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Prometne in potovalne informacije (TTI) ï Sporoį ila TTI prek celiį nih omreģij ï 5. del: Notranje storitve/sluģbe

Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 5: Internal services

Verkehrs- und Reiseinformationen (TTI)-TTI-Nachrichten über mobile - Teil 5: Interne Dienste

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35.240.60	Uporabniške rešitve IT v transportu in trgovini	IT applications in transport and trade

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TECHNICAL SPECIFICATION
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English version

Traffic and Travel Information (TTI) - TTI messages via cellular networks - Part 5: Internal services

This Technical Specification (CEN/TS) was approved by CEN on 10 May 2001 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

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Foreword

This document (CEN/TS 14821-5:2003) has been prepared by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NEN, in collaboration with Technical Committee ISO/TC 204 "Transport information and control systems".

This technical specification was prepared by Working Group 7 of CEN TC278. In the field of Traffic and Traveller Information, the innovative rate is high, with many research and development projects under way in many countries, and there is a need to establish prospective standards which allow manufacturers to introduce competitive products to the market in the knowledge that they can accommodate the future issues of the standard(s) without fundamental change to equipment.

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No known national technical specifications (identical or conflicting) exist on this subject.

CEN/TS 14821 consists of eight parts; one part describing the framework and seven parts providing detailed specifications of all components, protocols and services that are within the scope of CEN/TS 14821.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this CEN Technical Specification: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Traffic and Traveller Information (TTI) may be disseminated through a number of services or means of communication, covering static displays, portable terminals and in-vehicle equipment.

For all such services, the data to be disseminated, and the message structure involved in the various interfaces, require clear definition and standards formats in order to allow competitive products to operate with any received data.

This technical specification focuses on an application data specification whereby data is produced at a central location and is disseminated via a cellular radio network. It addresses the data specifications for both downlink and uplink existing between a central location and randomly located vehicles. It enables messages to be exchanged between different systems and service providers adopting a variety of applications specifications.

Other techncial specifications are being produced by the CEN TC278 Working Group 4 to cover TTI dissemination via other means or services. This set of specifications is named GATS (Global Automotive Telematics Standard). GATS provides the modular framework for implementing such traffic telematics services on an open technology platform and is network - independent. In many details definitions are necessary to ensure interoperability. Therefore, those detailed definitions are given in a network-specific part (CEN/TS 14821-8). With the development of future mobile communication systems towards UMTS / IMT2000 the bottleneck of narrow-band data communication might fade. Due to its modular structure, the GATS framework and applications are prepared for that due to its network-independence. The same holds for emerging technologies for positioning which today is almost exclusively based on GPS.

Other relevant standard developments are, independent from telematics, the application-independent Wireless Application Protocol (WAP), enabling mobile access to the Internet. It is understood that these emerging technologies might fit into the framework of telematics applications in future WAP-versions. For the time being, GATS already today independently from WAP enables access to telematics services. Utilisation of GATS on a WAP protocol stack and identifying necessary adaptation of WAP specifications (if any) is currently under investigation of the appropriate groups within WAP-Forum and GATS-Forum.

1. Scope

This CEN/TS defines the specific interfaces and functionality of traffic telematics (TT) services based on the use of cellular networks. Device manufacturers are enabled to develop terminal equipment compatible to services based on this technical specification. This will allow for interoperability of different terminal equipment and service providers which allows competition between service providers and terminal manufacturers. Furthermore it sets the scene for international availability of these services.

This technical specification specifies

- TT-specific interfaces between terminal and service centre. This especially incorporates the message sets of the application data protocols and the service-independent communication handling (including conditional access and transport protocols).
- Functionality, procedures and requirements of basic terminal components as well as their interaction with the service centre. This especially comprises conditional access and security mechanisms.
- Service Specifications, which are essential to ensure consistent behaviour of terminal and service centre.

The services incorporated within this issue comprise:

- breakdown and emergency services
- interactive traffic information services
- broadcast traffic information services
- navigation services (route assistance, route advice, homing)
- operator services
- general information services
- floating car data collection

It is envisaged that future research and development will lead to improvements on the services listed above as well as to the creation of new services. Nevertheless this technical specification provides the framework for seamless integration of new features and services into the existing architecture.

