Mastering Advanced GeoNetwork

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GEOCAT

http://geocat.net

Contents

- **Introduction**
- Setup GeoNetwork with Tomcat/Apache
- Configure Postgres database
- GeoNetwork advanced configuration

Objectives

- Install GeoNetwork for a production environment, using
  - Tomcat as servlet container
  - Run Tomcat behind Apache
  - Use Postgres as GeoNetwork database
- Review advanced GeoNetwork configuration

Software

- OS: Ubuntu 10.04 LTS
- GeoNetwork 2.6.0RC2
- Sun Java JDK 1.6
- Apache Tomcat 6
- Apache Web Server 2
- Postgres 8.4

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- Introduction
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Install Java/Tomcat

- Install Sun Java JDK 1.6

```
user ~ $ sudo add-apt-repository "deb http://archive.canonical.com/ lucid partner"
user ~ $ sudo apt-get update
user ~ $ sudo apt-get install sun-java6-jdk
user ~ $ java –version
java version “1.6.0_20”
Java(TM) SE Runtime Environment (build 1.6.0_20-b2)
Java HotSpot(TM) Client VM (build 16.3-b01, mixed mode, sharing)
```

- Install Tomcat 6 and disable security manager

```
user ~ $ sudo apt-get install tomcat6
user ~ $ sudo vi /etc/default/tomcat6


REPLACE:

TOMCAT_SECURITY=YES
with
TOMCAT_SECURITY=NO
```

Install/Configure GeoNetwork

- Download GeoNetwork to the user folder
  - http://sourceforge.net/projects/geonetwork/files

- Deploy GeoNetwork in Tomcat

```
user ~ $  cd $HOME
user ~ $  sudo cp geonetwork.war /var/lib/tomcat6/webapps
```

- Update data paths in WEB-INF/config.xml

```
user ~ $  cd /var/lib/tomcat6/webapps/geonetwork/WEB-INF
user ~ $  mkdir data
user ~ $  chown tomcat6:tomcat6 data
user ~ $  vi config.xml

Change:

<uploadDir>WEB-INF/data/temp</uploadDir>
<dataDir>WEB-INF/data</dataDir>
```

Install/Configure GeoNetwork

- Add fix for JVM/Saxon in catalina.sh file

```
user ~ $  sudo vi /usr/share/tomcat6/bin/catalina.sh

Add:
JAVA_OPTS="$JAVA_OPTS -
XX:CompileCommand=exclude,net/sf/saxon/event/ReceivingContentHandler.startElement"
```

- Restart tomcat

```
user ~ $  sudo /etc/init.d/tomcat6 restart
```

- Check access to GeoNetwork
  - http://localhost:8080/geonetwork

Install and configure Apache 2

- Install Apache 2 and activate modproxy

```
user ~ $  sudo apt-get install apache2
user ~ $  sudo a2enmod proxy
user ~ $  sudo a2enmod proxy_http
```

- Add proxy configuration to the VirtualHost of the site

```
<VirtualHost *:80>
    ProxyRequests Off

    <Proxy *>
        Order deny,allow
        Allow from all
    </Proxy>

    ProxyPass /geonetwork http://localhost:8080/geonetwork
    ProxyPassReverse /geonetwork http://localhost:8080/geonetwork

    ProxyPreserveHost On
```

Install and configure Apache 2

- Restart Apache

```
user ~ $  sudo /etc/init.d/apache2 restart
```

- Check access to GeoNetwork (port 80)
  - http://localhost/geonetwork

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- **Configure Postgres database**
- GeoNetwork advanced configuration

Install Postgres

- Install postgres

```
user ~ $  sudo apt-get install postgresql
```

- Allow local/tcp connections

```
user ~ $  sudo vi /etc/postgresql/8.4/main/pg_hba.conf
user ~ $  sudo vi /etc/postgresql/8.4/main/postgres.conf
user ~ $  sudo /etc/init.d/postgresql-8.4 restart
```

```
local   all         all                               trust

# IPv4 local connections:
host    all         all         127.0.0.1/32          md5
```

```
listen_addresses = 'localhost'
port = 5432
```

