geOrchestra

a free, modular and secure SDI

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camptocamp

INNOVATIVE SOLUTIONS
BY OPEN SOURCE EXPERTS

What does SDI stand for ?

Store

Describe

Share

Spatial Data Infrastructure

Discover

View

Extract

Compose

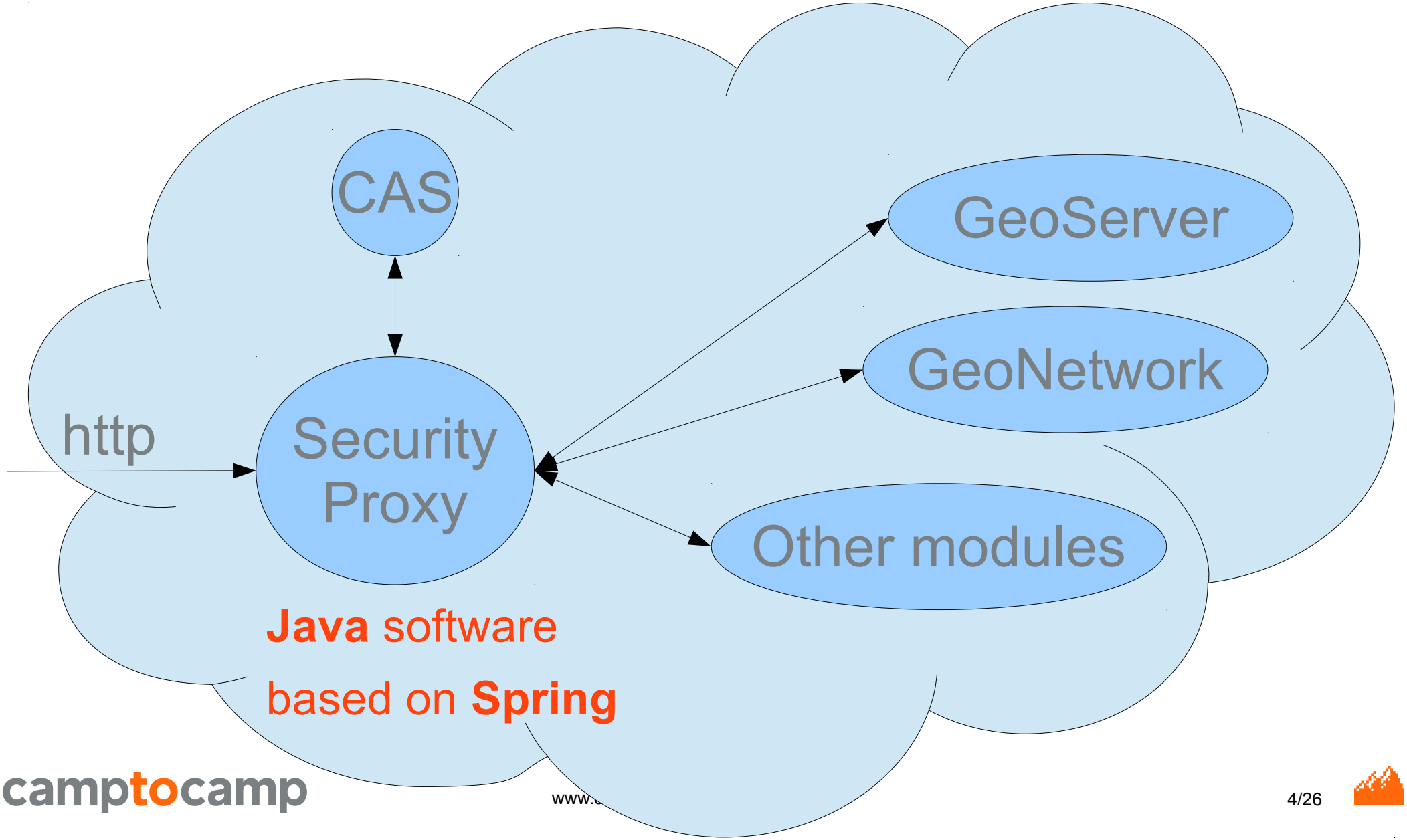
Download

What are the benefits ?

