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Intelligent transport systems — ITS data dictionaries —

Part 3: Object identifier assignments for ITS data concepts

Systèmes intelligents de transport — Dictionnaires de données des ITS —
Partie 3: Affectation d'identifiants d'objets pour les concepts liés aux données des 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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For an explanation on 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*.

A list of all parts in the ISO 14817 series can be found on the ISO website.

Introduction

Background

This document has been developed by ISO/TC 204 in order to provide a framework for the documentation and registration of data that passes through system interfaces within the Intelligent Transport Systems (ITS) domain. It is designed to maximize interoperability and facilitate information re-use across system interfaces.

Vision statement

This International Standard envisions a harmonized approach to ITS data and interfaces to promote maximum interoperability of data within the ITS sector by the creation and maintenance of the Central ITS Data Concept Registry (CIDCR), which are supported by interface and application-specific ITS data dictionaries, created and maintained in a common and interoperable form, and to ensure the minimization of duplication by clear rules for data concept definition and data concept registry management.

Mission statement

The mission is to develop tools that will promote a holistic, integrated approach involving vehicle technology, infrastructure, and the road user to increase transport safety and efficiency. Specifically, this standard defines the principles and concepts, scope, field of application, rules and procedures, and definition and concept of operation for the CIDCR and ITS functional data dictionaries. Furthermore, this standard also makes provision for the migration of data concepts from ITS functional data dictionaries to the CIDCR to maximize interoperability and minimize proliferation of similar (but inconsistently defined) data concept entries.

This International Standard defines the framework, formats, and procedures used to define information and information exchanges within the ITS sector. The standard is designed to be used by the ITS community at large, but should be of special interest to application developers, equipment providers, and data concept registry managers.

ISO 14817-1 specifies a set of meta-attributes for ITS data concepts, as well as associated conventions and schemes that enable the description, standardization and management of all exchanged ITS data. Through consistent use of these common structures and associated conventions and schemes, interchange of data and information among the various ITS functional subsystems via their specific application systems can be maximized. This International Standard also supports re-use of data elements and other data concepts across various ITS functional subsystems and their specific application systems.

The formats and processes defined within this International Standard are consistent with implementation(s) of the ISO ITS System Architecture defined in the ISO 14813 Standardization deliverables, particularly ISO 14813-2 and ISO 14813-2. This does not preclude the application of data concept registries using alternative international, regional or national system architecture methodologies or techniques, indeed, common formats and processes will ease migration and interoperability between such approaches.

The ITS data concepts that populate the CIDCR or data dictionary may originate from a Computer-Aided Software Engineering (CASE) tool implementation of the ISO 14813 ITS Reference Architecture, from International Standards for ITS, from national implementations for ITS, or from the submission by relevant users. Data dictionary entries are not limited to those generated by object-oriented methodologies.

Document overview

This clause provides an overview of this document. Clause 1 identifies the scope of this document. Clause 2 specifies the conformance tests that a data concept must pass to be assigned an arc under the "common-data" arc. Clause 3 identifies references required for proper implementation of this document. Clause 4 defines terms used and Clause 5 lists the abbreviations. Clause 6 declares the structure of

the centralized ITS naming tree and Clause 7 identifies management structure for adding new arcs underneath the centralized ITS naming tree.

Annex A contains the formal ASN.1 module defining all arcs defined in this document.

Annex B is informational and provides answers to frequently asked questions.

Intelligent transport systems — ITS data dictionaries —

Part 3:
Object identifier assignments for ITS data concepts

1 Scope

This document specifies how to assign an object identifier to a data concept under the “its” arc of the international object identifier tree.

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 3166-1, *Codes for the representation of names of countries and their subdivision — Part 1: Country codes*

ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1) — Specification of basic notation*

ISO/IEC 9834-1, *Information technology — Procedures for the operation of object identifier registration authorities: General procedures and top arcs of the international object identifier tree — Part 1*

ISO 14813-1, *Intelligent transport systems — Reference model architecture(s) for the ITS sector — Part 1: ITS service domains, service groups and services*

ISO 14817-1, *Intelligent transport systems — ITS central data dictionaries — Part 1: Requirements for ITS data definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14817-1 apply.

