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Welcome to GeoNode’s Documentation.

GeoNode is an Open Source, Content Management System (CMS) for geospatial data. It is a web-based application and platform for developing geospatial information systems (GIS) and for deploying spatial data infrastructures (SDI).
1.1 What is GeoNode

GeoNode is a geospatial content management system, a platform for the management and publication of geospatial data. It brings together mature and stable open-source software projects under a consistent and easy-to-use interface allowing non-specialized users to share data and create interactive maps.

Data management tools built into GeoNode allow for integrated creation of data, metadata, and map visualization. Each dataset in the system can be shared publicly or restricted to allow access to only specific users. Social features like user profiles and commenting and rating systems allow for the development of communities around each platform to facilitate the use, management, and quality control of the data the GeoNode instance contains.

It is also designed to be a flexible platform that software developers can extend, modify or integrate against to meet requirements in their own applications.

1.1.1 Showcase

A handful of other Open Source projects extend GeoNode’s functionality by tapping into the re-usability of Django applications. Visit our gallery to see how the community uses GeoNode: GeoNode Showcase.

The development community is very supportive of new projects and contributes ideas and guidance for newcomers.

For a live demo see also Online Demo

1.1.2 Most useful links

General

- Project homepage: https://geonode.org
- Repository: https://github.com/GeoNode/geonode
- Official Demo: http://master.demo.geonode.org
- GeoNode Wiki: https://github.com/GeoNode/geonode/wiki
- Issue tracker: https://github.com/GeoNode/geonode-project/issues
In case of sensitive bugs like security vulnerabilities, please contact a GeoNode Core Developer directly instead of using issue tracker. We value your effort to improve the security and privacy of this project!

**Related projects**

- GeoNode Project: [https://github.com/GeoNode/geonode-project](https://github.com/GeoNode/geonode-project)
- GeoNode at Docker: [https://hub.docker.com/u/geonode](https://hub.docker.com/u/geonode)

## 1.2 Licensing

GeoNode is Copyright 2018 Open Source Geospatial Foundation (OSGeo).

GeoNode is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version. GeoNode is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with GeoNode. If not, see [http://www.gnu.org/licenses](http://www.gnu.org/licenses).

## 1.3 Current Version and Features

GeoNode current version: **3.2.0**

Main Features: [State of GeoNode](https://live.osgeo.org/en/)

## 1.4 Get in touch with the community

GeoNode is an open source project and contributors are needed to keep this project moving forward. Learn more on how to contribute on our Community Bylaws.

- User Mailing List: [https://lists.osgeo.org/cgi-bin/mailman/listinfo/geonode-users](https://lists.osgeo.org/cgi-bin/mailman/listinfo/geonode-users)
- Developer Mailing List: [https://lists.osgeo.org/cgi-bin/mailman/listinfo/geonode-devel](https://lists.osgeo.org/cgi-bin/mailman/listinfo/geonode-devel)
- Gitter Chat: [https://gitter.im/GeoNode/general](https://gitter.im/GeoNode/general)

## 1.5 Roadmap

GeoNode’s development roadmap is documented in a series of GeoNode Improvement Projects (GNIPS). They are documented at GeoNode Wiki.

GNIPS are considered to be large undertakings which will add a large amount of features to the project. As such they are the topic of community discussion and guidance.

The community discusses these on the developer mailing list: [http://lists.osgeo.org/pipermail/geonode-devel/](http://lists.osgeo.org/pipermail/geonode-devel/)
1.6 GeoNode Basics

is a platform for the management and publication of geospatial data. It brings together mature open-source software projects under an easy to use interface.

1.6.1 With GeoNode, non-specialized users can share data and create interactive maps.

1.6.2 Geospatial data storage

GeoNode allows users to upload vector data (currently shapefiles, json, csv, kml and kmz) and raster data in their original projections using a web form.

Vector data is converted into geospatial tables on a DB, satellite imagery and other kinds of raster data are retained as GeoTIFFs.

Special importance is given to standard metadata formats like ISO 19139:2007 / ISO 19115 metadata standards.

As soon as the upload is finished, the user can fill the resource metadata in order to make it suddenly available through the CSW (OGC Catalogue Service) endpoints and APIs.

Users may also upload a metadata XML document (ISO, FGDC, and Dublin Core format) to fill key GeoNode metadata elements automatically.

Similarly, GeoNode provides a web based styler that lets the users to change the data portrayals and preview the changes at real time.
Fig. 1: GeoNode simplified architecture
1.6.3 Data mixing, maps creation

Once the data has been uploaded, GeoNode lets the user search for it geographically or via keywords in order to create fancy maps.

All the datasets are automatically re-projected to web Mercator for maps display, making it possible to use different popular base datasets, like Open Street Map, Google Satellite or Bing datasets.

Once the maps are saved, it is possible to embed them in any web page or get a PDF version for printing.

1.6.4 GeoNode as a building block

A handful of other Open Source projects extend GeoNode’s functionality by tapping into the re-usability of Django applications.

Visit our gallery to see how the community uses GeoNode: GeoNode Projects.

The development community is very supportive of new projects and contributes ideas and guidance for newcomers.
MANAGEMENT AND PUBLICATION OF GEOSPATIAL DATA

Users can upload geospatial data from different file types, including Shapefile and GeoTiff.

RASTER DATA

Securely stores geospatial data.

Specialized tools to analyze geospatial data.

VECTOR DATA

Designed to be extended and modified; it can even be integrated into existing platforms.

DATA MANAGEMENT TOOLS
1.6.5 Convinced! Where do I sign?

The next steps are:

1. Make a ride on the Online Demo

2. Follow the Quick Installation Guide in order to play with your own local instance and access all the admin functionalities

3. Read the documentation starting from the user guide to the admin guide

4. Subscribe to the geonode-users and/or geonode-devel mailing lists to join the community. See also the section Get in touch with the community for more info.

Thanks for your interest!

1.7 Supported Browsers

GeoNode is known to be working on all modern web browsers.

This list includes (but is not limited to):

- Google Chrome.
- Apple Safari.
- Mozilla Firefox.
- Microsoft Edge.
Note: The vast majority of GeoNode developers prefer using Google Chrome.

1.8 Online Demo

Note: Disclaimer we do not guarantee for any data published on this Demo Site. Publish the data at your own risk. Every dataset will be removed automatically every Sunday. If you find some dataset that shouldn’t be there, please write suddenly to developers and maintainers.

See the section Get in touch with the community for details.

A live demo of the latest stable build is available at http://master.demo.geonode.org/.

Fig. 2: Online Demo @ master.demo.geonode.org

Anyone may sign up for a user account, upload and style data, create and share maps, and change permissions. Since it is a demo site, every sunday all the datasets will be wiped out. Users, passwords and groups will be preserved. It should hopefully allow you to easily and quickly make a tour of the main capabilities of GeoNode.

Warning: This GeoNode instance is configured with standards settings and a very low security level. This is a demo only not to be considered a really production ready system. For a complete list of settings, refer to the section: Settings
1.9 Quick Installation Guide

1.9.1 Introduction

The following is a quick guide to get started with GeoNode in most common operating systems.

Note: For a full setup and deployment, please refer to the complete installation guides

This is meant to be run on a fresh machine with no previously installed packages or GeoNode versions.

Warning: The methods presented here are meant to be used for a limited internal demo only. Before exposing your GeoNode instance to a public server, please read carefully the hardening guide

1.9.2 Recommended Minimum System Requirements

A definite specification of technical requirements is difficult to recommend. Accepted performance is highly subjective. Furthermore, the performance depends on factors such as concurrent users, records in the database or the network connectivity of your infrastructure.

For deployment of GeoNode on a single server, the following are the bare minimum system requirements:

• 8GB of RAM (16GB or more preferred for a production deployment).
• 2.2GHz processor with 4 cores. (Additional processing power may be required for multiple concurrent styling renderings)
• 30 GB software disk usage (Reserved to OS and source code only).
• Additional disk space for any data hosted with GeoNode, data stored on the DataBase and tiles cached with GeoWebCache. For db, spatial data, cached tiles, and “scratch space” useful for administration, a decent baseline size for GeoNode deployments is between 50GB and 100GB.
• 64-bit hardware strongly recommended.

1.9.3 Install via Docker

Docker is a free software platform used for packaging software into standardized units for development, shipment and deployment.

Note: credits to Docker

A container image is a lightweight, stand-alone, executable package of a piece of software that includes everything needed to run it: code, runtime, system tools, system libraries, settings.

Docker containers running on a single machine share that machine’s operating system kernel; they start instantly and use less compute and RAM.

Containers can share a single kernel, and the only information that needs to be in a container image is the executable and its package dependencies, which never need to be installed on the host system.

Multiple containers can run on the same machine and share the OS kernel with other containers, each running as isolated processes in user space.
CONTAINER
Tomcat
Java
Debian

CONTAINER
PHP
MySQL
Ubuntu

CONTAINER
Static Binary
Alpine

Kernel
This documentation will refer to the usage of Docker on a Ubuntu host, but you can of course run Docker also on other Linux distributions, Windows and Mac.

For the steps to setup Docker on Ubuntu you can jump ahead to *Ubuntu 22.04*

### 1.10 GeoNode Users Guide

#### 1.10.1 Accounts and User Profile

In GeoNode many contents are public so unregistered users have read-only access to public maps, datasets, documents, geostory and dashboard. In order to create maps, dashboard or geostory and add datasets or documents, edit the data and share these resources with other users, you need to sign in.

GeoNode is primarily a *social* platform, thus a primary component of any GeoNode instance is the user account.

This section will guide you through account registration, updating your account information and preferences, connections with social networks and email addresses.

### Creating a New Account

To take full advantage of all the GeoNode features you need a user account. Follow these step to create a new one.

1. From any page in the web interface, you will see a *Register* link. Click that link, and the register form will appear

   **Note:** The registrations in GeoNode must be open, in case you don’t see the register link then it’s not possible to register unless the administrator of the site does that for you.

   ![Register Link](image)

   **Fig. 3: Register Link**

2. On the next page, fill out the form. Enter a username and password in the fields. Also, enter your email address for verification.

3. You will be automatically logged in and redirected to the Profile page. An email will be sent confirming that you have signed up. If no errors occur during the registration, the following alerts will appear on the screen:

To log out click on the *Log out* link of the user menu.

You have to confirm this action as described in the picture below.
Sign up

Create a new local account

E-mail
john.smith@gmail.com

Username
johnsmith

Captcha
I'm not a robot

Password
******

Password (again)
******

Sign up

Fig. 4: Registering for a new account

Confirmation e-mail sent to john.smith@mail.com.

Successfully signed in as johnsmith.

Fig. 5: Alerts
Fig. 6: *Logout link*

Fig. 7: *Confirm Log out*
**Updating the Profile**

Once having an account you can enrich your profile with useful information, you can also edit or delete the existing ones. You can connect the account with your social network, associate many e-mail addresses to it and manage many options such as preferences about notifications.

You can update these information anytime from your *Profile* page which is accessible from the user menu.

So, click on your profile picture in the top right of the screen. A drop-down list will show. Click on *Profile* to enter the *Profile* settings page.

![Link to your profile](image)

Fig. 8: *Link to your profile*

The *Profile* page looks like the one shown in the picture below.

Your personal information is shown under the username. At the bottom of the page are listed all the resources associated to your *Profile*, you can decide to view only datasets, maps, documents, dashboard or geostory by clicking on the corresponding tab.

Through the link *User datasets WMS GetCapabilities document* you can retrieve an XML document with the list of the available datasets.

On the right side of the page there are many useful links to edit personal information to update your *Profile* settings and to get in touch with other GeoNode users.

The *My Activities* link allows to see all your recent activities on GeoNode such as datasets uploading and maps creation. All other links and their functionalities will be described in depth in the following sections.

**Editing Profile Information**

Your *Profile* contains personal information such as your address, your telephone number, your organization and so on but it is empty by default at the beginning.

Through the *Edit profile* button of the *Profile* page (see *Updating the Profile*) you can set your details, including your avatar.

When finished, click *Update profile*. You will be redirected to the *Profile* page. A message will confirm the profile has been correctly updated.
Fig. 9: User profile page

Fig. 10: Recent activities
Edit Your Profile

Fig. 11: *Updating Profile information*

Profile johnsmith updated.

Fig. 12: *Updating Profile correctly finalized*
Associating your Account with an e-mail

Your account is automatically associated with the e-mail that you used to register yourself on the platform.

![Fig. 13: Accounts e-mail](image)

By clicking on **Associated e-mails** of the **Profile** page (see *Updating the Profile*), you will have the possibility to fill up a new e-mail address. Type it in the **E-mail** input filed then click on **Add E-mail** to perform a new association.

You can make it primary if necessary, in order to receive the notification on this address. To do that, select the e-mail that you want, then click on **Make Primary**.

Managing the Password

To change your password, click on the **Set/Change password** link of the **Profile** page (see *Updating the Profile*). You will be asked to enter your current password and the new one (two times). Click on **Change my password** to perform the change.

If no errors occur you will see a confirmation message.

Next time you signin, you will have to use the new password.
E-mail Addresses

The following e-mail addresses are associated with your account:

- [john.smith@gmail.com](mailto:john.smith@gmail.com) Unverified Primary
- [john.smith.primary@gmail.com](mailto:john.smith.primary@gmail.com) Unverified

[Make Primary] [Re-send Verification] [Remove]

Add E-mail Address

**E-mail:** [john.smith.primary@gmail.com](mailto:john.smith.primary@gmail.com)

[Add E-mail]

Fig. 14: *New e-mail association*
E-mail Addresses
The following e-mail addresses are associated with your account:

- john.smith@gmail.com Unverified
- john.smith.primary@gmail.com Unverified Primary

Make Primary Re-send Verification Remove

Add E-mail Address

E-mail: E-mail address

Add E-mail

Primary e-mail address set.

Fig. 15: Primary e-mail address
Password Change

Change your password here

**Current Password**

..........

**New Password**

..........

**New Password (again)**

..........

Change my password

Fig. 16: *Change your password*

Password successfully changed.

Fig. 17: *Change password confirmation*
Setting Notification Preferences

By default GeoNode sends notifications to the users for events that they could be subscribed to such as a new dataset uploaded or a new rate added to a map. You can adjust your notification settings by clicking on the Notifications link of the Profile page (see Updating the Profile).

Note: Make sure to have a verified email address to which notices can be sent. If not see Associating your Account with an e-mail.

Now check/uncheck the notification types you wish to receive or not receive. It is possible to be notified for the events shown in the picture below.

1.10.2 Interacting with Users and Groups

The GeoNode platform allows you to communicate by message with other GeoNode users and groups of users.

You can also invite external users to join your GeoNode. In order to do that, click on Invite Users in the Profile page (see Updating the Profile) or in the About menu in the Home page.

You can invite your contacts typing their email addresses in the input field as shown in the picture below. Click on Submit to perform the action.

A message will confirm that invitations have been correctly sent.

Note: You can invite more than one user at the same time by typing the email addresses inline with a semi-colon separator.

The next sections will show you how to view information about other users and how to contact them.

Viewing other users information

Once your account is created, you can view other accounts on the system.

To see information about other users on the system, click the People link of the About menu in Home page.

You will see a list of users registered on the system.

The Search tool is very useful in case of many registered users, type the name of the user you are looking for in the input text field to filter the users list.

Select a user and click on its username to access to the user details page.

In this page the main information about the user are shown: personal information (organization) and the resources the user owns (datasets, maps, documents and other apps).

Through the User Activities link, in right side of the page, it is possible to visualize all the activities the user has been done.

The Message User link lets you to contact other users, see the next section to read more about that.
# Notification Settings

<table>
<thead>
<tr>
<th>Notification Type</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request to download a resource</td>
<td>✔</td>
</tr>
<tr>
<td>A request for downloading a resource was sent</td>
<td></td>
</tr>
<tr>
<td>Request resource change</td>
<td>✔</td>
</tr>
<tr>
<td>Owner has requested permissions to modify a resource</td>
<td></td>
</tr>
<tr>
<td>Dataset Created</td>
<td>✔</td>
</tr>
<tr>
<td>A Dataset was created</td>
<td></td>
</tr>
<tr>
<td>Dataset Updated</td>
<td>✔</td>
</tr>
<tr>
<td>A Dataset was updated</td>
<td></td>
</tr>
<tr>
<td>Dataset Approved</td>
<td>✔</td>
</tr>
<tr>
<td>A Dataset was approved by a Manager</td>
<td></td>
</tr>
<tr>
<td>Dataset Published</td>
<td>✔</td>
</tr>
<tr>
<td>A Dataset was published</td>
<td></td>
</tr>
<tr>
<td>Dataset Deleted</td>
<td>✔</td>
</tr>
<tr>
<td>A Dataset was deleted</td>
<td></td>
</tr>
<tr>
<td>Comment on Dataset</td>
<td>✔</td>
</tr>
<tr>
<td>A layer was commented on</td>
<td></td>
</tr>
<tr>
<td>Rating for Dataset</td>
<td>✔</td>
</tr>
<tr>
<td>A rating was given to a layer</td>
<td></td>
</tr>
<tr>
<td>Map Created</td>
<td>✔</td>
</tr>
<tr>
<td>A Map was created</td>
<td></td>
</tr>
<tr>
<td>Map Updated</td>
<td>✔</td>
</tr>
<tr>
<td>A Map was updated</td>
<td></td>
</tr>
<tr>
<td>Map Approved</td>
<td>✔</td>
</tr>
<tr>
<td>A Map was approved by a Manager</td>
<td></td>
</tr>
<tr>
<td>Map Published</td>
<td>✔</td>
</tr>
<tr>
<td>A Map was published</td>
<td></td>
</tr>
<tr>
<td>Map Deleted</td>
<td>✔</td>
</tr>
<tr>
<td>A Map was deleted</td>
<td></td>
</tr>
<tr>
<td>Comment on Map</td>
<td>✔</td>
</tr>
<tr>
<td>A map was commented on</td>
<td></td>
</tr>
<tr>
<td>Rating for Map</td>
<td>✔</td>
</tr>
<tr>
<td>A rating was given to a map</td>
<td></td>
</tr>
<tr>
<td>App Created</td>
<td>✔</td>
</tr>
<tr>
<td>A App was created</td>
<td></td>
</tr>
<tr>
<td>App Updated</td>
<td>✔</td>
</tr>
<tr>
<td>A App was updated</td>
<td></td>
</tr>
</tbody>
</table>
### Notifications settings

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>App Approved</td>
<td>A App was approved by a Manager</td>
</tr>
<tr>
<td>App Published</td>
<td>A App was published</td>
</tr>
<tr>
<td>App Deleted</td>
<td>A App was deleted</td>
</tr>
<tr>
<td>Comment on App</td>
<td>An App was commented on</td>
</tr>
<tr>
<td>Rating for App</td>
<td>A rating was given to an App</td>
</tr>
<tr>
<td>Document Created</td>
<td>A Document was created</td>
</tr>
<tr>
<td>Document Updated</td>
<td>A Document was updated</td>
</tr>
<tr>
<td>Document Approved</td>
<td>A Document was approved by a Manager</td>
</tr>
<tr>
<td>Document Published</td>
<td>A Document was published</td>
</tr>
<tr>
<td>Document Deleted</td>
<td>A Document was deleted</td>
</tr>
<tr>
<td>Comment on Document</td>
<td>A Document was commented on</td>
</tr>
<tr>
<td>Rating for Document</td>
<td>A rating was given to a document</td>
</tr>
<tr>
<td>User following you</td>
<td>Another user has started following you</td>
</tr>
<tr>
<td>User requested access</td>
<td>A new user has requested access to the site</td>
</tr>
<tr>
<td>Account activated</td>
<td>This account is now active and can log in the site</td>
</tr>
<tr>
<td>Dataset Uploaded</td>
<td>A layer was uploaded</td>
</tr>
<tr>
<td>Message received</td>
<td>New message received in one of your threads</td>
</tr>
</tbody>
</table>

Fig. 18: Notifications settings
Invite Users

Email

john.friend1@mail.com john.friend2@mail.com john.friend3@mail.com

Submit

Fig. 19: Invite users to join GeoNode

Invitations successfully sent to 'john.friend1@mail.com, john.friend2@mail.com, john.friend3@mail.com'

Fig. 20: Invitations confirm message
Fig. 21: About menu - People link
Fig. 22: *List of the registered users*
Fig. 23: **User details**

Fig. 24: **User activities**
It is also possible, in GeoNode, to see the recent activities of all users through the *Recent Activities* link of the user menu.

![Recent Activities link](image)

*Fig. 25: Recent Activities link*

In the picture below an example.

As you can see, you can decide whether to see only the activities related to datasets or those related to maps or comments by switching the tabs.

**Contacting other users**

GeoNode allows you to communicate by message with other registered users and groups.

To send a message to some user and/or groups you can follow the link *Message User* from your *Profile* page (see *Updating the Profile*) or from the *Profile* details page (see the previous section *Viewing other users information*) of that user.

Insert your content, type a subject and click on *Send message* to send the message to the users and groups you have selected.

You will be redirected to the *Conversation* details page related to the subject.

**The Inbox page**

You can view your conversations in your *Inbox* page, reachable through the *Back to inbox* button (see the picture above) or from the *Inbox* link of the user menu.

The picture below shows how your *Inbox* page should look like.

In *Inbox* all the unread messages are listed. You haven’t received any message yet so your *Inbox* is empty. If you switch to the *All* tab you can see all the conversations you are involved in.

When some user send a reply to your message your *Inbox* shows it, see the picture below for an example.
Recent activity

Fig. 26: Recent Activities
Create Message

To users

julia254

To groups

Geosolutions

Subject

Greetings from John Smith

Content

Hello,
I'm John Smith, I'm now registered on Geonode!

Send message

Fig. 27: Send message to users and groups
Greetings from John Smith

Sent to: julia254,

Nov. 17, 2021, 9:52 a.m. by me

Hello, I'm John Smith, I'm now registered on Geonode!

Fig. 28: Your message

Fig. 29: Inbox link
Fig. 30: *Inbox page*

Fig. 31: *All your conversations*
You can open the Conversation details by clicking on the Subject link.

As you can see in the picture above, in the Conversation page you have the ability to write a quick reply. Type your message in the text box and click on Send Reply to do that.

In the Inbox page there is also the Create Message button that provides you a quick link to the message creation form.

1.10.3 Data

Data management tools built into GeoNode allow integrated creation of resources eg datasets, documents, link to external documents, map visualizations and other configured geonode apps. Each resource in the system can be shared publicly or restricted to allow access to only specific users. Social features like user profiles and commenting and rating systems allow for the development of communities around each platform to facilitate the use, management, and quality control of the data the GeoNode instance contains.

The following sections will explain more in depth what data can be managed in GeoNode and how to easily find that data.

Data Types

GeoNode welcome page shows a variety of information about the current GeoNode instance. You can explore the existing data using many search tools and filters (see Finding Data) or through the links of the navigation bar at the top of the page.

There are three main types of resources that GeoNode can manage:

1. Documents
2. Datasets
3. Maps
Fig. 33: Conversation details
Datasets and Documents can be accessed from the *Data* menu of the navigation bar. The *Maps* menu lets you filter only maps in the available resource. This applies to other existing menu items like *GeoStories*.

**Note:** *GeoStories* and *Dashboards* In the screenshot below are GeoApp resource types which are added by the client.

![Data menu](image)

**Fig. 34:** *Data menu*

### Documents

GeoNode allows to publish tabular and text data and to manage metadata and associated documents. Documents can be uploaded directly from your disk (see *Upload/Add Documents* for further information). The following documents types are allowed: `txt`, `log`, `doc`, `docx`, `ods`, `odt`, `sld`, `qml`, `xls`, `xlsx`, `xml`, `bm`, `bmp`, `dwg`, `dxf`, `gif`, `jpg`, `jpeg`, `png`, `tif`, `tif`, `pmb`, `odp`, `ppt`, `pptx`, `pdf`, `tar`, `tgz`, `rar`, `gz`, `7z`, `zip`, `aif`, `aiff`, `au`, `mp3`, `mpga`, `wav`, `afl`, `avi`, `avs`, `fli`, `mp2`, `mp4`, `mpeg`, `ogg`, `webm`, `3gp`, `flv`, `vdo`, `glb`, `pcd`, `gltf`. Through the document detailed page is possible to view, download and manage a document.
Datasets

Datasets are a primary component of GeoNode. Datasets are publishable resources representing a raster or vector spatial data source. Datasets also can be associated with metadata, ratings, and comments.

By clicking the Datasets link you will get a list of all published datasets. If logged in as an administrator, you will also see the unpublished datasets in the same list. GeoNode allows the user to upload vector and raster data in their original projections using a web form.

Vector data can be uploaded in many different formats (ESRI Shapefile, KML and so on…). Satellite imagery and other kinds of raster data can be uploaded as GeoTIFFs.

Maps

Maps are a primary component of GeoNode. Maps are comprised of various datasets and their styles. Datasets can be both local datasets in GeoNode as well as remote datasets either served from other WMS servers or by web service datasets such as Google or MapQuest.

GeoNode maps also contain other information such as map zoom and extent, dataset ordering, and style. You can create a map based on uploaded datasets, combine them with some existing datasets and a remote web service dataset, share the resulting map for public viewing. Once the data has been uploaded, GeoNode lets the user search for it geographically or via keywords and create maps. All the datasets are automatically reprojected to web mercator for maps display, making it possible to use popular base maps such as OpenStreetMap.

Finding Data

This section will guide you to navigate GeoNode to find datasets, maps and documents and other resource types by using different routes, filters and search functions. On every page you can find some quick search tool.

The Search box in the navigation bar (see the picture below) let you type a text and find all the data which have to deal with that text.

Fig. 35: Search tool in GeoNode welcome page

When you trigger a search you are brought to the Search page which shows you the search result through all data types.
This page contains a wealth of options for customizing a search for various information on GeoNode. This search form allows for much more fine-tuned searches than the simple search box is available at the top of every page. It is possible to search and filter data by Text, Types, Categories, Keywords, Owners, Regions or Extent.

Try to set some filter and see how the resulting data list changes accordingly. An interesting type of filter is EXTENT: you can apply a spatial filter by moving or zooming a map within a box as shown in the picture below.

Data can be ordered by Most recent, Less recent, Name and Popularity.

For Users see Viewing other users information.

### 1.10.4 Managing Documents

In this section all the aspects concerning Documents will be discussed.

You will learn how to upload a document and how to inspect its metadata and details. All the editing tools will be also explained.
Fig. 37: Search filter by EXTENT
Fig. 38: Ordering Data
Upload/Add Documents

GeoNode allows to share reports, conceptual notes, posters, spreadsheets, etc. A wide range of documents files can be hosted on the platform, including text files (.doc, .docx, .txt, .odt), spreadsheets (.xls, .xlsx, .ods), presentations (.ppt, .pptx, .odp), images (.gif, .jpg, .png, .tif, .tiff), PDF, zip files (.rar, .zip, .gz), SLD, XML, QML files or as External URL.

**Warning:** Only authenticated users can upload data into GeoNode.

Documents uploading is accessible by clicking *Create new* which displays a list including *upload document link*:

![Document Upload link](image)

**Fig. 39: Document Upload link**

The *Document Upload* page looks like the one shown in the picture below.

On GeoNode documents can be:

- Upload from the **Local file**
- Created with reference to **External URL**

In order to upload a document from the **Local file**, you need to:

1. Click on *Select files* button
2. Select a file from your disk.
3. Click the *Upload* button

A document may refer to a remote document, without making a local copy of the remote resource. To add a document that references an **External URL** you need to:
Fig. 40: Document Upload page
Fig. 41: Upload document from the select files option
1. Click on *Add URL* button
2. Select an URL
3. Select an extension from the drop-down menu
4. Click the *Upload* button

![Add document from the add URL option](image)

At the end of the uploading process, by clicking on the View button, you will be driven to the document page with the Info panel open. Here it is possible to view more info, edit metadata, share, download, and delete the document. See the next section to know more about Metadata.

**Note:** If you get the following error message:

*Total upload size exceeds 100.0 MB. Please try again with smaller files.*

This means that there is an upload size limit of 100 MB. An user with administrative access can change the upload
Filling the Document Metadata

You can open the Metadata form by clicking on the Edit link in the document details menu and then Edit Metadata Link.

Metadata contains all the information related to the document: they are its ID card. They provide essential information for its identification and its comprehension. Metadata also make the document more easily retrievable through search by other users.

Editing a document’s metadata is done in three steps (Basic Metadata, Location and Licenses, Optional Metadata). The first two steps are mandatory (no documents will be published if the required information are not provided) whereas the last one is optional.

1. On the Basic Metadata page, the essential information that has to be filled is:
   - Title of the document, which should be clear and understandable;
   - Abstract of the document;
   - Creation/Publication/Revision dates which define the time period that is covered by the document;
   - Keywords, which should be chosen within the available list. The contributor search for available keywords by clicking on the searching bar, or on the folder logo representing, or by entering the first letters of the desired word. Key-words should be relevant to the imported document;
   - Category in which the document belongs;
   - Group to which the document is linked.

   Once all the fields are filled, click on the blue button Next >> in the bottom right corner of the page.

