

Open European Location Services

Title **WFSs for Open ELS products**
Speaker **Marcin Grudzień**
Event **Contributing to ELS / OpenELS workshop**
Date **2018-09-26**



Plan

- Principles
- Specification documents
- Production process
- Sample services

Principles



General principles

- Open ELS Download WFS services provide data in INSPIRE or ELF data model
 - Themes: Addresses, Buildings, TN-Road, TN-Rail
 - Download services published in INSPIRE data model are acceptable. However, services provided in ELF data model are preferable.
 - ELF data model is conformant to INSPIRE data model
 - Implementation of ELF data model = implementation of INSPIRE data model
 - However, implementation of INSPIRE data model <> implementation of ELF data model
 - For theme Addresses the ELF and INSPIRE data models are identical

Specification documents



INSPIRE data specification

- Provide
 - harmonised data specification for the spatial data themes Addresses, Buildings, Transport Networks
- Cover
 - Data content and data structure description
 - Information about reference systems
 - Data Quality requirements
 - Metadata requirements
 - Delivery requirements
 - Portrayal requirements (for view services)



INSPIRE
Infrastructure for Spatial Information in Europe

D2.8.1.5 Data Specification on Addresses – Technical Guidelines

Title	D2.8.1.5 Data Specification on Addresses – Technical Guidelines
Creator	INSPIRE Thematic Working Group Addresses
Date	2014-04-17
Subject	INSPIRE Data Specification for the spatial data theme Addresses
Publisher	European Commission Joint Research Centre
Type	Text
Description	This document describes the INSPIRE Data Specification for the spatial data theme Addresses.
Contributor	Members of the INSPIRE Thematic Working Group Addresses
Format	Portable Document Format (pdf)
Source	
Rights	Public
Identifier	D2.8.1.5_v3.1
Language	En
Relation	Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)
Coverage	Project duration

INSPIRE data specification

- Relevant links

- AD –

- <https://inspire.ec.europa.eu/id/document/tg/ad>

- BU –

- <https://inspire.ec.europa.eu/id/document/tg/bu>

- TN –

- <https://inspire.ec.europa.eu/id/document/tg/tn>



INSPIRE
Infrastructure for Spatial Information in Europe

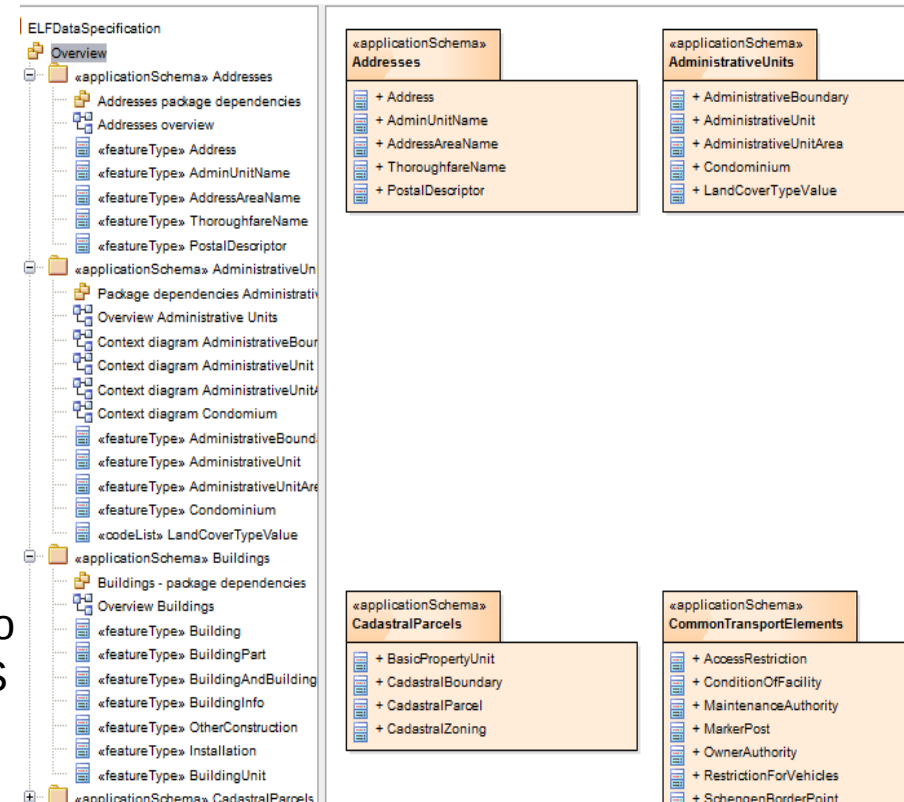
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ELF/OpenELS data model