- For **users**:
  - Eases geodata search & access
  - *Should* work with all OGC client software

- For **administrators**:
  - INSPIRE constraint → opportunity
  - No data duplication
  - Less maintenance work

What is geOrchestra ?



What is geOrchestra ?

- **Free** as in speech – GPL
- **Modular** – more than 10 available « modules »
- **Interoperable** – OGC services and REST apis
- **Secure** – https support, continuous delivery, ...

Demo → http://sdi.georchestra.org/

Where do we come from ?

- 2008 – developing Brittany's **own** SDI
- 2009 – trying to create something **more generic**
- 2010 – **first** production deployment
- 2011 – **Aquitaine** (French region)
- 2012 – **Bolivia** plurinational state SDI
- 2013 – **Picardie**, **Alsace**, **Auvergne** regions
- 2014 – **Cities** : Rennes, Le Puy, Vienne ...

+ Research labs & Industry at the same time

Community

Very diverse :
nation, regions, cities, research, companies

Community

Mostly in **France ...**

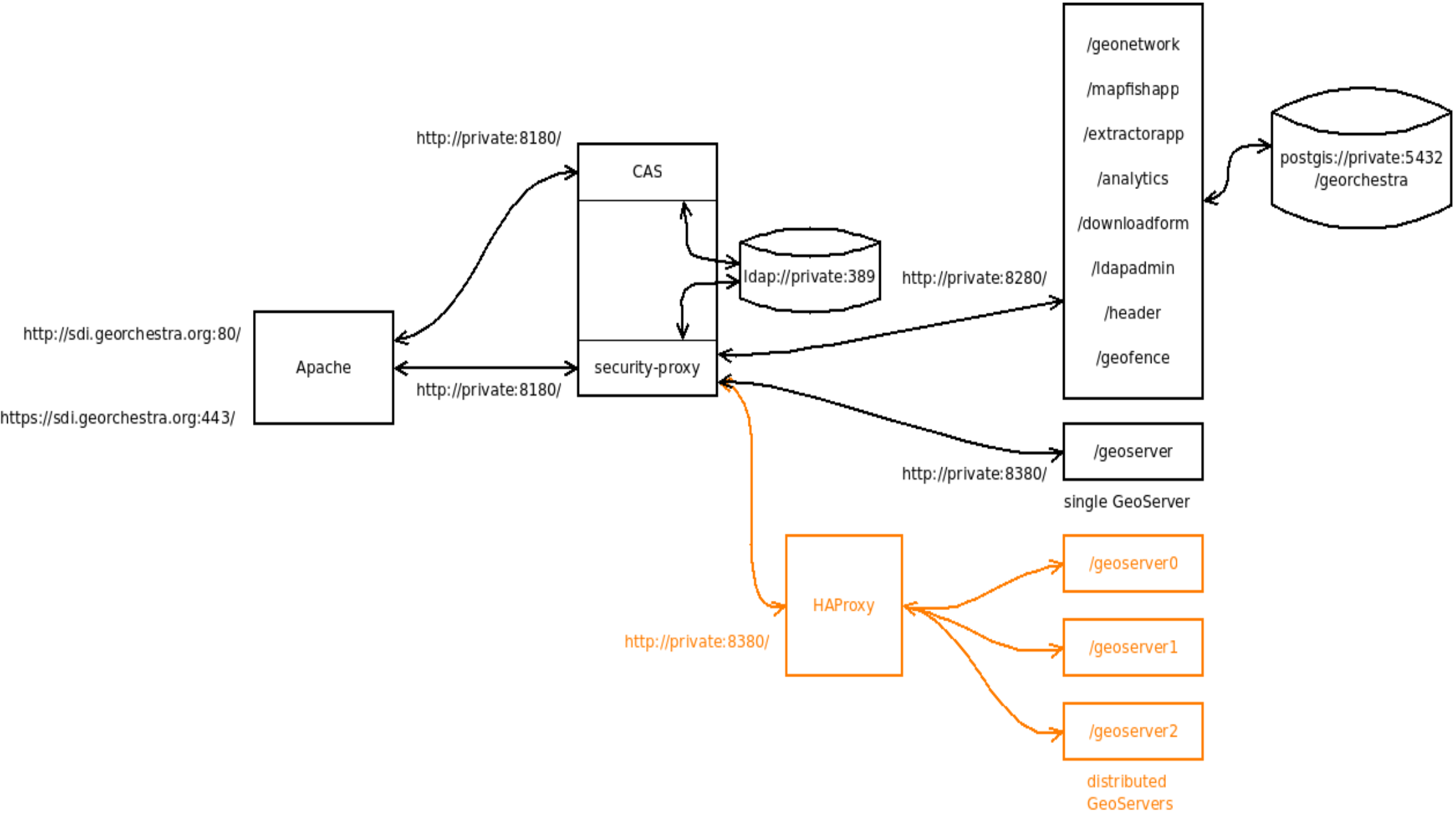
… but also around the world

… and a strong
presence in **Bolivia**

Community

- IRC freenode #georchestra
- Mailing lists
  - georchestra@googlegroups.com
  - georchestra-dev@googlegroups.com
- Source & Issues
  - on **github.com/georchestra**
- « geOcom » annual community meeting
  - 3rd edition this year

Software architecture



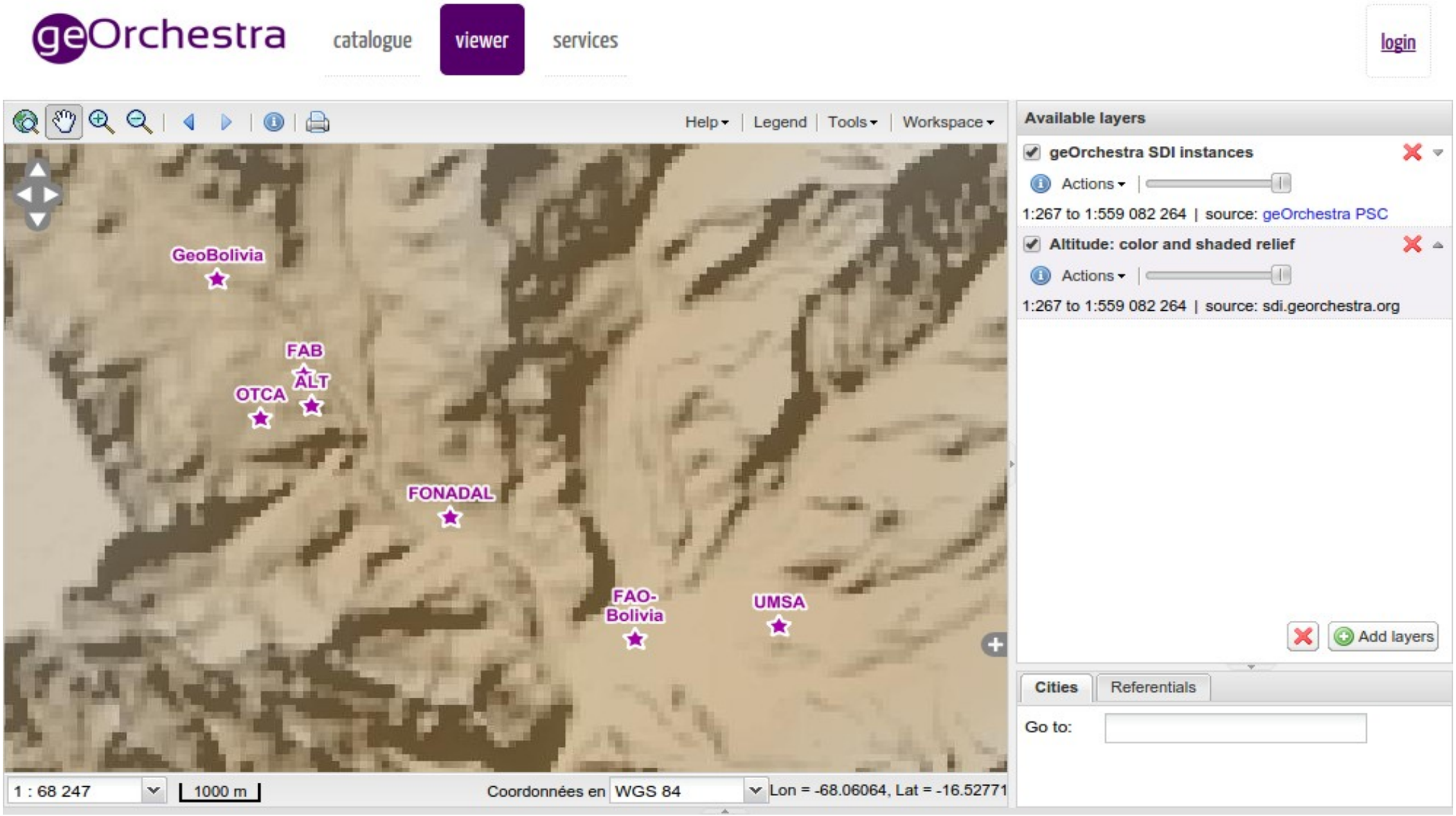
How it works...