2. On the Location and Licenses page, the following information should be filled:
   - Language of the document;
   - Regions, which informs on the spatial extent covered by the document. Proposed extents cover the following scales: global, continental, regional, national;
### Metadata for single_point.txt

<table>
<thead>
<tr>
<th>Basic Metadata</th>
<th>Location and Licenses</th>
<th>Optional Metadata</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td><strong>Date</strong></td>
<td></td>
</tr>
<tr>
<td>single_point.txt</td>
<td>Creation</td>
<td></td>
</tr>
<tr>
<td><strong>Link to</strong></td>
<td><strong>Date type</strong></td>
<td></td>
</tr>
<tr>
<td>Select an option</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Abstract</strong></td>
<td><strong>Category</strong></td>
<td></td>
</tr>
<tr>
<td>File Edit View Insert Format Tools Table Help</td>
<td></td>
<td><em>Field declared Mandatory by the Metadata Schema</em></td>
</tr>
</tbody>
</table>

**Group**

**Free-text Keywords**

![Metadata for single_point.txt](image)

**Fig. 44: Document Basic Metadata**
- *Data Quality statement* (general explanation of the data producer’s knowledge about the lineage of a dataset);
- Potential *Restrictions* to sharing the document should be provided in the Restrictions box.

Click on the blue button *Next >>* to go ahead to the next step.

3. On the **Optional Metadata** page, complementary information can be added:
   - *Edition* to indicate the reference or the source of the document;
   - *Purpose* of the document and its objectives;
   - *Supplemental information* that can provide a better understanding of the uploaded document;
   - *Maintenance frequency* of the document;
   - *Spatial representation type* used.
   - *Related resources* to link one or multiple resources to the document. These will be visible inside the *Document Information* panel.

*Responsible Parties, Owner* and *Share options* are listed on the right side of the page, you can edit them.

If all the mandatory information is filled out the document can be published, if not the Completeness progress bar warns you that something is missing.
Fig. 46: Document Optional Metadata
Click on the blue button *Update* to save information on the system.

**Document Information**

From the *Documents Search Page* (see *Finding Data*) you can select the document you are interested in and click on its name to see an overview about it.

![Document Information](image)

The information panel reports:

- The **Info** tab is active by default. This tab section shows some document metadata such as its title, the abstract, date of publication etc. The metadata also indicates the document owner, what are the topic categories the document belongs to and which regions are affected.

- The **Location** tab shows the spacial extent of the document.

By clicking on the copy icons you have a copy of the current *Bounding Box* or the *Center* in the clipboard which once pasted will be a WKT text.

**Warning:** From the *Document Information* the *Location* tab is in read only mode, to edit it see the *Document Editing*

- The **Linked Resources** tab shows the resources, that can be *Datasets, Maps, GeoStories* and *Dashboards*, linked to the document.

**Note:** When a resource is *linked from* the document the link is under the *Linked by* list while when a resource is *linked to* the document the link is under the *Used by* list.
Fig. 47: Document Information tab
Fig. 48: Document Location tab

Fig. 49: Bounding Box and Center
Fig. 50: Document Linked Resources tab

Warning: From the document metadata it is possible edit the document Linked Resources

From the right toolbar on the Info panel it is possible:

- Add document in your Favorites (see Updating the Profile), clicking on star icon.
- Directly Download the document oh ShapeFile format
- Share the document url
- Change the document Title by clicking on it

You can access the document details page by clicking on View document in the overview panel. That page looks like the one shown in the picture below.
On the page of a document, the resource is either directly displayed on the page or accessible by clicking on the link provided under the title.

Exploring the Document detail menu Sections

As soon as a document is opened, the Info panel is shown. It reports the document metadata such as its title, abstract, date of publication etc. The metadata also indicates the user who is responsible for uploading and managing this content, as well as the group to which it is linked.

Through the View, it should look as follows.

button it is possible to visualize the metadata of the document

The Share, it should look as follows.

link provides the document link to share.

Fig. 53: Document Sharing

If you want to download the document, click on the Download, it should look as follows.

link in the menu and the document will be downloaded automatically.

Fig. 54: Document Metadata download
Document Editing

The Document Information page makes available useful menu for document editing. Click on the Edit link then Edit Metadata to see editing forms.

Setting the Document Thumbnail

From the Metadata Form, it is possible to Set the Thumbnail of the document. Click on Choose file to open the Thumbnail Uploading page and chose the image that will illustrate your document. Once this is done, click on the ok button and save. If the thumbnail has been successfully uploaded you can see it by coming back to the document list.

Fig. 55: Upload Document’s Thumbnail

If no errors occur, the new selected thumbnail will be shown.
Editing the Document Metadata

You can edit the metadata of your document as described in the *Filling the Document Metadata* section or by using the *Advanced Metadata* option below.

The *Advanced Metadata* button takes you to a big form where all the available metadata of the document can be edited. Some information are mandatory such as the *Title* or the *Category* the document belongs to, some others are optional.

In the example shown in the picture above, the information inside the red rectangles have been changed. To save the changes click on *Update*, you will be redirected to the document page.
Editing the Document Info

You can edit the information of your document by clicking on the *Info* button.

From the Info panel, it is possible to upload the **Thumbnail** of the document.

![Fig. 58: Upload Thumbnail](image)

If you want this document in your **Favorites** (see *Updating the Profile*), click on the start icon.

![Fig. 59: Favorite document](image)

You can directly **Download** the document and **Share** the document url by clicking the buttons on the top-right of the panel.

By clicking the document **Title**, you can change it.

From the **Locations** tab, you can manage the spacial extent of the document.
Fig. 60: Share and Download document

Fig. 61: Document Title

Fig. 62: Document Title
Here numerical fields and a map show the spatial extent (WGS 84) for the document and you can edit it by Shift+click and drag to draw the new extent on the map and change its location by clicking the marker and drag.

Fig. 63: Document Title

Note: The Location tab is also available for Dashboard and GeoStory

Share Options

GeoNode encourages to publicly, share and make available for download information uploaded on the platform. By default, anyone can see and download a document. However, the document responsible can choose to limit access to the document to some contributors and/or groups.

Through the Share Link shown in the menu it is possible to manage the document share options. It opens a form where set up who can:

- None (the document is not visible).
- View Metadata (allows to view the document).
- View and Download (allows to view and download the document).
- Edit (allows to change the document metadata and attributes).
- Manage it (allows to update, delete, change share options, publish/unpublish).
See an example in the picture below.

**Note:** After making changes, always save them with the *Save* Link in the menu

Usually those with options of editing metadata and the management of a document are in charge and responsible of the document, i.e. the contributor who uploaded it has those options by default.

Once the share options are set, click *Save* link in the menu to save them.

**1.10.5 Managing Datasets**

Datasets are published resources representing raster or vector spatial data sources. Datasets can also be associated with metadata, ratings, and comments.

In this section, you will learn how to create a new dataset by uploading a local data set, add dataset info, change the style of the dataset, and share the results.

**Datasets Uploading**

The most important resource type in GeoNode is the *Dataset*. A dataset represents spatial information so it can be displayed inside a map.

To better understand what we are talking about lets upload your first dataset.

The *Dataset Uploading* page can be reached from the *Upload dataset* link of the *Add Resource* menu above the resources list page.
Fig. 64: Changing the Document share options

Fig. 65: Link for Datasets Uploading
The *Datasets Uploading* page looks like the one in the picture below.

![Datasets Uploading page](image)

**Fig. 66: The Datasets Uploading page**

Through the *Select files* button you can select files from your disk, make sure they are valid raster or vector spatial data, then you can click to *Upload* button.

A progress bar shows the operation made during the dataset upload and alerts you when the process is over.

In this example the ne_10m_airports2 ESRI Shapefile, with all its mandatory files (*shp*, *shx*, *dbf* and *prj*), has been chosen. When the process ends click on *View* button.

**Note:** There are lot of free spatial dataset available in the Internet. In this example, an extract of the Berlin city center roads map from the BBBike extracts OpenStreetMap dataset has been used.

In the next paragraphs you will learn how to create a dataset from scratch, how to set share options, how to explore the dataset properties and how to edit them.

**Note:** If you get the following error message:

*Total upload size exceeds 100.0 MB. Please try again with smaller files.*

This means that there is an upload size limit of 100 MB. An user with administrative access can change the upload size limits at the *admin panel for size limits*.

Similarly, for the following error message:

*The number of active parallel uploads exceeds 5. Wait for the pending ones to finish.*

You can modify the upload parallelism limits at the *admin panel for parallelism limits.*
Fig. 67: *Upload dataset*

Fig. 68: *Dataset uploading finished*
Creating a Dataset from scratch

An interesting tool that GeoNode makes available to you is the *Create dataset*. It allows you to create a new vector dataset from scratch. The *Dataset Creation Form* is reachable through the *Create dataset* link shown in the picture below.

![Create dataset link](image)

Fig. 69: *Create dataset link*

In order to create the new Dataset you have to fill out the required fields:

- **Name**
- **Title**
- **Geometry type**

![Geometry types](image)

Fig. 70: *Geometry types*

Usually the datasets features should have some **Attributes** that enrich the amount of information associated with each of them. Through the *Add Attribute* button you can add new attributes.

Once the form has been filled out, click on *Create*. You will be redirected to the *Dataset Page* (see *Dataset Information*). Now your Dataset is created but is still empty, no features have been added yet. See the *Dataset Editing* section to learn how to add new features.
Create an empty dataset

Dataset name
my_dataset

Dataset title
My Dataset

Geometry type
Points

Add Attribute

Name

String

Remove

Image

String

Remove

Create

Fig. 71: New Dataset creation from scratch
Using Remote Services

In GeoNode you can add new datasets not only by loading them from your disk but also using Remote Services. In this section you will learn how to add a new service and how to load resources in GeoNode through that.

Let’s try it!

Click on the Remote Services link of the Add Resource menu in the navigation bar.

The page that opens will contain the list of the available services.

To configure a new service:

- click on Add Remote Service
- type the Service URL
- select the Service Type
- click on Create

GeoNode supports four types of remote services:

- **Web Map Service**
  
  Generic Web Map Service (WMS) based on a standard protocol for serving georeferenced map images over the Internet. These images are typically produced by a map server (like GeoServer) from data provided by one or more distributed geospatial databases. Common operations performed by a WMS service are: GetCapabilities (to retrieves metadata about the service, including supported operations and parameters, and a list of the available datasets) and GetMap (to retrieves a map image for a specified area and content).

  **Note:** Lots of WMS services are available on the internet, in this example we used the https://demo.geo-solutions.it/geoserver/wms.

- **GeoNode Web Map Service**

  Generally a WMS is not directly invoked; client applications such as GIS-Desktop or WEB-GIS are used that provide the user with interactive controls. A GeoNode WMS automatically performs some operations and lets you to immediately retrieve resources.
Remote Services

<table>
<thead>
<tr>
<th>Title</th>
<th>URL</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>GeoServer Web Map Service</td>
<td><a href="https://portal.irc.gob.gt/geoserver/wms">https://portal.irc.gob.gt/geoserver/wms</a></td>
<td>Web Map Service</td>
</tr>
<tr>
<td>GeoServer Web Map Service</td>
<td><a href="https://demo.geo-solutions.it/geoserver/wms">https://demo.geo-solutions.it/geoserver/wms</a></td>
<td>Web Map Service</td>
</tr>
<tr>
<td>Maps Base de España</td>
<td><a href="https://www.ign.es/wms-inspire/ign-base">https://www.ign.es/wms-inspire/ign-base</a></td>
<td>Web Map Service</td>
</tr>
<tr>
<td>World Imagery</td>
<td><a href="https://server.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer">https://server.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer</a></td>
<td>ArcGIS REST MapServer</td>
</tr>
<tr>
<td>USA Topo Maps</td>
<td><a href="http://services.arcgisonline.com/arcgis/rest/services/USA_Topo_Maps/MapServer">http://services.arcgisonline.com/arcgis/rest/services/USA_Topo_Maps/MapServer</a></td>
<td>ArcGIS REST MapServer</td>
</tr>
<tr>
<td>USA Topo Maps</td>
<td><a href="http://services.arcgisonline.com/arcgis/rest/services/USA_Topo_Maps/MapServer/0">http://services.arcgisonline.com/arcgis/rest/services/USA_Topo_Maps/MapServer/0</a></td>
<td>ArcGIS REST MapServer</td>
</tr>
</tbody>
</table>

Fig. 73: Remote Services

Service Type

- Web Map Service
- GeoNode (Web Map Service)
- ArcGIS REST MapServer
- ArcGIS REST ImageServer

Fig. 74: Service Types
Note: An example of GeoNode WMS is available at http://dev.geonode.geo-solutions.it/geoserver/wms.

• **ArcGIS REST MapServer**

  This map service provides basic information about the map, including the datasets that it contains, whether the map is cached or not, its spatial reference, initial and full extents, whether the service is allowed to export tiles and max tiles export count, etc. A set of operations that manage the state and contents of the service are allowed: Edit Service, Refresh, Update Tiles. The URL should follow this pattern: https://<servicecatalog-url>/services/<serviceName>/MapServer.

  Note: Try the following service to better understand how it works: https://sampleserver6.arcgisonline.com/arcgis/rest/services/USA/MapServer.

• **ArcGIS REST ImageServer**

  This Image Server allows you to assemble, process, analyze, and manage large collections of overlapping, multi-resolution imagery and raster data from different sensors, sources, and time periods. You can also publish dynamic image services that transform source imagery and other raster data into multiple image products on demand—without needing to preprocess the data or store intermediate results—saving time and computer resources. In addition, ArcGIS Image Server uses parallel processing across multiple machines and instances, and distributed storage to speed up large raster analysis tasks. The URL should follow this pattern: https://<servicecatalog-url>/services/<serviceName>/ImageServer.

  Note: Try the following service to better understand how it works: https://sampleserver6.arcgisonline.com/arcgis/rest/services/Toronto/ImageServer.

Once the service has been configured, you can load the resources you are interested in through the **Import Resources** page where you will be automatically redirected to.

From the page where the services are listed, it is possible to click on the **Title** of a service. It opens the **Service Details** page.

Each service has its own metadata such as the **Service Type**, the **URL**, an **Abstract**, some **Keywords** and the **Contact user**.

You can edit those metadata through the form available from the **Edit Service Metadata** link of the **Service Details** page (see the picture below).

**Share Options**

In order to modify the Dataset **Share options** settings, on the detail page of the dataset click the **Share** link in the menu. By default only owners can edit and manage datasets, anyone can view them.

Through the **Share options Settings Panel** you can add or remove options for users and groups. The picture below shows an example.

You can set the following share options:

- **View** (allows to view the dataset).
- **Download** (allows to view and download the dataset).
Edit (allows to change the dataset metadata, change attributes and properties of the datasets features and change the dataset style).

Manage (allows to update, delete, change share options, publish and unpublish the dataset).

Warning: When assigning options to a group, all the group members will have those options. Be careful in case of editing them.

Click on Save link in the menu to save these settings.

**Dataset Information**

From the *Dataset Search Page* (see *Finding Data*) you can select the dataset you are interested in and click on its name to see an overview about it.

The information panel reports:

- The *Info* tab is active by default. This tab section shows some dataset metadata such as its title, the abstract, date of publication etc. The metadata also indicates the dataset owner, what are the topic categories the dataset belongs to and which regions are affected.

- The *Location* tab shows the spatial extent of the dataset.

By clicking on the copy icons you have a copy of the current *Bounding Box* or the *Center* in the clipboard which once pasted will be a WKT text.

- The *Attributes* tab shows the data structure behind the dataset. All the attributes are listed and for each of them some statistics (e.g. the range of values) are estimated (if possible).
Fig. 76: Change Dataset Share options
Fig. 77: Dataset Share options settings for users and groups
Fig. 78: Dataset Info tab
Fig. 79: Dataset Location tab
Fig. 80: Bounding Box and Center

Fig. 81: Dataset Attributes tab
• The Linked Resources tab shows the resources, that can be Documents, Maps, GeoStories and Dashboards, linked to the dataset.

![Dataset Linked Resources tab](image)

**Fig. 82: Dataset Linked Resources tab**

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**Note:** When a resource is linked from the dataset the link is shown under the *Linked by* list while when a resource is linked to the dataset the link is shown under the *Used by* list.

From the right toolbar on the Info panel it is possible:

- Add dataset in your Favorites (see Updating the Profile), clicking on star icon.
- Directly Download the dataset oh ShapeFile format
- Share the dataset url
- Copy the WMS Capabilities url
- Change the dataset Title by clicking on it

You can access the dataset details page by clicking on View dataset in the overview panel. That page looks like the one shown in the picture below.
Fig. 84: *Dataset page*

**Downloading Datasets**

At the top of the *Dataset Menu* there is a *Download* link where it is possible to download:

- Dataset
- ISO Metadata
- Dublin Core Metadata

Clicking the *ISO Metadata* or the *Dublin Core Metadata* exports the layer metadata in *xml* format.

Fig. 85: *Downloading Metadata*

Open the *Dataset* option you will be able to select from a list of options of the supported export file formats.
As shown in the image above, GeoNode allows you to download a subset of data. Click on *Download filtered dataset* to download filtered data.

On clicking Export, the file is prepared and a notification is showed when file is ready.

To download the file to your machine, click on the export dataset icon. This opens the prepared export files and you can save the files on your by clicking on the save icon on each item.

**Printing**

The [MapStore](https://www.geonode.org) based map viewer of GeoNode allows you to print the current view with a customizable layout. Click the *Print* option from the *Menu*, the **Printing Window** will open.

From this window you can:

- enter *Title* and *Description*;
- choose the *Resolution* in dpi;
- select the format
- select the coordinate
- add the scale
- add grid with label
- customize the *Layout*
  - the *Sheet size* (A3, A4);
Fig. 87: Export Ready

Fig. 88: *Export Results Icon*
Fig. 89: The Printing Window
– if include the legend or not;
– if to put the legend in a separate page;
– the page Orientation (Landscape or Portrait);

• customize the Legend
  – the Label Font;
  – the Font Size;
  – the Font Emphasis (bold, italic);
  – if Force Labels;
  – if use Anti Aliasing Font;
  – the Icon Size;
  – the Legend Resolution in dpi.

To print the view click on Print.

Performing Measurements

Click on the Measure option of the Menu to perform a measurement. As you can see in the picture below, this tool allows you to measure Distances, Areas and the Bearing of lines.

Fig. 90: The Measure Tool
Dataset Editing

The *Edit* link in the menu of the *Dataset Page* opens a list of options like ones shown in the picture below.

![Fig. 91: Dataset Editing Link](image)

In that options list, you can see three options listed as:

1. *Edit Info*
2. *Edit Data*
3. *Edit Styles*
4. *Edit Metadata*
5. Upload Style
6. Upload Metadata

In this section you will learn how to edit a *Dataset*, and its data. See *Datasets Metadata* to learn how to explore the dataset *Metadata*, how to upload and edit them. The *Styles* will be covered in a dedicated section, see *Dataset Styling*.

**Editing the Dataset Data**

The *Edit data* link of the *Dataset Editing* options opens the *Dataset* within a *Map*.

The *Attribute Table* panel of the *Dataset* will automatically appear at the bottom of the *Map*. In that panel all the features are listed. For each feature you can zoom to its extent by clicking on the corresponding *magnifying glass* icon at the beginning of the row, you can also observe which values the feature assumes for each attribute.

Click the *Edit Mode* button to start an editing session.

Now you can:

- **Add new Features**

  Through the *Add New Feature* button, it is possible to set up a new feature for your dataset. Fill the attributes fields and click to save your change. Your new feature doesn’t have a shape yet, click on to draw its shape directly on the *Map* then click on to save it.

  **Note:** When your new feature has a multi-vertex shape you have to double-click the last vertex to finish the drawing.
Fig. 92: *Editing the Dataset Data*
Fig. 93: Create New Feature
• **Delete Features**

If you want to delete a feature you have to select it on the Attribute Table and click on ![Delete](delete_icon.png).

• **Change the Feature Shape**

You can edit the shape of an existing geometry dragging its vertices with the mouse. A blue circle lets you know what vertex you are moving.

Features can have *multipart shapes*. You can add parts to the shape when editing it.

• **Change the Feature Attributes**

When you are in *Edit Mode* you can also edit the attributes values changing them directly in the corresponding text fields. You can achieve this by going into the edit mode and double click in the values.

Once you have finished you can end the *Editing Session* by clicking on the ![Back](back_icon.png).

By default the GeoNode map viewer is MapStore based, see the MapStore Documentation for further information.

**Datasets Metadata**

In GeoNode special importance is given to *Metadata* and their standard formats.

**Editing Metadata**

Metadata contains all the information related to the dataset. They provide essential information for its identification and its comprehension. Metadata also make the dataset more easily retrievable through search by other users.

The Metadata of a dataset can be changed through a *Edit Metadata* form which involves four steps, one for each type of metadata considered:

You can open the *Metadata* form of a Dataset by clicking the *Edit Metadata* link from the *Edit* options on the Dataset Page.

• **Basic Metadata**

The first two steps are mandatory (no datasets will be published if the required information are not provided) whereas the last two are optional.

In the first step the system asks you to insert the following metadata:

— *Thumbnail* of the dataset (click *Edit* to change it);
— *Title* of the dataset, which should be clear and understandable;
— *Abstract*: brief narrative summary of the content of the dataset

**Note**: The *Abstract* panel allows you to insert HTML code through a *wysiwyg* text editor

— *Creation/Publication/Revision Dates* which define the time period that is covered by the dataset;
— *Keywords*, which should be chosen within the available list. The contributor search for available keywords by clicking on the searching bar, or on the folder logo representing, or by entering the first letters of the desired word;
— *Category* which the dataset belongs to;
Fig. 94: Basic Dataset Metadata
• Group which the dataset is linked to.

• Location and Licenses

The following list shows what kinds of metadata you are required to enter (see also the picture below):

– Language of the dataset;
– License of the dataset;
– DOI of the dataset; if available, this represents the Digital Object Identifier of the resource
– Attribution of the dataset; authority or function assigned, as to a ruler, legislative assembly, delegate, or the like
– Regions, which informs on the spatial extent covered by the dataset. Proposed extents cover the following scales: global, continental, regional, national;
– Data Quality statement (general explanation of the data producer’s knowledge about the lineage of a dataset);
– Potential Restrictions on dataset sharing.

Note: The Data Quality statement and Restrictions panels allow you to insert HTML code through a wysiwyg text editor

• Optional Metadata

Complementary information are:
Fig. 96: Optional Dataset Metadata
– Edition to indicate the reference or the source of the dataset;
– Purpose of the dataset and its objectives;
– Supplemental information that can provide a better understanding of the uploaded dataset;
– Maintenance frequency of the dataset;
– users who are Responsible for the dataset, its Owner, and the Author of its metadata;
– Spatial representation type used.
– Related resources to link one or multiple resources to the document. These will be visible inside the Dataset Information panel

**Note:** The Purpose and Supplemental information panels allow you to insert HTML code through a wysiwyg text editor

**Dataset Attributes**

![Metadata for roads](image)

**Fig. 97: Dataset Attributes Metadata for Dataset**

At this step you can enrich the dataset attributes with useful information like the following:

– The Label displayed
– A detailed Description
– The Display Order
– The Display Type; the default value is Label, which means that the value of the attribute will be rendered as a plain text. There's the possibility to instruct GeoNode to treat the values as different media-types. As an instance, if the values of the selected attribute will contain image urls, by selecting the IMAGE Display Type you will allow GeoNode to render the image directly when querying the dataset from the maps. The same for VIDEO, AUDIO or IFRAME mime types.

– The Visible flag; allows you to instruct GeoNode whether or not hiding an attribute from the Get Feature Type outcomes.

It is possible to define a completely custom HTML template for the Get Feature Type outcome. That is possible by enabling the Use a custom template flag as shown in the figure below.

![Image of GeoNode screen showing metadata for roads]

Fig. 98: Use a custom template

By using the keyword `${properties.<attribute_name>}`, you can tell to GeoNode to render the actual value of the attribute on the map.

As an instance, the example below:

Will render an HTML Table along with values as shown here below

Use next >> or << back to navigate through those steps. Once you have finished click on Update.

Some metadata are mandatory, if you miss any of that metadata the Completeness bar shows you a red message like the one in the picture below.
Fig. 99: Use a custom template: HTML

Fig. 100: Use a custom template: Get Feature Info outcome
Metadata Advanced Editing

In the Edit Metadata page the Advanced Metadata button is also available.

Dataset Styling

Maps are helpful because they allow you gain a deeper understanding of your data by allowing you to visualize it in many different ways. So you can tell different stories depending on how the data is presented. For any given data or dataset, you should explore different styling options and choose the best style for that.

In GeoNode each dataset has one style refered to as a Default Style which is determined by the nature of the data you're mapping. When uploading a new dataset (see Datasets Uploading) a new default style will be associated to it.
Editing the Dataset Style

In order to edit a dataset style, open the Dataset Page (see Dataset Information) and click on Edit. Then click the Edit Style link in the options (see the picture below).

![Edit Styles button](image)

The Dataset will open in a new Map. The Styles Panel will show you all the default style for the dataset and some useful tools. By default, the style will be shown in a text editor form.

![The Styles Panel in the Map](image)

You could continue to change the style with the text editor or switch to a visualized editor using the Visual editor above the text editor.

The visual editor looks like this

You can then edit the style by clicking on each attribute of the style.
Creating Style Rules

In order to create a new rule, Three options are provided.

1. Mark rule
2. Icon rule
3. text rule

Click on any of the buttons below to create a type of style you want.

The rule you have chosen is now added on the top with default attributes which you can edit to your preference*. If the rule has errors, the following will be shown.

You can switch the rule ordering by dragging it to the top or bottom depending on your preference.

It would be nice to change the style in order to decrease the opacity of the filling color as well as to reduce the lines width. The embedded MapStore makes available a powerful Style Editor to accomplish that tasks. In the next paragraph we will explain how.

Each rule has a delete icon on the top right which you can use to remove the rule on the style.

Click on Save on the top to save your changes.

Fig. 105: Visual Styles Panel in the Map
Fig. 106: *Create new rule buttons*

Fig. 107: *New style*
Advanced Dataset Management with MapStore

GeoNode provides the user with some advanced features for dataset manipulation such as dataset filtering, attribute edition and dataset export in different formats. In a nutshell, these feature are provided via MapStore and we will redirect the user to MapStore specific documentation for further details.

Filtering Datasets

With GeoNode you can filter a dataset via it’s attributes, direct map filter by drawing an area of interest over the map canvas and via cross-dataset filter, allowing intersection, contained and contains overlay methods. For more detail please check the MapStore documentation here.
1.10.6 Managing Maps

Maps are sets of datasets displayed together on an interactive web map. Maps can be composed in the map composer and saved as GeoNode resources. Maps can also be associated with metadata, ratings, and comments.

In this section, you will learn how to create a new map and share it.

Creating Maps

In this section, we’ll create a Map using some uploaded datasets, combine them with some other datasets from remote web services, and then share the resulting map for public viewing.

In order to create new maps you can use:

- The Create map listed after clicking the Create new link on the menu above the resources list page.

![Fig. 109: The Create Map link](image)

- The Create map link in the Dataset Page (it creates a map using a specific dataset)

![Fig. 110: The Create map link from dataset](image)

The new Map will open in a Map Viewer like the one in the picture below.

Using the Add dataset link, you can add a layer by clicking on one of the layers listed in the catalog. In the upper left corner the TOC button button opens the Table of Contents (TOC) of the Map. It allows to manage all the datasets associated with the map and to add new ones from the Add dataset. The TOC component makes possible to manage datasets overlap on the map by shifting their relative positions in the list (drag and drop them up or down in the list). It also allows to hide/show datasets (and ), to zoom to datasets extents ( ) and to manage their properties ( ). Once the map datasets have been settled it is possible to save the Map by clicking on the Save as link in the map toolbar.
If you followed the steps above, you have just created your first Map. Now you should see it in the Explore Maps page, see Map Information for further details.

We will take a closer look at the Map Viewer tools in the Exploring Maps section.

Map Information

From the Map Search Page (see Finding Data) you can select the map you are interested in and click on its name to see an overview about it.

The information panel reports:

- The Info tab is active by default. This tab section shows some map metadata such as its title, the abstract, date of publication etc. The metadata also indicates the map owner, what are the topic categories the map belongs to and which regions are affected.

- The Location tab shows the spacial extent of the map.

By clicking on the copy icons you have a copy of the current Bounding Box or the Center in the clipboard which once pasted will be a WKT text.

- The Linked Resources tab shows resources, that can be Documents, Datasets, GeoStories and Dashboards, linked to the map.

Note: When a resource is linked from the map the link is shown under the Linked by list while when a resource is linked to the map the link is shown under the Used by list.

From the right toolbar on the Info panel it is possible:

- Add map in your Favorites (see Updating the Profile), clicking on star icon.
Fig. 112: Map Info tab
Map

a map from admin / September 29th 2023

<table>
<thead>
<tr>
<th>Info</th>
<th>Location</th>
<th>Linked Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bounding Box (WGS84)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min Lat</td>
<td>-90.000000</td>
<td></td>
</tr>
<tr>
<td>Min Lon</td>
<td>-180.000000</td>
<td></td>
</tr>
<tr>
<td>Max Lat</td>
<td>90.000000</td>
<td></td>
</tr>
<tr>
<td>Max Lon</td>
<td>180.000000</td>
<td></td>
</tr>
<tr>
<td>Center (WGS84)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lat</td>
<td>0.000000</td>
<td></td>
</tr>
<tr>
<td>Lon</td>
<td>0.000000</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 113: Map Location tab
Fig. 114: Bounding Box and Center

Fig. 115: Map Linked Resources tab
Fig. 116: Map Info toolbar

- Share the map url
- Change the map Title by clicking on it

You can access the map details page by clicking on View map in the overview panel. That page looks like the one shown in the picture below.

