Prospects prototyping the new ELS architecture

Saulius Urbanas, Jari Reini, EuroGeographics

Warsaw, 28th November 2018

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EuroGeographics' vision for future European Location Services

To provide the single access point for international users of harmonised, pan-European, authoritative geospatial information and services.

For National mapping, cadastral and land registry authorities to be recognised in our International effort to contribute to the wider public good.

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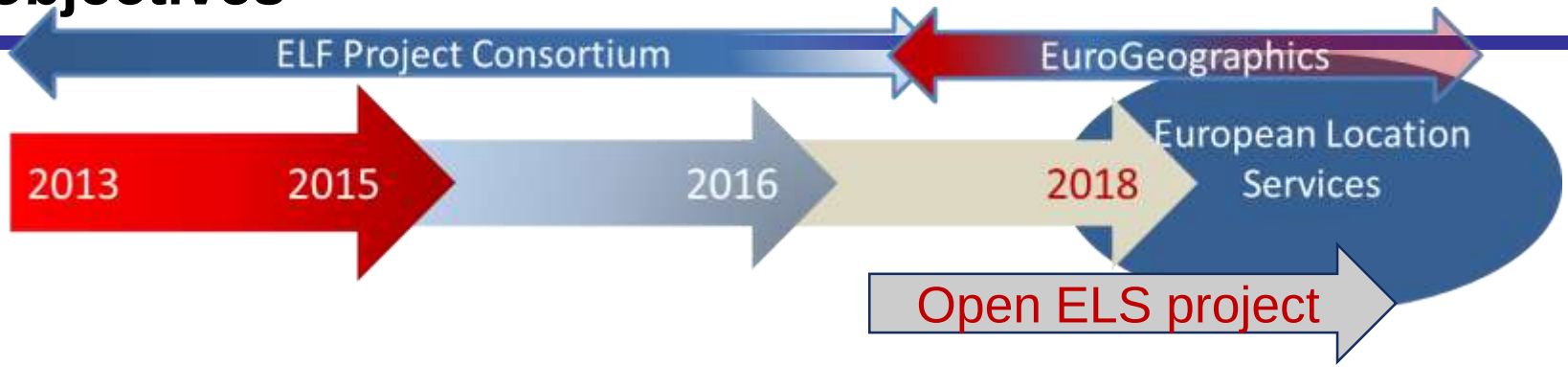
European Location Services Transition Programme objectives



European Location Framework project

Established standards, tools, technical infrastructure and pilot services – the ELF Platform

Pilot products & services to defined standards (INSPIRE-compliant spatial reference data, harmonised at a cross-border and pan-European level)

Transition Programme (Oct 2016 – Oct 2018)

Build on ELF Platform and hand-over ownership of the ELF platform from ELF Consortium to EuroGeographics

Design and build operational and customer focused services with key partners (Kartverket, Kadaster, OSGB, NLSFI, BKG)

