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**Intelligent transport systems — ITS  
station management —**

**Part 2:  
Remote management of ITS-SCUs**

*Systèmes intelligents de transport — Gestion de la station ITS —*

*Partie 2: Gestion à distance des SCUs-ITS*

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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 (see [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 (see [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.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

This second edition ~~is a technical revision of the first edition (ISO 24102-2:2015)~~ which has been technically revised.

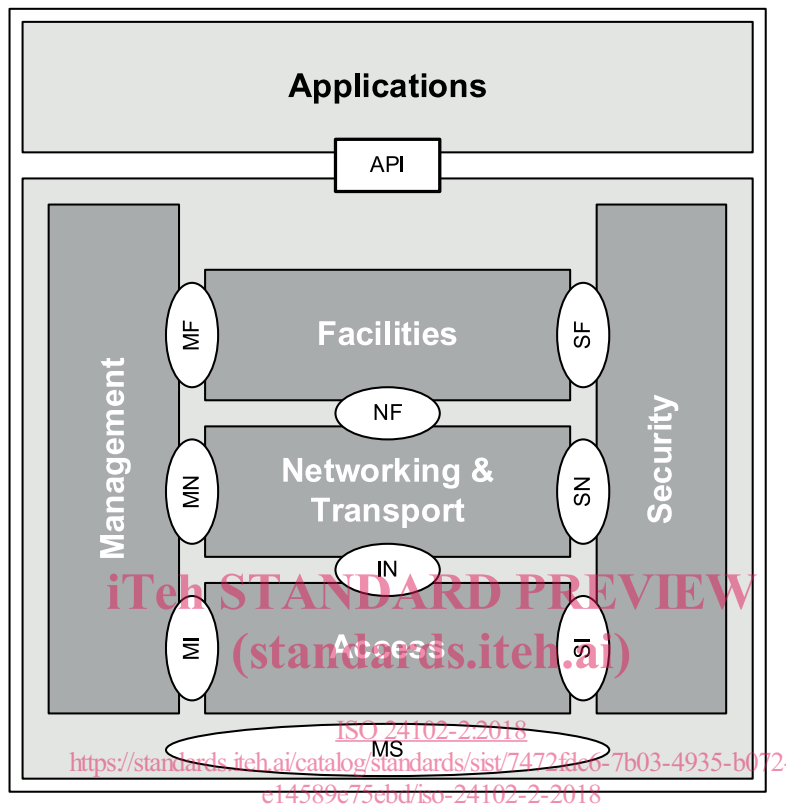
A list of all parts in the ISO 24102 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

NOTE The former ISO 24102-5 has been converted into a separate standard ISO 22418, as it is not a station management standard.

## Introduction

This document is part of a series of International Standards for communications in intelligent transport systems (ITS) based on the ITS station and communications architecture specified in ISO 21217 and illustrated in [Figure 1](#).



**Figure 1 — ITS station reference architecture**

This document is Part 2 of a multi-part document which determines remote management of an ITS station unit (ITS-SU) operated as a bounded secured managed entity (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, communication protocol layer parameters[5],
- installation, update and uninstallation of persistent information in an ITS-SCU, e.g. ITS-S application processes specified in ISO 21217, ITS-S communication protocols,
- 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[1].

# Intelligent transport systems — ITS station management —

## Part 2: Remote management of ITS-SCUs

### 1 Scope

This document provides specifications for intelligent transport systems (ITS) station management to conform with the ITS station reference architecture.

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 communication unit. Distinction is made between managed entities (management clients) and managing entities (management servers).

