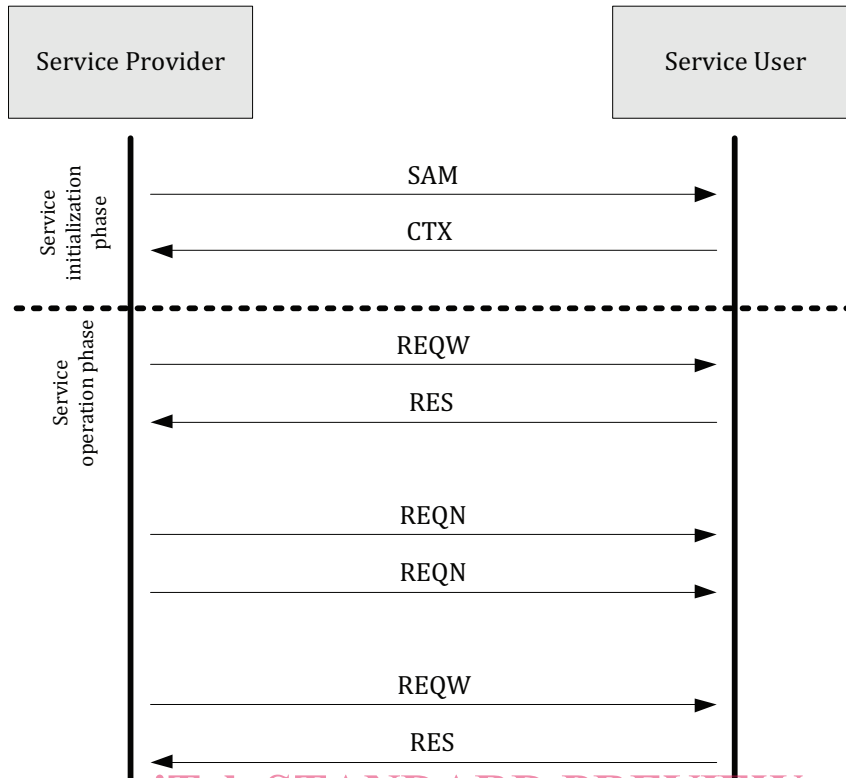
Two operational options of SIP are specified. The distinction originally was motivated by the two ITS application objects:

- 1) ITS application class[1]; and
- 2) ITS application.

NOTE A SAM may also contain just a message, which cannot result in a subsequent session.

Option one, originally designed for ITS application classes (DSRC-like SIP) [1], is illustrated in Figure 5. SAM is sent by a service provider ITS station to invite for a service initialization phase. CTX is sent by a service user ITS station to acknowledge SAM. Successful SIP is given by the first successful REQW or REQN of the service provider.

NOTE In [1], BST equals SAM, and VST equals CTX.



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Figure 5 — ITS application session with CTX

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NOTE The concept of application classes was introduced in [1]. Distinction of classes was done with an identifier of ASN.1 type DSRCApplicationEntityID. The difference between an ITS application class and an ITS application is that, for an ITS application object, several contexts exist. Each context itself can be referred to as an ITS application.

During an SOP

- requests, either with or without an expected response, typically are sent by the service provider but may also be sent by the service user, and
- responses typically are sent by the service user but may also be sent by the service provider, depending on the specification of the ITS application.

NOTE 1 The rule on which data are sent by a service provider or by a service user applies strictly for [1]. In general, for ITS there is no such rule.

NOTE 2 As specified in ISO 21217, the service user and the service client instances of an ITS application are referred to as ITS-S applications.

Option two, originally designed for ITS applications (WAVE-like SIP) [2], is illustrated in Figure 6. SAM is sent by a service provider ITS sub-system to perform service initialization. Successful SIP is given by the first successful REQW or REQN of the service user.