Setup GeoNetwork database

- Create database

```
user ~ $  sudo su postgres
postgres ~ $  psql
postgres=# CREATE USER geonetwork WITH PASSWORD 'secret';
postgres=# CREATE DATABASE geonetwork WITH OWNER = geonetwork ENCODING 'UTF8';
postgres=# \q
postgres ~ $  exit
user ~ $
```

- Create tables and load initial data

```
user ~ $  cd /var/lib/tomcat6/webapps/geonetwork/WEB-INF/classes/setup/sql/create
user ~ $  psql -d geonetwork -U geonetwork -W -f create-db-postgres.sql

user ~ $  cd /var/lib/tomcat6/webapps/geonetwork/WEB-INF/classes/setup/sql/data
user ~ $  psql -d geonetwork -U geonetwork -W -f data-db-postgres.sql
```

Configure database in GeoNetwork

- Set database configuration

```
user ~ $  cd /var/lib/tomcat6/webapps/geonetwork/WEB-INF/geonetwork/WEB-INF
user ~ $  vi config.xml
user ~ $  sudo /etc/init.d/tomcat6 restart
```

```
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<!-- mckoi standalone -->
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<resource enabled="false">
    ....

<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<!-- postgres -->
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<resource enabled="true">
    <name>main-db</name>
    <provider>jeeves.resources.dbms.DbmsPool</provider>
    <config>
        <user>geonetwork</user>
        <password>secret</password>
        <driver>org.postgresql.Driver</driver>
        <url>jdbc:postgresql://127.0.0.1/geonetwork</url>
        <poolSize>10</poolSize>
        <reconnectTime>3600</reconnectTime>
    </config>
</resource>
```

Spatial index

- Stores metadata geographic extents
  - Used in spatial queries
- By default, stored in shapefile format
  - Simple, no configuration needed
- Can be also stored in Postgis
  - Improve perfomance in queries (big catalogs)
  - Need additional configuration

Configure spatial index in postgis (I)

- Install postgis support in postgres

```
user ~ $  sudo apt-get install postgresql-8.4-postgis
```

- Setup postgis in postgres

```
user ~ $  sudo su postgres
postgres ~ $ createdb postgistemplate
postgres ~ $ createlang plpgsql postgistemplate
postgres ~ $ psql -d postgistemplate -f /usr/share/postgresql/8.4/contrib/postgis.sql
postgres ~ $ psql -d postgistemplate -f /usr/share/postgresql/8.4/contrib/spatial_ref_sys.sql
postgres ~ $ psql -d postgistemplate -c "SELECT postgis_full_version();"
postgis_full_version -----------------------------------------------------------------------------
POSTGIS="1.4.0" GEOS="3.1.0-CAPI-1.5.0" PROJ="Rel. 4.7.1, 23 September 2009" USE_STATS
(1 row)
```

- Create GeoNetwork database

```
postgres ~ $ psql -d postgistemplate
postgres=# CREATE USER geonetwork WITH PASSWORD 'secret';
postgres=# CREATE DATABASE geonetwork WITH OWNER = geonetwork TEMPLATE = postgistemplate
ENCODING='UTF8';
postgres=# ALTER TABLE geometry_columns OWNER TO geonetwork;
postgres=# ALTER TABLE spatial_ref_sys OWNER TO geonetwork;
postgres=# \q
postgres ~ $  exit
user ~ $
```

Configure spatial index in postgis (II)

- Load GeoNetwork data

```
user ~ $  cd /var/lib/tomcat6/webapps/geonetwork/WEB-INF/classes/setup/sql/create
user ~ $  psql -d geonetwork -U geonetwork -W -f create-db-postgis.sql

user ~ $  cd /var/lib/tomcat6/webapps/geonetwork/WEB-INF/classes/setup/sql/data
user ~ $  psql -d geonetwork -U geonetwork -W -f data-db-postgres.sql
```

- Configure database in `WEB-INF/config.xml`

```
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<!-- postgis -->
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<resource enabled="true">
    <name>main-db</name>
    <provider>jeeves.resources.dbms.DbmsPool</provider>
    <config>
        <user>geonetwork</user>
        <password>secret</password>
        <driver>org.postgresql.Driver</driver>
        <url>jdbc:postgis://127.0.0.1:5432/geonetwork</url>
        <poolSize>10</poolSize>
        <reconnectTime>3600</reconnectTime>
    </config>
</resource>
```