Fig. 117: Map page

The Map Viewer shows the map with very basic functionalities:

- the Base Map Switcher that allows you to change the base map;
- the Zoom in/out tool to enlarge and decrease the view;
- the Zoom to max extent tool for the zoom to fit the datasets extents;
- the Query Objects tool to retrieve information about the map objects by clicking on the map;
- the Print tool to print the preview.
- the Measure tool to measure Distances, Areas and the Bearing of lines.
- the Annotations tool to add an annotation to the map
Maps Metadata

Maps Metadata can be Edited by clicking the Edit Metadata link from the Map Detail page.

Fig. 118: The Map Metadata Detail link

The Map Metadata Edit form will open. Metadata provide essential information for the identification and the comprehension of the map. They also make the map more easily retrievable through the search tools. Those Metadata can be filled out through three-steps in which you have to provide all mandatory information to complete the process. Those three steps are described below.

- **Basic Metadata**

Fig. 119: Basic Map Metadata

In the first step the system asks you to insert the following metadata (required fields are highlighted with red outlines):

- **Thumbnail** of the map (click Edit to change it);
– Title of the map, which should be clear and understandable;
– Abstract; brief narrative summary of the content of the Map

**Note:** The Abstract panel allows you to insert HTML code through a wysiwyg text editor

– Creation/Publication/Revision Dates which define the time period that is covered by the map;
– Keywords, which should be chosen within the available list;
– Category which the map belongs to;
– Group which the map is linked to.

Click Next >> to go to the next step.

- Location and Licenses

**Fig. 120: Location and Licenses Metadata for Maps**

The following list shows what kinds of metadata you are required to enter (see also the picture below):

– Language of the layer;
– License of the dataset;
– Regions covered by the layers extent. Proposed extents cover the following scales: global, continental, regional, national;
– Data Quality statement (general explanation of the data producer’s knowledge about the lineage of a dataset);
– Potential *Restrictions* on layer sharing.

No further mandatory metadata are required in the next step so, once the required fields have been filled out, a green *Done* button will be visible in the screen. Click Next >> to go to the next step or << Back to go back to the previous step.

- **Optional Metadata**

![Optional Map Metadata](image)

**Fig. 121: Optional Map Metadata**

Complementary information are:

- *Edition* of the map;
- *Purpose* of the map and its objectives;
- *Supplemental information* that can provide a better understanding of the map;
- *Maintenance frequency* of the map;
- *Spatial representation type*, the method used to represent geographic information in the dataset;
- Users who are *Responsible* for the layer, its *Owner*, and the *Author* of its metadata;
- *Related resources* to link one or multiple resources to the document. These will be visible inside the *Map Information* panel

If you miss some mandatory metadata the *Completeness* bar shows you a red message like the one in the picture below.
Metadata Advanced Editing

The Advanced Metadata editing button in the Metadata Edit form allows to change the map metadata.

Click on it to display the Metadata Advanced Editing Page. That page allows you to edit all the map metadata described in the previous paragraph.

Once you have finished to edit them click on Update to save your changes.

Share Options

In GeoNode the share options management system is indeed more complex. Administrators can choose who can do what for each map. Users can manage only the maps they own or the maps which they are authorize to manage.

By default only owners can edit and manage maps, and anyone can view them.

In order to modify the Map Share Options settings you can click the Share link in the Map Detail Page.

Through the Share Options Settings Panel you can add or remove options for users and groups. The picture below shows an example.

You can set the following options:

- View (allows to view the map).
- Download (allows to view and download the map).
- Edit (allows to change the map’s metadata);
- Manage allows to update, delete, change share options, publish and unpublish the map.
Warning: When assigning options to a group, all the group members will have that option. Be careful in case of editing them.

Click on Save link in the menu to save these settings.

Exploring Maps

In this section, we are going to explore all tools provided on the Map View page. From the list of available maps, you can select the map you are interested in and click View map, The map view will look like this.

The Map Viewer (based on MapStore) provides the following tools:

- the Table of Contents (TOC) to manage the map contents;
- the Basemap Switcher to change the basemap (see the next paragraphs);
- the Search Bar to search by location, name and coordinates (see the paragraph below);
- the Other Menu Tools which contains the link to the Print tool, to the datasets Catalog, to the Measure tool and the Annotations tool;
- the Sidebar and its tools such as the Zoom tools and the Get Features Info tool;
- the Footer Tools to manage the scale of the map, to track the mouse coordinates and change the CRS (Coordinates Reference System).
Table of Contents (TOC)

In the upper left corner, click on ☞ to open the Table Of Contents, briefly TOC from now on, of the map. The TOC shows all the datasets involved with the Map and allows to manage their properties and representations on the map.

From the TOC you can:

- manage the datasets Overlap;
- filter the datasets list by typing text in the Filter Datasets field;
- manage the datasets properties such as Opacity (scroll the opacity cursor), Visibility (click on ☰ to make the dataset not visible, click on ☯ to show it on map);
- manage the Dataset Settings, see the next paragraph.

Select a Dataset from the list and click on it, the Dataset Toolbar should appear in the TOC.

The Toolbar shows you many buttons:

- the Zoom to dataset extent button allows you to zoom to the dataset extent;
- the Filter layer button that acts directly on a layer with WFS available and filter its content;
- the Attribute Table button to explore the features of the dataset and their attributes (more information at Attributes Table);
- the Delete button to delete datasets (click on Delete Dataset to confirm your choice);
- the Widgets button to create Widgets (see Creating Widgets).
Fig. 126: *The Table Of Contents (TOC)*

Fig. 127: *Scrolling the Dataset Opacity*
Fig. 128: The Dataset Toolbar
• the Export data button;
• the Settings button drives you through the dataset settings customization (see the next paragraph);
• the Compare tool button to Swipe or Spy the selected layer
• the Edit Style button;

Managing Dataset Settings

The Dataset Settings panel looks like the one below.

![Dataset Settings Panel](image)

The Dataset Settings are divided in three groups:

1. General settings
2. **Visibility settings**

3. **Style settings**

4. **Tiling settings**

In the **General** tab of the *Settings Panel* you can customize the dataset *Title*, insert a *Description*, change/add the *Dataset Group* and change the *Tooltip content* and the *Tooltip placement*.

The **Visibility** tab where you can Change the *Opacity* of the layer and add the *Visibility limits* to display the layer only within certain scale limits.

```latex
ne_10m_airports2.otjgm1f

> General settings

> Visibility settings

- **Opacity %**
  - 100

- **Visibility limits**
  - Max value (excluded)
  - Min value (included)
  - Select min value
  - Limits type
    - Scale

> Style settings

> Tiling settings
```

Fig. 130: *The Visibility tab on Settings Panel*

The **Style** tab allows you to select the style from the available layer styles and change the *Width* and the *Height* of the *Legend*.

Click on the **Tiling** tab to change the output *Format* of the WMS requests, the *Tile Size* and enable/disable the *Trasparent*, the *Use cache options* and the *Single Tile*. 
Fig. 131: The Style tab on Settings Panel
Fig. 132: The Tiling tab on Settings Panel
Attributes Table

When clicking on the button of the Table of Contents (TOC), the Attributes Table panel opens at the bottom of the Map page.

Fig. 133: The Attributes Table Panel

In that panel you can navigate through the features of the dataset, zoom to their geometries by clicking on the icon and explore their attributes.

The Attribute Tables has a row for each feature belonging to the dataset and a column for each attribute that describes the feature.
Each column has a Filter input field through which you can filter the features basing on some value or expression (depending on the data type of the field).

The Attributes Table panel contains a Toolbar which makes you available some useful functionalities.
Those functionalities are:

- **Edit Mode**
  By clicking on you can start an editing session. It permits you to add new features, to delete or modify the existing ones, to edit geometries. See the Editing the Dataset Data section for further information.

- **Advanced Search**
Fig. 134: Filtering Features by Attribute

Fig. 135: The Attributes Table Toolbar
Click on a new panel opens. That panel allows you to filter features in many different ways. This functionality will be explained in depth in the Advanced Search section.

- **Zoom to page extent**
  Click on to zoom to the page extent.

- **Export Data**
  Click on to open the export/download data form.

- **Hide/show columns**
  When clicking on another panel opens inside the Attributes Table. Through that panel you can choose what columns you want to see.

- **Create a chart**
  Through the button you can open the Chart Widgets panel where many functionalities to describe and visualize the dataset data are available (see Creating Widgets).

- **Sync map with filter**
  Click on the icon to synchronize the map with the filter.

### Advanced Search

As mentioned before, GeoNode allows both an attribute based and spatial filtering. When clicking on from the dataset Attributes Table the Advanced Search panel opens and shows you three different filtering functionalities:

- In the **Attribute Filter** section you can compose a series of conditions about the attributes of the dataset. Click on to insert a new empty condition. Select the attribute you are interested in, select an operator and type a comparison value. You can group conditions through the Add Group button. Click on to perform the search.

  You can also decide if All the conditions have to be met, if only Any or None of them (see the red arrow in the picture above).

- The **Area of interest** filtering allows you to filter features that have some relationship with a spatial region that you draw on the map.
  Select the Filter Type (Circle, Viewport, Polygon or Rectangle), draw the spatial region of interest on the map, select a Geometric Operation (Intersects, Bounding Box, Contains or Is contained) and then click on .

- Through the **Dataset Filter** you can select only those features which comply with some conditions on other datasets of the map. You can also add conditions on attributes for those datasets.

You can read more about the Attributes Table and the Advanced Search on the [MapStore Documentation](#).
Attribute filter

Match **any** of the following conditions:

Area of interest

Filter type

Geometric operation

Layer filter

Target layer

Fig. 136: Advanced Search
Attribute filter

Match all of the following conditions:

- **fid** = 1
- **featurecla** = Airport
- **scalerank** = 37

Area of interest

- Filter type: Select...
- Geometric operation: Intersects

Layer filter

- Target layer: Select layer

Fig. 137: Filtering by Attributes
Fig. 138: Filtering by Area Of Interest

Fig. 139: Dataset Filtering
Creating Widgets

Widgets are graphical elements that describe the datasets data. They can be of different types such as Charts, Texts, Tables and Counters. Through the button of the Table of Contents (TOC) you can open the Widgets panel.

![Select the widget type](image)

Chart

*add a chart*

Text

*add a text area*

Table

*add a table*

Counter

*add a counter*

Fig. 140: Creating Widgets

Chart Widgets

Chart Widgets are graphical representations of the dataset data. They can be Bar Chart, Pie Chart or Line Chart as shown in the picture below.

Lets create a new Bar Chart.

Click on Bar Chart then select the X Attribute, the Y Attribute, the Operation and the Color do you prefer. You can also display the Legend, Hide the Y axis, Hide the grid and decide what Label display into the legend.

Now you can filter the data to be considered for the chart by clicking on We don’t need any filter so click to configure other widget options. Insert a Title and a Description and click on Save.
Select the Chart type

**Bar Chart**
Create a bar chart to add to the map

**Pie Chart**
Create a pie chart to add to the map

**Line Chart**
Create a line chart to add to the map

Fig. 141: *Chart Widgets*
The green icon means that the chart is connected to the viewport.

At the top of the bar chat, there is the options menu of the widget where you can Download graph as png, Zoom the widgets and Reset axes.

**Text Widgets**

If you select Text on the Widgets panel you can create Text Widgets. Add a Title and the desired descriptive text, then click on .

The resulting widget looks like the following.

**Table Widgets**

Through the Table Widgets you can add the Attributes Table of the dataset to the map. You can decide to show a subset of the features, through filters, and you can select one or more columns/attributes.

You can also enter a Title for each column to be displayed as the table header in place of the Name of the layer field and enter a Description for each field to be displayed as a tooltip, visible moving the mouse on the column header. So, choose what attributes you are interested in and click on .

Insert Title and Description (optional) and click on . The example below shows the Table Widget on the map.

**Counter Widgets**

Counter Widgets are numeric representations of some attributes. For example you can represent the average speed limit on a road network.

Click on , insert Title and Description then click on .

The GeoNode map viewer is MapStore based, see the MapStore Documentation for further information.

**Timeline**

GeoNode can manage datasets with a time dimension. Those vector datasets may vary their data through time so it is useful to represent that variation on the map.

The MapStore based map viewer used in Geonode makes available the Timeline tool which allows you to observe the datasets’ evolution over time, to inspect the dataset configuration at a specific time instant and to view different dataset configurations time by time dynamically through animations (see the MapStore Documentation for further details).

**Warning:** Timeline actually works only with WMTS-Multidim extension (WMS time in capabilities is not fully supported).
Fig. 142: Chart Widgets Creation
Fig. 143: Chart Widgets Options

Fig. 144: Text Widgets Creation
Fig. 145: *My Text Widget*

Configure table options

Columns

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>scalerank</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>featurecla</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>type</td>
<td>Point type</td>
<td>type of point of interest</td>
</tr>
<tr>
<td></td>
<td>name</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>abbrev</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>location</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>gps_code</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iata_code</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>wikipedia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig. 146: *Table Widgets Columns*
Fig. 147: Table Widget

Configure data

Use: Select attribute

Operation: Select attribute

Unit of measure:

Fig. 148: Counter Widget Creation
Fig. 149: Counter Widget

Fig. 150: The Timeline
When loading a temporal dataset into the map, the *Timeline* opens automatically.

On the left side of the *Timeline* panel you can set the time value in which you want to observe the data. You can type it directly filling out the corresponding input fields or by using the up/down arrows.

![The Time Control Buttons](image1)

*Fig. 151: The Time Control Buttons*

On the other side there are the buttons responsible for managing the animations. In particular you can *Play* the animation by clicking , go back to the previous time instant through , go forward to next time step using , and stop the animation by clicking .

![The Animation Control Buttons](image2)

*Fig. 152: The Animation Control Buttons*

The *Timeline* panel can be expanded through the button.

![The Expanded Timeline](image3)

*Fig. 153: The Expanded Timeline*

The expanded section of the *Timeline* panel contains the *Time Datasets List* and an *Histogram* which shows you:

- the distribution of the data over time
- the *Time Cursor*
You can show/hide the datasets list by clicking (it is active by default).

Through the *Time Range* function you can observe the data in a finite temporal interval. Click on and set the initial and the final times to use it.

**Animations**

The *Timeline* allows you to see the data configurations (one for each time in which the data are defined) through ordered sequences of steps.

As said before, you can play the resulting *Animation* by clicking the play button. The dataset data displayed on map will change accordingly to the time reach by the cursor on the *Histogram*.

By clicking on you can manage some *Animation Settings*. 

---

**Fig. 154: The Timeline Histogram**

**Fig. 155: The Time Cursor**

**Fig. 156: The Time Range Settings**
Fig. 157: *The Timeline Settings*
You can activate the *Snap to guide dataset* so that the time cursor will snap to the selected dataset’s data. You can also set up the *Frame Duration* (by default 5 seconds).

If the *Snap to guide dataset* option is disabled, you can force the animation step to be a fixed value.

The *Animation Range* option lets you define a temporal range within which the time cursor can move.

![Timeline Animation Range](image)

**Fig. 158: The Timeline Animation Range**

See the MapStore Documentation for more information.

**Other Menu Tools**

At the top of the *Map* there are more menu items which we are going to explain in this section.
Printing a map

The MapStore based map viewer of GeoNode allows you to print the current view with a customizable layout. Click the *Print* option from the *Menu*, the **Printing Window** will open.

From this window you can:

- enter *Title* and *Description*;
- choose the *Resolution* in dpi;
- select the format;
- select the coordinate.

**Fig. 159: The Map Options Menu**

**Fig. 160: The Printing Window**
• add the scale
• add grid with label
• customize the Layout
  – the Sheet size (A3, A4);
  – if include the legend or not;
  – if to put the legend in a separate page;
  – the page Orientation (Landscape or Portrait);
• customize the Legend
  – the Label Font;
  – the Font Size;
  – the Font Emphasis (bold, italic);
  – if Force Labels;
  – if use Anti Aliasing Font;
  – the Icon Size;
  – the Legend Resolution in dpi.

To print the view click on Print.

**Add dataset**

All the datasets available in GeoNode, both uploaded and remote, can be loaded on the map through the Catalog. Click on the Add dataset option of the Menu to take a look at the catalog panel.

You can navigate through datasets and look at their Thumbnail images, Title, Description and Abstract. Click on a dataset to load it into the map, it will be also visible in the Table of Contents (TOC).

**Performing Measurements**

Click on the Measure option of the Menu to perform a measurement. As you can see in the picture below, this tool allows you to measure Distances, Areas and the Bearing of lines.

To perform a measure draw on the map the geometry you are interested in, the result will be displayed on the left of the unit of measure select menu (this tool allows you to change the unit of measure also).
Fig. 161: *The Datasets Catalog*

Fig. 162: *The Measure Tool*
Add an Annotation

Click on the Annotations option of the Menu to enrich the map with special features which expose additional information, mark particular position on the map and so on.

To begin, from the annotation panel, the editor can open the new annotation panel by selecting the button.

From here the editor can insert a Title, a Description and choose between five different types of Geometries:

1. Marker
2. Line
3. Polygon
4. Text
5. Circle

See the MapStore Documentation for more information.

Saving a map

Once all the customizations have been carried out, you can Save your map by clicking on the Save option of the Menu. Click Save again under the Save options.

| You could create a new map from the existing view by clicking Save As... | A new popup window will open.

The current map title is filled by default, You can change it to the preferred naming then click on Save. The page will reload and your map should be visible in the Finding Data list.
Customizing The Datasets’ GetFeatureInfo Templates

When “clicking” over a feature of a dataset into a GeoNode Map, an info window popups showing a formatted representation of the raw data identified by the coordinates (see Fig. 1).

The way how such information is presented to the user is defined by what we call “GetFeatureInfo Template”. The latter is basically an HTML snippet containing some placeholders and special inline codes that instruct GeoServer on how to generate the raw data output.

The outcome is a rendered HTML snippet with the real values replacing the placeholders of the Template.

Currently, GeoNode allows a very simple mechanism to customize the “GetFeatureInfo Template” of a dataset.

It is possible, through the dataset Metadata Editor, to assign a name, a label and also set the attributes we want to display on the GetFeatureInfo output.

As an instance, by using the example above, we can customize a bit the dataset Metadata as shown in Fig. 2.

The “GetFeatureInfo” output will change accordingly as shown in Fig. 3.

Simple Template: Assigning A Media-Type To Attribute Values

The easiest way to render a different media-type (image, audio, video or iframe) to a property value, is to change it from the Metadata Edit attributes panel.

By changing the Display Type of an attribute from this panel as shown in Fig. 4, GeoNode will create automatically the HTML media type when rendering by using the value of the selected property.

So, as an example, if, in the figure above, the attribute NAME contains values representing some links to other resources, GeoNode will create those links automatically for you when clicking over a geometry.

Selecting image as media-type (Fig. 6) and editing the contents accordingly (Fig. 7)
Fig. 165: Add an Annotations

Fig. 166: Saving Maps
Fig. 167: Fig. 1
Fig. 168: Fig. 2

Fig. 169: Fig. 3
Fig. 170: Fig. 4

Fig. 171: Fig. 5

Fig. 172: Fig. 6
you will get a nice effect as shown in Fig. 8

Advanced Template: Use A Custom HTML Template

By selecting the option *Use a custom template?* as shown in Fig. 9

You will be able to provide your own custom HTML Template for the Feature Info output. Attributes from the dataset can be represented inside the template using `$(properties.ATTRIBUTE)`, where ATTRIBUTE is the name of an attribute (field) from your dataset.

The example below uses the `wikipedia` and the `name` attributes to show the name of the airport as a link to the Wikipedia page:

This is the result shown when you click on an airport
Fig. 175: Fig. 9

Fig. 176: Fig. 10
This is $\{\text{properties.name}\}$

Fig. 177: Fig. 11

Fig. 178: Fig. 12
Optional: Customizing the HTML WYSIWYG Editor Menu Bar

The Menu Bar and Tool Bar of the HTML Editor, can be easily customized by overriding the TINYMCE_DEFAULT_CONFIG variable on settings.py (see TINYMCE_DEFAULT_CONFIG).

There are many plugins and options allowing you to easily customize the editor and also provides some predefined templates to speed up the editing.

For more information about the Javascript tool, please refer to https://www.tiny.cloud/

Search Bar

The Search Bar of the map viewer allows you to find point of interests (POIs), streets or locations by name. Let's type the name of some place then select the first record.

![Search Bar](image)

Fig. 179: The Search Bar

The map will automatically re-center on that area delimiting it by a polygon in the case of an area, by a line in the case of a linear shape (e.g. streets, streams) and by a marker in the case of a point.
Fig. 180: Result of a Search
**Sidebar Tools**

The *Map Viewer* makes also available the *Sidebar*. It is a navigation panel containing various tools that help you to explore the map such as tools for zooming, changing the extent and querying objects on the map. By default the *Sidebar* shows you the zooming buttons † and ‡, other options can be explored by clicking on ‡ which expands/collapses the toolbar.

![The Default Sidebar](image)

*Fig. 181: The Default Sidebar*

The *Sidebar* contains the following tools:

- The *Query Objects on map* allows you to get feature information through the button. It allows you to retrieve information about the features of some datasets by clicking them directly on the map. When clicking on map a new panel opens. That panel will show you all the information about the clicked features for each active loaded dataset.

- You can *Zoom To Max Extent* by clicking †.
Fig. 182: The Expanded Sidebar
Basemap Switcher

By default, GeoNode allows to enrich maps with many world backgrounds. You can open available backgrounds by clicking on the map tile below:

- OpenStreetMap
- OpenTopoMap
- Sentinel-2-cloudless

You can also decide to have an Empty Background.

Footer Tools

At the bottom of the map, the Footer shows you the Scale of the map and allows you to change it.

The button allows you to see the pointer Coordinates and to change the Coordinates Reference System (CRS), WGS 84 by default.
Fig. 184: *The Basemap Switcher Tool*
Fig. 185: Switching the Basemap
Fig. 186: *The Map Scale*

Fig. 187: *The Pointer Coordinates and the CRS*
1.10.7 Dashboard

Dashboard is a MapStore tool integrated in GeoNode that provides the user with a space to add many Widgets, such as charts, maps, tables, texts and counters, and can create connections between them in order to:

- Provide an overview to better visualize a specific data context
- Interact spatially and analytically with the data by creating connections between widgets
- Perform analysis on involved data/layers

To build a new Dashboard go to *Add Resource* option on the resource page and choose option *Create dashboard*.

![New Dashboard Apps option](image)

**Fig. 188: New Dashboard Apps option**

Now you landed on the Dashboard edition page that is composed of the following sections:

![Dashboard Edition Page](image)

**Fig. 189: New Dashboard Apps option**
Further Reading

Follow the link below to get more detailed information about the usage of Dashboard.
Dashboard Documentation

1.10.8 GeoStory

GeoStory is a MapStore tool integrated in GeoNode that provides the user a way to create inspiring and immersive stories by combining text, interactive maps, and other multimedia content like images and video or other third party contents. Through this tool you can simply tell your stories on the web and then publish and share them with different groups of GeoNode users or make them public to everyone around the world.

To build a new GeoStory go to Add Resource option on the resource page and choose option Create geostory.

![New GeoStory Apps option](image)

Now you landed on the GeoStory edition page that is composed of the following sections:

The GeoStory content is organized in Sections, that can be added with the button in the Container area. In particular, the user can add to the story the following kind of sections:

For more information on these specific section please follow the official MapStore documentation:

- Title Section
- Banner Section
- Paragraph Section
- Immersive Section
- Media Section
- Web Page Section
Fig. 191: New GeoStory Apps option

Fig. 192: GeoStory Sections Types
Add GeoNode content to GeoStory

With GeoNode you can add content to your GeoStory using internal GeoNode documents and maps as well external sources. This ability to add internal GeoNode content makes the GeoStory creation a very useful feature.

To add GeoNode content to your GeoStory use the button on top of your GeoStory section.

From here you can add Images, Videos and Maps. To enable GeoNode internal catalog, on Services dropdown choose GeoNode as shown in picture down. On the left you get a list of media documents available with a complementary text filter feature on top.

Fig. 193: Add Media to GeoStory

To save your GeoStory, on the top your Geostory content choose Save and then Save as…
Now your GeoStory can be shared with everyone!

Further Reading

Follow the link below to get more detailed information about the usage of GeoStory.
GeoStory Documentation

1.10.9 Publishing Data

In GeoNode, each resource can be published in order to share it with other people.

In order to publish a map, document or dataset or any other Geonode resource, Go to the settings tab in the Metadata Edit form, The check for publishing and unpublishing is available. See picture below.
Click :guilabel: Update to save the changes.
1.10.10 Using GeoNode with Other Applications

Your GeoNode project is based on core components which are interoperable and as such, it is straightforward for you to integrate with external applications and services. This section will walk you through how to connect to your GeoNode instance from other applications and how to integrate other services into your GeoNode project. When complete, you should have a good idea about the possibilities for integration, and have basic knowledge about how to accomplish it. You may find it necessary to dive deeper into how to do more complex integration in order to accomplish your goals, but you should feel comfortable with the basics, and feel confident reaching out to the wider GeoNode community for help.

QGIS Desktop

QGIS is a professional GIS application that is built on top of and proud to be itself Free and Open Source Software (FOSS). QGIS is a volunteer driven project if you are interested you can find more information at https://www.qgis.org.

How can I connect to Geonode?

Open QGIS Desktop and go to Layer Menu > Data Source Manager. At the bottom of Data Source Manager, you can see a tab with the name and an icon related to GeoNode. This is because GeoNode is recognized as a data source inside QGIS.

Note: It’s possible as well load Geonode instances from an existence file this is useful to share between users or to backup existence connections.

To add a new Geonode instance, in the Geonode tab selected click on New and you will see the following dialog:

In the dialog Fill the name as you like and in the URL put the link of the Geonode instance. It’s possible edit some WFS and WMS options to optimize the connection. If everything is ok you will receive the following successful connection dialog:
Fig. 195: QGIS Desktop Main Window
Fig. 196: *Data Source Manager Dialog*
Fig. 197: Details of Geonode instance Dialog
After the successful dialog it’s now possible to load all layers of the Geonode instance clicking on **Connect** button. You can see both WMS and WFS connections of the Geonode and you can load to QGIS Desktop.

After select a layer (WMS or WFS) click on the **Add** button and the layer will be displayed in the main window of QGIS.

**Warning:** This procedure only work with public layers. If the layers are for private use is necessary to do the standard qgis add remote WMS/WFS layers (through **Data Source Manager**) along with basic auth method and specific endpoints.

### Connect to Private layers by using OAuth2

**GeoNode OAuth2 Client App Setup**

Login to GeoNode as a superuser

Browse to `http://<geonode>/o/applications/`

Create a new specific app or, better, edit the existing one (“GeoServer”) based on OAuth2 Authorization Code Grant Type

Click on “Edit” and add the Redirect URI `http://127.0.0.1:7070/qgis-client` as shown below

**Note:** This is an example. The port and path of the URI can be customized. They must be the same on both GeoNode and QGis Client as shown later.

Also you will need the *Client ID* and *Client Secret* keys later when configuring QGis.
Fig. 199: Geonode instance layers Dialog
Fig. 200: Example of Geonode layer
Your applications

- GeoServer

New Application

GeoServer

Client id
Jrchz2oPY3akmzndmgUTYrs9gczlgoV20YPsvqaV

Client secret

Client type
confidential

Authorization Grant Type
authorization-code

Redirect Uris
http://localhost:8080/geoserver/index.html
http://localhost/geoserver/index.html
http://127.0.0.1:7070/qgis-client

Edit
Delete
Edit application GeoServer

- **Name**: GeoServer
- **Client id**: Jrchz2oPY3akmzndmgUTYrs9gc
- **Client secret**: ***************
- **Client type**: Confidential
- **Authorization grant type**: Authorization code
- **Redirect uris**:
  - http://localhost/geoserver/index.html
  - http://127.0.0.1:7070/qgis-client
- **Algorithm**: RSA with SHA-2 256

[Save button]
Configure QGis Desktop Client OAuth2 Authentication

Open the QGis Desktop Client and add a new OWS remote Layer configuration

Create a new service connection

Provide the connection details

**Note:** It is important that the URL ends with /gs/ows

When finished click on “+” in order to add a new auth configuration

Provide the needed information as shown below:
• Name: any descriptive string
• Type: OAuth2 authentication
• Grant Flow: Authorization Code
• Request URL: must end with /o/authorize/
• Token URL and Refresh URL: must end with /o/token/
• Redirect URL: must match with the one defined on GeoNode above
• Client ID and Client Secret: must match with the one defined on GeoNode above
• Scopes: openid write

Enable the persistent Token Session via Headers

Save and click on “Connect”. QGis will redirect you on a browser page asking to GeoNode to authenticate. Approve the Claims and go back to QGis.