Establish the organisational model for operations

Operational European Location Services

Provide reliable and efficient products/services for pan-European users

Single point of access for licensing official data on European level

Business model and business case in place

Delivery organisation decided

Operational model implemented

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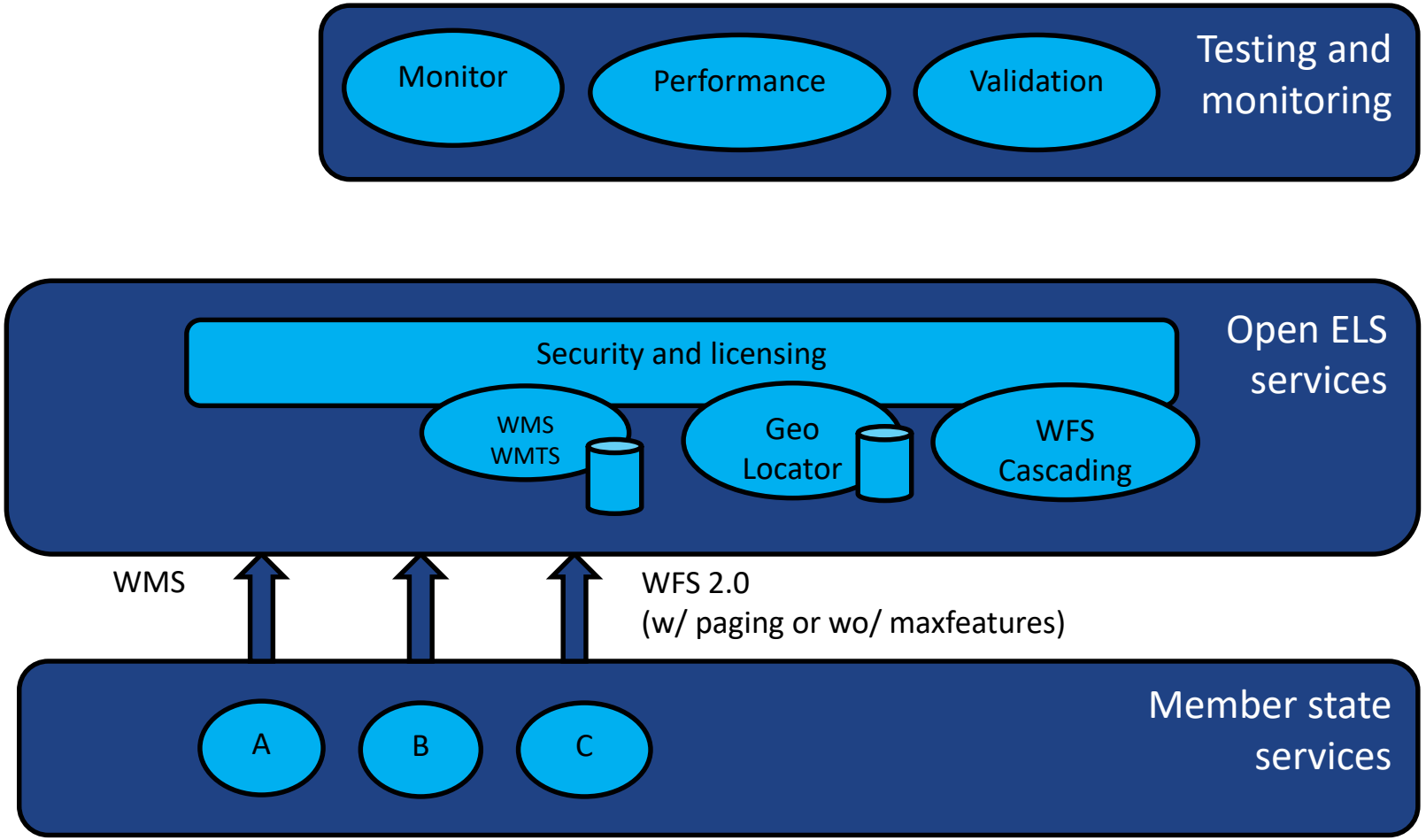
Current ELS / Open ELS Architecture



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Current (distributed) ELS / Open ELS architecture

Advantages

- Partners host and maintain their own services
- Update cycles may be very fast

Disadvantages

- Some of the services are responding slowly
- WFS paging missing or maxfeatures limit is low
- Cross-border harmonization shall be implemented by each Data provider

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Toward more centralized approach

Open ELS hackathon in Kartverket, Hønefoss, Norway, 3-5 September 2018

- Participants: Kartverket, National Land Survey of Finland and EuroGeographics
- Centralised architecture has been prototyped
- Objective - to upload country-specific GML files to a centralized PostGIS data store and distribute the data through OGC interfaces
- Address data have been used for testing the content

