INTERNATIONAL STANDARD

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

Part 2:
Remote management of ITS-SCUs

Systèmes intelligents de transport — Accès aux communications des services mobiles terrestres (CALM) — Gestion de la station ITS —

Partie 2: Gestion à distance des SCUs-ITS

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Foreword

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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 (see www.iso.org/directives).

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

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

This first edition, together with ISO 24102-1, ISO 24102-3, ISO 24102-4, ISO 24102-5 and ISO 24102-6, cancels and replaces ISO 24102:2010, which has been technically revised.

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 2: Remote management of ITS-SCUs*

— *Part 3: Service access points*

— *Part 4: Station-internal management communications*

— *Part 5: Fast service advertisement protocol (FSAP)*

— *Part 6: Path and flow management*

Introduction

This part of ISO 24102 is part of a family of International Standards for communications access for land mobiles (CALM). An introduction to the whole set of International Standards for Intelligent Transport Systems (ITS) is provided in ISO 21217.

This part of ISO 24102 is the second part of a multipart International Standard which determines remote management of an ITS station unit (ITS-SU) with the ITS station and communication architecture specified in ISO 21217 and illustrated in Figure 1, and operated as a bounded secured managed domain (BSME).

Remote ITS station management has the purpose of

— setting, updating, and deletion of configuration and operation information in an ITS station communication units (ITS-SCU) of an ITS station unit (ITS-SU) specified in ISO 21217, e.g. information on policies and regulations, security related information, accounting information, access layer parameters (see Reference [1]),

— installation, update, and deinstallation of persistent information in an ITS-SCU, e.g. ITS-S application processes specified in ISO 21217, ITS-S communication protocols, and

— notification and retrieval of management information, e.g. log files of events, alarms generated by the ITS-SCU(s) of an ITS-SU.

By this, it covers the five management areas identified in ISO/IEC 7498-4.
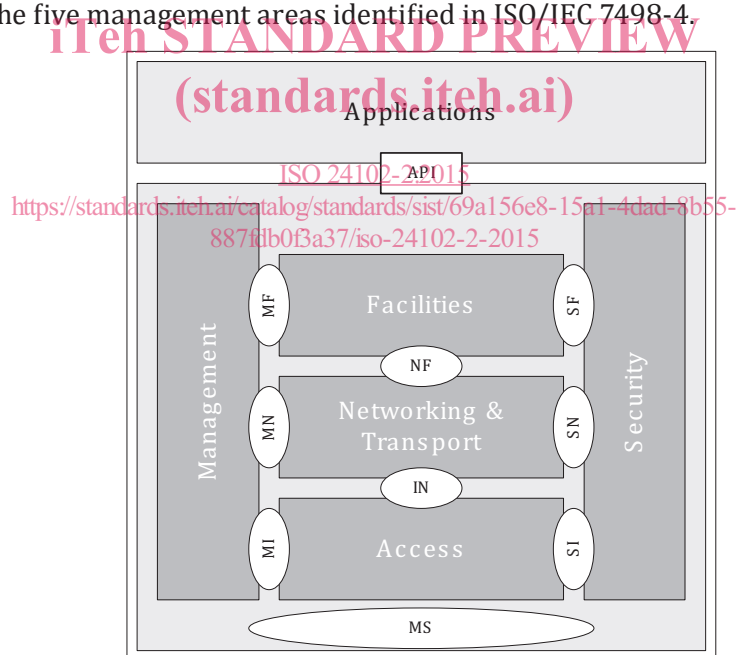

Figure 1 — ITS station reference architecture

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

Part 2:
Remote management of ITS-SCUs

1 Scope

This part of ISO 24102 provides specifications for Intelligent Transport Systems (ITS) station management to be compliant with the ITS station reference architecture and the set of related standards from ISO/TC 204.

Remote ITS station management is specified by means of protocol data units (PDUs) and procedures of the "Remote ITS Station Management Protocol" (RSMP) related to managed objects in an ITS station unit. Distinction is made between managed ITS station units (management clients) and managing remote ITS station units (management servers).

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

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*

ISO/IEC 7498-4, *Information processing systems — Open Systems Interconnection — Basic Reference Model — Part 4: Management framework*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21217, ISO 24102-1, ISO 24102-3, ISO 24102-4, ISO/IEC 7498-4, and the following apply.

3.1
remote management client
ITS station communication unit in which remote ITS station management is performed by a *remote management server* (3.2)

3.2
remote management server
entity performing remote ITS station management in an ITS station communication unit

4   Symbols and abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO 21217, ISO 24102-1, ISO 24102-3, ISO/IEC 7498-4, and the following apply.