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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)*

ISO 24102-2:2018

ISO TS 16460, *Intelligent transport systems — Communications access for land mobiles (CALM) — Communication protocol messages for global usage*

ISO 17419, *Intelligent transport systems — Cooperative systems — Globally unique identification*

ISO 17423, *Intelligent transport systems — Cooperative systems — Application requirements and objectives*

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

ISO 24102-1, *Intelligent transport systems — ITS station management — Part 1: Local management*

ISO 24102-3, *Intelligent transport systems — ITS station management — Part 3: Service access points*

### 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 TS 16460, and ISO/IEC 7498-4<sup>[1]</sup> and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **remote management client**

ITS station communication unit in which remote ITS station management is performed by a remote management server

### 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 TS 16460, and ISO/IEC 7498-4<sup>[1]</sup> and the following apply.

BSME	Bounded Secured Managed Entity (from ISO 21217)
FSAP	Fast Service Advertisement Protocol (from ISO 22418 <sup>[3]</sup> )
ITS	Intelligent Transport Systems
ITS-SCU	ITS Station Communication Unit (from ISO 21217)
ITS-SCU-CMC	ITS-SCU Configuration Management Centre (from ISO 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

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## 5 Requirements

The ITS station management entity provides the functionality specified in the various parts of this multi-part document:

- The functionality of local ITS station management specified in ISO 24102-1.
- **The functionality of remote ITS station management specified in this document (Part 2).**
- The functionality of management service access points specified in ISO 24102-3.
- The functionality of ITS station-internal management communications specified in <sup>[2]</sup> (ISO 24102-4).
- The functionality of 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 document.

Detailed mandatory requirements are specified in the following clauses of this document:

- [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).



- [Clause 11](#) identifies dynamic data.
- [Clause 12](#) informs about conformance declaration.
- [Clause 13](#) informs about conformance testing.
- The normative [Annex A](#) specifies contexts of the RMPE ITS application class.
- The normative [Annex B](#) specifies the ASN.1 module for remote management.
- The informative [Annex C](#) proposes settings of communication service parameters used for automatic selection of communication profiles specified in ISO 17423.
- The normative [Annex D](#) presents the implementation conformance statement (ICS) proforma.

## 6 Remote management architecture

### 6.1 Functionality

The "Remote ITS Station Management Protocol" (RSMP) specified in this document 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 (ISO 17419), security related information, accounting information, access layer parameters<sup>[5]</sup>, etc.
- installation, update and uninstallation of persistent information in an ITS-SCU, e.g. ITS-S application processes, ITS-S communication protocols,
- 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<sup>[1]</sup>.

Remote ITS station management covers a set of management processes where an ITS station unit (ITS-SU) acting as remote management server (RMS) manages an ITS station communication unit (ITS-SCU) of an ITS-SU acting as remote management client (RMC).

An RMS is associated with an ITS-SCU configuration management centre identified in ISO 17419. An RMS may be implemented e.g. in a roadside ITS sub-system, or in a central ITS sub-system. Several RMSs may be associated with the same ITS-SCU configuration management centre. A single RMSs may be associated with several ITS-SCU configuration management centre. A single ITS-SCU always is associated only with a single ITS-SCU configuration management centre.

Remote ITS station management is applied to managed objects<sup>[1]</sup> 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)<sup>[3]</sup> 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 document enable future specifications of remote management features in separate standards or by means of registries.

