

INSPIRE validator i testiranje usklađenosti na primjeru skupa podataka Registar geografskih imena



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Državna geodetska uprava

Sadržaj

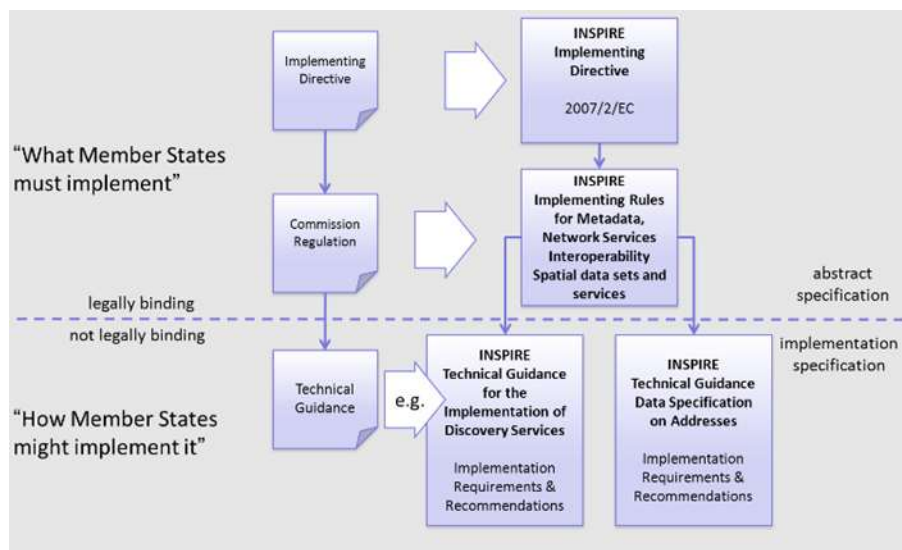
- Uvod
 - cilj i svrha INSPIRE validatora
 - veza između INSPIRE dokumenata
 - pristup i logika testiranja
 - razvojni proces
 - Apstraktni testni paket (ATS)
 - Izvršni testni paket (ETS)
- Primjer testiranja skupa podataka Registar geografskih imena
 - test za provjeru sheme
 - test za popis kodova
 - test za ograničenja
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Cilj i svrha INSPIRE validatora

- JRC u srpnju 2017. objavio verziju 1.0 zajedničkog INSPIRE validatora
- Pomaže pružateljima podataka, pružateljima rješenja i nacionalnim koordinatorima provjeriti jesu li skupovi podataka, mrežne usluge i metapodaci zadovoljili uvjete definirane u INSPIRE Provedbenim pravilima i Tehničkim smjernicama.
- Pruža detaljna izvješća o testiranju
- Omogućava testiranje za:
 - skupove podataka (Skupina I)
 - mrežne usluge (usluga preuzimanja WFS i ATOM)
 - metapodatke

