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Ersatz für
DIN CEN ISO/TS 17575-1
(DIN SPEC 70660):2011-08

**Elektronische Gebührenerhebung –
Definition der Anwendungsschnittstelle für autonome Systeme –
Teil 1: Abrechnung (ISO 17575-1:2016);
Englische Fassung EN ISO 17575-1:2016**

Electronic fee collection –
Application interface definition for autonomous systems –
Part 1: Charging (ISO 17575-1:2016);
English version EN ISO 17575-1:2016

Perception du télépéage –
Définition de l'interface d'application pour les systèmes autonomes –
Partie 1: Imputation (ISO 17575-1:2016);
Version anglaise EN ISO 17575-1:2016

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DIN-Normenausschuss Automobiltechnik (NAAutomobil)
DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE

Nationales Vorwort

Dieses Dokument (EN ISO 17575-1:2016) wurde vom technischen Komitee ISO/TC 204 „Intelligent transport Systems“ in Zusammenarbeit mit dem technischen Komitee CEN/TC278 „Intelligente Verkehrssysteme“ erarbeitet, dessen Sekretariat vom NEN (Niederlande) gehalten wird.

Das zuständige deutsche Normungsgremium ist der Gemeinschaftsarbeitsausschuss NA 052-02-71 GA „Intelligente Verkehrssysteme“ des Normenausschusses Automobiltechnik.

Das Präsidium des DIN hat mit seinem Beschluss 1/2004 festgelegt, dass von dem in den Regeln der europäischen Normungsarbeit von CEN/CENELEC verankerten Grundsatz, wonach Europäische Normen in den drei offiziellen Sprachen Deutsch, Englisch und Französisch veröffentlicht werden, in begründeten Ausnahmefällen abgewichen und auf die deutsche Sprachfassung verzichtet werden kann.

Dieser Teil der Normenreihe EN ISO 17575 definiert das Format und die Semantik der Austauschdaten zwischen elektronischer Gebührenerhebungseinrichtung im Fahrzeug und der elektronischen Einrichtung der korrespondierenden Anbieter von Mautgebühren.

Damit wird eine einheitliche Schnittstelle zwischen Straßenfahrzeug und Mautanbieter definiert, die die Einführung international standardisierter Mautsysteme unterstützt.

Änderungen

Gegenüber DIN CEN ISO/TS 17575-1 (DIN SPEC 70660):2011-08 wurden folgende Änderungen vorgenommen:

- a) Korrektur verschiedener Fehler;
- b) Anpassung an neuere Versionen anderer Normen, besonders zu ISO 14906;
- c) Verschiedene kleinere technische- und editorische Verbesserungen unter Berücksichtigung der Abwärtskompatibilität;
- d) Überführung in eine DIN EN ISO.

Frühere Ausgaben

DIN CEN/TS 17575-1 (DIN SPEC 70660): 2011-08

Nationaler Anhang NA

(informativ)

Begriffe

Die Benennungen der folgenden Begriffe sind identisch mit den Benennungen in der Englischen Fassung.

Für die Anwendung dieses Dokuments gelten die folgenden Begriffe.

3.1

Gebietsabrechnung

(en: area charging)

Abrechnung basierend auf einer Straßennutzung innerhalb eines vorgegebenen Gebiets

3.2

Attribut

(en: attribute)

adressierbares Datenpaket, welches aus einem einzelnen Datenelement, oder einer strukturierten Sequenz von Datenelementen besteht

3.3

authentifizierendes Merkmal

(en: authenticator)

möglicherweise verschlüsselte Daten, die zur Authentifizierung verwendet werden

[QUELLE: EN 15509:2014, 3.3]

3.4

Back End

Teil eines Backoffice-Systems, welches mit einem oder mehreren *Front End* (3.12) verbunden sind

3.5

Abrechnungsobjekt

(en: charge object)

geografisches- oder straßenbezogenes Objekt zur abrechnungsbezogenen Nutzung

3.6

Abrechnungsbericht

(en: charge report)

Informationen, die für das *Front End* (3.12) hervorgebrachte Straßennutzungs- und Zusatzinformationen beinhalten

3.7

Absperrung

(en: cordon)

Grenzlinie in einem Gebiet

3.8

Absperrabrechnung

(en: cordon charging)

Abrechnung zur Überquerung einer *Absperrung* (3.7)

3.9

Datenelement

(en: data element)

kodierte Information, welche selbst aus weiteren Basis-Informationsstrukturen bestehen kann

3.10

Datengruppe

(en: data group)