Other considerations

- Increase default poolSize in GeoNetwork database configuration

```
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<!-- postgres -->
<!-- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -->
<resource enabled="true">
    <name>main-db</name>
    <provider>jeeves.resources.dbms.DbmsPool</provider>
    <config>
        <user>geonetwork</user>
        <password>secret</password>
        <driver>org.postgresql.Driver</driver>
        <url>jdbc:postgresql://127.0.0.1/geonetwork</url>
        <poolSize>10</poolSize>
        <reconnectTime>3600</reconnectTime>
    </config>
</resource>
```

- Postgres optimizations
  - http://wiki.postgresql.org/wiki/Performance_Optimization

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Configuration files (config.xml)

- `WEB-INF/config.xml`
  - Database configuration
  - Definition of GeoNetwork services
    - Service definitions are splitted across other files
  - Default language for GUI
  - Folders to upload files, data and lucene indexes
- `WEB-INF/log4j.cfg`
  - Logging configuration of GeoNetwork

Configuration files (config-gui.xml)

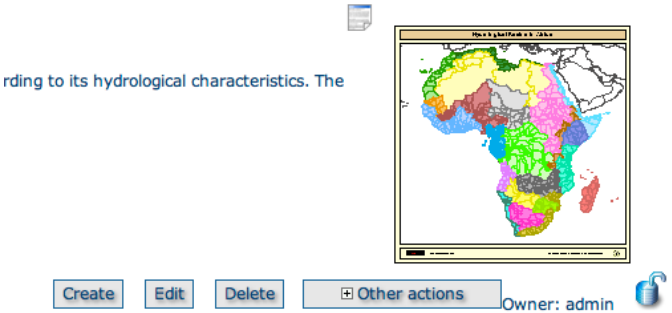
- `WEB-INF/config-gui.xml`
  - List of languages to show in language selector

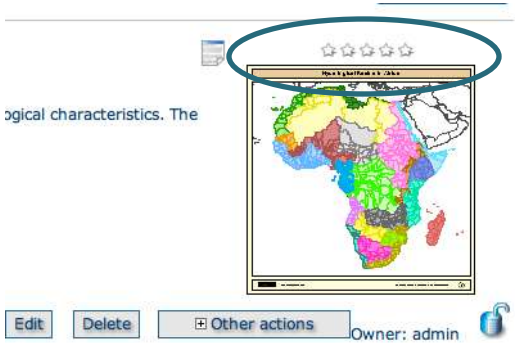

```
<!-- Comment out languages to hide them
from language selector. -->
<languages>
 <!--<ar/>-->
 <cn/>
 <de/>
 <en/>
 <es/>
 <fr/>
 <nl/>
 <pt/>
 <!--ru/-->
</languages>
```

  - Category configuration
    - Show/hide categories
    - Show/hide icons

Configuration files (config-gui.xml)

- `WEB-INF/config-gui.xml`
  - Display metadata rating



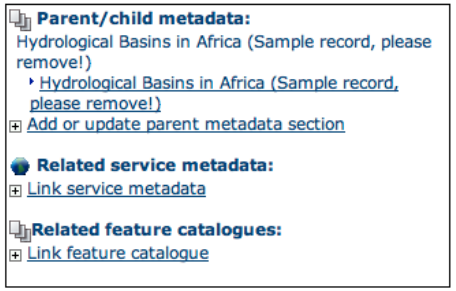


  - Map viewer configuration

Configuration files (config-gui.xml)

- `WEB-INF/config-gui.xml`
  - Metadata editor:
    - Use of Google translation API

    - Show/hide metadata relations



    - Editor actions
      - Compute the extent from keyword analysis

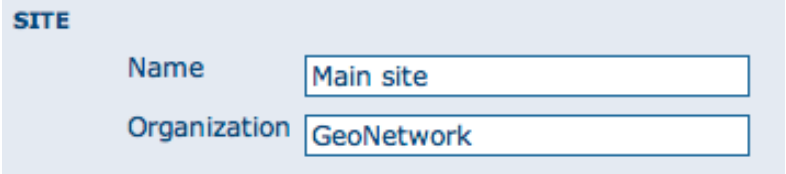
Configuration files (config-gui.xml)