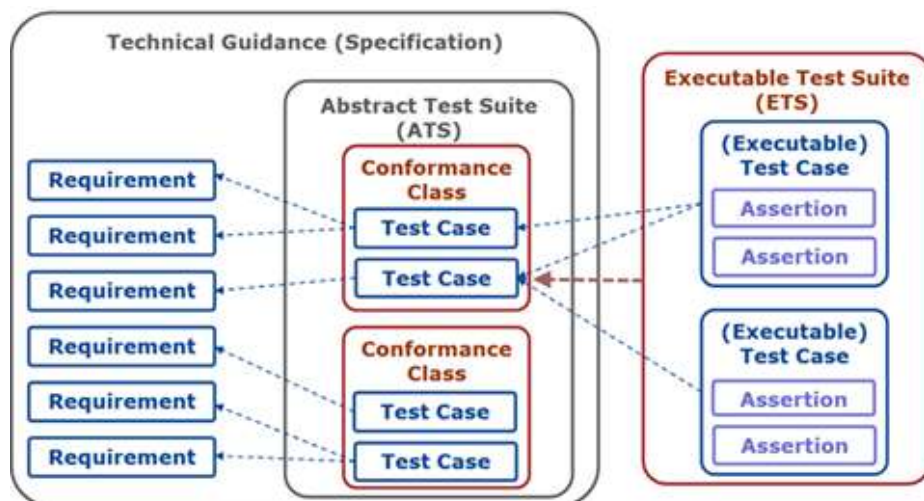
Veza između INSPIRE dokumenata

- Provedbena Pravila (IR) – zakonski obvezujuća (zahtjevi koji se moraju provesti)
- Tehničke smjernice (TG) navode implementacijske opcije za Provedbena pravila (kako se mogu provesti)
- Zahtjevi precizno definirani u Tehničkim smjernicama i grupirani u klase usklađenosti
- Opći cilj je maksimizirati interoperabilnost INSPIRE skupova podataka



Pristup i logika testiranja

- Klasa usklađenosti je skup zahtjeva definiranih u specifikaciji
- Klase usklađenosti definirane u apstraktnom testnom paketu (ATS) – Prilog A Tehničkih specifikacija
- Svaka klasa usklađenosti obuhvaća nekoliko testnih slučajeva
- Svaki testni slučaj testira jedan ili više zahtjeva iz Tehničkih smjernica
- Testni slučajevi se izvršavaju putem računalnih kodova definiranih u izvršnom testnom paketu (ETS)



Razvojni proces

- Razvojni proces (od Tehničkih smjernica preko ATS-a do razvoja ETS-a)

Tehničke smjernice



Apstraktni testni paket (ATS)



Izvršni testni paket (ETS)

IR Requirement
Article 6
Code Lists and Enumerations

(...)

2) Code lists may be hierarchical. Values of hierarchical code lists may have a more generic parent value. Where the valid values of a hierarchical code list are specified in a table in this Regulation, the parent values are listed in the last column.

The type of code list and whether it is hierarchical or not is also indicated in the feature catalogues.

5.2.4.2. Obligations on data providers

IR Requirement
Article 6
Code Lists and Enumerations

(...)

3) Where, for an attribute whose type is a code list as referred to in points (b), (c) or (d) of paragraph 1, a data provider provides a value that is not specified in this Regulation, that value and its definition shall be made available in a register.

4) Attributes or association roles of spatial object types or data types whose type is a code list may only take values that are allowed according to the specification of the code list.

Code list values

Version 1

Requires tests whether all attributes whose value type is a code list take the values set out therein.

Prerequisites

Test method

When an attribute has a code list as its type, verify that the values comply with the definitions and exclude the values set out in Annex II of the regulation. To pass this test that any instance of an attribute

- takes only values explicitly specified in the INSPIRE code list register when the code lists extensibility is 'open'.

Otherwise report `InvalidCodeListValue`.

In the Geographical Names application scheme, the following properties have to be tested:

- FeatureType (s): Valid values:**
 - administrativeUnit
 - building
 - hydrography
 - landuse
 - landuse2
 - populationPlace
 - protectedArea
 - transportNetwork
 - water
- FeatureType (s): Valid values:**
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/featureTypeAdministrativeUnit>
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/building>
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/hydrography>
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/landuse>
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/landuse2>
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/populationPlace>
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/protectedArea>
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/transportNetwork>
 - <http://inspire.ec.europa.eu/ontology/inspire/featureType/water>

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Apstraktni testni paket (ATS)

- Dokumentirani zapis ljudima razumljiv, sadrži:
 - svrhu testiranja
 - metodu testiranja
 - reference na zahtjeve iz Tehničkih smjernica i Provedbenih pravila
 - povratne poruke ukoliko testirani zahtjevi nisu ispunjeni

Table 6. Overview of the tests within this Abstract Test Suite.