ISO and IEC maintain terminological 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

4 Conformance

4.1 General

Prior to standardizing an arc assignment to any data concept under the joint “its” arc, the developer of the data concept shall enter the data concept into the CIDCR so that it reaches the quality level of “recorded” or higher. In addition, it is recommended that the following conditions be met:

NOTE ISO 14817-2 defines the “recorded” level as “Indicates that the data concept has syntactically valid entries for all mandatory meta-attributes and passes all defined automated checks for the data concept type”.

4.2 Contextual name

Verify that the name is descriptive of the data concept being defined.

4.3 Parent object class

Verify that the parent object class properly identifies the object class that the data concept describes when this meta-attribute is required.

4.4 Definition

Verify that the definition unambiguously describes the data concept meaning.

4.5 Context

Verify that the context properly references the correct module or dictionary document.

4.6 Data type

Verify that the data type conforms to the rules of ISO 14817-1:2015, 7.4.1.

5 Abbreviated terms

ASN.1 Abstract Syntax Notation One

CEN European Committee for Standardization

CIDCR Central ITS Data Concept Registry

IEC International Electrotechnical Commission

ISO International Organization for Standardization

ITS Intelligent Transport System(s)

ITU-T International Telecommunications Union – Telecommunications Sector

JTC Joint technical committee

OID Object identifier

SC Sub-committee

6 ITS naming tree

6.1 General requirements

The value assigned to the object identifier meta-attribute of any data concept shall be an ASN.1 OBJECT IDENTIFIER that conforms to the rules of ISO/IEC 9834-1. It is recommended that the assigned value be a node underneath the “its (28)” arc of the “joint-iso-itu-t(2)” root arc of the international object identifier tree.

NOTE 1 Placing all ITS data concepts under a single arc allows for the greatest possible benefit of the RELATIVE OID type. Having this arc directly underneath the joint-iso-itu-t arc allows for efficient encodings even when the RELATIVE OID format is not used.

NOTE 2 Placing All ITS data concepts under a single arc assists in harmonization efforts as developers will have a way to easily become aware of similar efforts (i.e. by going to the CIDCR and looking at the OID tree). This is one of the main factors driving the design of this tree structure.

NOTE 3 Nothing in this document precludes users from assigning numbers under other arcs to their data. For example, ISO standards can still define their data under {iso(1) standard(0) < standard number > }; however, by grouping definitions together under the "its" arc, additional benefits can be achieved, as described above.

NOTE 4 A specific data concept can be identified by more than one OID. For example, an existing ITS data concept may have an OID assigned to it prior to the publication of this document. Networks may continue to use that OID for interoperability, while new users of the data concept may wish to use an OID under the "its" node in order to achieve the benefits described above.

6.2 ITS arc

6.2.1 General

ISO/IEC JTC 1/SC 6 and ITU-T Study Group 17 have assigned the value 28 under the "joint-iso-itu-t(2)" arc to the "its" arc. The arcs underneath the "its" arc shall be assigned by the Central ITS Data Concept Registry (CIDCR) registrar and documented in the CIDCR. Annex B provides the formal ASN.1 module that defines the currently assigned arcs under the "its" arc; Figure 1 shows the first-level arcs under the "its" arc.

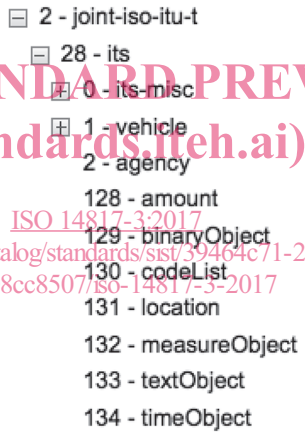

Figure 1 — Structure of ITS arc

6.2.2 ITS misc arc

6.2.2.1 General

Arc 0 under the "its'" arc shall be assigned the identifier "its-misc".

The "its-misc" arc shall be used to register ITS data concepts that do not relate to internationally standardized object classes and include:

- data specific to countries, standards organizations, and private corporations;
- value and aggregate domains;
- dialogues.

