GeoNetwork Opensource

Le manuel complet

Par les développeurs

V 2.4

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Préface

A propos de ce projet. Ce document présente comment utiliser et personnaliser le catalogue GeoNetwork opensource. L'initiative à l'origine de ce projet est la mise en place du catalogue de données spatiales pour l' Organisation pour l'Agriculture et l'Alimentation de l'ONU (FAO)[1], le Programme d'Alimentation Mondial (WFP)[2] et le United Nations Environmental Programme (UNEP)[3]. Actuellement le projet est largement utilisé dans les Infrastructures de données spatial (SDI) dans le monde entier. Le projet est également un des projets de Open Source Geospatial Foundation (OSGeo) et est disponible sur http://geonetwork-opensource.org.

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Information sur les auteurs. Cette documentation a été rédigée par les développeurs du projet GeoNetwork opensource. Si vous avez des questions, vous trouvez des erreurs ou avez des améliorations à proposer , contactez-nous via la liste de diffusion de GeoNetwork opensource `<geonetwork-devel@lists.sourceforge.net>`

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[1] http://www.fao.org

[2] http://vam.wfp.org

[3] http://www.unep.org

[4] http://www.osgeo.org

[5] http://creativecommons.org/licenses/by-nd/3.0/

Part I. Guide utilisateur

Cette section du document présente l'utilisation générale de GeoNetwork pour les utilisateurs ainsi que les gestionnaires de données souhaitant publier les données et les métadonnées.

1. A Geographic Information Management System for all

1.1 Introduction

What is GeoNetwork opensource

GeoNetwork opensource is a standard based and decentralized spatial information management system, designed to enable access to geo-referenced databases and cartographic products from a variety of data providers through descriptive metadata, enhancing the spatial information exchange and sharing between organizations and their audience, using the capacities and the power of the Internet. The system provides a broad community of users with easy and timely access to available spatial data and thematic maps from multidisciplinary sources, that may in the end support informed decision making. The main goal of the software is to increase collaboration within and between organizations for reducing duplication and enhancing information consistency and quality and to improve the accessibility of a wide variety of geographic information along with the associated information, organized and documented in a standard and consistent way.

Main Features

- Instant search on local and distributed geospatial catalogues

- Uploading and downloading of data, documents, PDF's and any other content

- An interactive Web map viewer that combines Web Map Services from distributed servers around the world

- Online map layout generation and export in PDF format

- Online editing of metadata with a powerful template system

- Scheduled harvesting and syncronization of metadata between distributed catalogues

- Groups and users management

- Fine grained access control

Background and evolution

The prototype of the GeoNetwork catalog was developed by the Food and Agriculture Organization of the United Nations (FAO) in 2001 to systematically archive and publish the geographic datasets produced within the Organization. The prototype was built on experiences within and outside the organization. It used metadata content available from legacy systems that was transformed into what was then only a draft metadata standard, the ISO 19115. Later on, another UN agency, the World Food Programme (WFP) joined the project and with its contribution the first version of the software was released in 2003 and operational catalogues were established in FAO and WFP. The system was based on the ISO19115:DIS metadata standard and embedded the Web Map Client InterMap that supported Open Geospatial Consortium (OGC) compliant Web Map Services. Distributed searches were possible using the standard Z39.50 catalog protocol. At that moment it was decided to develop the program as a Free and Open Source Software to allow the whole geospatial users community to benefit from the development results and to contribute to the further advancement of the software.

Jointly with the UN Environmental Programme (UNEP), FAO developed a second version in 2004. The new release allowed users to work with multiple metadata standards (ISO 19115, FGDC and Dublin Core) in a transparent manner. It also allowed metadata to be shared between catalogues through a caching mechanism, improving reliability when searching in multiple catalogues.

In 2006, the GeoNetwork team dedicated efforts to develop a DVD containing the GeoNetwork version 2.0.3 and the best free and open source software in the field of Geoinformatics. The DVD was produced and distributed in hard copy to over three thousand people and is now also available for download from the GeoNetwork Community website[1].

The latest release of GeoNetwork opensource is the result of another round of critical improvements, supported by FAO, the UN Office for the Coordination of Humanitarian Affairs (UNOCHA), the Consultative Group on International Agricultural Research (CSI-CGIAR), UNEP and other donors. Support for the final metadata standard ISO19115:2003 has been enabled by using the ISO19139:2007 implementation specification schema published in May 2007. The release also serves as the open source reference implementation of the OGC Catalog Service for the Web (CSW 2.0.1) specification. Improvements to give users a more responsive and interactive experience have been substantial and include a new Web map viewer and a complete revision of search interface.

The use of International Standards

GeoNetwork has been developed following the principles of a Free and Open Source Software (FOSS) and based on International and Open Standards for services and protocols, like the ISO-TC211 and the Open Geospatial Consortium (OGC) specifications. The architecture is largely compatible with the OGC Portal Reference Architecture, i.e. the OGC guide for implementing standardized geospatial portals. Indeed the structure relies on the same three main modules identified by the OGC Portal Reference Architecture, that are focused on spatial data, metadata and interactive map visualization. The system is also fully compliant with the OGC specifications for querying and retrieving information from Web catalogues (CSW). It supports the most common standards to specifically describe geographic data (ISO19139 and FGDC) and the international standard for general documents (Dublin Core). It uses standards (OGS WMS) also for visualizing maps through the Internet.

Harvesting geospatial data in a shared environment

Within the geographic information environment, the increased collaboration between data providers and their efforts to reduce duplication have stimulated the development of tools and systems to significantly improve the information sharing and guarantee an easier and quicker access of data from a variety of sources without undermining the ownership of the information. The harvesting funcionality in GeoNetwork is a mechanism of data collection in perfect accordance with both rights to data access and data ownership protection. Through the harvesting functionality it is possible to collect public information from the different GeoNetwork nodes installed around the world and to copy and store periodically this information locally. In this way a user from a single entry point can get information also from distributed catalogues. The logo posted on top each harvested record informs the user about the data source.

1.2 GeoNetwork and the Open Source Community Development

The community of users and developers of the GeoNetwork software has increased dramatically since the release of version 2.0 in December 2005 and the subsequent releases. At present, the user and developer mailing lists count well over 250 subscriptions each. Subscription to these lists is open to

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[1] http://geonetwork-opensource.org

anyone interested. The archive of the mailing lists provides an important resource for users and can be freely browsed online. Members provide feedback within the community and provide translations, new functionalities, bug reports, fixes and instructions to the project as a whole. Building a self sustaining community of users and developers is one of the biggest challenges for the project. This community-building process relies on active participation and interaction of its members. It also relies on building trust and operating in a transparent manner, thereby agreeing on the overall objectives, prioritization and long term direction of the project. A number of actions have been taken by the project team to facilitate this process.

The foundation for the establishment of a GeoNetwork Advisory Board was laid at the 2006 workshop in Rome and membership criteria were defined.

A work plan is presented and discussed at the yearly GeoNetwork workshop; subsequently, the plan is maintained and updated throughout the year where needed. The project management team reports back to the advisory board about the reached developments and objectives during the annual workshops.

Two public Websites have been established. One focuses on the users of the software (http://geonetwork-opensource.org), while the other one is dedicated to the developers (http://trac-osgeo.org/geonetwork). Both can be updated and maintained online by trusted members of the community. They provide documentation, bug reporting and tracking, Wiki pages et cetera. A small part of the community connects through Internet Relay Chat (IRC) on a public #geonetwork[2] channel. But most interaction takes place on the user[3] and the developer[4] mailing lists.

During the 2006 workshop, the Project Advisory Board decided to propose the GeoNetwork opensource project as an incubator project to the newly founded Open Source Geospatial Foundation (OSGeo)[5]. This incubation process is currently ongoing but close to conclusions. The project Websites have been moved to servers accessible under the umbrella of the OSGeo foundation. Web pages have been updated to reflect the OSGeo principles and a source code review performed.

Source code is maintained in a publicly accessible code repository, hosted at an independent service provider, SourceForge.net[6] that hosts thousands of FOSS projects. Developers and users have full access to all sections of the source code, while trusted developers can make changes in the repository itself. A special mailing list has been established to monitor changes in the code repository. This so-called "commit mailing list" delivers change reports by email to its subscribers.

The documentation is written in DocBook[7] format to ensure versioning and support of multiple output formats (e.g. HTML and PDF).

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[2] irc://irc.freenode.net/geonetwork

[3] https://lists.sourceforge.net/mailman/listinfo/geonetwork-users

[4] https://lists.sourceforge.net/mailman/listinfo/geonetwork-devel

[5] http://www.osgeo.org

[6] http://sourceforge.net/projects/geonetwork

[7] http://www.docbook.org

2. Pour démarrer

Veuillez vous assurer que vous avez ouvert la page d'accueil de votre catalogue GeoNetwork. [1]

Il existe plusieurs méthodes pour rechercher des cartes ou d'autres données géographiques dans le catalogue. Ce guide va vous présenter les méthodes de recherche les plus populaires : recherche par défaut, recherche avancée et recherche par catégorie. Quelle que soit la méthode que vous avez choisie, n'oubliez pas que les résultats que vous verrez sont fonction de vos privilèges (Section 2.5, "Privilèges, rôles and groupes d'utilisateurs") et du groupe auquel vous appartenez.

Le terme **données** dans ce progamme désigne indifféremment les jeux de données, cartes, tableaux, documents, etc. qui sont liés aux métadonnées d'un enregistrement donné.

2.1 Recherche par défaut

Le mode de recherche par défaut vous permet de chercher du texte (par exemple des mots-clefs ou un nom de lieu) dans l'ensemble du catalogue.

Recherche en texte intégral. *Entrez* les termes que vous recherchez dans le champ *Recherche*. Pour rechercher une séquence précise de mots, mettez votre texte entre guillemets.

Le texte et les opérateurs (and, or, not) ne sont pas sensibles à la casse. (Ref. Figure 2.1, "Le champ de recherche").

Figure 2.1. Le champ de recherche

Recherche géographique. Lors d'une recherche géographque, deux options permettent de sélectionner une région afin de restreindre l'étendue de la recherche :

Vous pouvez sélectionner une **région** dans une liste prédéfinie (Figure 2.2, "Le champ région");

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[1]Si vous avez installé et démarré le logiciel sur votre ordinateur, l'adresse par défaut est http://localhost:8080/geonetwork
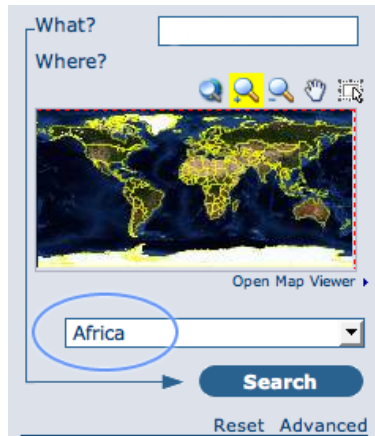
Figure 2.2. Le champ région

Vous pouvez définir votre propre *zone d'intérêt* de manière plus interactive. Il vous suffit de la dessiner sur la carte du monde miniature affichée sur l'écran. Pour cela, cliquez sur le bouton en haut à droite de la carte (Figure 2.3, "Carte interactive où définir les zones d'intérêt");
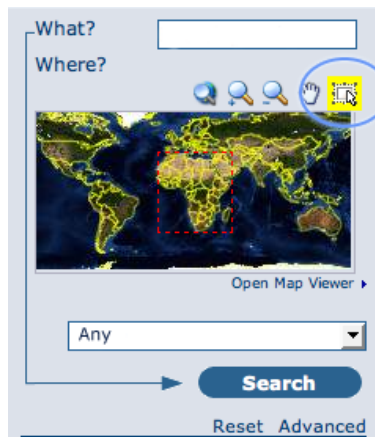
Figure 2.3. Carte interactive où définir les zones d'intérêt

Effectuer une recherche. Les deux types de recherche (texte intégral et géographique) peuvent être combinées pour affiner la requête.

Cliquez sur le bouton `Rechercher` pour lancer la recherche et afficher les résultats. (Figure 2.4, "Le bouton Rechercher").
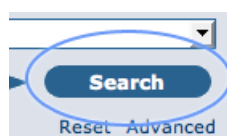
Figure 2.4. Le bouton Rechercher

2.2 Recherche par catégories

Une autre méthode pour rechercher des données dans GeoNetwork depuis la page d'accueil consiste à effectuer une recherche par **catégorie**. L'accès à la liste des catégories permet à l'utilisateur d'identifier des données de manière plus générique : **Applications**, **Autres ressources**, **Cartes & graphiques**, **Conférences**, **Étude de cas, meilleures pratiques**, **Jeux de données**, **Photographies**, **Répertoires**, **Ressources interactives**, **Vidéo/Audio**.

Pour rechercher uniquement des cartes, cliquez sur **Cartes & graphiques** (Figure 2.5, "Recherche par catégorie"). À partir de la liste des cartes affichée, vous pouvez accéder à la description d'une carte en cliquant sur le bouton **Plus d'information** qui y est associé.

Figure 2.5. Recherche par catégorie

2.3 Recherche avancée

L'option de recherche avancée (Figure 2.6, "Options de recherche avancée") fonctionne de manière semblable à la recherche par défaut. Cependant vous pouvez affiner vos recherches en profitant des différents critères proposés, chacun étant axé sur un thème particulier : **Quoi ?, Où ?, Quand ?**
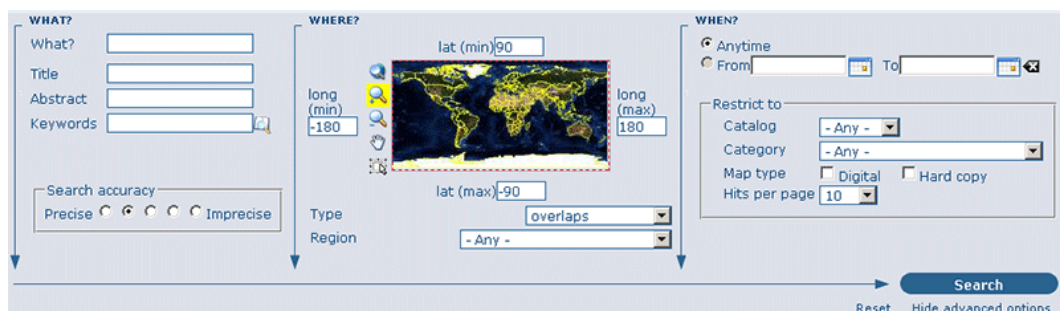
Figure 2.6. Options de recherche avancée

Pour effectuer une **recherche avancée** depuis la page d'accueil, **cliquez sur Avancée** situé sous le bouton Rechercher (ref. Figure 2.7, "Afficher les options de recherche avancée").
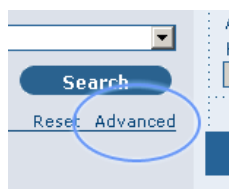
Figure 2.7. Afficher les options de recherche avancée

Dans la section **QUOI ?** tous les éléments sont liés au contenu des données. Par leur intermédiaire, au lieu de chercher uniquement des mots dans l'ensemble des métadonnées, vous pouvez chercher directement dans le titre ou le résumé et ajouter des mots-clefs pour affiner votre recherche. Vous pouvez également ajuster le niveau de précision que vous souhaitez atteindre lors de l'exécution de votre requête (Figure 2.8, "La section "Quoi" de la recherche avancée").

- Pour effectuer une recherche dans le **Titre**, le **résumé**, **partout**, ou parmi les **mots-clés**, saisissez votre texte dans le champ approprié. Vous pouvez renseigner plusieurs champs simultanément. Si vous souhaitez ignorer un critère de recherche, laissez le champ correspondant vide ;

- Vous pouvez définir la **précision** de votre recherche en terme de justesse orthographique, de **Précis** = 1 à **Imprécis** = 0.2, avec trois valeurs intermédiaires égales à 0.8, 0.6, 0.4.

Figure 2.8. La section "Quoi" de la recherche avancée

Les paramètres de la section **OÙ?** sont liés à l'empreinte géographique des données. Comme dans la recherche par défaut, ils vous permettent de définir votre propre zone d'intérêt ou d'en sélectionner une prédéfinie dans la liste déroulante. Dans cette section, vous pouvez également saisir les coordonnées géographiques d'une zone d'intérêt. (Figure 2.9, "La section "Où" de la recherche avancée")

- Pour définir **votre propre zone d'intérêt**, dessinez le cadre l'englobant sur la carte du monde en utilisant l'outil approprié accessible sur la gauche de la carte (bouton du bas) ;

- Pour saisir **librement les coordonnées** de votre zone d'intérêt, renseignez les champs latitude et longitude situés autour de la carte. Le nombre de décimales n'est pas limité ;

- Pour utiliser les coordonnées d'une **région prédéfinie**, sélectionnez cette région dans la liste déroulante.

Figure 2.9. La section "Où" de la recherche avancée

Quelque soit le type de recherche géographique que vous avez décidé d'effectuer, dans le champ **Type**, vous pouvez choisir une option parmi celles-ci: **identique**, **chevauche**, **contient**, **en dehors de** (Figure 2.9, "La section "Où" de la recherche avancée"). Si vous utilisez ce critère, faites attention à la manière dont cela affecte le résultat de votre recherche :

- Si vous choisissez le **type** de recherche spatiale *identique* "Pays", seules les cartes du pays sélectionné seront affichées. En d'autres termes, la carte d'une ville de ce pays ne sera pas affichée dans la liste des résultats de la recherche.

- Si vous choisissez le **type** de recherche spatiale *chevauche* "Pays", toutes les cartes dont l'emprise chevauche ce pays seront affichées dans la liste des résultats : c.-à-d. les pays limitrophes, le continent du pays en question et les cartes du monde.

- Si vous choisissez le **type** de recherche spatiale *contient* "Pays" vous obtiendrez en premier dans la liste des résultats les cartes du pays suivies de toutes les cartes incluses dans ce dernier.

- De la même manière, si vous choisissez le **type** de recherche spatiale *en dehors* d'une région sélectionnée, seules les cartes répondant strictement à ce critère sont affichées dans la liste des résultats.

La section **QUAND ?** vous donne la possibilité de restreindre votre recherche en fonction de critères temporels en indiquant une période pour la création ou la publication des données (Figure 2.10, "La section "Quand" de la recherche avancée").

- Pour définir une période, cliquez sur le bouton représentant un calendrier à côté des champs **Début - Fin**. Utilisez les symboles **>** et **>>** en haut du calendrier pour choisir d'abord le mois et l'année avant de cliquer sur le jour ; une date complète est formatée de la manière suivant : AA-MM-JJ.

- Pour effacer les champs de début et fin de période, cliquez sur la croix blanche à la droite du champ fin ; l'option **N'importe quand** sera sélectionnée automatiquement et la recherche sera exécutée sans aucune restriction temporelle.
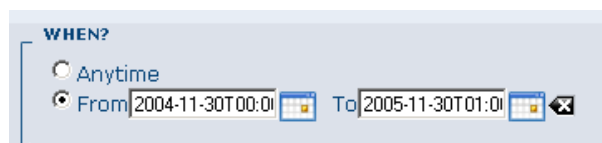
Figure 2.10. La section "Quand" de la recherche avancée

Enfin, la recherche avancée permet de restreindre la recherche en appliquant des critères supplémentaires à la source des données, leur catégorie et leur format (Figure 2.11, "Autres options de la recherche avancée").

- Pour limiter vos requêtes à un seul **Catalogue** parmi ceux rendus accessibles au moment de l'installation grâce au mécanisme de moissonnage, cliquez sur le catalogue qui vous intéresse. Autrement, sélectionnez **Tous** pour chercher dans tous les catalogues. (Pour en savoir plus sur **le moissonnage de métadonnées**, veuillez vous référer à la Section 4 Chapitre 1 de ce manuel).

- Pour rechercher des données organisées en **Catégories** telles que Applications, Jeux de données, etc., sélectionnez dans la liste déroulante la catégorie dans laquelle vous souhaitez effectuer votre recherche. Autrement, nous vous suggérons de laisser sélectionnée la valeur **Tous** dans le champ Catégories.

- Vous pouvez chercher des cartes **numériques** ou **imprimées**. Pour cela, sélectionnez la case à cocher correspondant au type de carte que vous souhaitez rechercher. Si aucune case n'est cochée, la recherche sera effectuée pour les deux types de cartes.

Enfin, vous pouvez personnaliser le nombre de résultats affichés par page dans le champ **Nombre de résultats par page**.

- Cliquez sur le bouton **Rechercher**.
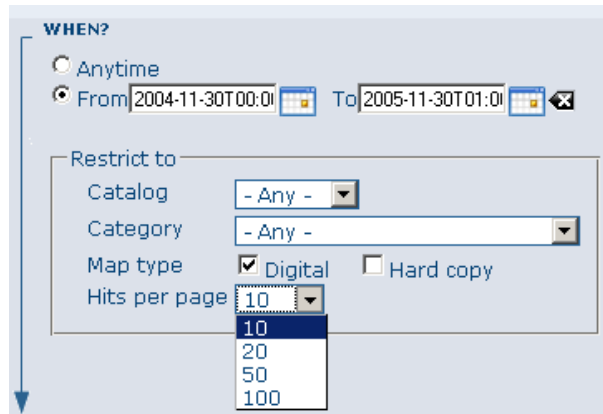
Figure 2.11. Autres options de la recherche avancée

2.4 Analyser les résultats de la recherche

Le résultat d'une recherche est constitué d'une liste de métadonnées qui devraient correspondre à votre requête. Pour chaque élément dans cette liste, le titre, un résumé et les mots-clefs sont affichés dans la page de résultats. En fonction des privilèges qui ont été associés à chaque métadonnée, au maximum quatre sections peuvent être consultées comme le montre la capture d'écran ci-dessous. (Figure 2.12, "Résultats de la recherche")

Figure 2.12. Résultats de la recherche

1. **Métadonnées** : La section relative aux métadonnées décrit le jeu de données (par exemple : citation, propriétaire de la donnée, information temporelle / spatiale / méthodologique) et peut éventuellement contenir des liens vers d'autres sites internet susceptibles de fournir de plus amples informations sur le jeu de données.

2. **Télécharger** : Selon les privilèges associés à chaque résultat, lorsque ce bouton est présent, le jeu de données est disponible et téléchargeable. Accéder aux données est simple et rapide puisqu'il suffit de cliquer sur le bouton de téléchargement (Figure 2.13, "Un résultat de recherche") ou d'utiliser

le lien approprié dans la section Distribution des métadonnées lorsqu'elles sont affichées en entier (Figure 2.14, "Services disponibles associés à cette ressource").
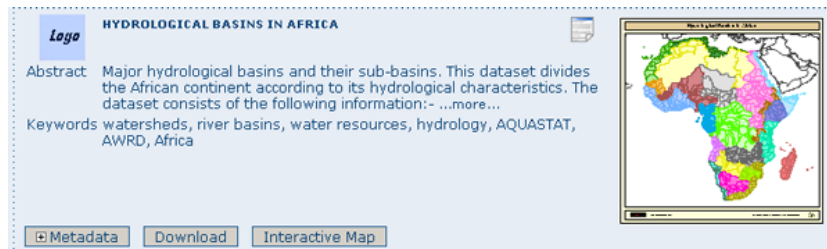
Figure 2.13. Un résultat de recherche

Figure 2.14. Services disponibles associés à cette ressource

3. **Carte interactive** : Le service cartographique est également optionnel. Lorsque ce bouton est visible, une carte interactive pour cette couche d'information est disponible et, par défaut, sera affichée sur la carte associée à la recherche simple. Pour mieux voir la carte, **cliquez** sur **Afficher la carte** situé en bas à droite de la carte miniature (Figure 2.15, "La carte interactive").
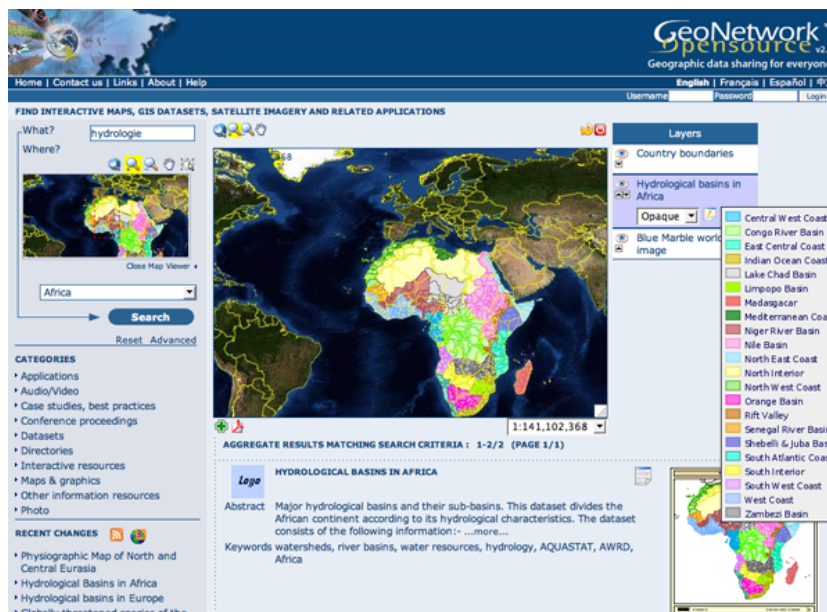
Figure 2.15. La carte interactive

4. **Aperçu visuel** : Des aperçus visuels de la donnée de petite et de grande taille permettent d'évaluer son utilité, en particulier lorsque la carte interactive n'est pas disponible. Il suffit de cliquer sur la petite image pour l'agrandir. (Figure 2.16, "Aperçu visuel de grande taille")
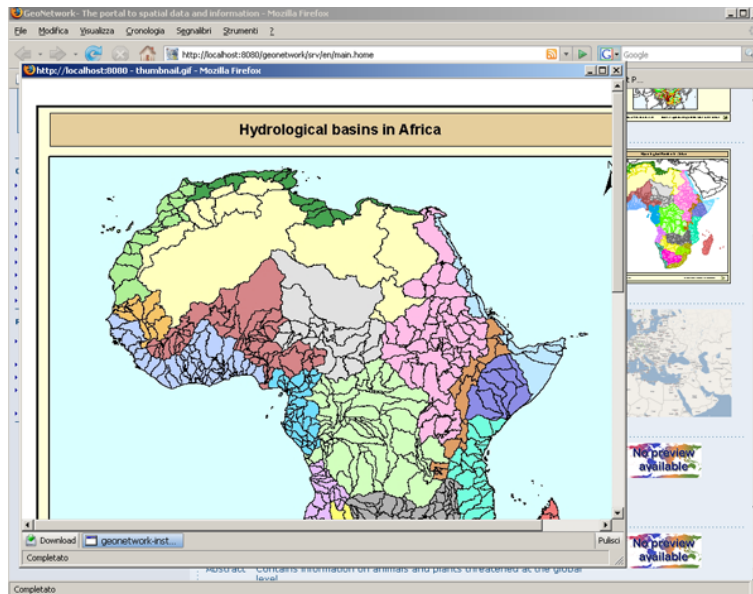
Figure 2.16. Aperçu visuel de grande taille

2.5 Privilèges, rôles and groupes d'utilisateurs

GeoNetwork utilise un système constitué de *Privilèges*, de *Rôles* et de *groupes d'utilisateurs*.

Il n'y a pas de restrictions imposées aux utilisateurs désireux de rechercher ou d'accéder à des **informations publiques** contenues dans un catalogue GeoNetwork opensource. Pour accéder à des **informations à accès restreint** ou à des fonctionnalités avancées, il est nécessaire de posséder un compte afin de se connecter sur le site. Celui-ci devrait être fourni par l'administrateur de Geonetwork.

Pour se connecter, il suffit de se rendre sur la page d'accueil, de saisir son nom d'utilisateur et son mot de passe dans l'angle en haut à droite et de cliquer sur le bouton de connexion. (Ref. Figure 2.17, "Bouton de connexion au catalogue")

Figure 2.17. Bouton de connexion au catalogue

Privilèges. En fonction des privilèges associés à un enregistrement de métadonnées et de votre rôle en tant qu'utilisateur authentifié, vous serez à même de lire des informations qui y sont liées et aurez la possibilité de télécharger ou de visualiser interactivement les données associées à cet enregistrement.

