



**ELF** EUROPEAN  
LOCATION  
FRAMEWORK

# ArcGIS Online as a hub of the European Location Framework (ELF)

**Presentation to:** Esri European User Conference 2014; SDI, NMA's and Cadastre track

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the Competitiveness and Innovation framework Programme (CIP)  
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EUROPEAN LOCATION FRAMEWORK

## The ELF vision

- ★ ELF will provide immediate and reliable access to consistent and authoritative reference geo-information
- ★ ELF will provide the most up-to-date information via the web
- ★ ELF will ensure that national level data and services “join up” at borders

**Location is a fundamental aspect of making effective business decisions and setting public policies**

# The ELF project

- ★ A first step towards the ELF vision
- ★ Started 1st March 2013
- ★ 36 month project
- ★ 30 partners

## **EuroGeographics**

**15 national/regional data providers**

**3 service integrators**

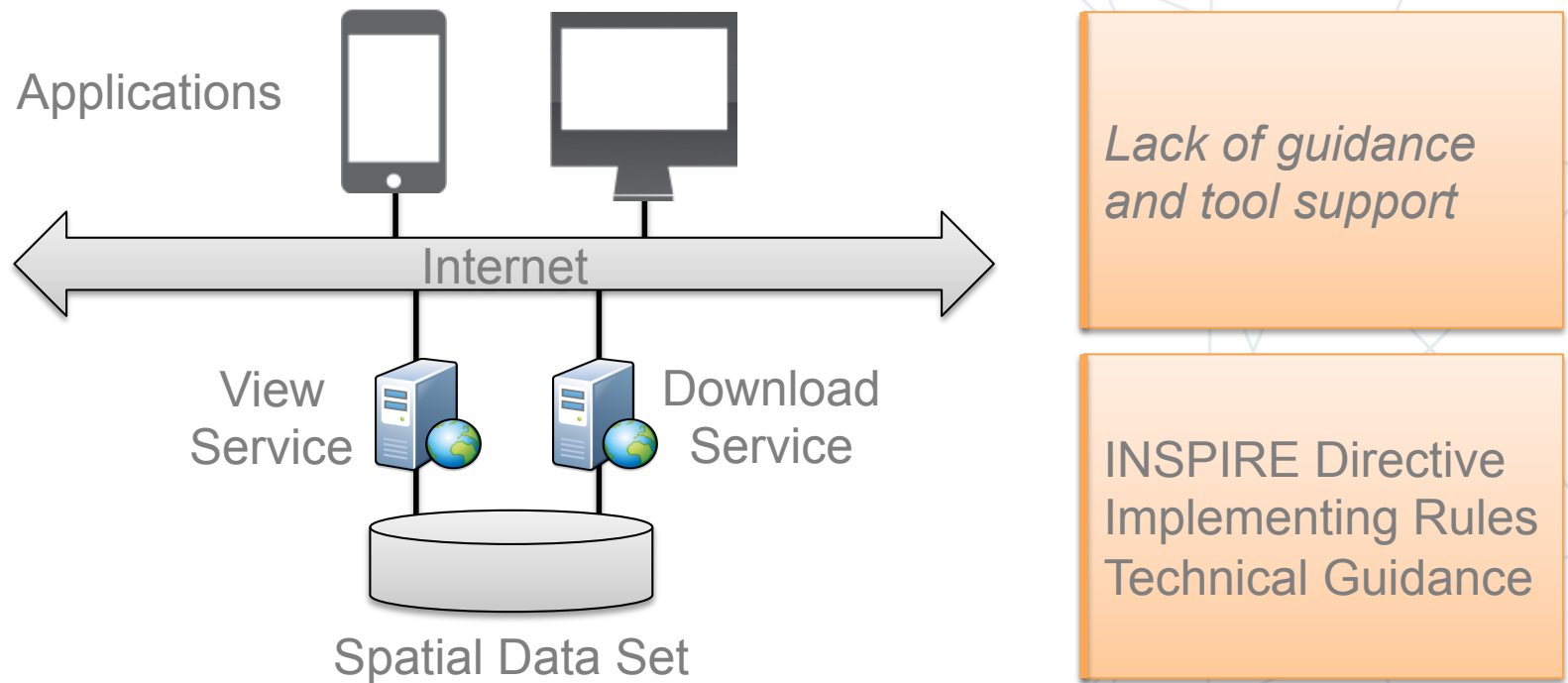
**6 application developers and domain experts**