The major branches of the "its-misc" arc are shown in Figure 2.

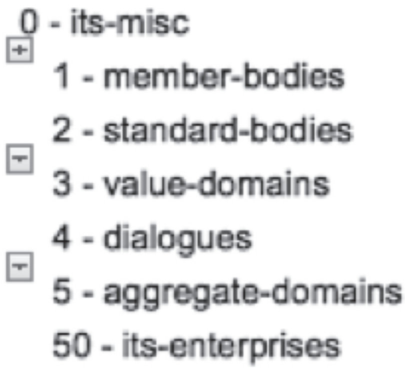

Figure 2 — Major branches of the "its-misc" arc

6.2.2.2 Member body arcs

Arc 1 under the "its-misc'" arc shall be reserved to register arcs for member bodies. Each member body shall be assigned an arc under the "member-bodies" arc corresponding to the three-digit country code (without leading zeroes) as assigned by ISO 3166-1.

EXAMPLE ISO 3166 assigns the number 578 to Norway; therefore, Norway is assigned the arc 578 under the "member-bodies" arc, as shown in Figure 3.

Figure 3 — "norway" ITS arc

The structure of the arc under a member body arc shall be managed by the appropriate body that has been appointed nationally, according to the national law and regulations.

EXAMPLE In the case of Norway in 2015, the arc is managed by an organization appointed by the Ministry of Transport and Communications, which can be the ministry itself. The appointed organization can further delegate the management of the arc by designating some arcs to be managed by other organizations.

6.2.2.3 Standard body arcs

Arc 2 under the "its-misc" arc shall be reserved to register arcs for standard development organizations that have a need to register ITS-related data concepts that are not appropriate for or are not approved for other locations under the "its" arc.

Each arc under the "standard-bodies" arc shall be managed by the standards development organization to which it has been assigned.

EXAMPLE A consortium of technology firms can wish to standardize data for use within an ITS environment, but feel that their data may not be applicable for an international standard. The consortium can acquire an arc under the "standard-bodies" arc and assign a sub arc to represent the document in which their data concepts are defined and then another sub arc for each data concept defined in the document. The resulting OID for such a data concept would be of the form {joint-iso-itu-t(2) its(28) its-misc(0) standard-bodies(2) group(x) document(y) dataConcept(z)}. This offers a much smaller OID for these groups than what is currently available through IANA under the {iso(1) identified-organization(3) dod(6) internet (1) private(4) enterprises(1)} arc.

6.2.2.4 Value-domains arc

Arc 3 under the "its-misc" arc shall be assigned the identifier "value-domains".

The “value-domains” arc shall be used to define internationally standardized value domains that may be used by multiple ITS standards.

The CIDCR registrar shall assign all arcs under the “value-domains” arc.

Arc 0 under the “value-domains” arc shall be the “value-domains-modules” arc and shall represent the module containing all value-domain objects. The arcs underneath the “value-domains-modules” arc shall represent the major versions of the module.

All other arcs under the “value-domains” arc shall reference specific value domains.

EXAMPLE Figure 4 shows the major nodes under the domains arc as defined in ISO 14817-1.

Figure 4 — “value-domains” arc

6.2.2.5 Dialogues arc

Arc 4 under the “its-misc” arc shall be assigned the identifier “dialogues”.

The “dialogues” arc shall be used to register dialogues according to the ITS service domain to which they most closely relate.

The arcs immediately under the “dialogues” arc shall reflect the service domains identified by the annexes in ISO 14813-1 with an additional arc for cooperative ITS, as shown in Figure 5. Dialogues that relate to only one service domain shall be registered under the arc for that service domain. Dialogues that relate to more than one service domain shall be assigned an arc by the CIDCR registrar based on a consensus decision of the CIDCR stewards.

NOTE This arrangement provides an easy way for users of the CIDCR to search the tree for standardized dialogues within a service domain and to discover what has already been standardized.

EXAMPLE Electronic Fee Collection is a defined user service in the Transport-related Electronic Payment Service Domain, as defined in ISO 14813-1; thus, a dialogue for electronic fee collection would appear under arc 7 (“electronic-payment”).