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Technical Specification

Intelligent Transport Systems (ITS);
OSI cross-layer topics;
Part 2: Management information base

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport System (ITS).

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [3].

Introduction

Intelligent Transport Systems (ITS) are systems to support transportation of goods and humans with information and communication technologies in order to efficiently and safely use the transport infrastructure and transport means (cars, trains, planes, ships). Complementary elements of ITS are standardized in various standardisation organisations such as ISO TC204/CEN TC278 and ETSI TC ITS.

The architecture of communications in ITS (ITSC) specified in [1] and [2] introduces the ITS station reference architecture with the internal functional blocks:

- access layer,
- networking & transport layer,
- facilities layer,
- ITS applications;
- management entity,
- security entity,

and the interfaces between these blocks.

Various general addressing mechanisms, the ITS station management information base, and the details of these interfaces specified in this multi-part Technical Specification complement the general architecture of ITSC.

This multi-part deliverable partly acts as input to the standards making process for the various protocols of ITSC, but also is built from feed-back from this process.

1   Scope

The present document:

- specifies the architectural approach to specify a "Management Information Base" (MIB) for ITS,

- specifies common addressing parameters needed for MIBs.

2   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 reference document (including any amendments) applies.

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2.1   Normative references

The following referenced documents are necessary for the application of the present document.

[1]   ETSI EN 302 665: "Intelligent Transport Systems (ITS); Communications Architecture".

[2]   ISO 21217: "Intelligent transport systems - Communications access for land mobiles (CALM) - Architecture".

[3]   ETSI TS 102 723-1: "Intelligent Transport Systems (ITS); OSI cross-layer topics; Part 1: Architecture and addressing schemes ".

[4]   IETF RFC 2578 (1999): "Structure of Management Information Version 2 (SMIv2)".

[5]   IETF RFC 2579: "Textual Conventions for SMIv2".

[6]   IETF RFC 3418 (2002): "Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)".

[7]   IETF RFC 3411 (2002): "An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks".

2.2   Informative references

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]   IETF RFC 3410 (2002): "Introduction and Applicability Statements for Internet Standard Management Framework".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in [1] and [2] apply.

3.2   Abbreviations

For the purposes of the present document, the abbreviations given in [1] and [2] and the following apply:

ASN   Abstract Syntax Notation
MIB   Management Information Base
OID   Object Identifier
SMI   Structure of Management Information
SNMP   Simple Network Management Protocol

4   Management of communication objects in ITS

4.1   Introduction

ITS communication objects are addressable instances of functionality of ITS stations (ITS-S) specified in [1], [2] and [3]. The behaviour of such objects may be given by parameter settings. Values of such parameters may be set either at time of installation of the object, or may be set dynamically during operation of the object. Dynamic setting either could be done off-line in a protected service environment, or on-line using communication links into the ITS-S.

In order to support dynamic management, the parameters of the object need to be specified in terms of a "Management Information Base" (MIB). A possible means to access a MIB is the "Simple Network Management Protocol" (SNMP) of which version 2 is currently being used for network objects.

The current Internet-standard management framework is described in RFC 3410 [i.1].

Whether a MIB shall be required for a specific ITS-S functionality will have to be specified in the standard of this functionality.

4.2   MIB for SNMPv2

Design of MIBs for access with version 2 of the SNMP shall be as specified in RFC 3418 [6], in line with general requirements set up in [1], [2] and [3]. RFC 3418 [6] contains several references to other RFCs, of which very essential applicable RFCs are listed below:

- Structure of Management Information Version 2 [4].

- Architecture of SNMP [7].

- Textual Conventions for SMIv2 [5].

The MIB for SNMPv2 is based on deprecated elements of an old version of ASN.1. Nevertheless IETF so far did not migrate towards elements of the latest version of ASN.1. In case new elements presented in a new version of ASN.1, where this new version is no more supporting the deprecated elements required for the MIB design, need to be used in the specification of an ITS-S functionality, then it is recommended to create several ASN.1 modules:

- One or more ASN.1 modules containing MIBs based on the old version of ASN.1 containing the deprecated elements.

- One or more other ASN.1 modules based on the new version of ASN.1 not containing deprecated elements.

NOTE: There might be problems with IMPORT of elements between these two types of ASN.1 modules.

4.3   Other MIBs

In case SNMP is not required to be used to manage a MIB for a specific ITS-S functionality, the design of a MIB may be directly based on elements of the latest version of ASN.1 applying any reasonable solution.

4.4 OID

MIBs and there elements are addressed by means of "Object Identifiers" (OID). The root to a MIB specified in an ETSI deliverable produces by ETSI TC ITS shall be as specified in [3].

History

Document history		
V1.1.1	November 2011	Publication