Remove Saved Token Sessions From QGis and Login with another User

Edit the QGis configuration
Click on the “pencil”
Clean up the saved Tokens and save
Try to connect again.
### GeoNode Users Guide

#### Layers

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Title</th>
<th>Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>GeoNode Local...</td>
<td>This is a description of your Web Map Server.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>geonode:ACQU...</td>
<td>acqu_e_interne...</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>geonode:Abruz...</td>
<td>ctr_aquila</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>geonode:CP.Cas...</td>
<td>Particelle</td>
<td>Il layer contiene le particelle catalastali.</td>
</tr>
<tr>
<td>7</td>
<td>geonode:CP.Cas...</td>
<td>Mappe</td>
<td>Il layer contiene la rappresentazione</td>
</tr>
<tr>
<td>9</td>
<td>geonode:RC015...</td>
<td>Praterie</td>
<td>Nam quam nunc, blandit vel, luctus</td>
</tr>
<tr>
<td>11</td>
<td>geonode:acque</td>
<td>Acque</td>
<td>Il layer contiene la rappresentazione</td>
</tr>
<tr>
<td>13</td>
<td>geonode:codici...</td>
<td>Codice particella</td>
<td>Il layer contiene la rappresentazione</td>
</tr>
<tr>
<td>15</td>
<td>geonode:provin...</td>
<td>Province - Uffici</td>
<td>Il layer contiene la rappresentazione</td>
</tr>
<tr>
<td>17</td>
<td>geonode:shp...</td>
<td>shp_monument...</td>
<td>No abstract provided</td>
</tr>
<tr>
<td>20</td>
<td>geonode:states</td>
<td>states</td>
<td>No abstract provided</td>
</tr>
<tr>
<td>24</td>
<td>geonode:strade</td>
<td>Strade</td>
<td>Il layer contiene la rappresentazione</td>
</tr>
<tr>
<td>26</td>
<td>geonode:typhf...</td>
<td>Dataset Test</td>
<td>Lorem ipsum dolor sit amet, consectetur...</td>
</tr>
</tbody>
</table>
1.10.11 Dynamic Extra Metadata

In GeoNode is possible to add metadata to each resource dynamically without extending the base model provided by the application using the extra metadata field.

Settings

Three main settings control the extra metadata field:

DEFAULT_EXTRA_METADATA_SCHEMA: define the schema used to store the metadata

- id: (optional int): the identifier of the metadata. Optional for creation, required in the Upgrade phase
- filter_header: (required object): Can be any type, is used to generate the facet filter header. Is also an identifier.
- field_name: (required object): name of the metadata field
- field_label: (required object): a verbose string of the name. Is used as a label in the facet filters.
- field_value: (required object): metadata values

An example of metadata that can be ingested is the following:

```
[
  {
    "filter_header": "Bike Brand",
    "field_name": "name",
    "field_label": "Bike Name",
    "field_value": "KTM",
  },
  {
    "filter_header": "Bike Brand",
    "field_name": "name",
    "field_label": "Bike Name",
    "field_value": "Bianchi",
  }
]
```

The above schema is valid by using the schema <https://github.com/keleshev/schema>

CUSTOM_METADATA_SCHEMA: environment variable used to inject additional schema to the default one. Helpful for third-party libraries

EXTRA_METADATA_SCHEMA: used to get the expected metadata schema for each resource_type.

Metadata manipulation

There are two possible ways to manipulate extra metadata in geonode:

- via Metadata Editor (Wizard and advanced)
- via Rest API
Metadata Editor (wizard/advanced):

The metadata section is placed under the OPTIONAL METADATA section available for all the GeoNode resources. The metadata must follow two specific rules to save to the resource:

- Must always be a list of JSON. This permits to add of more than one metadata for each resource
- The JSON must follow the schema defined in the settings.py for the selected resource.

For example, for my document resource, I can have something like the following:

```json
[  
  
  "field_name": "bik",  
  "field_label": "KTM",  
  "field_value": "ktm",  
  "filter_header": "Sports Parameters"
]
```

Fig. 201: *Advanced edit wizard menù*

After pressing the save button, the system will perform the following checks:

- Check if the text provided is a valid JSON. In case of wrong format input, the following error is shown:
- Check if the metadata schema is provided for the resource if not will raise the following error
- Check if the metadata schema is coherent with the schema defined in the settings. In case of wrong format input, the error will print the missing JSON keys
• 0: extra_metadata: The value provided for the Extra metadata field is not a valid JSON

Fig. 202: invalid JSON error

• 0: extra_metadata: EXTRA_METADATA_SCHEMA validation schema is not available for resource dashboard

Fig. 203: missing schema error
Facet Filtering

Automatically the web interface will create dynamically the facets if there is at least 1 metadata defined for the resource.

Suppose that a resource have the following metadata:

```json
[
  {
    "field_name": "bike",
    "field_label": "KTM",
    "field_value": "ktm",
    "filter_header": "Sports Parameters"
  },
  {
    "field_name": "mountain",
    "field_label": "Monte bianco",
    "field_value": "monte_bianco",
    "filter_header": "Italian Mountains"
  }
]
```

By default GeoNode will convert this metadata info in facets available for the resource.

The facet will convert: - **filter_header**: used as the header filter - **field_value**: used to perform the search - **field_name**: used for calculate the unique values (along with **field_value**)

After says that, the facet will be the follow:
Rest API

The `api/v2/resources` endpoint provide different ways to handle the metadata.

**GET:**

Get the metadata list of the selected resource

URL: http://host/api/v2/resources/{resource_id}/extra_metadata

Response:

```
[  
  {  
    "id": 1,  
    "field_name": "bike",  
    "field_label": "KTM",  
    "field_value": "ktm",  
    "filter_header": "Sports Parameters"  
  }  
]
```

**POST:**

Adding new metadata to the resource

URL: http://host/api/v2/resources/{resource_id}/extra_metadata
data = [
  {  
    "field_name": "bike",  
    "field_label": "KTM",  
    "field_value": "ktm",  
    "filter_header": "Sports Parameters"  
  }
]

Response:

```
status_code: 201
response json: List of the available metadata for the resource [
  {  
    "id": 1,  
(continues on next page)```
PUT:
Update specific metadata for the selected resource. In this case the metadata ID is required to perform the update

```
http://host/api/v2/resources/{resource_id}/extra_metadata
```

payload:
```
[
    {
        "id": 1,
        "field_name": "bike",
        "field_label": "KTM - sport", <- this value need to be updated
        "field_value": "ktm",
        "filter_header": "Sports Parameters"
    }
]
```

Response:
status_code: 200
response: the available payload for the selected resource
```
[
    {
        "id": 1,
        "field_name": "bike",
        "field_label": "KTM - sport",
        "field_value": "ktm",
        "filter_header": "Sports Parameters"
    }
]
```

DELETE:
Delete the metadata for a given resource by ID.

```
http://host/api/v2/resources/{resource_id}/extra_metadata
```

payload: list of ID to be deleted
```
[ 1, 2, 3, 4, 5
]
```

Response:
status_code: 200
response: List of the available metadata
```
[]
```
API search

Is possible to search for resources with specific metadata. This feature is available for both API v1 and API v2.

API v1:
To perform the search is enough to add as query parameters the field of the metadata payload.

Assuming that the payload is the same as the example above, the URL could be something like the following:

```
http://host/api/base/?metadata__field_category=bike
```

In this way, we can retrieve all the resources that have at least 1 metadata with the `field_category = ‘bike’`

API v2

For the API v2 is a bit different since the library doesn’t have a support for the JSON field.

To reproduce the same search above, we need to call a URL like the following one:

```
http://localhost:8000/api/v2/resources?filter{metadata.metadata.icontains}=%22field_category%22:%22%20%22bike%22
```

In this way, we can retrieve all the resources that have at least 1 metadata with the `field_category = ‘bike’`

1.10.12 Download Handlers

With GeoNode 4.2.x has been introduced the concept of Download Handler and ofc GeoNode provides a default implementation of it which process the download via WPS.

Follow an example of how to create a custom download handler and to replace the default one or add an additional one.

1.10.13 Settings

**DEFAULT_DATASET_DOWNLOAD_HANDLER**

Default: `geonode.layers.download_handler.DatasetDownloadHandler`

path to the download handler location

**DATASET_DOWNLOAD_HANDLERS**

Default: `[]`

List of paths of the additional download handlers

1.10.14 CODE

The default download handler is placed under the `geonode.layers` [package](https://github.com/GeoNode/geonode/blob/master/geonode/layers/download_handler.py)

Follow an example of an basic class for define the download handler:

```python
class DatasetDownloadHandler:
    def __str__(self):
        return f"{self.__module__}.{self.__class__.__name__}"`
```

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def __repr__(self):
    return self.__str__()

def __init__(self, request, resource_name) -> None:
    self.request = request
    self.resource_name = resource_name
    self._resource = None

def get_download_response(self):
    """Main method used, this method should return the response object """
    return response

@property
def download_url(self):
    """Used by the API, it should return the URL where the resource can be downloaded from """
    return reverse("dataset_download", args=[resource.alternate])

...  
If you prefer to inherit from the already existing one, the response is generated in the process_download method

1.11 GeoNode Basic Installation

1.11.1 Overview

The followings are the easiest and recommended ways to deploy a full-stack GeoNode server on your host.

1. **First Step**: Deploy GeoNode on a local server, running as http://localhost/ service. GeoServer will be also available at http://localhost/geoserver/

2. **Second Step**: Deploy GeoNode on a production server, running as https://my_geonode.geonode.org/service. GeoServer will be also available at https://my_geonode.geonode.org/geoserver/

3. **Third Step**: Customize .env to match your needs

4. **Fourth Step**: Secure your production deployment; change the admin passwords and OAuth2 keys

5. **Further Production Enhancements**

1.11.2 First Step: Deploy GeoNode on a local server

Docker Setup for Ubuntu (22.04)

```
# install OS level packages..
sudo add-apt-repository universe
sudo apt-get update -y
sudo apt-get install -y git-core git-buildpackage debhelper devscripts python3.10-dev
    ...python3.10-venv virtualenvwrapper
sudo apt-get install -y apt-transport-https ca-certificates curl lsb-release gnupg gnupg-agent software-properties-common vim

# add docker repo and packages...
sudo mkdir -p /etc/apt/keyrings
curl -fsSl https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o /etc/apt/keyrings/docker.gpg
sudo chmod a+r /etc/apt/keyrings/docker.gpg
sudo chmod a+r /etc/apt/keyrings/docker.gpg
echo "deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyrings/docker.gpg]https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
```
Create an instance of your geonode-project

Let’s say your project is named `my_geonode` perform the following steps:

```bash
git clone https://github.com/GeoNode/geonode-project.git
# Checkout the desired branch. For example, 4.2.2 to generate a project for GeoNode 4.2.2
```  
```bash
git checkout -b 4.2.2
```

```bash
# Ubuntu
source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
mkvirtualenv --python=/usr/bin/python3 my_geonode
```

Alternatively you can also create the virtual env like below

```bash
python3.8 -m venv /home/geonode/dev/.venvs/my_geonode
source /home/geonode/dev/.venvs/my_geonode/bin/activate
```

```bash
pip install Django==3.2.13
```

```bash
# CentOS
virtualenv -p python3 my_geonode
source my_geonode/bin/activate
```

```bash
django-admin startproject --template=./geonode-project -e py,sh,md,rst,json,yml,ini,env, --sample,properties -n monitoring-cron -n Dockerfile my_geonode
```

```bash
# If the previous command does not work for some reason, try the following one
python -m django startproject --template=./geonode-project -e py,sh,md,rst,json,yml,ini, --env,sample,properties -n monitoring-cron -n Dockerfile my_geonode
```

Prepare the .env file

GeoNode uses an .env where the environment variables required by Docker and GeoNode itself must be configured. A simple way to generate a basic .env is using the `create-envfile.py` utility command. If run without arguments it will generate a valid .env for a local deployment.

The command accepts the following arguments:

- `--https`: Enable SSL. It’s disabled by default
- `--env_type`:
- When set to `prod` DEBUG is disabled and the creation of a valid SSL is requested to Letsencrypt’s ACME server
- When set to `test` DEBUG is disabled and a test SSL certificate is generated for local testing
- When set to `dev` DEBUG is enabled and no SSL certificate is generated

- `--hostname`: The URL that will serve GeoNode (localhost by default)
- `--email`: The administrator’s email. Notice that a real email and valid SMTP configurations are required if `--env_type` is set to `prod`. Letsencrypt uses email for issuing the SSL certificate
- `--geonodepwd`: GeoNode’s administrator password. A random value is set if left empty
- `--geoserverpwd`: GeoNode’s administrator password. A random value is set if left empty
- `--pgpwd`: PostgreSQL’s administrator password. A random value is set if left empty
- `--dbpwd`: GeoNode DB user role’s password. A random value is set if left empty
- `--geodbpwd`: GeoNode data DB user role’s password. A random value is set if left empty
- `--clientid`: Client id of Geoserver’s GeoNode Oauth2 client. A random value is set if left empty
- `--clientsecret`: Client secret of Geoserver’s GeoNode Oauth2 client. A random value is set if left empty

**Build and run**

```bash
docker compose build
docker compose up -d
```

- You can follow the containers startup by running the following commands from `my_geonode` root folder:

  ```bash
  # GeoNode Container
docker-compose logs -f django
  
  # GeoServer Container
docker-compose logs -f geoserver
  
  # DB Container
docker-compose logs -f db
  
  # NGINX Container
docker-compose logs -f geonode
  ```

- If any error occurs, try to catch the error stacktrace by running the following commands from `my_geonode` root folder:

  ```bash
  # GeoNode “entrypoint.sh” Logs
tail -F -n 300 invoke.log
  ```
Connect to http://localhost/

The startup typically takes some time, so be patient...

If everything goes well, you should be able to see from the geonode startup logs a line similar to the following one:

```
<some date> [UWSGI] Uwsgi running...
```

Connect to http://localhost/

The default credentials are:

- GeoNode (http://localhost/) admin:
  username: admin password: admin
- GeoServer (http://localhost/geoserver/) admin:
  username: admin password: geoserver

1.11.3 Second Step: Deploy GeoNode on a production server

In the case you would like to deploy to, let’s say, https://my_geonode.geonode.org/, you will need to change .env as follows:

```
DOCKER_ENV=production
SITEURL=https://my_geonode.geonode.org/
NGINX_BASE_URL=https://my_geonode.geonode.org/
ALLOWED_HOSTS=['django',]
GEOSERVER_WEB_UI_LOCATION=https://my_geonode.geonode.org/geoserver/
GEOSERVER_PUBLIC_LOCATION=https://my_geonode.geonode.org/geoserver/
HTTP_HOST=http://my_geonode.geonode.org
HTTP_PORT=80
HTTPS_PORT=443
LETSENCRYPT_MODE=production # This will use Letsencrypt and the ACME server to generate valid SSL certificates
```

These variables are automatically set by the create-envfile.py script if the --https and --hostname variables are used.

**Warning:** When LETSENCRYPT_MODE is set to production a valid email and email SMTP server are required to make the system generate a valid certificate.
**Restart the containers**

Whenever you change something on `.env` file, you will need to rebuild the container

```
docker-compose up -d
```

**Warning:** Note that the following command drops any change you might have done manually inside the containers, except for the static volumes.

```
docker-compose up -d
```

**Troubleshooting**

If for some reason you are not able to reach the server on the HTTPS channel, please check the NGINX configuration files below:

1. Enter the NGINX container
   ```
docker-compose exec geonode sh
   ```
2. Install an editor if not present
   ```
apk add nano
   ```
3. Double check that the nginx.https.enabled.conf link has been correctly created
   ```
ls -lah
   ```

If the list does not match exactly the figure above, please run the following commands, and check again

```
rm nginx.https.enabled.conf
ln -s nginx.https.available.conf nginx.https.enabled.conf
```

4. Inspect the nginx.https.enabled.conf contents
   ```
nano nginx.https.enabled.conf
   ```
Make sure the contents match the following

**Warning:** Change the *Hostname* accordingly. *This is only an example!*

```
# NOTE : $VARIABLES are env variables replaced by entrypoint.sh using:
    envsubst
# not to be mistaken for nginx variables (also starting with $, but usually
    lowercase)

# This file is to be included in the main nginx.conf configuration if HTTPS_  
    →HOST is set
ssl_session_cache shared:SSL:10m;
ssl_session_timeout 10m;

# this is the actual HTTPS host
server {
    listen 443 ssl;
    server_name my_geonode.geonode.org;
    keepalive_timeout 70;

    ssl_certificate /certificate_symlink/fullchain.pem;
    ssl_certificate_key /certificate_symlink/privkey.pem;
    ssl_protocols TLSv1 TLSv1.1 TLSv1.2;
    ssl_ciphers HIGH:!aNULL:!MD5;

    include sites-enabled/*.conf;
}

# if we try to connect from http, we redirect to https
server {
    listen 80;
    server_name my_geonode.geonode.org;  # TODO : once geoserver supports
    →relative urls, we should allow access though both HTTP and HTTPS at the
    →same time and hence remove HTTP_HOST from this line

    # Except for let's encrypt challenge
    location /.well-known {
        alias /geonode-certificates/.well-known;
        include /etc/nginx/mime.types;
    }

    # Redirect to https
    location / {
        return 302 https://my_geonode.geonode.org/$request_uri;  # TODO : we
        →should use 301 (permanent redirect, but not practical for debug)
    }
}
```
5. Reload the NGINX configuration

```
nginx -s reload
```

```
2020/06/24 10:00:11 [notice] 112: signal process started
```

```
/etc/nginx# exit
```

6. It may be helpful to disable https to isolate the source of errors. After reverting the HTTPS-related changes in the `.env` file, repeat the above steps and ensure that the `nginx.http.enabled.conf` link has been correctly created.

```
ln -s nginx.conf nginx.http.enabled.conf
nano nginx.http.enabled.conf
```

### 1.11.4 Customize `.env` to match your needs

In the case you would like to modify the GeoNode behavior, always use the `.env` file in order to update the `settings`. If you need to change a setting which does not exist in `.env`, you can force the values inside `my_geonode/settings.py`

Refer to the section: Settings

You can add here any property referred as

```
Env: PROPERTY_NAME
```

### Restart the containers

Whenever you change something on `.env` file, you will need to rebuild the containers.

```
Warning: Be careful! The following command drops any change you might have done manually inside the containers, except for the static volumes.
```

```
docker-compose up -d django
```

### [Optional] Configure your SSL Certificates

In production deployment mode, GeoNode uses by default *Let's Encrypt* certificates

You may want to provide your own certificates to GeoNode

```
docker exec -it nginx4my_geonode_geonode sh -c 'mkdir /geonode-certificates/my_geonode'
```

```
wget --no-check-certificate 'http://<url_to_your_chain.crt>' \
    -0 chain.crt
```

```
wget --no-check-certificate 'http://<url_to_your_key.key>' \
    -0 my_geonode.key
```

(continues on next page)
docker cp chain.crt nginx4my_geonode_geonode:/geonode-certificates/my_geonode

docker cp my_geonode.key nginx4my_geonode_geonode:/geonode-certificates/my_geonode

docker-compose exec geonode sh
apk add vim

vim nginx.https.enabled.conf

-ssl_certificate /certificate_symlink/fullchain.pem;
-ssl_certificate_key /certificate_symlink/privkey.pem;
+ssl_certificate /geonode-certificates/my_geonode/chain.crt;
+ssl_certificate_key /geonode-certificates/my_geonode/my_geonode.key;

nginx -s reload
exit

1.12 GeoNode Advanced Installation

1.12.1 GeoNode Vanilla

Overview

The following steps will guide you to a fresh setup of GeoNode.

All guides will first install and configure the system to run in DEBUG mode (also known as DEVELOPMENT mode) and then by configuring an HTTPD server to serve GeoNode through the standard HTTP (80) port.

Warning: Those guides are not meant to be used on a production system. There will be dedicated chapters that will show you some hints to optimize GeoNode for a production-ready machine. In any case, we strongly suggest to task an experienced DevOp or System Administrator before exposing your server to the WEB.

Ubuntu 22.04 LTS

This part of the documentation describes the complete setup process for GeoNode on an Ubuntu 22.04.1LTS 64-bit clean environment (Desktop or Server).

All examples use shell commands that you must enter on a local terminal or a remote shell.

- If you have a graphical desktop environment you can open the terminal application after login;
- if you are working on a remote server the provider or sysadmin should has given you access through an ssh client.
1. Install the dependencies

In this section, we are going to install all the basic packages and tools needed for a complete GeoNode installation.

**Warning:** To follow this guide, a basic knowledge about Ubuntu Server configuration and working with a shell is required.

**Note:** This guide uses vim as the editor; fill free to use nano, gedit or others.

**Upgrade system packages**

Check that your system is already up-to-date with the repository running the following commands:

```
sudo add-apt-repository ppa:ubuntugis/ppa
sudo apt update -y
```

**Packages Installation**

**Note:** You don’t need to install the `system packages` if you want to run the project using Docker

We will use `example.org` as fictitious Domain Name.

First, we are going to install all the `system packages` needed for the GeoNode setup. Login to the target machine and execute the following commands:

```
# Install packages from GeoNode core
sudo apt install -y --allow-downgrades build-essential \
  python3-gdal=3.4.1+dfsg-1build4 gdal-bin=3.4.1+dfsg-1build4 libgdal-dev=3.4.1+dfsg-1build4 \
  python3-all-dev python3.10-dev python3.10-venv virtualenvwrapper \
  libxml2 libxml2-dev gettext libmemcached-dev zlib1g-dev \
  libxslt1-dev libjpeg-dev libpng-dev libpq-dev \
  software-properties-common build-essential \
  git unzip gcc zlib1g-dev libgeos-dev libproj-dev \
  sqlite3 spatialite-bin libsqlite3-mod-spatialite libsqlite3-dev

# Install Openjdk
sudo apt install openjdk-11-jdk-headless default-jdk-headless -y

# Verify GDAL version
gdalinfo --version
  $> GDAL 3.4.1, released 2021/12/27

# Verify Python version
python3.10 --version
  $> Python 3.10.4
```

(continues on next page)
which python3.10
    $> /usr/bin/python3.10

# Verify Java version
java -version
    $> openjdk version "11.0.16"

# Install VIM
sudo apt install -y vim

# Cleanup the packages
sudo apt update -y; sudo apt autoremove --purge

Warning: GeoNode 4.2.x is not compatible with Python < 3.7

2. GeoNode Installation

This is the most basic installation of GeoNode. It won’t use any external server like Apache Tomcat, PostgreSQL or HTTPD.

First of all we need to prepare a new Python Virtual Environment

Since geonode needs a large number of different python libraries and packages, its recommended to use a python virtual environment to avoid conflicts on dependencies with system wide python packages and other installed software. See also documentation of Virtualenvwrapper package for more information

Note: The GeoNode Virtual Environment must be created only the first time. You won’t need to create it again everytime.

which python3.10  # copy the path of python executable

# Create the GeoNode Virtual Environment (first time only)
export WORKON_HOME=~/.virtualenvs
source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
mkvirtualenv --python=/usr/bin/python3.10 geonode  # Use the python path from above

# Alterantively you can also create the virtual env like below
mkdir -p ~/.virtualenvs
python3.10 -m venv ~/.virtualenvs/geonode
source ~/.virtualenvs/geonode/bin/activate

At this point your command prompt shows a (geonode) prefix, this indicates that your virtualenv is active.

Note: The next time you need to access the Virtual Environment just run

source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
workon geonode

(continues on next page)
# Alternatively you can also create the virtual env like below
source ~/.virtualenvs/geonode/bin/activate

Note: In order to save permanently the virtualenvwrapper environment

vim ~/.bashrc

# Write to the bottom of the file the following lines
export WORKON_HOME=~/.virtualenvs
source /usr/share/virtualenvwrapper/virtualenvwrapper.sh

# Let’s create the GeoNode core base folder and clone it

# Clone the GeoNode source code on /opt/geonode
cd /opt; git clone https://github.com/GeoNode/geonode.git -b 4.2.x geonode

# Install the Python packages
cd /opt/geonode
pip install -r requirements.txt --upgrade
pip install -e . --upgrade
pip install pygdal="`gdal-config --version`.*"

3. Postgis database Setup

Be sure you have successfully completed all the steps of the section 1. Install the dependencies.

In this section, we are going to setup users and databases for GeoNode in PostgreSQL.

Install and Configure the PostgreSQL Database System

In this section we are going to install the PostgreSQL packages along with the PostGIS extension. Those steps must be done only if you don’t have the DB already installed on your system.

# Ubuntu 22.04.1 (focal)
sudo sh -c 'echo "deb http://apt.postgresql.org/pub/repos/apt/ `lsb_release -cs`-pgdg_main" >> /etc/apt/sources.list.d/pgdg.list'
sudo wget --no-check-certificate --quiet -O - https://www.postgresql.org/media/keys/ACCC4CF8.asc | sudo apt-key add -
sudo apt update -y; sudo apt install -y postgresql-13 postgresql-13-postgis-3 postgresql-13-postgis-3-scripts postgresql-13 postgresql-client-13

We now must create two databases, geonode and geonode_data, belonging to the role geonode.
Warning: This is our default configuration. You can use any database or role you need. The connection parameters must be correctly configured on settings, as we will see later in this section.

Databases and Permissions

First, create the geonode user. GeoNode is going to use this user to access the database

```bash
sudo service postgresql start
sudo -u postgres createuser -P geonode
# Use the password: geonode
```

You will be prompted asked to set a password for the user. **Enter geonode as password**.

**Warning:** This is a sample password used for the sake of simplicity. This password is very weak and should be changed in a production environment.

Create database geonode and geonode_data with owner geonode

```bash
sudo -u postgres createdb -O geonode geonode
sudo -u postgres createdb -O geonode geonode_data
```

Next let's create PostGIS extensions

```bash
sudo -u postgres psql -d geonode -c
  'CREATE EXTENSION postgis;'
sudo -u postgres psql -d geonode -c
  'GRANT ALL ON geometry_columns TO PUBLIC;'
sudo -u postgres psql -d geonode -c
  'GRANT ALL ON spatial_ref_sys TO PUBLIC;'
sudo -u postgres psql -d geonode -c
  'GRANT ALL PRIVILEGES ON ALL TABLES IN SCHEMA public
   TO geonode;'
sudo -u postgres psql -d geonode -c
  'GRANT ALL PRIVILEGES ON ALL SEQUENCES IN SCHEMA public
   TO geonode;'
sudo -u postgres psql -d geonode_data -c
  'CREATE EXTENSION postgis;'
sudo -u postgres psql -d geonode_data -c
  'GRANT ALL ON geometry_columns TO PUBLIC;'
sudo -u postgres psql -d geonode_data -c
  'GRANT ALL ON spatial_ref_sys TO PUBLIC;'
sudo -u postgres psql -d geonode_data -c
  'GRANT ALL PRIVILEGES ON ALL TABLES IN SCHEMA public
   TO geonode;'
sudo -u postgres psql -d geonode_data -c
  'GRANT ALL PRIVILEGES ON ALL SEQUENCES IN SCHEMA public
   TO geonode;'
```

Final step is to change user access policies for local connections in the file `pg_hba.conf`

```bash
sudo vim /etc/postgresql/13/main/pg_hba.conf
```

Scroll down to the bottom of the document. We want to make local connection trusted for the default user.

Make sure your configuration looks like the one below.

```
...
# DO NOT DISABLE!
# If you change this first entry you will need to make sure that the
```

(continues on next page)
# database superuser can access the database using some other method.  
# Noninteractive access to all databases is required during automatic  
# maintenance (custom daily cronjobs, replication, and similar tasks).  
#  
# Database administrative login by Unix domain socket  
local all postgres trust  
# TYPE DATABASE USER ADDRESS METHOD  
# "local" is for Unix domain socket connections only  
local all all md5  
# IPv4 local connections:  
host all all 127.0.0.1/32 md5  
# IPv6 local connections:  
host all all ::1/128 md5  
# Allow replication connections from localhost, by a user with the  
# replication privilege.  
local replication all peer  
host replication all 127.0.0.1/32 md5  
host replication all ::1/128 md5

Warning: If your PostgreSQL database resides on a separate/remote machine, you’ll have to allow remote access to the databases in the /etc/postgresql/13/main/pg_hba.conf to the geonode user and tell PostgreSQL to accept non-local connections in your /etc/postgresql/13/main/postgresql.conf file.

Restart PostgreSQL to make the change effective.

```bash
sudo service postgresql restart
```

PostgreSQL is now ready. To test the configuration, try to connect to the geonode database as geonode role.

```bash
psql -U postgres geonode  
# This should not ask for any password

psql -U geonode geonode  
# This should ask for the password geonode

# Repeat the test with geonode_data DB  
psql -U postgres geonode_data
psql -U geonode geonode_data
```
4. Install GeoServer

In this section, we are going to install the Apache Tomcat 8 Servlet Java container, which will be started by default on the internal port 8080.

We will also perform several optimizations to:

1. Correctly setup the Java VM Options, like the available heap memory and the garbage collector options.
2. Externalize the GeoServer and GeoWebcache catalogs in order to allow further updates without the risk of deleting our datasets.

Note: This is still a basic setup of those components. More details will be provided on sections of the documentation concerning the hardening of the system in a production environment. Nevertheless, you will need to tweak a bit those settings accordingly with your current system. As an instance, if your machine does not have enough memory, you will need to lower down the initial amount of available heap memory. Warnings and notes will be placed below the statements that will require your attention.

Install Apache Tomcat

The reference version of Tomcat for the Geoserver for GeoNode is Tomcat 9.

The following steps have been adapted from https://yallalabs.com/linux/ubuntu/how-to-install-apache-tomcat-9-ubuntu-20-04/

**Warning:** Apache Tomcat 9 and Geoserver require Java 11 or newer to be installed on the server. Check the steps before in order to be sure you have OpenJDK 11 correctly installed on your system.

First, it is not recommended to run Apache Tomcat as user root, so we will create a new system user which will run the Apache Tomcat server

```
sudo useradd -m -U -d /opt/tomcat -s /bin/bash tomcat
sudo usermod -a -G www-data tomcat
```

**Warning:** Now, go to the official Apache Tomcat website and download the most recent version of the software to your server. But don't use Tomcat10 because there are still some errors between Geoserver and Tomcat.

