



Federal Agency for
Cartography and Geodesy



INSPIRE implementation:

Example of DLM250 – Administrative Units

Federal Agency for Cartography and Geodesy (BKG)

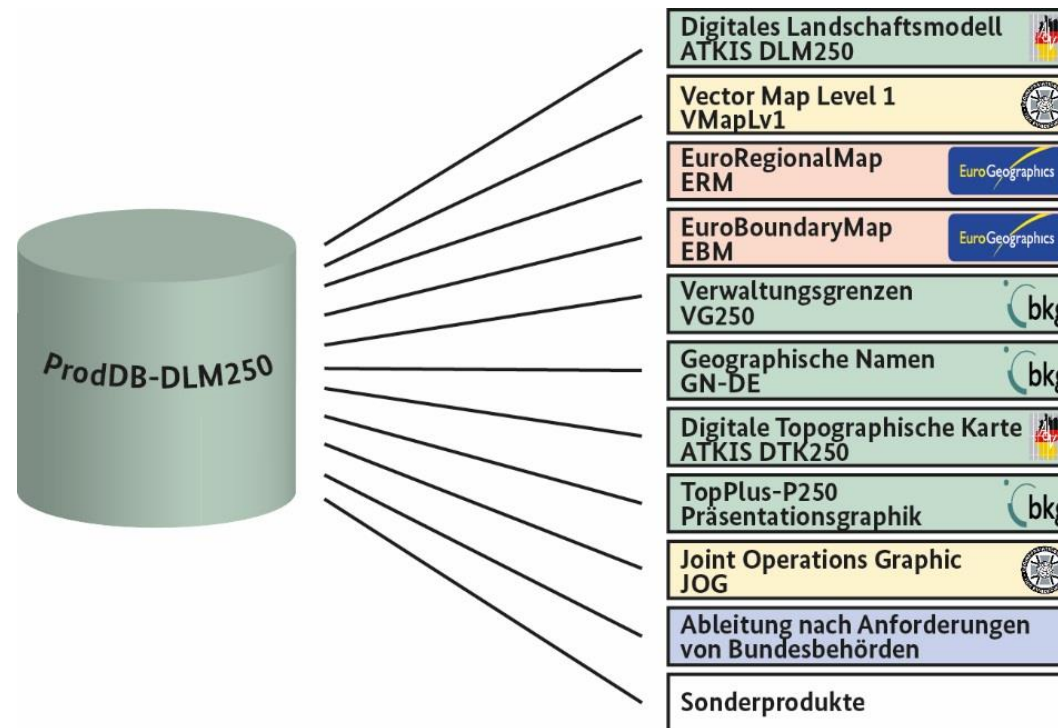
Krystallo Grammenou

Agenda

1. Source data
2. Transformation process
3. Service

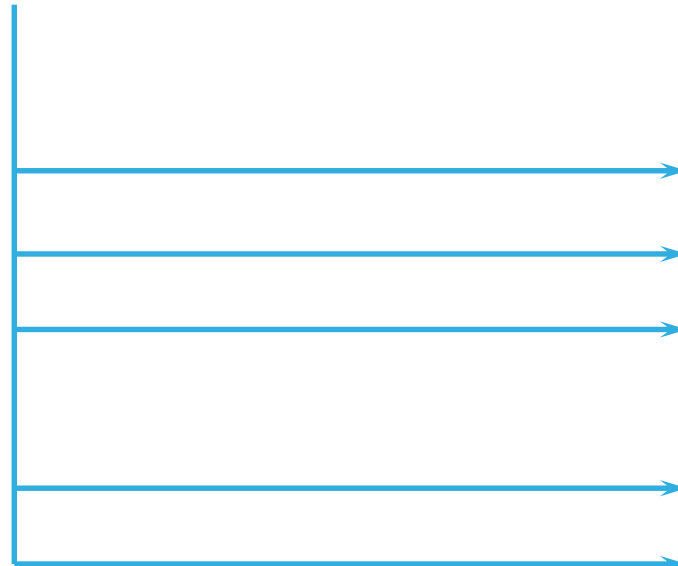
Source Data

- Production database DLM250 (Digital Landscape Model 1:250.000)
 - ProdDB-DLM250 is an elementary component of various products
 - Geoobjects (Features) of the products are traceable to ProdDB-DLM250 via unique identifiers (UIDs)