Rôles. Les utilisateurs avec un rôle d'*Éditeur* peuvent créer, importer et éditer des enregistrements de métadonnées. Ils peuvent également charger des données et configurer les liens vers les services de cartographie interactive.

Groupes d'utilisateurs. Chaque utilisateur authentifié est membre d'un groupe de travail particulier et a la possibilité de visualiser des données au sein de ce groupe.

3. Viewing and Analyzing the Data

Once you have completed your search, you view details of a particular record by clicking on the **Metadata** button.

The metadata profiles used by GNos to present and describe geographic data and general documents stored in the catalogue are based on the **International Standard ISO 19115:2003**, encoded according to the **implementation schema 19139:2007**, the **FGDC** and the international standard **Dublin Core**.

In this guide the **ISO 19139** metadata implementation will be described in details since it is also suggested as profile for the creation of new metadata records.

3.1 Meta Data Description

The metadata ISO 19139 profile used by GeoNetwork opensource to describe the geographic data and services is based on the ISO standard 19115:2003 and provides information related to the identification, the maintenance and constraints, the spatial and temporal extent, the spatial representation and reference, the quality and distribution of a geographic dataset.

The metadata profile is organized in sections and the most important, illustrated in Figure 3.1, "Main metadata sections", are the: **Identification Section, Distribution Section, Reference System Section, Data Quality Section and Metadata Section**. These sections are described here in details.

Figure 3.1. Main metadata sections

Identification Section

This section includes information on the citation of the resource (**title, date of creation or publication, edition, presentation form**), the **abstract**, the **purpose** and the present **status** of the resource that can be defined among the options: completed, historical archive, obsolete, ongoing, planned, required or under development. (Figure 3.2, "Identification information").

Figure 3.2. Identification information

This section also contains information about the person or organization responsible for the data and who is considered to be a **point of contact** for the resource i.e. the dataset owner, originator, distributor, publisher, etc. and it provides information on **data maintenance** i.e. annually, monthly, daily, not planned, as needed, etc. (Figure 3.3, "Point of Contact")

Figure 3.3. Point of Contact

Elements for **keywords** and for describing restrictions on **data access** and **use** are also included in this section in addition to **spatial representation** info like data type (vector, raster, text table, etc.) (Figure 3.4, "Descriptive keywords").

Figure 3.4. Descriptive keywords

The identification section provides information about the **scale**, the **language** and **character set** used within the resource and the list of **ISO categories** through which your map could be classified (Figure 3.5, "Scale and other data properties").

Figure 3.5. Scale and other data properties

Finally, the temporal and spatial extent are also defined in this section. The temporal extent is defined through the starting and ending date of data validation (Figure 3.6, " **Temporal extent** ");

*Figure 3.6. **Temporal extent***

The spatial extent of the interested area is defined through geographic coordinates or through the selection of a country or region from a predefined list (Figure 3.7, " **Geographic bounding box** "). Free text **supplemental information** can be added to complete the data identification section.

Figure 3.7. **Geographic bounding box**

Distribution Section

This section provides metadata elements for **accessing** other useful **on-line resources** available **through the web**. The distribution elements allow for on-line access using an URL address or similar addressing scheme and provide the protocol for the proper connection **for accessing geographic data** or any other types of digital documents **using the download function**. Furthermore, it is possible **to link** a metadata with a **predefined map service** through the **on line resource** and see the map interactively (Figure 3.8, "Distribution information").

Figure 3.8. Distribution information

Reference System Section

The Spatial Reference System section **defines metadata** required **to describe** the **spatial reference system** of a dataset. It contains one element to identify the name of the reference system used (Figure 3.9, "Reference system"). Using elements **from the advanced form**, this section may be modified to provide more **details** on **data projection**, **ellipsoid** and **datum**. Note that if this information is provided, a reference system identifier is not mandatory.

Figure 3.9. Reference system

Data Quality Section

The Data Quality section provides a **general assessment** of the **quality of the data**. It describes the **different hierarchical levels of data quality**, namely a **dataset series**, **dataset**, **features**, **attributes**, etc. This section also contains information about **sources of the input data**, and a **general explanation of the production processes** (lineage) used for creating the data (Figure 3.10, "Data quality").

Figure 3.10. Data quality

Metadata Information Section

This section contains information about the metadata itself: the **Global Unique Identifier** (GUID) assigned to the record (this is the 'File identifier'), **language** and **character set** used, **date** of **last edit** ('Date stamp') and the **metadata standard** and **version name** of the record. It also contains information on the **metadata author** responsible for the metadata record; this person can also be a point of contact for the resource described. Information on the Metadata author is mandatory (Figure 3.11, "Metadata properties").

Figure 3.11. Metadata properties

4. Ajout d'une nouvelle métadonnée et saisie de l'information

Cette partie présente la manière de créer et saisir des métadonnées dans le catalogue en utilisant soit l'éditeur en ligne, soit l'outil d'insertion basé sur les documents XML. Dans les deux cas, vous utiliserez le système de modèles (templates), l'ajout d'aperçu, le téléchargement de données, le lien vers des services et la gestion des privilèges pour l'accès aux données et aux métadonnées.

Pour ajouter et éditer une métadonnée, vous devez être **enregistré** comme **Editeur** dans le groupe dans lequel vous souhaitez l'ajouter. Si ce n'est pas le cas, contactez l'administrateur.

Pour la création d'une métadonnée utilisant l'éditeur en ligne, Géosource fournit un certain nombre de modèles de métadonnées basés sur les normes ISO 19115/119. Ces modèles permettent de décrire divers types de ressource (données vecteur ou raster, services WMS/MFS, service de téléchargement...) avec un nombre minimal d'éléments pré-remplis dans la vue découverte. Ces modèles peuvent être complétés avec des éléments de la vue avancée.

Afin de saisir correctement une métadonnée, vous devez donner un maximum de détails pour décrire la ressource en prenant en compte les éléments qui ont été présentés dans le chapitre précédent.

Les champs les plus importants à remplir sont les suivants :**Le titre, la date de création et de publication, le résumé, la langue utilisée pour documenter la donnée, le thème, l'échelle, la maintenance et la fréquence de mise à jour, la langue de la métadonnée**.

En plus des champs obligatoires, nous recommandons de remplir ces champs optionnels mais importants (si ces informations sont disponibles) :**l'objectif, les mots-clés, la forme, l'état, le type de erprésentation spatiale, la localisation géographique, les informations sur le système de référence, l'étendue temporelle, les informations sur la qualité, les contraintes d'accès et d'utilisation, le point de contact, les informations sur la distribution (ressource en ligne)**

Vous avez également la possibilité de fournir un aperçu de la ressource, qui apparaîtra dans les résultats de la recherche.

La prochaine section vous guidera vers le processus de création utilisant l'éditeur en ligne.

4.1 Utilisation de l'éditeur en ligne pour la création d'une nouvelle métadonnée

1. Dans la page d'accueil, cliquez sur l'**l'onglet "administration"**.

2. Selectionner**"nouvelle métadonnée"**) partir de la liste dans la page d'administration.

3. Selectionner le modèle de métadonnée **Modèle**, if possible, using the preferred ones (Figure 4.3, "Sélection du modèle")For the ISO standard, two templates have been developed; one for vector and one for raster data. Both contain a relevant set of elements to describe the respective types of data. More templates can be developed online.

4. Selectionner le**Groupe** auquel sera rattaché la métadonnée. Les groupes proposés sont ceux autorisés par l'administrateur.

5. Cliquez sur **"créer"**.

The steps in more details

1. Entrez votre identifiant et mot de passe et cliquez sur le bouton "Connecter" (Figure 4.1, "Login"). Le système vous identifiera et vous assignera les privilèges correspondant à votre compte.

Figure 4.1. Login

2. Ouvrez la page d'administration en cliquant sur le bouton "Administration" puis cliquez sur le lien de la nouvelle métadonnée (Figure 4.2, "Administration panel").
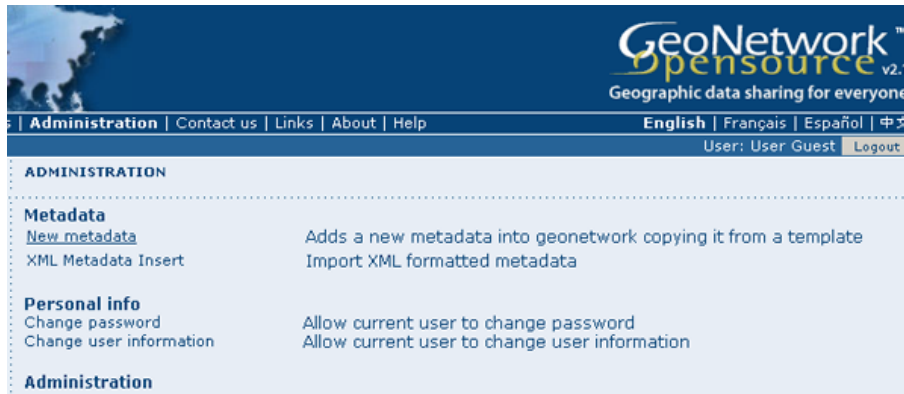
Figure 4.2. Administration panel

3. A partir de la page de création de métadonnée, sélectionnez le standardon page, select the metadata standard to use from the dropdown list (Figure 4.3, "Sélection du modèle")

Figure 4.3. Sélection du modèle

4. Après avoir sélectionné le modèle correct, vous devez identifier à quel groupe d'utilisateurs se rattachera la métadonnée créée (Figure 4.4, "Sélection du groupe")puis cliquez sur **"Créer"**.
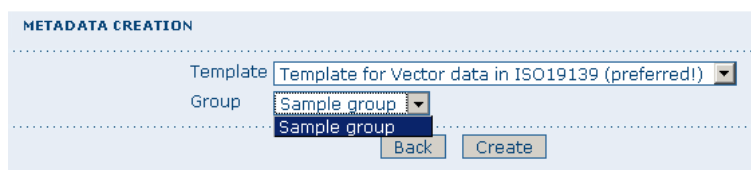
Figure 4.4. Sélection du groupe

Une nouvelle métadonnée basée sur le modèle sélectionné est ensuite chargée.

Switching Editing Views from Default to Advanced to XML View

Lorsque vous créez un nouvel enregistrement, vous pouvez choisir entre **Vue découverte**, **Vue avancée**, **Vue complète** ou **Vue XML**. Pour charger la vue, cliquez simplement sur la vue correspondante dans la colonne de gauche de la page. La vue en **gras** correspond à la vue courante (Figure 4.5, "Options sur la vue de métadonnée").
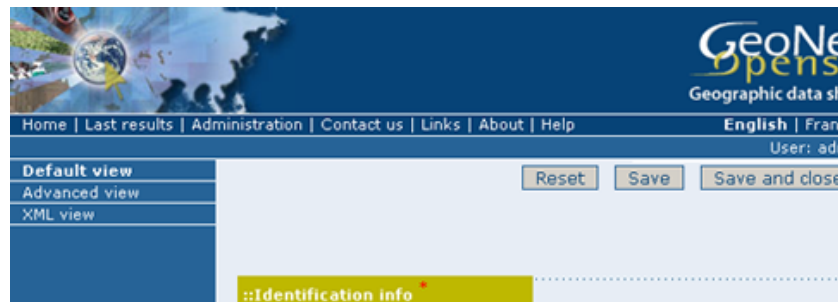
Figure 4.5. Options sur la vue de métadonnée

Dans le chapitre précédent, vous avez analysé la structure de la métadonnée présentée dans la **Vue découverte**. A selection of the main fields from different categories of information is shown in one single view. The minimum set of metadata required to serve the full range of metadata applications (data discovery, determination of data fitness for use, data access, data transfer and use of digital data) is defined here, along with optional metadata elements to allow for a more extensive standard description of geographic data, if required. However, if should be there a need to add more metadata elements, you can switch to the advanced view at any time while editing.

Dans la **Vue complète**, le profil ISO donne la possibilté de visualiser et éditer la métadonnée dont la structure est organisée dans des sections dans la colonne de gauche. Vous pouvez utiliser cette vue pour écrire des descriptions supplémentaires sur la métadonnée ou des modèles selon vos besoins. (Figure 4.6, "Vue complète")
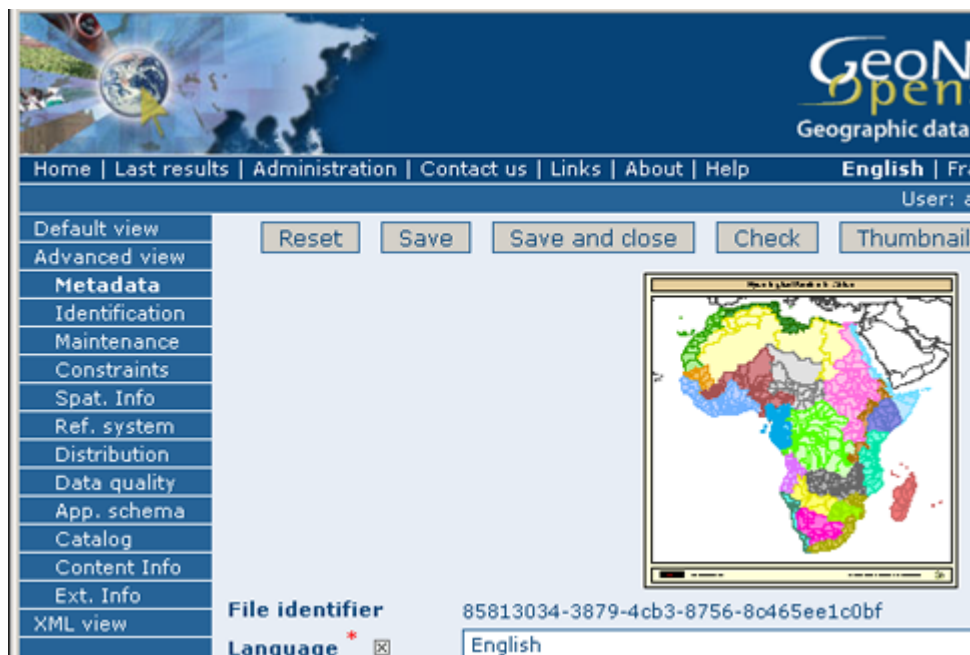
Figure 4.6. Vue complète

La **Vue XML** montre l'ensemble du contenu de la métadonnée dans la structure hiérarchique d'origine; des couleurs différentes permettent de distinguer le nom de l'élément et sa valeur. La structure XML est composée de balises, à chacune des balises doit correspondre une balise fermée (Figure 4.7, "Vue XML"). Le contenu est entièrement placé entre les deux balises, i.e.

```
<gmd:language>
    <gco:CharacterString>eng</gco:CharacterString>
```

```
</gmd:language>
```


Figure 4.7. Vue XML

Cependant, l'utilisation de la vue XML requiert une connaissance minimale du langage XML.

Les deux vues **Avancée** et **complète** sont composées d' `obligatoires`, `conditionnels` et `optionnels` champs de métadonnées. La signification d'obligatoire et optionnel est assez intuitif; Les champs obligatoires sont requis, comme `le titre` et `le résumé` par exemple, alors que les champs optionnels peuvent être renseignés mais ne sont pas fondamentaux, et dépend de l'auteur de la métadonnée. Les champs conditionnels peuvent être considérés comme obligatoires dans certaines circonstances : essentiellement un champ conditionnel indique que sa présence est dépendante de la valeur ou de la présence d'autres éléments dans la même section, par exemple, le `Nom individuel` de l'élément `Point de contact`, qui est un élément conditionnel de la section Identification devient obligatoire si un autre élément de la même section, `le nom de l'organisation` ou `la position` n'est pas déjà défini (Figure 4.8, "Point de contact").

Figure 4.8. Point de contact

Les **champs obligatoires** aussi bien que **ceux fortement recommendés** sont annotés d'un **astérisque rouge [*]**. La définition de chacun des champs peut être lu en passant la souris sur ce même champ.

La**vue avancée** is the preferred view as it provides a selection of the available metadata elements, facilitating both the user and the editor in reading and editing a metadata record, and at the same time it ensures that a geospatial data can be properly described, through :

- the minimum set of metadata required to serve the full range of metadata applications (data discovery, determination of data fitness for use, data access, data transfer, and use of digital data);

- optional metadata elements - to allow for a more extensive standard description of geographic data, if required;

- a method for extending metadata to fit specialized needs.

Utiliser les commandes basiques de la métadonnée champs de l'éditeur

Les champs ont soit **des domaines de texte libre** soit **des lstes de codes**. Texte libre signifie que vous pouvez écrire n'importe quel texte dans ce champ. Drop down lists allow you to select only one option from the list. You can add multiple fields of the same kind by clicking on the **[+]** symbol next to the element. Every new field that you will add in the advanced view will then be visible in the default view. You can also delete existing fields by clicking on the **[x]** symbol next to the element. Clearly, mandatory fields cannot be deleted. One example of the need to add multiple fields can arise if the content of your dataset has some text written in two different languages (Figure 4.9, "Describing multilingual data").

Figure 4.9. Describing multilingual data

4.2 Entering Metadata for your Map

As we mentioned in the introduction to this guide, GNos provides tools to describe any type of geographic data (vector layers, raster, tables, map services, etc.) as well as general document like reports, projects, papers, etc. For the purpose of this Quick Start Guide, an example of required and useful metadata elements to properly describe a thematic map will be provided hereafter. You should gather as much information as possible to identify and understand the map's resource and characteristics you want to describe. Use the default view to start. If necessary, you can always switch to advanced view or come back later and edit the record with the additonal information collected.

Entering Metadata For Your Map

Please follow these steps to enter your map's metadata. Note that we will only go through the fields that have been identified as compulsory (i.e. those fields marked with the asterix **[*],** mandatory or highly recommended).

 Titre * : Dans **les informations d'identification** donnez un **nom**à vos données. Il s'agit d'un nom par défaut de votre jeu de données. Utilisez un texte libre pour décrire vos données.

 Date * : Indique la **date** exacte de **création**, **publication** ou **révision** de votre jeu de données

 Forme de présentation: spécifie le type de présentation i.e. **digital**, **document papier**, **table**, etc.

 résumé * : description du jeu de données

 Objectifs: un court résumé des objectifs du jeu de données.

 Etat: Spécifie l'état de votre jeu de données, avec différents choix possibles : complété, archive historique, obsolète, en cours, planifié, requis, en cours de développement.

 Point de Contact: Saisir l'information sur le contact sur la ressource. A noter que certains champs sont conditionnels, comme le nom de l'organisation si le nom individuel ou la position ne sont pas renseignés.

 Maintenance and update frequency * : Specify the frequency with which you expect to make changes and additions to your map after the initial version is completed. If any changes are scheduled you can leave `As Needed` selected from the drop-down list.

 Descriptive Keywords: Enter keywords that describe your map. Also specify the type of keyword you are entering, i.e. place, theme, etc. Remember that you can add another keyword field if you need to add different types of keywords.

Access Constraints: Enter an access constraint here, such as a copyright, trademark, etc. to assure the protection of privacy and intellectual property.

User Constraints: Enter a user constraint here to assure the protection of privacy and intellectual property.

Other Constraints * : Enter other constraint here to assure the protection of privacy and intellectual property. Note that this field is conditionally mandatory if Access and Use constraints are not entered.

Spatial representation type: Select, from the drop-down list the method used to spatially represent your data. The options are: vector, grid, text table, stereo model, video.

Scale Denominator * : Enter the denominator for an equivalent scale of a hard copy of the map.

Language * : Select the language used within your map

Topic category * : Specify the main ISO category/ies through which your map could be classified (see Annex for the complete list of ISO topic categories).

Temporal Extent * : Enter the starting and ending date of the validity period.

Geographic Bounding Box * : Enter the longitude and latitude for the map or select a region from the predefined drop-down list. Make sure you use degrees for the unit of the geographic coordinates as they are the basis for the geographic searches.

Supplemental Information: Enter any other descriptive information about your map that can help the user to better understand its content.

Distribution Info: Enter information about the distributor and about options for obtaining your map.

Online Resource: Enter information about online resources for the map, such as where a user may download it, etc. This information should include a link, the link type (protocol) and a description of the resource.

Reference System Info: Enter information about the spatial reference system of your map. The **default view contains** one element to provide the **alphanumeric value** identifying the reference system used. GNos uses the **EPSG codes** which are numeric codes associated with coordinate system definitions. For instance, EPSG:4326 is Geographic lat-long WGS84, and EPSG:32611 is "UTM zone 11 North, WGS84". Using elements **from the advanced view**, you may add **more details** on **data projection, ellipsoid** and **datum**. Note that if this information is provided, a reference system identifier is not mandatory.

Data Quality: Specify the hierarchal level of the data (**dataset series**, **dataset**, **features**, **attributes**, etc.) and provide a **general explanation on the production processes** (lineage) used for creating the data. The statement element is mandatory if the hierarchical level element is equal to `dataset` or `series`. Detailed information on **completeness, logical consistency** and **positional**, **thematic** and **temporal accuracy** can be directly added **into the advanced form**.

Metadata Author * : Provide information about the author of the map, including the person's name, organization, position, role and any other contact information available.

After completion of this section, you may select the **Type** of document that you are going to save in the catalogue. You have three options: **Metadata**, **Template**, **Sub-template**. By default **Metadata** is set up.

When done, you may click `Save` or `Save and Close` to close the editing session.

Creating a Thumbnail

Next, you need to create a graphic overview of your map which will be for a double purpose; as small thumbnail will be displayed in search results and as large thumbnail with much more details, to allow users to properly evaluate the data usefulness. As for the latest, the image that you will use as source should be a significant reproduction of the real dataset, possibly inclusive of the legend.

To create a thumbnail, go to the editing menu for your map. If you are no longer in editing mode, retrieve the map from one of the search options then click on `Edit`. Then follow these simple steps:

- From the editing menu, click on the `Thumbnails` button on the top or bottom of the page. (Figure 4.10, "The thumbnail wizard button")
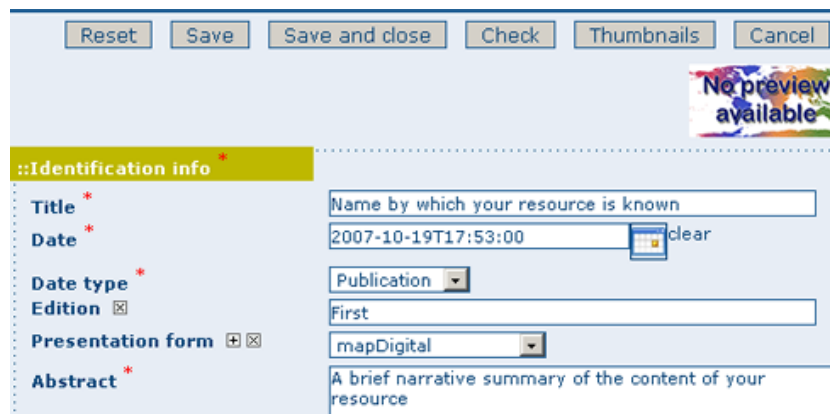
Figure 4.10. The thumbnail wizard button

- You will be taken to the `Thumbnail Management` wizard (Figure 4.11, "Thumbnail wizard").

- To create a small or large thumbnail, click on the `Browse` button next to either one. It is recommended that you use 180 pixels for small thumbnails and 800x600 for large thumbnails. Using the 'Large thumbnail' option allows you to create both a small and large thumbnail in one go.

- You can use GIF, PNG and JPEG images as input for the thumbnails.

- A pop up window will appear allowing you to browse your files on your computer. `Select` the file you wish to create a thumbnail with by double-clicking on it.

- Click on `Add`.

- Your thumbnail will be added and displayed on the following page.

- You can then click on `Back to Editing` and save your record (Figure 4.12, "Completed thumbnail wizard").

Figure 4.11. Thumbnail wizard

Figure 4.12. Completed thumbnail wizard

Linking data for download

Finally, you can upload the dataset stored on your local computer and then create a link between data and related description. Files in whatever format can be uploaded: doc, PDF, images, vector layers, etc. For the latter the distribution in a compressed file is recommended. You can include the vector data, the legend, any documentation that can help the interpretation of the data, related reports, detailed descriptions of the data processing, base data used to create the dataset specified and/or other relevant information. Follow these guidelines for uploading datasets:

- Make sure the total size of the compressed file is reasonable (less than 50 MB). Should your data be bigger than 50MB, consider a different mechanism to serve this data, e.g. through an FTP or HTTP server and than link the resource through an online resource 'Web address (URL)'.

- You can create several smaller files when appropriate and upload them sequentially.

- You add the size of the file at the end of the description field.

To Upload a Dataset, follow these steps (Figure 4.13, "An online resource"):

1. The **URL** field can be left empty when uploading a file. The system will automatically fill this field out;

2. Select the correct **protocol** to be used. If you do not see the buttons to browse and upload when File for download is selected, save the metadata and return to the upload section. Both buttons should appear;

3. Provide a short **description** of the data;

4. Click the `Browse` button and navigate to the folder where the file to be released is stored. Consider if you want to upload multiple files as one unique zip file or as multiple separate downloads. It is a good idea to add additional documentation with the datasets that provide the user with information related to the data described. Remind: the size of a single file to upload can't exceed 50 Mbytes;

5. Click `Upload` and then `Save`.
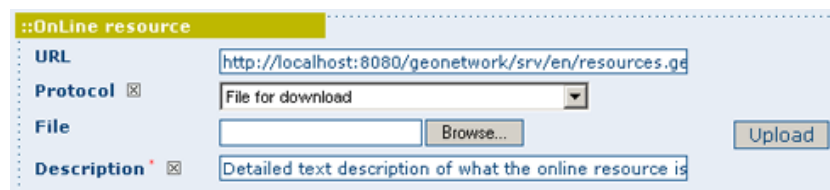
Figure 4.13. An online resource

Assigning Privileges for a Map

As an important step of entering metadata to your map, you need to assign privileges for each map. This means that you will identify which work groups have which privileges, i.e. view, download, etc. for your particular map.

For instance, you can define if the information and related services is visible to all (Internet users) or just to internal users only (Intranet). Privileges are assigned on a per group basis. Depending on the user profile (Guest, Registered User, Editor, Admin etc.) access to these functions may differ on a per user basis.

To assign privileges for your map, follow these steps:

- Find your map by using the search option. Whether you have multiple or single results from the search, on top of the individual record or next to the record you will always see a row of buttons including a Privileges button (Figure 4.14, "The editing toolbar with `Privileges` button").

Figure 4.14. The editing toolbar with `Privileges` button

- Click on the Privileges button. This will take you to a new page. You can assign certain privileges to specific groups by selecting or deselecting them from this page. Simply click on the small box next to the privilege to place or remove a checkmark. **Set All** and **Clear All** buttons allow you to place and remove the checkmarks all at once (Figure 4.15, "Privileges settings").
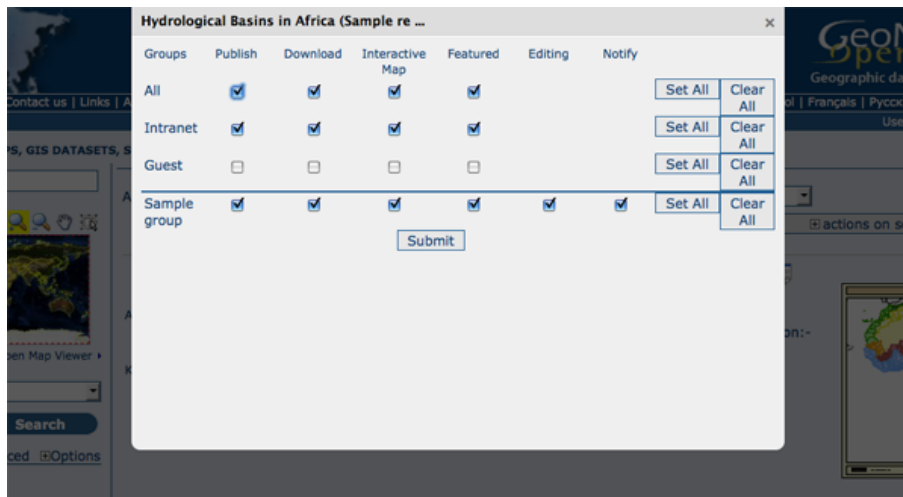
Figure 4.15. Privileges settings

Below is a brief description for each privilege to help you identify which ones you should assign to which group(s).

