TinyOWS

An high performance OGC WFS-T server
Summary

- Camptocamp Presentation
- What TinyOWS is?
- Why TinyOWS?
- Architecture
- OGC Compliant
- Implementation
- Configuration
- Performance Bench
- Projet WebSite
- Roadmap
- Conclusions
- Questions
Camptocamp, an Open Source Base Camp!

- **35 employees (CH and FR)**
- **about 50 to 70 % of growth per year since 2002**
- **3 activity domains**
  - Spatial solutions
  - Business solutions
  - Infrastructure solutions
- **4 services poles**
  - Consulting
  - Engineering
  - Supporting
  - Training
What TinyOWS is?

- Tiny OWS is
  - Light OGC Web Service for PostGIS
  - Speed in mind OWS Server
    - Currently WFS-T implementation
    - WMS work in progress
  - Tiny approach
    - Deeply rely on PostGIS application
    - Easy to deploy
      - Quite simple configuration file
- OSS Software
  - MIT Licence
Why TinyOWS?

- R&D Project
- Yet Another WFS Server...
- Implement latest OGC WS standard
- Performance is a priority
TinyOWS Architecture

Common OWS Architecture Stack

- Data Storage
- Data API
- Map Engine
- OWS Server
- OWS Client

TinyOWS Architecture Stack

- PostGIS
- TinyOWS
- OWS Client
TinyOWS and OGC

Abstract High Level

Web Service Level

Additional Specifications

OWS
OGC Web Service

WMS
Web Map Service

WFS-T
Web Feature Service

... 

SLD
Styled Layer Description

FE
Filter Encoding
OCG Standards Compliant

**WFS**
- Basic Profile
- Transactional Profile
- Output format
  - GML 2.1.2
  - GML 3.1.1
- Versions:
  - WFS 1.0.0
  - WFS 1.1.0

**FE**
- Versions:
  - FE 1.0.0
  - FE 1.1.0

**WMS**
- REQUEST
  - GetCapabilities
  - GetMap
- Output format:
  - SVG
- Versions:
  - WMS 1.1.0
  - WMS 1.3.0
Implementation

- CGI based
- ANSI C language
- About 15000 lines code
- Required Libraries and applications
  - Libxml2
  - PostgreSQL C API
  - PostGIS (current svn version)
- Valgrind unit tests (error checker and memory leak)
PostGIS GML Patch

- Patch content
  - AsGML export syntax problem
    - GML 2.1.2 corrections to be really OCG compliant
  - Add GML 3.1.1 support

- Patch commited
  - Title: 'Review of AsGML() patch – change of AsGML() parameters'
Configuration

- One single config file
- XML config file based
- Fews config blocks:
  - Metadata (contact and service)
  - Service limits
  - PostgreSQL connection parameter
  - Layers
<tinyows>

<limits
    layers="12"
    features="5000"
    width="800"
    height="600" />

<pg
    host="127.0.0.1"
    user="postgres"
    password="postgres"
    dbname="tinyows_test"
    port="5432" />

<layer name="root" title="root" srid="4326"
    queryable="1" retrievable="1" writable="1">

    <layer name="OGCfeatures" title="OGCfeatures" prefix="cdf"
        server="http://www.opengis.net/cite/data" srid="32615">
        <layer name="Nulls" title="Nulls" />
        <layer name="Seven" title="Seven" />
        <layer name="Fifteen" title="Fifteen" />
        <layer name="Other" title="Other" />
        <layer name="Inserts" title="Inserts" />
        <layer name="Updates" title="Updates" />
        <layer name="Deletes" title="Deletes" />
        <layer name="Locks" title="Locks" />
    </layer>
</layer>

</layer>

</tinyows>
## Performances Quick Bench

<table>
<thead>
<tr>
<th></th>
<th>TinyOWS</th>
<th>GeoServer</th>
<th>MapServer</th>
</tr>
</thead>
<tbody>
<tr>
<td>GetFeature (100 features)</td>
<td>102 ms</td>
<td>279 ms</td>
<td>98 ms</td>
</tr>
<tr>
<td>GetFeature (1000 features)</td>
<td>1636 ms</td>
<td>4095 ms</td>
<td>2675 ms</td>
</tr>
<tr>
<td>GetFeature (5000 features)</td>
<td>4801 ms</td>
<td>6646 ms</td>
<td>7935 ms</td>
</tr>
</tbody>
</table>
## Performances Operator Quick Bench

<table>
<thead>
<tr>
<th>Operator</th>
<th>TinyOWS</th>
<th>GeoServer</th>
<th>MapServer</th>
</tr>
</thead>
<tbody>
<tr>
<td>PropertyIsGreaterThan (us_states)</td>
<td>102 ms</td>
<td>279 ms</td>
<td>98 ms</td>
</tr>
<tr>
<td>PropertyIsLike (us_lakes)</td>
<td>1636 ms</td>
<td>4095 ms</td>
<td>2675 ms</td>
</tr>
<tr>
<td>PropertyIsNotEqualTo (us_states)</td>
<td>4801 ms</td>
<td>6646 ms</td>
<td>7935 ms</td>
</tr>
<tr>
<td>PropertyIsBetween (us_states)</td>
<td>703 ms</td>
<td>1225 ms</td>
<td>541 ms</td>
</tr>
<tr>
<td>Intersects (us_states)</td>
<td>1974 ms</td>
<td>4437 ms</td>
<td>3691 ms</td>
</tr>
<tr>
<td>BBOX (us_states)</td>
<td>2396 ms</td>
<td>3505 ms</td>
<td>2158 ms</td>
</tr>
</tbody>
</table>
Performance Synthesis

- Seems faster than both GeoServer and MapServer
  - Meaningful with medium datasets
  - Meaningful with some operators (not all !)
- Speed equivalent to the others
  - On small datasets
  - On GetCapabilities requests
- Need to do further benchmarks
  - Large and huge dataset
  - Load increase...
Tinyows Web Site

- Project available from: http://www.tinyows.org
- Trac based
- Current Content:
  - Download stable release
  - Wiki user documentation
  - SVN code browser
  - Doxygen documentation
Roadmap

- Current version is 0.6.0 (alpha phase)
- Future work before 1.0:
  - WFS Lock
    - Use PostGIS long transaction
  - WFS alternatives formats (GeoJSON, GeoRSS, KML...)
  - SLD implementation
    - SLD to SVG style conversion
    - User Layer defined
  - WMS full implementation
    - Time and extra dimension
    - OGC WMS units test compliant
  - Cache system (Request + Config file)
  - FastCGI mode
  - ...

Conclusions

- PostGIS light architecture seems to be performant
- TinyOWS could become now a real usable WFS-T project
- Still a lot of work before a 1.0 Release
Contacts

- Camptocamp SA
  - Web Site: http://camptocamp.com/
  - Barbara: barbara.philippot@camptocamp.com
  - Olivier: olivier.courtin@camptocamp.com
Thanks and Reactions

- Thanks for your attention!
- Questions and reactions...