Source Data

- Official German AAA Product DLM250
 - Digital Landscape Model
 - Scale: 1 : 250 000
 - Schema: AAA Model



INSPIRE Themes Annex I

Addresses



Cadastral parcels



Geographical grid systems



Hydrography



Transport networks



Administrative units



Coordinate reference systems



Geographical names



Protected sites

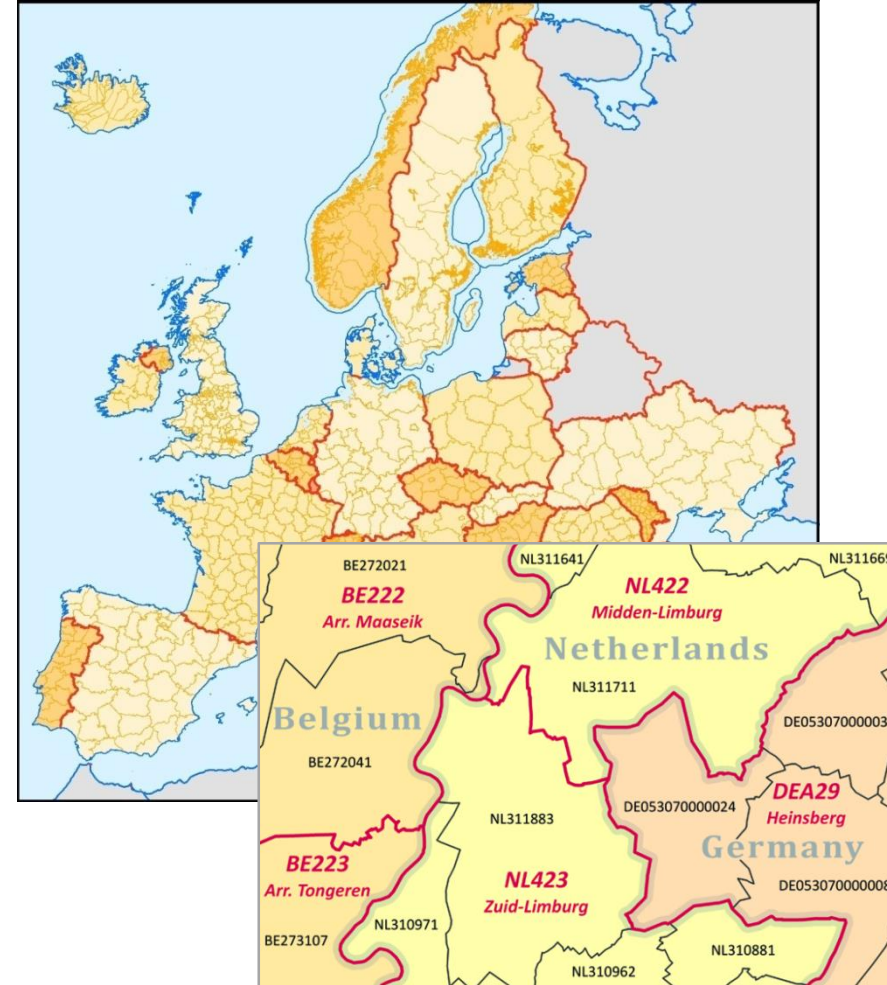


Source Data

