SLOVENSKI STANDARD
SIST-TS CEN/TS 16986:2017

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Elektronsko pobiranje pristojbin - Interoperabilni profili aplikacije za informativno izmenjavo med ponudnikom storitve in operaterjem cestninjenja

Electronic Fee Collection - Interoperable application profiles for information exchange between Service Provision and Toll Charging

Elektronische Gebührenerhebung - Interoperables Anwendungsprofil für den Datenaustausch zwischen Dienstanbietern und Mauterhebern

Perception de télépéage - Profil d'application interopérabilité pour échange d'informations entre la prestation de service et la perception du péage

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35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport

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Electronic Fee Collection - Interoperable application profiles for information exchange between Service Provision and Toll Charging

Perception de télépéage - Profil d'application interopérabilité pour échange d'informations entre la prestation de service et la perception du péage

Elektronische Gebührenerhebung - Interoperable Anwendungsprofile für den Informationsaustausch zwischen den Dienste-Versorgern und Mauterhebern

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European foreword

This document (CEN/TS 16986:2016) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

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Introduction

The Standard on information exchange between service provision and toll charging (i.e. EN ISO 12855:2015) is a so-called toolbox standard. That means that it provides a large number of options that can be used to support various needs of toll chargers and toll service providers. As such, it provides useful but not sufficient support to ensure technical interoperability.

The aim of this Technical Specification is to produce a profile specification that provides technical interoperability to support the EFC information exchange between toll service providers (TSPs) and toll chargers (TCs):

— based on DSRC;

— based on GNSS/CN – autonomous systems.

This Technical Specification covers the definition of interoperable application profiles (IAP) applicable for the use of EN ISO 12855:2015. These profiles define a specific coherent set of transactions, triggers, conditions, data elements, transfer mechanisms and supporting functions for an interoperable exchange of data between the central equipment of TCs and TSPs (in Europe).

This IAP defines profiles using the concept of "International Standardised Profiles (ISP)", as defined in ISO/IEC TR 10000-1. The ISP-concept is specifically suited for defining interoperability specifications where a set of base standards can be used in different ways. This is exactly the case for EN ISO 12855:2015, where the base standard allows for different choices that are not interoperable.

The principles of the ISP-concept can be summarized as follows:

— an ISP will make references only to base standards or other ISPs;

— the profile will restrict the choice of base standard options to the extent necessary to maximize the probability of interoperability (e.g. chosen classes, conforming subsets, options and parameter values of base standards);

— the ISP will not copy content of the base standards (in order to avoid consistency problems with the base standards);

— the profile will not specify any requirements that would contradict or cause non-conformance to the base standards;

— the profile may contain conformance requirements that are more specific and limited in scope than those of the base standards;

— conformance to a profile implies by definition conformance to a set of base standards, whereas conformance to that set of base standards does not necessarily imply conformance to the profile.

This Technical Specification is consistent with and is intended to provide support for the technical specification of the EETS laid down in the European Directive 2004/52/EC and in the subsequent European Commission Decision 2009/750/EC.

A suite of test specifications is currently being developed to support assessment of an implementation for compliance with this Technical Specification.

1 Scope

This Technical Specification defines an application interface definition by selecting suitable options from the base standard EN ISO 12855:2015. Furthermore, it defines transfer mechanisms and supporting functions to ensure the interoperability between TCs and TSPs.

This Technical Specification covers:

— exchange of information between the central equipment associated with the two roles service provision and toll charging, e.g.:

  — charging related data (exception lists, toll declarations, billing details, payment claims);

  — administrative data (trust objects, EFC context data, contact details for enforcement, etc.);

  — confirmation data.

— transfer mechanisms and supporting functions;

— semantics of data elements;

— implementation conformance statement proforma (Annex A), as a basis for assessment of conformity to this Technical Specification;

— an Interoperability statement proforma (Annex B), as a basis for assessment of transactional intereoperability of two technical implementations;

— a web service definition (Annex C) for the use of web services as communication technology.

The implementation of the underlying back office systems and their business processes is not covered. Therefore, outside of the scope is in particular:

— details on how to achieve security using the authenticator data elements of the base standards;

— how to operate compliance checking and the enforcement process;

— commercial aspects;

— definition of non-functional features such as performance indicators like accuracy, availability and reporting requirements.

This Technical Specification further provides an assessment of support of the EETS (Annex D) and an explanation how to read the unified modelling language (UML) diagrams (Annex E) that are used in this document.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 12855:2015, *Electronic fee collection — Information exchange between service provision and toll charging*

IETF RC 959, *File Transfer Protocol [Oct 1985]*

IETF RFC 4217, *Securing FTP with TLS [Oct 2015]*

WSDL 1.1, *Web Services Description Language (WSDL) 1.1* [1)]

1) http://www.w3.org/TR/2001/NOTE-wsdl-20010315 [15.03.2001]

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
attribute
addressable package of data consisting of a single data element or structured sequences of data elements

[SOURCE: EN ISO 17575-1:2016, 3.2]

3.2
authentication
security mechanism allowing verification of the provided identity

[SOURCE: ETSI EN 301 175]

3.3
authenticator
data, possibly encrypted, that is used for authentication

[SOURCE: EN 15509:2014, 3.3]

3.4
availability
property of being accessible and useable upon demand by an authorized entity

[SOURCE: CEN ISO/TS 19299:2015, 3.6]

3.5
base standard
approved international standard, technical specification or ITU-T Recommendation

[SOURCE: ISO/IEC TR 10000-1:1998, 3.1.1, modified]

3.6
billing detail
information needed to determine or verify the amount due for the usage of a given service

[SOURCE: EN ISO 12855:2015, 3.1]

3.7
channel
information transfer path

[SOURCE: ISO 7498-2:1989, 3.3.13]