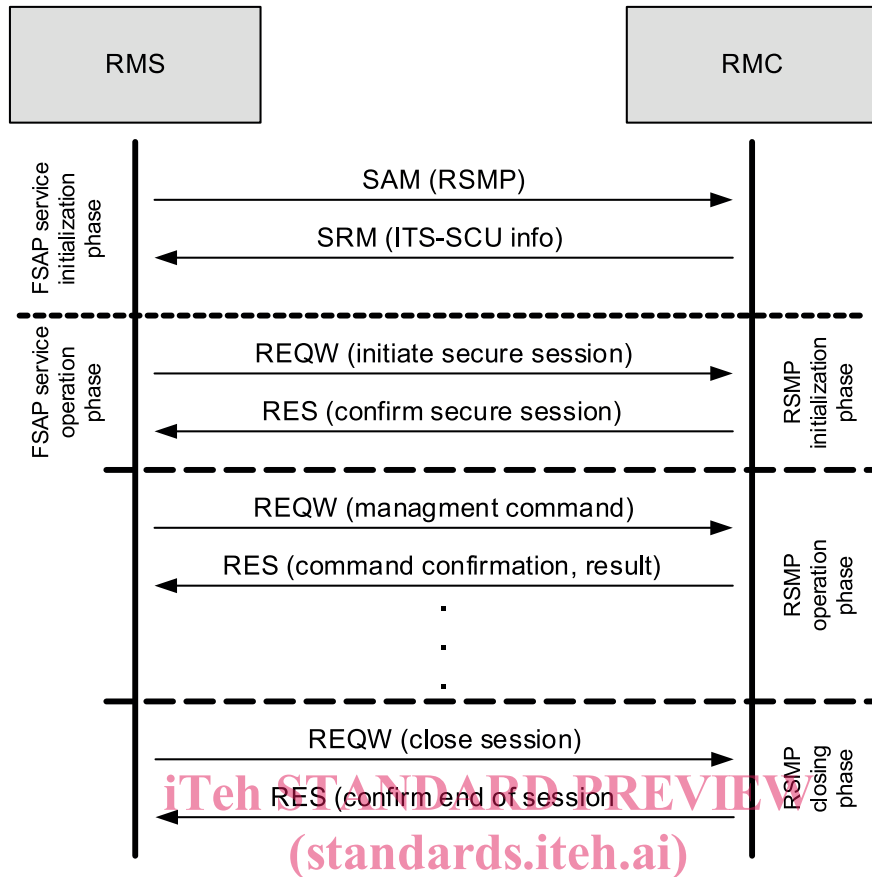


Figure 2 — Server initiated session (example with FSAP)

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SAM and SRM specified in [3] with details specified in this document 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.

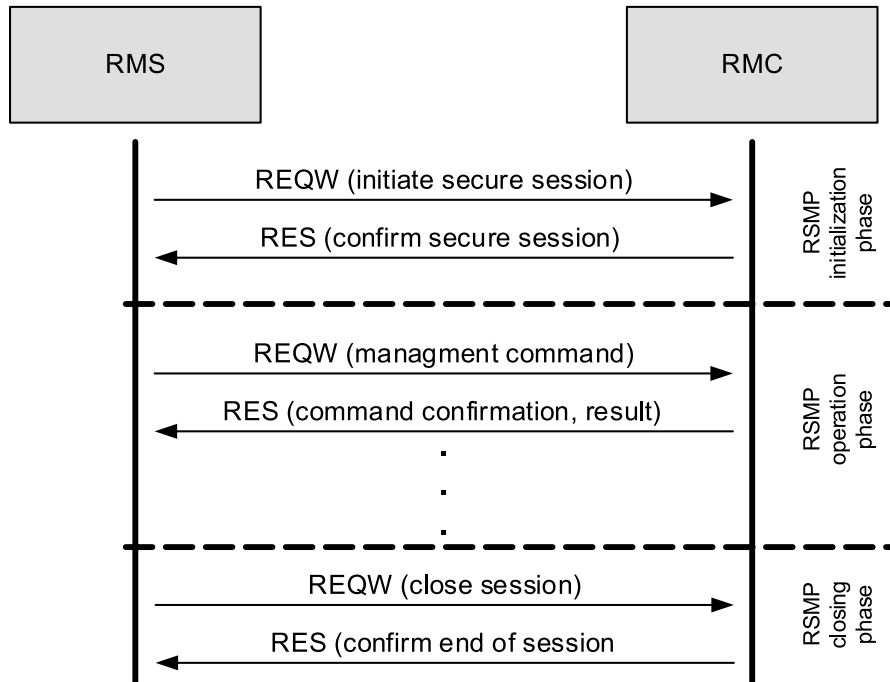


Figure 3 — Direct server initiated session

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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.

