SLOVENSKI STANDARD
SIST-TS CEN/TS 17154-2:2019

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Elektronsko pobiranje pristojbin - Ugotavljanje skladnosti za izvajanje tehnične specifikacije CEN/TS 16986 - 2. del: Abstraktni preskuševalni niz

Electronic fee collection - Evaluation of implementation for conformity to CEN/TS 16986 - Part 2: Abstract test suite

Elektronische Gebührenerhebung - Konformitätsevaluierung von Implementierungen nach CEN/TS 16986 - Teil 2: Zusammengefasstes Prüfprogramm

Perception du télépéage - Évaluation de la conformité de la mise en œuvre de la CEN/TS 16986 - Perception du télépéage - Évaluation de la conformité de la mise en œuvre de la CEN TS 16986 - Partie 2 : Suite d'essais abstraite

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This Technical Specification (CEN/TS) was approved by CEN on 8 March 2019 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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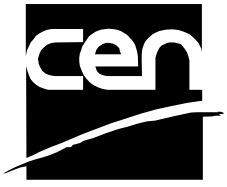

EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (CEN/TS 17154-2:2019) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

CEN/TS 17154, *Electronic fee collection — Evaluation of implementation for conformity to CEN/TS 16986*, consists of two parts:

— *Part 1: Test suite structure and purposes*; and

— *Part 2: Abstract test suite* (this document).

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The Standard on information exchange between service provision and toll charging (i.e. EN ISO 12855) is a so-called toolbox standard. It provides the foundation for interoperability but is not sufficient to achieve full technical interoperability. The interoperable application profile specified in CEN/TS 16986 makes useful choices amongst the options which EN ISO 12855 provides and defines a coherent set of transactions, triggers and data elements for an interoperable data exchange at the interface between the central system equipment of toll service providers and toll chargers. The interoperable application profile supports in both:

— dedicated short-range communication (DSRC)-based systems; and

— global navigation satellite systems /cellular network (GNSS/CN)- based – autonomous systems.

This document provides the specification for testing the conformity of technical implementations to CEN/TS 16986. Technical implementations which can be tested using the specifications included in this Standard are:

— central equipment of toll chargers; and

— central equipment of toll service providers.

While CEN/TS 17154-1 describes the tests on a higher abstract level which is human readable, this Part 2 uses the test notation TTCN-3 to provide a test specification that can be used and executed in state-of-the-art test environments.

The associated requirements specifications CEN/TS 16986 support the implementation of interoperability in general and European electronic toll service (EETS) in particular. The technical requirements defined in CEN/TS 16986 correspond to requirements listed in Commission Decision 2009/750/EC. CEN/TS 16986:2016, Table D.1 provides a list that outlines how requirements in CEN/TS 16986:2016 relate to essential requirements in European legislation. Consequently, the CEN/TS 17154 series supports EETS in terms of providing a set of standardized test specifications to evaluate conformance of implementation of toll chargers and toll service providers – including implementations that provide interoperability and the EETS.

1 Scope

This document provides a suite of tests in order to assess the central equipment of toll chargers and toll service providers for compliancy towards the requirements listed in CEN/TS 16986. This document contains the definition of such tests in the form of test cases, reflecting the required individual steps listed in specific Test Purposes defined in CEN/TS 17154-1. The test cases are written in Testing and Test Control Notation version 3 (TTCN v3).

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.

CEN/TS 16986:2016, *Electronic Fee Collection — Interoperable application profiles for information exchange between Service Provision and Toll Charging*

ETSI ES 201 873-1 (V3.4.1:2008-09), *Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language*

ETSI ES 201 873-4 (V4.6.1:2017-05), *Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 4: TTCN-3 Operational Semantics*

ETSI ES 201 873-7 (V4.7.1:2018-05), *Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3, Part 7: Using ASN.1 with TTCN-3*

ETSI ES 202 784 (V1.6.1:2017-04), *Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Advanced Parameterization*

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

EN ISO 17575-1:2016, *Electronic fee collection — Application interface definition for autonomous systems — Part 1: Charging (ISO 17575-1:2016)*

EN ISO 17575-2, *Electronic fee collection — Application interface definition for autonomous systems — Part 2: Communication and connection to the lower layers (ISO 17575-2)*

EN ISO 17575-3, *Electronic fee collection — Application interface definition for autonomous systems — Part 3: Context data (ISO 17575-3)*

3 Terms and definitions

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

3.1
base standard
approved international standard, technical specification or ITU-T Recommendation

Note 1 to entry: This includes but is not limited to approved standard deliverables from ISO, ITU, CEN, CENELEC, ETSI and IEEE.

[SOURCE: ISO/IEC TR 10000-1:1998, 3.1.1, modified — The bit "technical specification" and Note 1 to entry were added.]

