LinkedMap
Maps, Linked Data and INSPIRE

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Outline

1. Context: The PlanetData project
2. The Linked Map project
3. Technologies: Linked Map Service & Platform
4. Current status
The context: PlanetData

- FP7 Network of Excellence (Oct 2010- Sep 2014)
- State-of-art of large-scale public data management
  - Web friendly representation
  - Assessment/improvement quality
  - Topics: provenance, privacy, trust, access rights

- http://www.planet-data.eu/
Linked Map

- **PlanetData Call 2 subproject (Oct 2013-Sep 2014)**
  - Focus on GI, in particular VGI + Linked Data

- **Partners**
  - IAAA Research Lab - Universidad Zaragoza
    - [http://iaaa.unizar.es/](http://iaaa.unizar.es/)
  - Geospatium Lab (Zaragoza)
    - [http://www.geospatiumlab.com/](http://www.geospatiumlab.com/)

- **Background: SDI + INSPIRE**
Linked Data and INSPIRE

• LD + Geographic Information has enormous potential
  • But many GI producers (national mapping agencies, cadasters, etc.) don’t use it yet!
  • Even with success stories such as Ordnance Survey!!!

• Why? Interoperability with “legacy” GIS systems
  • Example: WMS, WFS, …. standards endorsed by INSPIRE
  • Fear of change?
Vision and objectives

• **Vision**
  • Address a complex GI problem relevant for professional GI producers with the help of Linked Data

• **Objectives**
  • Integration of Volunteer Geographic Information (VGI) with authoritative GI (e.g. National Map)
  • Quality assessment of VGI/authoritative GI
  • In the context of INSPIRE Data and INSPIRE NS
Interoperability LD & INSPIRE NS

• **Key idea:** Transform WMS → LD Server
  - Keep GetCapabilities, GetMap, GetFeatureInfo
  - Add URI dereferencing to RDF
  - Add POST/PUT/DELETE resources

• **Behaviour**
  - WMS clients see the node as WMS
  - Semantic clients see the node as LD platform
  - Enhanced WMS clients see both worlds

• **We call this “Linked Map Service” (LMS)**
How?

1. Transform a National Map into LD

1. Transform VGI source (OpenStreetMap) into LD

1. Link both datasets

1. Develop the Linked Map Web platform (plus LMS)

2. Use for QA through crowdsourcing experiments
Research lines involved

• **Geographic data provisioning**
  - Convert a large authoritative GI dataset into linked data
  - Link authoritative GI dataset with VGI data sources

• **Geographic data access**
  - Research and develop a read/write Linked Data enabled standard OGC Web map service
  - “Linked Map Service”
Research lines involved

- **Crowdsourcing platform development**
  - Integration of static geographic data with dynamic data

- **Quality experiments**
  - To measure data quality trade-offs associated with crowdsourcing and geographic data
Linked Map Service

WMS client

LMS client

LMS

Data Repository
(RDF store, SPARQL endpoint, ...)

Remote WMS
Linked Map Service

![Diagram of Linked Map Service]

- **HTML Templates**
- **Source Config**
- **Service Capabilities**
- **REST API**
- **Direct URI resolution**
- **WMS 1.3.0**
- **Web controllers**
- **GET endpoint**
- **POST endpoint**
- **DELETE endpoint**
- **PUT endpoint**
- **PATCH endpoint**
- **KVP endpoint**
- **XML endpoint**
- **Data management**
- **Local RDF store**
- **SPARQL 1.1**
- **WMS 1.3.0**

**REST API Service Capabilities**

- **Direct URI resolution**
- **WMS 1.3.0**

**Web controllers**

- **GET endpoint**
- **POST endpoint**
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- **PUT endpoint**
- **PATCH endpoint**
- **KVP endpoint**
- **XML endpoint**

**Data management**

- **Local RDF store**
- **SPARQL 1.1**
- **WMS 1.3.0**
Linked Map Platform

National map Linked data

Conversion

National map data

Mapping

Semantic Geo mashup

VGI Linked data

Conversion

VGI data

User’s edits and fixes

IAAA
Advanced Information Systems Laboratory
Universidad Zaragoza
GeoSLab

Planet Data
SEVENTH FRAMEWORK PROGRAMME
Linked Map Platform

- Enabler of crowdsourced assessment
  - VGI – INSPIRE data mapping
Current status

1. Transform a National Map into LD
   - Done (available July)

2. Transform VGI source (OpenStreetMap) into LD
   - Done (available July)

3. Link both datasets
   - In progress (planned July)

4. Develop the Linked Map Web platform (plus LMS)
   - In progress (planned July)

5. Use for QA through crowdsourcing experiments
   - Planned (July - Septembre)
http://linkedmap.unizar.es/
Feedback, comments are welcome!

Thanks!

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