Possibility of using ZOO Project for Hanoi Digital Archive

www.zoo-project.org

February, 1st, 2010

Dr. Nicolas BOZON
CEO and communication manager
3LIZ (www.3liz.fr)

Personal background

- Geography and GIS education (2000 - 2005)

- PhD in applied mathematics (2006 - 2009)

- Research collaboration with Osaka City University (2009)

- Join 3LIZ company (end 2009)

Main research interests

- Open Source GIS and Web GIS

- Web design and user-experience for webmapping applications

What is ZOO Project ?

ZOO Project is a **WPS compliant and developer-friendly framework** allowing to easily create and chain OGC (Open Geospatial Consortium) webservices.

It is made of a powerful and extensible server-side C Kernel, which is able to **load dynamic librairies and to orchestrate** Service Providers in several common programming languages.

This make it easy to setup **spatial based webservices** using FOSS4G and existing libraries, on Windows, Mac OS and Linux.

History of ZOO Project

- Project founded by Gerald FENOY, Venkatesh RAGHAVAN and Nicolas BOZON (FOSS4G 2008, CapeTown, South Africa)

- Development process done by GeoLabs company in close collaboration with 3LIZ company and Osaka city university (2008/2009)

- Project presentation and community starts as the « ZOO Tribe » (FOSS4G 2009, Sydney, Australia)

- Open source release under MIT/X11 license planned for April 2010

- ZOO presentation, workshop and booth planned for FOSS4G 2010 in Barcelona, Spain.

The ZOO Tribe

ZOO Project steering comitee

Gérald FENOY (GeoLabs), FR

Venkatesh RAGAHAVAN (OCU), JP

Nicolas BOZON (3LIZ), FR

Jeff McKenna (Gateway geomatics), CA

Hirofumi HAYASHI (AppTech), JP

Markus Neteler (Centro di Ecologia Alpina), IT

Massimiliano Cannata (Supsi), CH

Daniel Kastl (GeoRepublik), DE & JP

Geo Grid AIST (name to be confirmed), JP

Goals of ZOO Project

- Not to reinvent the wheel, but rather make existing FOSS4G communicate together in a standardized way using OGC WPS 1.1.0

- Create spatial based webservices using GDAL/OGR, GRASS, CGAL, Sextante (...) libraries, in order to use them for web GIS applications.

- Develop the ZOO Platform to provide powerful web GIS system with advanced functionnalities such as:

- Conversion/Reprojection of geographic datasets
- Use of advanced spatial based algorithms (raster analysis, triangulation..)
- Use of external scientific models to provide innovative functionnalities out of research projects.

How does ZOO work ?

ZOO core source code (**ZOO Kernel**) handles and chains ZOO services

A **ZOO service** is made of:

      A .zcfg metadata file (Title, Metadata, Inputs, Output...)

      A Service Provider, a « Service Shared Object » (SSO)
      (Dynamic library, Python modules, JAVA Class, PHP script ...)

WPS GetCapabilities and **DescribeProcess** requests are resolved only by parsing the .zcfg file metadata (Flex+Bison)

The ZOO Kernel is able to dynamicaly load SSO, extract and run specific functions to respond to **WPS Execute** requests.

ZOO Platform architecture

Mapserver
(WMS, WFS,WCS,SOS)

+

Apache Server
(HTTP)

+

Open Office Server
(ODF)

+

ZOO Kernel
(WPS)