Annex A (normative) Abstract Test Suite	
A.1 Application Schema Conformance Class	
A.1.1 Schema element denomination test	
A.1.2 Value type test	
A.1.3 Value test	
A.1.4 Attributes/associations completeness test	
A.1.5 Abstract spatial object test	
A.1.6 Constraints test	
A.1.7 Geometry representation test	
A.2 Reference Systems Conformance Class	
A.2.1 Datum test	
A.2.2 Coordinate reference system test	
A.2.3 View service coordinate reference system test	
A.2.4 Temporal reference system test	
A.2.5 Units of measurements test	
A.3 Data Consistency Conformance Class	
A.3.1 Unique identifier persistence test	
A.3.2 Version consistency test	
A.3.3 Life cycle time sequence test	
A.3.4 Update frequency test	
A.4 Metadata IR Conformance Class	
A.4.1 Metadata for interoperability test	
A.5 Information Accessibility Conformance Class	
A.5.1 CRS publication test	
A.6 Data Delivery Conformance Class	
A.6.1 Encoding compliance test	
A.7 Portrayal Conformance Class	
A.7.1 Layer designation test	



Abstract Test Suite: INSPIRE Data Specification Template (DRAFT)

The specification specifies the following conformance classes:

Conformance class	Standardization target
Schemas	INSPIRE spatial data set encoded in GML
Data consistency	INSPIRE spatial data set
Information accessibility	INSPIRE spatial data set
Reference systems	INSPIRE spatial data set
Metadata for interoperability	ISO 19115/19119 metadata record

Rules for HTTP requests

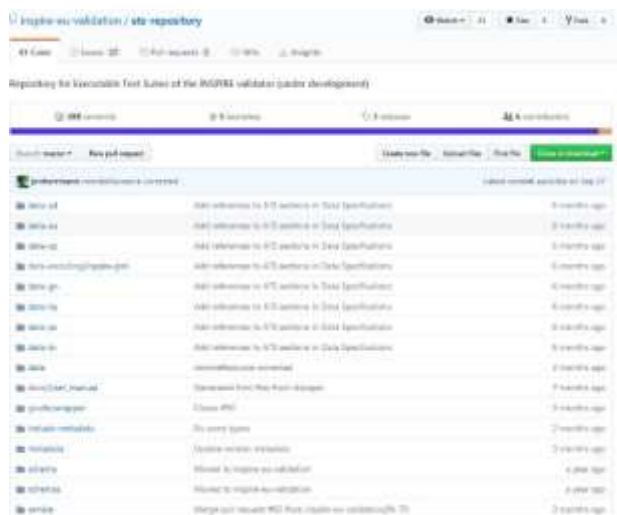
The INSPIRE technical guidance documents are in general unspecific on the details of HTTP requests to access resources. The following rules apply to all HTTP requests unless a test case explicitly states deviations from these rules.

Use of HTTPS

Where HTTP is mentioned as the protocol, HTTPS may be used, too. SSL certificates must be valid and issued by a trusted Certification Authority.

Izvršni testni paket (ETS)

- Skup testova koji testiraju izvor po svim zahtjevima iz pripadajuće klase usklađenosti
- Računalni kod putem kojeg se izvršavaju testovi navedeni u ATS-u
- Implementiran u grafičko sučelje INSPIRE validatora
- Postoje različite opcije za provedbu validacije:
 - mogu se upotrijebiti službeni ETS-ovi koji se nalaze u ETS Repozitoriju
 - može se pozvati direktno on line aplikacija INSPIRE validatora (u kojoj su ugrađeni ETS-ovi)
 - mogu se testirati vlastiti ETS-ovi koji su razvijeni prema dogovorenim ATS pravilima



VALIDACIJA SKUPA PODATAKA REGISTRA GEOGRAFSKIH IMENA

Primjer testiranja skupa podataka

- Testirani skup podataka: Registar geografskih imena-INSPIRE
- INSPIRE Tema: Geografska imena
- Test izvršen uz pomoć korisničkog sučelja INSPIRE validatora:
<http://inspire-sandbox.jrc.ec.europa.eu/etf-webapp/>
- Skup podataka preuzet putem usluge za preuzimanje WFS sa geoportala NIPP-a:
<http://cgn.dgu.hr/deegree///services/wfs?service=WFS&request=GetCapabilities&version=2.0.0>
- Skup podataka sadrži 63 534 obilježja veličine 96 MB
- Trajanje testiranja: 2 min i 30 s
- Izvješće dostupno na:
<http://inspire-sandbox.jrc.ec.europa.eu/etf-webapp/#test-reports>



INSPIRE tema: geografska imena

- Definicija:

Imena područja, regija, mjesta, velikih gradova, predgrađa, gradova ili naselja, ili bilo kojeg geografskog ili topografskog obilježja od javnog ili povijesnog značenja.