- `WEB-INF/config-gui.xml`
  - Metadata editor:
    - Allow edit harvested metadata
    - Metadata views
      - Default: simple, advanced, iso, xml
      - Optional: INSPIRE

Configuration settings

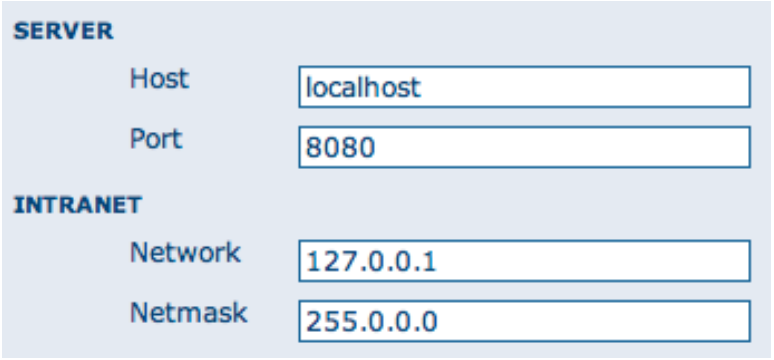
Site identification

- Used to identify the GeoNetwork node in operations like harvesting



Configuration settings
Server/Intranet

- Server:
  - The node's public address or IP number.
- Intranet: discriminate among
  - internal anonymous users (users that access the node from within the organisation)
  - and external (users from the Internet).



