SLOVENSKI STANDARD
SIST-TS CEN/TS 16614-3:2016

01-julij-2016

Javni prevoz - Izmenjava omrežnih in voznorednih podatkov (NeTEx) - 3. del: Format za izmenjavo informacij o vozovnicah

Public transport - Network and Timetable Exchange (NeTEx) - Part 3: Public transport fares exchange format

Öffentlicher Verkehr - Netzwerk- und Fahrplan Austausch (NeTEx) - Teil 3: Austauschformat für die Fahrkartenauskunft des öffentlichen Verkehrs

Transport public - Echange des données de réseau et d'horaires (NeTEx) - Partie 3 : Format d'échange d'informations voyageurs concernant le réseau de transport public

Ta slovenski standard je istoveten z: **CEN/TS 16614-3:2016**

ICS:

03.220.01	Transport na splošno	Transport in general
35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport

SIST-TS CEN/TS 16614-3:2016 **en**

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 16614-3

March 2016

ICS 35.240.60

English Version

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Ref. No. CEN/TS 16614-3:2016 E

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European foreword

This document (CEN/TS 16614-3:2016) 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 3 of the European Technical Specification known as "NeTEx". NeTEx provides a framework for specifying communications and data exchange protocols for organizations 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.

Part 1 is fully standalone, and Part 2 and Part 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 to keep the text readable. In particular a set of formatting conventions is followed that enhance the usual CEN writing rules in order to distinguish references to elements of the formal models within text:

— Transmodel terms and NeTEx conceptual model elements are in capital letters (JOURNEY PATTERN for example).

— NeTEx physical model names are in bold italic font and use camelcase style with no spaces (***JourneyPattern*** for example).

— NeTEx physical model attribute 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.

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; publicising fares, issuing tickets and receipts; providing real-time information on service running, and so on.

The first two parts of the European Technical Specification NeTEx specifies a Network and Timetable Exchange for Public Transport. It is intended to be used to exchange data relating to scheduled public transport between the systems of PT organiZations. 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.

This European Technical Specification (NeTex – Part 3) specifies exchanges of Public Transport fares between systems and organisations. It is a complement to the Parts 1 and 2 in the sense that it uses a subset of concepts defined there.

Well-defined, open interfaces have a crucial role in improving the economic and technical viability of Public Transport Information Systems of all kinds. Using standardized 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, (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 12986), IFOPT (EN 28701) and SIRI (CEN/TS 15531-4, CEN/TS 15531-5 and EN 15531-1, EN 15531-2, EN 15531-3[1]) 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 NeTEx is a refinement and an implementation of Transmodel and IFOPT; the definitions and explanations of these concepts are extracted directly from the respective standard and reused in NeTEx, sometimes with adaptations 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 Fares scope

This Part 3 of NeTEx, is specifically concerned with the exchange of fare structures and fare data, using data models that relate to the underlying network and timetable models defined in Part 1 and Part 2 and the Fare Collection data model defined in Transmodel V51. See the use cases below for the overall scope of Part 3. In summary, it is concerned with data for the following purposes:

(i) To describe the many various possible fare structures that arise in public transport (for example, flat fares, zonal fares, time dependent fares, distance based fares, stage fares, pay as you go fares, season passes, etc., etc.).

(ii) To describe the fare products that may be purchased having these fare structures and to describe the conditions that may attach to particular fares, for example if restricted to specific groups of users, or subject to temporal restrictions. These conditions may be complex.

(i) To allow actual price data to be exchanged. Note however that NeTEx does not itself specify pricing algorithms or how fares should be calculated. This is the concern of Fare Management Systems. It may be used may be used to exchange various parameters required for pricing calculations that are needed to explain or justify a fare.

(iii)To include the attributes and the text descriptions necessary to present fares and their conditions of sale and use to the public.

NeTEx should be regarded as being 'upstream' of retail systems and allows fare data to be managed and integrated with journey planning and network data in public facing information systems. It is complementary to and distinct from the 'downstream' ticketing and retail systems that sell fares and of the control systems that validate their use. See 'Excluded Use Cases' below for further information on the boundaries of NeTEx with Fare Management Systems.

1.3 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, air journeys, and air fares, but there has not been any specific consideration of any additional requirements that apply specifically to air transport.

[1] Under development

1.4 Compatibility with existing standards and recommendations

The overall approach for the definition of fares within NeTEx Part 3 follows the approach used by Transmodel V5.1, namely the definition of access rights rather than of just products.

