SLOVENSKI STANDARD
SIST-TS CEN/TS 16614-1:2014

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Javni prevoz - Izmenjava omrežnih in voznorednih podatkov (NeTEx) - 1. del: Izmenjavni format za topologijo omrežja javnega prevoza

Public transport - Network and Timetable Exchange (NeTEx) - Part 1: Public transport network topology exchange format

Öffentlicher Verkehr - Netzwerk und Fahrplan Austausch (NeTEx) - Teil 1: Öffentlicher Verkehr Netzwerk Topologie

Transport Public - Échanges des informations planifiées (NeTEx) - Partie 1: Topologie du réseau

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English Version

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This Technical Specification (CEN/TS) was approved by CEN on 12 November 2013 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
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document (CEN/TS 16614-1:2014) 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 [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document presents Part 1 of the European Technical Specification known as “NeTEx”. NeTEx provides a framework for specifying communications and data exchange protocols for organisations wishing to exchange scheduled Information relating to public transport operations.

This technical specification is made up of three parts defining a single European Standard series, which provides a complete exchange format for public transport networks, timetable description and fare information.

— Part 1 is the description of the public transport network topology exchange format. It also contains use cases shared with part 2, and modelling rules and the description of a framework shared by all parts.

— Part 2 is the description of the scheduled timetables exchange format.

— Part 3 is the description of the fare information exchange format.[1]

Part 1 is fully standalone, and part 2 and 3 rely on part 1.

The XML schema can be downloaded from www.**netex**.org.uk, along with available guidance on its use, example XML files, and case studies of national and local deployments.

NOTE This document is higly technical, and a special care has been taken on keeping the text readable. This has been done through a set of editorial rules enhancing usual CEN writing rules:

— To avoid confusion with usual wording, Transmodel terms are in capital letters (JOURNEY PATTERN for example).

— To avoid confusion with usual wording, attributes names are in bold/italic style and use camelcase style with no spaces (***JourneyPattern*** for example).

— To avoid confusion with usual wording, attributes types are in italic style and use camelcase style with no spaces (*TypeOfEntity* for example).

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

[1] Currently under development

Introduction

Public transport services rely increasingly on information systems to ensure reliable, efficient operation and widely accessible, accurate passenger information. These systems are used for a range of specific purposes: setting schedules and timetables; managing vehicle fleets; issuing tickets and receipts; providing real-time information on service running, and so on.

This European Technical Specification specifies a Network and Timetable Exchange (NeTEx) standard for Public Transport. It is intended to be used to exchange data relating to scheduled public transport between the systems of PT organisations. It can also be seen as complementary to the SIRI (Service Interface for Real-time Information) standard, as SIRI needs a prior exchange of reference data from NeTEx's scope to provide the necessary context for the subsequent exchange of a real-time data.

Well-defined, open interfaces have a crucial role in improving the economic and technical viability of Public Transport Information Systems of all kinds. Using standardised interfaces, systems can be implemented as discrete pluggable modules that can be chosen from a wide variety of suppliers in a competitive market, rather than as monolithic proprietary systems from a single supplier. Interfaces also allow the systematic automated testing of each functional module, vital for managing the complexity of increasing large and dynamic systems. Furthermore, individual functional modules can be replaced or evolved, without unexpected breakages of obscurely dependent function.

This standard will improve a number of features of public transport information and service management: Interoperability – the standard will facilitate interoperability between information processing systems of the transport operators by: (i) introducing common architectures for message exchange; (ii) introducing a modular set of compatible information services for real-time vehicle information; (iii) using common data models and schemas for the messages exchanged for each service; and (iv) introducing a consistent approach to data management.

Technical advantages include the following: a modular reusing of a common communication layer shared with SIRI for all the various technical services enables cost-effective implementations, and makes the standard readily extensible in future.

1 Scope

1.1 General

NeTEx is dedicated to the exchange of scheduled data (network, timetable and fare information). It is based on Transmodel V5.1 (EN 12896), IFOPT (EN 28701) and SIRI (CEN/TS 15531-4, CEN/TS 15531-5 and prEN 15531-1, prEN 15531-2 and prEN 15531-3[2]) and supports the exchange of information of relevance for passenger information about public transport services and also for running Automated Vehicle Monitoring Systems (AVMS).

NOTE Many NeTEx concepts are taken directly from Transmodel and IFOPT; the definitions and explanation of these concepts are extracted directly from the respective standard and reused in NeTEx, sometimes with adaptions in order to fit the NeTEx context.

Although the data exchanges targeted by NeTEx are predominantly oriented towards provisioning passenger information systems and AVMS with data from transit scheduling systems, it is not restricted to this purpose and NeTEx can also provide an effective solution to many other use cases for transport data exchange.