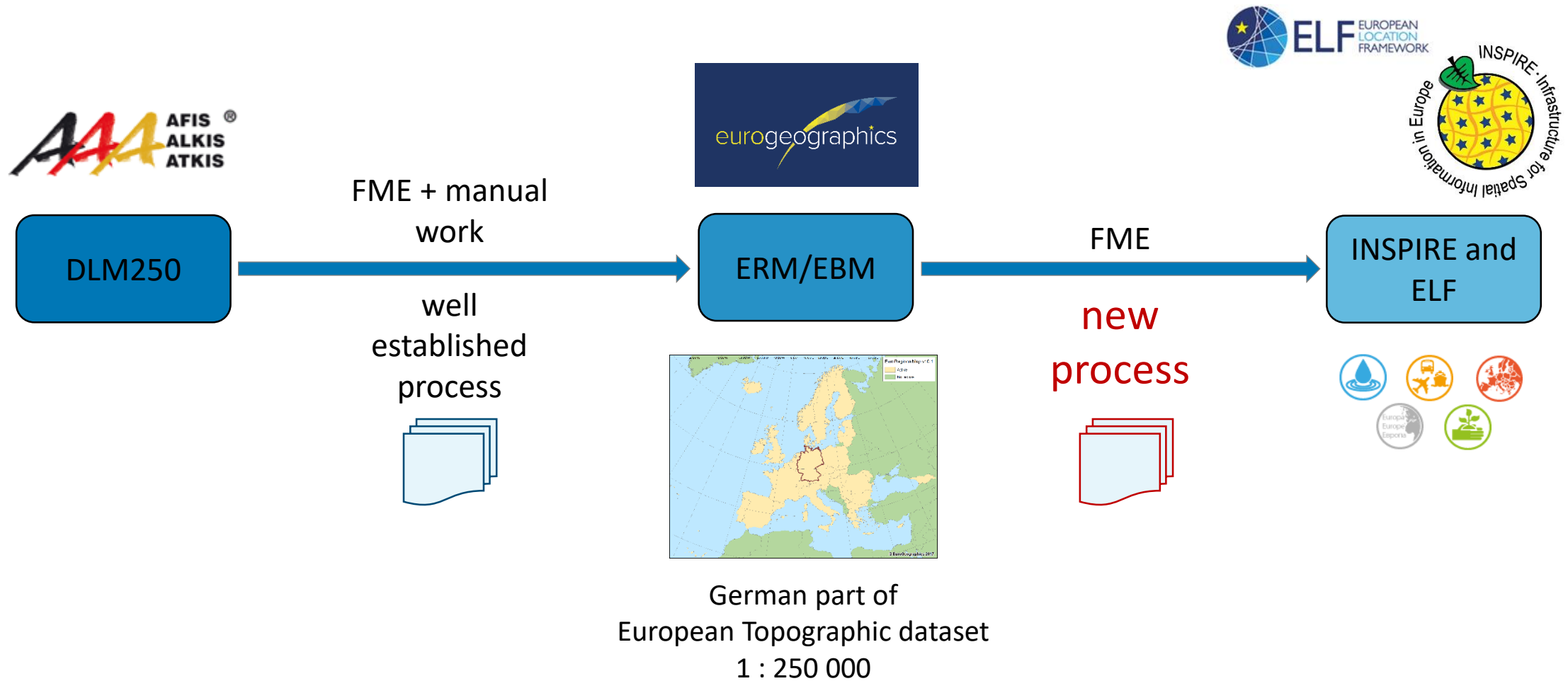
European context for administrative units:

- EuroBoundaryMap (EBM)
 - Up-to-date geometry, names and codes of administrative units covering 55 countries* from 39 data producers
 - Derived LAU- and NUTS regions based on the linkage to the statistical codes used by National Statistics Institutes and Eurostat
- Yearly update, reference date: 31st December
- Product managed by BKG

