ISO/DTS 26048-1

ISO/TC 204

~~ISO/AWI TS 26048-1(en)~~

Secretariat: ~~–~~ANSI

Date: 2024-09-04

Intelligent transport systems — Field device Simple Network Management Protocol (SNMP) data interface —

Part 1: Global objects

~~*Systèmes de transports intelligents - Interface de données SNMP pour les équipements en bord de route —*~~

~~*Partie 1: objets globaux*~~

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: + 41 22 749 01 11
E-mail: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

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~~document 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).

~~Attention is drawn~~ISO draws attention to the possibility that ~~some of~~ the ~~elements~~implementation of this document may ~~be~~involve the ~~subject~~use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights~~.~~ in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. 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).~~

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~~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 ~~the following URL:~~ www.iso.org/iso/foreword.html.

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

~~This is the first edition of ISO/TS 26048-1.~~

A list of all parts in the ISO 26048 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~~ www.iso.org/members.html.

Intelligent transport systems — Field device ~~SNMP~~Simple Network Management Protocol (SNMP) data interface —

Part 1:
Global objects

1 Scope

Field devices are a key component in intelligent transport systems (ITS). Field devices include traffic signals, message signs, weather stations, traffic sensors, roadside equipment for connected ITS environments, etc.

The ISO 26048 series defines data that can be used to manage field devices, including device configuration, control~~,~~ and monitoring. Field devices can be quite complex, necessitating the standardization of many data concepts for exchange. As such, the ISO 26048 series is divided into several individual parts. This document (~~Part~~ ISO 26048-1) introduces the ISO 26048 series, provides ~~normative~~ content that ~~applies to all~~is normatively referenced in subsequent parts, and defines data that is applicable to the management of a wide range of field devices.

The scope of the ISO 26048 series does not define the logic used by the management station, the underlying protocols used to exchange the defined data elements, or internal design of the field device. However, the ISO 26048 series does define functional requirements on the interface and assumes an interface based on an SNMPv3 environment as specified by ISO~~/DIS~~ 15784-2.

NOTE Many of the concepts defined in this document were derived from ~~[1]~~NTCIP 1103[1] and ~~[2]~~NTCIP 1201;[2] however, the design has been updated to better address security concerns. It is expected that future versions of NTCIP will migrate to the design defined in this document.

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 5345:2022, *Intelligent transport systems — Identifiers*~~

~~ISO/DIS~~ ISO 15784-2, *Intelligent transport systems (ITS) — Data exchange involving roadside modules communication — Part 2: Centre to field device communications using ~~SNMP~~Simple Network Management Protocol (SNMP)*

ISO/IEC 8825-1~~:2021~~, *Information technology — ASN.1 encoding rules — Part 1: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*

ISO/IEC 8825-7~~:2021~~, *Information technology — ASN.1 encoding rules — Part 7: Specification of Octet Encoding Rules (OER)*

ISO/IEC/IEEE 24765~~:2017~~, *Systems and software engineering — Vocabulary*

ISO/TS 14812~~:2022~~, *Intelligent transport systems — Vocabulary*

~~RFC 2578, *Structure of Management Information Version 2 (SMIv2), April 1999.*~~

~~RFC 2579, *Textual Conventions for SMIv2, April 1999.*~~

~~RFC 2580, *Conformance Statements for SMIv2, April 1999*~~

~~RFC 3411, *Simple Network Management Protocol (SNMP) Management Frameworks, December 2002.*~~

~~RFC 3413, *Simple Network Management Protocol (SNMP) Applications, December 2002.*~~

RFC 3415, *View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP~~), December 2002.~~)*

~~RFC 3418, *Management Information Base (MIB) for the Simple Network Management Protocol (SNMP), December 2002.*~~

~~RFC 4133, *Entity MIB (Version 3), August 2005.*~~

RFC 4217, *Securing FTP with TLS~~, October 2005.~~*

RFC 5424, *The Syslog Protocol~~, March 2009.~~*

RFC 5676, *Definitions of Managed Objects for Mapping SYSLOG Messages to Simple Network Management Protocol (SNMP) Notifications~~, October 2009.~~*

RFC 8446, *The Transport Layer Security (TLS) Protocol Version 1.3*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC/IEEE– 24765~~:2017~~, ISO/TS 14812~~:2022, as well as~~ and the following apply.