**2 universities**

**3 user community representatives**

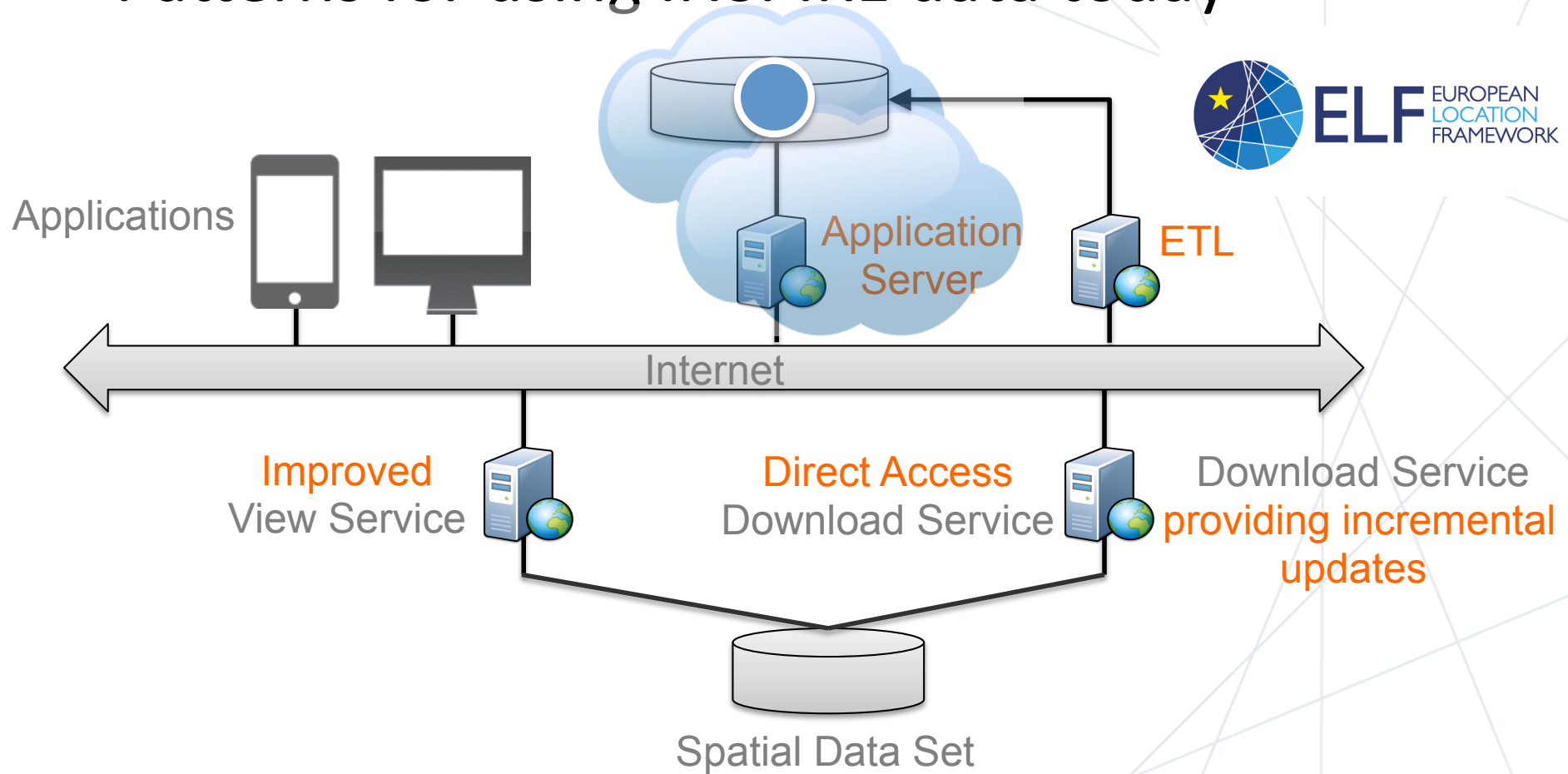


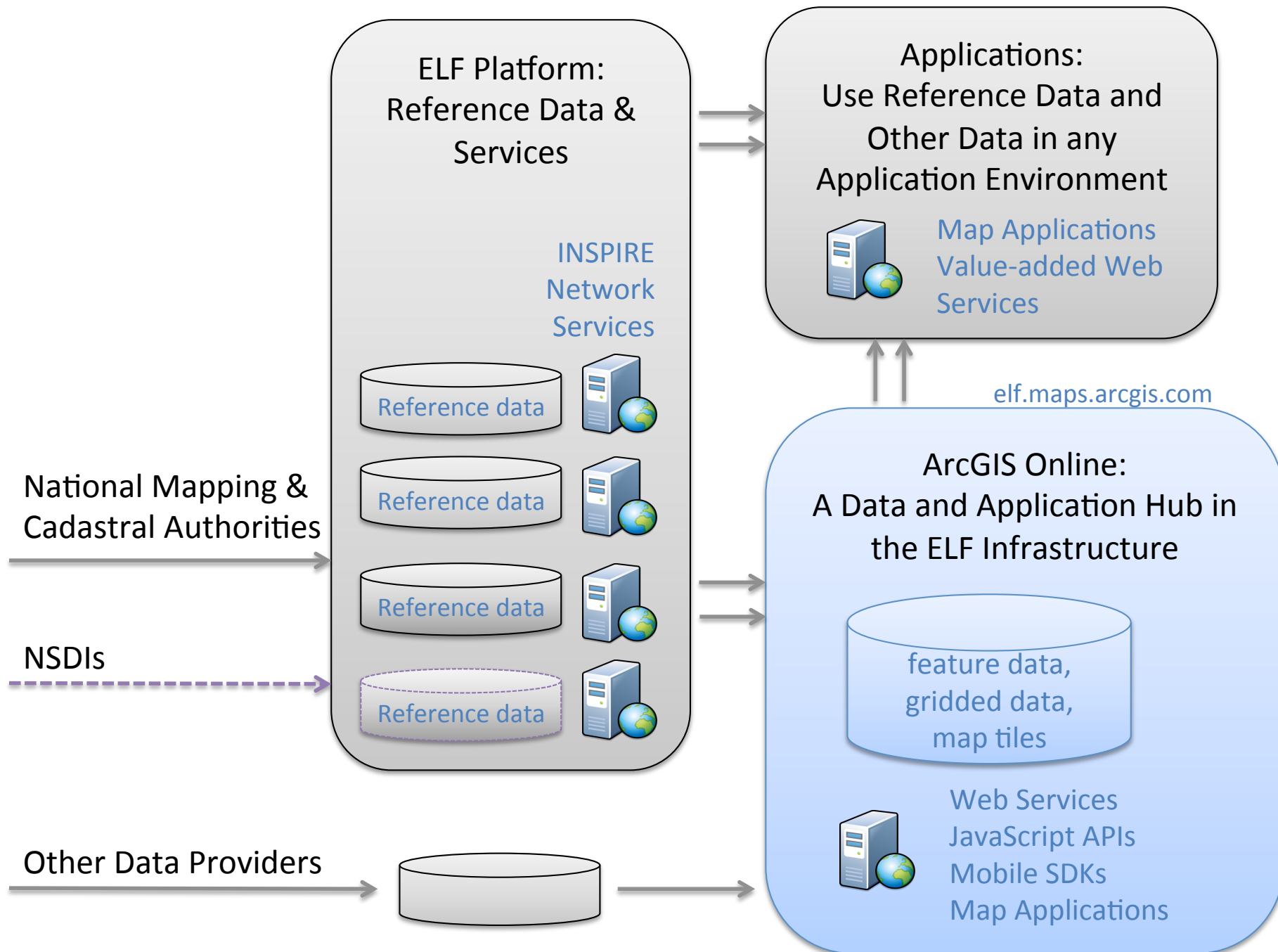
# INSPIRE is looking only at part of the dataflow





# Patterns for using INSPIRE data today





# Patterns for using INSPIRE data on the web

★ Use a **base map** with authoritative reference data  
**likely needs multiple layouts for different applications**

➔ ★ Prepare business data for use in a map-based app: **geo-reference data**  
**only needs thematic/feature identifiers and geometry from INSPIRE data**

➔ ★ Use **feature data** directly in apps  
**needs easy integration, good API, good documentation, etc.**

# Prepare data for use in map-based apps

- ★ **Flatten structures:** most platforms for map-based apps only support tabular structures with a geometry field
- ★ **Reduce content:** the data becomes easier to understand and handle by developers that are not INSPIRE experts or familiar with spatial data