* According to ISO country code and Kosovo

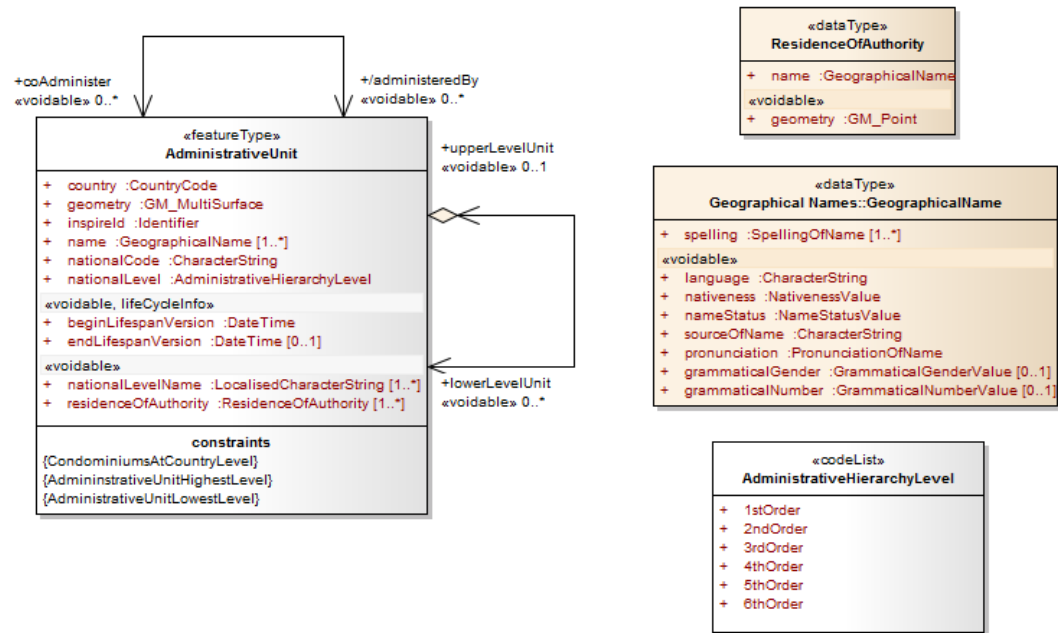


Transformation process

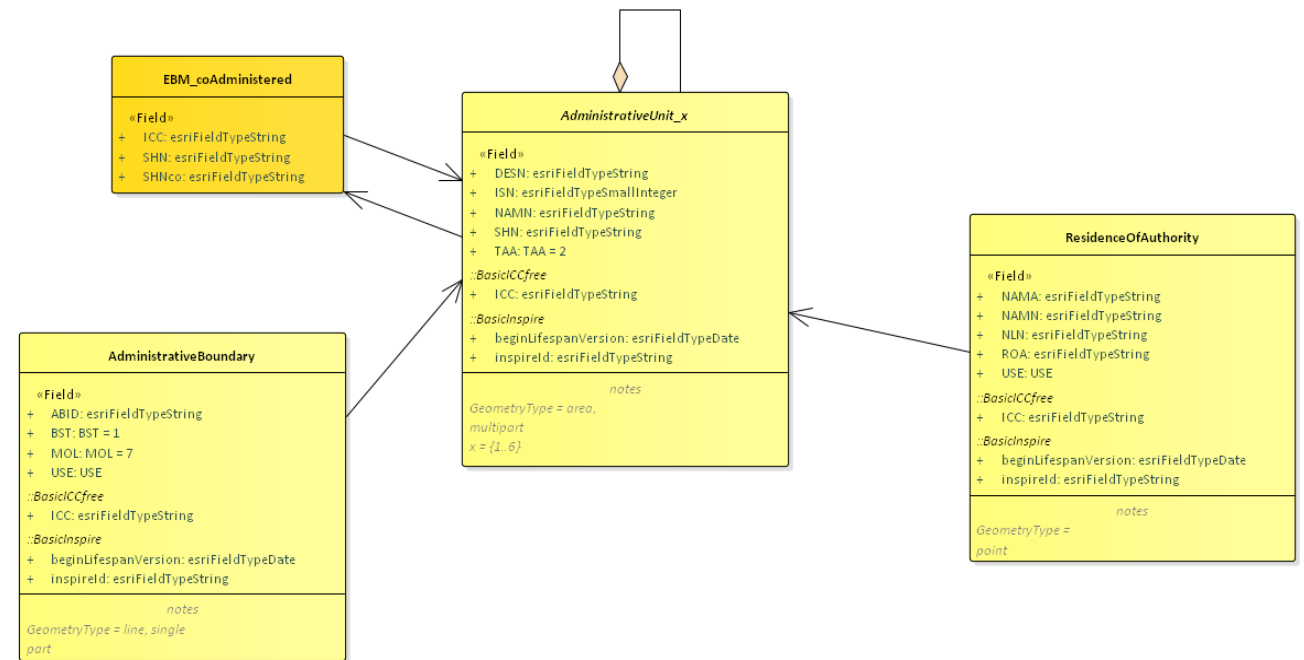


Transformation process