ZOO OWS Platform

ZOO example with OGR Service Provider

WFS input data and buffer process using OGR library

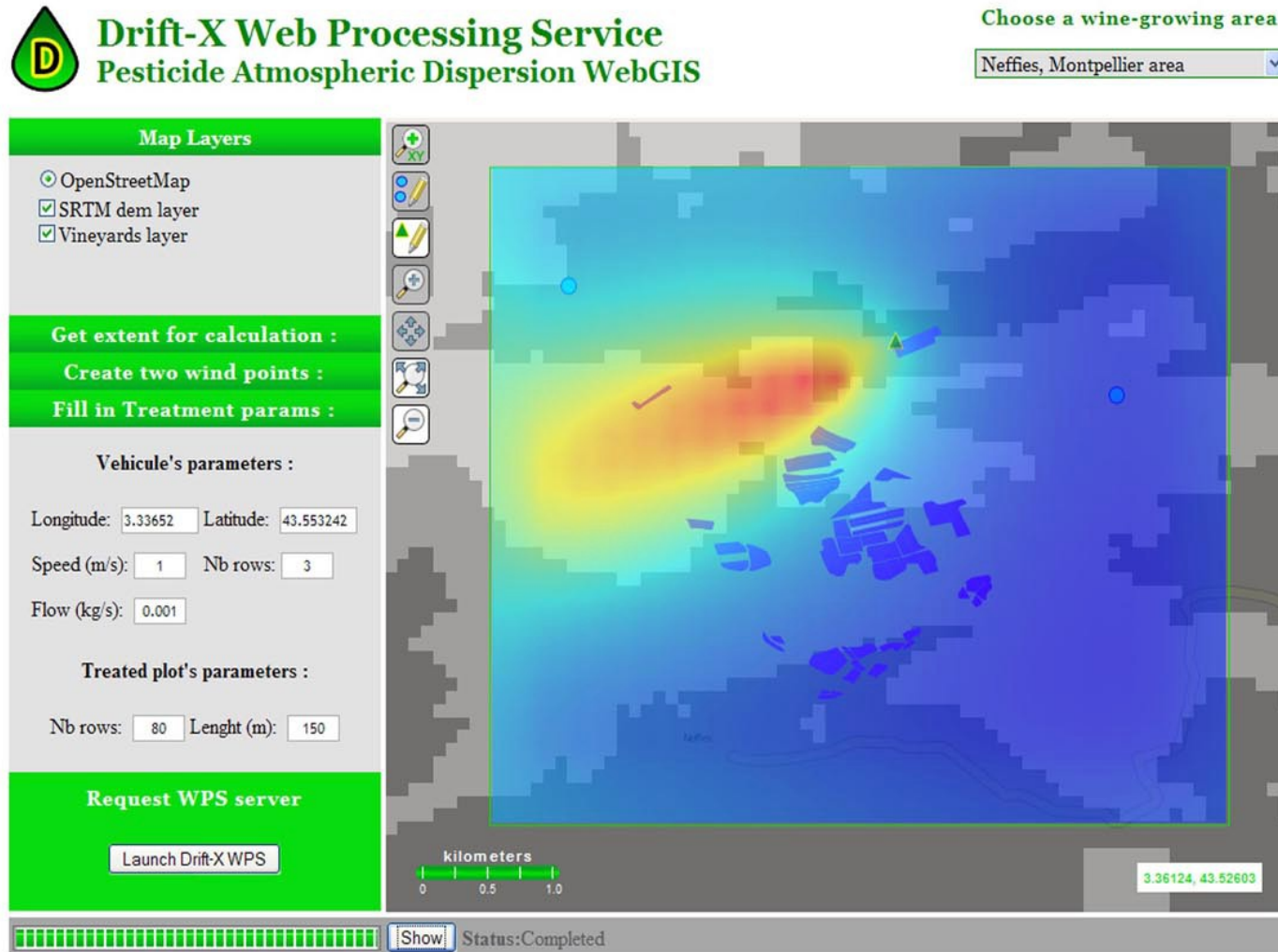# ZOO example with CGAL Service Provider
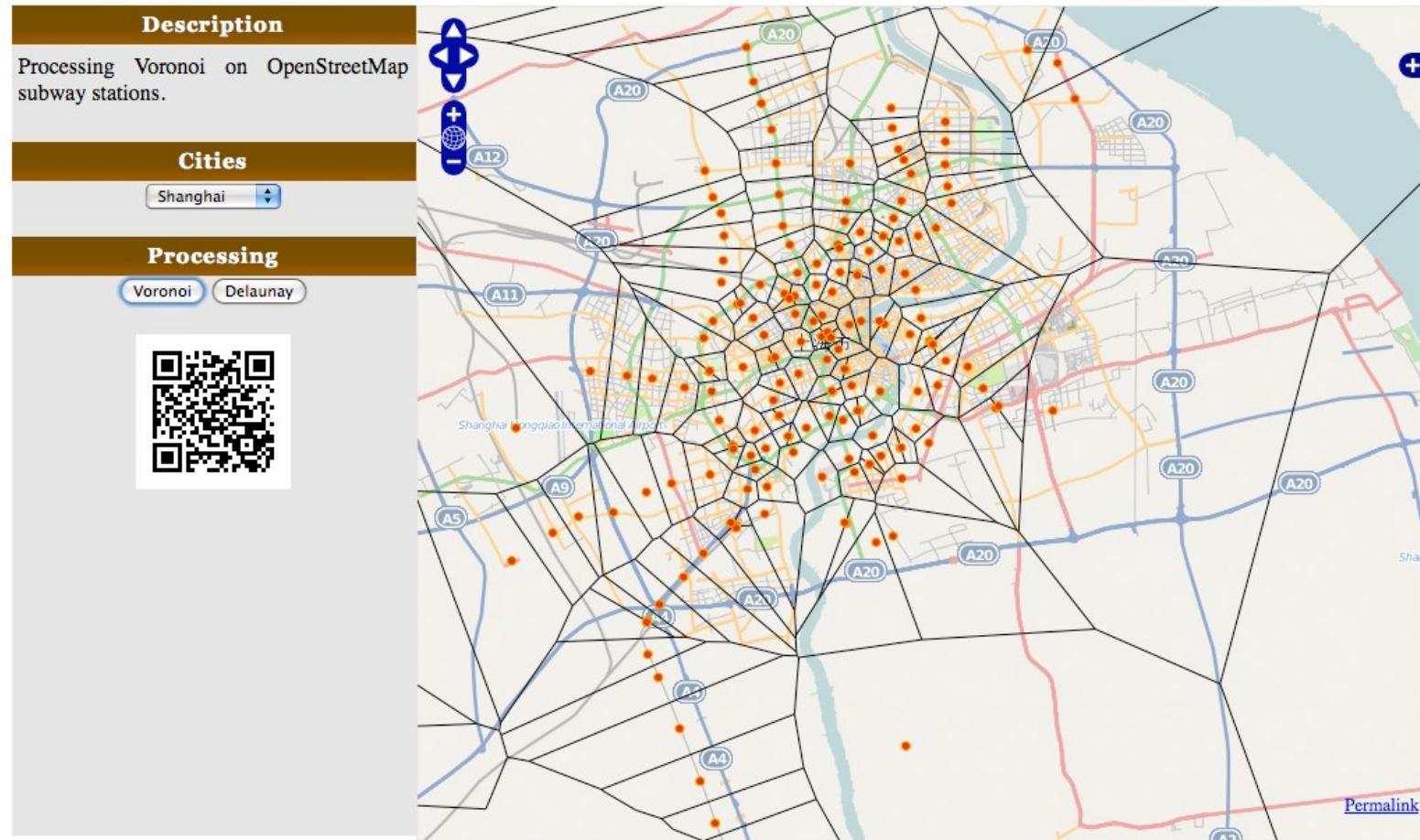
GML input data and Voronoi or Delaunay triangulation process using CGAL