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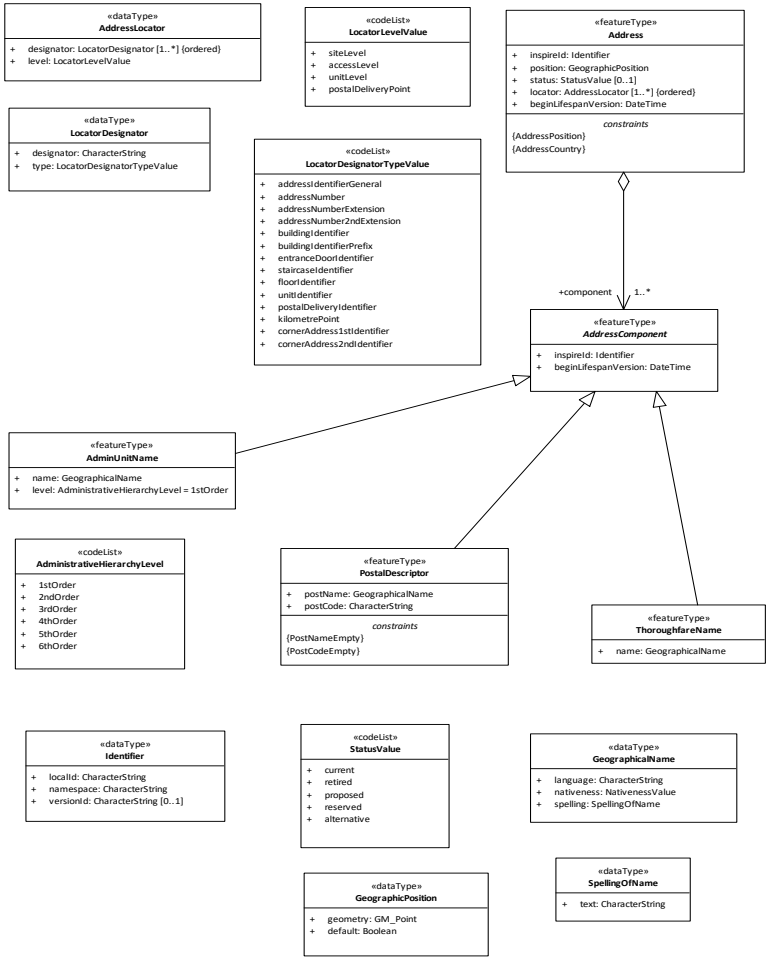
The data model is based on the UML model (Sparx Enterprise Architect)

- reduce options and unused constrains
- keep the INSPIRE structure
- remove most voidable and optional elements
- make some central elements mandatory



