Enhancing spatial webservices with analytics – case LNE

DATABASE ONDERGROND VLAANDEREN
Database of the soil and subsoil of Flanders
MercatorNet cooperation

GWF, 25/05/2016
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DOV- and MercatorNet coordinator
Overview

- Situation of the case LNE
  - Open data in Flanders
  - What is DOV?
  - What is MercatorNet?

- Enhancing spatial web services of LNE with analytics
  - Sesam
  - Kibana
  - Zabbix
  - Google monitor
  - Spatineo Monitor

- Conclusions
Open data in Flanders versus SDI

- MercatorNet
- DOV
- Geopunt

Graph showing connections between MercatorNet, DOV, and Geopunt, with labels such as "miniknooppunt," "medioknooppunt," and "hoofdknooppunt."
What is DOV?

- URL: [http://dov.vlaanderen.be](http://dov.vlaanderen.be)
- DOV is a cooperation in Flanders:
  - First established in 1996
  - Open data online since 2002
  - 3 entities are the core partners:
    - Mobility and Public Works Department (MOW)
    - Environment, Nature and Energy Department (LNE)
    - Flemish Environment Agency (VMM)

**MISSION**
Structuring and managing all data and information concerning the soil and subsoil of Flanders and make them available

**VISION**
DOV is a cooperation of partners that mobilizes data and information concerning the soil and subsoil of Flanders, guards and reports on their quality and makes them accessible in an integrated way. DOV works according to Flemish decrees and international agreements, in the most effective, efficient and flexible way.
Which data in DOV?

DOV offers data and information on thematic areas related to soil and subsoil:

- groundwater
- geology
- geotechnics
- soil

All data is available as open data. Reuse is allowed.

“gratis open data licentie Vlaanderen V1.2”
What is MercatorNet

- Cooperation within the government of Flanders
  - Mobility and Public Works (BD MOW)
  - Environment, Nature and Energy (BD LNE)
  - Physical Planning (BD RWO)

- Common infrastructure to support all GIS users of the partners involved
  - ArcSDE Database to be replaced by new Read Only databases (PostGis)

- Common infrastructure to support publication of geodata via services

All data is available as open data

Reuse is allowed

“gratis open data licentie Vlaanderen V1.2”
# Architecture for DOV/MercatorNet

## Both DOV and MercatorNet
- **PostgreSQL, PostGIS**
- **Services**
  - Catalog (Geonetwork): CSW
    - DOV: >1000 metadata files
    - MercatorNet: 980 files
  - OGC-services (Geoserver): WMS, WFS/WCS, WMTS
    - DOV: 470 layers
    - MercatorNet: 130 layers
- **Common application for publication: called**
  - “Mercurius” for DOV
  - “Ariadne” for MercatorNet

## DOV only:
- **Applications for datamanagement and viewing**
  - Java, GWT
  - Geotools, Geomajas
  - [Verkenner](#)
Mercurius / Ariadne
Analitics – several tools in use

- **Sesam since 2011**
  - Logging of all requests on Geonetwork and geoserver
  - Own application developed in 2011 – still running

- **Monitoring Website’s Uptime with Google Docs**
  - Real time uptime check, request every 5 min

- **Spatineo since 2015**
  - Real time monitoring of response times, request every 5 min
  - Usage analytics: based on own logfiles, shipped to Spatineo

- **Kibana**
  - Logging
  - Real time monitoring

- **Zabbix**
  - Monitoring
# Usage of DOV – Sesam compared to Spatineo

<table>
<thead>
<tr>
<th>Year</th>
<th>CSW</th>
<th>WMS</th>
<th>WFS</th>
<th>WCS</th>
<th>zips</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>250.000</td>
<td>500.000</td>
<td>0</td>
<td>0</td>
<td>na</td>
</tr>
<tr>
<td>2012</td>
<td>1.114.595</td>
<td>2.826.549</td>
<td>23.318</td>
<td>0</td>
<td>na</td>
</tr>
<tr>
<td>2013</td>
<td>24.135</td>
<td>8.789.788</td>
<td>2.561.662</td>
<td>2.281</td>
<td>na</td>
</tr>
<tr>
<td>2014</td>
<td>1.201.828</td>
<td>47.206.065</td>
<td>26.815.979</td>
<td>6.337</td>
<td>na</td>
</tr>
<tr>
<td>2015</td>
<td>1.504.838</td>
<td>60.401.191</td>
<td>26.723.257</td>
<td>2.148.405</td>
<td>1.531</td>
</tr>
</tbody>
</table>

Further investigation needed to understand the differences.

**Spatineo-rapport INSPIRE 2015 spreadsheet**

<table>
<thead>
<tr>
<th>Web service type</th>
<th>Number of requests</th>
<th>Data transferred (MiB)</th>
<th>Availability</th>
<th>Hours of maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>WMS</td>
<td>36.281.193</td>
<td>515.145</td>
<td>97.3%</td>
<td>0</td>
</tr>
<tr>
<td>WFS</td>
<td>15.389.579</td>
<td>2.527.837</td>
<td>97.4%</td>
<td>0</td>
</tr>
</tbody>
</table>
Spatineo Monitor – meters and alert settings
Spatineo – warnings and alerts

```xml
<?xml version="1.0" encoding="UTF-8"?>
    < ServiceException>
        java.io.IOException: No such resource: ps_ven_std.sld No such resource: ps_ven_std.sld
    </ ServiceException>
</ServiceExceptionReport>
```
All warnings combined in one mailbox – who’s the first?
Zabbix versus Spatineo

Onderwerp: FW: Mercator - productie: Te weinig lagen: PROBLEM

Op 24/05/16 15:53 schreef zabbix@milieuinfo.be <zabbix@milieuinfo.be>:

>Trigger: Te weinig lagen
>Trigger status: PROBLEM
>Trigger severity: Average
>
>Item: Wms Capabilities: aantal lagen
>Value: 1

May 24 2016 3:54 PM
Unavailable for 30 minutes
What happened yesterday?

DOV and MercatorNet were down for 30 à 50 minutes.

Probably caused by wrong changes of configuration related to DNS on the shared infrastructure....
Spatineo - Performance testing

- **Testscenario**
  - DOV: 50 req/s in total
  - MercatorNet: 56 req/s in total

- **First test on 19/04/2016**
  - Initial set up knowing existence of performance issues

- **Second test on 24/05/2016**
  - MercatorNet – no changes – Geoserver running on 2 nodes
  - DOV – Geoserver running on 4 nodes in stead of 2
Spatineo - Performance testing – results on 19/04/2016
Spatineo - Performance testing - results on 24/05/2016
Kibana during the test compared to regular usage

DOV - Requests from spateineo monitoring and performance test included

DOV – requests from “real” users during the testing time window
Kibana versus Spatineo

Spatineo monitor included
10,000 requests from Spatineo during the visible time frame

Spatineo monitor not included
Max: 3500 requests per min >> almost 60 requests per second

Kibana: all req on geoserver DOV

Corresponding views in Spatineo for the same day

Spatineo: Only req. on WMS DOV
Reporting with Spatineo
Conclusions

- Providing open data is challenging
- Using the same services that had been set up for publication of data in own applications leads to even more need to have insight in usage and performance
  → Several tools from different points of view have to be in place
- Positive feedback from users is motivating
  → Having the possibility to use DOV, our users “enjoy” paying taxes
- Due to open data policy in Europe – governemetal tasks related to it have become vital for the whole society. Costs are worth spending due to gain for all involved target users.
QUESTIONS?

Contact us at dov@vlaanderen.be