3.8
charge object
geographic or road related object for the use of which a charge is applied

[SOURCE: EN ISO 17575-1:2016, 3.5]

3.9
charge report
information containing road usage and related information originated at the Front End

[SOURCE: EN ISO 17575-1:2016, 3.6]

3.10
charging data
relevant data on the usage of a certain service

[SOURCE: EN ISO 12855:2015, 3.4]

3.11
conformance testing
assessment to determine whether an implementation complies with the requirements

3.12
context data
information defined by the responsible toll charger necessary to establish the toll due for using a vehicle on a particular toll context and to conclude the toll transaction

3.13
data element
coded information, which might itself consist of lower level information structures

[SOURCE: EN ISO 17575-1:2016, 3.9]

3.14
electronic fee collection
fee collection by electronic means

[SOURCE: EN ISO 12855:2015, 3.6]

3.15
enforcement
measures or actions performed to achieve compliance with laws, regulations or rules

[SOURCE: CEN ISO/TS 19299:2015, 3.15]

3.16
evaluation
systematic process of determining how individuals, procedures, systems or programs have met formally agreed objectives and requirements

[SOURCE: ISO 10795:2011, 1.90]

3.17
Front End
part of a tolling system consisting of OBE and possibly a proxy where tolling information and usage data are collected and processed for delivery to the Back End

[SOURCE: CEN ISO/TS 19299:2015, 3.20]

3.18
implementation conformance statement
statement of capabilities and options that have been implemented defining to what extent the implementation is compliant with a given specification

[SOURCE: CEN ISO/TS 14907-2:2016, 3.6]

3.19
implementation under test
implementation of one or more open systems interconnection (OSI) protocols in an adjacent user/provider relationship, being part of a real system which is to be studied by testing

3.20
international standardised profile
internationally agreed-to, harmonised document which describes one or more profiles

[SOURCE: ISO/IEC TR 10000-1:1998, 3.1.2]

3.21
interoperability
ability of systems to exchange information and to make mutual use of the information that has been exchanged

[SOURCE: ISO/IEC TR 10000-1:1998, 3.2.1 modified]

3.22
issuer
entity responsible for issuing the payment means to the user

[SOURCE: ISO/TS 16785:2014, 3.9]

3.23
on-board equipment
all required equipment on-board a vehicle for performing required EFC functions and communication services

3.24
payment claim
recurring statement referring to concluded billing details made available to the payer by the payee indicating and justifying the amount due

[SOURCE: EN ISO 12855:2015, 3.10]

3.25
profile
set of requirements and selected options from base standards or international standardized profiles used to provide a specific functionality

[SOURCE: ISO/IEC TR 10000-1:1998, 3.1.4 modified]

3.26
role
set of responsibilities

[SOURCE: ISO 17573:2010, 3.13]

3.27
system under test
real system in which the implementation under test resides

[SOURCE: ISO/IEC 9646-1:1996, 3.3.103 modified]

3.28
test
procedure designed to measure characteristics of a component or system in specified conditions

[SOURCE: CEN ISO/TS 14907-1:2015; 3.20]

3.29
toll
charge, tax or duty levied in connection to using a vehicle in a toll domain

[SOURCE: CEN ISO/TS 19299:2015, 3.42 modified]

3.30
toll charger
entity which levies toll for the use of vehicles in a toll domain

[SOURCE: ISO 17573:2010, 3.16 modified]

3.31
toll context
logical view as defined by attributes and functions of the basic elements of a toll scheme consisting of a single basic tolling principle, a spatial distribution of the charge objects and a single behaviour of the related Front End

[SOURCE: EN ISO 17575-1:2016, 3.17]

3.32
toll declaration
statement to declare the usage of a given toll service to a toll charger

[SOURCE: ISO 17573:2010, 3.17 modified]

3.33
toll domain
area or a part of a road network where a certain toll regime is applied

[SOURCE: ISO 17573:2010, 3.18 modified]

3.34
toll regime
set of rules, including enforcement rules, governing the collection of toll in a toll domain

[SOURCE: ISO 17573:2010, 3.20]

3.35
toll scheme
organizational view of a toll regime, including the actors and their relationships

[SOURCE: EN ISO 17575-3:2016, 3.22]

3.36
toll service provider
entity providing toll services in one or more toll domains

[SOURCE: ISO 17573:2010, 3.23 modified]

3.37
transaction
whole of the exchange of information between two physically separated communication facilities

[SOURCE: EN ISO 17575-1:2016, 3.21]

3.38
transaction type
identifier of a set of transactions that adhere to the same rules for the exchanged application protocol data units in terms of triggers, timings, content and sequence

3.39
trust object
information object that is exchanged between entities to ensure mutual trust

[SOURCE: ISO 17573:2010, 3.28]

4 Abbreviations

For the purposes of this document, the following abbreviations apply throughout the document unless otherwise specified.

ADU	Application Data Unit (EN ISO 14906)
APCI	Application Protocol Control Information (EN ISO 12855)
APDU	Application Protocol Data Unit (EN ISO 14906)
CCC	Compliance Check Communication (EN ISO 12813)
CN	Cellular Network(s)
CRL	Certificate Revocation List
DSRC	Dedicated Short-Range Communication (EN ISO 14906)
EETS	European Electronic Toll Service
EFC	Electronic Fee Collection (ISO 17573)
FE	Front End
FTP	File Transfer Protocol
GNSS	Global Navigation Satellite System
IAP	Interopability Application Profile (EN 15509)
IP	Internet Protocol
IUT	Implementation Under Test (CEN ISO/TS 14907-1)
MAC	Message Authentication Code (EN ISO 14906)
LAC	Localization Augmentation Communication (EN ISO 13141)
LPN	License Plate Number (EN ISO 12855)