BSME   Bounded Secured Managed Entity (from ISO 21217)

IICP   ITS station-Internal management Communications Protocol (from ISO 24102-4)

FSAP   Fast Service Advertisement Protocol (from ISO 24102-5)

ITS   Intelligent Transport Systems

ITS-SCU   ITS Station Communication Unit (from ISO 21217)

ITS-SCU-CMC   ITS-SCU Configuration Management Centre (from CEN/ISO/TS 17419)

ITS-SU   ITS Station Unit (from ISO 21217)

RMC   Remote Management Client

RMCH   Remote Management Communication Handler

RMPE   Remote Management Protocol Execution

RMS   Remote Management Server

RSMP   Remote ITS station Management Protocol

5   Requirements

The ITS station management entity shall provide the 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 this part of ISO 24102.

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 ISO 24102-5.

6)   The functionality of the path and flow management specified in ISO 24102-6.

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 presents the remote management architecture.

— Clause 7 specifies remote management protocol data units.

— Clause 8 specifies service primitive functions.

— Clause 9 specifies remote management procedures.

— Clause 10 specifies details needed for the Fast Service Advertisement Protocol (FSAP).

— Annex A specifies the ASN.1 module for remote management.

— Annex B proposes settings of communication service parameters used for automatic selection of communication profiles specified in CEN/ISO/TS 17423.

6 Remote management architecture

6.1 Functionality

The "Remote ITS Station Management Protocol" (RSMP) specified in this part of ISO 24102 has the purpose of

— setting, updating, and deletion of configuration and operation information in an ITS station communication unit (ITS-SCU) of an ITS station unit (ITS-SU) specified in ISO 21217, e.g. information on policies and regulations (CEN/ISO/TS 17419), security related information, accounting information, access layer parameters (see Reference [1]), etc.,

— installation, update, and deinstallation of persistent information in an ITS-SCU, e.g. ITS-S application processes, ITS-S communication protocols, and

— notification and retrieval of management information, e.g. log files of events, alarms generated by the ITS-SCU of an ITS-SU.

By this, it covers the five management areas identified in ISO/IEC 7498-4.

Remote ITS station management covers a set of management processes where ITS station units (ITS-SU) acting as remote management servers (RMS) manage ITS station communication units (ITS-SCU) of managed ITS-SUs acting as remote management clients (RMC).

An RMS is associated with an ITS-SCU configuration management centre identified in CEN/ISO/TS 17419. An RMS may be implemented, e.g. in a roadside ITS sub-system or in a central ITS sub-system.

Remote ITS station management is applied to managed objects (according to ISO/IEC 7498-4) in remote management sessions. Such sessions may be initiated

— by the RMS (server initiated session), e.g. by means of the Fast Service Advertisement Protocol (FSAP) (see Reference [2]) or by direct IPv6 based access, or

— by the RMC (client initiated session), typically using IPv6 communications, as illustrated in Figure 2 (server initiated session using FSAP), in Figure 3 (direct server initiated session), and in Figure 4 (client initiated session).

The mechanisms specified in this part of ISO 24102 enable future specifications of remote management features in separate standards or by means of registries.
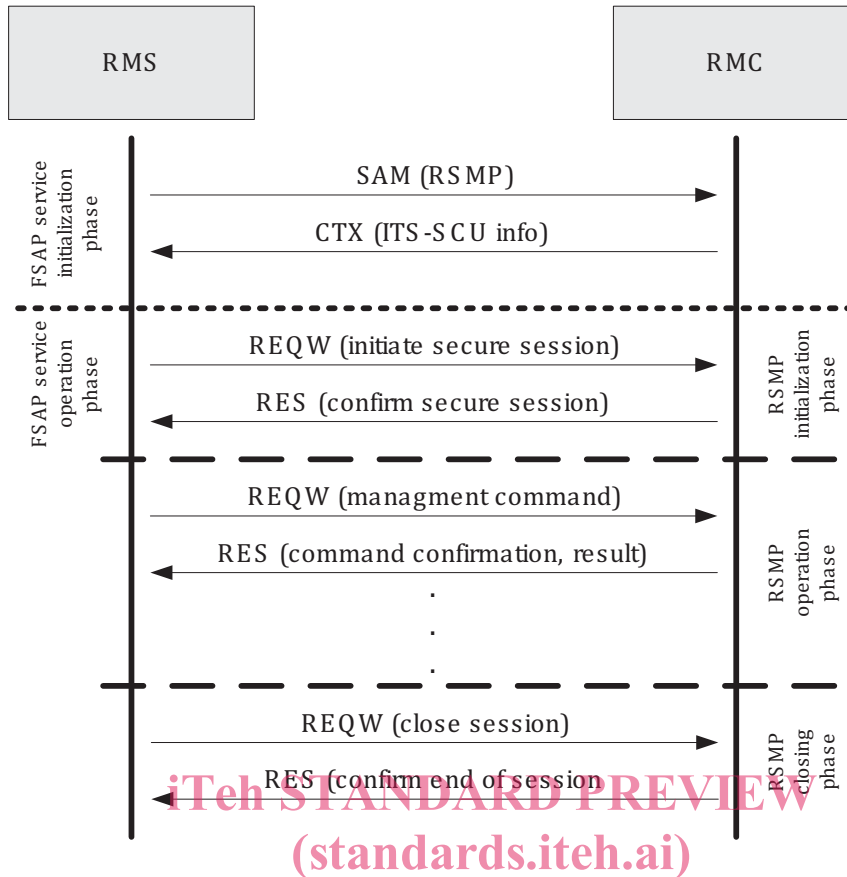
Figure 2 — Server initiated session (example with FSAP)