- Tehničke specifikacije

http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_GN_v3.1.pdf

- Apstraktni testni paket

<https://github.com/inspire-eu-validation/data-gn>

- Izvršni testni paket

<https://github.com/inspire-eu-validation/ets-repository/tree/master/data-gn>

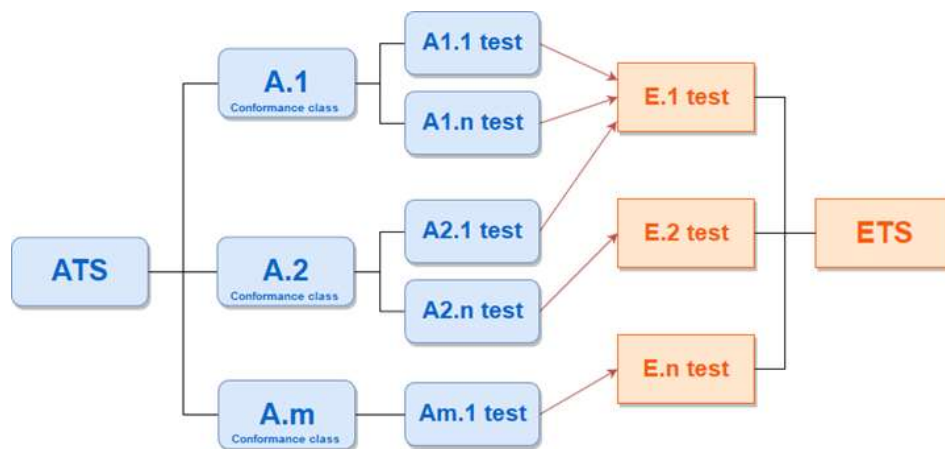
- U TS za temu Geografska imena – 7 TS zahtjeva i 32 preporuke

Tipovi testova – klase usklađenosti

- Zahtjevi koji se testiraju su grupirani u klase usklađenosti
- Mogu biti općeniti i specifični za temu
- Klase usklađenosti se odnose na zahtjeve vezane za:

- aplikacijsku shemu
- dosljednost podataka
- informacijsku dostupnost
- referentne sustave

- Različiti testovi provjeravaju:
 - zahtjeve iz Provedbenih pravila
 - vrijednosti iz popisa kodova
 - ograničenja iz kataloga obilježja



- Usklađenost s određenom klasom – skup mora proći sve testove definirane u toj klasi usklađenosti

Geografska imena: test za provjeru sheme

9.3.1.1. Specific requirements for GML encoding

This data specification proposes the use of GML as the default encoding, as recommended in sections 7.2 and 7.3 of [DS-D2.7]. GML is an XML encoding in compliance with ISO 15118, as required in Article 7(1). For details, see [SD 19136], and in particular Annex E (UML-to-GML application schema encoding rules).

The following TG requirements need to be met in order to be conformant with GML encodings.

TG Requirement 8: Data instance (XML) documents shall validate without error against the provided XML schema.

A.9.5 Encoding schema validation test

a) **Purpose:** Verify whether the provided dataset follows the rules of default encoding specified in section 9 of this document.

c) **Reference:** section 9 of this technical guideline.

b) **Test Method:** Inspect whether provided encoding(s) is conformant to the encoding(s) for the relevant application schema(s) as defined in section 9.



Schema validation

Version: 1

Purpose: Verify that all XML documents validate against their XML schema(s).