```
VERSION=9.0.65; wget https://archive.apache.org/dist/tomcat/tomcat-9/v$VERSION/bin/...apache-tomcat-$VERSION.tar.gz
```

Once the download is complete, extract the tar file to the /opt/tomcat directory:

```
sudo mkdir /opt/tomcat
sudo tar -xf apache-tomcat-$VERSION.tar.gz -C /opt/tomcat/; rm apache-tomcat-$VERSION*.tar.gz
```

Apache Tomcat is updated regulary. So, to have more control over versions and updates, we’ll create a symbolic link as below:
```
sudo ln -s /opt/tomcat/apache-tomcat-$VERSION /opt/tomcat/latest
```

Now, let's change the ownership of all Apache Tomcat files as below:
```
sudo chown -R tomcat:www-data /opt/tomcat/
```

Make the shell scripts inside the bin directory executable:
```
sudo sh -c 'chmod +x /opt/tomcat/latest/bin/*.sh'
```

Create the a systemd file with the following content:
```
# Check the correct JAVA_HOME location
JAVA_HOME=$(readlink -f /usr/bin/java | sed "s:bin/java::")
echo $JAVA_HOME
  > /usr/lib/jvm/java-1.11.0-openjdk-amd64/jre/

# Let's create a symbolic link to the JRE
sudo ln -s /usr/lib/jvm/java-1.11.0-openjdk-amd64/jre/ /usr/lib/jvm/jre

# Let's create the tomcat service
sudo vim /etc/systemd/system/tomcat9.service

[Unit]
Description=Tomcat 9 servlet container
After=network.target

[Service]
Type=forking
User=tomcat
Group=tomcat
Environment="JAVA_HOME=/usr/lib/jvm/jre"
Environment="JAVA_OPTS=-Djava.security.egd=file:///dev/urandom -Djava.awt.headless=true"
Environment="CATALINA_BASE=/opt/tomcat/latest"
Environment="CATALINA_HOME=/opt/tomcat/latest"
Environment="CATALINA_PID=/opt/tomcat/latest/temp/tomcat.pid"
Environment="CATALINA_OPTS=-Xms512M -Xmx1024M -server -XX:+UseParallelGC"
ExecStart=/opt/tomcat/latest/bin/startup.sh
ExecStop=/opt/tomcat/latest/bin/shutdown.sh

[Install]
WantedBy=multi-user.target
```

Now you can start the Apache Tomcat 9 server and enable it to start on boot time using the following command:
```
sudo systemctl daemon-reload
sudo systemctl start tomcat9.service
sudo systemctl status tomcat9.service
sudo systemctl enable tomcat9.service
```
For verification, type the following ss command, which will show you the 8080 open port number, the default open port reserved for Apache Tomcat Server.

```
ss -ltn
```

In a clean Ubuntu 22.04.1, the ss command may not be found and the iproute2 library should be installed first.

```
sudo apt install iproute2
# Then run the ss command
ss -ltn
```

In a clean Ubuntu 22.04.1, the ss command may not be found and the iproute2 library should be installed first.

If your server is protected by a firewall and you want to access Tomcat from the outside of your local network, you need to open port 8080.

Use the following command to open the necessary port:

```
sudo ufw allow 8080/tcp
```

**Warning:** Generally, when running Tomcat in a production environment, you should use a load balancer or reverse proxy.

It’s a best practice to allow access to port 8080 only from your internal network.

We will use **NGINX** in order to provide Apache Tomcat through the standard HTTP port.

**Note:** Alternatively you can define the Tomcat Service as follow, in case you would like to use systemctl

```
sudo vim /usr/lib/systemd/system/tomcat9.service
```

```ini
[Unit]
Description=Apache Tomcat Server
After=syslog.target network.target

[Service]
Type=forking
User=tomcat
Group=tomcat

Environment=JAVA_HOME=/usr/lib/jvm/jre
Environment=JAVA_OPTS=-Djava.security.egd=file:///dev/urandom
Environment=CATALINA_PID=/opt/tomcat/latest/temp/tomcat.pid
Environment=CATALINA_HOME=/opt/tomcat/latest
Environment=CATALINA_BASE=/opt/tomcat/latest

ExecStart=/opt/tomcat/latest/bin/startup.sh
ExecStop=/opt/tomcat/latest/bin/shutdown.sh
```

(continues on next page)
RestartSec=30
Restart=always

[Install]
WantedBy=multi-user.target

sudo systemctl daemon-reload
sudo systemctl enable tomcat9.service
sudo systemctl start tomcat9.service

Install GeoServer on Tomcat

Let's externalize the GEOSERVER_DATA_DIR and logs

```bash
# Create the target folders
sudo mkdir -p /opt/data
sudo chown -Rf $USER:www-data /opt/data
sudo chmod -Rf 775 /opt/data
sudo mkdir -p /opt/data/logs
sudo chown -Rf $USER:www-data /opt/data/logs
sudo chmod -Rf 775 /opt/data/logs

# Download and extract the default GEOSERVER_DATA_DIR
GS_VERSION=2.24.2
sudo unzip data-$GS_VERSION.zip -d /opt/data/
sudo mv /opt/data/data/ /opt/data/geoserver_data
dsudo chown -Rf tocat:www-data /opt/data/geoserver_data
dsudo chmod -Rf 775 /opt/data/geoserver_data

dsudo mkdir -p /opt/data/geoserver_logs
dsudo chown -Rf tocat:www-data /opt/data/geoserver_logs
dsudo chmod -Rf 775 /opt/data/geoserver_logs

dsudo mkdir -p /opt/data/gwc_cache_dir
dsudo chown -Rf tocat:www-data /opt/data/gwc_cache_dir
dsudo chmod -Rf 775 /opt/data/gwc_cache_dir

# Download and install GeoServer
sudo wget --no-check-certificate "https://artifacts.geonode.org/geoserver/$GS_VERSION/geoserver.war" -O geoserver-$GS_VERSION.war
dsudo mv geoserver-$GS_VERSION.war /opt/tomcat/latest/webapps/geoserver.war
```

Let's now configure the JAVA_OPTS, i.e. the parameters to run the Servlet Container, like heap memory, garbage collector and so on.
GeoNode Documentation, Release 4.2.5

```
sudo sed -i -e 's/xom-\*\.jar/xom-\*\.jar,bcprov-\*\.jar/g' /opt/tomcat/latest/conf/catalina.properties

export JAVA_HOME=$(readlink -f /usr/bin/java | sed "s:bin/java::")
sho'JAVA_HOME' | sudo tee --append /opt/tomcat/latest/bin/setenv.sh

echo 'JAVA_OPTS=-server -Djava.awt.headless=true -Dorg.geotools.shapefile.datetime=false -DGS-SHAPEFILE-CHARSET=UTF-8 -XX:+UseParallelGC -XX:ParallelGCThreads=4 -Dfile.encoding=UTF8 -Duser.timezone=$TIMEZONE -Xms512m -Xmx4096m -Djavax.servlet.request.encoding=UTF-8 -Djavax.servlet.response.encoding=UTF-8 -DGEOSERVER_CSRF_DISABLED=true -DPRINT_BASE_URL=http://localhost:8080/geoserver/pdf -DGEOSERVER_DATA_DIR=$GEOSERVER_DATA_DIR -Dgeofence.dir=$GEOFENCE_DIR -DGEOSERVER_LOG_LOCATION=$GEOSERVER_LOG_LOCATION -DGEOWEBCACHE_CACHE_DIR=$GEOWEBCACHE_CACHE_DIR -Dgwc.context.suffix=gwc' | sudo tee --append /opt/tomcat/latest/bin/setenv.sh
```

Note: After the execution of the above statements, you should be able to see the new options written at the bottom of the file /opt/tomcat/latest/bin/setenv.sh.

---

# If you run Tomcat on port numbers that are all higher than 1023, then you do not need authbind. It is used for binding Tomcat to lower port numbers.

#AUTHBIND=no
JAVA_HOME=/usr/lib/jvm/java-1.11.0-openjdk-amd64/jre/
GEOSERVER_DATA_DIR="/opt/data/geoserver_data"
GEOSERVER_LOG_LOCATION="/opt/data/geoserver_logs/geoserver.log"
GEOWEBCACHE_CACHE_DIR="/opt/data/gwc_cache_dir"
GEOFENCE_DIR="$GEOSERVER_DATA_DIR/geofence"
TIMEZONE="UTC"
JAVA_OPTS="-server -Djava.awt.headless=true -Dorg.geotools.shapefile.datetime=false -DGS-SHAPEFILE-CHARSET=UTF-8 -XX:+UseParallelGC -XX:ParallelGCThreads=4 -Dfile.encoding=UTF8 -Duser.timezone=$TIMEZONE -Xms512m -Xmx4096m -Djavax.servlet.request.encoding=UTF-8 -Djavax.servlet.response.encoding=UTF-8 -DGEOSERVER_CSRF_DISABLED=true -DPRINT_BASE_URL=http://localhost:8080/geoserver/pdf -DGEOSERVER_DATA_DIR=$GEOSERVER_DATA_DIR -Dgeofence.dir=$GEOFENCE_DIR -DGEOSERVER_LOG_LOCATION=$GEOSERVER_LOG_LOCATION -DGEOWEBCACHE_CACHE_DIR=$GEOWEBCACHE_CACHE_DIR -Dgwc.context.suffix=gwc"
```
Those options could be updated or changed manually at any time, accordingly to your needs.
**Warning:** The default options we are going to add to the Servlet Container, assume you can reserve at least 4GB of RAM to GeoServer (see the option `-Xmx4096m`). You must be sure your machine has enough memory to run both GeoServer and GeoNode, which in this case means at least 4GB for GeoServer plus at least 2GB for GeoNode. A total of at least 6GB of RAM available on your machine. If you don’t have enough RAM available, you can lower down the values `-Xms512m -Xmx4096m`. Consider that with less RAM available, the performances of your services will be highly impacted.

### Configure the Geofence DB

Before starting the service, Geofence must be configured to connect to the PostgreSQL DB, where its rules will be stored.

**Warning:** In previous versions this step was optional and a file-based H2 DB could be used. This option has been dropped since using H2 is highly discouraged.

Open the `geofence-datasource-ovr.properties` file for edit:

```bash
sudo vim /opt/data/geoserver_data/geofence/geofence-datasource-ovr.properties
```

And paste the following code by replace the placeholders with the required files

```properties
geofenceVendorAdapter.databasePlatform=org.hibernate.spatial.postgis.PostgisDialect
geofenceDataSource.driverClassName=org.postgresql.Driver
geofenceDataSource.url=jdbc:postgresql://localhost:5432/geonode_data
geofenceDataSource.username=geonode
geofenceDataSource.password=geonode
geofenceEntityManagerFactory.jpaPropertyMap[hibernate.default_schema]=public
```

In order to make the changes effective, you’ll need to restart the Servlet Container.

```
# Restart the server
sudo /etc/init.d/tomcat9 restart

# Follow the startup logs
sudo tail -F -n 300 /opt/data/geoserver_logs/geoserver.log
```

If you can see on the logs something similar to this, without errors

```
2019-05-31 10:06:34,190 INFO [geoserver.wps] - Found 5 bindable processes in GeoServer
  → specific processes
2019-05-31 10:06:34,281 INFO [geoserver.wps] - Found 89 bindable processes in Deprecated
  → processes
  → processes
  → processes
2019-05-31 10:06:34,307 INFO [geoserver.wps] - Found 1 bindable processes in
  → PolygonLabelProcess
```

(continues on next page)
as the input kernel of type class javax.media.jai.KernelJAI cannot be handled

ras:RasterZonalStatistics2 as the input zones of type class java.lang.Object cannot be handled

ras:RasterZonalStatistics2 as the input nodata of type class it.geosolutions.jaiext.range.Range cannot be handled

ras:RasterZonalStatistics2 as the input rangeData of type class java.lang.Object cannot be handled


Your GeoServer should be up and running at

http://localhost:8080/geoserver/

Warning: In case of errors or the file geoserver.log is not created, check the Catalina logs in order to try to understand what’s happened.

sudo less /opt/tomcat/latest/logs/catalina.out

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5. Web Server

Until now we have seen how to start GeoNode in DEBUG mode from the command line, through the paver utilities. This is of course not the best way to start it. Moreover you will need a dedicated HTTPD server running on port 80 if you would like to expose your server to the world.

In this section we will see:

1. How to configure NGINX HTTPD Server to host GeoNode and GeoServer. In the initial setup we will still run the services on http://localhost
2. Update the settings in order to link GeoNode and GeoServer to the PostgreSQL Database.
3. Update the settings in order to update GeoNode and GeoServer services running on a public IP or hostname.
4. Install and enable HTTPS secured connection through the Let’s Encrypt provider.

Install and configure NGINX

```
# Install the services
sudo apt install -y nginx uwsgi uwsgi-plugin-python3
```

Serving {“geonode”, “geoserver”} via NGINX

```
# Create the GeoNode UWSGI config
sudo vim /etc/uwsgi/apps-available/geonode.ini
```

**Warning: !IMPORTANT!**
Change the line `virtualenv = /home/<my_user>/.virtualenvs/geonode` below with your current user home directory!

e.g.: If the user is afabiani then `virtualenv = /home/afabiani/.virtualenvs/geonode`

```
[uwsgi]
uwsgi-socket = 0.0.0.0:8000
# http-socket = 0.0.0.0:8000
gid = www-data
plugins = python3
virtualenv = /home/<my_user>/.virtualenvs/geonode
env = DJANGO_SETTINGS_MODULE=geonode.settings
env = GEONODE_INSTANCE_NAME=geonode
env = GEONODE_LB_HOST_IP=
env = GEONODE_LB_PORT=
```

(continues on next page)
# backend

env = POSTGRES_USER=postgres
env = POSTGRES_PASSWORD=postgres
env = GEONODE_DATABASE=geonode
env = GEONODE_DATABASE_PASSWORD=geonode
env = GEONODE_GEODATABASE=geonode_data
env = GEONODE_GEODATABASE_PASSWORD=geonode
env = GEONODE_DATABASE_SCHEMA=public
env = GEONODE_GEODATABASE_SCHEMA=public
env = DATABASE_HOST=localhost
env = DATABASE_PORT=5432
env = DATABASE_URL=postgresql://geonode:geonode@localhost:5432/geonode
env = GEODATABASE_URL=postgresql://geonode:geonode@localhost:5432/geonode_data
env = GEONODE_DB_CONN_MAX_AGE=0
env = GEONODE_DB_CONN_TOUT=5
env = DEFAULT_BACKEND_DATASTORE=datastore
env = BROKER_URL=amqp://admin:admin@localhost:5672//
env = ASYNC_SIGNALS=False
env = SITEURL=http://localhost/
env = ALLOWED_HOSTS="['*']"

# Data Uploader
env = DEFAULT_BACKEND_UPLOADER=geonode.importer
env = TIME_ENABLED=True
env = MOSAIC_ENABLED=False
env = HAYSTACK_SEARCH=False
env = HAYSTACK_ENGINE_URL=http://elasticsearch:9200/
env = HAYSTACK_ENGINE_INDEX_NAME=haystack
env = HAYSTACK_SEARCH_RESULTS_PER_PAGE=200

# nginx
# HTTPD Server

env = GEONODE_LB_HOST_IP=localhost
env = GEONODE_LB_PORT=80

# IP or domain name and port where the server can be reached on HTTPS (leave HOST empty if you want to use HTTP only)
# port where the server can be reached on HTTPS
env = HTTP_HOST=localhost
env = HTTPS_HOST=

env = HTTP_PORT=8000
env = HTTPS_PORT=443

(continues on next page)
# geoserver
# #################
env = GEOSERVER_WEB_UI_LOCATION=http://localhost/geoserver/
env = GEOSERVER_PUBLIC_LOCATION=http://localhost/geoserver/
env = GEOSERVER_LOCATION=http://localhost:8080/geoserver/
env = GEOSERVER_ADMIN_USER=admin
env = GEOSERVER_ADMIN_PASSWORD=geoserver

env = OGC_REQUEST_TIMEOUT=5
env = OGC_REQUEST_MAX_RETRIES=1
env = OGC_REQUEST_BACKOFF_FACTOR=0.3
env = OGC_REQUEST_POOL_MAXSIZE=10
env = OGC_REQUEST_POOL_CONNECTIONS=10

# Java Options & Memory
env = ENABLE_JSONP=true
env = outFormat=text/javascript

# Security
# #################
# Admin Settings
env = ADMIN_USERNAME=admin
env = ADMIN_PASSWORD=admin
env = ADMIN_EMAIL=admin@localhost

# EMAIL Notifications
env = EMAIL_ENABLE=False
env = DJANGO_EMAIL_BACKEND=django.core.mail.backends.smtp.EmailBackend
env = DJANGO_EMAIL_HOST=localhost
env = DJANGO_EMAIL_PORT=25
env = DJANGO_EMAIL_HOST_USER=
env = DJANGO_EMAIL_HOST_PASSWORD=
env = DJANGO_EMAIL_USE_TLS=False
env = DJANGO_EMAIL_USE_SSL=False
env = DEFAULT_FROM_EMAIL='GeoNode <no-reply@geonode.org>'

# Session/Access Control
env = LOCKDOWN_GEONODE=False
env = CORS_ORIGIN_ALLOW_ALL=True
env = X_FRAME_OPTIONS="SAMEORIGIN"
env = SESSION_EXPIRED_CONTROL_ENABLED=True

(continues on next page)
env = DEFAULT_ANONYMOUS_VIEW_PERMISSION=True
env = DEFAULT_ANONYMOUS_DOWNLOAD_PERMISSION=True

# Users Registration
env = ACCOUNT_OPEN_SIGNUP=True
env = ACCOUNT_EMAIL_REQUIRED=True
env = ACCOUNT_APPROVAL_REQUIRED=False
env = ACCOUNT_CONFIRM_EMAIL_ON_GET=False
env = ACCOUNT_EMAIL_VERIFICATION=none
env = ACCOUNT_EMAIL_CONFIRMATION_EMAIL=False
env = ACCOUNT_EMAIL_CONFIRMATION_REQUIRED=False
env = ACCOUNT_AUTHENTICATION_METHOD=username_email
env = AUTO_ASSIGN_REGISTERED_MEMBERS_TO_REGISTERED_MEMBERS_GROUP_NAME=True

# OAuth2
env = OAUTH2_API_KEY=
env = OAUTH2_CLIENT_ID=Jrchz2oPY3akmzndmgUTYrs9gczlgoV20YPSvqaV
env = OAUTH2_CLIENT_SECRET=rCnp5txobUo83EpQEblM8fVj3QT5zb5qRfxNsuPzCqZaiRyIoM4jdgMiZKFfePBHYXClld7B8NlkfDBY9lKeIqPcy5Cp088

# GeoNode APIs
env = API_LOCKDOWN=False
env = TASTYPIE_APIKEY=

# Production and Monitoring
# #################
env = DEBUG=False
env = SECRET_KEY="myv-y4#7j-d*p-__@j#*3z@!y24fz8%^z2v6atuy4bo9vqr1_a"
env = CACHE_BUSTING_STATIC_ENABLED=False
env = MEMCACHED_ENABLED=False
env = MEMCACHED_BACKEND=django.core.cache.backends.memcached.MemcachedCache
env = MEMCACHED_LOCATION=127.0.0.1:11211
env = MEMCACHED_LOCK_EXPIRE=3600
env = MEMCACHED_LOCK_TIMEOUT=10
env = MAX_DOCUMENT_SIZE=2
env = CLIENT_RESULTS_LIMIT=5
env = API_LIMIT_PER_PAGE=1000

# GIS Client
env = GEONODE_CLIENT_LAYER_PREVIEW_LIBRARY=mapstore
env = MAPBOX_ACCESS_TOKEN=
env = BING_API_KEY=
env = GOOGLE_API_KEY=

# Monitoring
env = MONITORING_ENABLED=True
env = MONITORING_DATA_TTL=365
env = USER_ANALYTICS_ENABLED=True
env = USER_ANALYTICS_GZIP=True
env = CENTRALIZED_DASHBOARD_ENABLED=False
env = MONITORING_SERVICE_NAME=localhost
env = MONITORING_HOST_NAME=geonode

# Other Options/Contribs
env = MODIFY_TOPICCATEGORY=True
env = AVATAR_GRAVATAR_SSL=True
env = EXIF_ENABLED=True
env = CREATE_LAYER=True
env = FAVORITE_ENABLED=True

chdir = /opt/geonode
module = geonode.wsgi:application

strict = false
master = true
enable-threads = true
vacuum = true ; Delete sockets during shutdown
single-interpreter = true
die-on-term = true ; Shutdown when receiving SIGTERM (default is...
"respawn"
need-app = true

# logging
# path to where uwsgi logs will be saved
logto = /opt/data/logs/geonode.log
daemonize = /opt/data/logs/geonode.log
touch-reload = /opt/geonode/geonode/wsgi.py
buffer-size = 32768

harakiri = 60 ; forcefully kill workers after 60 seconds
py-callos-afterfork = true ; allow workers to trap signals

max-requests = 10000 ; Restart workers after this many requests
max-worker-lifetime = 3600 ; Restart workers after this many seconds
reload-on-rss = 2048 ; Restart workers after this much resident memory
worker-reload-mercy = 60 ; How long to wait before forcefully killing workers

cheaper-algo = busyness
processes = 128 ; Maximum number of workers allowed
cheaper = 8 ; Minimum number of workers allowed
cheaper-initial = 16 ; Workers created at startup
cheaper-overload = 1 ; Length of a cycle in seconds
cheaper-step = 16 ; How many workers to spawn at a time

cheaper-busyness-multiplier = 30 ; How many cycles to wait before killing workers
cheaper-busyness-min = 20 ; Below this threshold, kill workers (if stable for...
"multiplier cycles"
cheaper-busyness-max = 70 ; Above this threshold, spawn new workers
cheaper-busyness-backlog-alert = 16 ; Spawn emergency workers if more than this many requests are waiting in the queue
cheaper-busyness-backlog-step = 2 ; How many emergency workers to create if there are too many requests in the queue

# Enable the GeoNode UWSGI config
sudo ln -s /etc/uwsgi/apps-available/geonode.ini /etc/uwsgi/apps-enabled/geonode.ini

# Restart UWSGI Service
sudo pkill -9 -f uwsgi

# Create the UWSGI system service

# Create the executable
sudo vim /usr/bin/geonode-uwsgi-start.sh

#!/bin/bash
sudo uwsgi --ini /etc/uwsgi/apps-enabled/geonode.ini

sudo chmod +x /usr/bin/geonode-uwsgi-start.sh

# Create the systemctl Service
sudo vim /etc/systemd/system/geonode-uwsgi.service

[Unit]
Description=GeoNode UWSGI Service
After=rc-local.service

[Service]
User=root
PIDFile=/run/geonode-uwsgi.pid
ExecStart=/usr/bin/geonode-uwsgi-start.sh
PrivateTmp=true
Type=simple
Restart=always
KillMode=process
TimeoutSec=900

[Install]
WantedBy=multi-user.target

# Enable the UWSGI service
sudo systemctl daemon-reload
sudo systemctl start geonode-uwsgi.service
sudo systemctl status geonode-uwsgi.service
sudo systemctl enable geonode-uwsgi.service

# Backup the original NGINX config
sudo mv /etc/nginx/nginx.conf /etc/nginx/nginx.conf.orig

# Create the GeoNode Default NGINX config
sudo vim /etc/nginx/nginx.conf

# Make sure your nginx.config matches the following one
user www-data;
worker_processes auto;
pid /run/nginx.pid;
include /etc/nginx/modules-enabled/*.conf;

events {
    worker_connections 768;
    # multi_accept on;
}

http {
    ##
    # Basic Settings
    ##
    sendfile on;
tcp_nopush on;
tcp_nodelay on;
keepalive_timeout 65;
types_hash_max_size 2048;
    # server_tokens off;
    # server_names_hash_bucket_size 64;
    # server_name_in_redirect off;
    include /etc/nginx/mime.types;
default_type application/octet-stream;
    ##
    # SSL Settings
    ##
    ssl_protocols TLSv1 TLSv1.1 TLSv1.2; # Dropping SSLv3, ref: POODLE
    ssl_prefer_server_ciphers on;
    ##
    # Logging Settings
    ##
    access_log /var/log/nginx/access.log;
error_log /var/log/nginx/error.log;
    ##
    # Gzip Settings
    ##
    gzip on;
gzip_vary on;
gzip_proxied any;
gzip_http_version 1.1;
gzip_disable "MSIE [1-6]\.";
gzip_buffers 16 8k;
gzip_min_length 1100;
gzip_comp_level 6;
gzip_types video/mp4 text/plain application/javascript application/x-javascript text/javascript text/xml text/css image/jpeg;

##

### Virtual Host Configs
###

include /etc/nginx/conf.d/*.conf;
include /etc/nginx/sites-enabled/*;

# Remove the Default NGINX config
sudo rm /etc/nginx/sites-enabled/default

# Create the GeoNode App NGINX config
sudo vim /etc/nginx/sites-available/geonode

uwsgi_intercept_errors on;

upstream geoserver_proxy {
    server localhost:8080;
}

# Expires map
map $sent_http_content_type $expires {
    default off;
    text/html epoch;
    text/css max;
    application/javascript max;
    ~image/ max;
}

server {
    listen 80 default_server;
    listen [::]:80 default_server;

    root /var/www/html;
    index index.html index.htm index.nginx-debian.html;

    server_name _;

    charset utf-8;

    etag on;
    expires $expires;
    proxy_read_timeout 600s;

    (continues on next page)
# set client body size to 2M #
client_max_body_size 50000M;

location / {
    etag off;
    uwsgi_pass 127.0.0.1:8000;
    uwsgi_read_timeout 600s;
    include uwsgi_params;
}

location /static/ {
    alias /opt/geonode/geonode/static_root/;
}

location /uploaded/ {
    alias /opt/geonode/geonode/uploaded/;
}

location /geoserver {
    proxy_pass http://geoserver_proxy;
    include proxy_params;
}

# Prepare the uploaded folder
sudo mkdir -p /opt/geonode/geonode/uploaded
sudo chown -Rf tomcat:www-data /opt/geonode/geonode/uploaded
sudo chmod -Rf 777 /opt/geonode/geonode/uploaded/

sudo touch /opt/geonode/geonode/.celery_results
sudo chmod 777 /opt/geonode/geonode/.celery_results

# Enable GeoNode NGINX config
sudo ln -s /etc/nginx/sites-available/geonode /etc/nginx/sites-enabled/geonode

# Restart the services
sudo service tomcat9 restart
sudo service nginx restart

Update the settings in order to use the PostgreSQL Database

**Warning:** Make sure you already installed and configured the Database as explained in the previous sections.

**Note:** Instead of using the `local_settings.py`, you can drive the GeoNode behavior through the `.env*` variables; see as an instance the file `./paver_dev.sh` or `./manage_dev.sh` in order to understand how to use them. In that case **you don't need to create** the `local_settings.py` file; you can just stick with the default one, which will take the values from the ENV. We tend to prefer this method in a production/dockerized system.
```bash
workon geonode
cd /opt/geonode

# Initialize GeoNode
chmod +x *.sh
./paver_local.sh reset
./paver_local.sh setup
./paver_local.sh sync
./manage_local.sh collectstatic --noinput
sudo chmod -Rf 777 geonode/static_root/ geonode/uploaded/
```

Before finalizing the configuration we will need to update the UWSGI settings

Restart UWSGI and update OAuth2 by using the new geonode.settings

```bash
# As superuser
sudo su

# Restart Tomcat
service tomcat9 restart

# Restart UWSGI
pkill -9 -f uwsgi

# Update the GeoNode ip or hostname
cd /opt/geonode

# This must be done the first time only
cp package/support/geonode.binary /usr/bin/geonode
cp package/support/geonode.updateip /usr/bin/geonode_updateip
chmod +x /usr/bin/geonode
chmod +x /usr/bin/geonode_updateip

# Refresh GeoNode and GeoServer OAuth2 settings
source .env_local
PYTHONWARNINGS=ignore VIRTUAL_ENV=$VIRTUAL_ENV DJANGO_SETTINGS_MODULE=geonode.settings␣ ˓
GEONODE_ETC=/opt/geonode/geonode GEOSERVER_DATA_DIR=/opt/data/geoserver_data TOMCAT_˓
SERVICE="service tomcat9" APACHE_SERVICE="service nginx" geonode_updateip -p localhost

# Go back to standard user
exit
```

Check for any error with

```bash
sudo tail -F -n 300 /var/log/uwsgi/app/geonode.log
```

Reload the UWSGI configuration with

```bash
touch /opt/geonode/geonode/wsgi.py
```
6. Update the settings in order to update GeoNode and GeoServer services running on a public IP or hostname

**Warning:** Before exposing your services to the Internet, make sure your system is hardened and secure enough. See the specific documentation section for more details.

Let’s say you want to run your services on a public IP or domain, e.g. www.example.org. You will need to slightly update your services in order to reflect the new server name.