Klasse von verwandten *Attributen* (3.2)

3.11

Mautbereich

(en: toll cluster)

Gruppe von Mautschemata die unter einem gemeinsamen Abkommen arbeiten um für Straßennutzer Interoperabilität zur Verfügung zu stellen, die einen Vertrag mit einem Dienstanbieter haben und Teil des Bereiches sind

3.12

Front End

Teil eines Mautsystems bestehend aus einer On-board Ausrüstung (OBE) und möglicherweise einem *Vertreter* (3.13) mit dem Straßenmautinformationen und Benutzungsdaten gesammelt, verarbeitet und an das *Back End* (3.4) übermittelt werden

[QUELLE: ISO/TS 19299:2015, 3.17]

3.13

Vertreter

(en: proxy)

optionale Einheit des *Front Ends* (3.12) welches mit externen Einrichtungen kommuniziert und Daten in ein abgestimmtes Format überführt und an das *Back End* (3.4) übermittelt

3.14

Straßensektionsmaut

(en: road section tolling)

Mautprinzip, bei dem die Gebühr anfällt, wenn ein vordefinierter Straßenabschnitt benutzt wird

3.15

Tarifwandler

(en: tariff modifier)

vier Klassen (Fahrzeugklasse, Zeitklasse, Nutzerklasse und Ortsklasse), von denen der Tarif für eine gegebene Straßennutzung abhängt

3.16

Maut

(en: toll)

Abrechnung, Steuer, oder Verpflichtungsabgabe in Verbindung einer Fahrzeugbenutzung innerhalb eines *Mautgebietes* (3.19)

[QUELLE: ISO/TS 19299:2015, 3.42, modifiziert - „beliebige“ wurde vor „Abrechnung“ gelöscht.]

3.17**Maut Kontext**

(en: toll context)

Logischer Blick auf ein Mautschema, welcher Anhand von *Attributen* (3.2) und Funktionen eines Basiselements definiert ist und aus einem einzelnen Basismautprinzip, der räumlichen Verteilung eines *Abrechnungsobjektes* (3.5) und dem einzelnen Verhalten des betroffenen *Front Ends* (3.12) besteht

3.18**Maut Kontextdaten**

(en: toll context data)

Information welche vom verantwortlichen Mauterheber festgelegt wird und notwendig ist, um die *Maut* (3.16) zur Nutzung eines Fahrzeugs in einem bestimmten *Maut Kontext* (3.17) festzusetzen und um die Mauttransaktion abzuschließen

[QUELLE: ISO 12855:2015, 3.15]

3.19**Mautgebiet**

(en: toll domain)

Bereich oder Teil eines Straßennetzwerks in der ein bestimmtes *Mautregime* (3.20) angewendet wird

[QUELLE: ISO 17573:2010, 3.18, modifiziert - „bestimmtes“ wurde ergänzt.]

3.20**Mautregime**

(en: toll regime)

Menge von Regeln, einschließlich Betreiberregeln, welche die Erhebung von *Maut* (3.16) in einem *Mautgebiet* (3.19) regeln

[QUELLE: ISO 17573:2010, 3.20]

3.21**Transaktion**

(en: transaction)

Ganzheit des Austausches von Informationen zwischen zwei, physikalisch separat kommunizierenden, Einrichtungen

3.22**Transaktionsmodell**

(en: transaction model)

funktionales Modell, welches die Transaktionsstruktur der elektronischen Bezahlung beschreibt

[QUELLE: ISO 14906:2011, 3.25, modifiziert - „Gebührenerhebung“ wurde gelöscht.]

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English Version

Electronic fee collection —
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Elektronische Gebührenerhebung —
Definition der Anwendungsschnittstelle
für autonome Systeme —
Teil 1: Abrechnung
(ISO 17575-1:2016)

This European Standard was approved by CEN on 11 December 2015.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

This document (EN ISO 17575-1:2016) has been prepared by Technical Committee ISO/TC 204 “Intelligent transport systems” in collaboration with Technical Committee CEN/TC 278 “Intelligent transport systems” the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2016, and conflicting national standards shall be withdrawn at the latest by August 2016.

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

This document supersedes CEN ISO/TS 17575-1:2010.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 17575-1:2016 has been approved by CEN as EN ISO 17575-1:2016 without any modification.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

This edition of ISO 17575-1 cancels and replaces ISO/TS 17575-1:2010, which has been technically revised. The following changes have been made:

- conversion from a Technical Specification to an International Standard;
- amendments to reflect changes to the underlying base standards, especially ISO 14906;
- adoption of security prescriptions previously located in other standards for specification of authenticated data structures;
- editorial and formal corrections as well as changes to improve readability.