INSPIRE AU Model






EBM AU Model



Transformation process

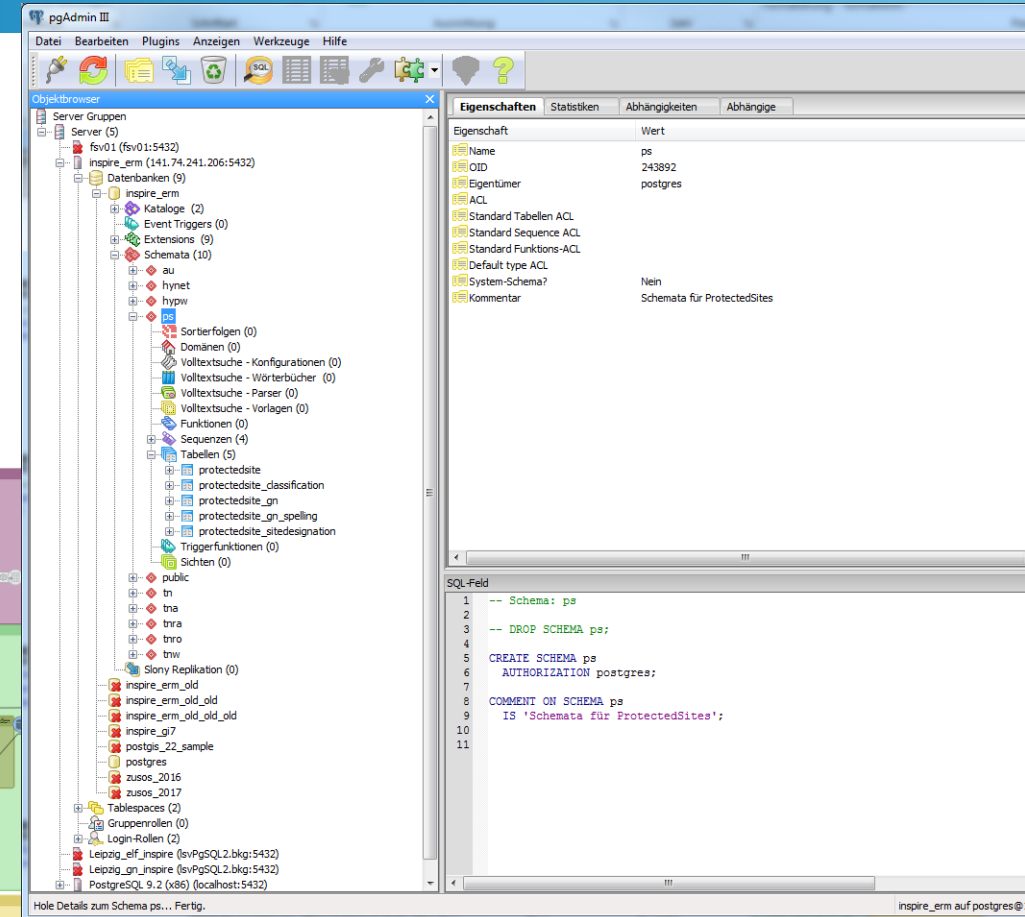
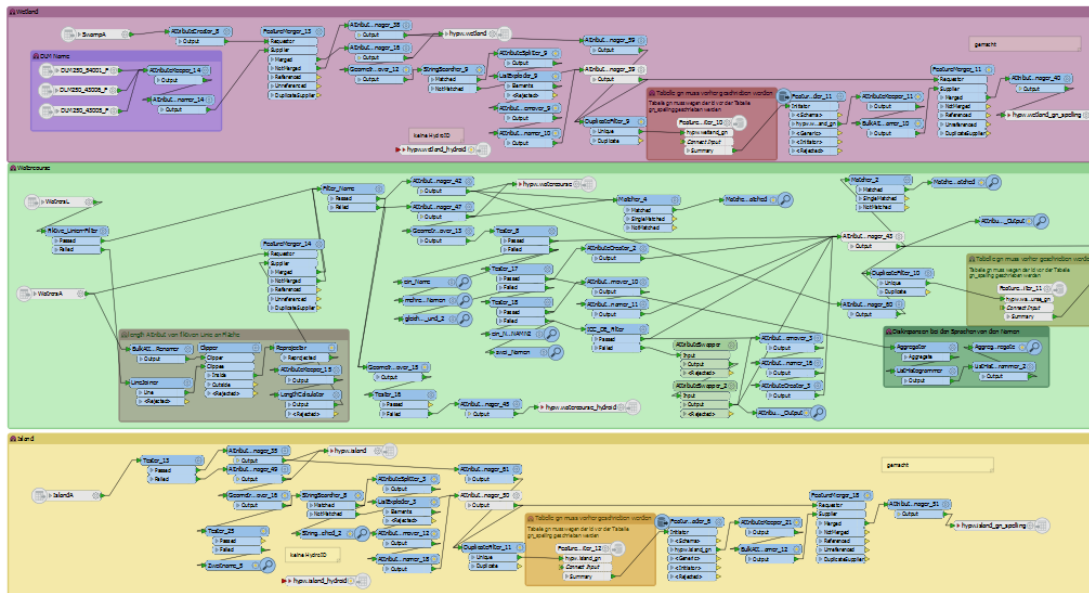
Preliminary work to derive INSPIRE from ERM