2. Normative references

This Technical Specification incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Technical Specification only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO/IEC 9797-1	Information technology -- Security techniques -- Message Authentication Codes (MACs) -- Part 1: Mechanisms using a block cipher
ISO/IEC 9797-2:2002	Information technology -- Security techniques -- Message Authentication Codes (MACs) -- Part 2: Mechanisms using a dedicated hash-function
ISO/IEC 10116	*Information technology – Security techniques - Modes of operation for an n-bit block cipher*
ISO/IEC 10118-1:2000	*Information technology - Security techniques – Hash-functions – Part 1: General*
ISO/IEC 10118-2	*Information technology – Security techniques – Hash-functions – Part 2: Hash-functions using an n-bit block cipher*
ISO 11568-3:	*Banking - Key management (retail) - Part 3: Key life cycle for symmetric ciphers*

PKCS#1: RSA Encryption Standard, RSA Labs Technical Notes, Version 1.5, Nov. 1993

CCITT, Annex A to CCITT Blue Book Rec. E212

3. Definitions and abbreviations

3.1 Definitions

For the purposes of this CEN/TS, the following terms and definitions apply:

3.1.1 Attribute (of a Traffic Information Message)

A Traffic Information Message is made up of separate parts that can be called attributes. This includes, for example, an item of information and a length of validity.

3.1.2 Authorisation

Reciprocal proof that the identity provided by the communications partner is valid

3.1.3 Broadcast Service

Data service within a cellular wireless network that allows for mono-directional dissemination of data from a service centre to multiple users in the area of signal reception

3.1.4 Bypass Description

Representation of a Bypass, consisting of a Bypass Hint and/or a Bypass Route.

3.1.5 Bypass Hint

Representation of a hint for a Bypass

3.1.6 Bypass Link

Prominent waypoints on a Bypass Route

3.1.7 Bypass Route

Representation of the route for a Bypass

3.1.8 Cell Broadcast

Broadcast service of the GSM network

3.1.9 Data telegram

Digital message exchanged between two systems

3.1.10 Delivery Notification

Network acknowledgement for successful/ unsuccessful delivery of a message to the mobile device

3.1.11 Functional Road Class

A classification based on the importance of the road element in the connectivity of the total road network

3.1.12 Functional Road Class 0

Motorways

3.1.13 Functional Road Class 1

All non-Motorways that are part of a connection used for nation wide traffic and transport

3.1.14 Geocode

Geocodes are unique identifiers unmistakably defining important points on road networks. Geocodes can be derived from / converted into WGS84 co-ordinates by the algorithm described in CEN/TS 14821-3.

3.1.15 Hardware service agents

Partner companies of the traffic telematics service providers who are authorised to install onboard equipment into vehicles and to maintain it

3.1.16 Homing

Simple form of guidance to destination, in which the direction and straight-line distance of the destination are indicated

3.1.17 Information Element

Information unit of a message

3.1.18 Intersection

Junction of two or more roads

3.1.19 Length of a Speech Report

Length of a Speech Report, including pauses, in tenths of a second

3.1.20 Mobile Originated

Data telegram sent from the onboard equipment to the Service Centre.

3.1.21 Mobile Terminated

Data telegram sent by the Service Centre to the onboard equipment.

3.1.22 Onboard equipment

A system, generally mobile, interacting with the service centre to handle traffic telematics services

3.1.23 Road Junction

Intersection of two or more roads

3.1.24 Route description

Description of a route showing the geometry of street intersections, manoeuvre instructions, street and place names, and geographical co-ordinates

3.1.25 Service centre

System produced by the traffic telematics operators / service providers to handle traffic telematics services

3.1.26 Short Message Service

Packet-based form of data transfer within the GSM network

3.1.27 Speech connection

Communications channel between two systems for the bi-directional transmission of speech

3.1.28 Speech Report

Traffic Information Report transmitted by a speech system

3.1.29 Terminal Device

Generally mobile system interacting with the service centre for implementation of telematics services

3.1.30 TINFO

Traffic Information Report

3.1.31 TINFO Version

Unique identification of a Traffic Message, consisting of a number and a time stamp

3.1.32 Traffic Data

Data for qualification of Traffic Events. This includes:

- Values: speed, traffic flow, traffic density
- Places: position, place designation
- Facts: description of situation

3.1.33 Traffic Event

An occurrence on a road or in an area that is worthy of reporting, such as a traffic jam, wrong-way driver, or fog.