- Provides
 - Extensions to the INSPIRE data models
- Covers
 - Dependencies between theme packages
 - Overviews of UML models
 - Feature types
 - Data types
 - Code lists
 - Attributes
 - Associations
 - Code lists values
- <http://www.elfproject.eu/documentation/specification/elf-data-model>

Only specific to
ELF/OpenELS



INSPIRE versus ELF/OpenELS data model

- AD – the same
- BU – code list extension
 - BuildingNatureValue
 - CurrentUseValue
- TN common elements
 - Additional feature type: ShengenBorderPoint
 - Additional attribute: veritcalRelation
 - Additional code list: VerticalRelationValue

INSPIRE versus ELF/OpenELS data model

- TN Rail
 - Additional feature type RailwayClass
 - Additional attributes: transEuropeanTransportNetwork, facilityType, RailwayPowerMethodCode, railwayClass, speedClass
 - Additional code lists: RailwayFacilityTypeValue, RailwayClassCode, RailwayPowerMethodCode, RailwayPowerMethodCode, RailwaySpeedClassValue
- TN Road
 - Additional feature type: InterchangePoint
 - Additional attribute: transEuropeanTransportNetwork
 - Additional code list: TypeOfInterchangeValue

ELF data specification

- Provides relevant information in more descriptive way
- http://elfproject.eu/sites/default/files/ELF_DataSpecification_v0.12_20160328.pdf

ELF WP 2	Reference: ELF_DataSpecification ELF Data Specification	2016-03-28	
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ELF Data Specification

Title	ELF Data Specification for topographic and administrative reference data at all levels of detail
Creator	WP2
Date	2016-03-24
Subject	ELF Data Specification for all LoD
Description	This document describes the ELF Data Specification for all levels of detail considered by ELF.
Format	Portable Document Format (pdf)
Source	
Rights	ELF project
Identifier	ELF_DataSpecification_v1.0
Language	En

Version history:

Version number	Date	Modified by	Comments
0.1	2015-09-18	Anja Hopfstock (BKG)	Adapting from ESDM project to ELF project; aligning TOC with INSPIRE DS template
0.2	2015-10-10	Anja Hopfstock, Marcus Brühl, Sonja Werhahn (BKG)	Baseline
0.3-0.7			WP2 contributions
0.8	2015-11-20	Anja Hopfstock (BKG)	For WP2 review
0.9	2016-02-26	Anja Hopfstock (BKG)	Comment resolution (DSGB, NLSS, IGNF) For PMG review
0.11	2016-03-04	Anja Hopfstock (BKG)	Comment resolution, LC embedded description
0.12	2016-03-28	Anja Hopfstock (BKG)	Final editorial changes
1.0			

v1.0

Application schemas

- AD – use INSPIRE 4.0 (<https://inspire.ec.europa.eu/schemas/ad/>)
- BU – use INSPIRE 4.0 Base (<https://inspire.ec.europa.eu/schemas/bu-base/>) and 2DCore (<https://inspire.ec.europa.eu/schemas/bu-core2d/>). If you want to implement 2D Extended data model use schemas developed by ČÚZK <https://themes.jrc.ec.europa.eu/discussion/view/31556/buildingsextendedbase-and-buildingsextended2d-xsd-schemas>
- TN Common use ELF 1.0 (<http://www.locationframework.eu/schemas/CommonTransportElements/>) or use INSPIRE 4.0 (<https://inspire.ec.europa.eu/schemas/tn-c/>)
- TN_Ra use ELF 1.0 (<http://www.locationframework.eu/schemas/RailwayTransportNetwork/>) or use INSPIRE 4.0 (<https://inspire.ec.europa.eu/schemas/tn-ra/>)
- TN_Ro use ELF 1.0 (<http://www.locationframework.eu/schemas/RoadTransportNetwork/1.0/>) or use INSPIRE 4.0 (<https://inspire.ec.europa.eu/schemas/tn-ro/>)

Level of Details (LoD)

Theme	ELF Master LoD0 <5K	ELF Master LoD1 5K-<25K	ELF Master LoD2 25K-<100K
Addresses	X		
Buildings	X	X	X
Railway Transport Network		X	X
Road Transport Network		X	X

