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Intelligent transport systems — Local dynamic map

Systèmes de transport intelligents — Carte dynamique locale

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

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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 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).

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This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent transport systems,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 18750:2018), which has been technically revised.

The main changes are as follows:

— "Co-operative ITS" has been removed from the title to align with the unchanged Scope;

— the ASN.1 module has been updated to support minor version changes;

— the ASN.1 module has been aligned with the latest developments of other ASN.1 modules (this alignment does not introduce technical changes in the module);

— the references have been updated.

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.

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Introduction

An essential property of cooperative intelligent transport systems (C-ITS; see ISO/TR 17465-1) is the sharing of data between different ITS applications providing different ITS services to users. This approach replaces the traditional approach, where each application is operated in an isolated environment, referred to as a "silo-approach". The C-ITS approach enables synergies in components of an ITS station unit (e.g. sharing of communication tools), improves overall performance and reliability, and reduces overall cost. In order to protect the interests of the various ITS applications, C-ITS implements the concept of an ITS station operated as a bounded secured managed domain.

The sharing of data between applications is achieved by subscribe/publish mechanisms, where at least two mechanisms are distinguished, i.e. one allowing ITS-S application processes to subscribe to standardized messages from ITS message sets (direct forwarding upon reception of such messages in an ITS station unit), and one using a local dynamic map (LDM) as a repository of standardized data objects. Such data objects stored in an LDM are named LDM Data Objects (LDM-DOs). LDM-DOs provide self-consistent information on real objects existing at a given geo-location during a given lifetime-interval. Authorized ITS-S application processes may add LDM-DOs to an LDM, and may retrieve LDM-DOs from an LDM. Retrieval of LDM-DOs may be performed in queries and by means of subscription. A subscription will result in automatic notifications of selected LDM-DOs, either in defined time intervals, or event driven.

This document introduces the usage of LDMs, and specifies the LDM for global usage in C-ITS.

Initial implementations of LDMs were included in the EU research projects CVIS[38] and Safespot.[40]

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Intelligent transport systems — Local dynamic map

1 Scope

This document:

— describes the functionality of a "local dynamic map" (LDM) in the context of the "bounded secured managed domain" (BSMD);

— specifies:

  — general characteristics of LDM Data Objects (LDM-DOs) that can be stored in an LDM, i.e. information on real objects such as vehicles, road works sections, slow traffic sections, special weather condition sections, which are as a minimum requirement location-referenced and time-referenced;

  — service access point functions providing interfaces in an ITS station (ITS-S) to access an LDM for:

    — secure add, update and delete access for ITS-S application processes;

    — secure read access (query) for ITS-S application processes;

    — secure notifications (upon subscription) to ITS-S application processes;

    — management access:

      — secure registration, de-registration and revocation of ITS-S application processes at LDM;

      — secure subscription and cancellation of subscriptions of ITS-S application processes;

  — procedures in an LDM considering:

    — means for maintaining the content and integrity of the data store;

  — mechanisms supporting several LDMs in a single ITS station unit.

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 21217, *Intelligent transport systems — Station and communication architecture*

ISO 24534-5, *Intelligent transport systems — Automatic vehicle and equipment identification — Electronic Registration Identification (ERI) for vehicles — Part 5: Secure communications using symmetrical techniques*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21217 and ISO 24534-5, and the following apply.

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

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

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

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