1.2 Transport modes

All mass public transport modes are taken into account by NeTEx, including train, bus, coach, metro, tramway, ferry, and their submodes. It is possible to describe airports and air journeys, but there has not been any specific consideration of any additional requirements that apply specifically to air transport.

1.3 Compatibility with existing standards and recommendations

Concepts covered in NeTEx that relate in particular to long-distance train travel include; rail operators and related organizations; stations and related equipment; journey coupling and journey parts; train composition and facilities; planned passing times; timetable versions and validity conditions.

In the case of long distance train the NeTEx takes into account the requirements formulated by the ERA (European Rail Agency) – TAP/TSI (Telematics Applications for Passenger/ Technical Specification for Interoperability, entered into force on 13 May 2011 as the Commission Regulation (EU) No 454/2011), based on UIC directives.

As regards the other exchange protocols, a formal compatibility is ensured with TransXChange (UK), VDV 452 (Germany), NEPTUNE (France), UIC Leaflet, BISON (Netherland) and NOPTIS (Nordic Public Transport Interface Standard).

The data exchange is possible either through dedicated web services, through data file exchanges, or using the SIRI exchange protocol as described in part 2 of the SIRI documentation.

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 15531-1, *Public transport - Service interface for real-time information relating to public transport operations - Part 1: Context and framework*[3]

[2] Under development

[3] Under development (WI 00278340)

EN 15531-2, *Public transport - Service interface for real-time information relating to public transport operations - Part 2: Communications infrastructure*[4]

EN 15531-3, *Public transport - Service interface for real-time information relating to public transport operations - Part 3: Functional service interfaces*[5]

CEN/TS 15531-4, *Public transport - Service interface for real-time information relating to public transport operations - Part 4: Functional service interfaces: Facility Monitoring*

CEN/TS 15531-5, *Public transport - Service interface for real-time information relating to public transport operations - Part 5: Functional service interfaces - Situation Exchange*

EN 12896, *Road transport and traffic telematics - Public transport - Reference data model*

EN 28701, *Intelligent transport systems - Public transport - Identification of Fixed Objects in Public Transport (IFOPT)*

3 Terms and definitions

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

NOTE A lot of definitions are shared with Transmodel (EN 12896) and IFOPT (EN 28701): special attention was paid to the consistency of definitions, keeping exactly the same wording. The italic bracket name at the beginning of the definition is a package name that will help the reader to find the related concept in the UML data model.

3.1
access
(Generic Place MODEL)

the physical (spatial) possibility for a passenger to access or leave the public transport system. This link may be used during a trip for the walking movement of a passenger from a PLACE (origin of the trip) to a STOP POINT (origin of the PT TRIP), or- the walking movement from a STOP POINT (destination of the PT TRIP) to a PLACE (destination of the trip)

3.2
access end
(Generic Place MODEL)

origin or destination end of an ACCESS link. May indicate a MODE, POINT and PLACE

3.3
access mode
(Reusable Transport Mode MODEL)

a characterisation of the passenger movement according to the means of transport different from public transport (e.g. walk, bicycle, etc)

[4] Under development (WI 00278341)

[5] Under development (WI 00278342)

3.4
access space
(Stop Place MODEL)

a passenger area within a STOP PLACE such as a concourse or booking hall, immigration hall or security area that is accessible by passengers, but without a direct access to vehicles. Direct access to a VEHICLE is always from a QUAY and/or BOARDING POSITION. An ACCESS SPACE may be a Room, Hall, Concourse, Corridor, or bounded open space within a STOP PLACE

3.5
access zone
(Site MODEL)

A ZONE for which the duration to cover any ACCESS LINK to a particular STOP POINT is the same.

3.6
accessibility assessment
(Accessibility MODEL)

the accessibility characteristics of an entity used by passengers such as a STOP PLACE, or a STOP PLACE COMPONENT. Described by ACCESSIBILITY LIMITATIONs, and/or a set of SUITABILITies

3.7
accessibility limitation
(Accessibility MODEL)

a categorisation of the accessibility characteristics of a SITE, e.g. a STOP PLACE or a STOP PLACE COMPONENT to indicate its usability by passengers with specific needs, for example, those needing wheelchair access, step-free access or wanting to avoid confined spaces such as lifts. A small number of well-defined categories are used that are chosen to allow the consistent capture of data and the efficient computation of routes for different classes of user

3.8
accomodation
(Facility MODEL)

a combination of accommodation characteristics available on a service, e.g. First Class Couchette with shower and 2 bunks