Publish: Users in the specified group/s are able to see the map, i.e. if searching with matching criteria.

Download: Users in the specified group/s are able to download the map.

Interactive Map: Users in the specified group/s are able to get an interactive map. **The interactive map** has to be created separately using a Web Map Server, which is part of the GeoNetwork opensource application.

Featured: When selected, the map is placed in the Features Maps of the home page and it appears there randomly.

Editing: When selected, the editors of the group(s) concerned can edit the respective metadata record.

Notify: A notification email is send to the emailaddress of the group, informing that the map has been downloaded.

Assigning Categories for a Map

As a final step to entering metadata for a map, you should assign categories for it. The assigned categories will determine the categories the map will display under on the home page. To assign categories for a map, follow these steps:

- Find your map by using the search option. Whether you have multiple or single results from your search, on top of the individual record or next to the record, you will always see a row of buttons including a **Categories** button.

- Click on the **Categories** button. This will take you to a new page. You can assign one or multiple categories selecting or deselecting them from this page. Simply click on the small box next to the category to place or remove a checkmark. (Figure 4.16, "Category management")
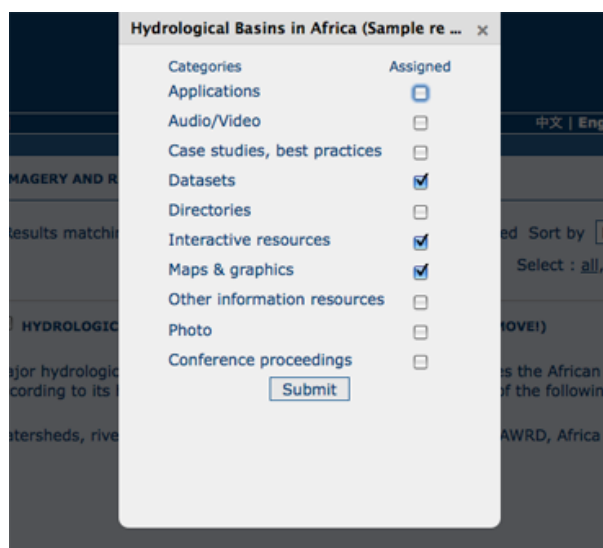
Figure 4.16. Category management

4.3 Uploading a New Record using the XML Metadata Insert Tool

A more advanced procedure to upload a new metadata record in the GeoNetwork system is using an XML document. This procedure is particularly useful for users who already have metadata in XML format, for instance created by some GIS application. To this regard, it has to be noted that the metadata must be in one of the standards used by GeoNetwork: ISO19115, FGDC and Dublin Core.

To start the metadata uploading process through the **XML Metadata Insert** tool, you should log in (see Step. 1. in paragraph 7.1.1) and select the appropriate option from the Administration page (Figure 4.17, "Administration panel").
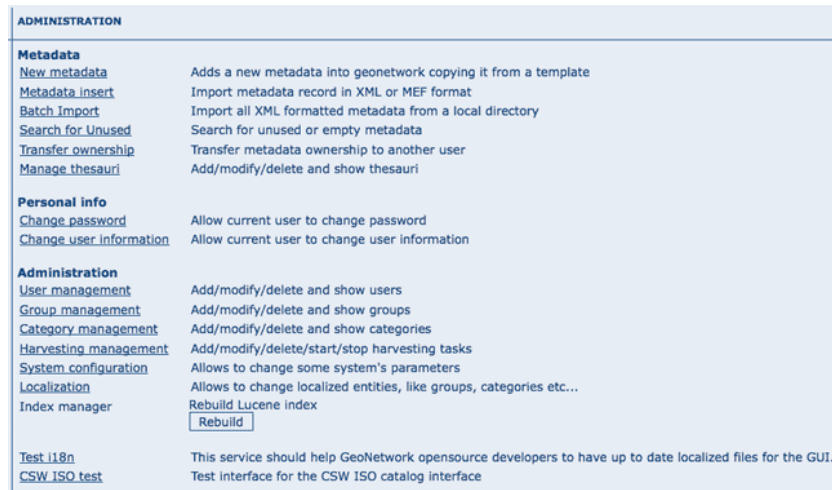
Figure 4.17. Administration panel

The main part of the page **Import XML Formatted Metadata** that is displayed (Figure 4.18, "XML metadata import tool") is the **Metadata** text area, where the user can paste the XML metadata to import. Below this, there is the **Type** choise, which allows you select the type of record that you are going to create (Metadata, Template and Subtemplate). Then you can apply a stylesheet to convert your metadata input from ArcCatalog8 to ISO1915 or from ISO19115 to ISO19139, if required. Otherwise you can just leave *none* selected. The **Destination schema** list provides you with four options to choose the final standard layout for your metadata (ISO19115, ISO19139, FDGDC and Dublin Core). Finally you should select the **Group** as main group in charge of the metadata and the **Category** that you want to assign to your metadata. By clicking the **Insert** button the metadata is imported into the system; please note that all links to external files, for istance to thumbnails or data for download, have to be removed from the metadata input, to avoid any conflict within the data repository.

Figure 4.18. XML metadata import tool

If your metadata is already in ISO19115 format, the main actions to be performed are the following (Figure 4.19, "XML metadata import 2"):

1. Paste the XML file that contains the metadata information in the **Metadata** text area;

2. Select Metadata as **type** of record that you are going to create

3. Select the metadata schema ISO19139 that will be the final **destination schema**;

4. Select the **validate** check box if you want your metadata to be validated according to the related schema.

5. Select the **group** in charge of the metadata from the drop down list;

6. Select **Maps and Graphics** from the list of categories;

7. Click the **Insert** button and the metadata will be imported into the system.

Figure 4.19. XML metadata import 2

5. Métadonnées dans la gestion des données

5.1 Qu'est ce que les métadonnées ?

Les métadonnées sont généralement définies comme "données sur les données" ou "information sur les données". Les métadonnées sont une liste structurée d'information qui décrivent les données ou les services (incluant les données numériques ou non) stockés dans les systèmes d'information. Les métadonnées peuvent contenir une brève description sur le contenu, les objectifs, la qualité et la localisation de la donnée ainsi que les informations relatives à sa création.

5.2 Quels sont les standards sur les métadonnées ?

Pour les gestionnaires de données, les standards sur les métadonnées décrivent le format d'échange et le contenu pour décrire leurs données ou services. Ceci permet aux utilisateurs d'évaluer la pertinence des données par rapport à leurs besoins.

Les standards fournissent un ensemble commun de descripteurs et leur définition.

5.3 Pourquoi avons nous besoin de standards ?

L'utilisation de standards permet aux utilisateurs d'avoir une terminologie commune permettant la réalisation de recherche efficace pour la découverte des données dans les catalogues. Les métadonnées reposant sur les standards permettent d'avoir un même niveau d'information et d'éviter la perte de connaissance sur les données.

5.4 Les standards pour les métadonnées géographiques

Les données géographiques sont souvent produites par des organisations ou des indépendants et peuvent répondre aux besoins de différents types d'utilisateurs (opérateurs SIG, analyse d'image, politiques, ...). Une documentation adéquate sur les données aide à mieux définir la pertinence de ces informations pour la production, l'utilisation et la mise à jour.

Les standards de métadonnées supportés par GeoNetwork opensource sont l'**ISO 19115:2003** - approuvé par l'ISO en avril 2003 comme l'outil pour définir les métadonnées dans le domaine de l'information géographique - et le **FGDC** - le standard de métadonnée adopté par les Etats-Unis / Federal Geographic Data Committee. En complément, GeoNetwork supporte également le standard international **Dublin Core** pour la description d'autres types de ressource.

L'ISO définit en détail comment décrire les ressources dans le domaine de l'information géographique tel que les données ou les services. Ce standard précise les descripteurs obligatoires et conditionels. Il s'applique aux séries de données, aux données, aux objets géographiques ainsi qu'à leurs propriétés. Bien que l'ISO 19115:2003 ai été conçu pour les données numériques, ces principes peuvent être étendus à d'autres type de ressources tel que les cartes, graphiques, documents ou données non géographiques.

Le format d'échange de l'ISO19115:2003 est XML. GeoNetwork utilise `ISO Technical Specification 19139 Geographic information - Metadata - XML schema implementation` pour l'encodage XML de l'ISO19115.

5.5 Profile de métadonnées

GeoNetwork supporte plusieurs profiles de métadonnées. Les profiles peuvent prendre la forme de modèle ou `Templates` qu'il est possible de créer via l'éditeur. En utilisant la vue avancée de l'éditeur, potentiellement l'ensemble des éléments sont accessibles à l'utilisateur.

Le support d'extensions ou de profil spécifique peut également être mis en place par des développeurs connaissant les langages XML/XSL.

5.6 Transition entre les standards de métadonnée

Avec le standard ISO19115:2003 actuellement le principale standard utilisé, il est nécessaire de disposer d'outil de migration.

Pour cela, GeoNetwork permet d'importer et d'exporter différents formats. Il est également simple pour un administrateur d'ajouter de nouvelles transformations dans son catalogue via l'utilisation de transformation XSLT.

6. Installing the software

6.1 New version - New funtionalities

The new GeoNetwork opensource comes with substantial upgrades of different components for a more intuitive and responsive user-system interaction. Web 2.0 technologies have been adopted, in particular AJAX techniques, to allow for more interactive and faster services in the web interface and for the integration of the existing web map viewer in the home page. Similar functionalities have been implemented in the administrative part of the system, to provide an easier access to the configuration pages related to site settings, catalogue harvesting, scheduling and maintenance.

The search interface has been completely overhauled to provide highly interactive searching capabilities. Furthermore, the new version of GNos embeds GeoServer as map server. Users can now not only overlay OGC web map services available on the web, but also create their own map services for other users to browse without having to download additional plugins. Maps created with web map services can be now saved as PDF and sent to others.

The metadata catalogue handles the latest ISO19115:2003 geographic metadata format based on the ISO19139:2007 schemas, as well as the older ISO19115 final draft format, FGDC and Dublin Core. The metadata editor is able to handle the majority of these complex standards, providing default, advanced and XML editing online tools.

The new version has a number of different harvesting interfaces allowing users to connect their own server to many other catalogues around the world. This is the result of the implementation of the open source reference for the web catalog services according to OGC specifications. Harvesting in the new version is fully compatible with GeoNetwork 2.0 and higher nodes.

We have added avanced online and offline administration funcionalities to configure, backup and migrate the application. We have also added a convenient import and export format "MEF" or `Metadata Exchange Format`, that allows the users to move metadata, previews and even data in a convenient single file. GNos can be easily expanded with plugins to export/import metadata to/from other software supporting MEF.

Figure 6.1. Standard home page of GeoNetwork opensource

6.2 Where do I get the installer?

You can find the software on the Internet at the GeoNetwork opensource Community website[1]. The software is also distributed through the SourceForge.net Website at http://sourceforge.net/projects/ geonetwork.

Use the platform independent installer (.jar) if you need anything more than a plain Windows installation.

6.3 System requirements

GeoNetwork can run either on **MS Windows**, **Linux** or **Mac OS X**.

Some general system requirements for the software to run without problems are listed below:

Processor: 1 GHz or higher

Memory (RAM): 512 MB or higher

Disk Space: 30 MB minimum. However, it is suggested to have a minimum of 250 MB of free disk space. Additional space is required depending on the amount of spatial data that you expect to upload into the internal geodatabse.

Other Software requirements: A Java Runtime Environment (JRE 1.5.0). For server installations, Apache Tomcat and a dedicated JDBC compliant DBMS (MySQL, Postgresql, Oracle) can be used instead of Jetty and McKoiDB respectively.

Additional Software

The software listed here is not required to run GeoNetwork, but can be used for custom installations.

1. MySQL DBMS v5.5+ (All)[2]

2. Postgresql DBMS v7+ (All)[2]

3. Apache Tomcat v5.5+ (All)[2]

4. Druid v3.8 (All)[2] to inspect the database

Supported browsers

GeoNetwork should work normally with the following browsers:

1. Firefox v1.5+ (All)[2]

2. Internet Explorer v6+ (Windows)

3. Safari v3+ (Mac OS X Leopard)[2]

---

[1] http://geonetwork-opensource.org

6.4 How do I install GeoNetwork opensource?

Before running the GeoNetwork installer, make sure that all system requirements are satisfied, and in particular that the Java Runtime Environment version 1.5.0 is set up on your machine.

On Windows

If you use Windows, the following steps will guide you to complete the installation (other FOSS will follow):

1. Double click on **geonetwork-install-2.2.0.exe** to start the GeoNetwok opensource desktop installer

2. Follow the instructions on screen (Figure 6.2, "Installer"). You can choose to install sample data, install the embedded map server (based on GeoServer[3] and the CSW 2.0.1 test client. Developers may be interested in installing the source code and installer building tools. Full source code can be found in the GeoNetwork SubVersion code repository.

3. After completion of the installation process, a 'GeoNetwork desktop' menu will be added to your Windows Start menu under 'Programs'

4. Click Start > Programs > GeoNetwork desktop > Start server to start the Geonetwork opensource Web server. The first time you do this, the system will require about 1 minute to complete startup.

5. Click Start > Programs > Geonetwork desktop > Open GeoNetwork opensource to start using GeoNetwork opensource, or connect your Web browser to http://localhost:8080/geonetwork/
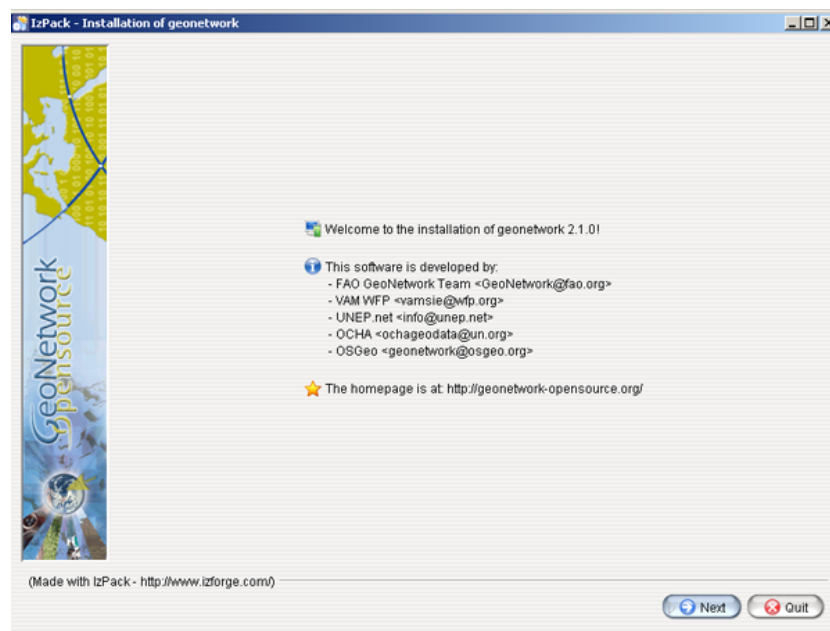
Figure 6.2. Installer
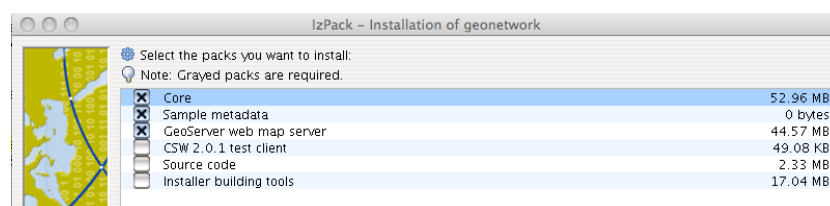
Figure 6.3. Packages to be installed

Installation using the platform independent installer

If you downloaded the platform independent installer (a .jar file), you can in most cases start the installer by simply double clicking on it.

Follow the instructions on screen (see also the section called "On Windows").

At the end of the installation process you can choose to save the installation script (Figure 6.4, "Save the installation script for commandline installations").
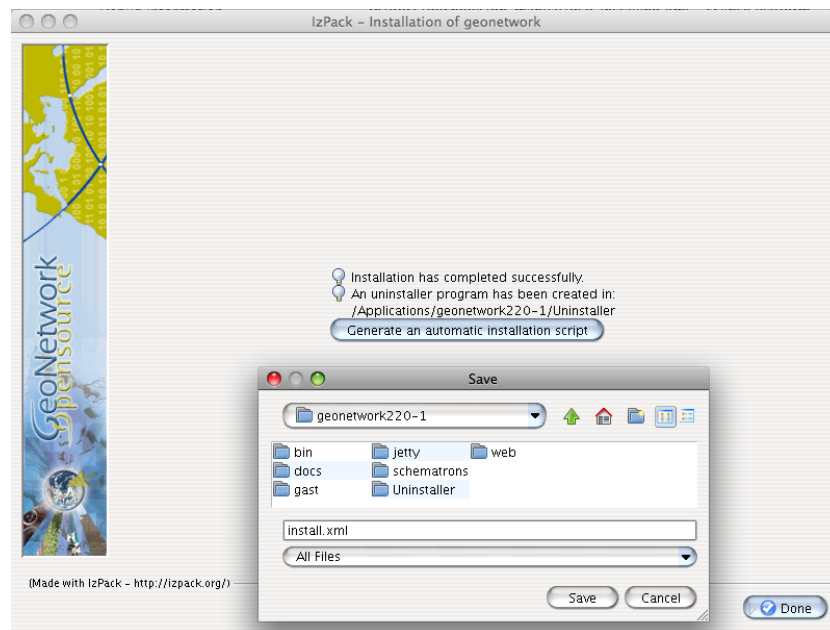
Figure 6.4. Save the installation script for commandline installations

Commandline installation

If you downloaded the platform independent installer (a .jar file), you can perform commandline installations on computers without a graphical interface. You first need to generate an install script (see Figure 6.4, "Save the installation script for commandline installations"). This install script can be edited in a text editor to change some installation parameters.

To run the installation from the commandline, issue the following command in a terminal window and hit enter to start:

```
java -jar geonetwork-install-2.2.0-0.jar install.xml
[ Starting automated installation ]
[ Starting to unpack ]
[ Processing package: Core (1/3) ]
[ Processing package: Sample metadata (2/3) ]
[ Processing package: GeoServer web map server (3/3) ]
[ Unpacking finished ]
[ Writing the uninstaller data ... ]
[ Automated installation done ]
```

You can also run the installation with lots of debug output. To do so run the installer with the flag -DTRACE=true:

```
java -DTRACE=true -jar geonetwork-install-2.2.0-0.jar
```

Part II. Guide des administrateurs

Cette section explique comment configurer et administrer les applications reposant sur GeoNetwork. L'outil est divisé en 2 catégories :

1. Application web : cette interface est accessible directement à partir du web et permet aux utilisateurs de paramètrer la majorité des options de GeoNetwork.

2. Outil GAST : cette application fournie des tâches spécifiques à l'administration du catalogue.

7. Configuration simple

7.1 Configuration du système

La majorité des options de configuration du système GeoNetwork peut être modifiée via l'interface web . Les paramètres ne pouvant pas être modifés via l'application web sont modifiables en utilisant l'outil GAST.

Pour aller à la configuration du système, vous devez tout d'abord vous identifier en tant qu'administrateur. Ouvrir la page d'Administration et choisissez Configuration du système (Figure 7.1, "Liens vers la page d'administration").

Important

Les nouvelles installations de GeoNetwork utilisent `admin` pour le nom d'utilisateur et le mot de passe. Il est important de changer ces informations à partir de la page d'Administration une fois identifié!

Figure 7.1. Liens vers la page d'administration

En cliquant sur le lien vous obtenez la liste des paramètres que vous pouvez modifier (Figure 7.2, "Options de configuration"). Ces paramètres sont décris de la manière suivante :

Figure 7.2. Options de configuration

Au bas de la page, les boutons permettent de réaliser les principales actions :

1. Retour : Retourner à la page d'administration principale.

2. Sauver : Sauver les options en cours. Le système valide les principales options, une boîte de dialogue apparaît en cas d'erreur et indique l'option erronée.

3. Rafraîchir : Rappel les options (cette option peut être utile lorsqu'un autre utilisateur à modifier les options).

Utilisation des options hôte public et port

Ces paramètres sont utilisés dans les cas suivant :

1. Au cours d'une session d'édition, lors de l'ajout d'un lien dans une métadonnée : Le Nom d'hôte et le port seront utilisés pour construire l'URL pour le téléchargement des informations.

2. Au cours de requêtes CSW : Le document retourné par l'opération GetCapabilities est un document XML contenant des liens HTTP vers le service CSW. Ces liens sont créés dynamiquement en utilisant ces 2 paramètres.

Paramètre général du site.

1. nom : Le nom de l'installation de GeoNetwork. Ce nom sera utilisé pour identifier le noeud dans les opérations tel que le moissonage.

2. organisation : L'organisation à laquelle le noeud appartient. Uniquement informatif.

Serveur.

1. hôte : L'adresse du noeud GeoNetwork. Cette adresse est importante car utilisée pour l'accès au catalogue. L'adresse du noeud ou son adresse IP peut être saisie. Si le noeud est public (ie. accessible sur Internet) vous devez utiliser le nom de domaine du serveur. Si le noeud est placé sur un réseau privé et que vous avez un parfeu ou un serveur web s'occupant des redirections (ie. reverse proxy) dans ce cas vous devez saisir l'adresse du parfeu ou serveur web accessible depuis Internet.

2. Port : Le numéro du port (habituellement 80 ou 8080).

Intranet : Un besoin fréquent est de pouvoir distinguer un utilisateur Internet d'un utilisateur Intranet (ie. sur le réseau local). Les privilèges sur les métadonnées peuvent être définis pour ces 2 types d'utilisateurs. Pour cela, les paramètres suivants doivent être renseignés.

1. réseau : L'adresse IP du réseau.

2. masque de sous réseau.

Connection distante (CSW, Z39.50)

Configuration du service CSW

Lors de l'utilisation du service CSW, les clients demandent une description du service. Cette description est accessible via le document GetCapabilities transmis par le service. La configuration du service CSW permet la définition des propriétés suivantes :

1. *Activer* permet d'activer ou pas le service. Si inactif, les autres catalogues ne peuvent se connecter au catalogue via CSW.

2. *Contact* permet de définir le contact pour le service. Ce contact est un utilisateur définit dans les utilisateurs du catalogue.

3. *Titre* permet de décrire le service.

4. *Abstract* correspond au résumé. Il peut indiquer la couverture géographique et thématique du catalogue.

5. *Fees*

6. *Access constraints* / Contrainte d'accès

La description du service contient également des mots clés. Ces mots-clés sont automatiquement définis par le catalogue à partir des mots clés les plus fréquent dans le catalogue.

Serveur Z39.50

Serveur Z39.50 : GeoNetwork peut être un serveur Z39.50. Activez cette option en cochant la case.

1. Cochez cette option pour activer le module. Attention, vous devez redémarrer GeoNetwork pour activer cette fonction.

2. port : Cette option définie le port sur lequel GeoNetwork écoute les requêtes Z39.50. En général, la valeur est 2100. Celle-ci est la plus commune pour le serveur Z39.50. Cependant, si vous souhaitez déployer plusieurs noeuds GeoNetwork, vous devez utiliser des ports différents afin d'éviter les conflits de ports. Par ailleurs, dans le cas où le noeud est localisé derrière un proxy, il est nécessaire de le configurer afin de router les requêtes.

Configuration du proxy

1. host : Le nom ou l'adresse IP du proxy.

2. port : Le port à utiliser.

Notification email

Alerte par email : GeoNetwork peut envoyer des messages à l'administrateur du noeud sur certains événements tel que le téléchargement des données ou l'utilisation du formulaire Contact. Pour cela, vous devez configurer GeoNetwork.

1. email : L'adresse email à laquelle les alertes sont envoyées.

2. serveur SMTP : Le serveur SMTP devant être utilisé.

3. port SMTP : Le port SMTP devant être utilisé (en général 25).

Métadonnées supprimées

Définir le répertoire utilisé pour stocker les métadonnées supprimées.

Authentification LDAP

Propriété de la connection à un serveur LDAP.

8. User and Group Administration

GeoNetwork uses the concept of Users, Groups and User Profiles. A User can be part of several Groups. A User also has a User Profile[1]. The combination of User Profile and Group defines what tasks the User can perform on the system or on specific metadata records.

8.1 Creating new user Groups

The administrator can create new groups of users. User groups can correspond to logical units within an organization. For example groups for Fisheries, Agriculture, Land and Water, Health etcetera.

To create new groups you should be logged on with an account that has administrative privileges. To log in, simply go to the homepage and enter your username and password in the top right corner fields, then click on the login button (Figure 8.1, "Login form").

Important

New installations of GeoNetwork use `admin` for both username and password. It is important to change this from the Administration page once you logged on!

Figure 8.1. Login form

- Select the `Administration` button in the menu. On the Administration page, select `Group management` (Figure 8.2, "Administration page").

Figure 8.2. Administration page

1. Select **Add a new group**[2];

---

[1]A User can only have one User Profile associated.

Figure 8.3. Group management

2. Fill out the details. The email address will be used to send feedback on data downloads when they occur for resources that are part of the Group.

Figure 8.4. Group edit form

3. Click on **Save**

Important

The `Name` should *NOT* contain spaces! You can use the localization functions to provide localised names for groups.

Access privileges can be set per metadata record. You can define privileges on a per Group basis. Privileges that can be set relate to visibility of the Metadata (*Publish*), data Download, Interactive Map access and display of the record in the Featured section of the home page. Notify defines what groups are notified when a file managed by GeoNetwork is downloaded.

Below is an example of the privileges management table related to a dataset (Figure 8.5, "Privilege settings").
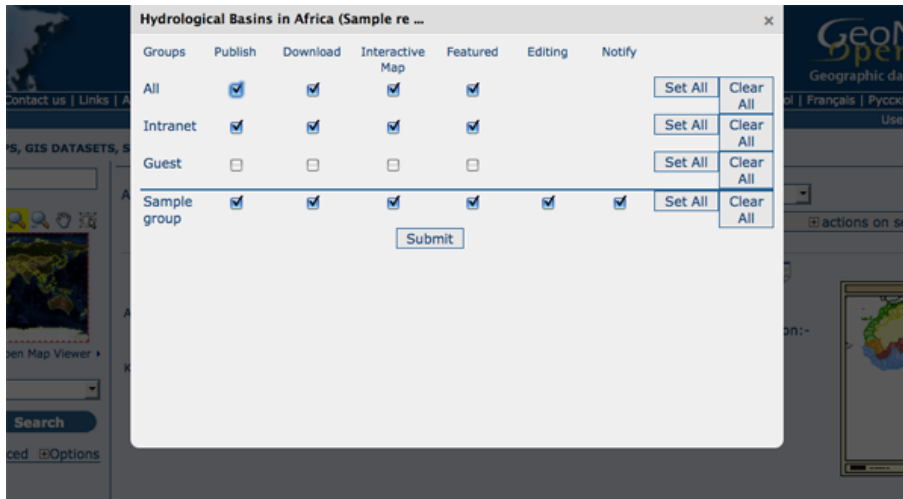
Figure 8.5. Privilege settings

8.2 Creating new Users

To add a new user to the GeoNetwork system you do the following:

1. Select **User Management** from the Administration link in the toolbar (Figure 8.2, "Administration page");

2. Click the button **Add a new user** (Figure 8.6, "User administration form");

Figure 8.6. User administration form

3. Provide the **information** required for the new user (Figure 8.7, "User information form");

Figure 8.7. User information form

4. Assign the correct **profile** (Section 8.3, "User Profiles");

5. Assign the user to a **group**;

6. Click on **Save**.

8.3 User Profiles

Users can have different profiles depending on their role in the GeoNetwork system. A profile defines what tasks the user can perform.

User profiles are hierarchical and based on inheritance. This means that a user with an Editor profile can create and modify new metadata records, but can also use all functions a Registered user can use.