Other ELF/OpenLS documents

- Feature Catalogue
 - LOD0
<http://www.locationframework.eu/documentation/specification/fc/FeatureCatalogMasterLoD0.html>
 - LOD1
<http://www.locationframework.eu/documentation/specification/fc/FeatureCatalogMasterLoD1.html>
 - LOD2
<http://www.locationframework.eu/documentation/specification/fc/FeatureCatalogMasterLoD2.html>
- Matching tables templates
<http://www.locationframework.eu/documentation/specification/mapping/>
- Matching tables documentation
http://www.elfproject.eu/sites/default/files/ELF_MatchingTableGuidelines_v1.3.pdf

Technical Guidance for the implementation of INSPIRE Download Services

- Contains
 - Requirements for ATOM services implementation
 - Requirements for WFS pre-defined services implementation
 - **Requirements for WFS direct access services implementation**
 - Quality of service requirements
 - <https://inspire.ec.europa.eu/documents/technical-guidance-implementation-inspire-download-services>



INSPIRE

Infrastructure for Spatial Information in Europe

Technical Guidance for the Implementation of INSPIRE Download Services

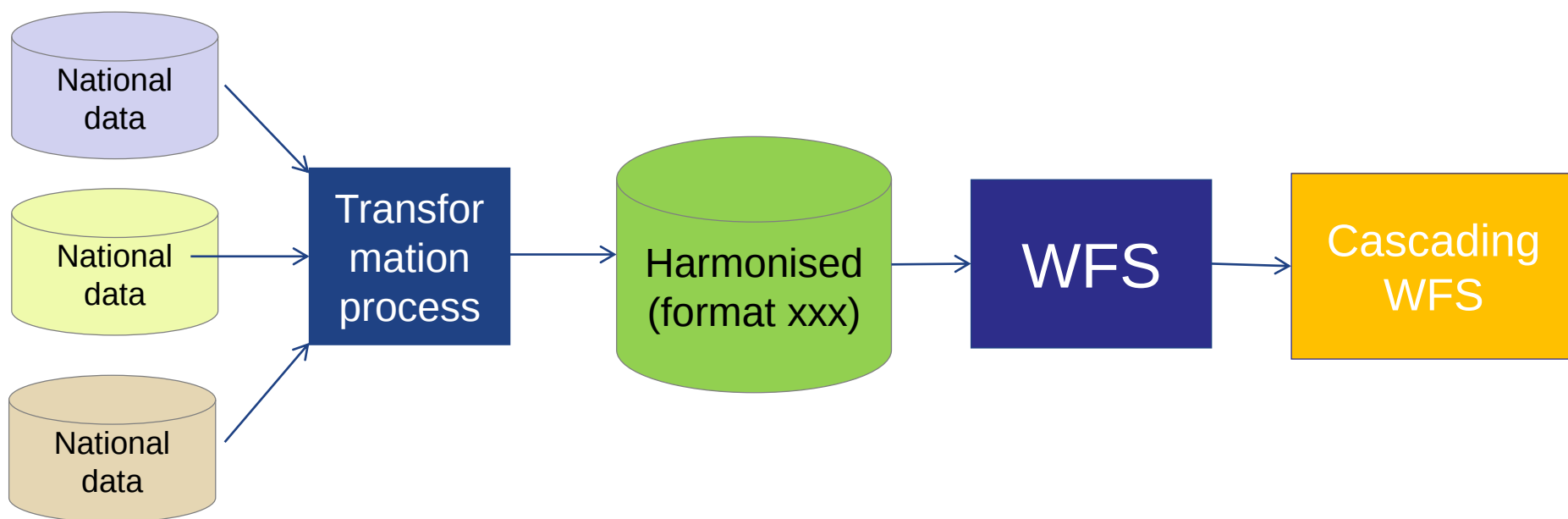
Title	Technical Guidance for the implementation of INSPIRE Download Services
Creator	Initial Operating Capability Task Force for Network Services
Date	00-00-2013
Subject	INSPIRE Download Services
Status	Published, Version 3.1
Publisher	Initial Operating Capability Task Force
Type	Text
Description	This document defines technical guidance for INSPIRE Download Services
Format	PDF
Source	Technical Guidance for the Implementation of INSPIRE Download Services (version 3.1)
Rights	Public
Identifier	Technical_Guidance_Download_Services_v3.1
Language	EN
Relation	COMMISSION REGULATION (EU) No 1080/2010 of 23 November 2010 amending Regulation (EC) No 976/2009 as regards download services and transformation services
Coverage	Project duration