3.2
basic trigger
trigger that stimulate a transaction as defined in CEN/TS 16986:2016, 3.37

3.3
conformance testing
assessment to determine whether an implementation complies with the requirements

3.4
data element
coded information, which might itself consist of lower level information structures

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

3.5
electronic fee collection
fee collection by electronic means

[SOURCE: EN ISO 12855:2015, 3.6]

3.6
evaluation
systematic process of determining how individuals, procedures, systems or programs have met formally agreed objectives and requirements

[SOURCE: ISO 10795:2011, 1.90]

3.7
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]

3.8
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

3.9
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 — The beginning of the definition was slightly altered.]

3.10
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 — The whole wording of the definition was modified and shortened and the original Note 1 to entry was left out.]

3.11
role
set of responsibilities

[SOURCE: ISO 17573:2010, 3.13]

3.12
support trigger
basic trigger with additional restrictions

3.13
test
procedure designed to measure characteristics of a component or system in specified conditions

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

3.14
test case
description of test purpose, unique test case identifier, test inputs, test execution conditions, test steps, and the results required to pass the test

[SOURCE: ISO/IEC 18013-4:2011, 4.1]

3.15
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 — "Any" was deleted at the start of the definition and "in relation with" was replaced with "in connection to".]

3.16
toll charger
entity which levies toll for the use of vehicles in a toll domain

[SOURCE: ISO 17573:2010, 3.16, modified — The wording of the definition was altered and the original Note 1 to entry was left out.]

3.17
toll domain
area or a part of a road network where a certain toll regime is applied

[SOURCE: ISO 17573:2010, 3.18, modified — "Certain" was added.]

3.18
toll service provider
entity providing toll services in one or more toll domains

[SOURCE: ISO 17573:2010, 3.23, modified — The definition was shortened and the original Notes were left out.]

3.19
transaction
whole of the exchange of information between two physically separated communication facilities

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

4 Symbols and abbreviations

For the purposes of this document, the following abbreviated terms apply.

ADU Application Data Unit (EN ISO 14906)

APDU Application Protocol Data Unit (EN ISO 14906)

ASN.1 Abstract Syntax Notation One

ATM Abstract Test Method

BI Behaviour Invalid (EN 15876-1)

BV Behaviour Valid (EN 15876-1)

DSRC Dedicated Short Range Communication

EETS European Electronic Toll Service

EFC Electronic Fee Collection (ISO 17573)

GNSS Global Navigation Satellite Systems

ICS Implementation Conformance Statement (ISO/IEC 9646-7)

IUT Implementation Under Test (CEN ISO/TS 14907-1)

PIXIT Protocol Implementation Extra Information for Testing

TC Toll Charger

TP Test Purpose

TSP Toll Service Provider

TTCN-3 Testing and Test Control Notation version 3 (ETSI ES 201 873-1)

5 Abstract Test Method (ATM)

5.1 Introduction

This clause describes the ATM used to test the exchange of information between the central equipment associated with the two roles service provision and toll charging.

5.2 Test architecture

The implementation under test is either the central equipment of the toll charger or the toll service provider.

The tester shall execute the test cases of the present test specification as specified in Annex A, running on an emulated communication sub-layer. The test cases are written in TTCN-3 which is defined in ETSI ES 201 873-1, *TTCN-3 Core Language (CL)*, ETSI ES 201 873-4, *TTCN-3 Semantics*, and ETSI ES 201 873-7, *TTCN-3: Using ASN.1 with TTCN-3*. Furthermore, to mirror the parametrization capabilities used in the ASN.1 definitions of CEN/TS 16986, ETSI ES 202 784, *TTCN-3: Extensions: Advanced Parameterization* is utilized.

Figure 1 describes the test system architecture.

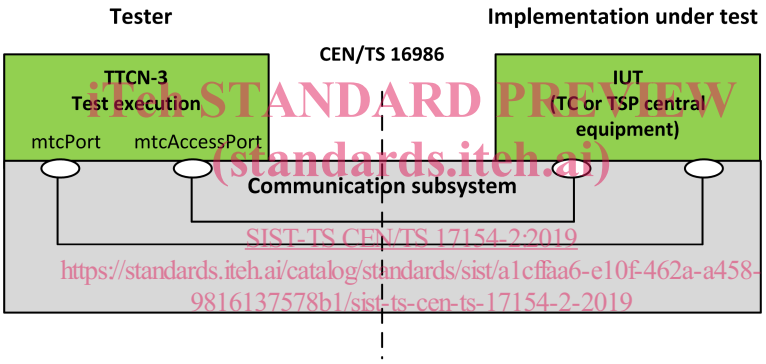

Figure 1 — Test system architecture

5.3 Protocol Implementation Extra Information for Testing (PIXIT)

The supplier of the central equipment, i.e. the toll charger or toll service provider, is responsible for providing the Protocol Implementation Extra Information for Testing (PIXIT).

The supplier of the central equipment shall complete a PIXIT; see Annex B for a proforma.

6 Untestable Test Purposes (TP)

No untestable TP has been identified.