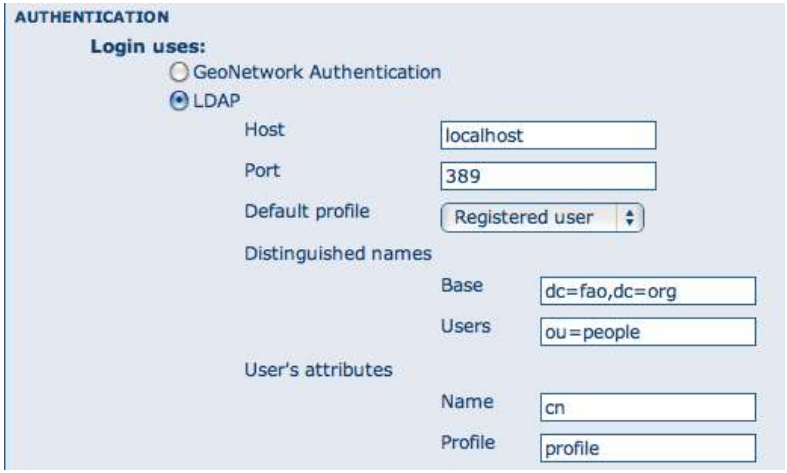
Configuration settings
CSW Server

- Enable/disable the CSW service
- Properties to return in Capabilities document

Configuration settings
Authentication

- GeoNetwork default

- LDAP



- Shibboleth

Configuration settings

Other settings

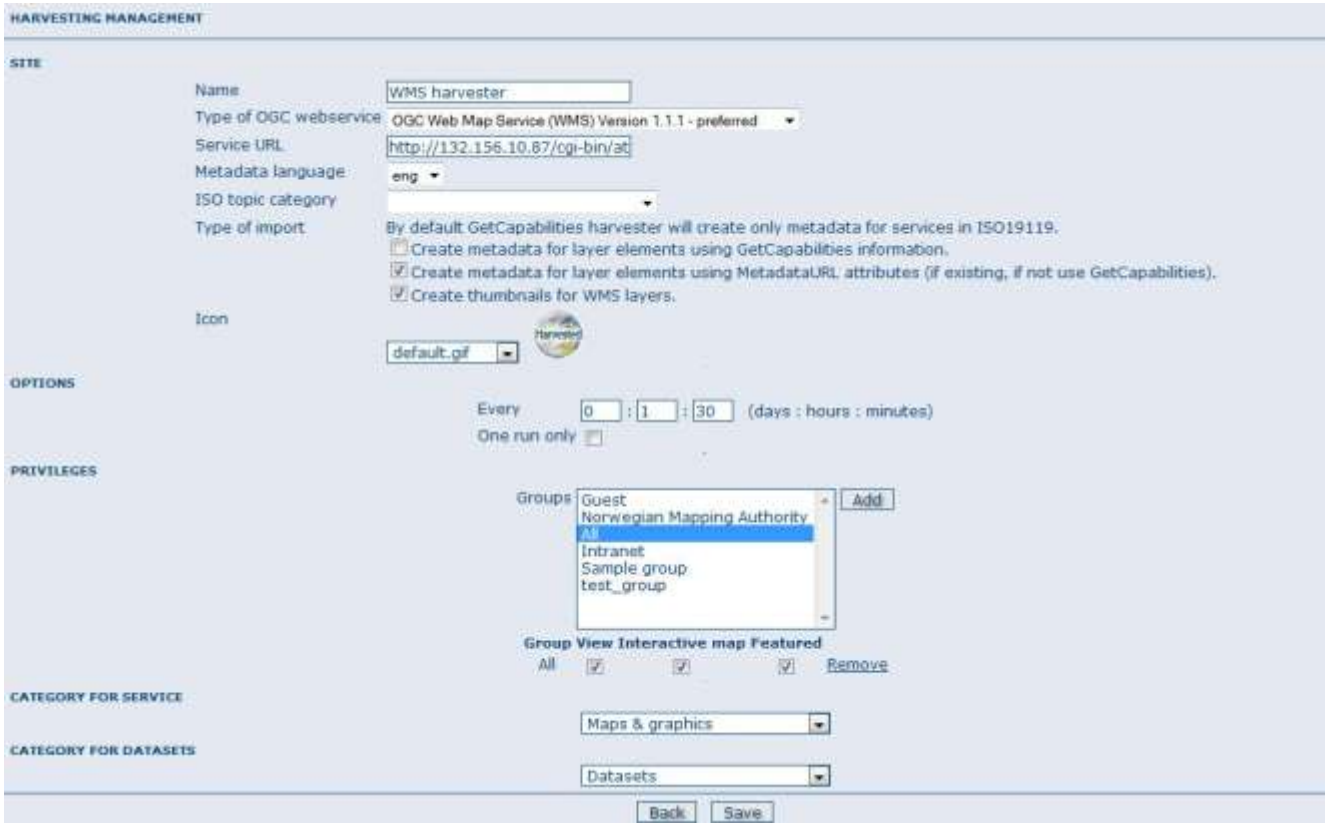
- Maximum selected metadata records
  - Limit the number of records to select in GUI
- Clickable hyperlinks
  - show urls in metadata as hyperlinks
- Local rating
  - Enabled: Rating is applied always to local metadata
  - Disabled: Harvested metadata from GeoNetwork nodes is rated remotelly
- Inspire
  - Show inspire panel in advanced search
- Removed metadata
  - Folder to store a backup of removed metadata
- Feedback
  - Mail config for feedback form