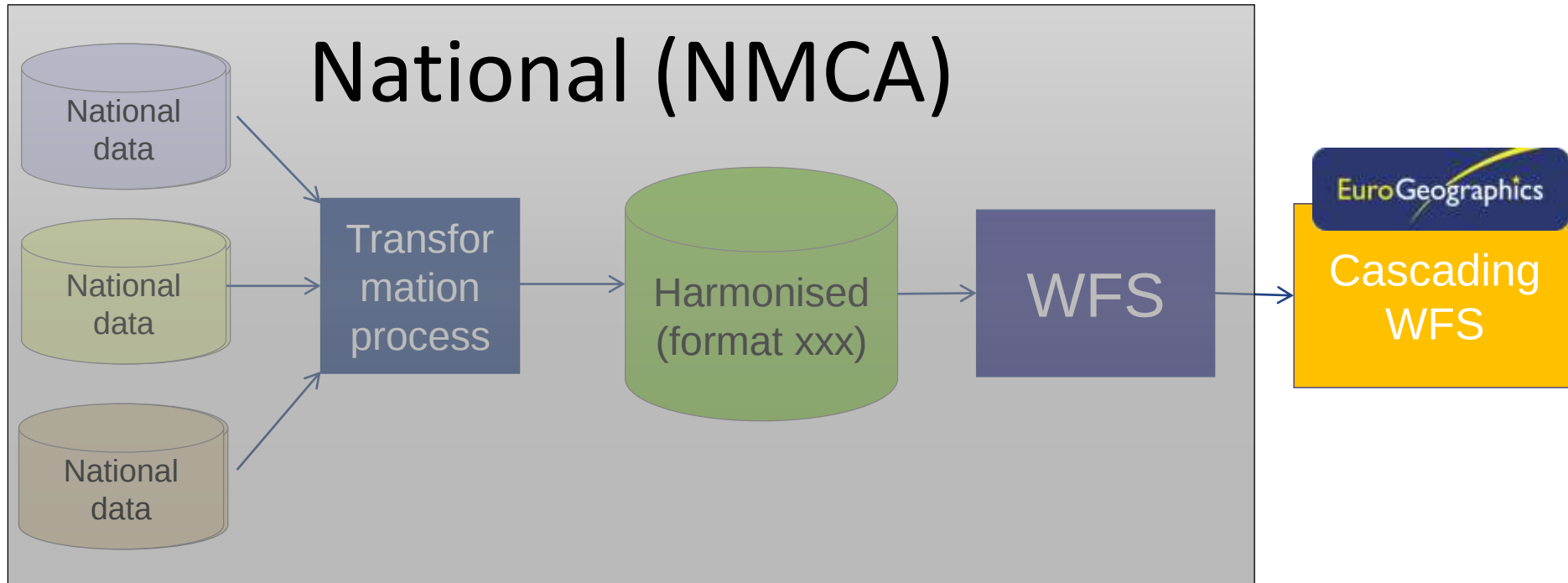
Production process



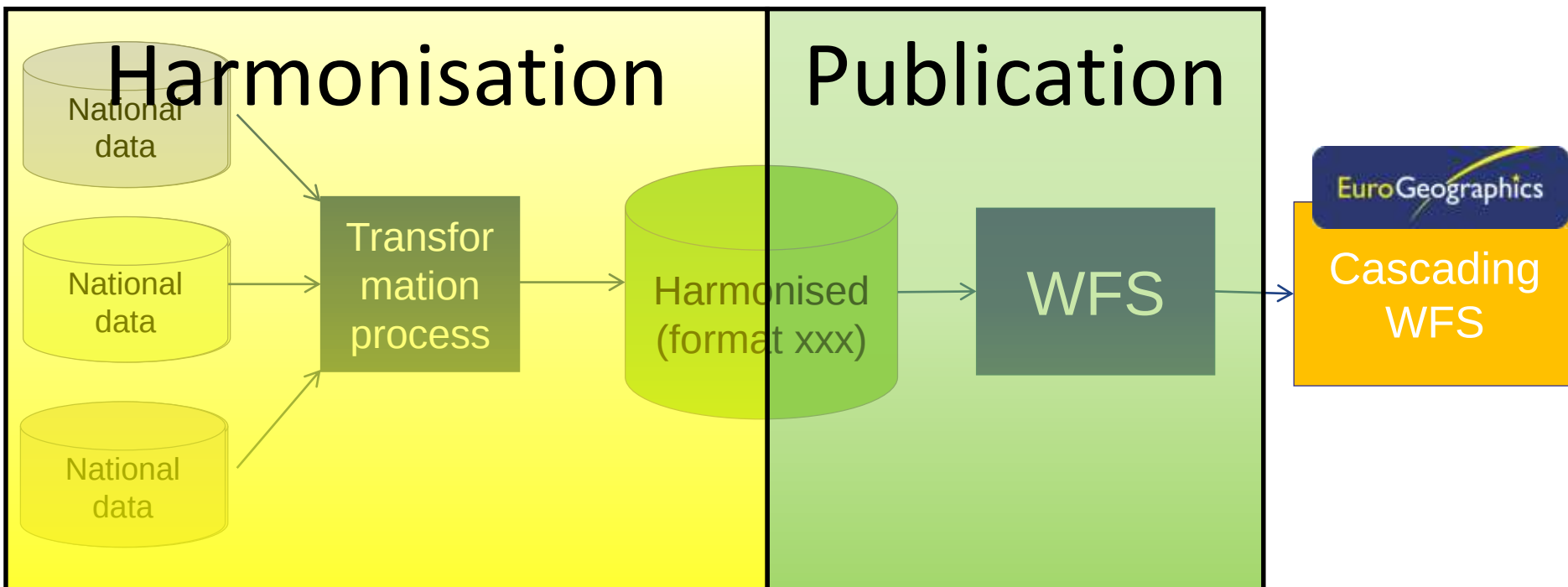
Production process overview



Production process overview



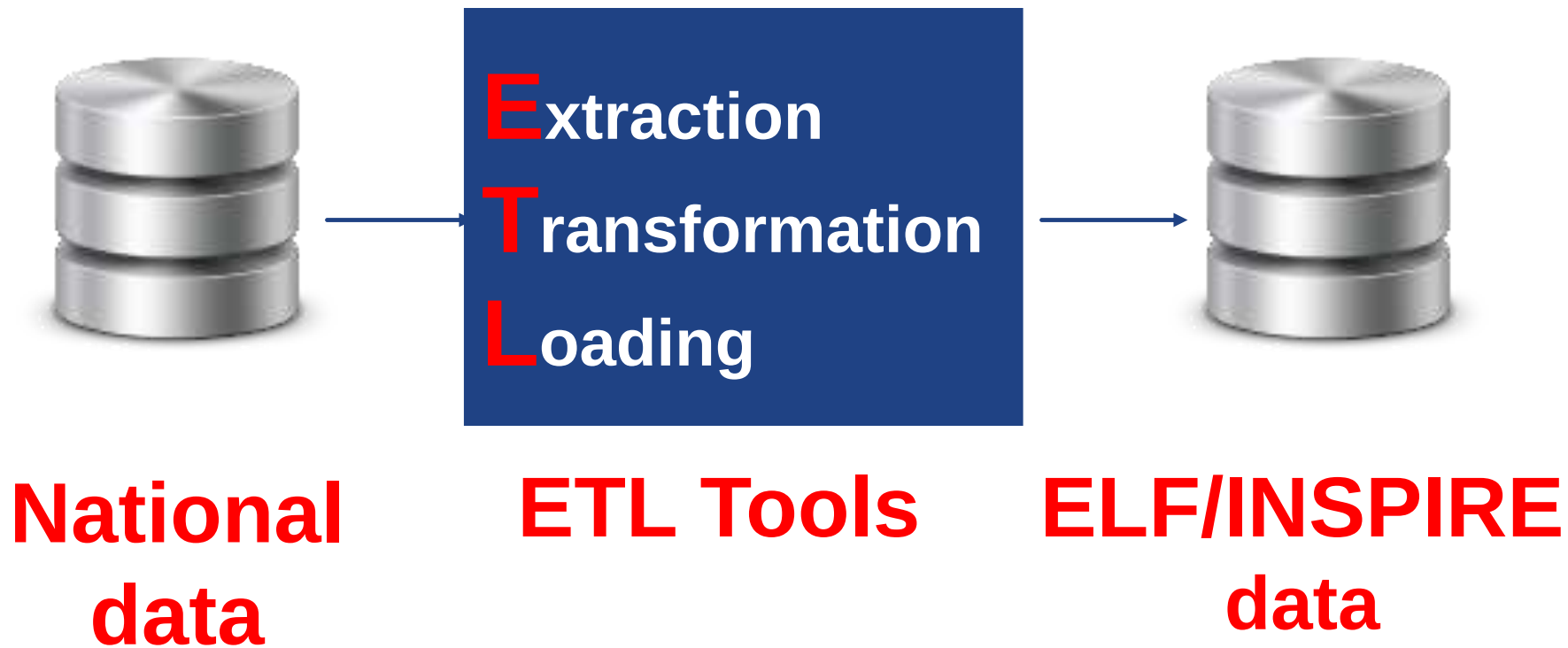
Production process overview



Harmonisation process

- Conceptual phase:
 - Data models (national and INSPIRE/ELS)
 - Application schemas
 - Matching tables
- Transformation phase
 - Software manuals and tutorials
 - Data models (national and INSPIRE/ELS)
 - Application schemas
 - Matching tables

HARMONISATION PROCESS



1 – Analyse target data model