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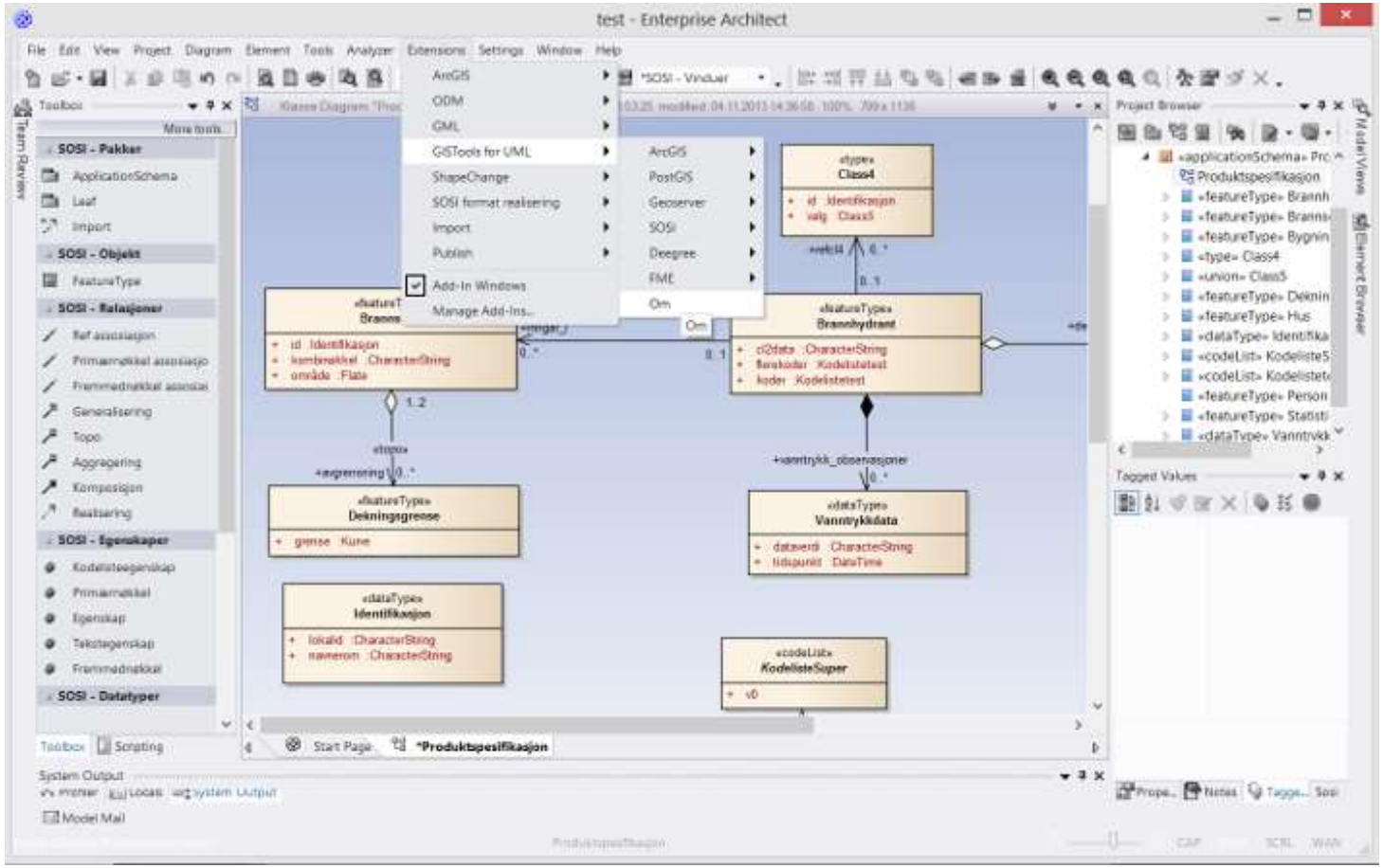
XML schema (xsd) and DDL commands were created for the database to be initialized (GIStools by Arkitektum)



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From GML to DB model: use of Hale Studio – ETL tool

- GML data was read and converted to the database model by wetransform.to's Open Source HALE tool
- The modified data was uploaded to the database using HALE's JDBC connection to the PostGIS database.