- ELF project <http://www.elfproject.eu/>
- Objective:
 - European Location Framework (ELF) to provide up-to-date, authoritative, interoperable, harmonized cross-border, reference geo-information for use by the European public and private sectors
 - Practical implementation of INSPIRE compliant geo-information
- Technical work performed
 - UML schema 
 - SQL queries out of GoPublisher from Snowflake 
 - Mapping Tables (generated from INSPIRE schema) 

Transformation process

Implementation with FME

- Source: ERM + EBM
- Destination: PostGIS database with INSPIRE and ELF schema
- Themes: TN, HY, AU, PS, GN



INSPIRE Services based on deegree

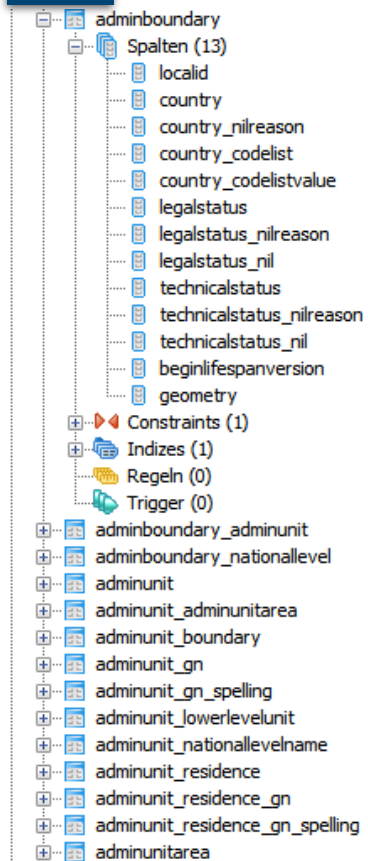
- What is deegree?
 - Open source software for spatial data infrastructures and the geospatial web
 - Implements geospatial webservice specifications of the OGC and the INSPIRE Network Services
- Why deegree?
 - Implements WFS standards 1.0.0, 1.1.0 and 2.0.0
 - Designed for rich data models from the bottom up
 - Backend supports flexible mapping of GML application schemas to relational models
 - Implements WMS standards 1.1.1 and 1.3.0
 - Good experiences when participating in ELF-Project
 - Fits in our infrastructure

Schema creation

- deegree offers tools to create mapping and DB schema from application schemas
 - Automated and GML-schema driven
 - Latest release drops wizard in GUI
 - own tool based on deegree libraries
- Manual post processing
 - Putting themes in DB schemas for better structures
 - Renaming tables and column names
 - Dropping unused FeatureTypes, properties and relations

