Use of SLD by the ELF project

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Program

- Objective: ELF view products
- Main tool : the SLD standard
- Lessons learnt
  - Design portrayal rules
  - Create SLD file
  - Implement SLD
  - Conclusions

ELF view products

ELF (European Location Framework)

ELF is a European project

- ★From March 2013 to October 2016
- ★Around 30 partners
  - NMCAs and EuroGeographics
  - Technology providers, Universities, Application developers
- ★Co-funded by European Commission and the consortium partners
- ★ Main objectives:
  - Implement INSPIRE (interoperability – download services)
  - Offer single access point to these harmonised data and services from NMCAs
  - Make use of INSPIRE data and services
    - Basic applications: **view**, search
    - Business applications

ELF partners
(data providers)

Administrative BaseMap

- A pyramid of digital images at various levels of zoom
  - From 140 K to 40M
- From EBM (EuroBoundaryMap) data
  - Theme AU
- WMTS service (for performance)

From countries to municipalities

Topographic BaseMap

A pyramid of digital images at various levels of zoom

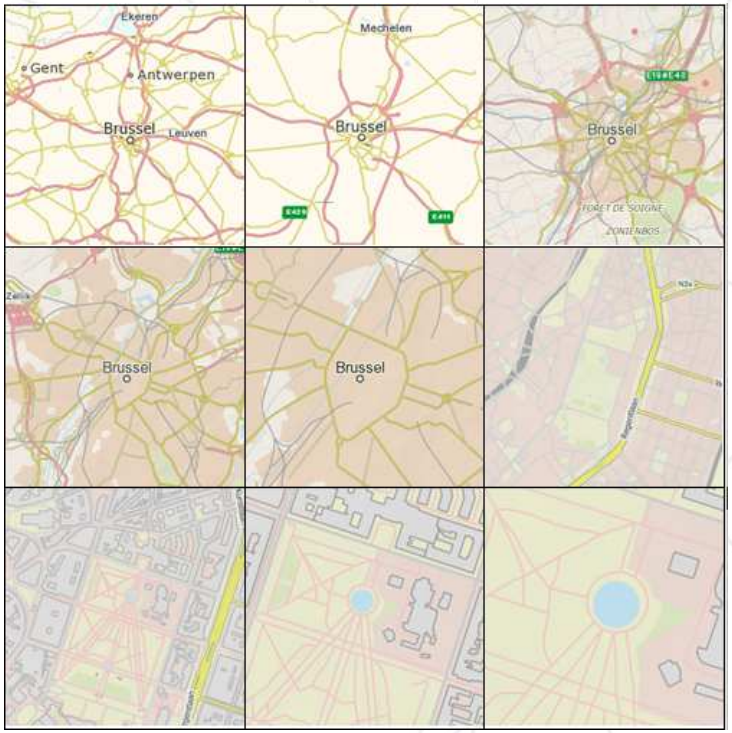
- ★From 2K to 40M

From INSPIRE based data

- ★ themes AU, TN, HY, LC, BU, GN, EL

Service WMTS harvesting national WMS services

- Images are « cached »



ELF Cadastral Index Map

Themes:

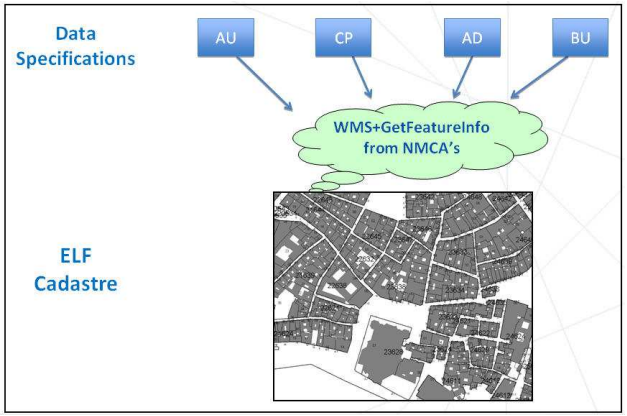
- ★Cadastral Parcels
- ★Administrative Units
- ★Addresses
- ★Buildings