3.9
activated equipment
(Activation MODEL)

an equipment activated by the passage of a vehicle at an ACTIVATION POINT or on an ACTIVATION LINK

3.10
activation assignment
(Activation MODEL)

an assignment of an ACTIVATION POINT/LINK to an ACTIVATED EQUIPMENT related on its turn to a TRAFFIC CONTROL POINT. The considered ACTIVATION POINT/LINK will be used to influence the control process for that TRAFFIC CONTROL POINT (e.g. to fix priorities as regards the processing of competing requests from different ACTIVATION POINTs/LINKs)

3.11
activation link
(Activation MODEL)

a LINK where a control process is activated when a vehicle passes it

3.12
activation point
(Activation MODEL)

a POINT where a control process is activated when a vehicle passes it. Equipment may be needed for the activation

3.13
actual vehicle equipment
(Actual Vehicle Equipment MODEL)

an item of equipment of a particular type in an individual VEHICLE

3.14
address
(Topographic MODEL)

an address of a PLACE

3.15
administrative zone
(Generic Organisation MODEL)

the area of a district, a region, a city, a municipality, or other area with which an ORGANIZATION has a RESPONSIBILITY ROLE

3.16
allowed line direction
(Route MODEL)

an allowed DIRECTION that can be used on a given ROUTE. This can be used to validate the selection of allowed values

3.17
alternative name
(Site MODEL)

alternative name for the entity

3.18
assistance service
(Local Service Equipment MODEL)

specialisation of LOCAL SERVICE for ASSISTANCE providing information like language, accessibility trained staff, etc.

3.19
authority
(Transport Organisations MODEL)

the organisation under which the responsibility of organising the transport service in a certain area is placed

3.20
availability condition
(Reusable Availability MODEL)

a VALIDITY CONDITION expressed in terms of temporal parameters and referring to DAY TYPEs

3.21
beacon point
(Activation MODEL)

a POINT where a beacon or similar device to support the automatic detection of vehicles passing by is located

3.22
block
(Vehicle Service MODEL)

the work of a vehicle from the time it leaves a PARKING POINT after parking until its next return to park at a PARKING POINT. Any subsequent departure from a PARKING POINT after parking marks the start of a new BLOCK. The period of a BLOCK has to be covered by DUTies

3.23
block part
(Vehicle Service MODEL)

part of a BLOCK corresponding to the different JOURNEY PARTs of the VEHICLE JOURNEYs in a BLOCK

3.24
boarding position
(Stop Place MODEL)

a location within a QUAY from which passengers may directly board, or onto which passengers may directly alight from a VEHICLE

3.25
booking arrangements
(Flexible Network MODEL)

booking arrangements for FLEXIBLE LINE

3.26
check constraint
(Check Constraint MODEL)

characteristics of a process that takes place at a SITE COMPONENT, such as check-in, security screening, ticket control or immigration, that may potentially incur a time penalty that should be allowed for when journey planning

3.27
check constraint delay
(Check Constraint MODEL)

time penalty associated with a CHECK CONSTRAINT

3.28
check constraint throughput
(Check Constraint MODEL)

throughput of a CHECK CONSTRAINT: the number of passengers who can pass through it in a specified interval

3.29
class in frame
(Generic Version MODEL)

the different CLASSEes IN REPOSITORY which can be relevant for corresponding VERSION FRAMEs

3.30
class in repository
(Generic Entity MODEL)

any ENTITY name belonging to the repository. E.g. DAY TYPE, PROPERTY OF DAY, TIME BAND, VEHICLE TYPE, DUTY, etc. are relevant instances of CLASS IN REPOSITORY in the context of Version Management

3.31
class of use
(Fare-Related Service Restriction MODEL)

a classification of fare and other service classes by category of user entitled to use them

3.32
common section
(Generic Point & Link MODEL)

a part of a public transport network where the ROUTEs of several JOURNEY PATTERNs are going in parallel and where the synchronisation of SERVICE JOURNEYs may be planned and controlled with respect to commonly used LINKs and STOP POINTs. COMMON SECTIONs are defined arbitrarily and need not cover the total lengths of topologically bundled sections

3.33
communication service
(Local Commercial Service MODEL)

specialisation of LOCAL SERVICE dedicated to communication services

3.34
complaints service
(Local Service Equipment MODEL)

specialisation of CUSTOMER SERVICE for COMPLAINTs

3.35
complex feature
(Generic Zone and Feature MODEL)

an aggregate of SIMPLE FEATUREs and/or other COMPLEX FEATUREs; e.g. a STOP AREA: combination of STOP POINTS; a train station: combination of SIMPLE FEATUREs (POINTs, LINKs) and COMPLEX FEATUREs (STOP AREAs)