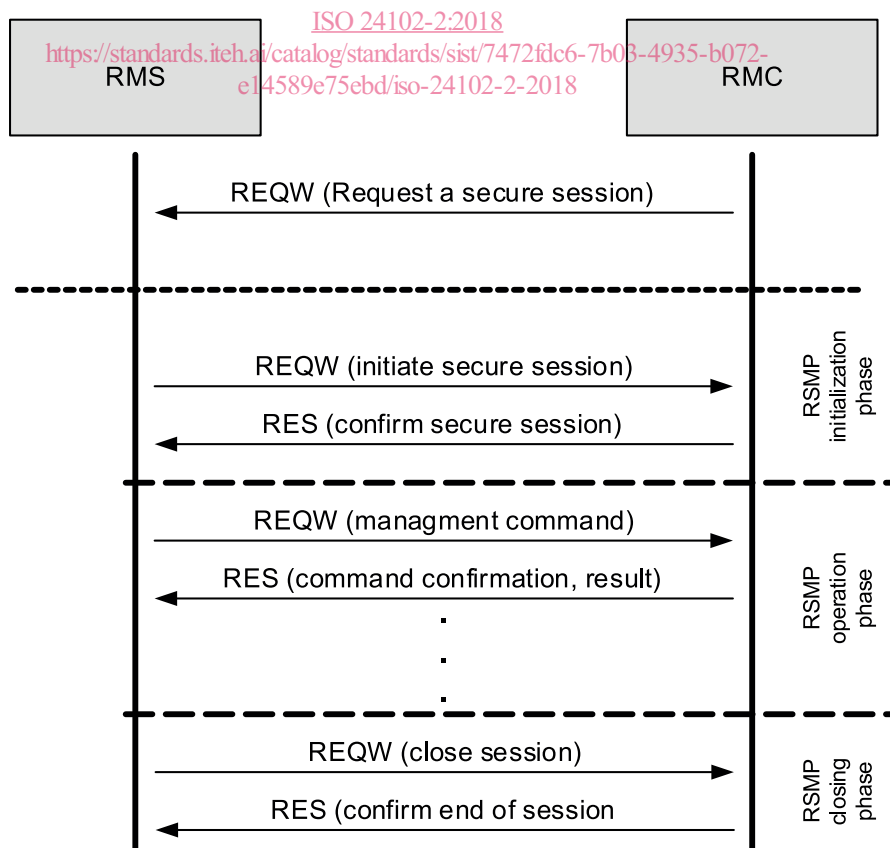


Figure 4 — Client initiated session

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 Application Identifier" (ITS-AID) and "the ITS-S application process identifier" (ITS-SAPID) of values
  - 1 for the RSM client and
  - 2 for the RSM server;
- the ITS-S facility "Remote Management Communication Handler" (RMCH) using a well-known registered ITS port number PORT\_RSMP and dynamically assigned ITS port numbers<sup>[4]</sup> for localized communications .The value of PORT\_RSMP 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 ISO 17419.

