GeoNetwork opensource

Spatial data management
Geographic data sharing for everyone
Lab topics

- Getting started with GeoNetwork opensource
- Installation at a glimpse
- Directory structure
- How-to?
  - search in a GeoNetwork node
  - synchronise & harvest nodes
  - customize your catalogue
  - add a service
- Q&A
• History at a glimpse:
  • 2000/2001: prototyping by FAO
  • 2002/2003: version 1 by FAO/WFP
  • 2004/2005: version 2 by FAO/UNEP/WFP
  • 2006/2007: version 2.1
Users:

- UN: FAO/UNEP/WFP/WHO/OCHA/UNHCR
- Other: CGIAR/ESA FGDC/JRC/FEWSNET
- Individual projects: Spain, France, Czech, UK, Australia, South Africa, ...

- 200+/150+ members on user/dev mailing lists
• What is GeoNetwork?
  • A web based catalogue application
  • Platform independant (Java) / JDBC compliant DB
  • A component in the Spatial Data Infrastructure (SDI)
  • GPL
  • OSGEO incubation process
Functionnality:

- Searching of spatial data & services (lucene)
- Downloading of data
- Online dynamic viewing through OGC services
- Metadata editor (template, validation)
- Users management
- Synchronisation / catalogue / distributed search
Getting started with GeoNetwork

User interaction through web pages

Webdav

GeoNetwork Node

Catalogues

Automatic process between nodes & catalogues (client & server sides)

Remote search
Local search

Harvesting mechanism
Z39.50
OGC CSW2
OpenSearch
XML search
OAI
GeoRSS

Catalogue access mode

Echange format XML

Basic building blocks

XML-ISO191XX Core
XML-ISO191XX Profil(s)
XML-FGDC
XML-DC

ISO19115
ISO19139

FGDC
DC

GeoNetwork Node

User interaction through web pages

Automatic process between nodes & catalogues (client & server sides)
Getting started with GeoNetwork

- Architecture & technologies: Labs 09 configuration using version 2.1RC1
- 2 webapps:
  - GeoNetwork
  - Intermap
Installation at a glimpse

- Download the archive
  http://geonetwork-opensource.org/

- Run the installer (needed java 1.5) which will:
  - Install jetty container
  - Install GeoNetwork & Intermap webapp
  - Install default mckoi DB
  - (Optional) install sample data
  - (Optional) use GAST to:
    - migrate/import
    - configure another database
Installation at a glimpse

Welcome to the installation of geonetwork 2.1.0 RCI

This software is developed by:
- FAO GeoNetwork Team <Geonetwork@fao.org>
- VAM WFP <vamsie@wfp.org>
- UNEP.net <info@unep.net>
- OCHA <ochageodata@un.org>
- OSGeo <geonetwork@osgeo.org>

🌟 The homepage is at: http://geonetwork-opensource.org/

(Made with IzPack - http://www.izforge.com/)
Installation at a glimpse

### IzPack - Installation of Geonetwork

Select the packs you want to install:

- **Core** [X] 32.35 MB
- **CSV 2.0.1 test client**
- **Source code** [X] 56.68 KB
- **Installer building tools** [X] 2.14 MB
- **Java source code JavaDoc** [X] 2.68 MB

**Description**

```
Description
```

**Total space Required:** 32.35 MB

**Available space:** 529.79 MB

(Made with IzPack - http://www.izforge.com/)
Test installation:

- Start GeoNetwork
- By default GeoNetwork is installed: http://localhost:8080/geonetwork
Directory structure

- Localized string
- GeoNetwork Configuration (config.xml)
- Database (default mckoi)
- Lucene index
- Thesaurus
- Metadata Schemas (XSD, i18n, thumbnails upload)

**XSL Stylesheets:**
- Portal web page (main, rss, metadata, ...)
- Editor
- Administration
- Convert/import/export
- Harvest GeoNetwork/CSW/Webdav/Z39.50
• Objectivs:
  • How-to search in a GeoNetwork node?
  • How-to synchronise & harvest nodes?
  • How-to customize your catalogue? (beginner)
  • How-to add a service? (advanced)
Ex1: Search in a GeoNetwork node
Search in a GeoNetwork node

Web search
XML search
CSW search
GeoRSS search
Search in a GeoNetwork node

- Search criteria:
  - Any (full text index)
  - Title, Abstract, Keywords
  - Fuzzy/exact search
  - Simple geographic search (bbox)
  - Group, Category, Site ... and others could be added
Exercise: Objective of this exercise is discovering the search interface & criteria of GeoNetwork

You need to perform the following steps:
1) Go to the home page
2) Try some search
3) Test the rss view
4) (Advanced) test the CSW client
Physiographic maps for the CIS and Baltic States (CIS_BS), Mongolia, China and Taiwan Province of China. Between the three regions (China, Mongolia, and CIS_BS countries) DCW boundaries were ...more...