Prerequisites:

Test method:

- Verify for each XML document that the root element that a `schemasLocation` attribute is provided. Otherwise report `noSchemasLocation`.
- Validate each document against the schema(s) specified in the `schemasLocation` attribute using their XML schema validation. Otherwise report `invalidSchema`.

References:

- TG DC Template 0 requirement Article 3
- TG DC Template 0 requirement Article 4 (2)
- TG DC Template 0 requirement Article 4 (3)
- TG DC Template 0 requirement Article 5 (2)
- TG DC Template 0 requirement Article 5 (3)
- TG DC Template 0 requirement Article 6 (2)
- TG DC Template 0 requirement Article 6 (3)
- TG DC Template 0 requirement 7
- TG DC Template 0 requirement 8

Test type: Automated

Apstraktni testni paket



```
...
<!-- REQUIREMENT 8: Data instance (XML) documents shall validate without error against the provided XML schema. -->
Source: <a href='\"#\">Abstract Test Case: Schema validation</a>, INSPIRE Data Specification System, A.9.5
...
<!-- REQUIREMENT 8: Data instance (XML) documents shall validate without error against the provided XML schema. -->
Status: Passed
Duration: 0.001 s
...

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Tehničke smjernice

- Zahtjev: XML dokument treba testirati bez pogreške u odnosu na predviđenu XML shemu

Prilog A Tehničkih smjernica

- Test: Provjerava da je kodiranje usklađeno sa kodiranjem za određenu aplikacijsku shemu, XML shema – predefinirana, provjerava strukturu xml dokumenta (vrijednosti elemenata, atributa, tipove podataka itd.)

Verify for each XML document that the `schemasLocation` attribute is provided in the root element.

Relevant requirements:

- TG Requirement 8: Data instance (XML) documents shall validate without error against the provided XML schema.

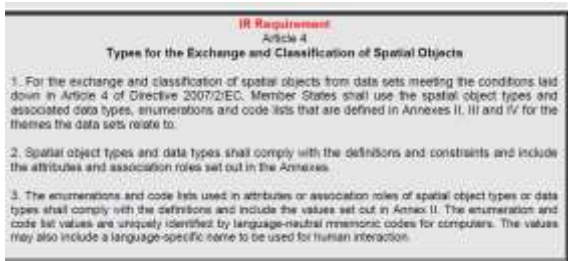
Source: [Abstract Test Case: Schema validation](#), INSPIRE Data Specification System, A.9.5

Status: Passed
Duration: 0.001 s

Završno izvješće validatora

Izvršni testni paket

Geografska imena: test za vrijednosti popisa kodova



A.1.3 Value test

- a) **Purpose:** Verify whether all attributes or association roles whose value type is a code list or enumeration have the values set out therein.
- b) **Reference:** Art 4 (3) of Commission Regulation No 1089/2010.
- c) **Test Method:** When an attribute / association role has an enumeration or code list as its type, compare the values of each instance with those provided in the application schema. To pass this tests any instance of an attribute / association role

NamedPlaceTypeValue	
Definition:	The type of a named place.
Extensibility:	none
Identifier:	http://inspire.ec.europa.eu/codeList/NamedPlaceTypeValue
Values:	The allowed values for this code list comprise only the values specified in I table below.
administrativeUnit	
Name:	administrative unit
Definition:	Units of administration, dividing areas where Member States have and exercise jurisdictional rights, for local, regional and national governan separated by administrative boundaries.
building	
Name:	building
Definition:	Geographical location of buildings.
hydrography	
Name:	hydrography

Code list values	
Version:	1
Purpose:	Only member of attributes whose value type is a code list value for version one of the schema.
Identifier:	
Extensibility:	none
Values:	When an attribute has a code list as its type, verify that the values comply with the definition and include the values set out in table 2 of this regulation. To pass the test that any instance of an attribute: <ul style="list-style-type: none"> • when only value explicitly specified in the GMLSC code list register shall be used for its extensibility or none.
Information system identification details	
System:	INSPIRE
Code list values:	<ul style="list-style-type: none"> • AdministrativeUnit: <ul style="list-style-type: none"> 1 administrative 2 building 3 hydrography 4 settlement 5 waterbody 6 geographical 7 geographical 8 management 9 other • Building: <ul style="list-style-type: none"> 1 hydrography 2 settlement 3 geographical 4 geographical 5 geographical 6 geographical 7 geographical 8 geographical 9 other

Prilog C tehničkih smjernica

- Vrijednosti popisa kodova za NamedPlace data type (administrativne jedinice, zgrade, itd.)

Tehničke smjernice

- Zahtjev: svi atributi koji imaju vrijednost atributa popis kodova trebaju poprimiti vrijednosti koje su navedene u popisu kodova

Prilog A Tehničkih smjernica

- Test: Kada atribut ima vrijednost popis kodova usporedi s vrijednostima iz aplikacijske sheme. Da bi test prošao svaki atribut treba imati vrijednosti definirane u popisu kodova

Apstraktni testni paket