- **CAS** authenticates the user
- **Security proxy** :
  - keeps the user session
  - routes all requests to the modules ...
  - … adding « security headers »
- **Modules** :
  - read the security headers
  - grant or deny access to resources accordingly

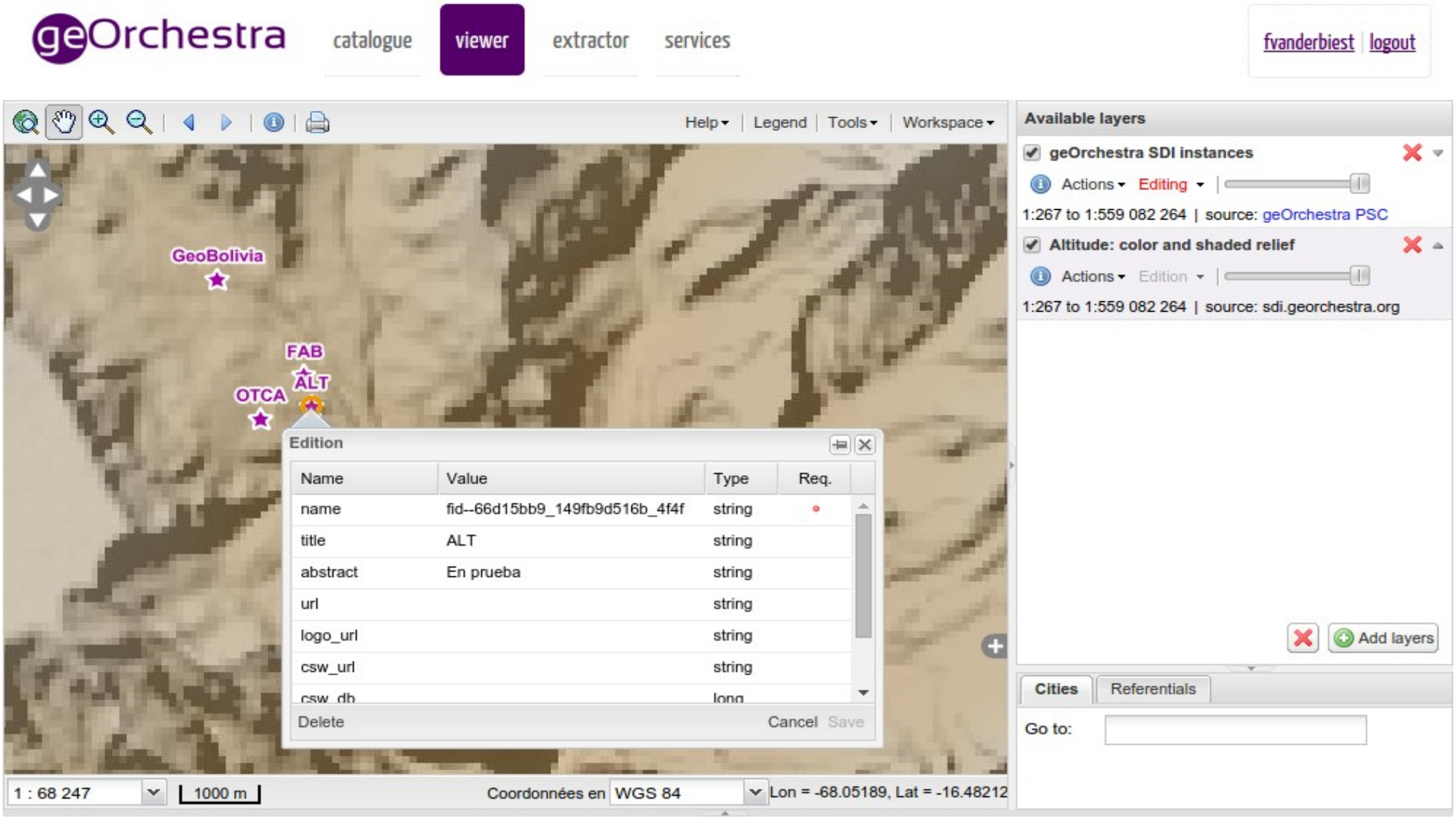
Modules

- **We're standing on the shoulders of giants**
  - **GeoNetwork** 2 & 3
  - **GeoServer** (latest), optionally with **GeoFence**
  - **CAS** - Single Sign On
- Advanced geodata **viewer & editor**
- **Extractor** – allows to download geodata extracts
- Users & groups **management console**
- **Analytics** – monitors OGC services usage

Viewer UI


geOrchestra
catalogue
viewer
services
login
Help
Legend
Tools
Workspace
GeoBolivia
FAB
ALT
OTCA
FONADAL
FAO-
Bolivia
UMSA
Available layers
geOrchestra SDI instances
Actions
1:267 to 1:559 082 264 | source: geOrchestra PSC
Altitude: color and shaded relief
Actions
1:267 to 1:559 082 264 | source: sdi.georchestra.org
Add layers
Cities
Referentials
Go to:
1 : 68 247
1000 m
Coordonnées en
WGS 84
Lon = -68.06064, Lat = -16.52771