3.1.34 Traffic Information

Technical representation of a Traffic Situation within the onboard equipment, accomplished by a number of Traffic Information Reports.
This Traffic Information can be displayed to the customer via suitable terminals.

3.1.35 Traffic Information Report

Technical representation of a Traffic Event produced by processing traffic data.
Each Traffic Reports uniquely identified by a number, the TINFO ID, a time stamp, the TINFO version.

Note: If the Traffic Event changes, the time stamp changes, but the TINFO ID number does not.

3.1.36 Traffic Situation

The total number of all Traffic Events taking place that deserve reporting within an area. The Traffic Situation is always linked to an area. Thus, for example, an areas could be a conurbation or a geometrically demarcated area; an example is the radius around a point.

3.1.37 Voice connection

Circuit-switched channel between two systems for bi-directional voice transmission

3.1.38 Waypoint

Significant points on the route

3.2 Abbreviations

For the purposes of this CEN/TS, the following abbreviations apply:

3.2.1 % ott

percent of the time

3.2.2 ADP

Application Data Protocol, i.e. a message set for a telematics service

3.2.3 AM

Acknowledge Message

3.2.4 ASN.1

Abstract Syntax Notation

3.2.5 BC
Broadcast

3.2.6 BCS
Broadcast Service

3.2.7 CA
Conditional Access

3.2.8 CAS
Conditional Access and Security

3.2.9 CB
Cellular Broadcast

3.2.10 CBC
Cipher Block Chaining

3.2.11 CLI
Calling Line Identification

3.2.12 CRM
Calling Request Message

3.2.13 CSD
Circuit Switched Data

3.2.14 DES
Data Encryption Standard: symmetrical encryption procedure

3.2.15 DRM
Digital Road Map

3.2.16 DSC
Data Service Centre: depending on the mobile communication network

3.2.17 ELB
Extended Location Block

3.2.18 FCD
Floating Car Data

3.2.19 FCDGM
FCD General Message

3.2.20 FCDPM
FCD Parameter Message

3.2.21 FCDNSM
FCD Notification Set-up Message

3.2.22 FCDRM
FCD Revoke Message

3.2.23 FCDVDSUM
FCD Virtual Detection Site Update Message

3.2.24 GATS
Global Automotive Telematics Standard

3.2.25 GEM
General Error Message

3.2.26 GPS
Global Positioning System NAVSTAR GPS

3.2.27 GSM
Global System for Mobile Communication

3.2.28 IE
Information Element

3.2.29 ICV
Initial Chaining Value

3.2.30 L_max
Max. length of transferable data in **one** data transaction

3.2.31 MAC
Message Authentication Code

3.2.32 MNA
Mobile Network Address

3.2.33 MF
Mandatory Fixed format

3.2.34 MO
Mobile Originated Message

3.2.35 MT
Mobile Terminated Message

3.2.36 MV
Mandatory Variable format

3.2.37 N_min
Minimum number of ELB waypoints

3.2.38 OBU
Onboard Unit, synonymously used telematics device, telematics terminal

3.2.39 OF
Optional Fixed format

3.2.40 OV
Optional Variable format

3.2.41 PDU
Protocol Data Unit

3.2.42 PFA
Probability of false alarm (i.e. estimated error is too large)

3.2.43 PMD
Probability of missed detection (i.e. estimated error is too small)

3.2.44 RSA
Asymmetrical encryption procedure by Rivest, Shamir and Adleman

3.2.45 SAE
Society of Automotive Engineers, Inc.

3.2.46 SMS
Short Message Service

3.2.47 SMSC
SMS Centre

3.2.48 SV
Space Vehicle

3.2.49 TEG
Telematics Expert Group – Group within the WAP-Forum Ltd.

3.2.50 TINFO
Traffic Information Report

3.2.51 TOC
Telematics Operator Code

3.2.52 TRP
Transport Protocol

3.2.53 TT
Traffic telematics

3.2.54 TTI
Traffic and Traveller Information

3.2.55 TTFF
Time to First Fix

3.2.56 UTC
Universal Time Co-ordinated

3.2.57 VDS
Virtual Detection Site

3.2.58 vel, V
Velocity

3.2.59 VIN
Vehicle Identification Number

3.2.60 WAP
Wireless Application Protocol

3.2.61 WGS84
World Geodetic System