IMKL and INSPIRE

Liesbeth Rombouts
Informatie Vlaanderen

Luc Van Linden
HL Consulting
KLIP – before 2016
KLIP – since 2016

Map request initiator

request

answer

KLIP

answer

request

answer

request

Utility Network Authority

...
“The Model”

INSPIRE

Generic Network Model

Utility Services

Activity Complex

Cross theme

Sewer

Water

Oil, Gas, Chemicals

Thermal

Telecommunications

Electricity

Depth

Extra topography

Extra map

Annotation

Connection

IMKL

Extra information

+
Challenge (UNA): Validate the source data vs Model

1. Data geo-referenced wrt common reference large-scale basemap?
Challenge (UNA): Validate the source data vs Model

1. Data geo-referenced wrt common reference large-scale basemap?
2. Required elements (features, properties and relationships) available in the source data?
**Challenge (UNA): Validate the source data vs Model**

1. **Data geo-referenced wrt common reference** large-scale basemap?
2. **Required elements** (features, properties and relationships) available in the source data?
3. Does an **asset register** exist?
Challenge (UNA): Automate the Responses (via REST)

netwerk / as-built information systeem:
- CAD files
- GIS files
- Database
Challenge (UNA): Automate the Responses (via REST)

- MRI
- KLIP transactional REST web-service organiser
- REST OAuth 2.0 secured webservice communication
- UNA
  - netwerk / as-built information systeem:
    - CAD files
    - GIS files
    - Database

OGC Underground Infrastructure Mapping and Modeling Workshop
Challenge (UNA): Automate the Responses (via REST)

KLIP transactional REST web-service organiser

REST OAuth 2.0 secured webservice communication

Integrated “in-memory” IMKL transformation

IMKL mapping definition

netwerk / as-built information systeem:
- CAD files
- GIS files
- Database

OGC Underground Infrastructure Mapping and Modeling Workshop
Challenge (UNA): Automate the Responses (via REST)

KLIP transactional REST web-service organiser

REST OAuth 2.0 secured webservice communication

Integrated “in-memory” IMKL transformation

IMKL mapping definition

netwerk / as-built information systeem:
- CAD files
- GIS files
- Database
Challenge (UNA): Automate the Responses (via REST)

- KLIP transactional REST web-service organiser
- REST OAuth 2.0 secured webservice communication
- Integrated “in-memory” IMKL transformation
- IMKL mapping definition

netwerk / as-built information systeem:
- CAD files
- GIS files
- Database

OGC Underground Infrastructure Mapping and Modeling Workshop
Challenge (UNA): Automate the Responses (via REST)

- KLIP transactional REST web-service organiser
- REST OAuth 2.0 secured webservice communication
- Integrated "in-memory" IMKL transformation
- IMKL mapping definition

Hosted

- netwerk / as-built information systeem:
  - CAD files
  - GIS files
  - Database

OGC Underground Infrastructure Mapping and Modeling Workshop
Technical implementation: use of Open Source underpinned by Open Standards

Mainstream IT
Open source Data Integration & ESB platform
TALEND Spatial Extension
1. Source & Target schemas
   - Read from data-sources
   - Or XSD GML Application schemas
     ▪ Extremely efficient

2. Creating schema mappings
   - Domain experts
   - Easily maintained external to the processing
   - Rich transformations

3. Transforms & encode IMKL GML 3.2.1 file
   - From GUI
   - From command line using mapping definition config file

OGC Underground Infrastructure Mapping and Modeling Workshop
IMKL → Viewer

> IMKL → blob
> Data validation
  ▪ .NET
  ▪ xsd validation: standard library
  ▪ Extra validation rules: custom written

> Data in the viewer
  ▪ xml → json
  ▪ harvest background layer
Any Questions?

Liesbeth Rombouts
Business analist KLIP
liesbeth.roombouts@kb.vlaanderen.be
Tel. +32 9 276 16 14

Informatie Vlaanderen
Koningin Maria Hendrikaplein 70
9000 Gent
Belgium

Luc Van Linden
Managing Consultant
Luc.vanlinden@hlconsulting.be
Tel. +32 486 50 75 78

HL Consulting
G. Lobertstraat 59
9700 Oudenaard
Belgium
More information...
Technology stack

> Website
  - Knockout, Durandal, OpenLayers

> Wrapper
  - Electron

> Backend
  - Azure SDK

> Web API
  - ASP.NET Web API
Infrastructure
Application architecture

- CQRS with Event Sourcing
  - commands (writes) separated from queries (reads)
  - natural audit log
Application architecture
API

> REST API over HTTPS
> Secured by the OAuth 2.0 protocol

> Supports JSON and XML
> POST instructions asynchronous
> GET instructions synchronous

> Functionally broken down into methods for the Map Request Initiator and the Utility Network Authority
IMKL Model

- Information model Cables & Pipes (IMKL)
- Extension to INSPIRE Utility Theme (INSPIRE US 3.0)
  - Additional classes, properties and relationships
IMKL Model

IMKL

Extra information

Depth
Extra topography
Extra map
Annotation
Connection

Electricity
Telecommunications
Thermal
Oil, Gas, Chemicals
Water
Sewer
Cross theme
Activity Complex

INSPIRE

Utility Services

Generic Network Model

Activity Complex
IMKL Model
Viewer
Info and Documentation

> Our answer to the RFI

> Everything about KLIP (most of it in Dutch)
  ▪ www.klip.be

> Test
  ▪ https://klip.beta.agiv.be
    > application
  ▪ https://klip.agiv.be/api
    > API documentation
Cable and Pipe Information Portal (KLIP)

- Purpose: precaution and avoiding accidents or damages to underground infrastructures.
- Contractor is legally obliged since 2009 to request upfront as-built information via a central portal (KLIP) hosted by the Flemish government.
- All infrastructure owners or maintainers need to register and supply plans for every request.

New KLIP 1st of January 2016

- Shortening maximum term from 15 to 7 working days
- Exchange only network elements
- Usage of 1 single data model (IMKL)
- Offer the requestor 1 single view of the underground infrastructure
KLIP IN THE PAST

KLIP DIGITAL SINCE JAN ‘16

1 digitaal plan

XML
KLIP: COMMUNICATION

IMKL - PROTOCOL & API

• Exchange of network elements ONLY:
  • XML/GML 3.2.1 IMKL
  • Form & content compliant with IMKL model
  • No topography
• Communication with the KLIP platform only
• Portal
• Automated via REST web services
  • machine – machine
  • Transactional (per plan request)
• Security OAuth 2.0
KLIP: TRANSFORM SOURCE
KLIP: INTO A RESPONSE

IMKL XML:

• Geographical Markup Language
• Version 3.2.1
• Open International Standard of Open Geospatial Consortium
HOSTED SERVICE

Cloud hosted @Amazon AWS

- Secure & Reliable
- Scalable and high-performance
- Industry leader
With the support of

FLANDERS INVESTMENT & TRADE

FLANDERSINVESTMENTANDTRADE.COM