Rights associated with the profiles are illustrated in detail in the list below:

1. Administrator Profile

   The Administrator has special privileges that give access to all available functions. These include:

   • Full rights for creating new groups and new users

   • Rights to change users/groups' profiles

   • Full rights for creating/editing/deleting new/old metadata

   • Perform system administration and configuration tasks.

2. User Administrator Profile

   The User Administrator is the administrator of his/her own group with the following privileges:

   • Full rights on creating new users within the own group

   • Rights to change users profiles within the own group

- Full rights on creating/editing/ deleting new/old data within the own group

3. Content Reviewer Profile

   The content reviewer is the only person allowed to give final clearance on the metadata publication on the Intranet and/or on the Internet:

   - Rights on reviewing metadata content within the own group and authorizing its publication

4. Editor Profile

   The editor works on metadata with following privileges:

   - Full rights on creating/editing/ deleting new/old data within the own group

5. Registered User Profile

   The Registred User has more access privileges than unlogged users:

   - Right to download protected data

9. Import facilities

9.1 Batch import

The batch import facility allows you to import a set of metadata into the system all at once. In order to use this facility, you have to be logged in as an administrator. After the login step, go to the administration page and select the batch import's link (Figure 9.1, " How to reach the batch import page ". The link is surrounded with a red rectangle).
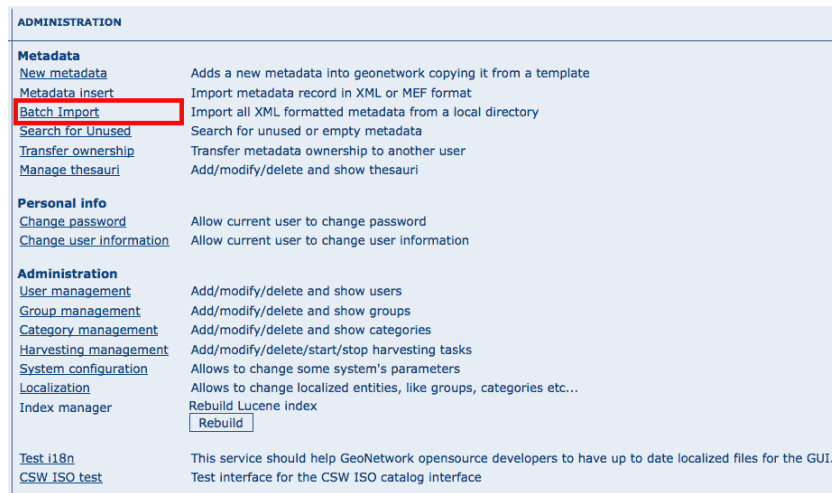
Figure 9.1. How to reach the batch import page

Clicking the link, you will reach the batch import's page as illustrated in Figure 9.2, " The batch import options ". You have to specify a set of parameters to make the import working. They are:

Directory This is the full path on the server's file system of the directory to scan. GeoNetwork will look for and try to import all XML files present into this directory. It is important to notice that this is the directory on the *server* machine and *not* on the client of the user that is doing the import. All metadata files present into the import directory *must* have the same schema format. Schema GeoNetwork supports only some metadata formats so you have to specify the schema of the metadata you want to import. If a metadata does not belong to the selected schema, the entire operation will be aborted. Validate This is a simple validation step that you can choose to perform. The metadata is validated against its schema. Group You have to select a group to associate to the imported metadata. Usually the group is the creator of the metadata set. Category You can specify one category to associate to your metadata in order to simplify the search. Stylesheet This is a powerfull option because allows you to specify a stylesheet for an XSL transformation. The drop down control is filled with files taken from the web/xsl/conversion/import folder : all XSL files you put there will be made available. This is a dymanic process so you don't have to restart GeoNetwork. The purpose of this option is to allow the conversion of a metadata into a suitable format that is supported by GeoNetwork. Therefore, it is important that the result of the transformation matches the schema format selected above.

Below the page, there are the following buttons:

Back Goes back to the administration form. Upload Starts the import process. When the process ends, the total count of imported metadata will be shown. Please notice that the import is transactional: the metadata set will be fully imported or fully discarded (there are no partial imports). Files that starts with '.' or that do not end with '.xml' are ignored.

Figure 9.2. The batch import options

Structured import

An hidden feature of the batch import is the possibility to specify some import parameters in more detail. This feature is triggered when the specified folder contains the import-config.xml file. When this happen, this file is read and the standard import switches to the structured one.

The import-config.xml file has a config root element with the following children:

1. categoryMapping [1] : this element specifies the mapping of directories to categories.

   a. mapping [0..n] : This element can appear 0 or more times and maps one directory name to a category name. It must have a dir attribute that indicates the directory and a to attribute that indicates the category name.

   b. default [1] : This element specifies a default mapping of categories for all directories that do not match the other mapping elements. It must have only the to attribute.

2. schemaMapping [1] : this element specifies the mapping of directories to metadata schemas.

   a. mapping [0..n] : This element can appear 0 or more times and maps one directory to the schema name that must be used when importing. The provided schema must match the one used by the metadata contained into the specified directory, which must all have the same schema. It must have a dir attribute that indicates the directory and a to attribute that indicates the schema name.

   b. default [1] : default behaviour to use when all other mapping elements do not match. It must have only the to attribute.

Here is an example of the `import-config.xml` file:

```
<config>
    <categoryMapping>
        <mapping dir="1" to="maps" />
        <mapping dir="3" to="datasets" />
        <mapping dir="6" to="interactiveResources" />
        <mapping dir="30" to="photo" />
        <default to="maps" />
    </categoryMapping>
    <schemaMapping>
        <mapping dir="3" to="fgdc-std" />
        <default to="dublin-core" />
    </schemaMapping>
```

```
</config>
```

The import procedure starts by scanning the provided directory. This can contain, beside the import-config.xml file, only subdirectories which name will be ignored but used only as a container. Inside each directory, there is another level made only by directories that represent a metadata grouping for categories. Each directory name will be used as the dir attribute in the mapping scheme previously described.

10. Moissonnage

10.1 Introduction

Depuis le début du projet en 2000, le besoin de partage des métadonnées entre différents noeuds était présent. En général, chaque noeud se focalise sur une région d'intérêt, il est donc nécessaire de pouvoir réaliser des recherches sur ces différents catalogues. Ce mécanisme est appelé recherche décentralisée et utilise le réseau Internet. Dans notre cas, cette recherche distribuée peut être complexe à réaliser dans le cas ou de nombreuses données et imagettes doivent être échangées. De plus, GeoNetwork est fréquemment utilisé dans des régions (tel que l'Afrique, l'Asie) où la connectivité peut être limité rendant les recherches décentralisées impossible ou du moins délicates.

Le moissonnage et un mécanisme permettant de collecter des métadonnées sur un catalogue distant et de les stocker sur le noeud local pour un accès plus rapide. Cette action de moissonnage est une action périodique, par exemple, une fois par semaine. Le moissonnage n'est pas un import simple : les métadonnées locale et celle du catalogue distant sont synchronisées. En effet, un catalogue GeoNetwork est capable de découvrir quelles sont les métadonnées ayant été ajoutée, supprimée ou mise à jour dans le noeud distant.

GeoNetwork peut moissoner les ressources suivantes (pour plus de détail, voir plus bas):

1. Un noeud GeoNetwork (version 2.1 ou plus).

2. Un noeud GeoNetwork 2.0.

3. Un serveur WebDAV.

4. Un catalogue supportant CSW 2.0.1 or 2.0.2.

5. Un serveur OAI-PMH.

6. Un service OGC en utilisant le document GetCapabilities. Incluant les services WMS, WFS, WPS et WCS.

10.2 Présentation du mécanisme

Le moissonnage repose sur le concept *d'identifiant unique (uuid)*. Cet identifiant est en effet particulier car il n'est pas seulement unique au sein du catalogue mais dans le monde entier. Celui-ci est une combinaison entre l'adresse MAC, la date et l'heure ainsi qu'un nombre aléatoire. Chaque fois que vous créz des métadonnées dans GeoNetwork, un nouvel uuid est généré puis assigné à la métadonnée.

Un autre concept important derrière la notion de moissonnage est la *date de dernière mise à jour*. Chaque fois que vous modifiez une métadonnée, la date est mise à jour. En comparant cette information, il est possible de savoir si la métadonnée a été mise à jour.

Ces deux concepts permettent à GeoNetwork de récupérer les métadonnées distantes, vérifier leur mise à jour et les supprimer si elles ont été supprimées. Par ailleurs, grâce aux identifiants uniques, une hiérarchie de noeuds peut être moissonée où un noeud B moissone un noeud C C et un noeud A moissonne B. Des boucles peuvent être créées car les métadonnées moissonnées ne peuvent pas être modifiées.

10.3 Cycle de vie du moissonnage

Lors de la configuration d'un noeud, il n'y a pas de métadonnées. Pendant la première itération , toutes les métadonnées qui correspondent au paramétrage sont récupérées et stockées localement. Ensuite, seulement les changements sont retournés. Les métadonnées moissonées ne sont pas éditable :

1. Le moissonnage est périodique donc les changements sur le noeud local seraient perdus.

2. La date de mise à jour est utilisée pour garder trace des changements, à chaque édition elle est mise à jour en dehors du site originel, le mécanisme de moissonnage serait compromi.

Au delà des métadonnées, ceci implique que l'utilisateur ne peut pas changer les autres propriétés (eg catégories, privilèges etc...).

Le moissonnage fonctionne jusqu'à rencontrer un des cas suivantes :

1. Un administrateur arrête le noeud.

2. Une exception.

Lorsqu'un noeud est supprimé, toutes les métadonnées associées sont également supprimées.

10.4 Moissonnages multiples et hiérarchie

Les catalogues fournissant des identifiants uniques (par exemple un noeud GeoNetwork et un serveur CSW) peuvent être moissoné plusieurs fois sans craindre les doublons.

Ce mécanisme permet aux différents types de moissonnage de GeoNetwork de réaliser des moissonnages avec des hiérarchies complexes de noeuds. De cette façon, un métadonnée peut être moissonée à partir de différents noeuds. Par exemple, dans les cas suivants :

1. Noeud (A) créé la métadonnée (a)

2. Noeud (B) moissone (a) depuis (A)

3. Noeud (C) moissone (a) depuis (B)

4. Noeud (D) moissone depuis (A), (B) et (C)

Dans ce scénario, le noeud (D) aura la même métadonnée (a) à partir des 3 noeuds (A), (B), (C). La métadonnée va remonter dans le noeud (D) en suivant 3 voies différentes mais les uuid permettent de stocker une seule copie. Lorsque la métadonnée (a) change au sein du noeud (A), une nouvelle version remonte au noeud (D) mais, en utilisant la date de mise à jour, la copie dans le noeud (D) sera mise à jour avec la version la plus récente.

10.5 Autres remarques

Principes

1. Le moteur de moissonnage ne stocke pas les métadonnées.

2. Un changement des paramètres du moissonnage (par exemple les privilèges et catégories) sera pris en compte au prochain moissonnage.

Moissonnage de catalogue GeoNetwork

1. Au cours du moissonnage, les icônes sont moissonées et les copies locales mises à jour. Les icônes sont également propagées aux autres noeuds.

2. L'identifiant unique des métadonnées est récupéré dans le fichier info.xml du format MEF. Tout uuid stocké dans les métadonnées est remplacé par celui-ci.

Moissonnage de répertoire WebDAV

1. La même métadonnée peut être moissonée plusieurs fois sur différents noeuds. Cependant, ce n'est pas une bonne pratique car chaque copie auront un uuid différent et le système se rempliera de la même copie de métadonnées.

Moissonnage de service CSW

1. Si le champ dct:modified est absent de la réponse GetRecords la métadonnées sera toujours moissonée.

2. Toute exception ayant lieu lors de l'opération getRecordById est annulée et la métadonnée passée.

Moissonnage de serveur OAI-PMH

1. L'identifiant du serveur distant doit être un uuid. Dans le cas contraire, la métadonnée peut être moissonée mais des problèmes peuvent se produire dans le cas de hiérarchie.

2. Au cours du moissonnage, GeoNetwork essaye de détecter automatiquement le schéma de chaque métadonnée. Si le schéma est inconnu, la métadonnée n'est pas importée.

Moissonnage de service OGC

1. Chaque fois que le moissonnage fonctionne, GeoNetwork supprime les informations moissonées auparavant et en crée de nouvelles. GeoNetwork génère les identifiants pour toutes les métadonnées (aussi bien pour les services que les données). Cependant, pour les données, si la métadonnée est créée en utilisant document XML distant si un attribut MetadataUrl est présent dans le document GetCapability), l'identifiant de ce document est conservé.

2. Les imagettes sont générées pour les services WMS uniquement. Le service doit de plus supporter la projection WGS84.

10.6 La page principale

Pour accéder à l'interface de configuration du moissonnage, vous devez vous identifier en tant qu'administrateur. A partir de la page d'administration, cliquer sur le lien Figure 10.1, "Interface de configuration du moissonnage" Gestion du moissonnage.
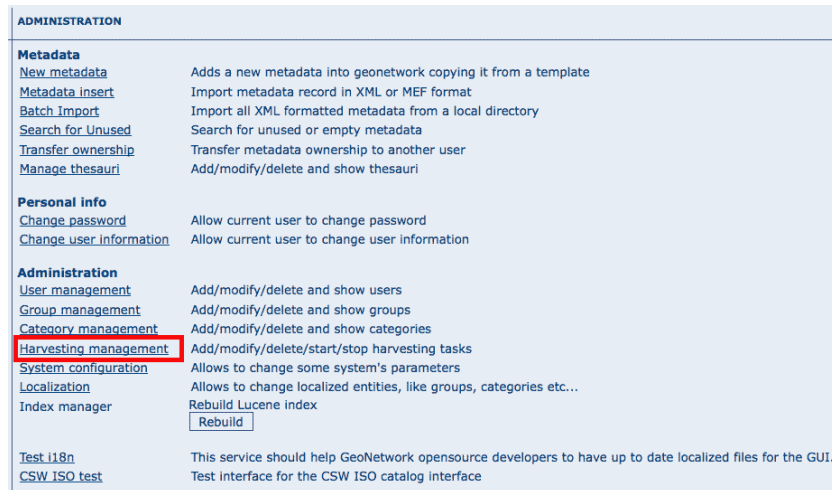
Figure 10.1. Interface de configuration du moissonnage

Figure 10.2, "La page de moissonnage" présente l'interface de configuration du moissonnage. Cette page présente la liste des noeuds moissonés qui ont été créés. Au bas de la page, les buttons permettent de gérer les actions des noeuds. La définition des colonnes est la suivante :

1. *Sélectionner*: Case à cocher pour la sélection d'un noeud. Fonction des actions lancées (Activer, Désactiver, Lancer, ...), le noeud sélectionné sera impacté. Par exemple, si vous sélectionnez 3 noeuds, ceux là seront supprimés.

2. *Nom*: Nom du noeud tel que défini par l'administrateur.

3. *Type*: Type de noeud (GeoNetwork, CSW, WebDav, ...).

4. *Status*: Icône représentant l'état du noeud. Voir Table 10.1, "Icône représentant les différents états" pour les différents status possibles.

5. *Erreur*: Status du dernier moissonnage joué. Les informations sur le moissonnage (nombre de résultats, ajouts, suppression sont disponibles dans l'info bulle de l'icône. Voir See Table 10.2, "Icône pour les erreurs".

6. *Fréquence (j:h:m)*: Fréquence de moissonnage.

7. *Dernière exécution*: Date du dernier moissonnage.

8. *Opération*: Opérations possibles sur le noeud dont l'édition des propriétés.

Figure 10.2. La page de moissonnage

Le bas de la page présente deux rangés de bouttons. La première ligne peuvent réaliser des actions sur un ou plusieurs noeuds. Vous pouvez sélectionner les noeuds en utilisant les case à cocher dans la

première colonne et presser sur le bouton correspondant à l'action souhaitée. Lorsque le bouton termine son action, la case à cocher est désactivée. La deuxième ligne contient des boutons correspondant à des actions générales. Les actions possibles sont les suivantes :

Activer : Lors de la création d'un noeud, son état est *inactif*. L'utilisation de ce bouton le rend *actif* et permet de commencer le moissonnage du noeud distant. Désactiver permet l'arrêt du moissonnage périodique du noeud. Ceci ne signifie pas qu'un moissonnage en cours sera arrêté mais que le noeud sera ignoré lors des moissonnages futurs. Lancer permet de réaliser le moissonnage immédiatement. Ceci permet de tester facilement les paramètres de configuration d'un noeud. Supprimer permet la suppression d'un ou plueiurs noeuds. Un message demande confirmation avant suppression. Retour permet de retourner à la page d'administration. Ajouter permet la création d'un nouveau noeud. Rafraîchir permet de mettre à jour la liste des noeuds et leur état.

Table 10.1. Icône représentant les différents états

Icône	Etat	Description
	Inactif	Le moissonnage est désactivé pour ce noeud.
	Actif	Le moteur de moissonnage attend la prochaine exécution pour ce noeud. Lorsque l'heure est arrivée, le moissonnage est lancé.
	En cours	Le moteur de moissonnage est en cours, récupérant les métadonnées depuis le noeud distant. Lorsque le processus est terminé, l'état revient à actif.

Table 10.2. Icône pour les erreurs

Icônes	Description
	Le moissonnage s'est bien déroulé, pas d'erreur rencontrée. Dans ce cas, une info bulle présente une synthèse du moissonnage (nombre de métadonnées ...).
	Le moissonnage a été annulé suite à une erreur. L'info bulle présente alors l'erreur rencontrée.

Info bulle présentant les résultats du moissonnage

Si le moissonnage s'est déroulé correctement, une info-bulle présente les informations détaillée au sujet du processus. De cette façon il est possible de vérifier que le moissoneur a fonctionné ou s'il y a des paramètres à préciser. L'info bulle est un tableau présentant :

Total est le nombre total de métadonnées trouvées dans le noeud distant. Les métadonnées avec le même identifiant sont considérées comme une seule. Ajouté correspond au nombre de métadonnées ajoutées au système car elle n'était pas présente localement. Supprimé correspond au nombre d'enregistrement supprimés car non présent dans le noeud distant. Mis à jour indique le nombre de métadonnées mises à jour du fait d'un changement de date de dernière mise à jour. Inchangé présente le nombre de métadonnées non modifiées. Schema inconnu indique le nombre de métadonnées non intégrées du fait d'un schéma non reconnu par GeoNetwork. Inrécupérable correspond à des erreurs de transfert d'information lors du moissonnage. Mauvais format correspond à des métadonnées ayant un document XML invalide. Validation correspond aux métadonnées invalides par rapport à leur schéma.

Table 10.3. Types d'information selon le type de moissonnage

Résultat vs Type de moissonnage	GeoNetwork	WebDAV	CSW	OAI-PMH	Service OGC
Total	x	x	x	x	x
Ajouté	x	x	x	x	x
Supprimé	x	x	x	x	x
Mis à jour	x	x	x	x	
Inchangé	x	x	x	x	
Schema inconnu	x	x	x	x	x
Irrécupérable	x	x	x	x	x
Mauvais Format		x		x	
Non valide		x		x	
Imagettes					x
Utilisation de l'attribut MetadataURL					x

10.7 Ajouter de nouveaux noeuds

Le bouton ajouter de la page principale permet l'ajout de nouveaux noeuds. En cliquant sur ce bouton, vous accèdez à la page présentée Figure 10.3, "Ajouter un nouveau noeud". Lors de la création d'un nouveau noeud, vous devez choisir le type de moissonnage du serveur distant. Les protocoles supportés sont les suivants :

1. Geonetwork est le protocole le plus avancé utilisé dans GeoNetwork. Celui-ci permet de se connecter à un noeud distant et de réaliser une recherche utilisant les critères de recherche et importer les métadonnées correspondantes. De plus, ce protocol permet de transférer les privilèges et les catégories des métadonnées moissonées si ils existent localement. Notez que depuis la version 2.1 de GeoNetwork protocole de moissonnage s'est amélioré. Il n'est pas possible de moissoner les anciennes version de GeoNetwork.

2. Web DAV permet d'utiliser les répertoires Web DAV (Distributed Authoring and Versioning) . Il peut être pratique pour des utilisateurs souhaitant publier leurs métadonnées via un serveur web supportant l'interface DAV. Le protocole permet de récupérer le contenu d'une page (la liste des fichiers présent sur le webdav) avec leur date de mise à jour.

3. CSW correspond à *Catalogue Services for the Web* et est une interface de recherche pour les catalogues développé par l'Open Geospatial Consortium. GeoNetwork est compatible avec la version 2.0.1 et 2.0.2 de ce protocole.

4. Ancienne version de GeoNetwork permet de moissoner d'ancien noeud GeoNetwork car depuis la version 2.1 le mécanisme de moissonnage a fortement évolué. Un catalogue en version 2.0 peut toujours moissoner un catalogue en version 2.1 mais un catalogue 2.1 doit utiliser ce protocole pour moissoner un ancien noeud. Ce mécanisme est conservé tant que les versions 2.1 et sup. ne sont pas largement déployée.

5. L'acronyme OAI-PMH correspond à *Open Archive Initiative Protocol for Metadata Harvesting*. C'est un protocole largement utilisé. GeoNetwork est compatible avec la version 2.0 de ce protocole.

La liste déroulante présente la liste des protocoles disponibles. En cliquant sur Ajouter, vous accédez la page d'édition des paramètres qui dépend du type de protocole choisi. Le bouton retour permet de revenir à la page principale.

Figure 10.3. Ajouter un nouveau noeud

Ajouter un noeud GeoNetwork

Ce type de moissonnage permet de se connecter à un catalogue et GeoNetwork et de réaliser des recherches simples. La recherche permet ainsi d'obtenir les métadonnées utiles uniquement. Une fois le noeud ajouté, vous accédez à une page du type Figure 10.4, "Paramètre pour les noeuds de type GeoNetwork". La définition des paramètres est la suivante :

Figure 10.4. Paramètre pour les noeuds de type GeoNetwork

Site permet d'attribuer un nom au noeud moissoné en précisant le nom d'hôte, le port et le nom du servlet (en général geonetwork). Si vous souhaitez accéder à des métadonnées protégées, vous devez spécifier un compte utilisateur. Dans la section recherche, les paramètres présentés correspondent à ceux disponibles dans l'interface de recherche du catalogue. Avant de paramètrer cette information vous devez vous rappeler qu'un catalogue GeoNetwork peut moissoner de manière hierarchique et donc que les catalogues sont susceptibles de contenir à la fois leur métadonnée mais aussi celles moissonées à partir d'autres noeuds. Le bouton obtenir les sources permet d'avoir la liste des noeuds

du catalogue distant. Une fois obtenu, vous pouvez donc restreindre votre recherche à cette source uniquement. Sinon la recherche portera sur l'ensemble des métadonnées (moissonées ou non). Il est possible d'ajouter plusieurs critères de recherche avec le bouton ajouter. Les recherches seront réalisées et les résultats conbinés. Le bouton à la gauche du bloc de critère permet la suppresion de chaque bloc. Si aucun critère n'est défini, la recherche récupérer l'ensemble du catalogue distant. La section Option correspond aux options générales.

La fréquence permet de définir l'interval entre chaque itération du moissonnage. Elle peut être défini entre 1 min et 100 jours maximum. Une seule éxecution permet de faire la recherche une fois et de désactiver le moissonnage ensuite. La section privilèges permet de définir les privilèges selon les groupes. Il est possible de copier des privilèges pour chaque groupe. Le groupe Intranet n'est pas pris en compte car ça n'a pas de sens de copier les privilèges pour ce groupe. Le groupe Internet a des privilèges différents :

1. Copier : copier les privilèges.

2. Copier pour le groupe Intranet : Les privilèges sont copiés mais pour le groupe Intranet. De cette façon les métadonnées ne sont pas publiques.

3. Ne pas copier : Les privilèges ne sont pas copiés et les métadonnées ne seront pas publiques.

Pour les autres groupes :

1. Copier : Les privilèges sont copiés uniquement si un groupe ayant exactement le même nom existe dans le catalogue.

2. Créer et copier : Les privilèges sont copiés. Si le groupe n'existe pas, celui-ci est également créé.

3. Ne pas copier : Les privilèges ne sont pas copiés.

En bas de page le bouton retour permet de revenir à la page de configuration du moissonnage. Le bouton sauver permet de sauver la configuration en cours. Lors de la création d'un noeud, le noeud sera créé lors de cette action de sauvegarde.

Ajouter un noeud de type Web DAV

Dans ce cas, les métadonnées sont récupérées depuis un page web. Les options disponibles se présentent de la manière suivante Figure 10.5, "Ajouter un noeud de type Web DAV" et sont définies par :

Figure 10.5. Ajouter un noeud de type Web DAV

La section site donne les informations de connexion :

Le nom permet d'attribuer un nom au noeud distant L'URL correspond à l'URL du répertoire Web DAV
Pour chaque fichier ayant une extension .xml sera considéré comme une métadonnée et sera importé.
L'icône permet d'assigner une icône aux métadonnées moissonées . Celle-ci sera visible dans les
résultats de recherche. La section compte utilisateur permet de définir les paramétres d'identification
nécessaire à une authorisation basique HTTP. Les options générales sont :

Les paramètres fréquence et une seule éxecution sont présentés dans le type de moissonnage
GeoNetwork. L'option valider permet de valider les métadonnées pendant l'import. Si la validation est
réussie, la métadonnée est importée sinon elle est rejetée. Lorsque le moteur de moissonnage rencontre
un répertoire, il parcourt le répertoire si l'option récursif est sélectionnée. Les privilèges peuvent être
assignés aux différents groupes du catalogue locale. Pour cela, sélectionnez un ou plusieurs groupes,
cliquez sur ajouter puis définissez les privilèges pour chacun. La section catégories permet d'attribuer
une catégorie à l'ensemble des métadonnées récupérées.

En bas de page le bouton retour permet de revenir à la page de configuration du moissonnage. Le bouton sauver permet de sauver la configuration en cours. Lors de la création d'un noeud, le noeud sera créé lors de cette action de sauvegarde.

Ajouter un noeud de type CSW

Ce type permet de se connecter à un catalogue supportant le protocle CSW . Les métadonnées doivent avoir un schéma connu par GeoNetwork. Figure 10.6, "Ajouter un noeud de type CSW" présente les options de configuration :

Figure 10.6. Ajouter un noeud de type CSW

Le site permet de définir les paramètres de connexion de la même manière que pour le type Web DAV . Dans ce cas, l'URL pointe vers le document GetCapabilities du serveur CSW. Ce document permet d'obtenir les adresses pour réaliser les recherches distantes. Ajouter des critères de recherche de la même manière que pour les catalogues de type GeoNetwork en cliquant sur le bouton ajouter. Pour les options générales ou les catégories, reportez-vous à la description dans la section Web DAV.

En bas de page le bouton retour permet de revenir à la page de configuration du moissonnage. Le bouton sauver permet de sauver la configuration en cours. Lors de la création d'un noeud, le noeud sera créé lors de cette action de sauvegarde.

Ajouter un noeud de type OAI-PMH

OAI-PMH est un protocole que GeoNetwork, en tant que client, est capable de moissonner. Si vous demandez un format oai_dc, GeoNetwork le convertira en dublin core. D'autres formats peuvent être moissonés si et seulement si GeoNetwork connait le schéma. Figure 10.7, "Ajouter un noeud de type OAI-PMH" présente les différentes options :

Figure 10.7. Ajouter un noeud de type OAI-PMH

Pour la section site les options sont les mêmes que pour le moissonnage de type web DAV. La seule différence est que l'URL pointe vers le serveur OAI. Cette URL est le point d'entrée pour les commandes PMH que GeoNetwork exécute. La section recherche permet de définir les critères de recherche. Plusieurs recherches peuvent être renseignée. et les résultats combinés. Dans chaque recherche, les paramètres suivants peuvent être définis :

La date de début et de fin correspondant à la date de mise à jour des métadonnées. Pour cela utiliser le calendrier en cliquant sur l'icône pour le faire apparaître. Ce champ est optionel. Utiliser l'icône pour effacer le critère. Jusqu'à fonctionne de la même manière mais ajoute un contraint sur

la date de dernier changement. Les ensembles permettent de classifier les métadonnées dans des groupes hierarchiques. Vous pouvez donc filtrer les métadonnées n'appartenant qu'à un seul ensemble (et ses sous-ensembles). Par défaut, un option vide définie *aucun ensemble*. En cliquant sur obtenir des information vous pouvez obtenir la liste des ensembles ainsi que la liste des préfixes. La notion de préfixe détermine ici le format de métadonnée. Le préfixe oai_dc est obligatoire pour les serveurs OAI-PMH..