Editor UI


geOrchestra
catalogue
viewer
extractor
services
fvanderbiest | logout
Help
Legend
Tools
Workspace
GeoBolivia
FAB
ALT
OTCA
Edition
Name
Value
Type
Req.
name
fid--66d15bb9_149fb9d516b_4f4f
string
title
ALT
string
abstract
En prueba
string
url
string
logo_url
string
csw_url
string
csw_db
long
Delete
Cancel
Save
Available layers
geOrchestra SDI instances
Actions
Editing
1:267 to 1:559 082 264 | source: geOrchestra PSC
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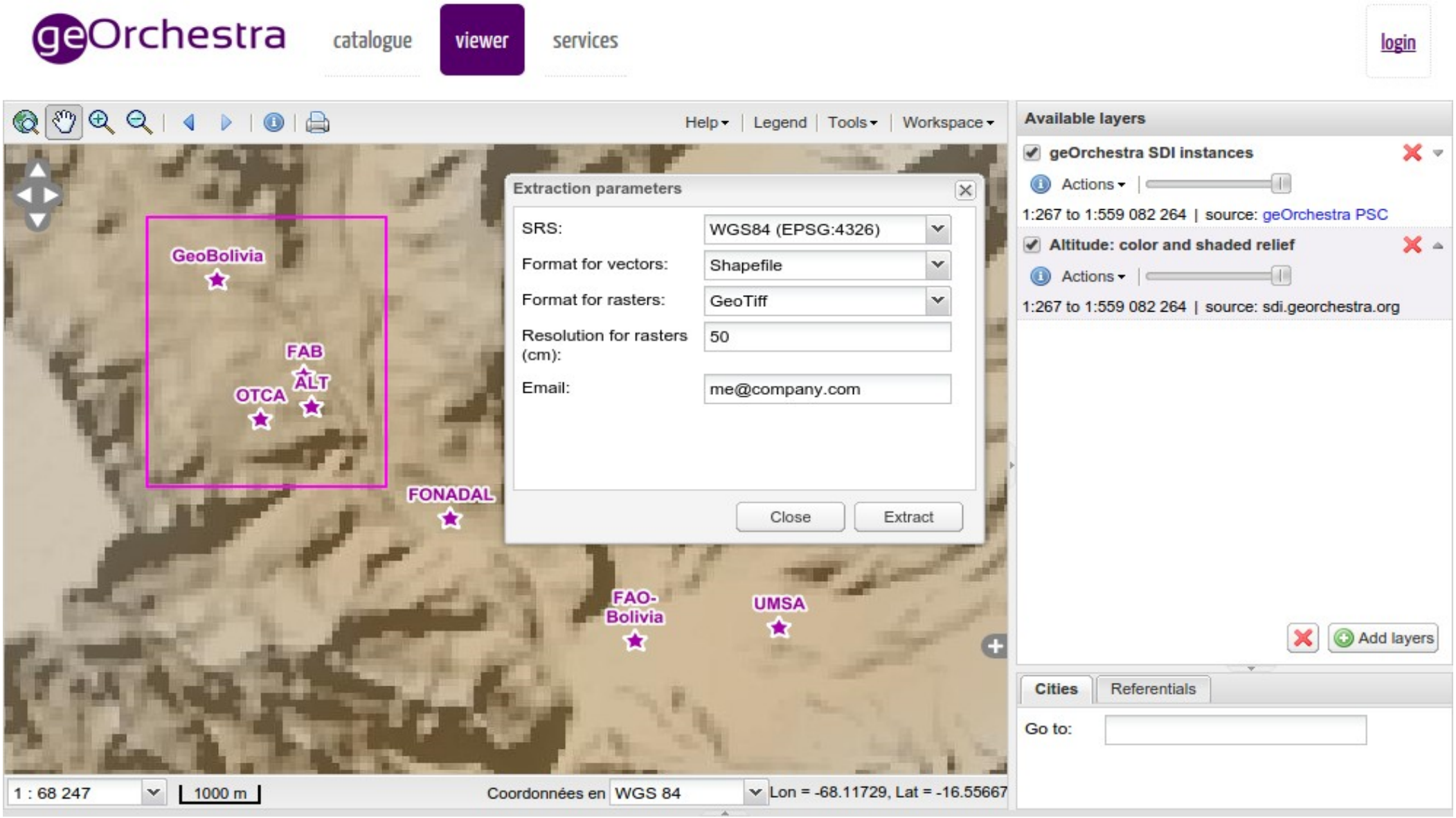
Add layers
Cities
Referentials
Go to:
1 : 68 247
1000 m
Coordonnées en
WGS 84
Lon = -68.05189, Lat = -16.48212

Extractor UI



geOrchestra in production

- Hardware & OSes
- Middleware & provisioning
- Scaling
- Monitoring the systems

Hardware & OS

- **Small to medium** sized deployments
  - Dedicated hardware
    - 2 to 32 CPU – 8 to 128 Gb RAM
  - OpenStack instances (demo / dev)
- **OSes** :
  - runtime tested on **Debian 6 to 8**
  - known to work on **RedHat / CentOS** boxes

Middleware & provisioning

- Middleware :
  - Apache / Nginx
  - Tomcat
  - PostGreSQL
  - OpenLDAP
- Provisioning
  - **Puppet**
  - Ansible

All-in-one deployment scenario:

```
node 'georchestra.example.com' {
  class { 'georchestra': }
}
```

```
ansible-playbook playbooks/georchestra.yml
```


Scaling

- **Modular architecture** means it's easier to scale
- **Scaling** the GeoServer component

```
node 'georchestra.example.com' {
  class { 'georchestra':
    geoserver    => false,
    loadbalancer => true,
  }
  class { 'georchestra::geoserver':
    workers => 2,
  }
}
```

- **Security-proxy** scaling is currently being investigated

Monitoring

- **Nagios** … Icinga 2 – checks the base system (disks, processes, ...)
- **M/Monit** – monitors and automatically restarts tomcat instances in case of failure
- **GeoHealthCheck** – checks the OGC services availability and response time
- **Collectd** … grafana – collects and displays metrics
- ELK – stores and analyses logs
- SAAS solutions:
  - **Pingdom** – checks the OGC services availability and response time, and alerts
  - Librato – displays metrics
  - statuspage.io – integrates well with pingdom to provide a status page for your services

What's next in geOrchestra?