ISO 17575 consists of the following parts, under the general title *Electronic fee collection — Application interface definition for autonomous systems*:

- *Part 1: Charging*
- *Part 2: Communication and connection to the lower layers*
- *Part 3: Context data*

In this edition of the ISO 17575-series the contents of ISO/TS 17575-4:2011 were incorporated into ISO 17575-3:2016. ISO/TS 17575-4:2011 will be withdrawn once ISO 17575-3 has been published.

Introduction

0.1 Autonomous systems

ISO 17575 is a series of standards defining the information exchange between the Front End and the Back End in electronic fee collection (EFC) based on autonomous on-board equipment (OBE). EFC systems automatically collect charging data for the use of road infrastructure including motorway tolls, zone-based fees in urban areas, tolls for special infrastructure like bridges and tunnels, distance-based charging and parking fees.

Autonomous OBE operates without relying on dedicated road-side infrastructure by employing wide-area technologies such as Global Navigation Satellite Systems (GNSS) and Cellular Networks (CN). These EFC systems are referred to by a variety of names. In addition to the terms autonomous systems and GNSS/CN systems, the terms GPS/GSM systems and wide-area charging systems are also in use.

Autonomous systems use satellite positioning, often combined with additional sensor technologies such as gyroscopes, odometers and accelerometers, to localize the vehicle and to find its position on a map containing the charged geographic objects, such as charged roads or charged areas. From the charged objects, the vehicle characteristics, the time of day and other data that are relevant for describing road use, the tariff and ultimately the road usage fee are determined.

Two strengths of the autonomous approach to electronic fee collection are its flexibility, allowing the implementation of almost all conceivable charging principles, and its independence from local infrastructure, thereby predisposing this technology towards interoperability across charging systems and countries. Interoperability can only be achieved with clearly defined interfaces, which is the aim and justification of ISO 17575.

0.2 The parts of ISO 17575

Part 1: Charging, defines the attributes for the transfer of usage data from the Front End to the Back End. The contents of charge reports might vary between toll regimes, hence, attributes for all requirements are offered, ranging from attributes for raw localization data, for map-matched geographic objects and for completely priced toll transactions. A toll regime comprises a set of rules for charging, including the charged network, the charging principles, the liable vehicles and a definition of the required contents of the charge report.

Part 2: Communication and connection to lower layers, defines basic communication services for data transfer over the OBE air-link or between Front End and Back End. The data defined in this part of ISO 17575-1 and ISO 17575-3 can but need not be exchanged using the communication stack as defined in ISO 17575-2.

Part 3: Context data, defines the data to be used for a description of individual charging systems in terms of charged geographical objects and charging and reporting rules. For every toll charger's system, attributes as defined in ISO 17575-3 are used to transfer data to the Front End in order to instruct it on which data to collect and report.

0.3 Application needs covered by ISO 17575

The ISO 17575-series of standards

- is compliant with the architecture defined in ISO 17573:2010,
- supports charges for use of road sections (including bridges, tunnels, passes, etc.), passage of cordons (entry/exit) and use of infrastructure within an area (depending on distance, time),
- supports fee collection based on units of distance or duration, and based on occurrence of events,
- supports modulation of fees by vehicle category, road category, time of usage and contract type (e.g. exempt vehicles, special tariff vehicles, etc.),
- supports limiting of fees by a defined maximum per period of usage,

- supports fees with different legal status (e.g. public tax, private toll),
- supports differing requirements of different toll chargers, especially in terms of
 - geographic domain and context descriptions,
 - contents and frequency of charge reports,
 - feedback to the driver (e.g. “green” or “red light”), and
 - provision of additional detailed data on request, e.g. for settling of disputes,
- supports overlapping geographic toll domains,
- supports adaptations to changes in
 - tolled infrastructure,
 - tariffs, and
 - participating toll schemes, and
- supports the provision of trust guarantees by the toll service provider to the toll charger for the data originated from the Front End.

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Electronic fee collection — Application interface definition for autonomous systems —

Part 1: Charging

1 Scope

This part of ISO 17575 defines the format and semantics of the data exchange between a Front End (OBE plus optional proxy) and corresponding Back Ends in autonomous toll schemes. It defines the data elements that are used to generate charge reports containing information about the road usage of a vehicle for certain time intervals, sent from the Front End to the Back End. It also defines the data that can be used to re-configure the ongoing process of gathering charge relevant information in the Front End. The scope is shown in Figure 1.