ZOO example with Drift-X WPS

Drift-X pesticide atmospheric dispersion model called as dynamic library by ZOO Fortran service provider

Possibility of using ZOO Project for Hanoi Digital Archive

Imagine core functionnalities

- Reproject raster and vector data on the server side according to the desired format and projection (possibility for the end-user to change them dynamically)

- Deal with any data for the application whether its type (raster, vector, 3D buildings, multimedia related data)

- Build a PostgreSQL database for the project (including geodata, historic context and related multimedia data), which could be queried and updated by a ZOO Service.

Potential of ZOO Platform for Hanoi Digital Archive Web GIS (1)

Setup reliable spatial data infrastructure

- Setup robust server-side architecture using Apache and PostgreSQL/PostGIS server.

- Serve raster and vector geodatasets trough OGC standards (WMS, WFS, WCS, TMS...) using **MapServer** and **TileCache.**

- Serve some of the multimedia and/or social data using Open Office Server

Potential of ZOO Platform for Hanoi Digital Archive Web GIS (2)

Publish Hanoi Digital Archive data

- Make MapServer, PostGIS database and potential ZOO Service communicate easily

- Use **OpenLayers** to render, overlay and query data layers

- Use modern Javascript library (Jquery, MetaJS or ExtJS) to provide advanced functionnalities to the end-user

>> Intuitive historical timeline to switch from a date to another
>> Layers opacity widget to easily compare landuseof different periods
>> Ajax calls to connect geometries with non GIS data out of the database

Thanks for your time !

nbozon@3liz.com