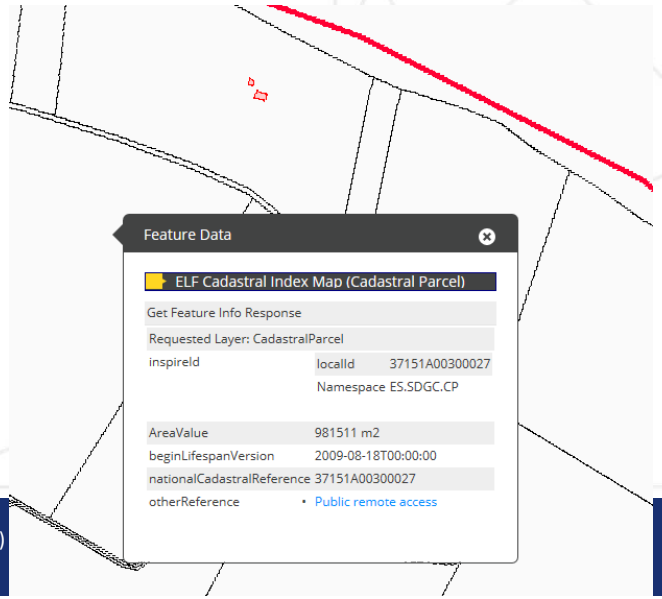
view

Cascading WMS => view territory

identify

GetFeatureInfo to consult the cadastral parcel attributes, to find the parcel code … and the associated information in land registry