Vous pouvez utiliser le bouton ajouter pour ajouter des critères de recherches. Les options, les privilèges et les catégories sont similaires aux autres type de moissonnage.

En bas de page le bouton retour permet de revenir à la page de configuration du moissonnage. Le bouton sauver permet de sauver la configuration en cours. Lors de la création d'un noeud, le noeud sera créé lors de cette action de sauvegarde.

Noter que lors d'un retour à la page édition, les listes sur les *ensembles* et les *préfixes* sont vides. Elles ne contiendront que les entrées précédemment sélectionnées. Vous devez cliquer sur le bouton obtenir les info pour récupérer l'ensemble des valeurs possibles.

Ajouter un noeud de type service OGC (ie. WMS, WFS, WCS, WPS)

Un service OGC implément une opération GetCapabilities que GeoNetwork, en tant que client, peut utiliser pour produire des métadonnées. Le document GetCapabilities fourni des informations sur le service et les données (layers/feature types/coverages/process) diffusées. GeoNetwork converti ces données au format ISO19139/119. Figure 10.8, "Ajouter un noeud de type service OGC (ie. WMS, WFS, WCS, WPS)" présente les différentes options :

Figure 10.8. Ajouter un noeud de type service OGC (ie. WMS, WFS, WCS, WPS)

La section site permet de définir le nom. Le type de service OGC indique au moteur de moissonnage le type de version pour le service. Les types supportés sont WMS (1.0.0 et 1.1.1), WFS (1.0.0 et 1.1.0, WCS (1.0.0) et WPS (0.4.0 et 1.0.0). L'URL du service est l'URL permettant de se connecter au service (sans paramètres tel que "REQUEST=GetCapabilities", "VERSION=", ...). Cette url doit être valide http://your.preferred.ogcservice/type_wms. La langue des métadonnées doit être spécifiée étant donnée qu'aucune information n'est disponible sur ce point dans un document GetCapabilities. Cette

langue sera la langue par défaut des métadonnées. Elle doit correspondre à la langue utilisée par l'administrateur du service OGC. Le topic ISO est ajouté à la métadonnée. Il est recommandé d'en choisir un car ce champ est obligatoire dans le standard ISO si le niveau de hiérarchie est "datasets".

Le type d'import permet de définir si le moissonnage doit produire seulement une fiche de métadonnée pour le service ou si il doit également créer les métadonnées pour chaque donnée disponible au sein du service. Pour chaque jeux de données, la deuxième option permet d'utiliser l'attribut MetadataURL du document GetCapabilities pour générer la métadonnée. Le document référencé dans cet attribut doit être un document XML valide dans un format connu par GeoNetwork. Pour les WMS, les imagettes peuvent être créées automatiquement.

Les icônes et les privilèges sont définis de la même manière que les autres types de moisson.

La métadonnée du service peut être associée à une catégorie (en générale "interactive resources"). Pour chaque données, il est également possible de choisir une catégorie.

11. Metadata ownership

11.1 Introduction

Starting from release 2.1.0, GeoNetwork has a new metadata access policy. The old edit and admin privileges have been removed and the concept of reviewer has been introduced. The purpose of this new profile is to control when a metadata can be published outside or not. In previous releases, all users belonging to a group with edit privileges could edit the same metadata. Now, a metadata is only visible to its creator, to a reviewer which has access to the group owner and to an administrator.

11.2 Access policy

A public metadata is a metadata that has the view privilege for the group named all.

Visualization

An administrator can view any metadata.

A reviewer can view a metadata if:

1. The group owner is one of the groups assigned to the reviewer.

2. He is the metadata owner.

A user administrator or an editor can view:

1. All metadata that have the view privilege in one of the groups visible to them.

2. All metadata created by theirself.

A registered user can view:

1. All metadata that have the view privilege in one of the groups visible to them.

Public metadata can be viewed by any user (logged in or not).

Editing

An administrator can edit any metadata.

A reviewer can edit a metadata if:

1. The group owner is one of the groups assigned to the reviewer.

2. He is the metadata owner.

A user administrator or an editor can edit only metadata created by theirself.

11.3 Privileges

The privileges administration page is accessible only by:

1. All administrators

2. All reviewers that have access to the metadata's group owner.

3. The owner of the metadata

Regarding privileges for the all and intranet groups, only administrators and reviewers can edit them.

11.4 Ownership transfer

A typical need that arises when a user is dismissed is to transfer all their metadata to another user into another group. To fill this need, the transfer ownership functionality has been introduced. This is located in the administration page (Figure 11.1, " How to reach the transfer ownership page ") and once selected, leads to the page shown in Figure 11.2, " The transfer ownership page ".
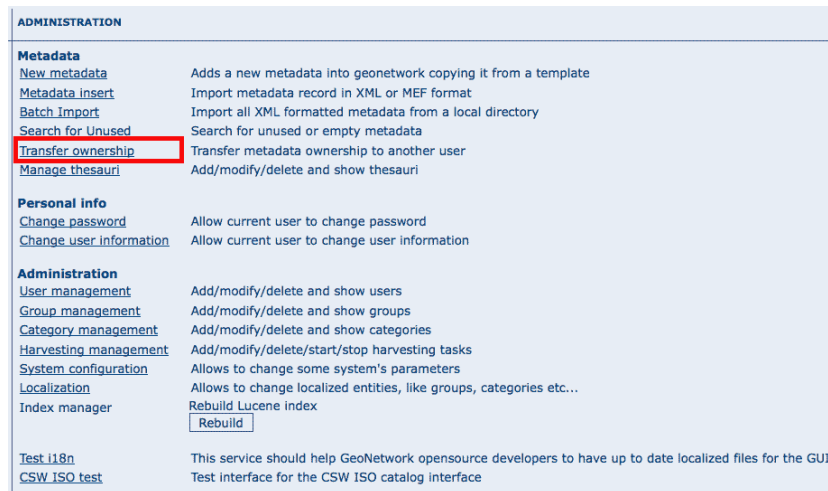
Figure 11.1. How to reach the transfer ownership page

Initially, the page shows only a drop down for a Source editor. The drop down is filled with all GeoNetwork's users which are editors and own some metadata. Selecting an editor means selecting all metadata that belong to that editor. An empty drop down means that there are no editors with metadata associated and hence no transfer is possible.

Note The drop down will be filled with all editors visible to you. If you are not an administrator, you will view only a subset of all editors.

Figure 11.2. The transfer ownership page

Once a source editor has been selected, a set of rows is displayed. Each row refers to an editor's group for which there are privileges. The meaning of each column is the following:

Source group This is a group that has privileges in the metadata that belong to the source editor. Put in another way, if one of the editor's metadata has privileges for one group, that group is listed here. Target group This is the destination group of the transfering process. All privileges relative to the source group are transferred to the target group. The target group drop down is filled with all groups visible to the logged user (tipically an administrator or a user administrator). By default, the source group is selected in the target drop down. Privileges to groups All and Intranet are not transferrable. Target editor

Once a target group is selected, this drop down is filled with all editors that belong to that target group. Operation Actually only the Transfer operation is possible.

By selecting the Transfer operation, if the source group is different than the target group, the system performs the ownership transfer, shows a brief summary and removes the current row because now there are no privileges to transfer anymore.

12. Thesaurus

12.1 Introduction

Thesaurus support in GeoNetwork allows:

- *Metadata editing*: controlled vocabulary on the metadata editing interface for ISO and Dublin Core

- *Administration interface* allows import/export/creation/browse thesaurus

- *Search interface*: a list of keyword is proposed for the keyword criteria

On a node, thesaurus types could be defined as:

- *External*: When a thesaurus is imported, it is flagged to "external" which means that users are not allowed to edit the thesaurus. This thesaurus is managed by an external organisation.

- *Local*: When a thesaurus is created, it is flagged to "local" which means that users are allowed to edit the thesaurus.

12.2 Thesaurus / SKOS format

The Simple Knowledge Organisation Systems (SKOS) `http://www.w3.org/2004/02/skos/` is an area of work developing specifications and standards to support the use of knowledge organisation systems (KOS) such as thesauri, classification schemes. This format is used by GeoNetwork to store thesaurus information.

A concept is defined by an identifier, a prefered label, a definition and links with other concepts. Labels and definitions could be stored in multiple languages (using the xml:lang attributes). Three type of links between concepts have been defined in the SKOS format:

- related terms

- broader terms

- narrower terms

For example, a concept "ABLETTE" could be defined as follow with a label in french and english, linked to broader concept:

```
<skos:Concept rdf:about="http://www.oieau.org/concept#c4fc54576dc00227b82a709287ac3681">
    <skos:prefLabel xml:lang="fr">ABLETTE</skos:prefLabel>
    <skos:prefLabel xml:lang="en">BLEAK</skos:prefLabel>
    <skos:broader rdf:resource="http://www.oieau.org/concept#9f25ece36d04776e09492c66627cccb9"/>
</skos:Concept>
```

GeoNetwork support multilingual thesaurus (e.g. Agrovoc). Search and edition are made based on current user interface language (i.e. if the interface is in english, when editing metadata, GeoNetwork will only search for concept in english).

12.3 Thesaurus administration

To reach the thesaurus administration page you have to be logged in as an administrator. From the administration page, click the link "Manage thesaurii". Figure 5.3 shows the list of thesaurus available

---

in the GeoNetwork node. The page shows a list of thesaurus that have been created or imported. The upper part of the page allows user to edit/add/modify/consult thesaurus. The lower part allows upload of thesaurus in SKOS format.

Creation of a new thesaurus

To create a new thesaurus, click the "+" sign in the category you want your thesaurus to be in. Once created, the thesaurus could be updated through the edit interface. The meaning of each column is as follows:

Type The type allows to classify thesaurus according to its type. First, is defined the type of the thesaurus following ISO category list, then the type indicates if the thesaurus is a local one or an external one. Name This is the thesaurus's name provided by the administrator on creation or filename on upload. When creating a thesaurus, the name of the thesaurus will be the filename of the thesaurus.

Figure 12.1. Administration interface for thesaurus

For each thesaurus the following buttons are available:

Download Link to the rdf file. Delete Remove thesaurus from the current node. View If type is external, the view button allows to search and view concepts. Edit If type is local, the edit button allows to search, add, remove and view concepts.

Import existing thesaurus

GeoNetwork allows thesaurus import in SKOS format. Once uploaded, an external thesaurus could not be updated. Select the category, browse for the thesaurus file and click upload. The file is located in `/web/xml/codelist/external/thesauri/category/`.
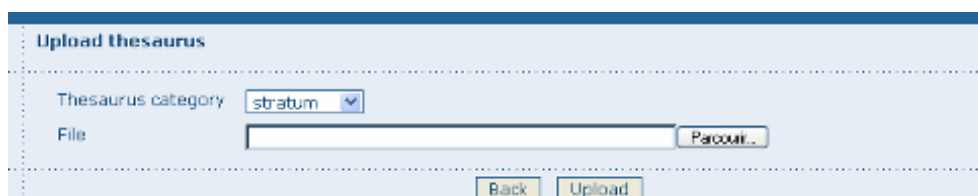
Figure 12.2. Upload interface for thesaurus

At the bottom of the page there are the following buttons:

Back Go back to the main administration page. Upload Upload the selected rdf file to the node. Then it will list all thesaurus available on the node.

12.4 Editing/browsing thesaurus: add/remove/browse keywords

From the thesaurus administration interface, click on the edit button for a local thesaurus or the view button for an external thesaurus. This interface allows:

• keywords search

• add/remove keywords for local thesaurus.

Use the textbox and the type of search in order to search for keywords.

Figure 12.3. Browse interface for thesaurus
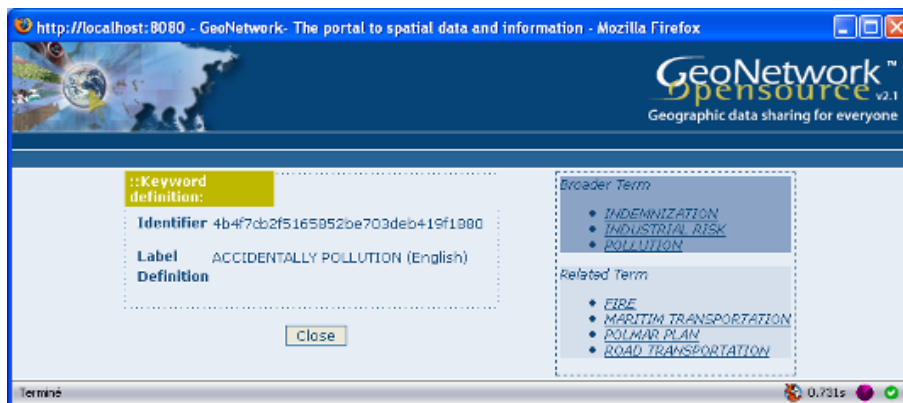
Figure 12.4. Keyword description

12.5 Metadata editing: adding keywords

When editing metadata in ISO or Dublin core, the keyword fields autocomplete when editor fill the fields. Keywords available in all thesaurus know by the current node are returned. Editor could select one of the list or could type any other keywords.
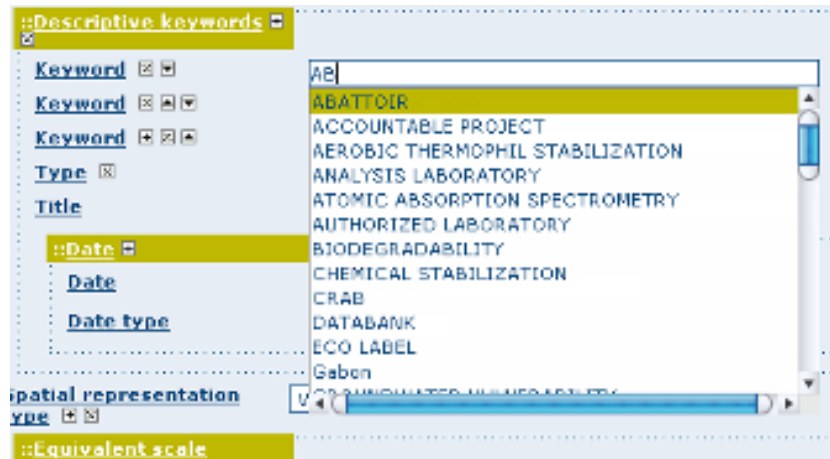
Figure 12.5. Autocomplete in keywords editor

12.6 Search criteria: keywords

In the advanced search interface, the keyword field will proposed all keywords used in the metadata. These keywords are indexed by Lucene on creation/update of metadata. The number of metadata linked to all keywords available in the index are display. User could type in the keyword field or click the icon to get the list of keywords available.
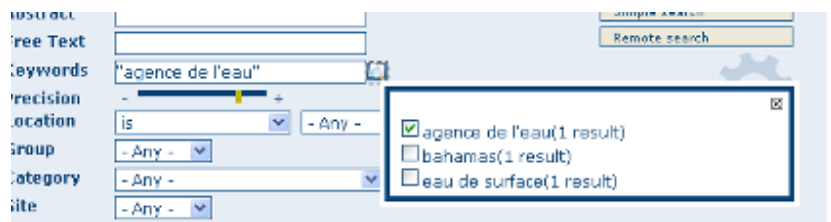
Figure 12.6. Thesaurus search interface
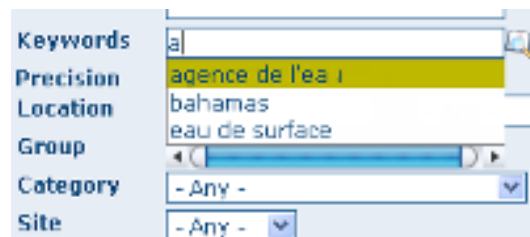
Figure 12.7. Autocomplete function in thesaurus search interface

13. GeoNetwork's Administrator Survival Tool - GAST

13.1 What is GAST?

GAST stands for `GeoNetwork's Administrator Survival Tool` and is a standalone application whose purpose is to simplify some low level tasks like change of the servlet, configuration of the JDBC account, setup the database and so on. Most of the GAST's facilities work only for the GeoNetwork's installation where GAST is in. This implies that if you are using a servlet container other than Jetty (like Tomcat) you will not be able to change some options (like the servlet's name). Other facilities work for any servlet container but you have to specify the GeoNetwork's URL into the GAST's configuration dialog.

13.2 Starting GAST

GAST belongs to the core components so it is installed by default.

On Windows computers, simply select the `Start GAST` option under the GeoNetwork opensource program group under `Start > Programs > GeoNetwork opensource`

Other options to start GAST are either to use a java command **from a terminal window** or just click its jar's icon. To issue the java command you have to:

1. change directory to the GeoNetwork installation folder

2. issue the command `java -jar gast/gast.jar`

GAST will be in current system language if any translation is available. If you want to force GAST GUI language, you could start GAST using the -Duser.language option (e.g. ./gast.sh -Duser.language=fr).

You can also try to simply open the GeoNetwork installation folder, go to the gast folder and doubleclick on the gast.jar file. If you have Java installed, GAST should start in a few seconds.

To run, GAST requires Java 1.5. It will not work on Java 1.4 and it should run on Java 1.6 (this has not been tested!).

13.3 Operating modes

When you start GAST, you get an application window like the one in Figure 13.1, " GAST's main window with a tool selected ". On the left side you have a panel with the tools you can use. After selecting a tool, on the right side you get the tool's options panel.
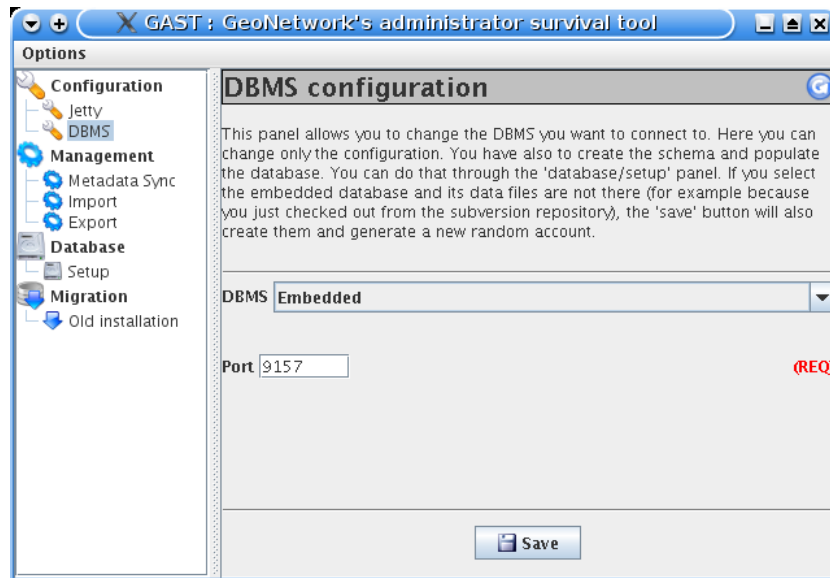
Figure 13.1. GAST's main window with a tool selected

Every function has an operating mode, which defines the condition under which the tool can be used. The tool's mode is shown with an icon on the right side of the tool's name. The operating modes, with their icons are summarized in the following table:

Mode	Icon	Description
Restarted		The tool can be always used, but GeoNetwork must be restarted in order to make the change effective.
Running		The tool can be used only if GeoNetwork is running.
Stopped		The tool can be used only if GeoNetwork is stopped. This is important because some tools change the database's account or create the database from scratch. These are sensitive operations that cannot be performed while GeoNetwork is running.

13.4 Tools subdivision

All GAST tools present into the left panel are logically subdivided into groups. Each group represents a GeoNetwork's aspect for which GAST allows you a graphic interface. The groups are:

Configuration You can change some configuration parameters, like the servlet's name, JDBC account etc... Management General purpose tools related to the site's administration. Database Operations that regard the database. Here you can find tools to create a database from scratch, creating the schema and filling it with proper data. Migration Tools that allow you to migrate metadata from old installation.

13.5 Server and Account configuration dialog

Some of the GAST's tools access a running GeoNetwork application. Usually, GAST connects to GeoNetwork using the connection parameters it finds on the installation folder but you can specify other parameters in order to connect to other instances. This is required when the GeoNetwork instance is not

running on the embedded Jetty server. In addition to that, some tools require authentication so account parameters must be provided.

To provide these parameters, you have to use the GAST 's configuration dialog. To open the dialog, select `Options >> Config` from the menubar. You will get the dialog shown in Figure 13.2, " The configuration dialog ".
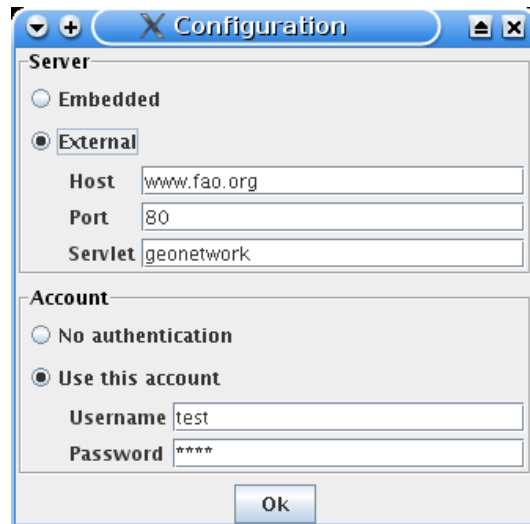
Figure 13.2. The configuration dialog

The dialog is subdivided into 2 areas: Server Tells GAST how to connect to a running GeoNetwork. If you select the embedded option, GAST will get the connection parameters from the installation directory. Alternatively, if you use Tomcat or an external servlet container you have to choose the external option and provide the connection parameters yourself. Remember that this will work only for tools which operating mode is *Running*. For all the others, GAST will access the parameters from the installation directory. Account Some tools require authentication. To authenticate, simply select the Use this account option and provide the username and password of a valid account. These parameters will work for both the embedded instance and for any external instance.

14. Localization

14.1 Localization of dynamic user interface elements

The user interface of GeoNetwork can be localized into several languages through XML language files. But beside static text, there is also more dynamic text that can be added and changed interactively. This text is stored in the database and is translated using the localization form that is part of the administrative functions (Figure 14.1, "How to open the localization form").
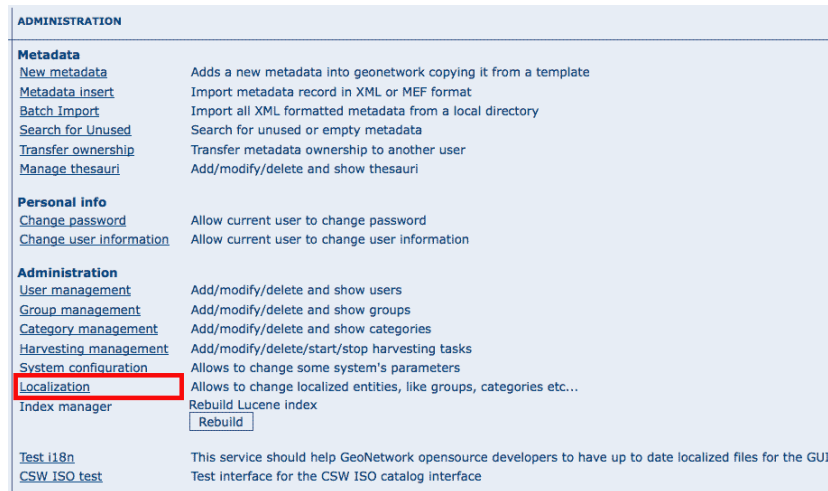
Figure 14.1. How to open the localization form

The form allows you to localize the following entities: *Groups*, *Categories*, *Operations* and *Regions*. The form (Figure 14.2, "The localization form") subdivided in a left and a right panel.

The left panel allows you to choose which elements you want to edit. On the top, a dropdown let you choose which entity to edit. All elements of the selected type are shown in a list.

When you select an element from the list, the right panel will show the text as it will be displayed in the user interface. The text in the source language is read only while you can update the text in the target language field.

> **Note**
>
> You can change the source and target languages to best suit your needs. Some users may for instance prefer to translate from French to Spanish, others prefer to work with English as the source language.

Use the Save button to store the updated label and move to the next element.

> **Important**
>
> If the user changes a label and chooses another target language without saving, the label change is lost.

Figure 14.2. The localization form

15. Import / export tools

15.1 Introduction

Using GAST, you can import and export metadata at will. It allows you to:

1. Create a **backup** of the entire metadata set. Each metadata has its own file, including maps and other data files. Once you have the backup, you can decide to import all or only some of them.

2. **Move your metadata** from one GeoNetwork catalog to another. This can be done to mirror your metadata or to upgrade an old installation. In the last case, you export your metadata from your old installation and then reimport them into the new one.

3. Fill the system with **test data**. Using the 'skip uuid' option, you can reimport the same metadata over and over again. This is usefull, for example, if you want to perform stress tests.

Metadata are exported using the MEF format.

> ## Ownership
>
> Please, consider that the MEF format version 1.0 does not take into account user and group ownership. When exporting metadata, you loose this information. When importing metadata, the new owner becomes the user that is performing the import while the group ownership is set to null.

15.2 Import

This tool is located under Management tools on the left panel and allows you to import a set of metadata that have been previously exported using the export facility (see Section 15.3, "Export"). Selecting the Import tool opens the option panel on the right (Figure 15.1, "The metadata import panel").
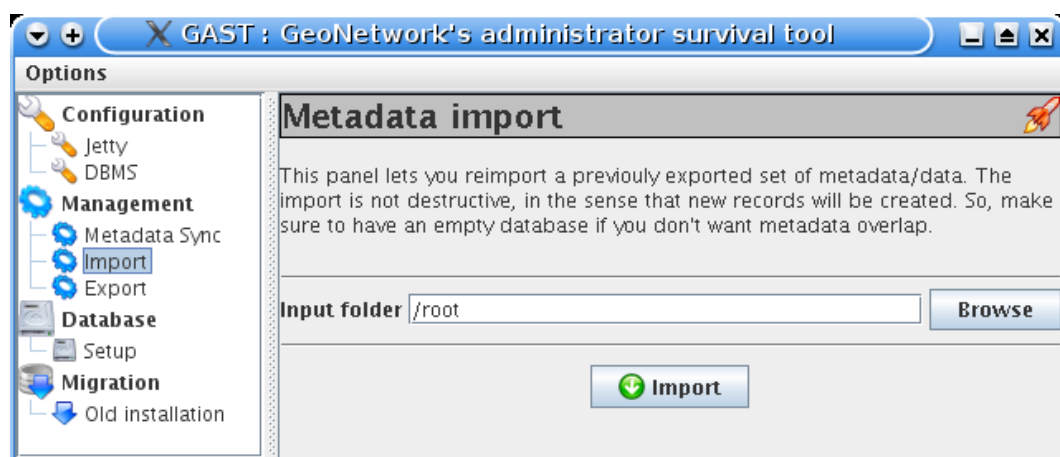
Figure 15.1. The metadata import panel

- **Input folder.** the source folder in your system that GAST will scan to collect metadata to import. GAST will try to import all files with the mef extension.

> ## Note
>
> Subfolders are not scanned.

- **Browse button.** Navigate through your file system to choose an output location or enter it manually into the textfield.

- **Import.** This will start the process. A progress dialog will be opened to show the import status.