Mapping configuration

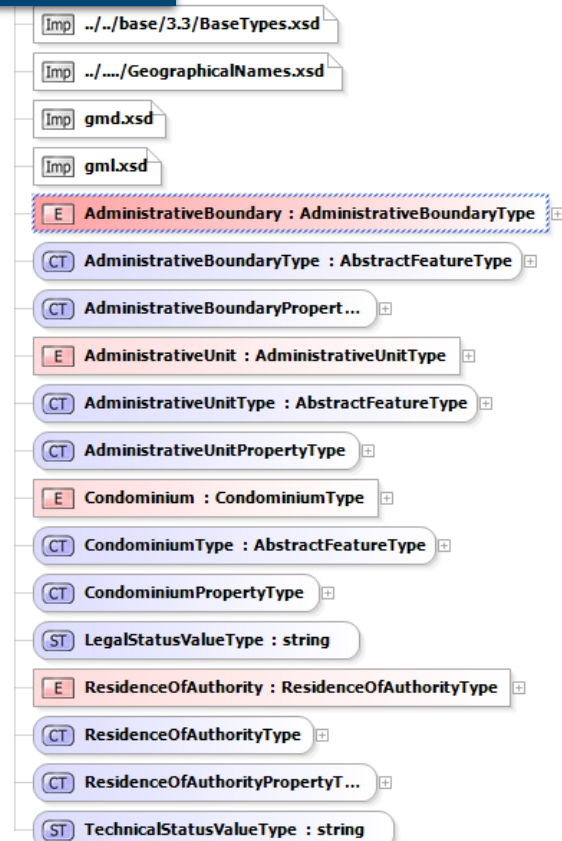
DB



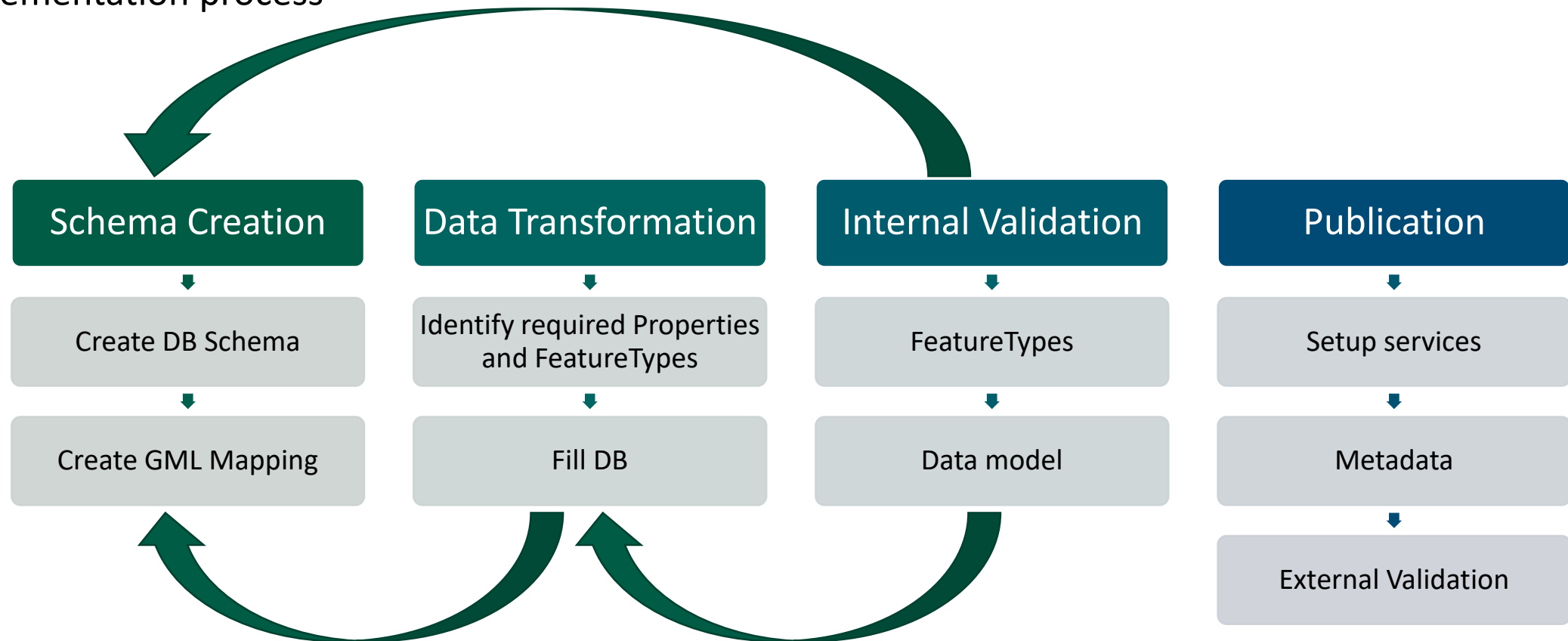
FeatureStore-Configuration

```
2 <SQLFeatureStore configVersion="3.1.0">
3
4 <JDBCConnId>d1m250</JDBCConnId>
5 <StorageCRS srid="4258" dim="2D">EPSG:4258</StorageCRS>
6
7 <GMLSchema>../../appschemas/elf/AdministrativeUnits.xsd</GMLSchema>
8
9
10 <FeatureTypeMapping name="au:AdministrativeBoundary" table="au.adminboundary">
11   <FIDMapping prefix="DLM250_AdministrativeBoundary_">
12     <Column name="localid" type="string"/>
13   </FIDMapping>
14   <Complex path="gml:identifier">
15     <Primitive path="text()" mapping="localid"/>
16     <Primitive path="@codeSpace" mapping="http://bkg.bund.de/d1m250"/>
17   </Complex>
18   <Complex path="au:geometry">
19     <Geometry path="." mapping="geometry"/>
20   </Complex>
21   <Complex path="au:inspireId">
22   </Complex>
23   <Complex path="au:country">
24   </Complex>
25   <Complex path="au:nationallevel">
26     <Join table="au.adminboundary_nationallevel" fromColumns="localid" toColumns="parentfk"/>
27     <Primitive path="@nilReason" mapping="nilreason"/>
28   </Complex>
29   <Feature path=".">
30     <Join table="?" fromColumns="id" toColumns="parentfk"/>
31     <Href mapping="href"/>
32   </Feature>
33 </Complex>
34 <Complex path="au:legalStatus">
35 </Complex>
36 <Complex path="au:technicalStatus">
37 </Complex>
38 <Complex path="au:beginLifespanVersion">
39 </Complex>
40 <Complex path="au:adminUnit">
41 </Complex>
42 </FeatureTypeMapping>