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ELF View Products

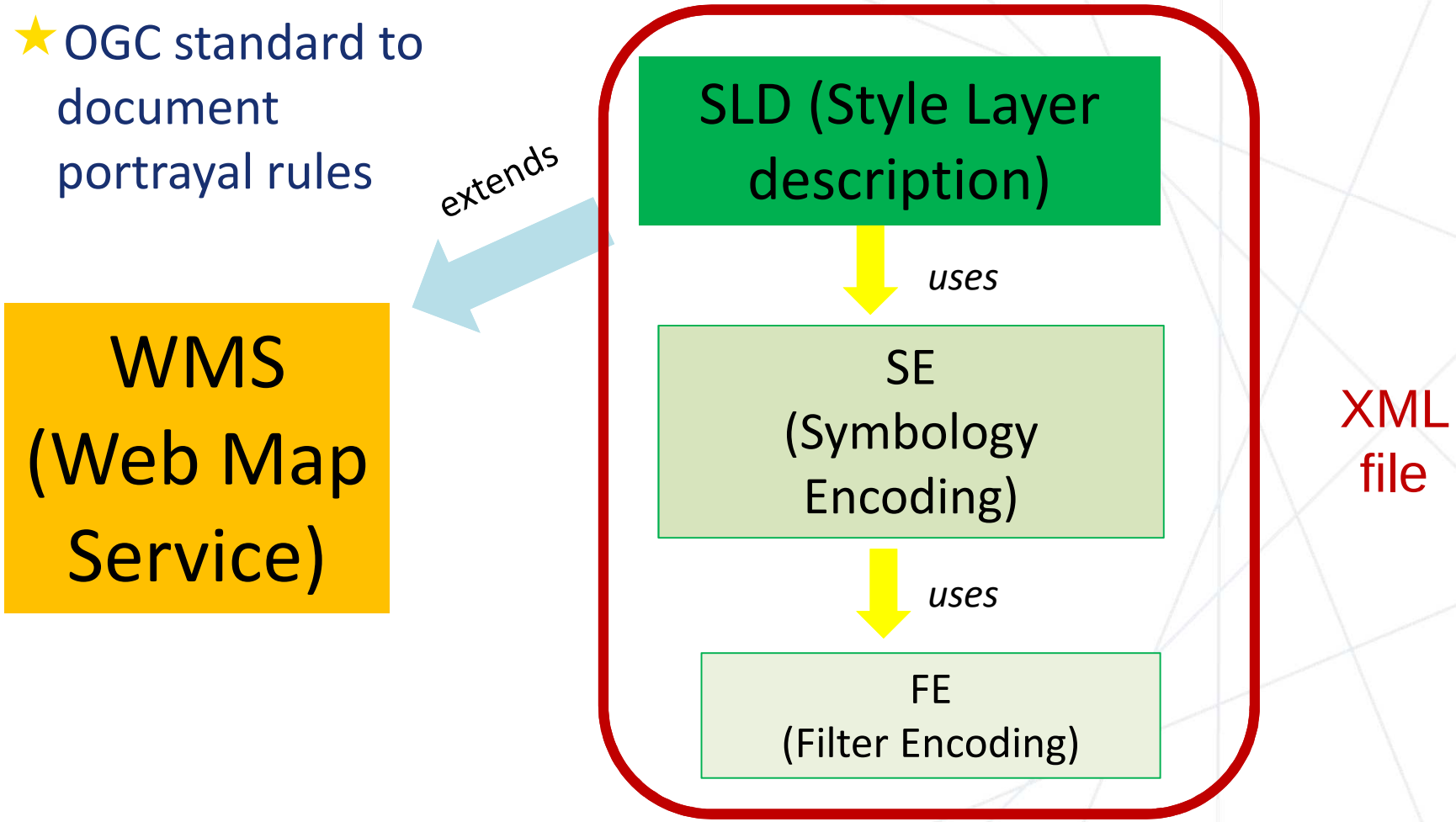
	Administrative BaseMap	Topographic BaseMap	Cadastral Index Map
Source data	European product (EBM)	European products (ERM) National data	National data
Portrayal rules	**Common portrayal rules (SLD) designed at centralised level**		
Done at national level		Set up WMS (for zooms 2K to 72K)	Set up WMS (from 2K to 10K)
Done at centralised level	Set up WMS Make tiles – set up WMTS	Set up WMS (for zooms 144K to 40M) Make tiles – set up WMTS	Set up cascading WMS

From centralised to decentralised approach

SLD standard

SLD (Style Layer Description)

★ OGC standard to document portrayal rules



SLD (Style Layer Description)

Provides

- ★Order to display layers
- ★For each layer
  - ★Layer name
  - ★Layer source : feature type + OGC filter if relevant
  - ★Scale range
  - ★Symbol

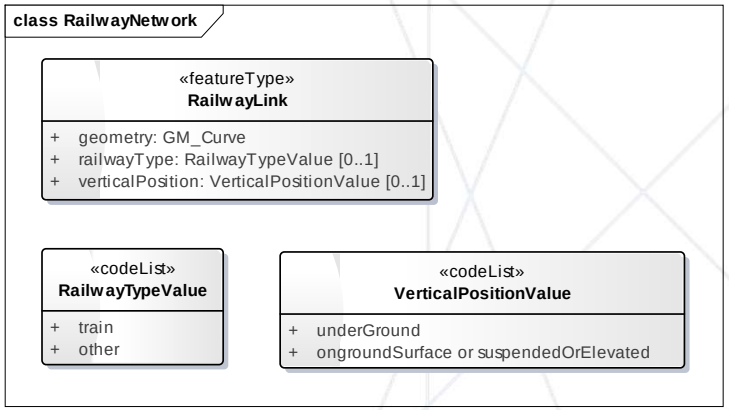
```
<se:Name>HY.PhysicalWaters.StandingWater</se:Name>
<UserStyle>
    <se:FeatureTypeStyle>
        <se:Rule>
            <se:Name>StandingWater</se:Name>
            <se:MaxScaleDenominator>72200.000000</se:MaxScaleDenominator>
            <se:PolygonSymbolizer>
                <se:Fill>
                    <se:SvgParameter name="fill">#c2e9fc</se:SvgParameter>
                </se:Fill>
            </se:PolygonSymbolizer>
        </se:Rule>
    </se:FeatureTypeStyle>
</UserStyle>
```