SAM and CTX specified in Reference [2] with details specified in this part of ISO 24102 are used in the example of Figure 2 to prepare for the secured management session. During the FSAP service operation phase, first, a secure session is requested from the RMS which is acknowledged by the RMC. After successful establishment of a session with mutual authentication of RMS and RMC with optional agreement on encryption of the management data to be exchanged in the session, the RMS may send out a sequence of management commands, each of which is acknowledged by the RMC providing also optional result data. Finally, the RMS closes the session, which also is acknowledged by the RMC. Subsequent to this, no more management data can be exchanged.
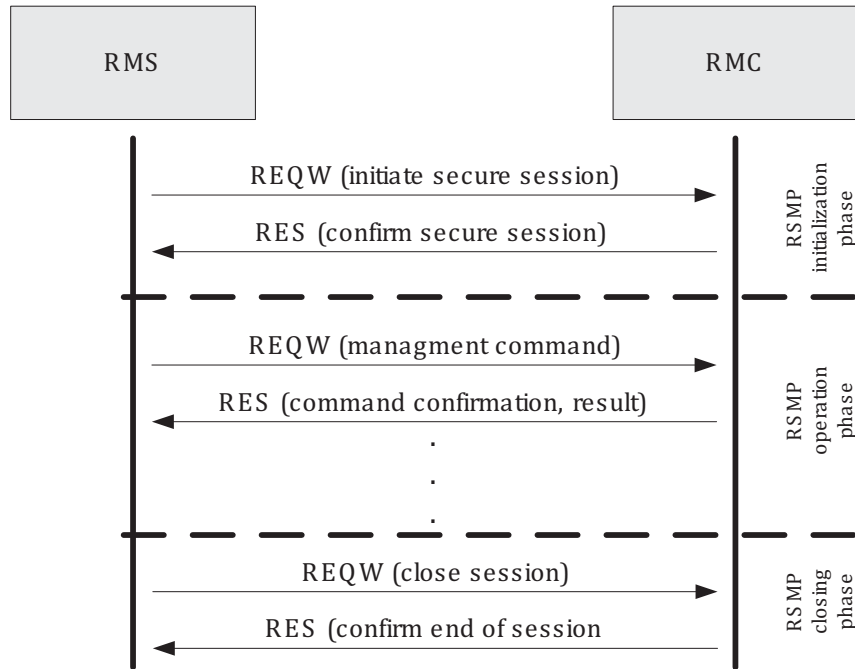
Figure 3 — Direct server initiated session

In the example of Figure 3, an RMS directly initiates a secure session with an RMC. After confirmation of the secure session by the RMC, the RMS runs and closes the secure session as illustrated above for the direct server initiated session.
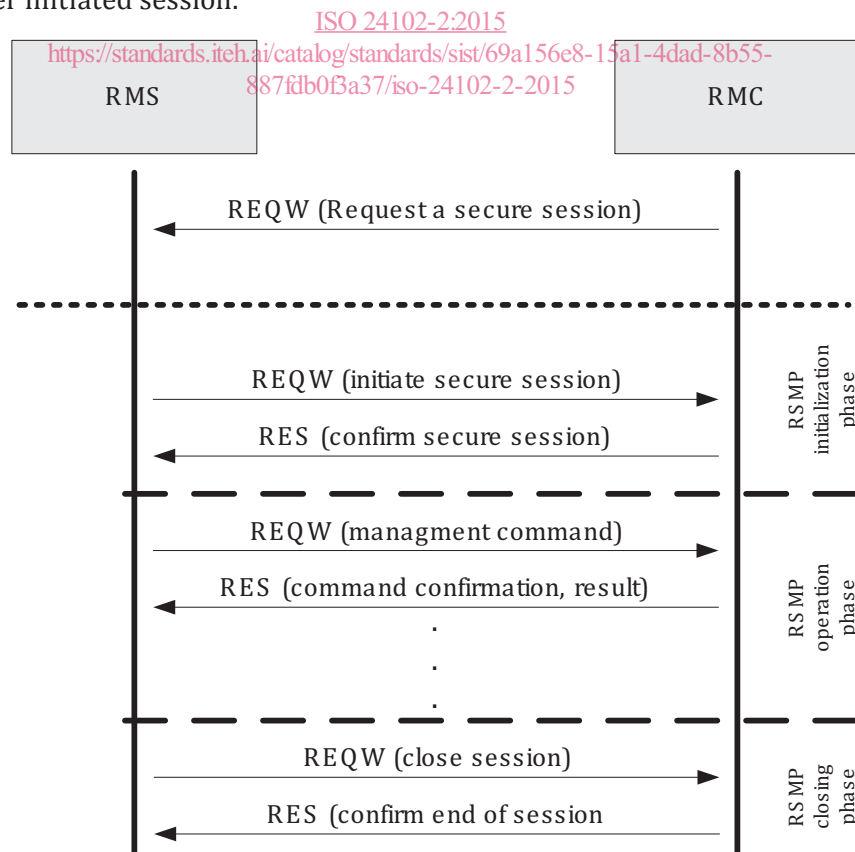
Figure 4 — Client initiated session

