RIMapperWMS
An SVG Client built in OGC
Web Mapping Service layers

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Overview

• Why SVG for a Web Mapping Service?
• Why a built-in GUI?
• Past: Predecessor projects
• Present
  • Principles
  • Technicalities
• Future: Outlook
What is a Web Mapping Service?

- A web service interface specification by the Open Geospatial Consortium (OGC)
- OGC delivers spatial interface specifications for Open Web Services (OWS) & related Encodings:
  - Geographic Markup Language (GML)
  - Web Catalog Service
  - Web Feature Service
  - Web Coverage Service
  - **Web Mapping Service**
  - Styled Layer Descriptor
  - Web Map Context Document
What is a Web Mapping Service?

“Standardized interface for the creation of superimposed map-like views of geographic information”

- Delivers map graphics from standardised URL requests
- WMS is actually the most mature and widest adopted OWS specification (numerous open source, as well as commercial solutions)
Why Scalable Vector Graphics for a WMS?

SVG is XML-based vector graphics
  - High quality (carto)graphics & attribute info
  - low-bandwidth well suited for mobile applications

Many WMS exist, some with (limited) SVG
  - All treat SVG as ‘static graphics format’ only
  - SVG also can hold attribute data
  - SVG also can provide animation
  - SVG also can provide application logic
    ➔ Can support built-in Graphical User Interface (GUI)
Why a built-in GUI?

No need for separate client application: “output = application”

- simple WMS conformant interface to the data
- data includes built-in client-side GUI
- GUI handles the map interaction and generates further requests
Past: Predecessor projects

RIMapperWMS has “organically grown” out of a range of earlier project at ITC:

- RIMapper
- FLAVOUR (part of Wireless Campus LBS)
- Campusmapper

...all of these are under the umbrella of the SDI\textsuperscript{LIGHT} programme
SDILIGHT

• Lightweight Spatial Data Infrastructure based on open standards/open source software
• testbed/playing ground at ITC
  • for research, PhD & MSc work
  • for projects & proof-of-concept applications
• server-side focus on MySQL/PostGIS, Java, open source OWS services
• client-side focus on SVG
RI Mapper: Risk Inventory Mapper

Java servlets to deliver SVG output (=application)

makeSVG

XML2SVG

parseXML

XML - configuration

```xml
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE RIM PUBLIC "RIMmapper/RI Mapper.dtd" "">
<RIM TYPE="SVG_STANDALONE" ID="ri mapper" LINK="ui" PW="psa">
<HEADER>
</HEADER>
<LAYERS>
</LAYERS>
<FOOTER>
</FOOTER>
</RIM>
```
Wireless CampusLBS

- co-operation between ITC & University of Twente
- to set up **infrastructure** necessary for Campus Location Based Services, pilot at **SVGopen2005**

Europe’s largest uniform hotspot
- 140 ha campus (covered in- and outdoors)
  + Enschede city centre (outdoors)
- 650+ individual access points

testbed for wireless and mobile applications
FLAVOUR prototype: architecture

Friendly Location-aware conference Assistant with priVacy Observant architectURe

- Location Managers
  - provide client with location
  - register with:
- Jini Lookup Services:
  - ‘pull’ (find others, locate resources)
  - ‘push’ (communicate with others, conference messages)
- Client application
- Mapping System based on RIMapper
From Flavour to CampusMapper

• Flavour mapping system based on RIMapper with addition of extent-based feature extraction
• useful for more than Wifi localization:
  • basis for quickly and easily customised maps of the UT Campus

→ CampusMapper pilot
• DHTML interface generates GET/POST requests
• JavaBeans store user/session settings
From CampusMapper to RIMapperWMS

CampusMapper already ‘almost’ an OGC WMS

- Only OGC compatible request/response missing
General setup of RIMapperWMS

- spatial database back-end (postGIS)
  - spatial and attribute data
  - Web Mapping Service configuration
- server application (Java)
  - responds to WMS compliant requests
  - provides output in SVG (with built-in GUI)
- mobile or desktop web client
  - renders interactive & dynamic SVG maps
spatial database back-end (PostGIS)

PostGIS spatial metadata

WMS metadata

spatial & attribute data per ‘layer’

WMS styling
Spatial data layer tables

- Object geometries in PostGIS GEOMETRY objects
  - follows OGC Simple Features Specification
  - spatially indexed
  - (re-)projectable
- Object attributes
- Can come from many data sources (eg. shp2pgsql)
**WMS metadata tables**

- Defines the WMS instance metadata
- Lists available layers and their:
  - projection data
  - extent
  - styles
  - etc...
WMS styling tables

- Defines available styles from WMS perspective
- Defines underlying SVG graphic styles
- Multi-purpose table for SVG & script fragments (e.g. GUI elements, interactivity event handlers, ...)
Interoperability considerations

• GetGUI=true would break a cascading WMS
  • Default GetGUI=false

• Other output formats support needed
  • At least GIF & PNG
  • planned through Batik transcoding
Status: first public bêta released

• Adheres to OGC WMS *Basic* 1.1.1 specification
• Supports *GetCapabilities* & *GetMap* requests
• Additional vendor-specific *getGUI* capability

Known limitations & issues:

• GUI client **very** limited, need to make GUI more complete (layer switcher, attribute info, etc...) and more flexible (support more User Agents & SVG 1.2)
• *getGUI=false* supported, but not yet output of formats other than SVG (PNG, GIF, etc...)
• most OGC Compliance Tests pass, but no full compliance (ao. PNG or GIF output needed)

• Free, open source (*creative commons* license)
Outlook

Immediate plans:

- extending to *Queryable* WMS compliance
  - already possible to see attributes (client-side)
  - add server-side support: *GetFeatureInfo interface*
- WMS setup application for Database
- adding transcoding to other formats (PNG, GIF,...)
- performance & useability testing

and further...?

- WMS 1.3.0 support (depends on Proj4 library)
- Styled Layer Descriptor & Web Map Context
- ...?
Thank you for your attention!

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http://kartoweb.itc.nl/RI Mapper