# Example: geographical names

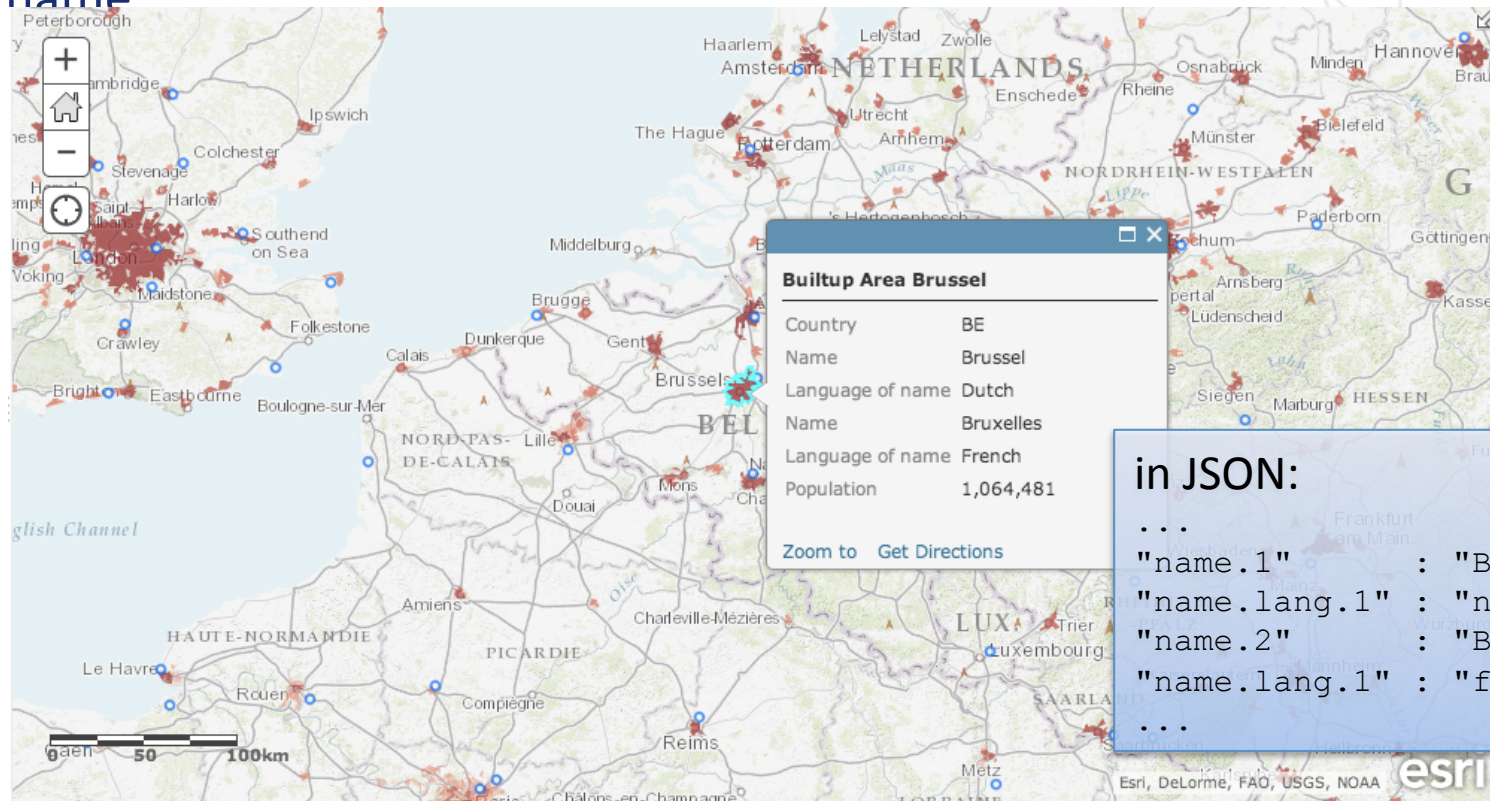
- ★ Reduce unlimited number of rich geographical names per feature

```
<AU:name>
  <GN:GeographicalName>
    <GN:language>ces</GN:language>
    <GN:nativeness>endonym</GN:nativeness>
    <GN:nameStatus>official</GN:nameStatus>
    <GN:sourceOfName>Český úřad zeměměřický a katastrální</GN:sourceOfName>
    <GN:pronunciation xsi:nil="true"/>
    <GN:spelling>
      <GN:SpellingOfName>
        <GN:text>Okoř</GN:text>
        <GN:script>Latn</GN:script>
      </GN:SpellingOfName>
    </GN:spelling>
  </GN:GeographicalName>
</AU:name>
```

# Example: geographical names

★ → 2 or 3 simple name attributes, optional language information for each

name



in JSON:

```

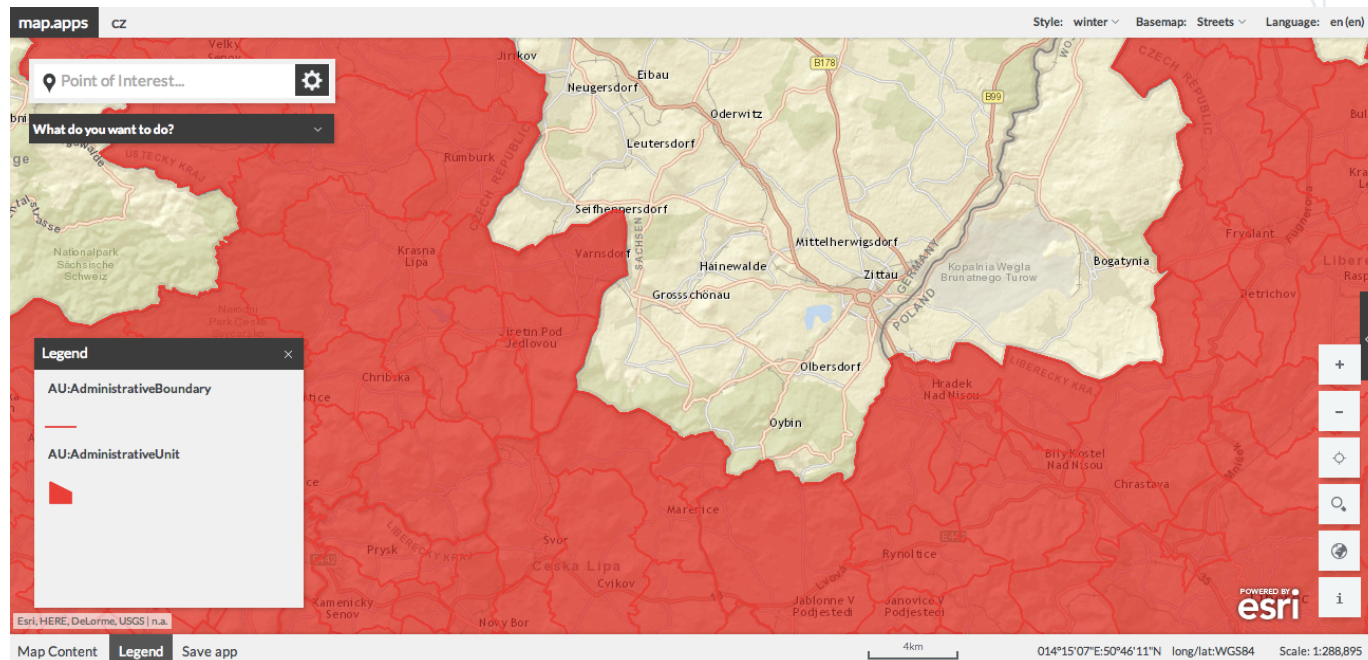
...
"name.1" : "Brussel",
"name.lang.1" : "nl",
"name.2" : "Bruxelles",
"name.lang.1" : "fr",
...