Lessons learnt

Design portrayal rules: FE

- Some INSPIRE models (mainly TN) include model patterns that can't be handled by SLD
  - Indirect geometry (aggregate objects as Roads)
  - Properties linked to geometry by linear referencing (instead of attributes)

- Solution: the BaseMap model
  - Using INSPIRE terminology
  - With only the content useful for mapping
    - Selection
    - Symbolisation
  - In simple and flat structure



- INSPIRE data had to be simplified for mapping purposes

Design portrayal rules: symbols

- SLD standard is known to be unable to deal with complex symbology
- In general, not a big issue for ELF view products
  - Basic cartography
  - Simple symbols are enough

		2k – 18 k	18 k – 72 k
WatercourseLine	perennial		
	nonPerennial		

- An exception: no common library for point symbols
  - ELF gave up to represent specific buildings (church, stadium, …)
  - The project used simple feature symbology (circle,square etc) for other point features

Design portrayal rules: labels

- The Filter Encoding enables **selection rules** about the labels to be displayed for a given scale range
- But importance of named places is often missing in source data
  - Use of ERM (250K) data for populated places (attribute “population”) for all levels of zoom
- If too many labels on a map, Web Map Servers generally make random selection within same priority groups

Design portrayal rules: labels

- In theory, SLD standard offers ways to define **how to locate labels** (geographical names, road numbers)
- In practice, Web Map Servers generally offer more advanced functionalities than SLD
- Adopted solution:
  - Simple rule in SLD
  - Guidelines for NMCA : do the best using your Web Map Server functionalities

Street names are along the street

Create SLD

- In practice, how to create SLD files? Which tools?
  - Administrative BaseMap (IGN France): QGIS + manual work
    - QGIS : selection and symbology depend on country
    - Manual work: to edit labels
  - Topographic BaseMap (kartverket): Mapserver + manual work
    - Map Server could export SLD V1.1.0
    - Manual work to make it validate for the ELF specs (data issue) => manual errors => several iterations
  - Cadastral Index map (TU Delft): manual work, tests with GeoServer and QGIS
    - GeoServer could not handle SLD V1.1.0, conversion scripts to SLD V1.0.0 needed
    - Different ways in SLD to achieve the same, but not all permutations supported by SLD software
    - Trial and error, therefore: best practices needed !
- ELF project has developed open-source tool: SLD editor
  - To modify existing SLD
  - Only graphical part
  - User-friendly

Implement SLDs

Setting up the ELF National Basemap - Technology in use

	Option1	Option2	Option3	Option4	Option5
Data used	National data	National data	National data	National data	
Data storage	Oracle, PostGIS	PostGIS	FileGDB		
Software	MapServer	GeoServer	Esri ArcGIS server	Intergraph WebMapServer	deegree WMS
To adapt for national ELF Basemap service	.map-file	SLD	SLD to Esri style, ArcMap document	SLD	
ELF Partner	GST, KARTV	NLSFI, IGNB	MAC	CUZK	

Various technologies have been used

SLD adaptation sometimes required

Conclusions

SLD has been used by all ELF data providers – *SLD has supplied common language to document portrayal rules in a decentralised context*	
SLD has been used -with some adaptation - by different technologies (Web Map Server)	
SLD has been used with several versions of portrayal rules (pilot implementation)	
SLD has been used for different types of services : WMS and WMTS *SLD includes the range scale for WMS => it enables to derive the various zoom levels for WMTS*	
There is no current tool (GIS, WMS) allowing good export of SLD file; still need for manual work to edit SLD	
Label processing raises various issues. *Improvement might come from better data (selection), better standard, better standard implementation.*