15.3 Export

This tool is located under the Management tool on the left panel and allows you to export a set of metadata using the MEF format. Selecting the Export tool opens the option panel on the right (Figure 15.2, "The metadata export panel").
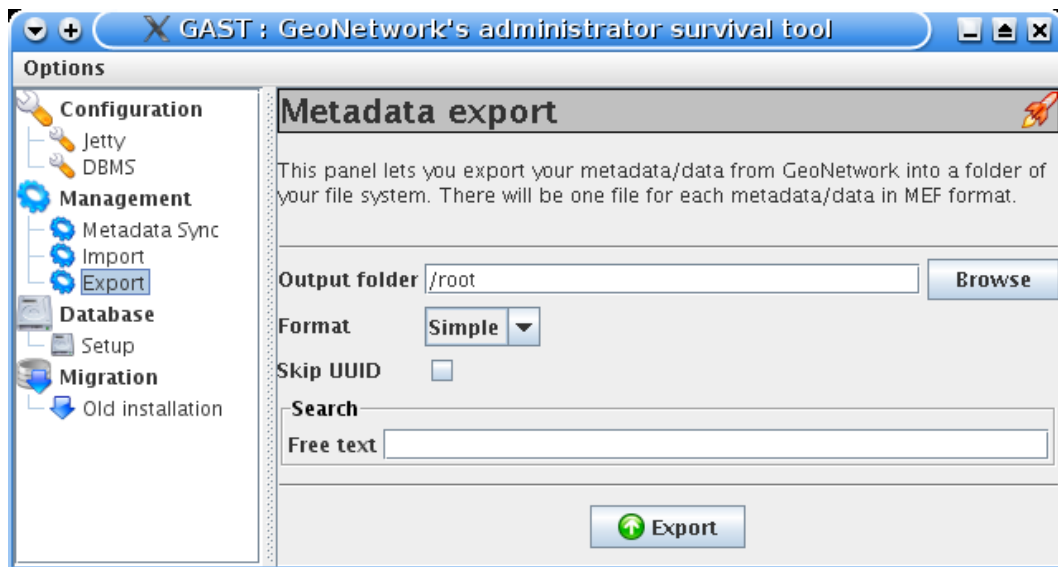
Figure 15.2. The metadata export panel

- **Output folder.** The target folder in your file system where GAST will put the exported metadata. You can either select the Browse button to navigate through your file system to choose a better location or enter it manually in the text field.

- **Format.** Here you can specify the metadata's output format. See the MEF specification for more information.

- **Skip UUID.** Normally this option is not required (see Warning). If you select it, you will loose the metadata's unique identifier (uuid) but you will be able to reimport that metadata over and over again. This is usefull to fill the system with test data.

- **Search.** Allows to specify free text search criteria to limit the set of exported records.

> ### Note
>
> the export result will depend on the metadata visible to the searching user. If you do not authenticate, you will get only public metadata.

- **Export.** This will start the export process. A progress dialog will be opened to show the export status.

> ### Warning
>
> Skipping the UUID on import or export can cause metadata to be duplicated. This should normally always be avoided

Part III. Documentation serveur

Cette section présente la structure interne de GeoNetwork opensource. Les opérations tel que la compilation, les protocoles utilisés, les services XML, les paramètres du catalogue et le lancement de l'application sont décrites.

Si vous êtes un développeur et que vous souhaitez personnaliser ou intégrer les services de GeoNetwork , cette section est pour vous.

16. Software development

16.1 System Requirements

GeoNetwork is a Java application that runs as a servlet so the Java Runtime Environment (JRE) must be installed in order to run it. You can get the JRE from the following address http://java.sun.com and you have to download the Java 5 Standard Edition (SE). GeoNetwork won't run with Java 1.4 and Java 6 has some problems with it so we recommend to use Java 5. Being written in Java, GeoNetwork can run on any platform that supports Java, so it can run on Windows, Linux and Mac OSX. For the latter one, make sure to use version 10.4 (Tiger) or newer. Version 10.3 (Panther) has only Java 1.4 so it cannot run GeoNetwork.

Next, you need a servlet container. GeoNetwork comes with an embedded one (Jetty) which is fast and well suited for most applications. If you need a stronger one, you can install Tomcat from the Apache Software Foundation (http://tomcat.apache.org). It provides load balance, fault tolerance and other corporate needed stuff. If you work for an organization, it is probable that you already have it up and running. The tested version is 5.5 but GeoNetwork should work with all other versions.

Regarding storage, you need a Database Management System (DBMS) like Oracle, MySQL, PostgreSQL and so on. GeoNetwork comes with an embedded one (McKoi) which is used by default during installation. This DBMS can be used for small or desktop installations, where the speed is not an issue. You can use this DBMS for several thousands of metadata. If you manage more than 10.000 metadata it is better to use a professional, stand alone DBMS. In this case, using a separate DBMS also frees up some memory for the application.

GeoNetwork does not require a strong machine to run. A good performance can be obtained even with 128 Mb of RAM. The suggested amount is 512 Mb. For the hard disk space, you have to consider the space required for the application itself (about 40 Mb) and the space required for data maps, which can require 50 Gb or more. A simple disk of 250 Gb should be ok. Maybe you can choose a fast one to reduce backup time but GeoNetwork itself does not speed up on a faster disk. You also need some space for the search index which is located in web/WEB-INF/lucene. Even with a lot of metadata the index is small so usually 10-20 Mb of space is enough.

16.2 Running the software with a servlet engine

The software is run in different ways depending on the servlet container you are using:

Tomcat You can use the manager web application to start/stop GeoNetwork. You can also use the startup.* and shutdown.* scripts located into Tomcat's bin folder (.* means .sh or .bat depending on your OS) but this way you restart all applications you are running, not only GeoNetwork. After installation and before running GeoNetwork you must link it to Tomcat. Jetty If you use the provided container you can use the scripts into GeoNetwork's bin folder. The scripts are start-geonetwork.* and stop-geonetwork.* and you must be inside the bin folder to run them. You can use these scripts just after installation.

16.3 Development

Compiling GeoNetwork

To compile GeoNetwork you first need to install the source code during installation. If you do so, you get a build.xml script and a src folder with the full source.

You also need the Ant tool to run the build script. You can download Ant from http://ant.apache.org. Version 1.6.5 works but any other recent version should be ok. Once installed, you should have the ant command in your path (on Windows systems, you have to open a shell to check).

When all is in place, go inside the GeoNetwork's root folder (the one where the build.xml file is located) and issue the ant command. You should see an output like this one:

```
gemini:/geonetwork/trunk# ant
Buildfile: build.xml
compile:
[delete] Deleting: /geonetwork/trunk/web/WEB-INF/lib/geonetwork.jar
[delete] Deleting: /geonetwork/trunk/csw/lib/csw-client.jar
[delete] Deleting: /geonetwork/trunk/csw/lib/csw-common.jar
[delete] Deleting: /geonetwork/trunk/gast/gast.jar
[mkdir] Created dir: /geonetwork/trunk/.build
[javac] Compiling 267 source files to /geonetwork/trunk/.build
[javac] Note: Some input files use or override a deprecated API.
[javac] Note: Recompile with -Xlint:deprecation for details.
[javac] Note: Some input files use unchecked or unsafe operations.
[javac] Note: Recompile with -Xlint:unchecked for details.
[copy] Copying 1 file to /geonetwork/trunk/.build
[jar] Building jar: /geonetwork/trunk/web/WEB-INF/lib/geonetwork.jar
[jar] Building jar: /geonetwork/trunk/csw/lib/csw-client.jar
[jar] Building jar: /geonetwork/trunk/csw/lib/csw-common.jar
[jar] Building jar: /geonetwork/trunk/gast/gast.jar
[delete] Deleting directory /geonetwork/trunk/.build
BUILD SUCCESSFUL
Total time: 9 seconds
gemini:/geonetwork/trunk#
```

The compilation phase, if it has success, puts all jars into the proper place (most of them will be copied into web/geonetwork/WEB-INF/lib and web/intermap/WEB-INF/lib). After this phase, simply restart GeoNetwork to see the effects.

Source code documentation

The GeoNetwork Java source code is based on Javadoc. Javadoc is a tool for generating API documentation in HTML format from doc comments in source code. To see documentation generated by the Javadoc tool, go to:

- GeoNetwork opensource Javadoc[1]

- InterMap opensource Javadoc[2]

Creating the installer

You can generate an installer by running the `ant` command inside the `installer` directory.

Both platform independent and Windows specific installers are generated by default.

Make sure you update version number and other relevant properties in the `installer/build.xml` file

You can also create an installer that includes a Java Runtime Environment (JRE) for Windows. This will allow GeoNetwork to run on a compatible, embedded JRE and thus avoid error messages caused by JRE incompatibilities on the PC.

Creating an installer with an embedded JRE requires you to first download and unzip the JRE in a folder `jre1.5.0_12` at the project root level. Refer to the `installer-config-win-jre.xml` file for exact configuration.

17. Harvesting

17.1 Structure

The harvesting capability is built around 3 areas: Javascript code, Java code and XSL stylesheets (on both the server and client side).

Javascript code

This refers to the web interface. The code is located in the web/geonetwork/scripts/harvesting folder. Here, there is a subfolder for each harvesting type plus some classes for the main page. These are:

1. harvester.js : This is an abstract class that must be implemented by harvesting types. It defines some information retrieval methods (getType, getLabel, etc...) used to handle the harvesting type, plus one getUpdateRequest method used to build the XML request to insert or update entries.

2. harvester-model.js : Another abstract class that must be implemented by harvesting types. When creating the XML request, the only method substituteCommon takes care of adding common information like privileges and categories taken from the user interface.

3. harvester-view.js : This is an important abstract class that must be implemented by harvesting types. It takes care of many common aspects of the user interface. It provides methods to add group's privileges, to select categories, to check data for validity and to set and get common data from the user interface.

4. harvesting.js : This is the main Javascript file that takes care of everything. It starts all the submodules, loads XML strings from the server and displays the main page that lists all harvesting nodes.

5. model.js : Performs all XML requests to the server, handles errors and decode responses.

6. view.js : Handles all updates and changes on the main page.

7. util.js : just a couple of utility methods.

Java code

The harvesting package is located in src/org/fao/geonet/kernel/harvest. Here too, there is one subfolder for each harvesting type. The most important classes for the implementor are:

1. AbstractHarvester : This is the main class that a new harvesting type must extends. It takes care of all aspects like adding, updating, removing, starting, stopping of harvesting nodes. Some abstract methods must be implemented to properly tune the behaviour of a particular harvesting type.

2. AbstractParams : All harvesting parameters must be enclosed in a class that extends this abstract one. Doing so, all common parameters can be transparently handled by this abstract class.

All others are small utility classes used by harvesting types.

XSL stylesheets

Stylesheets are spread in some foders and are used by both the Javascript code and the server. The main folder is located at web/geonetwork/xsl/harvesting. Here there are some general stylesheets, plus one subfolder for each harvesting type. The general stylesheets are:

1. buttons.xsl : Defines all button present in the main page (*activate*, *deactivate*, *run*, *remove*, *back*, *add*, *refresh*), buttons present in the "add new harvesting" page (*back* and *add*) and at the bottom of the edit page (*back* and *save*).

2. client-error-tip.xsl : This stylesheet is used by the browser to build tooltips when an harvesting error occured. It will show the error class, the message and the stacktrace.

3. client-node-row.xsl : This is also used by the browser to add one row to the list of harvesting nodes in the main page.

4. harvesting.xsl : This is the main stylesheet. It generates the html page of the main page and includes all panels from all the harvesting nodes.

In each subfolder, there are usually 4 files:

1. xxx.xsl : This is the server stylesheets who builds all panels for editing the parameters. XXX is the harvesting type. Usually, it has the following panels: site information, search criteria, options, privileges and categories.

2. client-privil-row.xsl : This is used by the Javascript code to add rows in the group's privileges panel.

3. client-result-tip.xsl : This is used by the Javascript code (which inherits from harvester-view.js) to show the tooltip when the harvesting has been successfull.

4. client-search-row.xsl : Used in some harvesting types to generate the html for the search criteria panel.

As you may have guessed, all client side stylesheets (those used by Javascript code) start with the prefix client-.

Another set of stylesheets are located in web/geonetwork/xsl/xml/harvesting and are used by the xml.harvesting.get service. This service is used by the Javascript code to retrieve all the nodes the system is currently harvesting from. This implies that a stylesheet (one for each harvesting type) must be provided to convert from the internal setting structure to an XML structure suitable to clients.

The last file to take into consideration contains all localized strings and is located at web/geonetwork/loc/XX/xml/harvesting.xml (where XX refers to a language code). This file is used by both Javascript code and the server.

17.2 Data storage

Harvesting nodes are stored inside the Settings table. Further useful information can be found in chapters ?? and ??.

The SourceNames table is used to keep track of the uuid/name couple when metadata get migrated to different sites.

17.3 Guidelines

To add a new harvesting type, follows these steps:

1. Add the proper folder in web/scripts/harvesting, maybe copying an already existing one.

2. Edit the harvesting.js file to include the new type (edit both constructor and init methods).

3. Add the proper folder in web/xsl/harvesting (again, it is easy to copy from an already existing one).

4. Edit the stylesheet web/xsl/harvesting/harvesting.xsl and add the new type

5. Add the transformation stylesheet in web/xsl/xml/harvesting. Its name must match the string used for the harvesting type.

6. Add the Java code in a package inside org.fao.geonet.kernel.harvest.harvester.

7. Add proper strings in web/geonetwork/loc/XX/xml/harvesting.xml.

Here follows a list of general notes to follow when adding a new harvesting type:

1. Every harvesting node (not type) must generate its UUID. This uuid is used to remove metadata when the harvesting node is removed and to check if a metadata (which has another uuid) has been already harvested by another node.

2. If a harvesting type supports multiple searches on a remote site, these must be done sequentially and results merged.

3. Every harvesting type must save in the folder images/logos a GIF image whose name is the node's uuid. This image must be deleted when the harvesting node is removed. This is necessary to propagate harvesting information to other GeoNetwork nodes.

4. When a harvesting node is removed, all collected metadata must be removed too.

5. During harvesting, take in mind that a metadata could have been removed just after being added to the result list. In this case the metadata should be skipped and no exception raised.

6. The only settable privileges are: view, dynamic, featured. It does not make sense to use the others.

7. If a node raises an exception during harvesting, that node will be deactivated.

8. If a metadata already exists (its uuid exists) but belong to another node, it must not be updated even if it has been changed. This way the harvesting will not conflict with the other one. As a side effect, this prevent locally created metadata from being changed.

9. The harvesting engine does not store results on disk so they will get lost when the server will be restarted.

10. When some harvesting parameters are changed, the new harvesting type must use them during the next harvesting without requiring to reboot the server.

18. Metadata Exchange Format v1.1

18.1 Introduction

The metadata exchange format (MEF in short) is a special designed file format whose purpose is to allow metadata exchange between different platforms. A metadata exported into this format can be imported by any platform which is able to understand it. This format has been developed with GeoNetwork in mind so the information it contains is mainly related to it. Nevertheless, it can be used as an interoperability format between any platform.

This format has been designed with these needs in mind:

1. Export a metadata record for backup purposes

2. Import a metadata record from a previous backup

3. Import a metadata record from a different GeoNetwork version to allow a smooth migration from one version to another.

All these operations regard the metadata and its related data as well.

In the paragraphs below, some terms should be intended as follows:

1. the term actor is used to indicate any system (application, service etc...) that operates on metadata.

2. the term reader will be used to indicate any actor that can import metadata from a MEF file.

3. the term writer will be used to indicate any actor that can generate a MEF file.

18.2 File format

A MEF file is simply a ZIP file which contains the following files:

1. metadata.xml : this file contains the metadata itself, in XML format. The text encoding of the metadata is that one specified into the XML declaration.

2. info.xml : this is a special XML file which contains information related to the metadata but that cannot be stored into it. Examples of such information are the creation date, the last change date, privileges on the metadata and so on. Now this information is related to the GeoNetwork's architecture.

3. public : this is a directory used to store the metadata thumbnails and other public files. There are no restrictions on the images' format but it is strongly recommended to use the portable network graphics (PNG), the JPEG or the GIF formats.

4. private : this is a directory used to store all data (maps, shape files etc...) associated to the metadata. Files in this directory are *private* in the sense that an authorization is required to access them. There are no restrictions on the file types that can be stored into this directory.

Any other file or directory present into the MEF file should be ignored by readers that don't recognize them. This allows actors to add custom extensions to the MEF file.

A MEF file can have empty public and private folders depending on the export format, which can be:

1. simple : both public and private are omitted.

2. partial : only public files are provided.

3. full : both public and private files are provided.

It is recommended to use the .mef extension when naming MEF files.

18.3 The info.xml file

This file contains general information about a metadata. It must have an info root element with a mandatory version attribute. This attribute must be in the X.Y form, where X represents the major version and Y the minor one. The purpose of this attribute is to allow future changes of this format maintaining compatibility with older readers. The policy behind the version is this:

1. A change to Y means a minor change. All existing elements in the previous version must be left unchanged: only new elements or attributes may be added. A reader capable of reading version X.Y is also capable of reading version X.Y' with Y'>Y.

2. A change to X means a major change. Usually, a reader of version X.Y is not able to read version X'.Y with X'>X.

The root element must have the following children:

1. general : a container for general information. It must have the following children:

   a. uuid : this is the universally unique identifier assigned to the metadata and must be a valid uuid. This element is optional and, when omitted, the reader should generate one. A metadata without a uuid can be imported several times into the same system without breaking uniqueness constraints. When missing, the reader should also generate the siteId value.

   b. createDate : This date indicates when the metadata was created.

   c. changeDate : This date keeps track of the most recent change to the metadata.

   d. siteId : This is an uuid that identifies the actor that created the metadata and must be a valid uuid. When the uuid element is missing, this element should be missing too. If present, it will be ignored.

   e. siteName : This is a human readable name for the actor that created the metadata. It must be present only if the siteId is present.

   f. schema : Indicates the metadata's schema. The value can be assigned as will but if the schema is one of those describe below, that value must be used:

      i. dublin-core : A metadata in the dublin core format as described in http://dublincore.org

      ii. fgdc-std : A metadata in the Federal Geographic Data Committee.

      iii. iso19115 : A metadata in the ISO 19115 format

      iv. iso19139 : A metadata in the ISO 19115/2003 format for which the ISO19139 is the XML encoding.

   g. format : Indicates the MEF export format. The element's value must belong to the following set: { *simple, partial, full* }.

   h. localId : This is an optional element. If present, indicates the id used locally by the sourceId actor to store the metadata. Its purpose is just to allow the reuse of the same local id when reimporting a metadata.

i. isTemplate : A boolean field that indicates if this metadata is a template used to create new ones. There is no real distinction between a real metadata and a template but some actors use it to allow fast metadata creation. The value must be: { *true*, *false* }.

j. rating : This is an optional element. If present, indicates the users' rating of the metadata ranging from 1 (a bad rating) to 5 (an excellent rating). The special value 0 means that the metadata has not been rated yet. Can be used to sort search results.

k. popularity : Another optional value. If present, indicates the popularity of the metadata. The value must be positive and high values mean high popularity. The criteria used to set the popularity is left to the writer. Its main purpose is to provide a metadata ordering during a search.

2. categories : a container for categories associated to this metadata. A category is just a name, like 'audio-video' that classifies the metadata to allow an easy search. Each category is specified by a category element which must have a name attribute. This attribute is used to store the category's name. If there are no categories, the categories element will be empty.

3. privileges : a container for privileges associated to this metadata. Privileges are operations that a group (which represents a set of users) can do on a metadata and are specified by a set of group elements. Each one of these, has a mandatory name attribute to store the group's name and a set of operation elements used to store the operations allowed on the metadata. Each operation element must have a name attribute which value must belong to the following set: { *view*, *download*, *notify*, *dynamic*, *featured* }. If there are no groups or the actor does not have the concept of group, the privileges element will be empty. A group element without any operation element must be ignored by readers.

4. public : All metadata thumbnails (and any other public file) must be listed here. This container contains a file element for each file. Mandatory attributes of this element are name, which represents the file's name and changeDate, which contains the date of the latest change to the file. The public element is optional but, if present, must contain all the files present in the metadata's public directory and any reader that imports these files must set the latest change date on these using the provided ones. The purpose of this element is to provide more information in the case the MEF format is used for metadata harvesting.

5. private : This element has the same purpose and structure of the public element but is related to maps and all other private files.

Any other element or attribute should be ignored by readers that don't understand them. This allows actors to add custom attributes or subtrees to the XML.

Figure 18.1, "Example of info file" shows an example of info file.

Date format

Unless differently specified, all dates in this file must be in the ISO/8601 format. The pattern must be YYYY-MM-DDTHH:mm:SS and the timezone should be the local one.

```
<info version="1.0">
    <general>
        <uuid>0619abc0-708b-eeda-8202-000d98959033</uuid>
        <createDate>2006-12-11T10:33:21</createDate>
        <changeDate>2006-12-14T08:44:43</changeDate>
        <siteId>0619cc50-708b-11da-8202-000d9335906e</siteId>
        <siteName>FAO main site</siteName>
        <schema>iso19139</schema>
        <format>full</format>
        <localId>204</localId>
        <isTemplate>false</isTemplate>
    </general>
    <categories>
        <category name="maps"/>
        <category name="datasets"/>
    </categories>
    <privileges>
        <group name="editors">
            <operation name="view"/>
            <operation name="download"/>
        </group>
    </privileges>
    <public>
        <file name="small.png" changeDate="2006-10-07T13:44:32"/>
        <file name="large.png" changeDate="2006-11-11T09:33:21"/>
    </public>
    <private>
        <file name="map.zip" changeDate="2006-11-12T13:23:01"/>
    </private>
</info>
```

Figure 18.1. Example of info file

19. XML Services

19.1 Calling specifications

Calling XML services

GeoNetwork provides access to several internal structures through the use of XML services. These are much like HTML addresses but return XML instead. As an example, consider the xml.info service: you can use this service to get some system's information without fancy styles and graphics. In GeoNetwork, XML services have usually the xml. prefix in their address.

Request

Each service accepts a set of parameters, which must be embedded into the request. A service can be called using different HTTP methods, depending on the structure of its request:

GET The parameters are sent using the URL address. On the server side, these parameters are grouped into a flat XML document with one root and several simple children. A service can be called this way only if the parameters it accepts are not structured. Figure 19.1, "A GET request to a XML service and its request encoding" shows an example of such request and the parameters encoded in XML. POST There are 3 variants of this method:

ENCODED The request has one of the following content types: `application/x-www-form-urlencoded` or `multipart/form-data`. The first case is very common when sending web forms while the second one is used to send binary data (usually files) to the server. In these cases, the parameters are not structured so the rules of the GET method applies. Even if the second case could be used to send XML documents, this possibility is not considered on the server side. XML The content type is `application/xml`. This is the common case when the client is not a browser but a specialized client. The request is a pure XML document in string form, encoded using the encoding specified into the prologue of the XML document. Using this form, any type of request can be made (structured or not) so any service can be called. SOAP The content type is `application/soap+xml`. SOAP is a simple protocol used to access objects and services using XML. Clients that use this protocol can embed XML requests into a SOAP structure. On the server side, GeoNetwork will remove the SOAP structure and feed the content to the service. Its response will be embedded again into a SOAP structure and sent back to the caller. It makes sense to use this protocol if it is the only protocol understood by the client.

```
<request>
    <hitsPerPage>10</hitsPerPage>
    <any />
</request>
```

Figure 19.1. A GET request to a XML service and its request encoding

Response

The response of an XML service always has a content type of `application/xml` (the only exception are those services which return binary data). The document encoding is the one specified into the document's prologue. Anyway, all GeoNetwork services return documents in the UTF-8 encoding.

On a GET request, the client can force a SOAP response adding the `application/soap+xml` content type to the Accept header parameter.

Exception handling

A response document having an error root element means that the XML service raised an exception. This can happen under several conditions: bad parameters, internal errors et cetera. In this cases the returned XML document has the following structure:

- error: This is the root element of the document. It has a mandatory id attribute that represents an identifier of the error from a common set. See Table 19.1, "Summary of error ids" for a list of all id values.

  - message: A message related to the error. It can be a short description about the error type or it can contain some other information that completes the id code.

  - class: The Java class of the raised error (name without package information).

  - stack: The server's stacktrace up to the point that generated the exception. It contains several at children, one for each nested level. Useful for debugging purposes.

    - at: Information about a nested level of called code. It has the following mandatory attributes:

      class Java class of the called method. method Java called method. line Line, inside the called method's source code where there the method call of the next nested level. file Source file where the class is defined.

  - object: An optional container for parameters or other values that caused the exception. In case a parameter is an XML object, this container will contain that object in XML form.

  - request: A container for some useful information that can be needed to debug the service.

    - language: Language used when the service was called.

    - service: Name of the called service.

Table 19.1. Summary of error ids

id	Meaning of message element	Meaning of object element
error	General message, human readable	
bad-format	Reason	-
bad-parameter	Name of the parameter	Parameter's bad value
file-not-found	-	File's name
file-upload-too-big	-	-
missing-parameter	Name of the parameter	XML container where the parameter should have been present.
object-not-found	-	Object's name
operation-aborted	Reason of abort	If present, the object that caused the abort
operation-not-allowed	-	-
resource-not-found	-	Resource's name
service-not-allowed	-	Service's name
service-not-found	-	Service's name
user-login	User login failed message	User's name
user-not-found	-	User's id or name
metadata-not-found	The requested metadata was not found	Metadata's id

Figure 19.2, "An example of generated exception" shows an example of exception generated by the mef.export service. The service complains about a missing parameter, as you can see from the content of the id attribute. The object element contains the xml request with an unknown test paremeter while the mandatory uuid parameter (as specified by the message element) is missing.

```
<error>
    <message>uuid</message>
    <class>MissingParameterEx</class>
    <stack>
        <at class="jeeves.utils.Util" file="Util.java" line="66"
            method="getParam"/>
        <at class="org.fao.geonet.services.mef.Export" file="Export.java"
            line="60" method="exec"/>
        <at class="jeeves.server.dispatchers.ServiceInfo" file="ServiceInfo.java"
            line="226" method="execService"/>
        <at class="jeeves.server.dispatchers.ServiceInfo" file="ServiceInfo.java"
            line="129" method="execServices"/>
        <at class="jeeves.server.dispatchers.ServiceManager" file="ServiceManager.java"
            line="370" method="dispatch"/>
    </stack>
    <object>
        <request>
            <asd>ee</asd>
        </request>
    </object>
    <request>
        <language>en</language>
        <service>mef.export</service>
    </request>
</error>
```

Figure 19.2. An example of generated exception

19.2 General services

xml.info

The xml.info service can be used to query the site about its configuration, services, status and so on. For example, it is used by the harvesting web interface to retrieve information about a remote node.

Request

The xml request should contain at least one type element to indicates the kind of information to retrieve. More type elements can be specified to obtain more information at once. The set of allowed values are:

site Returns general information about the site like its name, id, etc... categories Returns all site's categories groups Returns all site's groups visible to the requesting user. If the user does not authenticate theirselves, only the intranet and the all groups are visible. operations Returns all possible operations on metadata regions Returns all geographical regions usable for queries sources Returns all geonetwork sources that the remote site knows. The result will contain:

• The remote node's name and siteId

• All source uuids and names that have been discovered through harvesting.

• All source uuids and names of metadata that have been imported into the remote node through the MEF format.

• Administrators can see all users into the system (normal, other administrators, etc...)

• User administrators can see all users they can administrate and all other user administrators in the same group set. The group set is defined by all groups visible to the user administration, beside the All and the intranet groups.

- A logged user can se only theirself.

- A guest cannot see any user.

```
<request>
    <type>site</type>
    <type>groups</type>
</request>
```

Figure 19.3. Request example

Response

Each type element produces an XML subtree so the response to the previous request is like this:

```
<info>
    <site>...</site>
    <categories>...</categories>
    <groups>...</groups>
    ...
</info>
```

Figure 19.4. Response example

Here follows the structure of each subtree:

- site: This is the container

  - name: Human readable site name

  - siteId: Universal unique identifier of the site

  - platform: This is just a container to hold the site's backend

    - name: Plaform name. For GeoNetwork installations it must be geonetwork.

    - version: Platform version, given in the X.Y.Z format

    - subVersion: Additional version notes, like 'alpha-1' or 'beta-2'.

  Example:

```
<site>
    <name>My site</name>
    <organization>FAO</organization>
    <siteId>0619cc50-708b-11da-8202-000d9335906e</siteId>
    <platform>
        <name>geonetwork</name>
        <version>2.2.0</version>
    </platform>
</site>
```

Figure 19.5. Example site information

- categories: This is the container for categories.