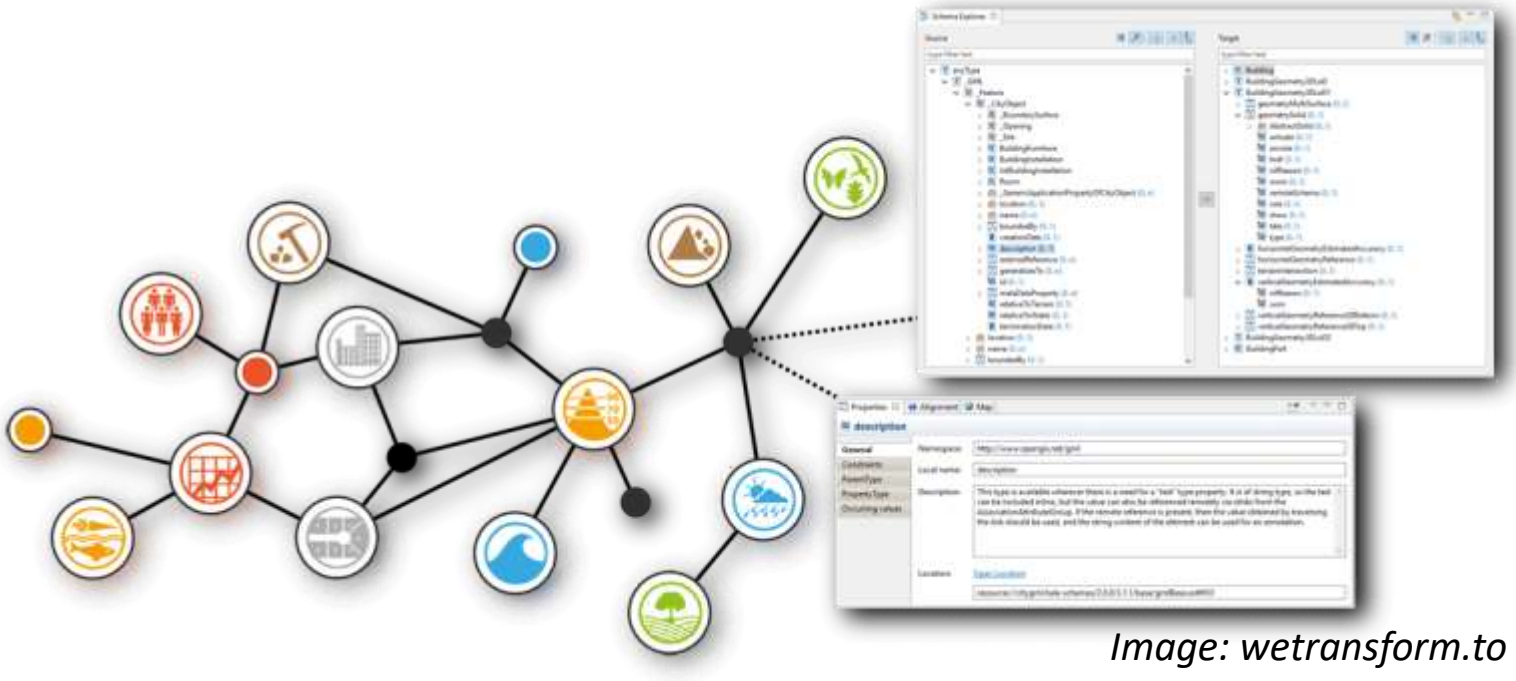

Image: wetransform.to

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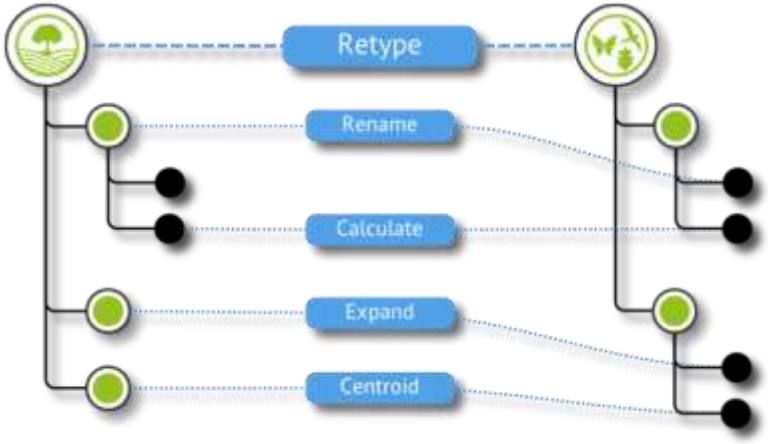
Schema mapping process

Image: wetransform.to



1) Create a Data Model (UML)
2) Data model is created for schemas and DB definition statements
3) The HALE tool reads the target schema and the GML file to be read
4) The HALE tool is used to create mapping between input data and the target model
5) The data of the target model is downloaded to the PostGIS DB

OGC interfaces were implemented using an open source Geoserver that connects to the PostGIS database and shares the data with the WFS standard.