In particular the steps to do are:

1. Update Nginx configuration in order to serve the new domain name.

   ```bash
   sudo vim /etc/nginx/sites-enabled/geonode
   # Update the 'server_name' directive
   server_name example.org www.example.org;
   # Restart the service
   sudo service nginx restart
   ```

2. Update UWSGI configuration in order to serve the new domain name.

   ```bash
   sudo vim /etc/uwsgi/apps-enabled/geonode.ini
   # Change everywhere 'localhost' to the new hostname
   :s/localhost/www.example.org/g
   :wq
   # Restart the service
   sudo service geonode-uwsgi restart
   ```

3. Update OAuth2 configuration in order to hit the new hostname.

   ```bash
   workon geonode
   sudo su
   cd /opt/geonode
   # Update the GeoNode ip or hostname
   PYTHONWARNINGS=ignore VIRTUAL_ENV=$VIRTUAL_ENV DJANGO_SETTINGS_MODULE=geonode.
   local_settings GEONODE_ETC=/opt/geonode/geonode GEOSERVER_DATA_DIR=/opt/data/
   geoserver_data TOMCAT_SERVICE="service tomcat9" APACHE_SERVICE="service nginx
   " geonode_updateip -l localhost -p www.example.org
   exit
   ```

4. Update the existing GeoNode links in order to hit the new hostname.

   ```bash
   workon geonode
   # To avoid spatialite conflict if using postgresql
   vim $VIRTUAL_ENV/bin/postactivate
   ```

   (continues on next page)
# Add these to make available. Change user, password and server information to yours.
export DATABASE_URL='postgresql://<postgresqluser>:<postgresqlpass>@localhost:5432/geonode'

# Close virtual environment and open it again to update variables
deactivate
workon geonode
cd /opt/geonode

# Update the GeoNode ip or hostname
DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py migrate_baseurl
˓→--source-address=http://localhost --target-address=http://www.example.org

Note: If at the end you get a “bad gateway” error when accessing your geonode site, check uwsgi log with sudo tail -f /var/log/uwsgi/app/geonode.log and if there is an error related with port 5432 check the listening configuration from the postgresql server and allow the incoming traffic from geonode.

7. Install and enable HTTPS secured connection through the Let’s Encrypt provider

# Install Let’s Encrypt Certbot
# sudo add-apt-repository ppa:certbot/certbot # for ubuntu 18.04 and lower
sudo apt update -y; sudo apt install python3-certbot-nginx -y

# Reload NGINX config and make sure the firewall denies access to HTTP
sudo systemctl reload nginx
sudo ufw allow 'Nginx Full'
sudo ufw delete allow 'Nginx HTTP'

# Create and dump the Let’s Encrypt Certificates
sudo certbot --nginx -d example.org -d www.example.org
# ...choose the redirect option when asked for

Next, the steps to do are:

1. Update the GeoNode OAuth2 Redirect URIs accordingly.
   From the GeoNode Admin Dashboard go to Home › Django/GeoNode OAuth Toolkit › Applications › GeoServer

2. Update the GeoServer Proxy Base URL accordingly.
   From the GeoServer Admin GUI go to About & Status > Global

3. Update the GeoServer Role Base URL accordingly.
   From the GeoServer Admin GUI go to Security > Users, Groups, Roles > geonode REST role service

4. Update the GeoServer OAuth2 Service Parameters accordingly.
Fig. 205: Redirect URIs

Fig. 206: Proxy Base URL
From the GeoServer Admin GUI go to Security > Authentication > Authentication Filters > geonode-oauth2

5. Update the UWSGI configuration

```bash
sudo vim /etc/uwsgi/apps-enabled/geonode.ini

# Change everywhere 'http' to 'https'
%http/https/g

# Add three more 'env' variables to the configuration
env = SECURE_SSL_REDIRECT=True
env = SECURE_HSTS_INCLUDE_SUBDOMAINS=True
env = AVATAR_GRAVATAR_SSL=True

# Restart the service
sudo service geonode-uwsgi restart
```

8. Enabling Fully Asynchronous Tasks

Install and configure “rabbitmq-server”

See also:

A March 2021 blog post from RabbitMQ provides alternative installations for other systems.

Install rabbitmq-server

Fig. 208: OAuth2 Service Parameters
Fig. 209: UWSGI Configuration
sudo apt install curl -y

## Import GPG Key
sudo apt update
sudo apt install curl software-properties-common apt-transport-https lsb-release
curl -fsSL https://packages.erlang-solutions.com/ubuntu/erlang_solutions.asc | sudo gpg - --dearmor -o /etc/apt/trusted.gpg.d/erlang.gpg

## Add Erlang Repository to Ubuntu
sudo apt update
sudo apt install erlang

## Add RabbitMQ Repository to Ubuntu
curl -s https://packagecloud.io/install/repositories/rabbitmq/rabbitmq-server/script.deb. --sh | sudo bash

## Install RabbitMQ Server
sudo apt install rabbitmq-server

# check the status (it should already be running)
sudo systemctl status rabbitmq-server

# check the service is enabled (it should already be enabled)
sudo systemctl is-enabled rabbitmq-server.service

# enable the web frontend and allow access through firewall
# view this interface at http://<your ip>:15672
sudo rabbitmq-plugins enable rabbitmq_management
sudo ufw allow proto tcp from any to any port 5672,15672

Create admin user
This is the user that GeoNode will use to communicate with rabbitmq-server.
sudo rabbitmqctl delete_user guest
sudo rabbitmqctl add_user admin <your_rabbitmq_admin_password_here>
sudo rabbitmqctl set_user_tags admin administrator
sudo rabbitmqctl add_vhost /localhost
sudo rabbitmqctl set_permissions -p /admin "." "." "." ".*" ".*" ".*"
sudo rabbitmqctl set_permissions -p /localhost admin "." "." "." ".*" ".*" ".*"

Managing RabbitMQ
You can manage the rabbitmq-server service like any other service:
sudo systemctl stop rabbitmq-server
sudo systemctl start rabbitmq-server
sudo systemctl restart rabbitmq-server

You can manage the rabbitmq-server node with rabbitmqctl. For example, to fully reset the server, use these commands:
sudo rabbitmqctl stop_app
sudo rabbitmqctl reset
sudo rabbitmqctl start_app

1.12. GeoNode Advanced Installation
After reset, you’ll need to recreate the admin user (see above).

**Install and configure “supervisor” and “celery”**

**Install supervisor**

```bash
sudo apt install supervisor

sudo mkdir /etc/supervisor

echo_supervisord_conf > /etc/supervisor/supervisord.conf

sudo mkdir /etc/supervisor/conf.d

**Configure supervisor**

```bash
sudo vim /etc/supervisor/supervisord.conf
```

```ini
; supervisor config file

[unix_http_server]
file=/var/run/supervisor.sock ; (the path to the socket file)
chdir=0700 ; sockef file mode (default 0700)

[supervisord]
nodaemon=true
logfile=/var/log/supervisor/supervisord.log ; (main log file;default $CWD/supervisord.log)
pidfile=/var/run/supervisor.pid ; (supervisor pidfile;default supervisord.pid)
childlogdir=/var/log/supervisor ; ('AUTO' child log dir, default $TEMP)

; the below section must remain in the config file for RPC
; (supervisorctl/web interface) to work, additional interfaces may be added by defining them in separate rpcinterface: sections

[rpcinterface:supervisor]
supervisor.rpcinterface_factory = supervisor.rpcinterface:make_main_rpcinterface

[rpcinterface:supervisor]
serverurl=unix:///var/run/supervisor.sock ; use a unix:/// URL for a unix socket

; The [include] section can just contain the "files" setting. This setting can list multiple files (separated by whitespace or newlines). It can also contain wildcards. The filenames are interpreted as relative to this file. Included files *cannot* include files themselves.
```

(continues on next page)
Note the last line which includes the geonode-celery.conf file that is described below.

**Set the `environment` directive**

Environment variables are placed directly into the /etc/supervisor/supervisord.conf file; they are exposed to the service via the `environment` directive.

The syntax of this directive can either be all on one line like this (shown above):

```
environment=ENV_KEY_1="ENV_VALUE_1",ENV_KEY_2="ENV_VALUE_2",...,ENV_KEY_n="ENV_VALUE_n"
```

or broken into multiple **indented** lines like this:

```
environment=
    ENV_KEY_1="ENV_VALUE_1",
    ENV_KEY_2="ENV_VALUE_2",
    ENV_KEY_n="ENV_VALUE_n"
```

The following are the minimum set of env key value pairs you will need for a standard GeoNode Celery instance:

- ASYNC_SIGNALS="True"
- BROKER_URL="amqp://admin:<your_rabbitmq_admin_password_here>@localhost:5672/
- DATABASE_URL
- GEODATABASE_URL
- DEBUG
- CACHE_BUSTING.Static_ENABLED
- SITEURL
- DJANGO_SETTINGS_MODULE
- GEOSERVER_ADMIN_PASSWORD
- GEOSERVER_LOCATION
- GEOSERVER_PUBLIC_LOCATION
- GEOSERVER_WEB_UI_LOCATION
- MONITORING_ENABLED

**Warning:**

- These key value pairs **must** match the values you have already set on the uwsgi.ini file.
- If you have custom tasks that use any other variables from django.conf.settings (like MEDIA_ROOT), these variables must also be added to the environment directive.

**Configure celery**

```bash
sudo vim /etc/supervisor/conf.d/geonode-celery.conf
```
Manage supervisor and celery

Reload and restart supervisor and the celery workers

```
# Restart supervisor
sudo supervisorctl reload
sudo systemctl restart supervisor

# Kill old celery workers (if any)
sudo pkill -f celery
```

Make sure everything is green

```
# Check the supervisor service status
sudo systemctl status supervisor

# Check the celery workers logs
sudo tail -F -n 300 /var/logs/geonode-celery.log
```

Install and configure “memcached”

```
sudo apt install memcached

sudo systemctl start memcached
sudo systemctl enable memcached

workon <your_geonode_venv_name>
cd /<full_path_to_the_geonode_source_code>

sudo apt install libmemcached-dev zlib1g-dev

pip install pylibmc==1.6.1
pip install sherlock==0.3.2

sudo systemctl restart supervisor.service
sudo systemctl status supervisor.service
```
Docker

In this section we are going to list the passages needed to deploy a vanilla GeoNode with Docker. You can follow the instructions at *Docker Setup for Ubuntu (22.04)* to prepare a Ubuntu 22.04 server with Docker and Docker Compose.

1. Clone GeoNode

```bash
# Let's create the GeoNode core base folder and clone it
sudo mkdir -p /opt/geonode/
sudo usermod -a -G www-data geonode
sudo chown -Rf geonode:www-data /opt/geonode/
sudo chmod -Rf 775 /opt/geonode/

# Clone the GeoNode source code on /opt/geonode
cd /opt
git clone https://github.com/GeoNode/geonode.git
```

2. Prepare the .env file

Follow the instructions at *Docker create env file*

3. Build and run

Follow the instructions at *Docker build and run*

**Test the instance and follow the logs**

If you run the containers daemonized (with the -d option), you can either run specific Docker commands to follow the startup and initialization logs or entering the image shell and check for the GeoNode logs.

In order to follow the startup and initialization logs, you will need to run the following command from the repository folder:

```bash
cd /opt/geonode
docker logs -f django4geonode
```

Alternatively:

```bash
cd /opt/geonode
docker-compose logs -f django
```

You should be able to see several initialization messages. Once the container is up and running, you will see the following statements:

```
... 789 static files copied to '/mnt/volumes/statics/static'.
static data refreshed
Executing UWSGI server uwsgi --ini /usr/src/app/uwsgi.ini for Production
[uWSGI] getting INI configuration from /usr/src/app/uwsgi.ini
```
To exit just hit CTRL+C.

This message means that the GeoNode containers have bee started. Browsing to http://localhost/ will show the GeoNode home page. You should be able to successfully log with the default admin user (admin / admin) and start using it right away.

With Docker it is also possible to run a shell in the container and follow the logs exactly the same as you deployed it on a physical host. To achieve this run

```
docker exec -it django4geonode /bin/bash
```

# Once logged in the GeoNode image, follow the logs by executing
tail -F -n 300 /var/log/geonode.log

Alternatively:

```
docker-compose exec django /bin/bash
```

To exit just hit CTRL+C and exit to return to the host.

**Override the ENV variables to deploy on a public IP or domain**

If you would like to start the containers on a public IP or domain, let’s say www.example.org, you can follow the instructions at Deploy to production variables to customize the GeoNode instance. See the GeoNode Settings section in order to get a list of the available options.

**Remove all data and bring your running GeoNode deployment to the initial stage**

This procedure allows you to stop all the containers and reset all the data with the deletion of all the volumes.

```
cd /opt/geonode
```

# stop containers and remove volumes
docker-compose down -v

**Get rid of old Docker images and volumes (reset the environment completely)**

**Note:** For more details on Docker commands, please refer to the official Docker documentation.

It is possible to let docker show which containers are currently running (add -a for all containers, also stopped ones)

```
# Show the currently running containers
docker ps
```

<table>
<thead>
<tr>
<th>CONTAINER ID</th>
<th>IMAGE</th>
<th>COMMAND</th>
<th>CREATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>4729b3dd1de7</td>
<td>geonode/geonode:4.0</td>
<td><code>/usr/src/geonode/en...</code></td>
<td>29 minutes ago</td>
</tr>
</tbody>
</table>

(continues on next page)
Stop all the containers by running

```
docker-compose stop
```

Force kill all containers by running

```
docker kill $(docker ps -q)
```

If you want to clean up all containers and images, without deleting the static volumes (i.e. the DB and the GeoServer catalog), issue the following commands

```
# Remove all containers
docker rm $(docker ps -a -q)

# Remove all docker images
docker rmi $(docker images -q)

# Prune the old images
docker system prune -a
```

If you want to remove a volume also

```
# List of the running volumes
docker volume ls

# Remove the GeoServer catalog by its name
docker volume rm -f geonode-gsdatadir

# Remove all dangling docker volumes
docker volume rm $(docker volume ls -qf dangling=true)

# update all images, should be run regularly to fetch published updates
```

(continues on next page)
1.12.2 GeoNode Project

Overview

The following steps will guide you to a new setup of GeoNode Project. All guides will first install and configure the system to run it in DEBUG mode (also known as DEVELOPMENT mode) and then by configuring an HTTPD server to serve GeoNode through the standard HTTP (80) port.

Those guides are not meant to be used on a production system. There will be dedicated chapters that will show you some hints to optimize GeoNode for a production-ready machine. In any case, we strongly suggest to task an experienced DevOp or System Administrator before exposing your server to the WEB.

Ubuntu 22.04

This part of the documentation describes the complete setup process for GeoNode on an Ubuntu 22.04 64-bit clean environment (Desktop or Server). All examples use shell commands that you must enter on a local terminal or a remote shell. - If you have a graphical desktop environment you can open the terminal application after login; - if you are working on a remote server the provider or sysadmin should has given you access through an ssh client.

Install the dependencies

In this section, we are going to install all the basic packages and tools needed for a complete GeoNode installation. To follow this guide, a piece of basic knowledge about Ubuntu Server configuration and working with a shell is required. This guide uses vim as the editor; fill free to use nano, gedit or others.

Upgrade system packages

Check that your system is already up-to-date with the repository running the following commands:

```
sudo apt update
```

Create a Dedicated User

In the following steps a User named geonode is used: to run installation commands the user must be in the sudo group.

Create User geonode if not present:

```
# Follow the prompts to set the new user's information.
# It is fine to accept the defaults to leave all of this information blank.
sudo adduser geonode

# The following command adds the user geonode to group sudo
sudo usermod -aG sudo geonode

# make sure the newly created user is allowed to login by ssh
```

(continues on next page)
# (out of the scope of this documentation) and switch to User geonode
su geonode

## Packages Installation

Add the Ubuntu GIS packages prior to installing the other system packages.

```bash
sudo add-apt-repository ppa:ubuntugis/ppa
sudo apt update
```

**Note:** You don’t need to install the **system packages** if you want to run the project using Docker

First, we are going to install all the **system packages** needed for the GeoNode setup.

```bash
# Install packages from GeoNode core
sudo apt install -y python3-gdal=3.3.2+dfsg-2~focal2 gdal-bin=3.3.2+dfsg-2~focal2
   -libgdal-dev=3.3.2+dfsg-2~focal2
sudo apt install -y python3-pip python3-dev python3-virtualenv python3-venv
   -virtualenvwrapper
sudo apt install -y libxml2 libxml2-dev gettext
sudo apt install -y libxslt1-dev libjpeg-dev libpng-dev libmemcached-dev
sudo apt install -y software-properties-common build-essential
sudo apt install -y git unzip gcc zlib1g-dev libgeos-dev libproj-dev
sudo apt install -y sqlite3 spatialite-bin libsqlite3-mod-spatialite

# Install Openjdk
sudo -i apt update
sudo apt install openjdk-8-jdk-headless default-jdk-headless -y

# Remember to select the correct java version /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/
   -java
sudo update-alternatives --config java

sudo apt update -y
sudo apt autoremove -y
sudo apt autoclean -y
sudo apt purge -y
sudo apt clean -y

# Install Packages for Virtual environment management
sudo apt install -y virtualenv virtualenvwrapper

# Install text editor
sudo apt install -y vim
```
Geonode Project Installation

Geonode project is the proper way to run a customized installation of Geonode. The repository of geonode-project contains a minimal set of files following the structure of a django-project. Geonode itself will be installed as a requirement of your project. Inside the project structure is possible to extend, replace or modify all geonode components (e.g. css and other static files, templates, models..) and even register new django apps without touching the original Geonode code.

**Note:** You can call your geonode project whatever you like following the naming conventions for python packages (generally lower case with underscores (_)). In the examples below, replace my_geonode with whatever you would like to name your project.

See also the README file on geonode-project repository

First of all we need to prepare a new Python Virtual Environment

Prepare the environment

```
sudo mkdir -p /opt/geonode_custom/
sudo usermod -a -G www-data geonode
sudo chown -Rf geonode:www-data /opt/geonode_custom/
sudo chmod -Rf 775 /opt/geonode_custom/
```

Clone the source code

```
cd /opt/geonode_custom/
git clone https://github.com/GeoNode/geonode-project.git
```

This will clone the master branch. You will have to checkout the desired branch or tag. As an example, if you want to generate a project for GeoNode 4.2.2 you will docker

```
git checkout -b 4.2.2
```

Make an instance out of the Django Template

**Note:** We will call our instance my_geonode. You can change the name at your convenience.

```
vim ~/.bashrc
# add the following line to the bottom
source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
```

```
source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
mkvirtualenv --python=/usr/bin/python3 my_geonode
```

Alternately you can also create the virtual env like below

```
python3.8 -m venv /home/geonode/dev/.venvs/my_geonode
source /home/geonode/dev/.venvs/my_geonode/bin/activate
```

```
pip install Django==3.2.13
```

```
django-admin startproject --template=./geonode-project -e py,sh,md,rst,json,yml,ini,env,˓
→ sample,properties -n monitoring-cron -n Dockerfile my_geonode
```
# Install the Python packages
```bash
cd /opt/geonode_custom/my_geonode
pip install -r src/requirements.txt --upgrade
pip install -e src/ --upgrade
```

# Install GDAL Utilities for Python
```bash
pip install pygdal==`gdal-config --version`.*`
```

# Dev scripts
```bash
mv .override_dev_env.sample src/.override_dev_env
mv src/manage_dev.sh.sample src/manage_dev.sh
mv src/paver_dev.sh.sample src/paver_dev.sh
```

## Install and Configure the PostgreSQL Database System

In this section we are going to install the PostgreSQL packages along with the PostGIS extension. Those steps must be done **only** if you don’t have the DB already installed on your system.

```bash
# Ubuntu 22.04
sudo sh -c 'echo "deb http://apt.postgresql.org/pub/repos/apt/ `lsb_release -cs`-pgdg main" >> /etc/apt/sources.list.d/pgdg.list'
sudo wget --no-check-certificate --quiet -O - https://www.postgresql.org/media/keys/ACCC4CF8.asc | sudo apt-key add -
sudo apt update -y; sudo apt install -y postgresql-13 postgresql-13-postgis-3 postgresql-13-postgis-3-scripts postgresql-13 postgresql-client-13
```

We now must create two databases, `my_geonode` and `my_geonode_data`, belonging to the role `my_geonode`.

**Warning:** This is our default configuration. You can use any database or role you need. The connection parameters must be correctly configured on `settings`, as we will see later in this section.

## Databases and Permissions

First, create the geonode user. GeoNode is going to use this user to access the database

```bash
sudo service postgresql start
sudo -u postgres createuser -P my_geonode
```

**Use the password:** `geonode`

You will be prompted asked to set a password for the user. **Enter geonode as password.**

**Warning:** This is a sample password used for the sake of simplicity. This password is very **weak** and should be changed in a production environment.

Create database `my_geonode` and `my_geonode_data` with owner `my_geonode`
Next let's create PostGIS extensions

```bash
sudo -u postgres createdb -O my_geonode my_geonode
sudo -u postgres createdb -O my_geonode my_geonode_data
```

```bash
Next let's create PostGIS extensions

```bash
sudo -u postgres psql -d my_geonode -c
| CREATE EXTENSION postgis; |
```

```bash
sudo -u postgres psql -d my_geonode -c
| GRANT ALL ON geometry_columns TO PUBLIC; |
```

```bash
GRANT ALL PRIVILEGES ON ALL TABLES IN SCHEMA PUBLIC TO my_geonode;
```

```bash
GRANT ALL ON spatial_ref_sys TO PUBLIC;
```

```bash
GRANT ALL PRIVILEGES ON ALL TABLES IN SCHEMA public TO my_geonode;
```

Final step is to change user access policies for local connections in the file `pg_hba.conf`

```bash
sudo vim /etc/postgresql/13/main/pg_hba.conf
```

Scroll down to the bottom of the document. We want to make local connection trusted for the default user.

Make sure your configuration looks like the one below.

```
...  # DO NOT DISABLE!
# If you change this first entry you will need to make sure that the
# database superuser can access the database using some other method.
# Noninteractive access to all databases is required during automatic
# maintenance (custom daily cronjobs, replication, and similar tasks).
# Database administrative login by Unix domain socket
local all postgres trust

# TYPE DATABASE USER ADDRESS METHOD
# "local" is for Unix domain socket connections only
local all all md5
# IPv4 local connections:
host all all 127.0.0.1/32 md5
# IPv6 local connections:
host all all ::1/128 md5

# Allow replication connections from localhost, by a user with the
# replication privilege.
local replication all peer
host replication all 127.0.0.1/32 md5
host replication all ::1/128 md5
```

**Warning:** If your PostgreSQL database resides on a separate/remote machine, you'll have to allow remote access to the databases in the `/etc/postgresql/13/main/pg_hba.conf` to the geonode user and tell PostgreSQL to accept non-local connections in your `/etc/postgresql/13/main/postgresql.conf` file
Restart PostgreSQL to make the change effective.

```
sudo service postgresql restart
```

PostgreSQL is now ready. To test the configuration, try to connect to the geonode database as geonode role.

```
psql -U postgres my_geonode
# This should not ask for any password

psql -U my_geonode my_geonode
# This should ask for the password geonode

# Repeat the test with geonode_data DB
psql -U postgres my_geonode_data
psql -U my_geonode my_geonode_data
```

### Run GeoNode Project for the first time in DEBUG Mode

**Warning:** Be sure you have successfully completed all the steps of the section *Install the dependencies*.

This command will run both GeoNode and GeoServer locally after having prepared the Spatialite database. The server will start in DEBUG (or DEVELOPMENT) mode, and it will start the following services:


This modality is beneficial to debug issues and/or develop new features, but it cannot be used on a production system.

```
# Prepare the GeoNode Spatialite database (the first time only)
{cd src/}
{chmod +x paver_dev.sh}
{./paver_dev.sh setup}
{./paver_dev.sh sync}
```

**Note:** In case you want to start again from a clean situation, just run

```
{./paver_dev.sh reset_hard}
```

**Warning:** This will blow up completely your `local_settings`, delete the SQLite database and remove the GeoServer data dir.

```
# Run the server in DEBUG mode
{./paver_dev.sh start}
```

Once the server has finished the initialization and prints on the console the sentence GeoNode is now available., you can open a browser and go to:
GeoNode Documentation, Release 4.2.5

http://localhost:8000/

Sign-in with:

user: admin
password: admin

From now on, everything already said for GeoNode Core (please refer to the section 3. Postgis database Setup and following), applies to a GeoNode Project.

**Be careful** to use the **new** paths and names everywhere:

- Everytime you’ll find the keyword geonode, you’ll need to use your geonode custom name instead (in this example my_geonode).
- Everytime you’ll find paths pointing to /opt/geonode/, you’ll need to update them to point to your custom project instead (in this example /opt/geonode_custom/my_geonode).

Docker

**Warning:** Before moving with this section, you should have read and clearly understood the INSTALLATION > GeoNode Core sections, and in particular the Docker one. Everything said for the GeoNode Core Vanilla applies here too, except that the Docker container names will be slightly different. As an instance if you named your project my_geonode, your containers will be called:

'django4my_geonode' instead of 'django4geonode' and so on...

**Deploy an instance of a geonode-project Django template with Docker on localhost**

Prepare the environment

```bash
sudo mkdir -p /opt/geonode_custom/
sudo usermod -a -G www-data geonode
sudo chown -Rf geonode:www-data /opt/geonode_custom/
sudo chmod -Rf 775 /opt/geonode_custom/
```

Clone the source code

```bash
cd /opt/geonode_custom/
git clone https://github.com/GeoNode/geonode-project.git
```

This will clone the master branch. You will have to checkout the desired branch or tag. As an example, if you want to generate a project for GeoNode 4.2.2 you will docker

```bash
git checkout -b 4.2.2
```

Make an instance out of the Django Template

**Note:** We will call our instance my_geonode. You can change the name at your convenience.
source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
mkvirtualenv --python=/usr/bin/python3 my_geonode

Alternatively you can also create the virtual env like below
python3.8 -m venv /home/geonode/dev/.venvs/my_geonode
source /home/geonode/dev/.venvs/my_geonode/bin/activate

pip install Django==3.2.13

django-admin startproject --template=./geonode-project -e py,sh,mrst,js,yml,ini,env,˓
˓→sample,properties -n monitoring-cron -n Dockerfile my_geonode
cd /opt/geonode_custom/my_geonode

Create the .env file

An .env file is required to run the application. It can be created from the .env.sample either manually or with the create-envfile.py script.

The script accepts several parameters to create the file, in detail:

- **hostname**: e.g. master.demo.geonode.org, default localhost
- **https**: (boolean), default value is False
- **email**: Admin email (this is required if https is set to True since a valid email is required by Letsencrypt certbot)
- **env_type**: prod, test or dev. It will set the DEBUG variable to False (prod, test) or True (dev)
- **geonodepwd**: GeoNode admin password (required inside the .env)
- **geoserverpwd**: Geoserver admin password (required inside the .env)
- **pgpwd**: PostgreSQL password (required inside the .env)
- **dbpwd**: GeoNode DB user password (required inside the .env)
- **geodbpwd**: Geodatabase user password (required inside the .env)
- **clientid**: Oauth2 client id (required inside the .env)
- **clientsecret**: Oauth2 client secret (required inside the .env)
- **secret key**: Django secret key (required inside the .env)
- **sample_file**: absolute path to a env_sample file used to create the env_file. If not provided, the one inside the GeoNode project is used.
- **file**: absolute path to a json file that contains all the above configuration

Note: if the same configuration is passed in the json file and as an argument, the CLI one will overwrite the one in the JSON file. If some value is not provided, a random string is used

Example USAGE

```bash
python create-envfile.py -f /opt/core/geonode-project/file.json \\  \\    --hostname localhost \\  \\    --https \\  \\    --email random@email.com \\  \\    --geonodepwd gn_password \\
```

(continues on next page)
Example JSON expected:

```json
{
    "hostname": "value",
    "https": "value",
    "email": "value",
    "geonodepwd": "value",
    "geoserverpwd": "value",
    "pgpwd": "value",
    "dbpwd": "value",
    "geodbpwd": "value",
    "clientid": "value",
    "clientsecret": "value"
}
```

Modify the code and the templates and rebuild the Docker Containers

```
docker-compose -f docker-compose.yml build --no-cache
```

Finally, run the containers

```
docker-compose -f docker-compose.yml up -d
```

**Deploy an instance of a geonode-project Django template with Docker on a domain**

**Note:** We will use [www.example.org](http://www.example.org) as an example. You can change the name at your convenience.

Stop the containers

```
cd /opt/geonode_custom/my_geonode

docker-compose -f docker-compose.yml stop
```

Edit the `ENV` override file in order to deploy on [www.example.org](http://www.example.org)

Replace everywhere `localhost` with [www.example.org](http://www.example.org)

```
vim .env
```

# e.g.: :%s/localhost/www.example.org/g
Note: It is possible to override here even more variables to customize the GeoNode instance. See the GeoNode Settings section in order to get a list of the available options.

Run the containers in daemon mode

```
docker-compose -f docker-compose.yml -f docker-compose.override.example-org.yml up --build -d
```

Test geonode-project with vagrant

Note: Inside geonode-project files you will find one file named `Vagrantfile.compose` and one named `Vagrantfile.stack`, copy one of them onto file `Vagrantfile` to use them with vagrant.

```
apt-get install -y vagrant
#choose what to test (in this case docker-compose.yml)
cp Vagrantfile.compose Vagrantfile
#this will start a vagrant virtual machine, generate and build geonode-project
vagrant up
# check services are up upon reboot
vagrant ssh geonode-compose -c 'docker ps'
vagrant destroy -f
# test docker swarm
cp Vagrantfile.stack Vagrantfile
vagrant up
# check services are up upon reboot
vagrant ssh geonode-vagrant -c 'docker service ls'
vagrant destroy -f
```

Note: Vagrant will generate a dummy project named “antani” inside vagrant, starting with the geonode-project codebase, this way it is possible to test inside vagrant almost instantly what one modifies into geonode-project.

1.12.3 Further Production Enhancements

GeoServer Production Settings

JVM Settings: Memory And GeoServer Options

The `.env` file provides a way to customize GeoServer JVM Options.