  - category [0..n]: A single GeoNetwork's category. This element has an id attribute which represents the local identifier for the category. It can be usefull to a client to link back to this category.

- name: Category's name

- label: The localized labels used to show the category on screen. See Figure 19.6, "Example response for categories".

```
<categories>
    <category id="1">
        <name>datasets</name>
        <label>
            <en>Datasets</en>
            <fr>Jeux de données</fr>
        </label>
    </category>
</categories>
```

Figure 19.6. Example response for categories

- groups: This is the container for groups

  - group [2..n]: This is a Geonetwork group. There are at least the internet and intranet groups. This element has an id attribute which represents the local identifier for the group.

    - name: Group's name

    - description: Group's description

    - referrer: The user responsible for this group

    - email: The email address to notify when a map is downloaded

    - label: The localized labels used to show the group on screen. See Figure 19.7, "Example response for groups".

```
<groups>
    <group id="1">
        <name>editors</name>
        <label>
            <en>Editors</en>
            <fr>Éditeurs</fr>
        </label>
    </group>
</groups>
```

Figure 19.7. Example response for groups

- operations: This is the container for the operations

  - operation [0..n]: This is a possible operation on metadata. This element has an id attribute which represents the local identifier for the operation.

    - name: Short name for the operation.

    - reserved: Can be y or n and is used to distinguish between system reserved and user defined operations.

    - label: The localized labels used to show the operation on screen. See Figure 19.8, "Example response for operations".

```
<operations>
    <operation id="0">
        <name>view</name>
        <label>
            <en>View</en>
            <fr>Voir</fr>
        </label>
    </operation>
</operations>
```

Figure 19.8. Example response for operations

• regions: This is the container for geographical regions

  • region [0..n]: This is a region present into the system. This element has an id attribute which represents the local identifier for the operation.

    • north: North coordinate of the bounding box.

    • south: South coordinate of the bounding box.

    • west: West coordinate of the bounding box.

    • east: east coordinate of the bounding box.

    • label: The localized labels used to show the region on screen. See Figure 19.9, "Example response for regions".

```
<regions>
    <region id="303">
        <north>82.99</north>
        <south>26.92</south>
        <west>-37.32</west>
        <east>39.24</east>
        <label>
            <en>Western Europe</en>
            <fr>Western Europe</fr>
        </label>
    </region>
</regions>
```

Figure 19.9. Example response for regions

• sources: This is the container.

  • source [0..n]: A source known to the remote node.

    • name: Source's name

    • uuid: Source's unique identifier

```
<sources>
    <source>
        <name>My Host</name>
        <uuid>0619cc50-708b-11da-8202-000d9335906e</uuid>
    </source>
</sources>
```

Figure 19.10. Example response for a source

- users: This is the container for user information

  - user [0..n]: A user of the system

    - id: The local identifier of the user

    - username: The login name

    - surname: The user's surname. Used for display purposes.

    - name: The user's name. Used for display purposes.

    - profile: User's profile, like Administrator, Editor, UserAdmin etc...

    - address:

    - state:

    - zip:

    - country:

    - email:

    - organisation:

    - kind:

```
<users>
    <user>
        <id>3</id>
        <username>eddi</username>
        <surname>Smith</surname>
        <name>John</name>
        <profile>Editor</profile>
        <address/>
        <state/>
        <zip/>
        <country/>
        <email/>
        <organisation/>
        <kind>gov</kind>
    </user>
</users>
```

Figure 19.11. Example response for a user

Localized entities

Localized entities have a general label element which contains the localized strings in all supported languages. This element has as many children as the supported languages. Each child has a name that reflect the language code while its content is the localized text. Here is an example of such elements:

```
<label>
    <en>Editors</en>
    <fr>Éditeurs</fr>
    <es>Editores</es>
</label>
```

xml.forward

This is just a router service. It is used by Javascript code to connect to a remote host because a Javascript program cannot access a machine other than its server. For example, it is used by the harvesting web interface to query a remote host and retrieve the list of site ids.

Request

```
<request>
    <site>
        <url>...</url>
        <type>...</type>
        <account>
            <username>...</username>
            <password>...</password>
        </account>
    </site>
    <params>...</params>
</request>
```

Figure 19.12. The service's request

where:

site A container for site information where the request will be forwarded.

url Indicates the remote url to connect to. Usually points to a GeoNetwork's xml service but can point to any XML service. type Its only purpose is to discriminate geonetwork nodes which use a different authentication scheme. The value geonetwork indicates these nodes. Any other value, or if the element is missing, indicate a generic node. account This element is optional. If present, the provided credentials will be used to authenticate to the remote site. params This is just a container for the request that must be executed remotely.

```
<request>
    <site>
        <url>http://mynode.org:8080/geonetwork/srv/en/xml.info</url>
    </site>
    <params>
        <request>
            <type>site<type>
        </request>
    </params>
</request>
```

Figure 19.13. Request for info from a remote server

Please note that this service uses the GeoNetwork's proxy configuration.

Response

The response is just the response from the remote service.

19.3 Harvesting services

Introduction

This chapter provides a detailed explanation of the GeoNetwork's harvesting services. These services allow a complete control over the harvesting behaviour. They are used by the web interface and can be used by any other client.

xml.harvesting.get

Retrieves information about one or all configured harvesting nodes.

Request

Called with no parameters returns all nodes. Example:

```
<request/>
```

Otherwise, an id parameter can be specified:

```
<request>
    <id>123</id>
</request>
```

Response

When called with no parameters the service provide its output inside a nodes container. You get as many node elements as are configured. Figure 19.14, "Example of an xml.harvesting.get response for a geonetwork node" shows an example of output.

```
<nodes>
    <node id="125" type="geonetwork">
        <site>
            <name>test 1</name>
            <uuid>0619cc50-708b-11da-8202-000d9335aaae</uuid>
            <host>localhost</host>
            <port>8080</port>
            <servlet>geonetwork</servlet>
            <account>
                <use>false</use>
                <username />
                <password />
            </account>
        </site>
        <searches>
            <search>
                <freeText />
                <title />
                <abstract />
                <keywords />
                <digital>false</digital>
                <hardcopy>false</hardcopy>
                <source>
                    <uuid>0619cc50-708b-11da-8202-000d9335906e</uuid>
                    <name>Food and Agriculture Organization</name>
                </source>
            </search>
        </searches>
        <options>
            <every>90</every>
            <oneRunOnly>false</oneRunOnly>
            <status>inactive</status>
        </options>
        <info>
            <lastRun />
            <running>false</running>
        </info>
        <groupsCopyPolicy>
            <group name="all" policy="copy"/>
            <group name="mygroup" policy="createAndCopy"/>
        </groupsCopyPolicy>
        <categories>
            <category id="4"/>
        </categories>
    </node>
</nodes>
```

Figure 19.14. Example of an xml.harvesting.get response for a geonetwork node

If you specify an id, you get a response like that one in Figure 19.15, "Example of an xml.harvesting.get response for a WebDAV node" (for a web DAV node).

```
<node id="165" type="webdav">
    <site>
        <name>test 1</name>
        <uuid>0619cc50-708b-11da-8202-000d9335aaae</uuid>
        <url>http://www.mynode.org/metadata</url>
        <icon>default.gif</icon>
        <account>
            <use>true</use>
            <username>admin</username>
            <password>admin</password>
        </account>
    </site>
    <options>
        <every>90</every>
        <oneRunOnly>false</oneRunOnly>
        <recurse>false</recurse>
        <validate>true</validate>
        <status>inactive</status>
    </options>
    <privileges>
        <group id="0">
            <operation name="view" />
        </group>
        <group id="14">
            <operation name="download" />
        </group>
    </privileges>
    <categories>
        <category id="2"/>
    </categories>
    <info>
        <lastRun />
        <running>false</running>
    </info>
</node>
```

Figure 19.15. Example of an xml.harvesting.get response for a WebDAV node

The node's structure has a common XML format, plus some additional information provided by the harvesting types. In the following structure, each element has a cardinality specified using the [x..y] notation, where x and y denote the minimum and the maximum values. The cardinality [1..1] is omitted for clarity.

- node: The root element. It has a mandatory id attribute that represents the internal identifier and a mandatory type attribute which indicates the harvesting type.

  - site: A container for site information.

    - name (*string*): The node's name used to describe the harvesting.

    - uuid (*string*): This is a system generated unique identifier associated to the harvesting node. This is used as the source field into the Metadata table to group all metadata from the remote node.

    - account: A container for account information.

      - use (*boolean*): true means that the harvester will use the provided username and password to authenticate itself. The authentication mechanism depends on the harvesting type.

      - username (*string*): Username on the remote node.

      - password (*string*): Password on the remote node.

- options: A container for generic options.

  - every (*integer*): Harvesting interval in minutes.

  - oneRunOnly (*boolean*): After the first run, the entry's status will be set to inactive.

  - status (*string*): Indicates if the harvesting from this node is stopped (inactive) or if the harvester is waiting for the timeout (active).

- privileges [0..1]: A container for privileges that must be associated to the harvested metadata. This optional element is present only if the harvesting type supports it.

  - group [0..n]: A container for allowed operations associated to this group. It has the id attribute which value is the identifier of a GeoNetwork group.

    - operation [0..n]: Specifies an operation to associate to the containing group. It has a name attribute which value is one of the supported operation names. The only supported operations are: *view*, *dynamic*, *featured*.

- categories [0..1]: This is a container for categories to assign to each imported metadata. This optional element is present if the harvesting type supports it.

  - category (*integer*) [0..n]: Represents a local category and the id attribute is its local identifier.

- info: A container for general information.

  - lastRun (*string*): The lastRun element will be filled as soon as the harvester starts harvesting from this entry. The value is the

  - running (*boolean*): True if the harvester is currently running.

- error: This element will be present if the harvester encounters an error during harvesting.

  - code (*string*): The error code, in string form.

  - message (*string*): The description of the error.

  - object (*string*): The object that caused the error (if any). This element can be present or not depending on the case.

Errors

- ObjectNotFoundEx If the id parameter is provided but the node cannot be found.

xml.harvesting.add

Create a new harvesting node. The node can be of any type supported by GeoNetwork (GeoNetwork node, web folder etc...). When a new node is created, its status is set to inactive. A call to the xml.harvesting.start service is required to start harvesting.

Request

The service requires an XML tree with all information the client wants to add. In the following sections, default values are given in parenthesis (after the parameter's type) and are used when the parameter

is omitted. If no default is provided, the parameter is mandatory. If the type is boolean, only the true and false strings are allowed.

All harvesting nodes share a common XML structure that must be honored. Please, refer to the previous section for elements explanation. Each node type can add extra information to that structure. The common structure is here described:

- node: The root container. The type attribute is mandatory and must be one of the supported harvesting types.

  - site [0..1]

    - name (*string*, ")

    - account [0..1]

      - use (*boolean*, 'false')

      - username (*string*, ")

      - password (*string*, ")

  - options [0..1]

    - every (*integer*, '90')

    - oneRunOnly (*boolean*, 'false')

  - privileges [0..1]: Can be omitted but doing so the harvested metadata will not be visible. Please note that privileges are taken into account only if the harvesting type supports them.

    - group [0..n]: It must have the id attribute which value should be the identifier of a GeoNetwork group. If the id is not a valid group id, all contained operations will be discarded.

      - operation [0..n]: It must have a name attribute which value must be one of the supported operation names.

  - categories [0..1]: Please, note that categories will be assigned to metadata only if the harvesting type supports them.

    - category (*integer*) [0..n]: The mandatory id attribute is the category's local identifier.

Please note that even if clients can store empty values (") for many parameters, before starting the harvesting entry those parameters should be properly set in order to avoid errors.

In the following sections, the XML structures described inherit from this one here so the common elements have been removed for clarity reasons (unless they are containers and contain new children).

Standard GeoNetwork harvesting

To create a node capable of harvesting from another GeoNetwork node, the following XML information should be provided:

- node: The type attribute is mandatory and must be geonetwork.

  - site

- host (*string*, "): The GeoNetwork node's host name or IP address.

- port (*string*, '80'): The port to connect to.

- servlet (*string*, 'geonetwork'). The servlet name choosen in the remote site.

- searches [0..1]: A container for search parameters.

- search [0..n]: A container for a single search on a siteID. You can specify 0 or more searches. If no search element is provided, an unconstrained search is performed.

  - freeText (*string*, ") : Free text to search. This and the following parameters are the same used during normal search using the web interface.

  - title (*string*, "): Search the title field.

  - abstract (*string*, ") : Search the abstract field.

  - keywords (*string*, ") : Search the keywords fields.

  - digital (*boolean*, 'false'): Search for metadata in digital form.

  - hardcopy (*boolean*, 'false'): Search for metadata in printed form.

  - source (*string*, "): One of the sources present on the remote node.

- groupsCopyPolicy [0..1]: Container for copy policies of remote groups. This mechanism is used to retain remote metadata privileges.

  - group: There is one copy policy for each remote group. This element must have 2 mandatory attributes: *name* and *policy*. The name attribute is the remote group's name. If the remote group is renamed, it is not found anymore and the copy policy is skipped. The policy attribute represents the policy itself and can be: *copy*, *createAndCopy*, *copyToIntranet*. copy means that remote privileges are copied locally if there is locally a group with the same name as the *name* attribute. createAndCopy works like *copy* but the group is created locally if it does not exist. copyToIntranet works only for the remote group named all, which represents the public group. This policy copies privileges of the remote group named *all* to the local intranet group. This is usefull to restrict metadata access.

Figure 19.16, "Example of an xml.harvesting.add request for a geonetwork node" shows an example of an XML request to create a GeoNetwork node.

```
<node type="geonetwork">
    <site>
        <name>South Africa</name>
        <host>south.africa.org</host>
        <port>8080</port>
        <servlet>geonetwork</servlet>
        <account>
            <use>true</use>
            <username>admin</username>
            <password>admin</password>
        </account>
    </site>
    <searches>
        <search>
            <freeText />
            <title />
            <abstract />
            <keywords />
            <digital>true</digital>
            <hardcopy>false</hardcopy>
            <source>0619cc50-708b-11da-8202-000d9335906e</source>
        </search>
    </searches>
    <options>
        <every>90</every>
        <oneRunOnly>false</oneRunOnly>
    </options>
    <groupsCopyPolicy>
        <group name="all" policy="copy"/>
        <group name="mygroup" policy="createAndCopy"/>
    </groupsCopyPolicy>
    <categories>
        <category id="4"/>
    </categories>
</node>
```

Figure 19.16. Example of an xml.harvesting.add request for a geonetwork node

WebDAV harvesting

To create a web DAV node, the following XML information should be provided.

• node: The type attribute is mandatory and must be webdav.

  • site

    • url (*string*, ''): The URL to harvest from. If provided, must be a valid URL starting with 'HTTP://'.

    • icon (*string*, 'default.gif') : Icon file used to represent this node in the search results. The icon must be present into the images/harvesting folder.

  • options

    • recurse (*boolean*, 'false'): When true, folders are scanned recursively to find metadata.

    • validate (*boolean*, 'false'): When true, GeoNetwork will validate every metadata against its schema. If the metadata is not valid, it will not be imported.

This type supports both privileges and categories assignment.

Figure 19.17, "Example of an xml.harvesting.add request for a WebDAV node" shows an example of an XML request to create a web DAV entry.

```
<node type="webdav">
    <site>
        <name>Asia remote node</name>
        <url>http://www.mynode.org/metadata</url>
        <icon>default.gif</icon>
        <account>
            <use>true</use>
            <username>admin</username>
            <password>admin</password>
        </account>
    </site>
    <options>
        <every>90</every>
        <oneRunOnly>false</oneRunOnly>
        <recurse>false</recurse>
        <validate>true</validate>
    </options>
    <privileges>
        <group id="0">
            <operation name="view" />
        </group>
        <group id="14">
            <operation name="features" />
        </group>
    </privileges>
    <categories>
        <category id="4"/>
    </categories>
</node>
```

Figure 19.17. Example of an xml.harvesting.add request for a WebDAV node

CSW harvesting

To create a node to harvest from a CSW capable server, the following XML information should be provided:

• node: The type attribute is mandatory and must be csw.

  • site

    • capabilitiesUrl (*string*): URL of the capabilities file that will be used to retrieve the operations address.

    • icon (*string*, 'default.gif') : Icon file used to represent this node in the search results. The icon must be present into the images/harvesting folder.

  • searches [0..1]

    • search [0..n]: Contains search parameters. If this element is missing, an unconstrained search will be performed.

      • freeText (*string*, '') : Search the entire metadata.

      • title (*string*, ''): Search the dc:title queryable.

      • abstract (*string*, ''): Search the dc:abstract queryable.

      • subject (*string*, ''): Search the dc:subject queryable.

This type supports both privileges and categories assignment.

Figure 19.18, "Example of an xml.harvesting.add request for a CSW node" shows an example of an XML request to create a CSW entry.

```
<node type="csw">
    <site>
        <name>Minos CSW server</name>
        <capabilitiesUrl>http://www.minos.org/csw?request=GetCapabilities
            &amp;amp;service=CSW&amp;amp;acceptVersions=2.0.1</capabilitiesUrl>
        <icon>default.gif</icon>
        <account>
            <use>true</use>
            <username>admin</username>
            <password>admin</password>
        </account>
    </site>
    <options>
        <every>90</every>
        <oneRunOnly>false</oneRunOnly>
        <recurse>false</recurse>
        <validate>true</validate>
    </options>
    <privileges>
        <group id="0">
            <operation name="view" />
        </group>
        <group id="14">
            <operation name="features" />
        </group>
    </privileges>
    <categories>
        <category id="4"/>
    </categories>
</node>
```

Figure 19.18. Example of an xml.harvesting.add request for a CSW node

Response

The service's response is the output of the `xml.harvesting.get` service of the newly created node.

Summary

The following table:

Table 19.2. Summary of features of the supported harvesting types

Harvesting type	Authentication	Privileges ?	Categories ?
GeoNetwork	native	through policies	yes
Web DAV	HTTP digest	yes	yes
CSW	HTTP Basic	yes	yes

xml.harvesting.update

This service is responsible for changing the node's parameters. A typical request has a node root element and must include the id attribute:

```
<node id="24">
    ...
```

```
</node>
```

The body of the node element depends on the node's type. The update policy is this:

• If an element is specified, the associated parameter is updated.

• If an element is not specified, the associated parameter will not be changed.

So, you need to specify only the elements you want to change. However, there are some exceptions:

privileges If this element is omitted, privileges will not be changed. If specified, new privileges will replace the old ones. categories Like the previous one. searches Some harvesting types support multiple searches on the same remote note. When supported, the updated behaviour should be like the previous ones.

Note that you cannot change the type of an node once it has been created.

Request

The request is the same as that used to add an entry. Only the id attribute is mandatory.

Response

The response is the same as the xml.harvesting.get called on the updated entry.

xml.harvesting.remove/start/stop/run

These services are put together because they share a common request interface. Their purpose is obviously to remove, start, stop or run a harvesting node. In detail:

start When created, a node is in the inactive state. This operation makes it active, that is the countdown is started and the harvesting will be performed at the timeout. stop Makes a node inactive. Inactive nodes are never harvested. run Just start the harvester now. Used to test the harvesting.

Request

A set of ids to operate on. Example:

```
<request>
    <id>123</id>
    <id>456</id>
    <id>789</id>
</request>
```

If the request is empty, nothing is done.

Response

The same as the request but every id has a status attribute indicating the success or failure of the operation. For example, the response to the previous request could be:

```
<request>
    <id status="ok">123</id>
    <id status="not-found">456</id>
    <id status="inactive">789</id>
</request>
```

Table 19.3, "Summary of status values" summarizes, for each service, the possible status values.

Table 19.3. Summary of status values

Status value	remove	start	stop	run
ok	+	+	+	+
not-found	+	+	+	+
inactive	-	-	-	+
already-inactive	-	-	+	-
already-active	-	+	-	-
already-running	-	-	-	+

19.4 System configuration

Introduction

The GeoNetwork's configuration is made up of a set of parameters that can be changed to accomodate any installation need. These parameters are subdivided into 2 groups:

• parameters that can be easily changed through a web interface.

• parameters not accessible from a web interface and that must be changed when the system is not running.

The first group of parameters can be queried or changed through 2 services: xml.config.get and xml.config.update. The second group of parameters can be changed using the GAST tool.

xml.config.get

This service returns the system configuration's parameters.

Request

No parameters are needed.

Response

The response is an XML tree similar to the system hierarchy into the settings structure. See ?? for more information. The response has the following elements:

• site: A container for site information.

  • name: Site's name.

  • organization: Site's organization name.

• server: A container for server information.

  • host: Name of the host from which the site is reached.

  • port: Port number of the previous host.

• intranet: Information about the intranet of the organization.

  • network: IP address that specifies the network.

- netmask: netmask of the network.

- z3950: Configuration about Z39.50 protocol.

  - enable: true means that the server component is running.

  - port: Port number to use to listen for incoming Z39.50 requests.

- proxy: Proxy configuration

  - use: true means that the proxy is used when connecting to external nodes.

  - host: Proxy's server host.

  - port: Proxy's server port.

  - username: Proxy's credentials.

  - password: Proxy's credentials.

- feedback: A container for feeback information

  - email: Administrator's email address

  - mailServer: Email server to use to send feedback

    - host: Email's host address

    - port: Email's port to use in host address

- removedMetadata: A container for removed metadata information

  - dir: Folder used to store removed metadata in MEF format

- ldap: A container for LDAP parameters

  - use:

  - host:

  - port:

  - defaultProfile:

  - login:

    - userDN:

    - password:

  - distinguishedNames:

    - base:

    - users:

  - userAttribs:

- name:

- password:

- profile:

Figure 19.19, "Example of xml.config.get response" shows an example of `xml.config.get` response.

```xml
<config>
    <site>
        <name>dummy</name>
        <organization>dummy</organization>
    </site>
    <server>
        <host>localhost</host>
        <port>8080</port>
    </server>
    <intranet>
        <network>127.0.0.1</network>
        <netmask>255.255.255.0</netmask>
    </intranet>
    <z3950>
        <enable>true</enable>
        <port>2100</port>
    </z3950>
    <proxy>
        <use>false</use>
        <host/>
        <port/>
        <username>proxyuser</username>
        <password>proxypass</password>
    </proxy>
    <feedback>
        <email/>
        <mailServer>
            <host/>
            <port>25</port>
        </mailServer>
    </feedback>
    <removedMetadata>
        <dir>WEB-INF/removed</dir>
    </removedMetadata>
    <ldap>
        <use>false</use>
        <host />
        <port />
        <defaultProfile>RegisteredUser</defaultProfile>
        <login>
            <userDN>cn=Manager</userDN>
            <password />
        </login>
        <distinguishedNames>
            <base>dc=fao,dc=org</base>
            <users>ou=people</users>
        </distinguishedNames>
        <userAttribs>
            <name>cn</name>
            <password>userPassword</password>
            <profile>profile</profile>
        </userAttribs>
    </ldap>
</config>
```

Figure 19.19. Example of xml.config.get response

xml.config.update

This service is used to update the system's information and so it is restricted to administrators.

Request

The request format must have the same structure returned by the `xml.config.get` service and can contain only elements that the caller wants to be updated. If an element is not included, it will not be updated. However, when included some elements require mandatory information (i.e. the value cannot be empty). Please, refer to Table 19.4, "Mandatory and optional parameters for the xml.config.update service".

Table 19.4. Mandatory and optional parameters for the xml.config.update service

Parameter	Type	Mandatory
site/name	string	yes
site/organization	string	-
server/host	string	yes
server/port	integer	-
intranet/network	string	yes
intranet/netmask	string	yes
z3950/enable	bool	yes
z3950/port	integer	-
proxy/use	bool	yes
proxy/host	string	-
proxy/port	integer	-
proxy/username	string	-
proxy/password	string	-
feedback/email	string	-
feedback/mailServer/host	string	-
feedback/mailServer/port	integer	-
removedMetadata/dir	string	yes
ldap/use	bool	yes
ldap/host	string	-
ldap/port	integer	-
ldap/defaultProfile	string	yes
ldap/login/userDN	string	yes
ldap/login/password	string	-
ldap/distinguishedNames/base	string	yes
ldap/distinguishedNames/users	string	yes
ldap/userAttribs/name	string	yes
ldap/userAttribs/password	string	yes
ldap/userAttribs/profile	string	-

Response

On success, the service returns a response element with the ok text. Example:

```
<response>ok</response>
```

Otherwise a proper error element is returned.

19.5 MEF services

Introduction

This chapter describes the services related to the Metadata Exchange Format. These services allow to import/export metadata using the MEF format.

mef.export

As the name suggests, this service exports a GeoNetwork's metadata using the MEF file format.

This service is public but metadata access rules apply. For a partial export, the view privilege is enough but for a full export the download privilege is also required. Without a login step, only partial exports on public metadata are allowed.

This service uses the system's temporary directory to build the MEF file. With full exports of big data maybe it is necessary to change this directory. In this case, use the Java's -D command line option to set the new directory before running GeoNetwork (if you use Jetty, simply change the script into the bin directory).

Request

This service accepts requests in GET/POST and XML form. The input parameters are:

uuid the universal unique identifier of the metadata format which format to use. Can be one of: simple, partial, full. skipUuid If provided, tells the exporter to not export the metadata's uuid. Without the uuid (which is a unique key inside the database) the metadata can be imported over and over again. Can be one of: true, false. The default value is false.

Response

The service's response is a MEF file with these characteristics:

- the name of the file is the metadata's uuid

- the extension of the file is mef

mef.import

This service is reserved to administrators and is used to import a metadata provided in the MEF format.

Request

The service accepts a `multipart/form-data` POST request with a single mefFile parameter that must contain the MEF information.

Response

If all goes well, the service returns an ok element containing the local id of the created metadata. Example:

```
<ok>123</ok>
```

Metadata ownership

Version 1.0 of the MEF format does not take into account the metadata owner (the creator) and the group owner. This implies that this information is not contained into the MEF file. During import, the user that is performing this operation will become the metadata owner and the group owner will be set to null.

19.6 Relations

Introduction

This chapter describes general services used to get and set relations between metadata records inside GeoNetwork. The association is performed by a Relations table which stores a metadata id and a metadata relatedId fields (see Table 19.5, "Structure of table Relations").

Table 19.5. Structure of table Relations

Field	Datatype	Description
id	foreign key to Metadata(id)	Source metadata whose relation is being described.
relatedId	foreign key to Metadata(id)	Metadata related to the source one

xml.relation.get

This service retrieves all relations between metadata.

Request

The request accepts an id and a relation parameters, whose meaning is this:

- id (*integer*): This is the local GeoNetwork identifier of the metadata whose relations are requested.

- relation (*string*, 'normal'): This optional parameter identifies the kind of relation that the client wants to be returned. It can be one of these values:

  - normal: The service performs a query into the id field and returns all relatedId records.

  - reverse: The service performs a query into the relatedId field and returns all id records.

  - full: Includes both normal and reverse queries (duplicated ids are removed).

Here is an example of POST/XML request:

```
<request>
    <id>10</id>
    <relation>full</relation>
</request>
```

Response

The response has a response root element with several metadata children depending on the relations found. Example:

```
<response>
    <metadata>...</metadata>
    <metadata>...</metadata>
    ...
</response>
```

Each metadata element has the following structure:

• title: Metadata title

• abstract: A brief explanation of the metadata

• keyword: Keywords found inside the metadata

• image: Information about thumbnails

• link: A link to the source site

• geoBox: coordinates of the bounding box

• geonet:info: A container for GeoNetwork related information

```
<metadata>
    <title>Globally threatened species of the world</title>
    <abstract> Contains information on animals.</abstract>
    <keyword>biodiversity</keyword>
    <keyword>endangered animal species</keyword>
    <keyword>endangered plant species</keyword>
    <link type="url">http://www.mysite.org</link>
    <geoBox>
        <westBL>-180.0</westBL>
        <eastBL>180.0</eastBL>
        <southBL>-90.0</southBL>
        <northBL>90.0</northBL>
    </geoBox>
    <geonet:info>
        <id>11</id>
        <schema>fgdc-std</schema>
        <createDate>2005-03-31T19:13:31</createDate>
        <changeDate>2007-03-12T14:52:46</changeDate>
        <isTemplate>n</isTemplate>
        <title/>
        <source>38b75c1b-634b-443e-9c36-a12e89b4c866</source>
        <uuid>84b4190b-de43-4bd7-b25f-6ed47eb239ac</uuid>
        <isHarvested>n</isHarvested>
        <view>true</view>
        <admin>false</admin>
        <edit>false</edit>
        <notify>false</notify>
        <download>true</download>
        <dynamic>false</dynamic>
        <featured>false</featured>
    </geonet:info>
</metadata>
```

Figure 19.20. Example of a metadata record

19.7 Schema information

Introduction

GeoNetwork is able to handle several metadata schema formats. Up to now, the supported schemas are:

- ISO-19115 (iso19115): GeoNetwork implements an old version of the draft, which uses short names for elements. This is not so standard so this schema is obsolete and will be removed in future releases.