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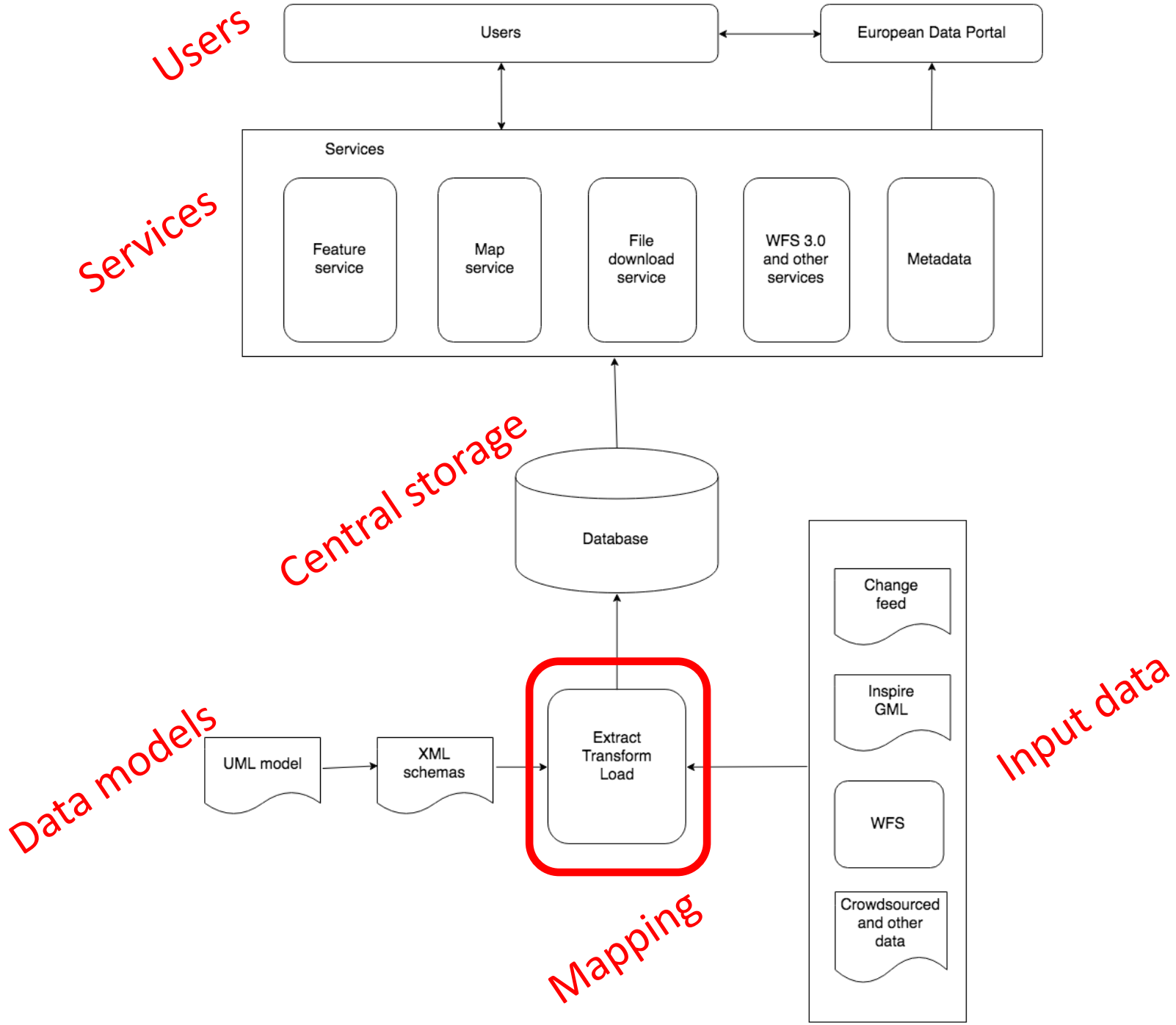
Users
Users
European Data Portal
Services
Services
Feature service
Map service
File download service
WFS 3.0 and other services
Metadata
Central storage
Database
Data models
UML model
XML schemas
Extract Transform Load
Mapping
Input data
Change feed
Inspire GML
WFS
Crowdsourced and other data

Open ELS future technology prototype - activities

- Simplified data model (addresses)
- Data models to XML schemas (using ShapeChange)
- Conversion from XML schemas to database model
- ETL process (Extract-Transform-Load) Inspire AD-data to new simplified model
- Publish content through WFS and WFS3 with alternative encodings
  - GML
  - JSON
  - JSON-LD
  - GeoJSON
  - Geopackage
  - Etc
- Testing change only updates