```

1  <!-- Test package for NamedPlaceTypeValue -->
2  <test-suite name="NamedPlaceTypeValue" >
3    <test name="AdministrativeUnit" >
4      <test-parameters >
5        <parameter name="codeList" value="http://inspire.ec.europa.eu/codeList/NamedPlaceTypeValue" />
6      </test-parameters >
7      <test-assertion name="AdministrativeUnit" />
8    </test >
9    <test name="Building" >
10     <test-parameters >
11       <parameter name="codeList" value="http://inspire.ec.europa.eu/codeList/NamedPlaceTypeValue" />
12     </test-parameters >
13     <test-assertion name="Building" />
14   </test >
15 </test-suite >
  
```



Završno izvješće validatora

Izvršni testni paket

Geografska imena: test za ograničenja

IR Requirement
Article 4
Types for the Exchange and Classification of Spatial Objects

1. For the exchange and classification of spatial objects from data sets meeting the conditions laid down in Article 4 of Directive 2007/2/EC, Member States shall use the spatial object types and associated data types, enumerations and code lists that are defined in Annexes I, II and IV for the themes the data sets relate to.
2. Spatial object types and data types shall comply with the definitions and constraints and include the attributes and association roles set out in the Annexes.
3. The enumerations and code lists used in attributes or association roles of spatial object types or data types shall comply with the definitions and include the values set out in Annex II. The enumeration and code list values are uniquely identified by language-neutral mnemonic codes for computers. The values may also include a language-specific name to be used for human interaction.

A.1.6 Constraints test

a) **Purpose:** Verification whether the instances of spatial object and/or data types provided in the dataset adhere to the constraints specified in the target application schema(s).

b) **Reference:** Art. 3, Art 4(1), and Art 4(2) of Commission Regulation No 1089/2010.

c) **Test Method:** Examine all instances of data for the constraints specified for the corresponding spatial object / data type. Each instance shall adhere to all constraints specified in the target application schema(s).

NOTE: Further technical information is in the Feature catalogue and UML diagram of the application schema(s) in section 5.2.

PronunciationOfName	
Multiplicity:	0..1
Stereotypes:	+voidable
Constraint: pronunciationSoundLink or pronunciationIPA not empty	
Natural language:	At least one of the two attributes pronunciationSoundLink and pronunciationIPA shall not be void.
UML:	self.pronunciationIPA != null() or self.pronunciationSoundLink != null()
OCL:	self.pronunciationIPA != null() or self.pronunciationSoundLink != null()

Katalog obilježja tehničkih smjernica

- Ograničenje za atribut Izgovor imena

Constraints

Version 1

Purpose: Verify that the features provided in the dataset adhere to the constraints specified in the INSPIRE application schema.

Prerequisites

Test method

Verify that the OCL constraints listed below that are specified in the UML model of the application schema are met. In voidable features against the constraints. For a constraint constraint name: constraintName.

For constraints that require following a referenced resource and the resource cannot be retrieved, report in the result the set of the following two types of constraint in disabled attributes filter a "F" followed by a digit in the same document as a HTTP URL.

Automated only for constraints on commonly used data types

- At least one of the two attributes pronunciationSoundLink and pronunciationIPA in type pronunciationOfName shall not be void. OCL: 'self.pronunciationIPA != null()' or 'self.pronunciationSoundLink != null()'. Verify that for all features either or both pronunciationSoundLink or pronunciationIPA is not void.

References

- ISO 19115 Topical IR requirement Article 4 (2)

Apstraktni testni paket