- ISO-19139 (iso19139): This is the XML encoding of the ISO 19115:2007 metadata specification.

- Dublin core (dublin-core): This is a simple metadata schema based on a set of elements capable of describing any metadata.

- FGDC (fgdc-std): It stands for Federal Geographic Data Committee and it is a metadata schema used in North America.

In parenthesis is indicated the name used by GeoNetwork to refer to that schema. These schemas are handled through their XML schema files (XSD), which GeoNetwork loads and interprets to allow the editor to add and remove elements. Beside its internal use, GeoNetwork provides some useful XML services to find out some element properties, like label, description and so on.

xml.schema.info

This service returns information about a set of schema elements or codelists. The returned information consists of a localized label, a description, conditions that the element must satisfy etc...

Request

Due to its nature, this service accepts only the POST binding with `application/XML` content type. The request can contain several element and codelist elements. Each element indicate the will to retrieve information for that element. Here follows the element descriptions:

- element: It must contain a schema and a name attribute. The first one must be one of the supported schemas (see the section above). The second must be the qualified name of the element which information must be retrieved. The namespace must be declared into this element or into the root element of the request.

- codelist: Works like the previous one but returns information about codelists.

```
<request xmlns:gmd="http://www.isotc211.org/2005/gmd">
    <element schema="iso19139" name="gmd:constraintLanguage" />
    <codelist schema="iso19115" name="DateTypCd" />
</request>
```

Note

The returned text is localized depending on the language specified during the service call. A call to `/geonetwork/srv/en/xml.schema.info` will return text in the English language.

Response

The response's root element will be populated with information of the elements/codelists specified into the request. The structure is the following:

- element: A container for information about an element. It has a name attribute which contains the qualified name of the element.

  - label: The human readable name of the element, localized into the request's language.

  - description: A generic description of the element.

  - condition [0..1]: This element is optional and indicates if the element must satisfy a condition, like the element is always mandatory or is mandatory if another one is missing.

- codelist: A container for information about a codelist. It has a name attribute which contains the qualified name of the codelist.

  - entry [1..n]: A container for a codelist entry. There can be many entries.

    - code: The entry's code. This is the value that will be present inside the metadata.

    - label: This is a human readable name, used to show the entry into the user interface. It is localized.

    - description: A generic localized description of the codelist.

```
<response>
    <element name="gmd:constraintLanguage">
        <label>Constraint language</label>
        <description>language used in Application Schema</description>
        <condition>mandatory</condition>
    </element>
    <codelist name="DateTypCd">
        <entry>
            <code>creation</code>
            <label>Creation</label>
            <description>date when the resource was brought into existence</description>
        </entry>
        <entry>
            <code>publication</code>
            <label>Publication</label>
            <description>date when the resource was issued</description>
        </entry>
        <entry>
            <code>revision</code>
            <label>Revision</label>
            <description>date identifies when the resource was examined
                or re-examined and improved or amended</description>
        </entry>
    </codelist>
</response>
```

Error management

Beside the normal exceptions management discussed in section ??, the service can encounter some errors trying to retrieve an element/codelist information. In this case, the object is copied verbatim to the response with the addition of an error attribute that describes the encountered error. The returned errors are described in Table 19.6, "Possible errors returned by xml.schema.info service". Here follows an example of such response:

```
<response>
    <element schemma="iso19139" name="blablabla" error="not-found"/>
</response>
```

Table 19.6. Possible errors returned by xml.schema.info service

Error code	Description
unknown-schema	The specified schema is not supported
unknown-namespace	The namespace of the specified prefix was not found
not-found	The requested element / codelist was not found

20. Settings hierarchy

20.1 Introduction

GeoNetwork stores many options and information inside the Settings table. Information is grouped into hierarchies where each node has a key/value pair and can have many children. Each key is limited to 32 characters while each value is limited to 250. The 2 top level hierarchies are system and harvesting.

In the following sections, the indentation is used to show hierarchies. Names in bold represent keys with the value's datatype in parenthesys. An *italic* font is used to indicate basic types (string, integer, boolean) while normal font with a | is used to represent a set of allowed values. Regarding the boolean type, value can be only true or false. A missing datatype means that the value of the node is not used. Square brackets indicate cardinality. If they are missing, a cardinality of [1..1] should be considered.

20.2 The system hierarchy

- site : Contains information about the site

  - name (*string*) : Name used to present this site to other sites. Used to fill comboboxes or lists.

  - organization (*string*) : Name of the organization/company/institute that is running GeoNetwork

  - siteId (*string*) : A UUID that uniquely identifies the site. It is generated by the installer.

- platform : Contains information about the current version

  - version (*string*) : GeoNetwork's version in the X.Y.Z format

  - subVersion (*string*) : A small description about the version, like 'alpha-1', 'beta' etc...

- server : Used when it is necessary to build absolute URLs to the GeoNetwork server. This is the case, for example, when creating links inside a metadata or when providing CS/W capabilities.

  - host (*string*) : Main HTTP server's address

  - port (*integer*) : Main HTTP server's port (can be empty)

- intranet : specify the network of the intranet

  - network (*string*) : Network's address

  - netmask (*string*) : Network's netmask

- z3950 : A container for Z39.50 server parameters

  - enable (*boolean*) : If true, GeoNetwork will start the Z30.50 server

  - port (*integer*) : The port opened by GeoNetwork to listen to Z39.50 requests. Usually is 2100.

- proxy : This container speficy proxy configuration to use

  - use (*boolean*) : If true, GeoNetwork will use the given proxy for outgoing connections

  - host (*string*) : Proxy's host

  - port (*integer*) : Proxy's port

- username (*string*) : Proxy's credentials.

- password (*string*) : Proxy's credentials.

- feedback : Feedback is sent with proper web form or when downloading a resource.

  - email (*string*) : email address of a GeoNetwork administrator or someone else

  - mailServer : This container represents the mail server that will be used to send emails

    - host (*string*) : Address of the SMTP server to use

    - port (*string*) : SMTP port to use

- removedMetadata : This container contains settings about removed metadata.

  - dir : This folder will contain removed metadata in MEF format. It gets populated when the user deletes a metadata using the web interface.

- ldap : Parameters for LDAP authentication

  - use (*boolean*)

  - host (*string*)

  - port (*integer*)

  - defaultProfile (*string*) : Default GeoNetwork's profile to use when the profile user attribute does not exist.

  - login

    - userDN (*string*)

    - password (*string*)

  - distinguishedNames

    - base (*string*)

    - users (*string*)

  - userAttribs : A container for user attributes present into the LDAP directory that must be retrieved and used to create the user in GeoNetwork.

    - name (*string*)

    - password (*string*)

    - profile (*string*)

20.3 Harvesting nodes

The second top level hierarchy is harvesting. All nodes added using the web interface are stored here. Each child has node in its key and its value can be geonetwork, webdav, csw or another depending on the node's type.

All harvesting nodes share a common setting structure, which is used by the harvesting engine to retrieve these common parameters. This imply that any new harvesting type must honor this structure, which is the following:

- site : A container for site information.

  - name (*string*) : Node's name as shown in the harvesting list.

  - uuid (*string*) : A unique identifier assigned by the system when the harvesting node is created.

  - useAccount (*boolean*) : Indicates if the harvester has to authenticate to access the data.

    - username (*string*) :

    - password (*string*) :

- options :

  - every (*integer*) : Timeout, in minutes, between 2 consecutive harvesting.

  - oneRunOnly (*boolean*) : If true, the harvester will harvest one time from this node and then it will set the status to inactive.

  - status (active|inactive) : Indicates if the harvesting from this node is stopped (inactive) or if the harvester is waiting until the timeout comes.

- privileges [0..1] : This is a container for privileges to assign to each imported metadata

  - group (*integer*) [0..n] : Indicate a local group. The node's value is its local identifier. There can be several group nodes each with its set of privileges.

    - operation (*integer*) [0..n] : Privilege to assign to the group. The node's value is the numeric id of the operation like 0=view, 1=download, 2=edit etc...

- categories [0..1] : This is a container for categories to assign to each imported metadata

  - category (*integer*) [0..n] : Indicate a local category and the node's value is its local identifier.

- info : Just a container for some information about harvesting from this node.

  - lastRun (*string*) : If not empty, tells when the harvester harvested from this node. The value is the current time in millis since 1 January, 1970.

Privileges and categories nodes can or cannot be present depending on the harvesting type. In the following structures, this common structure is not shown. Only extra information specific to the harvesting type is described.

Nodes of type geonetwork

This is the native harvesting supported by geonetwork 2.1 and above.

- site : Contains host and account information

  - host (*string*)

  - port (*integer*)

- servlet (*string*)

- search [0..n] : Contains the search parameters. If this element is missing, an unconstrained search will be performed.

  - freeText (*string*)

  - title (*string*)

  - abstract (*string*)

  - keywords (*string*)

  - digital (*boolean*)

  - hardcopy (*boolean*)

  - source (*string*)

- groupsCopyPolicy [0..n] : Represents a copy policy for a remote group. It is used to maintain remote privileges on harvested metadata.

  - name (*string*) : Internal name (not localized) of a remote group.

  - policy (*string*) : Copy policy. For the group all, policies are: copy, copyToIntranet. For all other groups, policies are: copy, createAndCopy. The intranet group is not considered.

Nodes of type geonetwork20

This type allows harvesting from old geonetwork 2.0.x nodes.

- site : Contains host and account information

  - host (*string*)

  - port (*integer*)

  - servlet (*string*)

- search [0..n] : Contains the search parameters. If this element is missing no harvesting will be performed but the host's parameters will be used to connect to the remote node.

  - freeText (*string*)

  - title (*string*)

  - abstract (*string*)

  - keywords (*string*)

  - digital (*boolean*)

  - hardcopy (*boolean*)

  - siteId (*string*)

Nodes of type webdav

This harvesting type is capable of connecting to a web server which is WEB DAV enabled.

- site : Contains the URL to connect to and account information

  - url (*string*) : URL to connect to. Must be well formed, starting with 'http://', 'file://' or a supported protocol.

  - icon (*string*) : This is the icon that will be used as the metadata source's logo. The image is taken from the images/harvesting folder and copied to the images/logos folder.

- options

  - recurse (*boolean*) : Indicates if the remote folder must be recursively scanned for metadata.

  - validate (*boolean*) : If set, the harvester will validate the metadata against its schema and the metadata will be harvested only if it is valid.

Nodes of type csw

This type of harvesting is capable of querying a Catalogue Services for the Web (CSW) server and retrieving all found metadata.

- site

  - capabUrl (*string*) : URL of the capabilities file that will be used to retrieve the operations address.

  - icon (*string*) : This is the icon that will be used as the metadata source's logo. The image is taken from the images/harvesting folder and copied to the images/logos folder.

- search [0..n] : Contains search parameters. If this element is missing, an unconstrained search will be performed.

  - freeText (*string*)

  - title (*string*)

  - abstract (*string*)

  - subject (*string*)

Appendix A. Frequently Asked Questions

A.1. Users FAQ

A.1.1. Where do I learn more about the use and functionality of the GeoNetwork opensource catalog?

The Quick Start Guide will provide you with an excellent first introduction. The Guide can be downloaded from the GeoNetwork Community website[1]

A.2. Administrators FAQ

A.2.1. I am having difficulty installing multiple instances of GeoNetwork on the same server

To run multiple installation you have to change the ports that GeoNetwork uses in order to avoid conflicts. The port are:

- **Z39.50 listening port.** This is the most probable source of conflicts. You have to edit the `web/WEB-INF/config.xml` file of the second installation and choose a value other than the default one, which is 2100. Use for example 2101 but keep in mind that remote nodes usually use 2100 so your second node will not be reachable. You cannot use the system configuration web form the first time because if the port conflicts, the server won't start.

- **If you are using Jetty.**

  - **Jetty's listening port.** This can be modified using GAST and its default value is usually 8080. To run a second installation use a different value, like 8081. The affected file is bin/ jetty.xml.

  - **Jetty's stop port.** This is defined into the scripts `bin/start-geonetwork.*` and `bin/ stop-geonetwork.*` (for both Windows and Linux). The provided value is 8079 as the value of the STOP.PORT parameter. Use another value for the second installation, like 8078. If you don't change this value, the stop script will stop all instances.

- **If you are using the embedded McKoi DBMS.**

  - **McKoi listening port.** This can be easily modified using GAST. The default value is 9157. For other installations you can use 9158, 9159 and so on. The affected files are `web/WEB-INF/config.xml` and `web/WEB-INF/db/db.conf`.

A.2.2. What is normally logged when running GeoNetwork opensource?

GeoNetwork has its own internal logging based on log4j Logging services[2] (written to the file jeeves.log). Additionaly there are log files generated by the web server (Jetty[3] , Apache Tomcat[4] etc..) and by the DBMS used (for example by the internal McKoi SQL[5]).

A.2.3. How do I control what is written to the GeoNetwork internal log file?

The logging is configured in the file `../web/WEB-INF/log4j.cfg`. You can change the settings by editing the file in a text editor. For operational systems it is suggested to put all log options to OFF or FATAL. The log options are, with increasing log intensity:

- OFF - The OFF Level has the highest possible rank and is intended to turn off logging.

- FATAL - The FATAL level designates very severe error events that will presumably lead the application to abort.

- ERROR - The ERROR level designates error events that might still allow the application to continue running.

- WARN - The WARN level designates potentially harmful situations.

- INFO - The INFO level designates informational messages that highlight the progress of the application at coarse-grained level.

- DEBUG - The DEBUG Level designates fine-grained informational events that are most useful to debug an application.

- ALL - The ALL Level has the lowest possible rank and is intended to turn on all logging.

A.3. Developers FAQ

A.3.1. What is Free and Open Source Software (FOSS) and how can I use, participate and contribute to the GeoNetwork opensource project?

The book "Producing Open Source Software" (shown in Figure A.1, "Producing Open Source Software") is a highly recommended book for anyone working on open source software projects. It provides insight in all aspects of FOSS development and on how to make a project successful. If you are interested in participating in the GeoNetwork opensource project, please spend some time reading through this book. It's definitely worth the time and money (so buy the hardcopy if you can afford it!).

Producing Open Source Software is a book about the human side of open source development. It describes how successful projects operate, the expectations of users and developers, and the culture of free software.

The book is available in bookstores and from the publisher (O'Reilly Media[6]), or you can browse or download it from http://producingoss.com/. Producing Open Source Software is released under an open copyright that allows everyone to share and modify the book freely. The latest version is always available on the website. The online version is the same as the commercially available print version ? in other words, you can buy a printed copy and know that it's up-to-date.


Figure A.1. Producing Open Source Software

Appendix B. Glossary of Metadata Fields Description

This glossary provides you with brief descriptions of the minimum set of metadata fields required to properly describe a geoghaphical data as well as some optional elements highly suggested for a more extensive standard description.

Contraintes d'accès. Contraintes d'accès appliquées pour assurer la protection de la propriété privée et intellectuelle, et autres restrictions spéciales ou limitations pour obtenir les métadonnées ou la ressource

Résumé. Court résumé explicatif du contenu de la donnée

Administrative area. State, province of the location

Etendue temporelle - Date de début. Date de début (YYYY-MM-DDTHH:mm:ss)

Jeu de caractères. Nom de l'encodage utilisé dans la métadonnée

Type de raster. Identification du type de raster (point ou cellule)

Ville. Nom de la ville

Code du système. Code. Par exemple, le code epsg.

Pays. Pays

Information sur la qualité de la donnée. Information sur la qualité de la donnée

Date. Date(s) de référence pour la ressource en question

Date de mise à jour. Date de mise à jour de la métadonnée (YYYY-MM-DDThh:mm:ss)

Type de date. Définit l'événement sur lequel porte la date

Adresse courrier. Adresse du point de distribution

Dénominateur de l'échelle. Dénominateur de l'échelle

Qualité de la donnée - Desciption. Description of the event, including related parameters or tolerances

Ressource en ligne - Description. Texte descriptif détaillé sur ce que la ressource en ligne est/fait

Mots-clés. Classe pour les mots clés, leur type et leur source de référence

Représentation spatiale du raster - Noms des axes. Nom de l'axe (i.e. lignes, colonnes)

Représentation spatiale du raster - Nombre de pixels. Nombre d'éléments le long de cet axe

Résolution. Degré de détail dans le jeu de données de type raster

Informations sur la distribution. Fournit des informations sur le distributeur et sur la manière d'obtenir la ressource

Rectangle englobant - Longitude est. coordonnée la plus à l'est de la limite de l'étendue du jeu de données, exprimée en longitude avec des degrés décimaux (EST positif)

Edition. Version de la ressource

Adresse mel. Adresse mel de l'organisation ou de la personne responsable

Etendue temporelle - Date de fin. Date de fin (YYYY-MM-DDTHH:mm:ss)

Echelle comparative. échelle d'un graphique ou carte papier exprimé par son dénominateur (ex 25000 pour une carte au 1/25000)

Emprise. Extension de la ressource. Type de données pour l'information sur l'étendue horizontale, verticale et temporelle du jeu de données

Fax. Numéro du fax permettant de contacter l'organisme et/ou le contact

Identifiant du fichier. Identifiant unique pour le fichier de métadonnées

Représentation spatiale du vecteur - Type d'objet géométrique. Nom des types d'objets spatiaux utilisés pour localiser les données : lignes, polygones,…

Représentation spatiale du vecteur - Nombre d'objets géométriques. Nombre total d'objets de type point ou vecteur intervenant dans le jeu de données

Rectangle englobant. Coordonnées des quatre points cardinaux constituant le rectangle englobant l'ensemble des données. Dans ce cas, les coordonnées s'expriment toujours en longitude / Latitude.

Représentation spatiale du raster. Classe contenant l'information sur les objets spatiaux de type raster du jeu de données

Représentation spatiale du raster - Résolution. Degré de détail dans le jeu de données de type raster

Représentation spatiale du raster - Disponibilité des paramètres de transformation. Indication si oui ou non des paramètres de transformation existent (booléen)

Qualité de la donnée - Niveau hiérarchique. Niveau hiérarchique des données spécifiées par l'attribut scope (79) du domaine d'applicabilité (B.5.25)

Informations d'identification. Informations de base sur la ressource

Point de contact - Nom. Nom de la personne responsable

Mot-clé. Mots ou notions courants utilisés pour décrire le sujet

Langue de la donnée. Langue utilisée pour la donnée documentée

Langue de la métadonnée. Langue utilisée pour la métadonnée

Qualité de la donnée - Généalogie. Informations de qualité concernant la provenance des données

Ressource en ligne - Adresse (URL). URL ou indication semblable d'une adresse Internet pour un accès en ligne, par exemple http://www.isotc211.org

Maintenance et fréquence de mise à jour. Informations sur la fréquence de mise à jour des données

Auteur de la métadonnée. Personne/équipe responsable pour l'information sur la métadonnée. (Point de contact) (Ci-citation et adresse)

Norme de métadonnée. Norme de la métadonnée utilisée

Version de la norme de métadonnée. Version de la norme de métadonnée utilisée

Ressource en ligne - Nom. Nom de la ressource en ligne

Rectangle englobant - Latitude nord. Coordonnée la plus au nord de la limite de l'étendue du jeu de données, exprimée en latitude avec des degrés décimaux (NORD positif)

Représentation du raster - Nombre de dimensions. Nombre d'axes spatio-temporels indépendants

Informations de distribution - Ressource en ligne. Informations sur les sources en ligne à partir desquelles la ressource peut être obtenue

Point de contact - Nom de l'organisation. Nom de l'organisation responsable

Autres contraintes. Autres restrictions et prérequis légaux pour accéder et utiliser les métadonnées ou la ressource

Point de contact. Identification, et mode de communication avec, des personnes ou des organisations devant servir de point de contact pour la ressource

Point de contact - Position. Rôle de la personne responsable dans l'organisation

Code postal. Code postal

Type de représentation. Type de représentation de la ressource

Ressource en ligne - protocole. Protocole de connection utilisé

Objectifs. Résumé des intentions pour lesquelles la donnée a été créée

Informations sur le système de localisation. Description du système de projection spatial et temporel utilisé par la ressource

Rapport sur la qualité de la donnée. Description d'un rapport sur la qualité sur l'une des 5 composantes de la qualité

Représentation spatiale du raster - Résolution. Degré de détail dans le jeu de données de type raster

Point de contact - Rôle. Fonction de la personne sur la ressource

Rectangle englobant - latitude sud. Coordonnée la plus au sud de la limite de l'étendue du jeu de données, exprimée en latitude avec des degrés décimaux (NORD positif)

Informations sur la représentation spatiale. Informations sur la représentation spatiale

Type de représentation spatiale. Méthode utilisée pour représenter spatialement l'information géographique

Qualité de la donnée - Généralités sur la provenance. Explication générale sur les connaissances du producteur de données sur la généalogie du jeu de données

Etat. Etat de la ressource

Information supplémentaire. Toute autre information descriptive sur le jeu de données

Etendue temporelle. Période de temps couverte par le jeu de données

Titre. Nom par lequel la ressource est connue

Thématique. thème(s) principal(aux) du jeu de données (voir liste fermée de la norme) (B.5.27)

Représentation spatiale du raster - Disponibilité des paramètres de transformation. Indication si oui ou non des paramètres de transformation existent (booléen)

Représentation spatiale du vecteur - Niveau topologique. Information qui identifie le degré de complexité des relations spatiales : topologie, planaire, (B.5.28)

Type de mots-clés. Thèmes utilisés pour grouper des mots clés similaires

URL. Unified Resource Locator

Contraintes d'utilisation. Contraintes appliquées pour assurer la protection des sphères privées et intellectuelles, et autres restrictions spéciales ou limitations ou mises en garde pour utiliser les métadonnées ou la ressource

Représentation spatiale du vecteur. Classe qui contient l'information sur les objets géographiques de type vecteur du jeu de données

Numéro de téléphone. Numéro de téléphone

Rectangle englobant - Longitude ouest. Coordonnée la plus à l'ouest de la limite de l'étendue du jeu de données, exprimée en longitude avec des degrés décimaux (EST positif)

Appendix C. ISO Topic Categories

Isotopic Categories and Keywords

Isotopic Category	Main Topic	Examples	Keywords
Base Maps	Base Maps, Scanned Maps, and Charts		Base Map
Biota	Biologic and Ecologic Information Flora and/or fauna in natural environment	wildlife, vegetation, biological sciences, ecology, wilderness, sea life, wetlands, habitat	
Boundaries	Administrative Legal land descriptions and Political Boundaries	political and administrative boundaries	Administrative boundaries,
Climatology Meteorology Atmosphere	cloud cover, weather, climate, atmospheric conditions, climate change, precipitation		NDVI, Drought, Floods
Earth Cover	Earth Surface Characteristics and Land Cover		Land Cover
Economy	Business and Economic Information, Economic activities, conditions and employment	production, labour, revenue, commerce, industry, tourism and ecotourism, forestry, fisheries, commercial or subsistence hunting, exploration and exploitation of resources such as minerals, oil and gas	
Elevation	Elevation and Derived Products, Height above or below sea level	altitude, bathymetry, digital elevation models, slope, derived products	Digital Elevation Model
Environment	Environmental Monitoring and Modelling, Environmental resources, protection and conservation	environmental pollution, waste storage and treatment, environmental impact assessment, monitoring environmental risk, nature reserves, landscape	
Farming	Agriculture and Farming Rearing of animals and/or cultivation of plants	agriculture, irrigation, aquaculture, plantations, herding, pests and diseases affecting crops and livestock	Agriculture, Crop Production, Livestock
Geoscientific Information	Geologic and Geophysical Information, Information pertaining to earth sciences	geophysical features and processes, geology, minerals, sciences dealing with the composition, structure and origin of the earth's rocks, risks of earthquakes, volcanic activity, landslides, gravity	

		information, soils, permafrost, hydrogeology, erosion	
Health	Human Health and Health, health services, human ecology, and Disease safety	disease and illness, factors affecting health, hygiene, substance abuse, mental and physical health, health services	Malnutrition, Wasting, Stunting, Underweight, Food Deficit, Crop Disease, Livestock Disease,
Imagery	Images and Photographs		
Imagery Base Maps Earth Cover	Base maps	land cover, topographic maps, imagery, unclassified images, annotations	
Inland Waters	Inland Water Resources and Characteristics, Inland water features, drainage systems and their characteristics	rivers and glaciers, salt lakes, water utilisation plans, dams, currents, floods, water quality, hydrographic charts	Rivers,
Intelligence Military	Military bases, structures, activities	barracks, training grounds, military transportation, information collection	
Location	Geodetic Networks Positional information and services and Control Points	addresses, geodetic networks, control points, postal zones and services, place names	Cartography
Oceans	Ocean and Estuarine Resources and Characteristics(excluding inland waters), Features and characteristics of salt water bodies	tides, tidal waves, coastal information, reefs	
Planning Cadastre	Cadastral and Legal Land Descriptions. Information used for appropriate actions for future use of the land	land use maps, zoning maps, cadastral surveys, land ownership	
Recreation	Tourism and Recreation		
Society	Society and Cultural and Demographic Information, Characteristics of society and cultures	Settlements, anthropology, archaeology, education, traditional beliefs, manners and customs, demographic data, recreational areas and activities, social impact assessments, crime and justice, census information	Vulnerability, Early Warning, Emergency, IDPS, Refugees, Population, Poverty, Food Security, Regional Bureaux, WFP Facilities, School feeding
Structure	Facilities, Man-made construction, Buildings and Structures	buildings, museums, churches, factories, housing, monuments, shops, towers	
Transportation	Transportation Means and aids for conveying persons and/or goods, Networks and Models	roads, airports/airstrips, shipping routes, tunnels, nautical charts, vehicle or vessel location, aeronautical	Infrastructure, COMPAS, Food Aid, Food Beneficiaries, Railways, Roads, Shipments

		charts, railways	
Utilities Communication	Utility Distribution Networks, Energy, water and waste systems and communications infrastructure and services	hydroelectricity, geothermal, solar and nuclear sources of energy, water purification and distribution, sewage collection and disposal, electricity and gas distribution, data communication, telecommunication, radio, communication networks	

Appendix D. Logiciel libre pour les Systèmes d'Information Géographique

Une suite de logiciel peut être utilisé en complément de GeoNetwork opensource pour déployer une infrastructure de données spatiales complète. Ceci inclu les outils pour la mise en place de serveurs cartographiques sur Internet, les SIG bureautiques et les outils de visualisation.

Ci-dessous, vous trouverez quelques exemples pour chacune des catégories.

D.1 Serveurs cartographiques

* GeoServer (All)[1] http://www.geoserver.org

* MapServer (All) http://www.mapserver.org/

* MapGuide Open Source (Windows & Linux) http://www.osgeo.org/mapguide

D.2 SIG

* GRASS (All) http://www.osgeo.org/grass

* gvSIG (All) http://www.gvsig.gva.es/

* uDig (All) http://udig.refractions.net

* Quantum GIS (All) http://www.osgeo.org/qgis

* OSSIM (Windows & OSX) http://www.osgeo.org/ossim

D.3 Cartographie sur Internet

* OpenLayers (All) http://www.osgeo.org/openlayers

* MapBender (All) http://www.osgeo.org/mapbender

* MapBuilder (All) http://www.osgeo.org/mapbuilder

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