

Mastering Advanced GeoNetwork

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<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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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 performance in queries (big catalogs)
 - Need additional configuration

Configure spatial index in postgres (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

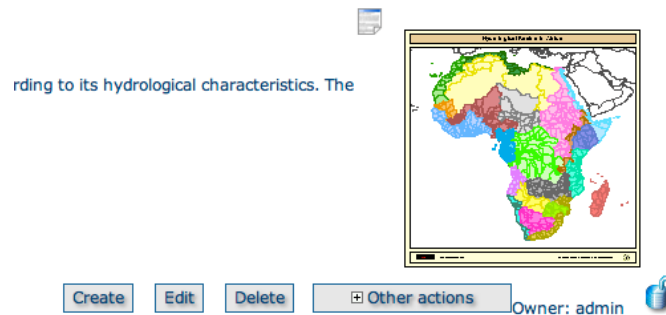
- Show/hide categories
- Show/hide icons

- Applications
- Audio/Video
- Case studies, best practices
- Conference proceedings
- Datasets
- Directories
- Interactive resources
- Maps & graphics
- Other information resources
- Photo

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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



Descriptive keywords ☒

Keyword * ☒ place English

Type ☒ Theme

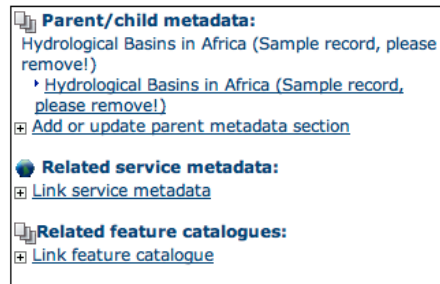


Descriptive keywords ☒

Keyword * ☒ Spanish

Type ☒ Theme

- Show/hide metadata relations



Parent/child metadata:
Hydrological Basins in Africa (Sample record, please remove!)
▸ [Hydrological Basins in Africa \(Sample record, please remove!\)](#)
+ [Add or update parent metadata section](#)

Related service metadata:
+ [Link service metadata](#)

Related feature catalogues:
+ [Link feature catalogue](#)

- 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

SITE	
Name	<input type="text" value="Main site"/>
Organization	<input type="text" value="GeoNetwork"/>

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).

SERVER	
Host	<input type="text" value="localhost"/>
Port	<input type="text" value="8080"/>
INTRANET	
Network	<input type="text" value="127.0.0.1"/>
Netmask	<input type="text" value="255.0.0.0"/>

Configuration settings

CSW Server

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

CSW ISO PROFILE

Enable	<input checked="" type="checkbox"/>
Contact	admin (admin admin)
Title	Test CSW service
Abstract	
Fees	none
Access Constraints	none
Inserted metadata is public	<input type="checkbox"/>

Configuration settings

Authentication

- GeoNetwork default

AUTHENTICATION

Login uses:

GeoNetwork Authentication

Enable user self-registration

- LDAP

AUTHENTICATION

Login uses:

GeoNetwork Authentication

LDAP

Host

Port

Default profile

Distinguished names

Base

Users

User's attributes

Name

Profile

- 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 performance
- 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

The screenshot displays the 'HARVESTING MANAGEMENT' web interface. The main section is titled 'SITE' and contains the following fields and options:

- Name:** WMS harvester
- Type of OGC webservice:** OGC Web Map Service (WMS) Version 1.1.1 - preferred
- Service URL:** http://132.156.10.87/cgi-bin/at
- Metadata language:** eng
- ISO topic category:** (empty dropdown)
- Type of import:** By default GetCapabilities harvester will create only metadata for services in ISO19119.
 - Create metadata for layer elements using GetCapabilities information.
 - Create metadata for layer elements using MetadataURL attributes (if existing, if not use GetCapabilities).
 - Create thumbnails for WMS layers.
- Icon:** default.gif (with a 'Harvester' icon button)

The 'OPTIONS' section includes:

- Frequency:** Every 0 : 1 : 30 (days : hours : minutes)
- One run only:**

The 'PRIVILEGES' section shows a list of groups:

- Guest
- Norwegian Mapping Authority
- All (highlighted)
- Intranet
- Sample group
- test_group

Below the group list are checkboxes for 'Group View', 'Interactive map', and 'Featured', all of which are checked. A 'Remove' button is also present.

The 'CATEGORY FOR SERVICE' dropdown is set to 'Maps & graphics'.

The 'CATEGORY FOR DATASETS' dropdown is set to 'Datasets'.

At the bottom, there are 'Back' and 'Save' buttons.

Harvesting OGC services

The screenshot displays the GeoNetwork OpenSource web interface. At the top right, the logo reads "GeoNetwork OpenSource" with the tagline "Geographic data sharing for everyone". A navigation bar includes links for Home, Administration, Contact us, Links, About, and Help. The user is logged in as "admin admin" and the language is set to English.

On the left side, there is a search interface with "WHAT?" and "WHERE?" sections. Below these is a search button and a list of categories: Applications, Audio/Video, Case studies, best practices, Conference proceedings, Datasets, Directories, and Interactive resources.

The main area is a "Map viewer" showing a map of North America with bathymetry data overlaid. The "Layer tree" on the left shows "Base Layer" and "Overlays" with "Bathymetry" and "Borders" checked. The map includes a scale bar (2000 km / 1000 mi) and a coordinate display (1 : 139511930). Below the map, there is a legend for "BATHYMETRY" with a "Harvested" icon and a description: "Bathymetry for the North America region." Buttons for "Metadata", "Interactive Map", "Delete", and "Other actions" are visible at the bottom.

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!