The variable `GEOSERVER_JAVA_OPTS` allows you to tune-up the GeoServer container and to enable specific GeoServer options.

```
GEOSERVER_JAVA_OPTS=
    -Djava.awt.headless=true -Xms4G -Xmx4G -XX:PerfDataSamplingInterval=500
    -XX:SoftRefLRUPolicyMSPerMB=36000 -XX:-UseGCOverheadLimit -XX:+UseConcMarkSweepGC
    -XX:+UseParNewGC -XX:ParallelGCThreads=4 -Dfile.encoding=UTF8 -Djavax.servlet.
```

(continues on next page)
-request.encoding=UTF-8
-Djavax.servlet.response.encoding=UTF-8 -Duser.timezone=GMT

-Djava.awt.headless (true)

Work with graphics-based applications in Java without an actual display, keyboard, or mouse. A typical use case of UI components running in a headless environment could be an image converter app. Though it needs graphics data for image processing, a display is not really necessary. The app could be run on a server and converted files saved or sent over the network to another machine for display.

-Xms4G -Xmx4G

This means that your JVM will be started with Xms amount of memory and will be able to use a maximum of Xmx amount of memory. Above will start a JVM like with 2 GB of memory and will allow the process to use up to 4 GB of memory. You need to adjust this value depending on your available RAM.

-DGEOSERVER_CRSF_DISABLED (True)

The GeoServer web admin employs a CSRF (Cross-Site Request Forgery) protection filter that will block any form submissions that didn't appear to originate from GeoServer. This can sometimes cause problems for certain proxy configurations. You can disable the CSRF filter by setting the GEOSERVER_CRSF_DISABLED property to true. https://docs.geoserver.org/stable/en/user/security/webadmin/csrf.html

Whenever you need to change one or more of the JVM options, you will need to restart the GeoServer Docker container.

# Hard restart of the container: the only way to update the .env variables
docker-compose up -d geoserver

This command will preserve all the GeoServer configuration and data, since the GEOSERVER_DATA_DIR is stored on a Docker static volume.

Nevertheless, any change you have made manually to the container, e.g. added a new plugin to GeoServer or updated some JARs into the WEB-INF/lib library folder, will be lost.

You will need to add the JARs again and restart GeoServer softly

# Soft restart of the container: the .env variables won't be updated
docker-compose restart geoserver

Global And Services Settings

- Check the GeoServer Memory usage and status; ensure the GEOSERVER_DATA_DIR path points to the static volume
- GeoServer Global Settings; make sure the Proxy Base URL points to the public URL and the LOGGING levels are set to Production Mode
- GeoServer Image Processing Settings; unless you are using some specific renderer or GeoServer plugin, use the following recommended options

**Note:** Further details at https://docs.geoserver.org/stable/en/user/configuration/image_processing/index.html#image-processing

- Tune up GeoServer Services Configuration; WCS, WFS, WMS and WPS;
Fig. 210: GeoServer Status

Fig. 211: Global Settings

Fig. 212: Image Processing Settings


- **WCS**: Update the limits accordingly to your needs. Do not use very high values, this will set GeoServer prone to DoS Attacks.

![Resource Consumption Limits](image1.png)

Fig. 213: *WCS Resource Consumption Limits*

- **WMS**: Specify here the SRS List you are going to use. Empty means all the ones supported by GeoServer, but be careful since the GetCapabilities output will become huge.

![Limited SRS list](image2.png)

Fig. 214: *WMS Supported SRS List*

- **WMS**: Raster Rendering Options allows you to tune up the WMS output for better performance or quality. Best Performance: Nearest Neighbour - Best Quality: Bicubic

**Warning**: Raster Images should be always optimized before ingested into GeoNode. The general recommendation is to never upload a non-processed GeoTIFF image to GeoNode.

Further details at:

- **WMS**: Update the limits accordingly to your needs. Do not use very high values, this will set GeoServer prone to DoS Attacks.
**GeoWebCache DiskQuota On Postgis**

By default GeoWebCache DiskQuota is disabled. That means that the layers cache might potentially grow up indefinitely.

GeoWebCache DiskQuota should be always enabled on a production system. In the case it is enabled, this **must** be configured to make use of a DB engine like Postgis to store its indexes.

- First of all ensure **Tile Caching** is enabled on all available layers

---

**Note:** GeoNode tipically does this automatically for you. It is worth to double check anyway.

- Configure **Disk Quota** by providing the connection string to the DB Docker Container as specified in the `.env` file
Fig. 217: *Tile Caching: Tiled Datasets*

Fig. 218: *Tile Caching: Disk Quota Configuration*
GeoFence Security Rules On Postgis

By default GeoFence stores the security rules on an H2 db.

On a production system, this is not really recommended. You will need to update the GeoServer Docker container in order to enable GeoFence storing the rules into the DB Docker Container instead.

In order to do that, follow the procedure below:

```
# Enter the GeoServer Docker Container
docker-compose exec geoserver bash

# Install a suitable editor
apt update
apt install nano

# Edit the GeoFence DataStore .properties file
nano /geoserver_data/data/geofence/geofence-datasource-ovr.properties
```

**Note:** Make sure to provide the same connection parameters specified in the .env file

```
geofenceVendorAdapter.databasePlatform=org.hibernate.spatial.postgis.PostgisDialect
geofenceDataSource.driverClassName=org.postgresql.Driver
geofenceDataSource.url=jdbc:postgresql://db:5432/my_geonode_data
geofenceDataSource.username=my_geonode_data
geofenceDataSource.password=********
geofenceEntityManagerFactory.jpaPropertyMap[hibernate.default_schema]=public
```

```
# Update the GeoServer WEB-INF/lib JARs accordingly
wget --no-check-certificate "https://repo1.maven.org/maven2/org/postgis/postgis-jdbc/1.3.3/postgis-jdbc-1.3.3.jar" -O postgis-jdbc-1.3.3.jar && 
wget --no-check-certificate "https://maven.geo-solutions.it/org/hibernatespatial/hibernate-spatial-postgis/1.1.3.2/hibernate-spatial-postgis-1.1.3.2.jar" -O hibernate-spatial-postgis-1.1.3.2.jar && 
rm /usr/local/tomcat/webapps/geoserver/WEB-INF/lib/hibernate-spatial-h2-geodb-1.1.3.1.jar && 
mv hibernate-spatial-postgis-1.1.3.2.jar /usr/local/tomcat/webapps/geoserver/WEB-INF/lib/ && 
mv postgis-jdbc-1.3.3.jar /usr/local/tomcat/webapps/geoserver/WEB-INF/lib/
```

The container is ready to be restarted now.

**Warning:** Remember to do a **soft restart** otherwise the WEB-INF/lib JARs will be reset to the original state

```
# Exit the GeoServer container
exit

# Soft Restart GeoServer Docker Container
docker-compose restart geoserver
```
**IMPORTANT:** The first time you perform this procedure, GeoFence won’t be able to retrieve the old security rules anymore.

You will need to *Fixup GeoNode Datasets Permissions* in order to regenerate the security rules.

**Fixup GeoNode Datasets Permissions**

The list of the GeoFence Security Rules is available from the *GeoFence Data Rules* section.

Always double check the list is accessible and the data rules are there. If empty, no layer will be accessible by standard users other than admin.

![GeoFence Data Rules](image)

**Fig. 219: GeoFence Data Rules**

In order to re-sync the GeoFence security rules, follow the procedure below:

```bash
# Enter the GeoNode Docker Container
docker-compose exec django bash

# Run the `sync_geonode_datasets` management command
./manage.sh sync_geonode_datasets --updatepermissions
```

**Regenerate GeoNode Datasets Thumbnails**

The following procedure allows you to *batch* regenerate all Datasets Thumbnails:

```bash
# Enter the GeoNode Docker Container
docker-compose exec django bash

# Run the `sync_geonode_datasets` management command
./manage.sh sync_geonode_datasets --updatethumbnails
```
**Regenerate GeoNode Datasets BBOXES**

The following procedure allows you to *batch* regenerate all Datasets BBOXES:

```bash
# Enter the GeoNode Docker Container
docker-compose exec django bash

# Run the `sync_geonode_datasets` management command
./manage.sh sync_geonode_datasets --updatebbox
```

**Fixup GeoNode Datasets Metadata And Download Links**

The following procedure allows you to fix-up broken or incorrect Metadata Links:

```bash
# Enter the GeoNode Docker Container
docker-compose exec django bash

# Run the `set_all_datasets_metadata` management command
./manage.sh set_all_datasets_metadata -d
```

It is also possible to *force* purging the links before regenerating:

```bash
# Enter the GeoNode Docker Container
docker-compose exec django bash

# Run the `set_all_datasets_metadata` management command
./manage.sh set_all_datasets_metadata -d --prune
```

**Migrate GeoNode To A New Hostname**

In the case you will need to move your instance to another domain, as an example from https://my_geonode.geonode.org/ to https://prod_geonode.geonode.org/, follow the procedure below:

1. Update the `.env` file by specifying the new name accordingly.
2. Restart the GeoNode Docker Container.
   ```bash
docker-compose up -d geonode
   ```
3. Run the following management commands from inside the GeoNode Docker Container.
   ```bash
   # Enter the GeoNode Docker Container
docker-compose exec django bash

   # Run the `migrate_baseurl` management command
   ./manage.sh migrate_baseurl --source-address=my_geonode.geonode.org --target-address=prod_geonode.geonode.org

   # Run the `set_all_datasets_metadata` management command
   ./manage.sh set_all_datasets_metadata -d
   ```
Add Huge Or DB Datasets To Your Instance

Uploaing huge datasets, or DB tables, to GeoNode from the Web Upload Interface is not really possible sometimes. The suggested procedure in such cases is the following one:

- Add the dataset to GeoServer first directly.
  
  You must upload the data into the GeoServer Docker Container Static Volume first and then adding manually the layer throught the GeoServer Admin GUI.

- Once the dataset is correctly configured on GeoServer, run the following management command from inside the GeoNode Docker Container

  ```
  # Enter the GeoNode Docker Container
  docker-compose exec django bash

  # Run the `updatelayers` management command
  ./manage.sh updatelayers -w <workspace_name> -f <layer_name>
  ```

1.13 GeoNode Settings

Settings

1.13.1 Settings

Here’s a list of settings available in GeoNode and their default values. This includes settings for some external applications that GeoNode depends on.

For most of them, default values are good. Those should be changed only for advanced configurations in production or heavily hardened systems.

The most common ones can be set through environment variables to avoid touching the settings.py file at all. This is a good practice and also the preferred one to configure GeoNode (and Django apps in general). Whenever you need to change them, set the environment variable accordingly (where it is available) instead of overriding it through the local_settings.

A

ACCESS_TOKEN_EXPIRE_SECONDS

Default: 86400

Env: ACCESS_TOKEN_EXPIRE_SECONDS

When a user logs into GeoNode, if no ACCESS_TOKEN exists, a new one will be created with a default expiration time of ACCESS_TOKEN_EXPIRE_SECONDS seconds (1 day by default).
ACCOUNT_ADAPTER

Default: geonode.people.adapters.LocalAccountAdapter
Custom GeoNode People (Users) Account Adapter.

ACCOUNT_APPROVAL_REQUIRED

Default: False
Env: ACCOUNT_APPROVAL_REQUIRED
If ACCOUNT_APPROVAL_REQUIRED equals True, newly registered users must be activated by a superuser through the Admin gui, before they can access GeoNode.

ACCOUNT_CONFIRM_EMAIL_ON_GET

Default: True
This is a django-allauth setting It allows specifying the HTTP method used when confirming e-mail addresses.

ACCOUNT_EMAIL_REQUIRED

Default: True
This is a django-allauth setting which controls whether the user is required to provide an e-mail address upon registration.

ACCOUNT_EMAIL_VERIFICATION

Default: optional
This is a django-allauth setting

ACCOUNT_LOGIN_REDIRECT_URL

Default: SITEURL
Env: LOGIN_REDIRECT_URL
This is a django-user-accounts setting It allows specifying the default redirect URL after a successful login.
ACCOUNT_LOGOUT_REDIRECT_URL

Default: SITEURL
Env: LOGOUT_REDIRECT_URL
This is a django-user-accounts setting It allows specifying the default redirect URL after a successful logout.

ACCOUNT_NOTIFY_ON_PASSWORD_CHANGE

Default: True
Env: ACCOUNT_NOTIFY_ON_PASSWORD_CHANGE
This is a django-user-accounts setting

ACCOUNT_OPEN_SIGNUP

Default: True
Env: ACCOUNT_OPEN_SIGNUP
This is a django-user-accounts setting Whether or not people are allowed to self-register to GeoNode or not.

ACCOUNT_SIGNUP_FORM_CLASS

Default: geonode.people.forms.AllauthReCaptchaSignupForm
Env: ACCOUNT_SIGNUP_FORM_CLASS
Enabled only when the RECAPTCHA_ENABLED option is True.
Ref. to RECAPTCHA_ENABLED

ACTSTREAM_SETTINGS

Default:

```python
{
    'FETCH_RELATIONS': True,
    'USE_PREFETCH': False,
    'USE_JSONFIELD': True,
    'GFK_FETCH_DEPTH': 1,
}
```

Actstream Settings.
ADDITIONAL_DATASET_FILE_TYPES

External application can define additional supported file type other than the default one declared in the SUPPORTED_DATASET_FILE_TYPES.

The variable should be declared in this way in settings.py (or via application hook):

Please rely on geonode.tests.test_utils.TestSupportedTypes for an example

ADMIN_IP_WHITELIST

Default: []

When this list is populated with a list of IPs or IP ranges (e.g. 192.168.1.0/24) requests from and admin user will be allowe only from IPs matching with the list.

ADMIN_MODERATE_UPLOADS

Default: False

When this variable is set to True, every uploaded resource must be approved before becoming visible to the public users.

Until a resource is in PENDING APPROVAL state, only the superusers, owner and group members can access it, unless specific edit permissions have been set for other users or groups.

A Group Manager can approve the resource, but he cannot publish it whenever the setting RESOURCE_PUBLISHING is set to True. Otherwise, if RESOURCE_PUBLISHING is set to False, the resource becomes accessible as soon as it is approved.

ADMINS_ONLY_NOTICE_TYPES

Default: ['monitoring_alert',]

A list of notification labels that standard users should not either see or set.

Such notifications will be hidden from the notify settings page and automatically set to false for non-superusers.

ADVANCED_EDIT_EXCLUDE_FIELD

Default: []

A list of element (item name) to exclude from the Advanced Edit page.

Example:

ADVANCED_EDIT_EXCLUDE_FIELD=['title', 'keywords', 'tkeywords']
AGON_RATINGS_CATEGORY_CHOICES

Default:

```python
{
    "maps.Map": {
        "map": "How good is this map?"
    },
    "layers.Layer": {
        "layer": "How good is this layer?"
    },
    "documents.Document": {
        "document": "How good is this document?"
    }
}
```

ALLOWED_DOCUMENT_TYPES

Default:

```python
['doc', 'docx', 'gif', 'jpg', 'jpeg', 'ods', 'odt', 'odp', 'pdf', 'png',
 'ppt', 'pptx', 'rar', 'sld', 'tif', 'tiff', 'txt', 'xls', 'xlsx', 'xml',
 'zip', 'gz', 'qml']
```

A list of acceptable file extensions that can be uploaded to the Documents app.

ANONYMOUS_USER_ID

Default: -1

Env: ANONYMOUS_USER_ID

The id of an anonymous user. This is a django-guardian setting.

API_INCLUDE_REGIONS_COUNT

Default: False

Env: API_INCLUDE_REGIONS_COUNT

If set to True, a counter with the total number of available regions will be added to the API JSON Serializer.

API_LIMIT_PER_PAGE

Default: 200

Env: API_LIMIT_PER_PAGE

The Number of items returned by the APIs 0 equals no limit. Different from CLIENT_RESULTS_LIMIT, affecting the number of items per page in the resource list.
API_LOCKDOWN

Default: True
Env: API_LOCKDOWN

If this is set to True users must be authenticated to get search results when search for for users, groups, categories, regions, tags etc. Filtering search results of Resourcebase-objects like Layers, Maps or Documents by one of the above types does not work. Attention: If API_LOCKDOWN is set to False all details can be accessed by anonymous users.

ASYNC_SIGNALS

Default: False
Env: ACCOUNT_NOTIFY_ON_PASSWORD_CHANGE

AUTH_EXEMPT_URLS

Default:

```
(r'^/?$',
 '/gs/*',
 '/static/*',
 '/o/*',
 '/api/o/*',
 '/api/roles',
 '/api/adminRole',
 '/api/users',
 '/api/layers',)
```

A tuple of URL patterns that the user can visit without being authenticated. This setting has no effect if LOCKDOWN_GEONODE is not True. For example, AUTH_EXEMPT_URLS = ('/maps',) will allow unauthenticated users to browse maps.

AUTO_ASSIGN_REGISTERED_MEMBERS_TO_CONTRIBUTORS

Default: True
Env: AUTO_ASSIGN_REGISTERED_MEMBERS_TO_CONTRIBUTORS

Assign new registered users to the contributors group. If set to False new registered members will not obtain automatic permissions to create and edit resources.
**AUTO_ASSIGN_REGISTERED_MEMBERS_TO_REGISTERED_MEMBERS_GROUP_NAME**

Default: True
Env: AUTO_ASSIGN_REGISTERED_MEMBERS_TO_REGISTERED_MEMBERS_GROUP_NAME

Auto assign users to a default REGISTERED_MEMBERS_GROUP_NAME private group after AUTO_ASSIGN_REGISTERED_MEMBERS_TO_REGISTERED_MEMBERS_GROUP_AT.

**AUTO_ASSIGN_REGISTERED_MEMBERS_TO_REGISTERED_MEMBERS_GROUP_AT**

Default: activation
Env: AUTO_ASSIGN_REGISTERED_MEMBERS_TO_REGISTERED_MEMBERS_GROUP_AT
Options: "registration" | "activation" | "login"

Auto assign users to a default REGISTERED_MEMBERS_GROUP_NAME private group after {“registration” | “activation” | “login”}.

Notice that whenever ACCOUNT_EMAIL_VERIFICATION == True and ACCOUNT_APPROVAL_REQUIRED == False, users will be able to register and they became active already, even if they won’t be able to login until the email has been verified.

**AUTOGENERATE_AVATAR_SIZES**

Default: 20, 30, 32, 40, 50, 65, 70, 80, 100, 140, 200, 240

An iterable of integers representing the sizes of avatars to generate on upload. This can save rendering time later on if you pre-generate the resized versions.

**AVATAR_GRAVATAR_SSL**

Default: False
Env: AVATAR_GRAVATAR_SSL
Options: True | False

Force SSL when loading fallback image from gravatar.com.

**AVATAR_DEFAULT_URL**

Default: /geonode/img/avatar.png
Env: AVATAR_GRAVATAR_SSL
Options: "filepath to image"

Allows to set a custom fallback image in case a User has not uploaded a profile image. Needs AVATAR_PROVIDERS to be set correctly.
**AVATAR_PROVIDERS**

Default:

```python
[avatar.providers.PrimaryAvatarProvider,'
 avatar.providers.GravatarAvatarProvider',
 avatar.providers.DefaultAvatarProvider]
```

Env: `AVATAR_PROVIDERS`

Options: Avatar provider object

This setting configures in which order gravatar images are loaded. A common use case is the use of a local image over a fallback image loaded from gravatar.com. To do so you would change the order like:

```python
[avatar.providers.PrimaryAvatarProvider,'
 avatar.providers.DefaultAvatarProvider',
 avatar.providers.GravatarAvatarProvider]
```

(DefaultAvatarProvider before GravatarAvatarProvider)

---

**BING_API_KEY**

Default: None

Env: `BING_API_KEY`

This property allows to enable a Bing Aerial background.

If using mapstore client library, make sure the `MAPSTORE_BASELAYERS` include the following:

```python
if BING_API_KEY:
    BASEMAP = {
        "type": "bing",
        "title": "Bing Aerial",
        "name": "AerialWithLabels",
        "source": "bing",
        "group": "background",
        "apiKey": "{{apiKey}}",
        "visibility": False
    }
    DEFAULT_MS2_BACKGROUNDS = [BASEMAP,] + DEFAULT_MS2_BACKGROUNDS
```
**BROKER_HEARTBEAT**

Default: 0

Heartbeats are used both by the client and the broker to detect if a connection was closed. This is a Celery setting.

**BROKER_TRANSPORT_OPTIONS**

Default:

```python
{
    'fanout_prefix': True,
    'fanout_patterns': True,
    'socket_timeout': 60,
    'visibility_timeout': 86400
}
```

This is a Celery setting.

**CACHES**

Default:

```python
CACHES = {
    'default': {
        'BACKEND': 'django.core.cache.backends.dummy.DummyCache',
    },
    'resources': {
        'BACKEND': 'django.core.cache.backends.locmem.LocMemCache',
        'TIMEOUT': 600,
        'OPTIONS': {
            'MAX_ENTRIES': 10000
        }
    }
}
```

A dictionary containing the settings for all caches to be used with Django. This is a Django setting

The 'default' cache is disabled because we don’t have a mechanism to discriminate between client sessions right now, and we don’t want all users fetch the same api results.

The 'resources' is not currently used. It might be helpful for caching Django template fragments and/or Tastypie API Caching.
**CACHE_BUSTING_STATIC_ENABLED**

Default: False  
Env: CACHE_BUSTING_STATIC_ENABLED

This is a Django Compressed Manifest storage provided by WhiteNoise. A boolean allowing you to enable the WhiteNoise CompressedManifestStaticFilesStorage storage. This works only on a production system.

**Warning:** This works only if DEBUG = False

**CASCADE_WORKSPACE**

Default: geonode  
Env: CASCADE_WORKSPACE

**CATALOGUE**

A dict with the following keys:

- **ENGINE**: The CSW backend (default is geonode.catalogue.backends.pycsw_local)  
- **URL**: The FULLY QUALIFIED base URL to the CSW instance for this GeoNode  
- **USER_NAME**: login credentials (if required)  
- **PASSWORD**: login credentials (if required)

pycsw is the default CSW enabled in GeoNode. pycsw configuration directives are managed in the PYCSW entry.

**CATALOGUE_METADATA_TEMPLATE**

Default: catalogue/full_metadata.xml

A string with the catalogue xml file needed for the metadata.

**CATALOGUE_METADATA_XSL**

Default: '/static/metadataxsl/metadata.xsl

A string pointing to the XSL used to transform the metadata XML into human readable HTML.

**CELERYD_POOL_RESTARTS**

Default: True

This is a Celery setting.
**CELERY_ACCEPT_CONTENT**

Default: `['json']`

This is a Celery setting.

**CELERY_ACKS_LATE**

Default: True

This is a Celery setting.

**CELERY_BEAT_SCHEDULE**

Here you can define your scheduled task.

**CELERY_DISABLE_RATE_LIMITS**

Default: False

This is a Celery setting.

**CELERY_ENABLE_UTC**

Default: True

This is a Celery setting.

**CELERY_MAX_CACHED_RESULTS**

Default: 32768

This is a Celery setting.

**CELERY_MESSAGE_COMPRESSION**

Default: `gzip`

This is a Celery setting.

**CELERY_RESULT_PERSISTENT**

Default: False

This is a Celery setting.
CELERY_RESULT_SERIALIZER

Default: json
This is a Celery setting.

CELERY_SEND_TASK_SENT_EVENT

Default: True
If enabled, a task-sent event will be sent for every task so tasks can be tracked before they are consumed by a worker. This is a Celery setting.

CELERY_TASK_ALWAYS_EAGER

Default: False if ASYNC_SIGNALS else True
This is a Celery setting.

CELERY_TASK_CREATE_MISSING_QUEUES

Default: True
This is a Celery setting.

CELERY_TASK_IGNORE_RESULT

Default: True
This is a Celery setting.

CELERY_TASK_QUEUES

Default:

```python
Queue('default', GEONODE_EXCHANGE, routing_key='default'),
Queue('geonode', GEONODE_EXCHANGE, routing_key='geonode'),
Queue('update', GEONODE_EXCHANGE, routing_key='update'),
Queue('cleanup', GEONODE_EXCHANGE, routing_key='cleanup'),
Queue('email', GEONODE_EXCHANGE, routing_key='email'),
```

A tuple with registered Queues.
CELERY_TASK_RESULT_EXPIRES

Default: 43200
Env: CELERY_TASK_RESULT_EXPIRES
This is a Celery setting.

CELERY_TASK_SERIALIZER

Default: json
Env: CELERY_TASK_SERIALIZER
This is a Celery setting.

CELERY_TIMEZONE

Default: UTC
Env: TIME_ZONE
This is a Celery setting.

CELERY_TRACK_STARTED

Default: True
This is a Celery setting.

CELERY_WORKER_DISABLE_RATE_LIMITS

Default: False
Disable the worker rate limits (number of tasks that can be run in a given time frame).

CELERY_WORKER_SEND_TASK_EVENTS

Default: False
Send events so the worker can be monitored by other tools.

CLIENT_RESULTS_LIMIT

Default: 5
Env: CLIENT_RESULTS_LIMIT
The number of results per page listed in the GeoNode search pages. Different from API_LIMIT_PER_PAGE, affecting the number of items returned by the APIs.
CORS_ALLOW_ALL_ORIGINS

Default: False
Env: CORS_ALLOW_ALL_ORIGINS

If set to true Access-Control-Allow-Origin: * header is set for any response. A safer option (not managed through env vars at the moment) is CORS_ALLOWED_ORIGINS, where a list of hosts can be configured, or CORS_ALLOWED_ORIGIN_REGEXES, where the list can contain regexes. Notice that the Nginx in front of GeoNode always includes Access-Control-Allow-Credentials true. This must also taken into account when CORS is enabled.

CREATE_LAYER

Default: False
Env: CREATE_LAYER

Enable the create layer plugin.

CKAN_ORIGINS

Default:

```python
CKAN_ORIGINS = [{
    "label": "Humanitarian Data Exchange (HDX)",
    "url": "https://data.hdx.rwlabs.org/dataset/new?title={name}&notes={abstract}",
    "css_class": "hdx"
}]
```

A list of dictionaries that are used to generate the links to CKAN instances displayed in the Share tab. For each origin, the name and abstract format parameters are replaced by the actual values of the ResourceBase object (layer, map, document). This is not enabled by default. To enable, uncomment the following line: SOCIAL_ORIGINS.extend(CKAN_ORIGINS).

CSRF_COOKIE_HTTPONLY

Default: False
Env: CSRF_COOKIE_HTTPONLY

Whether to use HttpOnly flag on the CSRF cookie. If this is set to True, client-side JavaScript will not be able to access the CSRF cookie. This is a Django Setting
CSRF_COOKIE_SECURE

Default: False
Env: CSRF_COOKIE_SECURE

Whether to use a secure cookie for the CSRF cookie. If this is set to True, the cookie will be marked as “secure,” which means browsers may ensure that the cookie is only sent with an HTTPS connection. This is a Django Setting

CUSTOM_METADATA_SCHEMA

Default: {}
If present, will extend the available metadata schema used for store new value for each resource. By default override the existing one. The expected schema is the same as the default

DATA_UPLOAD_MAX_NUMBER_FIELDS

Default: 100000
Maximum value of parsed attributes.

DATASET_DOWNLOAD_HANDLERS

Default: []
Additional download handlers that provides a link to download the resource

DEBUG

Default: False
Env: DEBUG

One of the main features of debug mode is the display of detailed error pages. If your app raises an exception when DEBUG is True, Django will display a detailed traceback, including a lot of metadata about your environment, such as all the currently defined Django settings (from settings.py). This is a Django Setting

DEBUG STATIC

Default: False
Env: DEBUG STATIC
Load non minified version of static files.
DEFAULT_ANONYMOUS_DOWNLOAD_PERMISSION

Default: True
Whether the uploaded resources should downloadable by default.

DEFAULT_ANONYMOUS_VIEW_PERMISSION

Default: True
Whether the uploaded resources should be public by default.

DEFAULT_AUTO_FIELD

Default: django.db.models.AutoField
Default primary key field type to use for models that don’t have a field with primary_key=True. Django documentation https://docs.djangoproject.com/it/3.2/ref/settings/#std:setting-DEFAULT_AUTO_FIELD

DEFAULT_DATASET_DOWNLOAD_HANDLER

Default: geonode.layers.download_handler.DatasetDownloadHandler
from GeoNode 4.2.x has been introduced with this issue #11296 and later improved with this issue #11421 the concept of Download Handler and ofc GeoNode provides a default implementation of it which process the download via WPS

DEFAULT_EXTRA_METADATA_SCHEMA

Default

```
{
   Optional("id"): int,
   "filter_header": object,
   "field_name": object,
   "field_label": object,
   "field_value": object,
}
```

Define the default metadata schema used for add to the resource extra metadata without modify the actual model. This schema is used as validation for the input metadata provided by the user

- **id**: (optional int): the identifier of the metadata. Optional for creation, required in Upgrade phase
- **filter_header**: (required object): Can be any type, is used to generate the facet filter header. Is also an identifier.
- **field_name**: (required object): name of the metadata field
- **field_label**: (required object): verbose string of the name. Is used as a label in the facet filters.
- **field_value**: (required object): metadata values

An example of metadata that can be ingested is the follow:
[{
    "filter_header": "Bike Brand",
    "field_name": "name",
    "field_label": "Bike Name",
    "field_value": "KTM",
},
{
    "filter_header": "Bike Brand",
    "field_name": "name",
    "field_label": "Bike Name",
    "field_value": "Bianchi",
}]

DEFAULT_LAYER_FORMAT

Default: image/png
Env: DEFAULT_LAYER_FORMAT
The default format for requested tile images.