```



# Prepare data for use in map-based apps

- ★ **Make layers explicit:** subtype the feature types in cases where a map-based app shows different features from the same feature type depending on the scale



# Prepare data for use in map-based apps

★ Example: a layer / feature class per administrative or statistical unit level

The screenshot shows the 'ELF web map: administrative and statistical units' interface. The 'Contents' panel on the left lists several layers, including 'ELF StatisticalUnit (NUTS 1-3)', 'ELF StatisticalUnit (LAU 1-2)', and 'ELF AdministrativeUnit (Level 1-6)'. A context menu is open over a layer, with 'Set Visibility Range' selected. The dialog box displays the following settings:

- Only show this layer when zoomed:
- In closer than: 1:3,466,743 (Use Current)
- Out farther than: 1:1,733,373 (Use Current)
- Map scale is 1:2,311,162 (Clear)



# API support for using data in map-based apps

- ★ The Feature Service in the ArcGIS REST API provides the capabilities of an INSPIRE direct access download service
- ★ Plus several capabilities that are important for using such services directly in map-based apps and which go beyond a "download service", e.g.:

## Support for HTTP caching

- ★ the ArcGIS JavaScript API requests feature data in vector tiles consistent with the map tile hierarchy
- ★ improves user experience when panning and zooming

## Generalisation of geometries

- ★ geometries are simplified to fit the scale of the current map scale
- ★ lower memory footprint in the client and faster data transmission (example for accessing level 1 administrative units in a constant area for different scales: 1:37M → 247kB; 1:1.1M → 1.3MB; 1:289k → 4.1MB; no generalisation → 10.4MB)

## Scale and rendering hints

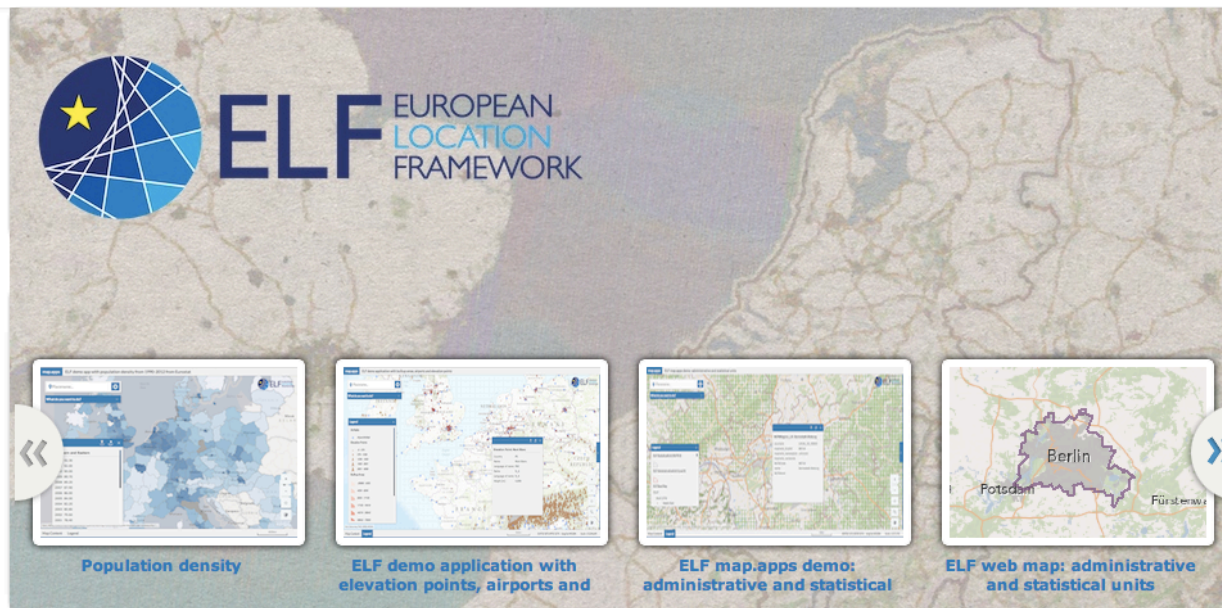
- ★ feature layers provide a hint for which scale levels they are suitable and how the features should be portrayed on a map

# ELF in ArcGIS Online

<http://elf.map.arcgis.com/>

HOME GALLERY MAP GROUPS MY CONTENT MY ORGANIZATION

Clemens ▾



Welcome to the European Location Framework (ELF) in ArcGIS Online - a single point of access for harmonised reference data from National Mapping, Cadastre and Land Registry Authorities for users of the ArcGIS platform. The European Location Framework aims at fostering the wider use of geo-information in Europe and enable the creation of innovative value-added services.