43
44 <FeatureTypeMapping name="au:Condominium" table="au.condominium">
45 </FeatureTypeMapping>
46
47 <FeatureTypeMapping name="au:AdministrativeUnit" table="au.adminunit">
48 </FeatureTypeMapping>
49
50 <!-- extended ELF-FeatureTypes -->
51 <FeatureTypeMapping name="elf-au:AdministrativeUnit" table="au.adminunit">
52 </FeatureTypeMapping>
53
54 <FeatureTypeMapping name="elf-au:AdministrativeUnitArea" table="au.adminunitarea">
55 </FeatureTypeMapping>
56
57 </SQLFeatureStore>
```

GML-Schema



Implementation process



Validation

- We required a method to validate generated data and services
 - Does the service work?
 - Is the data modelling correct?
 - Feedback in early stage of development to reduce costs for fixing.
- Online validators not suited:
 - Mostly concentrating on service parameters and metadata
 - Can't use internal test services
- First approach: manually typing URLs
- We implemented a simple tool for automatic testing
 - Validates provided FeatureTypes of WFS against schema

INSPIRE Download Services

BKG products	DLM250	CLC10	GN	DGM	NUTS
Annex I					
 Hydrography	available				
 Transport Networks	available				
 Administrative Units	available				
 Geographical Names			available		
 Protected Sites	available				
Annex II					
 Elevation				available	
 Land cover		available			
Annex III					
 Statistical Units					available



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Thank you for your kind attention!

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