- **New viewer** based on OpenLayers 3 & AngularJS
- **Custom Modules** tailored for specific needs
- Debian / RedHat **packages**
- **Streamlining the installation** process with puppet
  - from bare OS to OGC services in 5 minutes !
- **Docker** : from dev to production ?
- **Scaling** all the components
  - Auto-scaling would be really nice to have

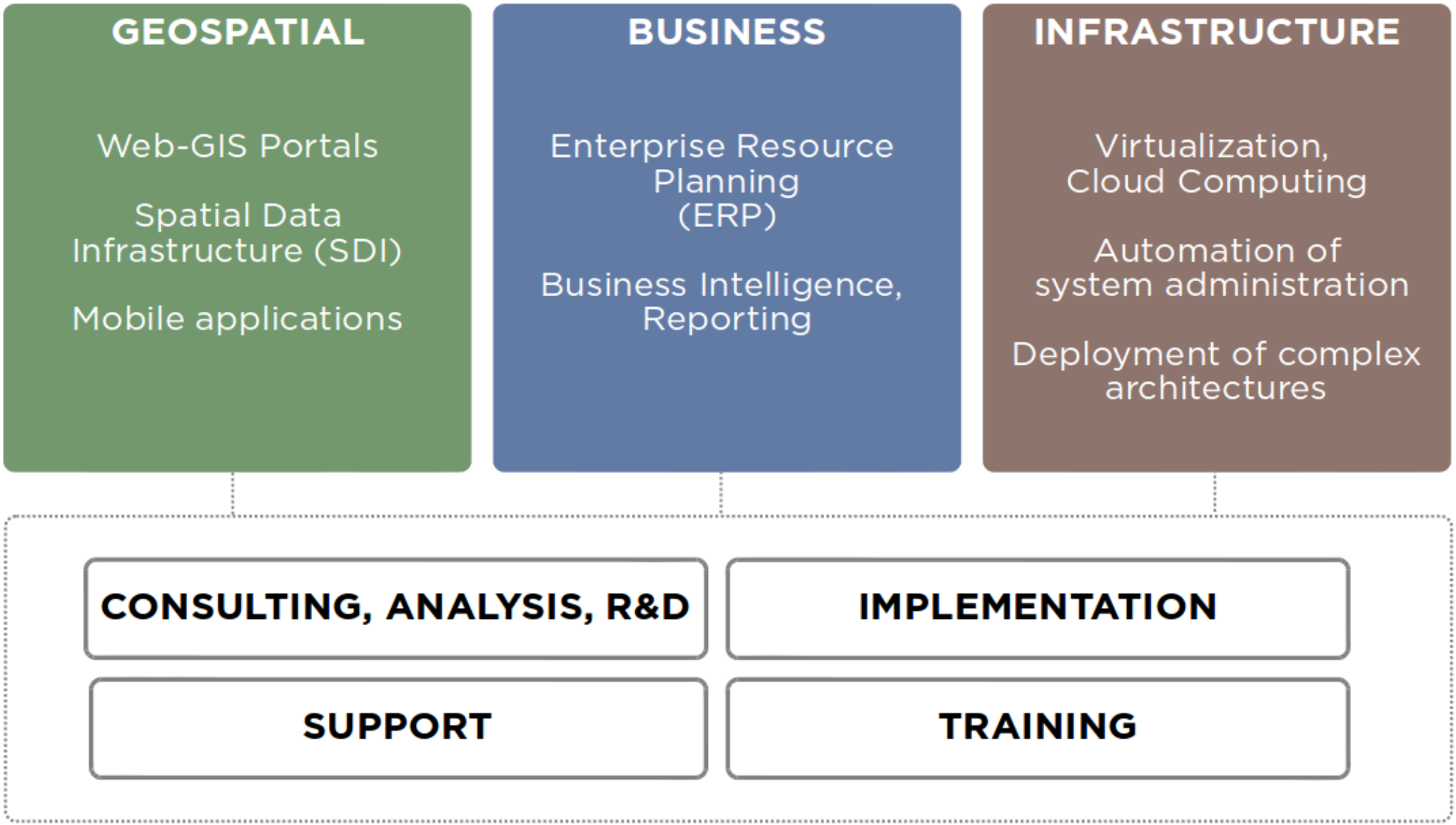
What we learned...