This approach, used in Transmodel V5.1 (Fare Collection data model) to specify the access rights related to the urban public transport (for all urban modes) has been extended to cover access rights for long-distance rail.

NOTE The concepts from Transmodel V5.1 and IFOPT used and/or modified by NeTEx are incorporated into Transmodel V6 to guarantee compatibility and coherence of standards.

Concepts covered in NeTEx Part 1 and 2 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 and train routing restrictions.

In the case of long distance train access rights, 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. The relate in partoiucalr to the B1 (Non Reservation Tickets), B2 (Integrated Reservation Tickets) and B3 (Special Fares) along with various UIC Leaflets.

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

The exchange of data in NeTEx format can be undertaken using a variety of protocols. For example: through dedicated web services, through data file exchanges, or by using the SIRI exchange protocol as described in part 2 of the SIRI documentation. NeTEx adds additional services using the common SIRI transport mechanism.

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.

CEN/TS 16614-1:2014, *Public transport — Network and Timetable Exchange (NeTEx) — Part 1: Public transport network topology exchange format*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 16614-1:2014 and the following apply.

3.1
access right in product
(Fare Product MODEL)
a VALIDABLE ELEMENT as a part of a PRE-ASSIGNED FARE PRODUCT, including its possible order in the set of all VALIDABLE ELEMENTs grouped together to define the access right assigned to that PRE-ASSIGNED FARE PRODUCT

3.2
access right parameter assignment
(Validity Parameters MODEL)
the assignment of a fare collection parameter (referring to geography, time, quality or usage) to an element of a fare system (access right, validated access, control mean, etc.)

3.3
amount of price unit
(Fare Product MODEL)
a FARE PRODUCT consisting in a stored value of PRICE UNITs: an amount of money on an electronic purse, amount of units on a value card etc.

3.4
blacklist
(Fare Contract MODEL)
a list of identified TRAVEL DOCUMENTs or CONTRACTs the validity of which has been cancelled temporarily or permanently, for a specific reason like loss of the document, technical malfunction, no credit on bank account, offences committed by the customer, etc.

3.5
border point
(Fare Zone MODEL)
a POINT on the Network marking a boundary for the fare calculation. May or may not be a SCHEDULED STOP POINT

3.6
cancelling
(Cancelling Usage Parameters MODEL)
parameter giving conditions for cancelling of a purchased access right

3.7
capped discount right
(Fare Product MODEL)
a specialisation of SALE DISCOUNT RIGHT where the discount is expressed as a rule specifying a ceiling for a given time interval. For example, the London Oyster card fare, which charges for each journey until travel equivalent to a day pass has been consumed after which further travel is free at that day

3.8
capping rule
(Fare Product MODEL)
a capping limit for a given time interval, where the capping is expressed by another product. For example, the London Oyster card fare, which charges for each journey until travel equivalent to a day pass for the mode of travel has been consumed

3.9
capping rule price
(Fare Product MODEL)
a set of all possible price features of a CAPPING RULE: default total price, discount in value or percentage etc.

3.10
cell
(Fare Table MODEL)
an unique individual combination of features within a FARE TABLE, used to associate a FARE PRICE with a fare element

3.11
charging moment
(Fare Product MODEL)
a classification of FARE PRODUCTs according to the payment method and the account location: pre-payment with cancellation (throw-away), pre-payment with debit on a value card, pre-payment without consumption registration (pass), post-payment etc.

3.12
charging policy
(Charging Usage Parameters MODEL)
parameter governing minimum amount and credit allowed when consuming a FARE PRODUCT

3.13
commercial profile
(Eligibility Usage Parameters MODEL)
a category of users depending on their commercial relations with the operator (frequency of use, amount of purchase etc.), often used for allowing discounts

3.14
companion profile
(Eligibility Usage Parameters MODEL)
the number and characteristics of the persons entitled to travel in a group or as companions to another USER PROFILE

3.15
controllable element
(Validable Element MODEL)
the smallest controllable element of public transport consumption, all along which any VALIDITY PARAMETER ASSIGNMENT remains valid

3.16
controllable element in sequence
(Validable Element MODEL)
a CONTROLLABLE ELEMENT as a part of a FARE STRUCTURE ELEMENT, including its possible order in the sequence of CONTROLLABLE ELEMENTs grouped together to form that FARE STRUCTURE ELEMENT, and its possible quantitative limitation

3.17
controllable element price
(Validable Element MODEL)
a set of all possible price features of a CONTROLLABLE ELEMENT: default total price, discount in value or percentage etc.