Keywords: physiography, soil, Eurasia

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Hydrological Basins in Africa

Major hydrological basins and their sub-basins. This dataset divides the African continent according to its hydrological characteristics. The dataset consists of the following information:...more...

Keywords: watersheds, river basins, water resources, hydrology, AQUASTAT, AWRD, Africa

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Natural Polar Ecosystems

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This page contains links to various maps and datasets related to geographic information, including physiographic maps of North and Central Eurasia, hydrological basins in Africa, and natural polar ecosystems.
Search in a GeoNetwork node

- Example of OSS searching into GeoNetwork nodes:
  - Browser using Opensearch or RSS
  - GeoNetwork using CSW2, XMLSearch, Z39.50
  - Cartoweb using XML search
  - OpenLayers using GeoRss search
Ex2: Harvesting & synchronisation between nodes
Harvesting & synchronisation

- Harvesting is a method to retrieve collection from different nodes based on criteria.

- Advantages:
  - faster than remote search (not rely on network availability)
  - Synchronisation
  - Multi-protocol
  - Harvesting configuration from the admin interface
Exercise: Objective of this exercise is illustrating harvesting methods available in GeoNetwork.

You need to perform the following steps:

1) Login: admin/admin
2) Move to « administration » section
3) Click on « Harvesting management »
4) Configure harvesting process (using XML harvesting and webdav)
1) Click add
2) Configure
3) Activate
4) Run or wait for the first run
5) (optional) Check the console to see what's going on
6) Check the new metadata
7) (optional) Add the logo
Harvesting & synchronisation

- Sample configurations:
  - GeoNetwork node synchronisation:
    - http://www.fao.org/geonetwork
    - http://sandre.eaufrance.fr/geonetwork
    - ... or from other existing nodes: http://geonetwork-opensource.org/geonetwork-nodes
  - Webdav harvesting:
    - Get metadata from xml document available on a directory on the web
    - http://sandre.eaufrance.fr/exist/webdav/db/tmp/Me
### HARVESTING MANAGEMENT

#### SITE

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>FAO</td>
</tr>
<tr>
<td>Host</td>
<td><a href="http://www.fao.org">www.fao.org</a></td>
</tr>
<tr>
<td>Port</td>
<td>80</td>
</tr>
<tr>
<td>Servlet</td>
<td>geonetwork</td>
</tr>
</tbody>
</table>

#### SEARCH CRITERIA

- **Site ID**:
  - **Site ID**: FAO
  - **Free text**: africa
  - **Title**: 
  - **Abstract**: 
  - **Keywords**: 

#### OPTIONS

- **Every**: hours:minutes (0:5)
- **One run only**: ✔

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*Please notice that harvesting old GeoNetwork nodes is unsafe. The old nodes do not have unique site ids and this could cause unpredictable results (like removing nodes from other harvestings).*
Harvesting & synchronisation

- Exchange format during harvesting process is based on XML.
- Between GeoNetwork nodes, a MEF format (Metadata Exchange Format) is used. It's composed of:
  - XML metadata
  - XML metadata privileges
  - Thumbnails (optional)
  - Data (optional)
Ex3: Customization
Customization

• Basic styling (colors, fonts) is made using CSS: Open the `geonetwork.css` file located in the `\web` folder in your text or CSS editor.

• Change images located in the images folder.

• Advanced styling is made using XSLT.
Customization

XSLT transformations happen here. Generating XML or HTML pages
Customization

• Exercise: Objective of this exercise is illustrating updating site design.