In the example of Figure 4, upon an event internal to an RMC, an RMC notifies the need for a secure session to the RMS. Then the RMS initiates, runs, and closes the secure session.

6.2 ITS station architecture

The "Remote ITS-station Management Protocol" (RSMP) consists of two functional blocks, i.e.

— the ITS-S application process "Remote Management Protocol Execution" (RMPE) with a registered ITS-AID, and

— the ITS-S facility "Remote Management Communication Handler" (RMCH) using a well-known registered ITS port number PORT_RSM and dynamically assigned ITS port numbers (see Reference [3]). The value of PORT_RSM is 32763.

The allocation of these functional blocks in the ITS station architecture specified in ISO 21217 is presented in Figure 5. Globally, unique identifiers are specified in CEN/ISO/TS 17419.
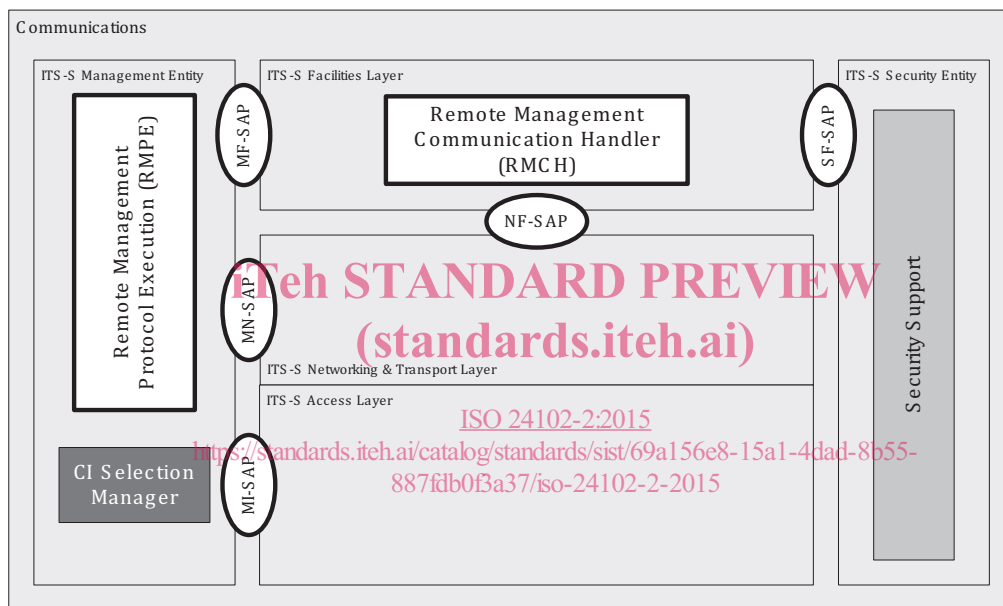

Figure 5 — Functional blocks of RSMP

The RMCH is located in the ITS-S facilities layer.

The RMPE is located in the ITS-S management entity.

RMCH and RMPE are connected via the MF-SAP services MF-COMMAND and MF-REQUEST with service primitive functions specified in Clause 8.

6.3 Distributed implementation of an ITS-S

The "Remote ITS-station Management Protocol" (RSMP) supports distributed implementations of ITS-S roles identified in ISO 21217, i.e. several ITS-SCUs per ITS-SU. The RMCH thus may communicate via the ITS station-internal network with an ITS-SCU providing the link to the peer ITS station unit. Details depend on the ITS-S networking and transport layer protocol used and are outside the scope of this part of ISO 24102.

6.4 RMPE

"Remote Management Protocol Execution" (RMPE) is an ITS-S application process located in the ITS-S management entity. There are two distinct instantiations of the RMPE, i.e. the server instantiation and