Carefully read INSPIRE and ELF/ELS documentation

2 – Identify and choose source data

- Data content
- Data Quality
 - Currency
 - Spatial extent
- Future update plans

3 – Create matching tables

- Do the mappings between source data model and target data model
- Use ELF matching tables templates

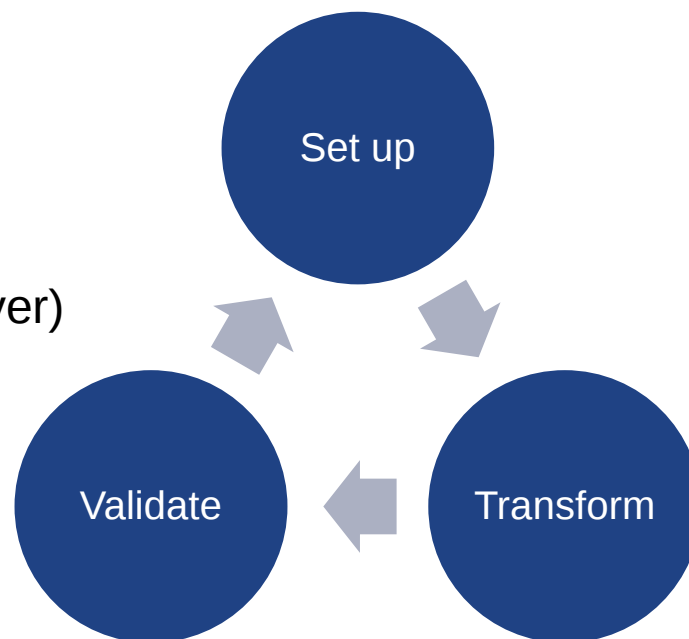
EXAMPLE

4 – Choose ETL tool

- NMCAs use following ETL tools:
 - Safe Software – FME
 - Snowflake – GO publisher
 - We transform - hale studio (open source)
 - Custom made scripts
- However, you can use any other ETL tool available

5 – Set up ETL tools

- Take the matching tables and set up the to ETL tools configuration
- Test the results of transformation
 - Iterative process
 - Use data samples
- Output
 - Database (used by WFS application server)



6 – perform transformation



**The harmonised
data is ready**

SERVICE INFRASTRUCTURE

EUROPE



WEB

Cascading WFS
Query distribution
Content aggregation

1 – Prepare Data



ELF
(recommended)



INSPIRE
(acceptable)

2a – Create service

- Software
 - GeoServer
 - Lat/Ion GmbH Degree
 - ESRI – ArcGIS Server and ArcGIS for INSPIRE
 - Hexagon – Geomedia WebMap
- Use what you already have