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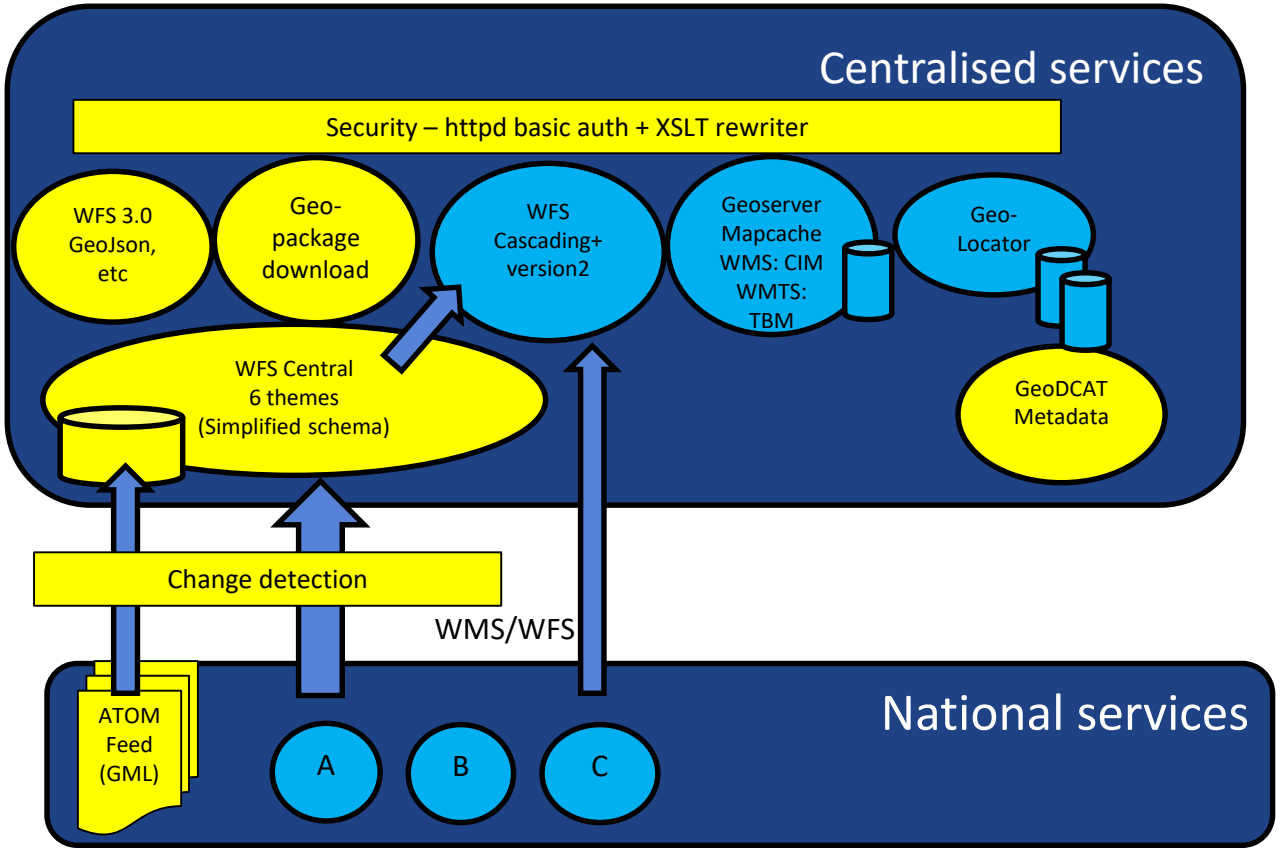
Open ELS future technology prototype



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Conclusions

- A central architecture is a good way to serve content from data providers which haven't an advanced tech infrastructure
- Secure storage for pan-European data
- Simplified schema -> easier to consume
- Easier to configure proper service performance
- Way forward to assure a cross-border harmonization offering a pan-European data content
- Wider variety of delivery products (datasets, services, apps)
- Demands for bigger capacities in the central node
  - Technical: storage, CPUs, HW/SW
  - Expertise: domain experts, web-service experts…

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