• You need to perform the following steps:
  1) Edit the CSS
  2) Edit the banner.xsl
Ex4: Add services
(advanced users with XSL knowledge)
Add services

- Objectivs of this service is adding a service to view metadata having WMS in GoogleEarth

1) Analyse output to produce (ie. kml)
2) Create the service in config.xml
3) Set privileges for the new service
4) Customize the service output
5) Modify the search result page to add a link to open GoogleEarth
Add services

Extract online source info (URL and layer Name) from metadata to produce the following KML file (icon/href element)

In order to start GoogleEarth when contacting the service mimetype has to be « application/vnd.google-earth.kml+xml »
Add services

· Create the service `xml.metadata.get.kml` in `config.xml`

· In `WEB-INF/config.xml` add

  · `<service name="xml.metadata.get.kml">
    · `<class name=".services.metadata.Show" />
    · `<output
      · `sheet="metadata-kml.xsl"
      · `contentType="application/vnd.google-earth.kml+xml; charset=UTF-8" />
  · `</service>`

Open the file `WEB-INF/config.xml`

· Locate the service called « xml.metadata.get », copy/paste and add the output element
Add services

- Set privileges for the new service
  - In xml/user-profiles.xml add ...
    - <allow service="xml.metadata.get.kml"/>
  - ... in the profile named « guest » (ie. For everyone)
- Then restart GeoNetwork in order to load the new service (config & privileges)
Add services

- Information needed to generate the kml link:

  - `<gmd:CI_OnlineResource>
    - `<gmd:linkage>
      - `<gmd:URL>`http://193.43.36.137/ows/7386_landf</gmd:URL>`
    - `<gmd:linkage>`
    - `<gmd:protocol>`
      - `<gco:CharacterString>`OGC:WMS-1.1.1-http-get-map</gco:CharacterString>`
    - `<gmd:protocol>`
    - `<gmd:name>`
      - `<gco:CharacterString>`landform</gco:CharacterString>`
    - `<gmd:name>`
    - `<gmd:description>`
      - `<gco:CharacterString>`Physiography of North and Central Eurasia Landform</gco:CharacterString>`
    - `<gmd:description>`
    - `<gmd:CI_OnlineResource>`
  - `<gmd:onLine>`

(2) Get URL ...

(1) Select only OnlineResource having protocol = WMS

(3) ... and get layer name.

... to create the url of the service.
Add services

• Information needed to generate the kml link – xPath expression to select the elements:
  
  • For each:
    ```
    ```
  
  • Then build URL using
    
    • gmd:linkage/gmd:URL
    
    • gmd:name/gco:CharacterString

**xPath tips:**

• `//` means select all nodes in the metadata XML tree
• Use `[ ]` to define a search criteria (eg. Select only if WMS)
Add services

- Customize service output
- Create the file xsl/metadata-kml.xsl (or get it from the www)

XSL tips:
• xsl:for-each is used to loop on each element selected by the select criteria
• xsl:value-of is used to select an element/attribute of a tag

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
                    xmlns:gmd="http://www.isotc211.org/2005/gmd"
                    xmlns:gco="http://www.isotc211.org/2005/gco"
                    version="1.0">
  <xsl:template match="/">
    <GroundOverlay>
      <!-- XSL tips: -->
        <icon>
          <href value-of select="gmd:linkage/gmd:URL"/>
          <viewRefreshMode>onStop</viewRefreshMode>
          <viewBoundScale>0.75</viewBoundScale>
          <LatLonBox>
            <north>90</north>
            <south>-90</south>
            <east>180</east>
            <west>-180</west>
          </LatLonBox>
        </icon>
        <kml>
          <GroundOverlay>
            <!-- XSL tips: -->
            <!-- xsl:for-each is used to loop on each element selected by the select criteria -->
            <!-- xsl:value-of is used to select an element/attribute of a tag -->
          </GroundOverlay>
        </kml>
      </xsl:for-each>
    </GroundOverlay>
  </xsl:template>
</xsl:stylesheet>
```
Add services

- Try the new kml service:
Add services

- Once the service up and running, add a link to the search result page.
  - Open the file search-results-xhtml.xsl
  - Add a button (line 346, 351):
    - `<button class="content" onclick="location.replace('{/root/gui/locService}/xml.metadata.get.kml?id={$metadata/geonet:info/id}')">GoogleEarth</button>`
What is up for the future?

- SDI Toolkit
  - Integrate mapserver administration & metadata management
  - Metadata for data & services (ISO19119)
  - Use GeoNetwork to store / provide services configuration
  - Add your catalogue to existing website (portlet?, widget?)

- OSGeo incubation process
Q&A?