With SDIs, **infrastructure is key !**

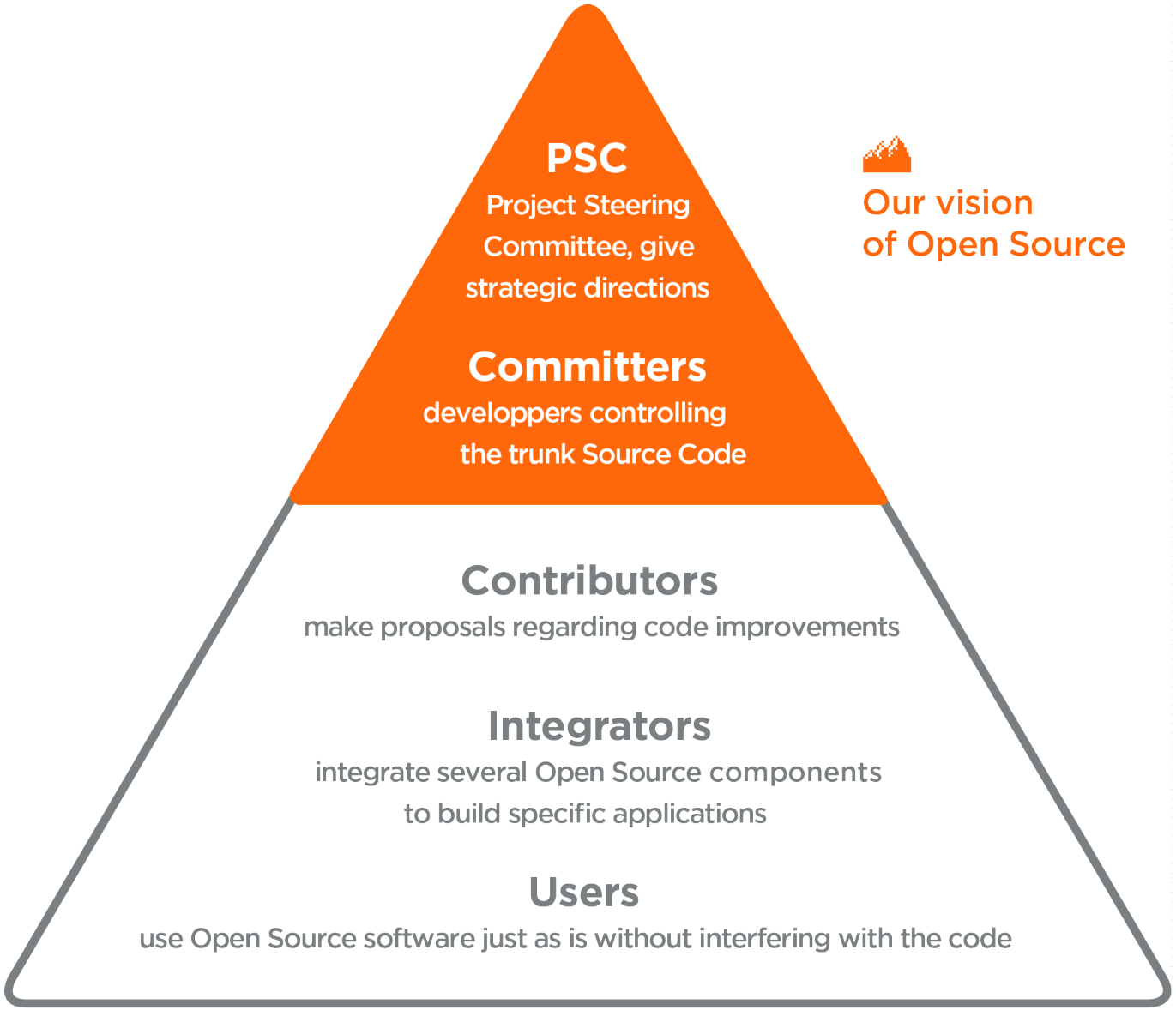
- Configuration management
- High availability & performance architectures
- Backup
- Scaling
- Monitoring

http://www.georchestra.org

Camptocamp - Our service offer



Camptocamp - Our vision of Open Source

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