3.18
customer
(Fare Contract MODEL)
an identified person or organisation involved in a fare process. There may be a CONTRACT between the CUSTOMER and the OPERATOR or the AUTHORITY ruling the consumption of services

3.19
discounting rule
(Fare Calculation Parameters MODEL)
a price calculation rule determined by a set of discounts, depending upon a USAGE PARAMETER, to be applied to a FARE PRICE

3.20
distance matrix element
(Distance Matrix Element MODEL)
a cell of an origin-destination matrix for TARIFF ZONEs or STOP POINTs, expressing a fare distance for the corresponding trip: value in km, number of fare units etc.

3.21
distance matrix element price
(Distance Matrix Element MODEL)
a set of all possible price features of a DISTANCE MATRIX ELEMENT: default total price etc.

3.22
distribution assignment
(Sales Package MODEL)
an assignment of the COUNTRY and/or DISTRIBUTION CHANNEL through which a product may or may not be distributed

3.23
distribution channel
(Sales Distribution MODEL)
a type of outlet for selling of a product

3.24
entitlement given
(Entitlement Parameters MODEL)
parameter indicating whether a particular FARE PRODUCT provides an entitlement to buy or use an access right

3.25
entitlement product
(Fare Product MODEL)
a precondition to access a service or to purchase a FARE PRODUCT issued by an organisation that may not be a PT operator (e.g. military card)

3.26
entitlement required
(Entitlement Parameters MODEL)
parameter indicating whether a particular FARE PRODUCT requires an entitlement to by or use an access right

3.27
exchanging
(Booking Usage Parameters MODEL)
whether and how the access right may be exchanged for another access right

3.28
fare
(Use Case)
from the customer perspective: the amount that a customer has to pay for a journey or for acquiring a product

3.29
fare day type
(Fare Calculation Parameters MODEL)
a type of day used in the fare collection domain, characterised by one or more properties which affect the definition of access rights and prices in the fare system

3.30
fare demand factor
(Quality Fare Structure MODEL)
a named set of parameters defining a period of travel with a given price, for example off peak, peak, super off peak, etc.

3.31
fare element in sequence
(Common Fare Structure MODEL)
a FARE ELEMENT as a part of an ELEMENT, including its possible order in the sequence of FARE ELEMENTs

3.32
fare frame
(Fare Frame MODEL)
the set of all fare data defined for a specific VEHICLE MODE to which the same VALIDITY CONDITIONs have been assigned

3.33
fare frame defaults
(Fare Frame MODEL)
set of pricing parameters and values to apply to an individual element in the frame if no explicit value is specified on the element

3.34
fare interval
(Common Fare Structure MODEL)
an interval based aspect of the fare structure

3.35
fare point in pattern
(Fare Zone MODEL)
a POINT IN PATTERN which represents the start or end of a FARE SECTION, or a point used to define a SERIES CONSTRAINT

3.36
fare price
(Fare Price MODEL)
price features DEFINED BY DEFAULT characterizing different PRICE GROUPs

3.37
fare product
(Fare Product MODEL)
an immaterial marketable element (access rights, discount rights, etc.), specific to a CHARGING MOMENT

3.38
fare product price
(Fare Product MODEL)
a set of all possible price features of a FARE PRODUCT: default total price, discount in value or percentage etc.

3.39
fare quota factor
(Quality Fare Structure MODEL)
a named set of parameters defining a number of quota fares available of a given denomination

3.40
fare scheduled stop point
(Fare Zone MODEL)
a specialisation of SCHEDULED STOP POINT describing a stop with fare accounting and routing characteristics

3.41
fare section
(Fare Zone MODEL)
a subdivision of a JOURNEY PATTERN consisting of consecutive POINTs IN JOURNEY PATTERN, used to define an element of the fare structure

3.42
fare structure
(Use Case)
set of parameters that determine the basic tariffs

3.43
fare structure element
(Fare Structure Element MODEL)
a sequence or set of CONTROLLABLE ELEMENTs to which rules for limitation of access rights and calculation of prices (fare structure) are applied

3.44
fare structure element in sequence
(Fare Structure Element MODEL)
a FARE STRUCTURE ELEMENT as a part of a VALIDABLE ELEMENT, including its possible order in the sequence of FARE STRUCTURE ELEMENTs forming that VALIDABLE ELEMENT, and its possible quantitative limitation