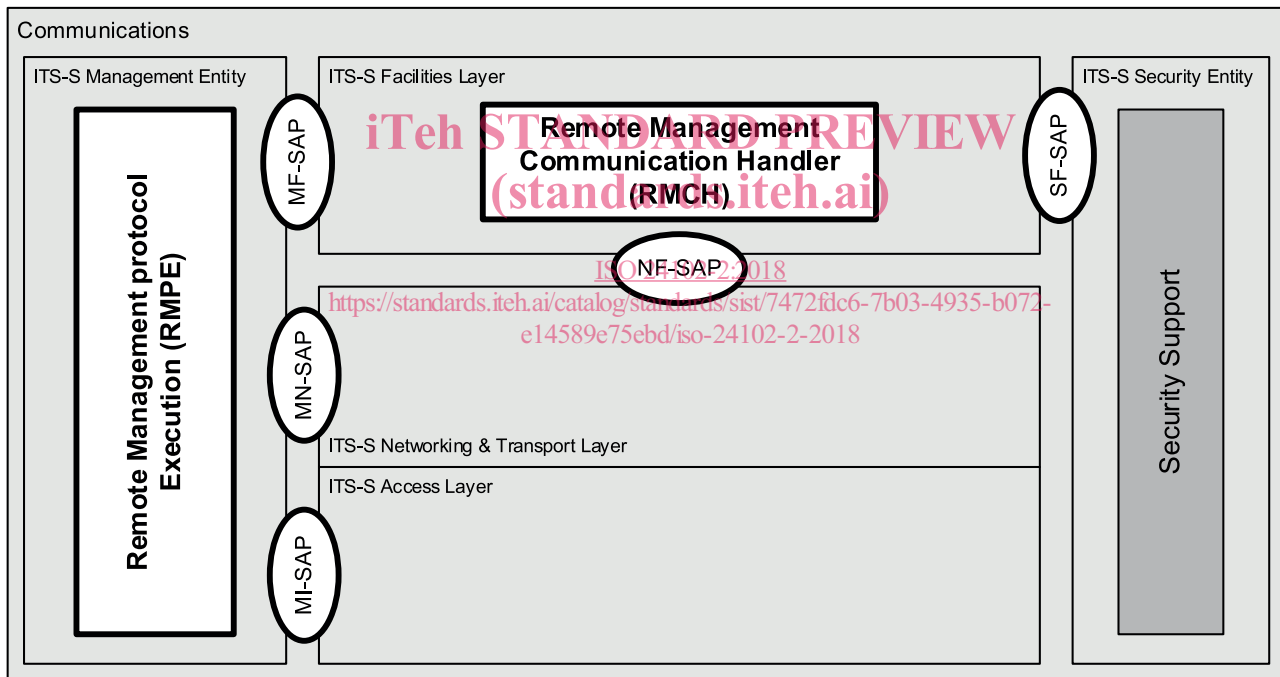


Figure 5 — Functional blocks of RSMP

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

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

RMCH and RMPE are connected via the MF-SAP services MF-COMMAND and MF-REQUEST specified in ISO 24102-3 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 & transport layer protocol used and are outside the scope of this document.

#### 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 the client instantiation. There is exactly one instantiation of RMPE in each ITS-SCU of an ITS-SU. The RMPE cannot manage ITS-SCUs in which it is not instantiated.

NOTE For more information on ITS-S application processes see ISO 21217.

Management activities include:

- updating firmware in the ITS-SCU;
- maintenance of ITS-S application processes:
  - new installations;
  - updates of existing installations;
  - deletion of existing installations;
- maintenance of communication, management and security protocols:
  - new installations;
  - updates of existing installations;
  - deletion of existing installations;
- maintenance of management parameters:
  - setting of parameter values and other information;
  - retrieval of parameter values and other information, e.g. logfiles;
- maintenance of security related managed objects.

#### 6.5 RMCH

The "Remote Management Communication Handler" (RMCH) is a communication facility located in the ITS-S facilities layer. The RMCH

- receives service data units which contain "RMCH Protocol Data Units" (RMCH-PDUs) illustrated in [Figure 6](#) from peer ITS-SUs,
- exchanges RSMP-PDUs illustrated in [Figure 7](#) with the RMPE via the MF-SAP,
- transmits RMCH-PDUs to peer ITS-SUs, and
- uses services from the ITS-S security entity via SF-SAP service primitives to authenticate peer ITS station units, and to optionally encrypt and decrypt RMPE-PDUs.

The well-known ITS port `PORT_RSMP`<sup>[4]</sup> for localized communications is used by

- a) an RMS for transmission of a message
  - as a source port number;
  - as a destination port number in case of direct session initiation, and only in the REQW (initiate secure session) message shown in [Figure 3](#). With the REQW (initiate secure session),