XSL transformations

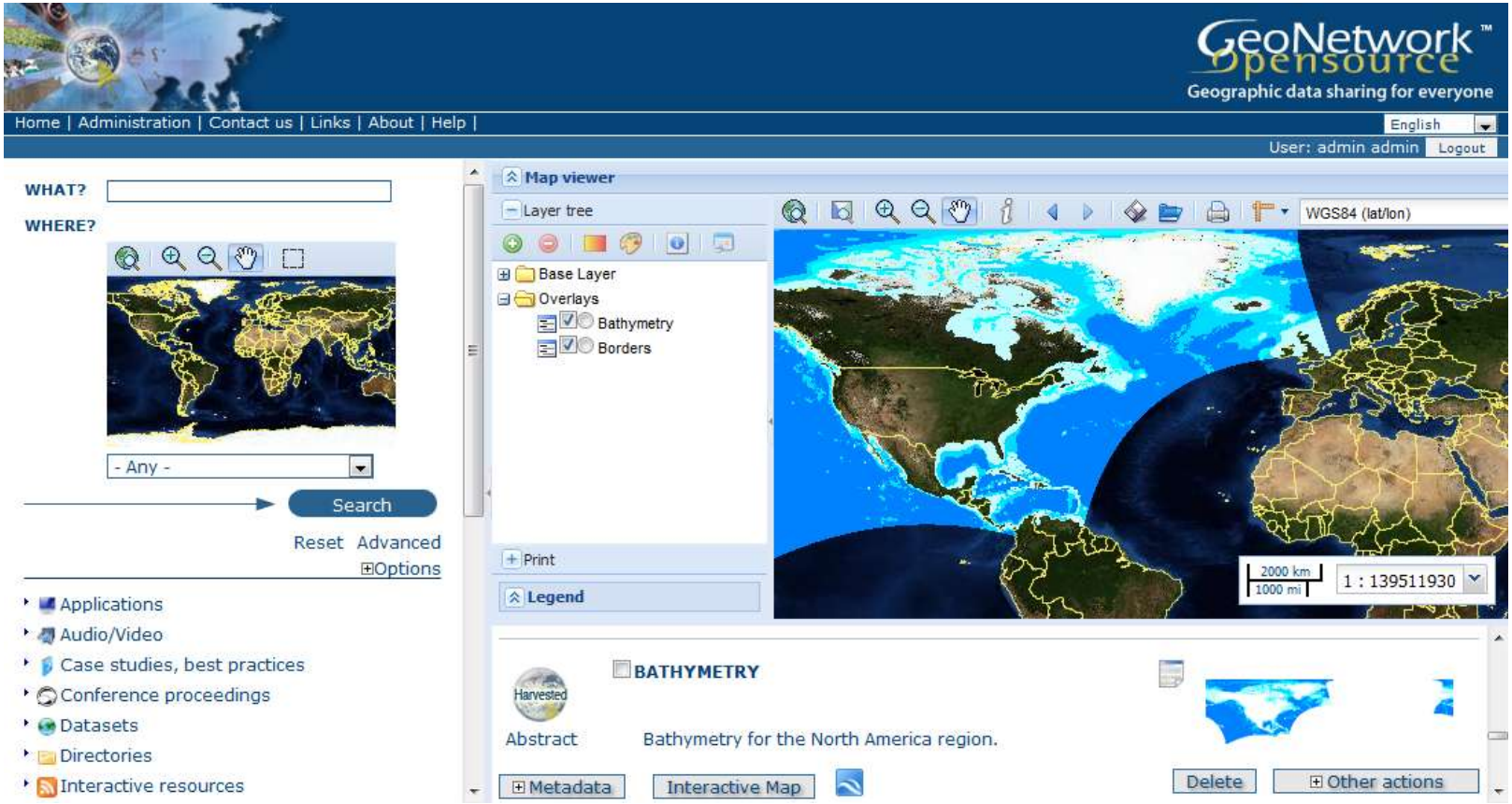
- GeoNetwork uses extensively XSL transformations
- By default, XSL caching is enabled for perfomance
- The file `WEB-INF\classes\META-INF\services\javax.xml.transform.TransformerFactory` defines the XSL processor to use:
  - `de.fzi.dbs.xml.transform.CachingTransformerFactory` (caching)
  - `net.sf.saxon.TransformerFactoryImpl` (no caching)

Harvesting OGC services

- Creates new metadata for OGC services and associated layers
  - http://132.156.10.87/cgi-bin/atlaswms_en?REQUEST=GetCapabilities



Harvesting OGC services



References

- Domain forwarding with DNS, Apache and Tomcat
  - http://geonetwork.tv/domain
- Postgres/Postgis
  - http://www.paolocorti.net/2008/01/30/installing-postgis-on-ubuntu/
  - http://wiki.postgresql.org/wiki/Performance_Optimization
- GeoNetwork with Tomcat/MySql
  - http://lab.usgin.org/groups/usgin-amazon-virtual-server-development/installing-geonetwork-242-under-tomcat-mysql-backend
- GeoNetwork related materials
  - http://geonetwork-opensource.org
  - http://geonetwork.tv

Thanks for coming!