2b – Create service

DOCUMENTS

ELF Data Model

INSPIRE Data Specifications

Technical Guidance for the implementation of INSPIRE Download Services

Software manuals and tutorials



STRUCTURE

ELF applications schemas

INSPIRE application schemas



SERVICE

```
<cp:CadastralParcel gml:id="cpParcelS.1">
  <gml:identifier codeSpace="http://inspire.jrc.ec.europa.eu
    http://mapy.geoportal.gov.pl/wss/ELF/CP/ufc/get?SERVI
    WFS::GetFeatureById&id=cpParcelS.1">
  </gml:identifier>
  <cp:areaValue uom="m2">256.000000</cp:areaValue>
  <cp:beginLifespanVersion xsi:nil="true" nilReason="oth
  <cp:endLifespanVersion xsi:nil="true" nilReason="other
  </cp:geometry>
  <gml:Polygon gml:id="cpParcelS.1.GeoM_0" srsName:
    <gml:exterior>
      <gml:LinearRing>
        <gml:posList>
          50.439397258000 16.6595594049000 50.43942
          16.659793253000 50.439319755000 16.65984
          50.439306279000 16.660053880000 50.43933
          16.660228051000 50.439268641000 16.66008
          50.439291691000 16.659771560000 50.43930
        </gml:posList>
      </gml:LinearRing>
    </gml:exterior>
  </gml:Polygon>
</cp:geometry>
```

3 – Set Service in production



PERFORMANCE



SUPPORT



AVAILABILITY

4 –Check quality

- Use INSPIRE validator
 - <http://inspire-sandbox.jrc.ec.europa.eu/validator/>
 - <http://validator.locationframework.eu/etf-webapp/> (supports authentication)



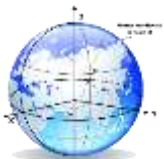
5 – Document



- Fill Excel Spreadsheet

WFS TECHNICAL REQUIREMENTS

CRS



EPSG:3035 Web Mercator
EPSG:3857 Lambert Azimuthal
Equal-Area (LAEA)

Formats

<GML>



WFS 2.0.0, GML 3.2.1 (ELF v1.0 or
INSPIRE v4.0)

Extent



We must have an extent at the
service level to be used in the
cascading service.
Only data within the land
boundary of the country.

WFS TECHNICAL REQUIREMENTS

Paging



Service should support paging mechanism (startIndex and count parameters)

Authentication



Service must be open or available through standard authentication.

Performance



Follow the INSPIRE requirements.

- Availability – 99% of time
- Performance
 - GetCapabilities – maximum 10 seconds
 - GetFeature – initial response in maximum 30 seconds, either 0,5 MB or 500 objects per second
 - DescribeFeatureType – initial response in maximum 10 seconds, either 0,5 MB or 500 descriptions per second
- Capacity – maximum number of simultaneous request 10 per second

SERVICE QUALITY

- Testing has to be done internally
 - Mandatory INSPIRE validator <http://inspire-sandbox.jrc.ec.europa.eu/validator/> or <http://validator.locationframework.eu/etf-webapp/> (supports authentication)
 - Optional in QGIS with WFS 2.0 client extension
 - Optional in OGC cite : <http://cite.opengeospatial.org>
- Send to Saulius Urbanas
saulius.urbanas@eurogeographics.org
- Attach results of INSPIRE validator tests and filled spreadsheet
- EuroGeographics (ProjectPartners) tests the service and sends a feedback
- Additional external performance test will be performed by Norwegian Mapping Authority

EXAMPLE

UPDATE FREQUENCY

- Ideally as often as source data
- At minimum follow INSPIRE requirements (no latter than 6 months form source data update)

- To be addressed latter in Cora's presentation

Summary

- NMCAs should provide download WFS services for AD, BU, TN-Ra, TN-Ro themes
- Services should provide the data in ELF (recommended) or INSPIRE (acceptable) data model
- Datasets and services should be documented
- Quality of services and datasets should be tested

Sample services



Examples

- Addresses
 - NL <https://geodata.nationaalgeoregister.nl/inspire/bu/wfs?&request=GetCapabilities&service=WFS>
 - ES <http://www.cartociudad.es/wfs-inspire/direcciones?request=GetCapabilities&service=WFS>

Examples

- Buildings

- NL

<https://geodata.nationaalgeoregister.nl/inspire/bu/wfs?&request=GetCapabilities&service=WFS>

Examples

- Transport Railway Network
 - CZ http://geoportal-inspirewfs.cuzk.cz/WFS_INSPIRE_TN_RAIL_ELF/WFService.aspx?service=WFS&request=GetCapabilities
 - ES <http://servicios.idee.es/wfs-inspire/transportes?request=GetCapabilities&service=WFS>

Examples

- Transport Road Network
 - CZ http://geoportal-inspirewfs.cuzk.cz/WFS_INSPIRE_TN_ROAD_ELF/WFSservice.aspx?service=WFS&request=GetCapabilities
 - ES <http://servicios.idee.es/wfs-inspire/transportes?request=GetCapabilities&service=WFS>

Contact point

- saulius.urbanas@eurogeographics.org

