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Intelligent Transport Systems (ITS); Classification and management of ITS application objects

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Foreword

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

Introduction

The present document presents the results of a joint approach of CEN, ETSI, IEEE and ISO towards classification and management of ITS application objects, i.e.:

- ITS message sets;
- ITS applications; and
- ITS application classes.

An essential element to manage ITS application objects is an ITS application (object) identifier (ITS-AID).

In Europe, standardization of ITS at CEN started in 1991 in the Technical Committee TC 278 "Road Transport and Traffic Telematics". In 2002, EN 12834 [4] produced by TC 278 WG9 "Dedicated Short Range Communication (DSRC)" was published. EN 12834 [4] contains the specification of a DSRC application class identifier of ASN.1 type DSRCApplicationEntityID. Numbers of DSRCApplicationEntityID for 16 classes of DSRC applications were allocated. The most prominent used on the market are (0) for "System" and (1) for "Electronic Fee Collection" (EFC).

In 1992, ISO TC204 "Intelligent Transport Systems" was founded. ISO TC 204 and CEN TC278 work jointly together. ISO TC204 WG15, the mirror group of CEN TC278 WG9, published ISO 15628 [5], i.e. the international version of EN 12834 [4]. ISO allocated numbers of DSRCApplicationEntityID for further three ITS DSRC application classes. ISO TC204 WG16 developed a basic set of communication standards for cooperative systems in ITS - CALM (Communications Access for Land Mobiles). In ISO 24102 [7], FAST ITS service advertisement is specified. Identification of ITS application classes and ITS applications was achieved by means of the ITS application identifier of ASN.1 type ServiceID specified in ISO 29281 [8]. ServiceID recognizes the work done so far at CEN TC278 WG9 and ISO TC204 WG15, adopting the already allocated numbers for DSRCApplicationEntityID.

IEEE developed the set of WAVE (Wireless Access in Vehicular Environment) standards 1609 - first version published in 2006. This work maintained and continued DSRCApplicationEntityID of ISO TC204 WG15. IEEE 1609.3 [i.11] specifies WAVE service advertisement. Identification of what [8] refers to as ITS application classes and ITS applications is achieved by means of a "Provider Service Identifier" (PSID).

End 2007, ETSI TC ITS was founded. ETSI and CEN work jointly together towards cooperative ITS under the EC mandate M/453 [i.3]. CEN TC278 WG16 and its international mirror committee ISO TC204 WG18 focus on cooperative applications in ITS, whereas ETSI TC ITS and ISO TC204 WG16 focus on communications for ITS. These bodies share the opinion that there is a need for a globally unique identifier of ITS application objects. EU and U.S. declared the intent to jointly develop cooperative systems for ITS [i.4]. This includes harmonization of standards. The globally unique approach to identify and manage ITS application objects is in line with [i.4].

In 2010, the original definition of PSID was revised by IEEE 1609 WG in cooperation with ETSI TC ITS STF 404 such that the PSID field contains the ITS Application Identifier (ITS-AID) applying unaligned PER as specified in the present document.

The present document provides mandatory specifications of technical elements for ITS application object management, and recommendations for management procedures with a major focus on the needs for communications.

CEN TC 278 WG16 and ISO TC 204 WG18 are complementing the present document with specifications of global management procedures, taking into account the recommendations of the present document. Further on, they are specifying further technical details related to classification and management of ITS application objects.

Experts from CEN, ISO TC204 WG16 and WG18, and IEEE 1609 indicated mutual interest to consider the specification of the ITS application identifier (ITS-AID) given in the present document for finalization or next revisions of their standards on cooperative systems and communications for ITS.

The purpose of global registration of ITS-AID is to identify uniquely ITS application objects which are defined by standards or by private specifications. Whether private specifications, in order to ensure proper operation in an ITS station with respect of overall system security and reliability, need to be publicly available is outside the scope of the present document. The operational purposes of ITS-AID and the related framework are:

- to identify endpoints in the ITS station for proper evaluation of protocol data units;
- to support secure installation and maintenance of ITS application objects in instances of ITS stations.