Cloud GIS platforms like ArcGIS Online are hubs of the ELF infrastructure. They integrate feature data and

# Sample layers from EuroGlobalMap (open data)

HOME ▾ ELF web map: elevation points, airports and builtup areas NEW MAP Clemens ▾

Details Add ▾ Basemap Save ▾ Share Print Directions Measure Bookmarks

**Legend**

**Airfields**

- Airport/Airfield

**Elevation Points**

- ▲ < 579m
- ▲ 579m - 1239m
- ▲ 1239m - 1933m
- ▲ 1933m - 2831m
- ▲ 2831m - 4808m

**Builtup Areas**

- < 4200
- 4200 - 8300
- 8300 - 17100
- 17100 - 44016
- 44016 - 58642
- 58642 - 73500
- 73500 - 99102
- 99102 - 152913

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**(1 of 2)**

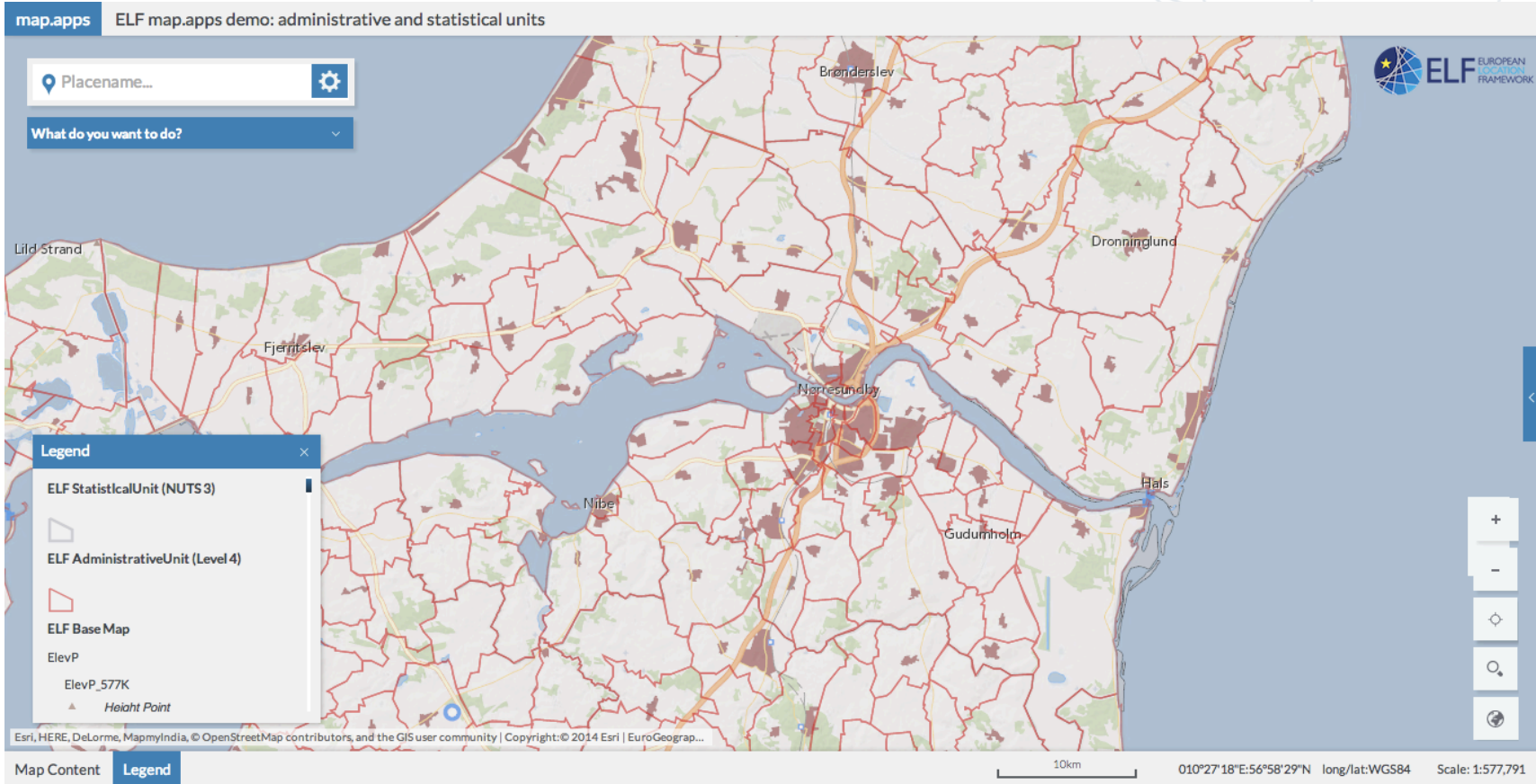
**Airport/Airfield Aeroporto di Bergamo Orio al Serio**