```
<?xml version="1.0" encoding="UTF-8" >
<FeatureCatalogue xmlns="http://www.opengis.net/inspire/1.0" >
  <FeatureType name="PronunciationOfName" >
    <Constraint name="PronunciationOfNameConstraint" >
      <OCLExpression language="UML" >
        self.pronunciationIPA != null() or self.pronunciationSoundLink != null()
      </OCLExpression >
    </Constraint >
  </FeatureType >
  <FeatureType name="PronunciationOfName" >
    <Constraint name="PronunciationOfNameConstraint" >
      <OCLExpression language="UML" >
        self.pronunciationIPA != null() or self.pronunciationSoundLink != null()
      </OCLExpression >
    </Constraint >
  </FeatureType >
  </FeatureCatalogue >
</FeatureCatalogue >
```



Izvršni testni paket



Tehničke smjernice

- Zahtjev: obilježja navedena u skupu podataka odgovaraju ograničenjima navedenim u INSPIRE aplikacijskoj shemi

Prilog A Tehničkih smjernica

- Test: ispituje sve tipove podataka prema ograničenjima navedenim u INSPIRE aplikacijskoj shemi

Verify that the features provided in the dataset adhere to the constraints specified in the INSPIRE application schema. This is usually part of the tests of the corresponding application schema. However, for data types that are used across the INSPIRE application schema, that is test data in this test suite to avoid duplicating the same test in every test suite. The relevant data types for the Annex I table Feature with constraints are: Topographic scheme.

Version 1.0 (1)

Purpose: Verify that the features provided in the dataset adhere to the constraints specified in the INSPIRE application schema. This is usually part of the tests of the corresponding application schema. However, for data types that are used across the INSPIRE application schema, that is test data in this test suite to avoid duplicating the same test in every test suite. The relevant data types for the Annex I table Feature with constraints are: Topographic scheme.

Prerequisites:

Test method:

Verify that the OCL constraints listed below that are specified in the UML model of the application schema are met. In voidable features against the constraints. For a constraint constraint name: constraintName.

For constraints that require following a referenced resource and the resource cannot be retrieved, report in the result the set of the following two types of constraint in disabled attributes filter a "F" followed by a digit in the same document as a HTTP URL.

Automated only for constraints on commonly used data types

- At least one of the two attributes pronunciationSoundLink and pronunciationIPA in type pronunciationOfName shall not be void. OCL: 'self.pronunciationIPA != null()' or 'self.pronunciationSoundLink != null()'. Verify that for all features either or both pronunciationSoundLink or pronunciationIPA is not void.

References:

- IR Requirement Article 4 (2): Types for the Exchange and Classification of Spatial Objects: Spatial object types and data types shall comply with the definitions and constraints and include the attributes and association roles set out in the Annexes.

Završno izvješće validatora

Zaključak

- Validator služi za testiranje primjene svih važnih zahtjeva i INSPIRE usklađenosti podataka
- Jednostavan za razumjeti i koristiti uz određeno tehničko znanje
- Rezultati pouzdani
- Dostupno završno izvješće o rezultatu testa (na serveru 8 dana)
- Baziran na zahtjevima iz Tehničkih smjernica
- Potrebno još razviti testove za Skupinu II i III i preostale mrežne usluge
- Prijedlog za unaprjeđenje – grafička vizualizacija izvješća (ne samo tekst), dostupnost izvješća o testiranju u obliku pdf-a (ne samo html)
- Povratne informacije i sugestije o daljnjem unaprjeđenju od strane korisnika (GitHub platforma)

Hvala na pažnji!