The constitution of the charge report is dependent on configuration data that are assumed to be present in the Front End. The assembly of charge reports can be configured for each individual toll scheme according to local needs. Charge reports generated in accordance with this part of ISO 17575 are consistent with the requirements derived from the architectural concept defined in ISO 17573:2010.

The definitions in this part of ISO 17575 comprise

- reporting data, i.e. data for transferring road usage data from Front End to Back End, including a response from the Back End towards the Front End,
- data for supporting security mechanisms,
- contract data, i.e. data for identifying contractually essential entities,
- road usage data, i.e. data for reporting the amount of road usage,
- account data for managing a payment account,
- versioning data, and
- compliance checking data, i.e. data imported from ISO 12813:2015, which are required in compliance checking communication.

Annex A contains the data type specifications using ASN.1 notation.

The protocol implementation conformity statements (PICS) proforma are provided in Annex B.

Annex C provides a graphical presentation of the structure of the data elements described in Clause 7.

Annex D provides information on how this part of ISO 17575 can be used in EETS environment and how the requirements that are specified in the EU-Decision 2009/750 are addressed by this standard.

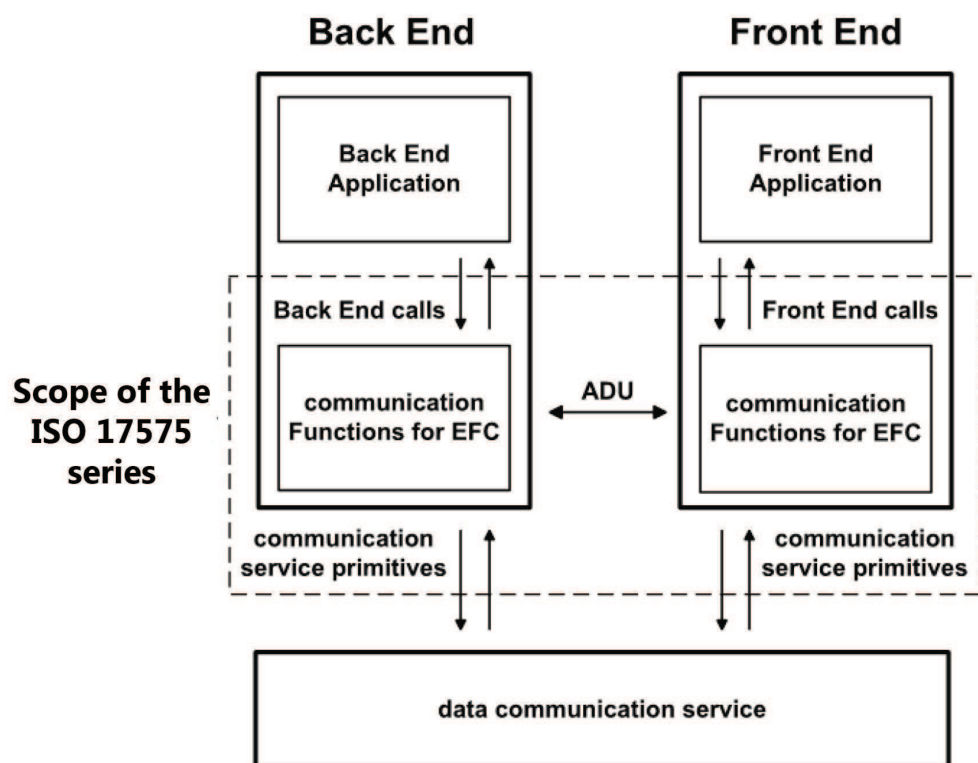


Figure 1 — Scope of ISO 17575-1

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.

ISO 6709:2008, *Standard representation of geographic point location by coordinates*

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

ISO/IEC 8825-2:2008, *Information technology — ASN.1 encoding rules: Specification of Packed Encoding Rules (PER) — Part 2*

ISO/IEC 9594-8:2014, *Information technology — Open Systems Interconnection — The Directory — Part 8: Public-key and attribute certificate frameworks*

ISO 12813:2015, *Electronic fee collection— Compliance check communication for autonomous systems*

ISO 13141:2015, *Electronic fee collection— Localisation augmentation communication for autonomous systems*

ISO 14906:2011/Amd1:2015, *Electronic fee collection — Application interface definition for dedicated short-range communication*

ISO 17573:2010, *Electronic fee collection — Systems architecture for vehicle-related tolling*