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

~~— IEC Electropedia: available at http://www.electropedia.org/~~

— ISO Online browsing platform: available at ~~http://www.iso.org/obp~~https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
command generator
Simple Network Management Protocol (SNMP) application (3.19) that monitors and manipulates management information

3.2
command responder
Simple Network Management Protocol (SNMP) application (3.19) that provides access to management information

3.3
control object
writable *Simple Network Management Protocol (SNMP) object* (3.23) used to request ~~immediately activate~~ immediate activation of a feature or state of the *field device* (3.5)

Note 1 to entry: Although control objects are writable, they are not considered part of the agent configuration and are therefore not *database parameters*~~.~~ (3.4).

3.4
database parameter
writable Simple Network Management Protocol (SNMP) object used to configure an *SNMP agent* (3.18) and that can be set and validated using a single SNMP SetRequest-PDU

3.5
field device
fixed or portable roadside module that includes ~~an SNMP agent~~a *Simple Network Management Protocol (SNMP) agent* (3.18)

3.6
fire
~~to~~ start a process when a *trigger* (~~**Error! Hyperlink reference not valid.**~~)3.28) value transitions from false to true

3.7
inform
notification (3.11) sent with an expectation of an acknowledgement

3.8
interrelated parameter
writable *Simple Network Management Protocol (SNMP) object* (3.23) used to configure an *SNMP agent* (3.18) and that is designed to require the use of multiple SNMP SetRequest-PDUs prior to validating and implementing a new value

Note 1 to entry: The need for multiple SetRequest-PDUs is typically due to the number of other SNMP objects that are associated with the object. For example, a table can contain a column indicating a percent value where all rows of the table are supposed to equal 100. Configuring all rows within the table at once can exceed the size limitations on a single PDU. In this case, the designer can declare the SNMP object to be an interrelated parameter.

Note 2 to entry: Interrelated parameters are set using the transaction feature defined in 8.21.

3.9
log
registry of data *snapshots* (3.17) within ~~an~~ a *Simple Network Management Protocol (SNMP) agent* (3.18) that can be retrieved by an *SNMP manager* (3.22)

3.10
management station
system that manages one or more *field devices* (3.5) with ~~an~~ a *Simple Network Management Protocol (SNMP) manager* (3.22)

3.11
notification
Simple Network Management Protocol (SNMP) message from ~~an~~a *SNMP agent* (3.18) that is generated independently from any explicit request

Note 1 to entry: While a notification is not generated in response to any explicit request, it can be generated based on configured parameters stored within the *SNMP agent*~~.~~ (3.18).

3.12
notification originator
Simple Network Management Protocol (SNMP) application (3.19) that initiates asynchronous messages

3.13
notification receiver
Simple Network Management Protocol (SNMP) application (3.19) that processes asynchronous messages

3.14
principal
entity on whose behalf services are provided or processing takes place

EXAMPLE 1 An individual.

EXAMPLE 2 An application.

3.15
proxy forwarder
Simple Network Management Protocol (SNMP) application (3.19) that forwards messages between entities

Note 1 to entry: Proxy forwarder applications typically change the protocol or message model as a part of ~~its~~their functionality.

3.16
response time
time from the receipt of a Confirmed Class pduType by the *command responder* (3.2) to the sending of the response PDU by the command responder

Note 1 to entry: For this document, the response time is measured at the application programming interface of the command responder. Any delays imposed within the lower layers are network delays and are not included in the response time.

3.17
snapshot
data snapshot
information captured when a *trigger* (3.28)*fires* (3.6) within ~~an~~ a *Simple Network Management Protocol (SNMP) agent* (3.18)

Note 1 to entry: A snapshot can be used in the generation of an SNMP *notification* (3.11) or the creation of a new entry within a *log*~~.~~ (3.9).

3.18
SNMP agent
Simple Network Management Protocol (SNMP) entity (3.20) containing one or more *command responder* (3.2) and/or *notification originator* (3.12) applications

3.19
SNMP application
application that provides specific functional processing of Simple Network Management Protocol (SNMP) management data

3.20
SNMP entity
implementation of one or more Simple Network Management Protocol (SNMP) message processing models with one or more associated *SNMP applications* (3.19)

Note 1 to entry: An SNMP entity may also support one or more security models.