Country	IT
IATA Code	BGY
ICAO Code	LIME
Name	Aeroporto di Bergamo Orio al Serio
Language of name	ITA
Name	N_A
Language of name	N_A

[Zoom to](#) [Get Directions](#)



# Administrative and statistical units & Base map

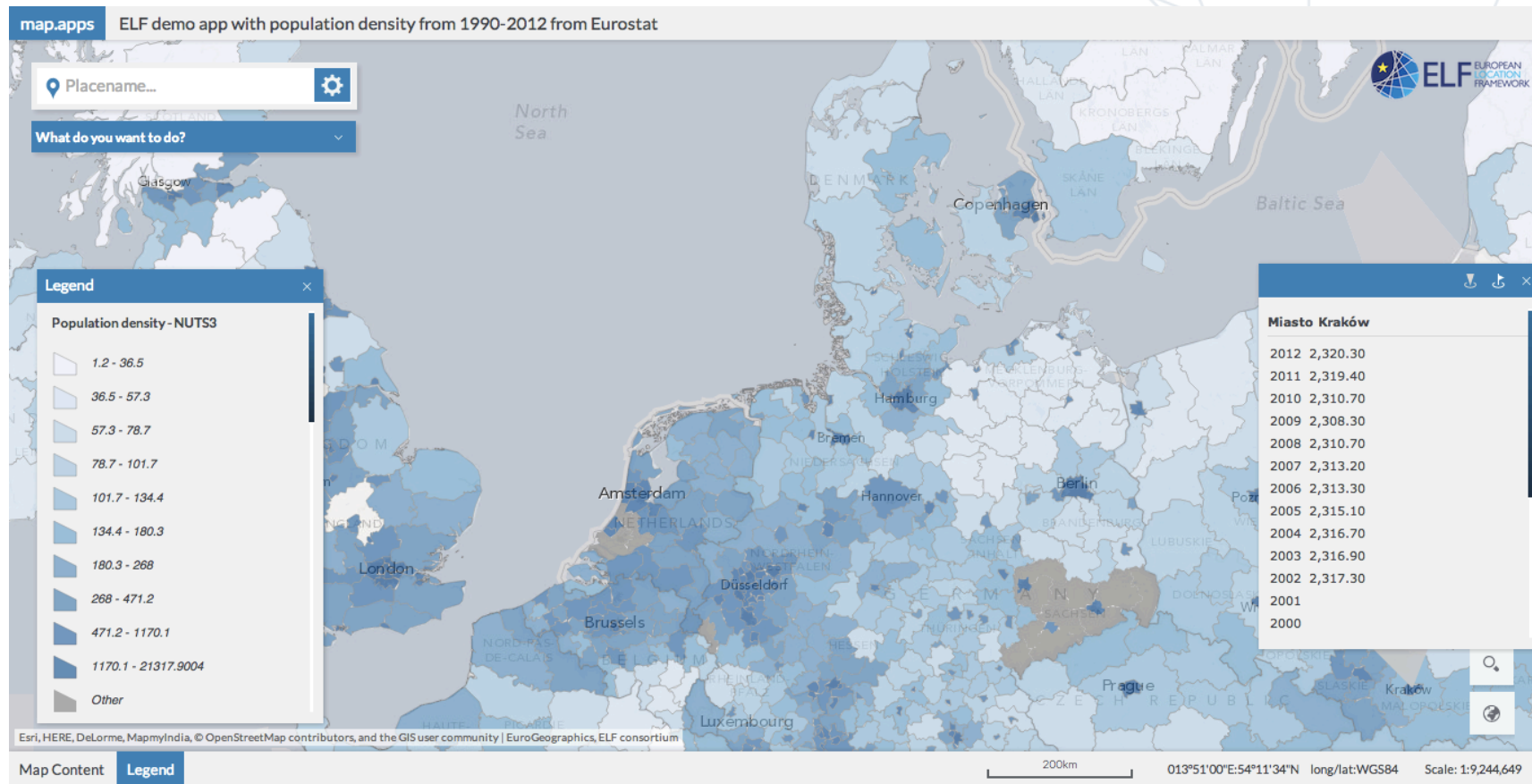


The screenshot displays the 'map.apps' interface for the 'ELF map.apps demo: administrative and statistical units'. The map shows a coastal region with various administrative and statistical units. A legend window is open, listing the following layers:

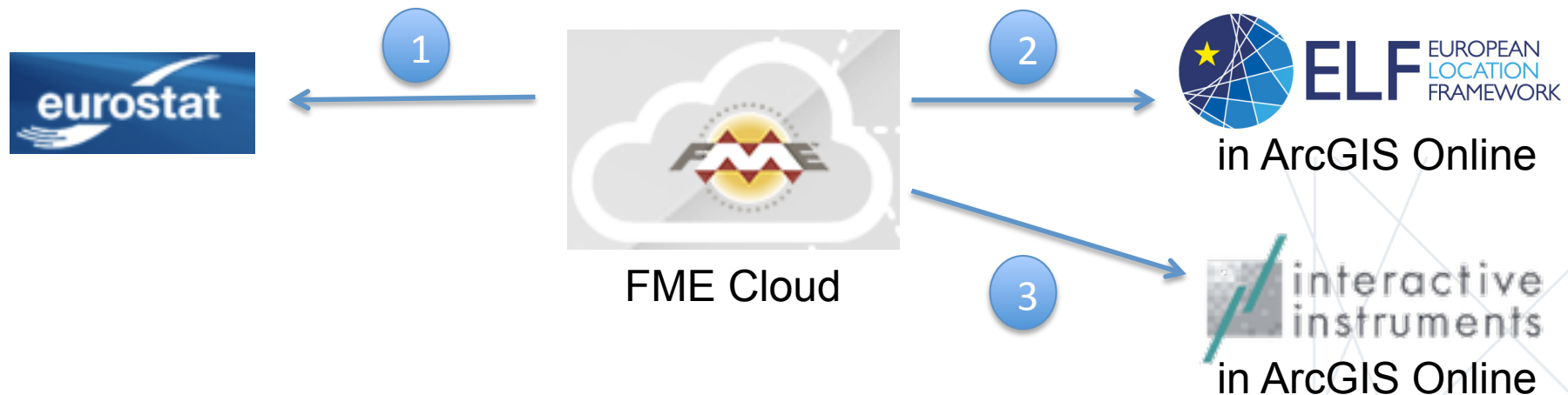
- ELF StatisticalUnit (NUTS3)
- ELF AdministrativeUnit (Level 4)
- ELF Base Map
- ElevP
- ElevP\_577K
- Heiht Point

The map includes a search bar with the placeholder 'Placename...', a dropdown menu 'What do you want to do?', and a scale bar at the bottom indicating 10km. The coordinates are 010°27'18"E:56°58'29"N long/lat:WGS84 and the scale is 1:577,791. The ELF logo is visible in the top right corner of the map area.

# Population density



# Geo-referencing statistical data



- 1 Access statistical data from Eurostat website
- 2 Access ELF feature service "administrative and statistical units" (NUTS area geometries)
- 3 Create/update feature service with statistical data and polygon geometries

*The cloud-based workflow supports unattended/periodic execution*

# ELF data in ArcGIS Online

- ★ ELF EuroGlobalMap

  - based on existing EuroGeographics dataset; **public** - open data licence

- ★ ELF EuroRegionalMap

  - based on existing EuroGeographics dataset

- ★ ELF Base Map

  - initial version created from EuroGlobalMap and EuroRegionalMap data

- ★ ELF Administrative and Statistical Units

  - based on existing EuroBoundaryMap dataset

- ★ Master level data from National Mapping Authorities will be added once the necessary agreements within ELF are in place

  - currently adding national dataset available under an open data license



One Reference Geo-Information Source for Europe

## Documentation

The components of the ELF Infrastructure will be documented incrementally on the following subpages as more specifications, datasets, tools, services and applications become available.

Terminology	Specifications	Datasets	Geo-tools
<a href="#">ELF Platform services</a>	<a href="#">ArcGIS Online services</a>	<a href="#">Applications</a>	<a href="#">Application Developers</a>

The ELF Platform (<http://locationframework.eu/>) is at the core of the technical architecture of ELF. It comprises the datasets provided by National Mapping and Cadastral Authorities (NMCAs) and – in the future – other data providers. Using ELF geo-tools, the datasets are prepared by the NMCAs to conform to the applicable ELF data and product specifications.

[www.elfproject.eu](http://www.elfproject.eu)

Welcome to the European Location Framework (ELF) service - a single point of access for harmonised reference data from National Mapping, Cadastre and Land Registry Authorities. This website is being developed as part of the ELF Project to create the technical infrastructure for delivering authoritative, interoperable, cross-border geospatial reference data. Global and regional level reference data is currently available along with a showcase application demonstrating search and selection options. You can also access the ELF ArcGIS online platform. More functionality and content will be added in the coming months. The service is jointly funded by the European Commission's Competitiveness and Innovation Framework Programme and the Project Partners. For more information about the ELF Project, please visit [www.elfproject.eu](http://www.elfproject.eu).

See the power of ELF

Showcase Applications



ELF in ArcGIS Online



Documentation



Application Developers



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Register for the on-line CEN/TC 287 workshop: Standardization

## A window into ELF



[www.locationframework.eu](http://www.locationframework.eu)

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