DEFAULT_MAP_CENTER

Default: (0, 0)
Env: DEFAULT_MAP_CENTER_X DEFAULT_MAP_CENTER_Y
A 2-tuple with the latitude/longitude coordinates of the center-point to use in newly created maps.

DEFAULT_MAP_CRS

Default: EPSG:3857
Env: DEFAULT_MAP_CRS
The default map projection. Default: EPSG:3857

DEFAULT_MAP_ZOOM

Default: 0
Env: DEFAULT_MAP_ZOOM
The zoom-level to use in newly created maps. This works like the OpenLayers zoom level setting; 0 is at the world extent and each additional level cuts the viewport in half in each direction.
DEFAULT_MAX_PARALLEL_UPLOADS_PER_USER

Default: 5

When uploading datasets, this value limits the number of parallel uploads.
The parallelism limit is set during installation using the value of this variable. After installation, only an user with administrative rights can change it. These limits can be changed in the admin panel or accessing by api.

DEFAULT_MAX_UPLOAD_SIZE

Default: 104857600 (100 MB in bytes)

When uploading datasets or uploading documents, the total size of the uploaded files is verified.
The size limits are set during installation using the value of this variable. After installation, only an user with administrative rights can change it. These limits can be changed in the admin panel or accessing by api.

DEFAULT_SEARCH_SIZE

Default: 10

Env: DEFAULT_SEARCH_SIZE

An integer that specifies the default search size when using geonode.search for querying data.

DEFAULT_WORKSPACE

Default: geonode

Env: DEFAULT_WORKSPACE

The standard GeoServer workspace.

DELAYED_SECURITY_SIGNALS

Default: False

Env: DELAYED_SECURITY_SIGNALS

This setting only works when GEOFENCE_SECURITY_ENABLED has been set to True and GeoNode is making use of the GeoServer BACKEND.

By setting this to True, every time the permissions will be updated/changed for a Layer, they won’t be applied immediately but only and only if either:

a. A Celery Worker is running and it is able to execute the geonode.security.tasks.synch_guardian periodic task; notice that the task will be executed at regular intervals, based on the interval value defined in the corresponding PeriodicTask model.

b. A periodic cron job runs the sync_security_rules management command, or either it is manually executed from the Django shell.

c. The user, owner of the Layer or with rights to change its permissions, clicks on the GeoNode UI button Sync permissions immediately
Warning: Layers won’t be accessible to public users anymore until the Security Rules are not synchronized!

DISPLAY_COMMENTS

Default: True
Env: DISPLAY_COMMENTS
If set to False comments are hidden.

DISPLAY_RATINGS

Default: True
Env: DISPLAY_RATINGS
If set to False ratings are hidden.

DISPLAY_SOCIAL

Default: True
Env: DISPLAY_SOCIAL
If set to False social sharing is hidden.

DISPLAY_WMS_LINKS

Default: True
Env: DISPLAY_WMS_LINKS
If set to False direct WMS link to GeoServer is hidden.

DISPLAY_ORIGINAL_DATASET_LINK

Default: True
Env: DISPLAY_ORIGINAL_DATASET_LINK
If set to False original dataset download is hidden.

DOWNLOAD_FORMATS_METADATA

Specifies which metadata formats are available for users to download.
Default:

```
DOWNLOAD_FORMATS_METADATA = [
    'Atom', 'DIF', 'Dublin Core', 'ebRIM', 'FGDC', 'ISO',
]
```
**DOWNLOAD_FORMATS_VECTOR**

Specifies which formats for vector data are available for users to download.

Default:

```
DOWNLOAD_FORMATS_VECTOR = [
    'JPEG', 'PDF', 'PNG', 'Zipped Shapefile', 'GML 2.0', 'GML 3.1.1', 'CSV',
    'Excel', 'GeoJSON', 'KML', 'View in Google Earth', 'Tiles',
]
```

**DOWNLOAD_FORMATS_RASTER**

Specifies which formats for raster data are available for users to download.

Default:

```
DOWNLOAD_FORMATS_RASTER = [
    'JPEG', 'PDF', 'PNG' 'Tiles',
]
```

**EMAIL_ENABLE**

Default: False

Options:

- **EMAIL_BACKEND**
  Default: django.core.mail.backends.smtp.EmailBackend
  Env: DJANGO_EMAIL_BACKEND

- **EMAIL_HOST**
  Default: localhost

- **EMAIL_PORT**
  Default: 25

- **EMAIL_HOST_USER**
  Default: ''

- **EMAIL_HOST_PASSWORD**
  Default: ''

- **EMAIL_USE_TLS**
  Default: False

- **EMAIL_USE_SSL**
  Default: False

- **DEFAULT_FROM_EMAIL**
EPSG_CODE_MATCHES

Default:

```python
{  'EPSG:4326': '(4326) WGS 84',
   'EPSG:900913': '(900913) Google Maps Global Mercator',
   'EPSG:3857': '(3857) WGS 84 / Pseudo-Mercator',
   'EPSG:3785': '(3785 DEPRECATED) Popular Visualization CRS / Mercator',
   'EPSG:32647': '(32647) WGS 84 / UTM zone 47N',
   'EPSG:32736': '(32736) WGS 84 / UTM zone 36S'
}
```

Supported projections human readable descriptions associated to their EPSG Codes. This list will be presented to the user during the upload process whenever GeoNode won’t be able to recognize a suitable projection. Those codes should be aligned to the UPLOADER ones and available in GeoServer also.

EXTRA_METADATA_SCHEMA

Default:

```python
EXTRA_METADATA_SCHEMA = {**{
    "map": os.getenv('MAP_EXTRA_METADATA_SCHEMA', DEFAULT_EXTRA_METADATA_SCHEMA),
    "layer": os.getenv('DATASET_EXTRA_METADATA_SCHEMA', DEFAULT_EXTRA_METADATA_SCHEMA),
    "document": os.getenv('DOCUMENT_EXTRA_METADATA_SCHEMA', DEFAULT_EXTRA_METADATA_SCHEMA),
    "geoapp": os.getenv('GEOAPP_EXTRA_METADATA_SCHEMA', DEFAULT_EXTRA_METADATA_SCHEMA)
}, **CUSTOM_METADATA_SCHEMA}
```

Variable used to actually get the expected metadata schema for each resource_type. In this way, each resource type can have a different metadata schema

FREETEXT_KEYWORDS_READONLY

Default: False
Env: FREETEXT_KEYWORDS_READONLY

Make Free-Text Keywords writable from users. Or read-only when set to False.
FACET_PROVIDERS

Default: pre filled list of providers
Env: FACET_PROVIDERS
Contains the list of the providers available to perform an serve the facets. In case the user wants remove a facets, is enough to remove the path of the proider from the list

G

GEOFENCE_SECURITY_ENABLED

Default: True (False is Test is true)
Env: GEOFENCE_SECURITY_ENABLED
Whether the geofence security system is used.

GEOIP_PATH

Default: Path to project
Env: PROJECT_ROOT
The local path where GeoIPLities.dat is written to. Make sure your user has to have write permissions.

GEONODE_APPS_ENABLED

Default: True
If enabled contrib apps are used. If disabled: - the geoapps URLs are not included in the routing paths - the geoapps resources are excluded from the search - the resource detail are forwarded to the homepage
ENABLE -> DISABLE transition:
This should be done if the geoapps were enabled in an environment where they are not needed.
DISABLE -> ENABLE transition:
It should be done only once to enable geoapps in an environment where are needed

GEONODE_CLIENT_LAYER_PREVIEW_LIBRARY

Default: "mapstore"
The library to use for display preview images of layers. The library choices are:
   "mapstore" "leaflet" "react"
**GEONODE_EXCHANGE**

Default: `Exchange("default", type="direct", durable=True)`

The definition of Exchanges published by geonode. Find more about Exchanges at celery docs.

**GEOSERVER_ADMIN_USER**

Default: `admin`

Env: `GEOSERVER_ADMIN_PASSWORD`

The geoserver admin username.

**GEOSERVER_ADMIN_PASSWORD**

Default: `geoserver`

Env: `GEOSERVER_ADMIN_USER`

The GeoServer admin password.

**GEOSERVER_FACTORY_PASSWORD**

Default: `geoserver`

Env: `GEOSERVER_FACTORY_PASSWORD`

The GeoServer admin factory password, required for the first time configuration fo Geoserver (Docker setup).

**GEOSERVER_EXCHANGE**

Default: `Exchange("geonode", type="topic", durable=False)`

The definition of Exchanges published by GeoServer. Find more about Exchanges at celery docs.

**GEOSERVER_LOCATION**

Default: `http://localhost:8080/geoserver/`

Env: `GEOSERVER_LOCATION`

Url under which GeoServer is available.
**GEOSERVER_PUBLIC_HOST**

Default: SITE_HOST_NAME (Variable)
Env: GEOSERVER_PUBLIC_HOST
Public hostname under which GeoServer is available.

**GEOSERVER_PUBLIC_LOCATION**

Default: SITE_HOST_NAME (Variable)
Env: GEOSERVER_PUBLIC_LOCATION
Public location under which GeoServer is available.

**GEOSERVER_PUBLIC_PORT**

Default: 8080 (Variable)
Env: GEOSERVER_PUBLIC_PORT
Public Port under which GeoServer is available.

**GEOSERVER_WEB_UI_LOCATION**

Default: GEOSERVER_PUBLIC_LOCATION (Variable)
Env: GEOSERVER_WEB_UI_LOCATION
Public location under which GeoServer is available.

**GROUP_PRIVATE_RESOURCES**

Default: False
Env: GROUP_PRIVATE_RESOURCES
If this option is enabled, Resources belonging to a Group won't be visible by others

**IMPORTER HANDLERS**

Default: pre filled list of handlers
Env: IMPORTER_HANDLERS
Contains the list of the handlers available to perform an import of a resource. In case the user wants to drop the support during the import phase, is enough to remove the path of the Handler from the list.
LEAFLET_CONFIG

A dictionary used for Leaflet configuration.

LICENSES

Default:

```python
{
    'ENABLED': True,
    'DETAIL': 'above',
    'METADATA': 'verbose',
}
```

Enable Licenses User Interface

LOCAL_SIGNALS_BROKER_URL

Default: memory://

LOCKDOWN_GEONODE

Default: False
Env: LOCKDOWN_GEONODE

By default, the GeoNode application allows visitors to view most pages without being authenticated. If this is set to True users must be authenticated before accessing URL routes not included in AUTH_EXEMPT_URLS.

LOGIN_URL

Default: account/login/{}.format(SITEURL)
Env: LOGIN_URL

The URL where requests are redirected for login.

LOGOUT_URL

Default: account/login/{}.format(SITEURL)
Env: LOGOUT_URL

The URL where requests are redirected for logout.
MAP_CLIENT_USE_CROSS_ORIGIN_CREDENTIALS

Default: False
Env: MAP_CLIENT_USE_CROSS_ORIGIN_CREDENTIALS

Enables cross origin requests for geonode-client.

MAPSTORE_BASELAYERS

Default:

```json
[
    {
        "type": "osm",
        "title": "Open Street Map",
        "name": "mapnik",
        "source": "osm",
        "group": "background",
        "visibility": true
    },
    {
        "type": "tileprovider",
        "title": "OpenTopoMap",
        "provider": "OpenTopoMap",
        "name": "OpenTopoMap",
        "source": "OpenTopoMap",
        "group": "background",
        "visibility": false
    },
    {
        "type": "wms",
        "title": "Sentinel-2 cloudless - https://s2maps.eu",
        "format": "image/jpeg",
        "id": "s2cloudless",
        "name": "s2cloudless:s2cloudless",
        "url": "https://maps.geo-solutions.it/geoserver/wms",
        "group": "background",
        "thumbURL": "%STATIC/mapstorestyle/img/s2cloudless-s2cloudless.png" %SITEURL,
        "visibility": false
    },
    {
        "source": "ol",
        "group": "background",
        "id": "none",
        "name": "empty",
        "title": "Empty Background",
        "type": "empty",
        "visibility": false,
        "args": ["Empty Background", {"visibility": false}]
    }
]```
Env: MAPSTORE_BASELAYERS

Allows to specify which backgrounds MapStore should use. The parameter visibility for a layer, specifies which one is the default one.

A sample configuration using the Bing background without OpenStreetMap, could be the following one:

```
[
  {
    "type": "bing",
    "title": "Bing Aerial",
    "name": "AerialWithLabels",
    "source": "bing",
    "group": "background",
    "apiKey": "{{apiKey}}",
    "visibility": true
  },
  {
    "type": "tileprovider",
    "title": "OpenTopoMap",
    "provider": "OpenTopoMap",
    "name": "OpenTopoMap",
    "source": "OpenTopoMap",
    "group": "background",
    "visibility": false
  },
  {
    "type": "wms",
    "title": "Sentinel-2 cloudless - https://s2maps.eu",
    "format": "image/jpeg",
    "id": "s2cloudless",
    "name": "s2cloudless:s2cloudless",
    "url": "https://maps.geo-solutions.it/geoserver/wms",
    "group": "background",
    "thumbURL": "%sstatic/mapstorestyle/img/s2cloudless-s2cloudless.png" % SITEURL,
    "visibility": false
  },
  {
    "source": "ol",
    "group": "background",
    "id": "none",
    "name": "empty",
    "title": "Empty Background",
    "type": "empty",
    "visibility": false,
    "args": ["Empty Background", {"visibility": false}]
  }
]
```
Warning: To use a Bing background, you need to correctly set and provide a valid BING_API_KEY

MAX_DOCUMENT_SIZE

Default: 2
Env: MAX_DOCUMENT_SIZE
Allowed size for documents in MB.

METADATA_PARSERS

Is possible to define multiple XML parsers for ingest XML during the layer upload.
The variable should be declared in this way in settings.py:

```
METADATA_PARSERS = ['list', 'of', 'parsing', 'functions']
```

If you want to always use the default metadata parser and after use your own, the variable must be set with first value as __DEFAULT__. Example:

```
METADATA_PARSERS = ['__DEFAULT__', 'custom_parsing_function']
```

If not set, the system will use the __DEFAULT__ parser.
The custom parsing function must be accept in input 6 parameter that are:

- exml (xmlfile)
- uuid (str)
- vals (dict)
- regions (list)
- keywords (list)
- custom (dict)

If you want to use your parser after the default one, here is how the variable are populated:

- exml: the XML file to parse
- uuid: the UUID of the layer
- vals: Dictionary of information that belong to ResourceBase
- regions: List of regions extracted from the XML
- keywords: List of dict of keywords already divided between free-text and thesaurus
- custom: Custom variable

NOTE: the keywords must be in a specific format, since later this dict, will be ingested by the KeywordHandler which will assign the keywords/thesaurus to the layer.

Here is an example of expected parser function

For more information, please rely to TestCustomMetadataParser which contain a smoke test to explain the functionality
**METADATA_STORERS**

Is possible to define multiple Layer storer during the layer upload.
The variable should be declared in this way:

```
METADATA_STORERS = ['custom_storer_function']
```

NOTE: By default the Layer is always saved with the default behaviour.
The custom storer function must be accept input 2 parameter that are:

- Layer (layer model instance)
- custom (dict)

Here is how the variable are populated by default:

- layer (layer model instance) that we want to change
- custom: custom dict populated by the parser

Here is an example of expected storer function

For more information, please rely to `TestMetadataStorers` which contain a smoke test to explain the functionality

**MISSING_THUMBNAIL**

Default: `geonode/img/missing_thumb.png`
The path to an image used as thumbnail placeholder.

**MEMCACHED_BACKEND**

Default: `django.core.cache.backends.memcached.PyMemcacheCache`
Define which backend of memcached will be used

**MEMCACHED_ENABLED**

Default: `False`
If True, will use MEMCACHED_BACKEND as default backend in CACHES

**MODIFY_TOPICCATEGORY**

Default: `False`
Metadata Topic Categories list should not be modified, as it is strictly defined by ISO (See: [http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml](http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml) and check the `<CodeListDictionary gml:id="MD_MD_TopicCategoryCode">` element).

Some customization is still possible changing the is_choice and the GeoNode description fields.

In case it is necessary to add/delete/update categories, it is possible to set the MODIFY_TOPICCATEGORY setting to True.
### MONITORING_ENABLED

Default: False

Enable internal monitoring application (geonode.monitoring). If set to True, add following code to your local settings:

```python
MONITORING_ENABLED = True
# add following lines to your local settings to enable monitoring
if MONITORING_ENABLED:
    INSTALLED_APPS = INSTALLED_APPS + ('geonode.monitoring',)
    MIDDLEWARE_CLASSES = MIDDLEWARE_CLASSES + ('geonode.monitoring.middleware.MonitoringMiddleware',)
```

See *Read-Only and Maintenance Mode* for details.

### MONITORING_DATA_AGGREGATION

Default:

```python
(tuple(timedelta(seconds=0), timedelta(minutes=1)),
 tuple(timedelta(days=1), timedelta(minutes=60)),
 tuple(timedelta(days=14), timedelta(days=1)),)
```

Configure aggregation of past data to control data resolution. It lists data age and aggregation in reverse order, by default:

- for current data, 1 minute resolution
- for data older than 1 day, 1-hour resolution
- for data older than 2 weeks, 1 day resolution

See *Read-Only and Maintenance Mode* for further details.

This setting takes effects only if *USER_ANALYTICS_ENABLED* is true.

### MONITORING_DATA_TTL

Default: 365

Env: MONITORING_DATA_TTL

How long monitoring data should be stored in days.
MONITORING_DISABLE_CSRF

Default: False
Env: MONITORING_DISABLE_CSRF

Set this to true to disable csrf check for notification config views, use with caution - for dev purpose only.

MONITORING_SKIP_PATHS

Default:

```
( 
   '/api/o/',
   '/monitoring/',
   '/admin',
   '/jsi18n',
   STATIC_URL,
   MEDIA_URL,
   re.compile('^/[a-z]{2}/admin/'),
)
```

Skip certain useless paths to not to mud analytics stats too much. See Read-Only and Maintenance Mode to learn more about it.

This setting takes effects only if USER_ANALYTICS_ENABLED is true.

NOTIFICATIONS_MODULE

Default: pinax.notifications

App used for notifications. (pinax.notifications or notification)

NOTIFICATION_ENABLED

Default: True
Env: NOTIFICATION_ENABLED

Enable or disable the notification system.

OAUTH2_API_KEY

Default: None
Env: OAUTH2_API_KEY

In order to protect oauth2 REST endpoints, used by GeoServer to fetch user roles and infos, you should set this key and configure the geonode REST role service accordingly. Keep it secret!
Warning: If not set, the endpoint can be accessed by users without authorization.

**OAUTH2_PROVIDER**

Ref.: OAuth Toolkit settings

**OAUTH2_PROVIDER_APPLICATION_MODEL**

Default: `oauth2_provider.Application`
Ref.: OAuth Toolkit settings

**OAUTH2_PROVIDER_ACCESS_TOKEN_MODEL**

Default: `oauth2_provider.AccessToken`
Ref.: OAuth Toolkit settings

**OAUTH2_PROVIDER_ID_TOKEN_MODEL**

Default: `oauth2_provider.IDToken`
Ref.: OAuth Toolkit settings

**OAUTH2_PROVIDER_GRANT_MODEL**

Default: `oauth2_provider.Grant`
Ref.: OAuth Toolkit settings

**OAUTH2_PROVIDER_REFRESH_TOKEN_MODEL**

Default: `oauth2_provider.RefreshToken`
Ref.: OAuth Toolkit settings

**OGC_SERVER**

Default: `{}` (Empty dictionary)

A dictionary of OGC servers and their options. The main server should be listed in the ‘default’ key. If there is no ‘default’ key or if the OGC_SERVER setting does not exist, Geonode will raise an Improperly Configured exception. Below is an example of the OGC_SERVER setting:

```python
OGC_SERVER = {
    'default': {
        'LOCATION': 'http://localhost:8080/geoserver/',
        'USER': 'admin',
    },
}
```

(continues on next page)
• **BACKEND**
  Default: "geonode.geoserver"
  The OGC server backend to use. The backend choices are:
  
  'geonode.geoserver'

• **BACKEND_WRITE_ENABLED**
  Default: True
  Specifies whether the OGC server can be written to. If False, actions that modify data on the OGC server will not execute.

• **DATASTORE**
  Default: '' (Empty string)
  An optional string that represents the name of a vector datastore, where Geonode uploads are imported into. To support vector datastore imports there also needs to be an entry for the datastore in the DATABASES dictionary with the same name. Example:

  ```python
  OGC_SERVER = {
    'default': {
      'LOCATION': 'http://localhost:8080/geoserver/',
      'USER': 'admin',
      'PASSWORD': 'geoserver',
      'DATASTORE': 'geonode_imports'
    }
  }
  
  DATABASES = {
    'default': {
      'ENGINE': 'django.db.backends.sqlite3',
      'NAME': 'development.db',
    },
    'geonode_imports': {
      'ENGINE': 'django.contrib.gis.db.backends.postgis',
      'NAME': 'geonode_imports',
      'USER': 'geonode_user',
      'PASSWORD': 'a_password',
      'HOST': 'localhost',
      'PORT': '5432',
    }
  }
  ```

• **GEONODE_SECURITY_ENABLED**
  Default: True
  A boolean that represents whether GeoNode’s security application is enabled.

• **LOCATION**
Default: "http://localhost:8080/geoserver/"

A base URL from which GeoNode can construct OGC service URLs. If using GeoServer you can determine this by visiting the GeoServer administration home page without the /web/ at the end. For example, if your GeoServer administration app is at http://example.com/geoserver/web/, your server’s location is http://example.com/geoserver.

- **MAPFISH_PRINT_ENABLED**
  
  Default: True

  A boolean that represents whether the MapFish printing extension is enabled on the server.

- **PASSWORD**
  
  Default: 'geoserver'

  The administrative password for the OGC server as a string.

- **PRINT_NG_ENABLED**
  
  Default: True

  A boolean that represents whether printing of maps and layers is enabled.

- **PUBLIC_LOCATION**
  
  Default: "http://localhost:8080/geoserver/"

  The URL used in most public requests from GeoNode. This setting allows a user to write to one OGC server (the LOCATION setting) and read from a separate server or the PUBLIC_LOCATION.

- **USER**
  
  Default: 'admin'

  The administrative username for the OGC server as a string.

- **WMST_ENABLED**
  
  Default: False

  Not implemented.

- **WPS_ENABLED**
  
  Default: False

  Not implemented.

- **TIMEOUT**
  
  Default: 10

  The maximum time, in seconds, to wait for the server to respond.
OGP_URL

Default: http://geodata.tufts.edu/solr/select
Env: OGP_URL
Endpoint of geodata.tufts.edu getCapabilities.

OPENGRAPH_ENABLED

Default: True
A boolean that specifies whether Open Graph is enabled. Open Graph is used by Facebook and Slack.

PINAX_NOTIFICATIONS_BACKENDS

Default: ("email", _EMAIL_BACKEND, 0),
Used notification backend. This is a pinax notification setting:

PINAX_NOTIFICATIONS_LOCK_WAIT_TIMEOUT

Default: -1
Env: NOTIFICATIONS_LOCK_WAIT_TIMEOUT
It defines how long to wait for the lock to become available. Default of -1 means to never wait for the lock to become available. This is a pinax notification setting:

PINAX_NOTIFICATIONS_QUEUE_ALL

Default: -1
Env: NOTIFICATIONS_LOCK_WAIT_TIMEOUT
By default, calling notification.send will send the notification immediately, however, if you set this setting to True, then the default behavior of the send method will be to queue messages in the database for sending via the emit_notices command. This is a pinax notification setting:

PINAX_RATINGS_CATEGORY_CHOICES

Default:

```json
{
    "maps.Map": {
        "map": "How good is this map?"
    },
    "layers.Layer": {
        "layer": "How good is this layer?"
    },
    "documents.Document": {

```
PROFILE_EDIT_EXCLUDE_FIELD

Default: []

A list of element (item name) to exclude from the Profile Edit page.

Example:
PROFILE_EDIT_EXCLUDE_FIELD=['organization', 'language']

PROXY_ALLOWED_HOSTS

Default: () (Empty tuple)

A tuple of strings representing the host/domain names that GeoNode can proxy requests to. This is a security measure to prevent an attacker from using the GeoNode proxy to render malicious code or access internal sites.

Values in this tuple can be fully qualified names (e.g. ‘www.geonode.org’), in which case they will be matched against the request’s Host header exactly (case-insensitive, not including port). A value beginning with a period can be used as a subdomain wildcard: .geonode.org will match geonode.org, www.geonode.org, and any other subdomain of geonode.org. A value of ‘*’ will match anything and is not recommended for production deployments.

PROXY_URL

Default /proxy/?url=

The URL to a proxy that will be used when making client-side requests in GeoNode. By default, the internal GeoNode proxy is used but administrators may favor using their own, less restrictive proxies.

PYCSW

A dict with pycsw’s configuration with two possible keys CONFIGURATION and FILTER.

CONFIGURATION Of note are the sections metadata:main to set CSW server metadata and metadata:inspire to set INSPIRE options. Setting metadata:inspire['enabled'] to true will enable INSPIRE support. Server level configurations can be overridden in the server section. See http://docs.pycsw.org/en/latest/configuration.html for full pycsw configuration details.

FILTER Optional settings in order to add a filter to the CSW filtering. The filter follow the django orm structure and must be a ResourceBase field/related field. By default CSW will filter only for layer resource_type

Example of PYCSW configuration. PYCSW: 

```python
PYCSW: {
    'CONFIGURATION': {...},
    'FILTER': {'resource_type__in':['layer']
}
```
R

RABBITMQ_SIGNALS_BROKER_URL

Default: amqp://localhost:5672
The Rabbitmq endpoint

RECAPTCHA_ENABLED

Default: False
Env: RECAPTCHA_ENABLED
Allows enabling reCaptcha field on signup form. Valid Captcha Public and Private keys will be needed as specified here https://pypi.org/project/django-recaptcha/#installation
You will need to generate a keys pair for reCaptcha v2 for your domain from https://www.google.com/recaptcha/admin/create
More options will be available by enabling this setting:

- **ACCOUNT_SIGNUP_FORM_CLASS**
  Default: geonode.people.forms.AllauthReCaptchaSignupForm
  Env: ACCOUNT_SIGNUP_FORM_CLASS
  Enabled only when the RECAPTCHA_ENABLED option is True.

- **INSTALLED_APPS**
  The captcha must be present on INSTALLED_APPS, otherwise you’ll get an error.
  When enabling the RECAPTCHA_ENABLED option through the environment, this setting will be automatically added by GeoNode as follows:

```python
if 'captcha' not in INSTALLED_APPS:
    INSTALLED_APPS += ('captcha',)
```

- **RECAPTCHA_PUBLIC_KEY**
  Default: geonode_RECAPTCHA_PUBLIC_KEY
  Env: RECAPTCHA_PUBLIC_KEY
  You will need to generate a keys pair for reCaptcha v2 for your domain from https://www.google.com/recaptcha/admin/create
  For mode details on the reCaptcha package, please see:
  1. https://pypi.org/project/django-recaptcha/#installation

- **RECAPTCHA_PRIVATE_KEY**
  Default: geonode_RECAPTCHA_PRIVATE_KEY
  Env: RECAPTCHA_PRIVATE_KEY
  You will need to generate a keys pair for reCaptcha v2 for your domain from https://www.google.com/recaptcha/admin/create
  For mode details on the reCaptcha package, please see:
1. https://pypi.org/project/django-recaptcha/#installation

**RECAPTCHA_PUBLIC_KEY**

Default: geonode_RECAPTCHA_PUBLIC_KEY  
Env: RECAPTCHA_PUBLIC_KEY  
You will need to generate a keys pair for reCaptcha v2 for your domain from https://www.google.com/recaptcha/admin/create  
Ref. to `RECAPTCHA_ENABLED`

**RECAPTCHA_PRIVATE_KEY**

Default: geonode_RECAPTCHA_PRIVATE_KEY  
Env: RECAPTCHA_PRIVATE_KEY  
You will need to generate a keys pair for reCaptcha v2 for your domain from https://www.google.com/recaptcha/admin/create  
Ref. to `RECAPTCHA_ENABLED`

**REDIS_SIGNALS_BROKER_URL**

Default: redis://localhost:6379/0  
The Redis endpoint.

**REGISTERED_MEMBERS_GROUP_NAME**

Default: registered-members  
Env: REGISTERED_MEMBERS_GROUP_NAME  
Used by `AUTO_ASSIGN_REGISTERED_MEMBERS_TO_REGISTERED_MEMBERS_GROUP_NAME` settings.

**REGISTERED_MEMBERS_GROUP_TITLE**

Default: Registered Members  
Env: REGISTERED_MEMBERS_GROUP_TITLE  
Used by `AUTO_ASSIGN_REGISTERED_MEMBERS_TO_REGISTERED_MEMBERS_GROUP_NAME` settings.
REGISTRATION_OPEN

Default: False
A boolean that specifies whether users can self-register for an account on your site.

RESOURCE_PUBLISHING

Default: False
By default, the GeoNode application allows GeoNode staff members to publish/unpublish resources. By default, resources are published when created. When this setting is set to True the staff members will be able to unpublish a resource (and eventually publish it back).

SEARCH_FILTERS

Default:

```
'TEXT_ENABLED': True,
'TYPE_ENABLED': True,
'CATEGORIES_ENABLED': True,
'OWNERS_ENABLED': True,
'KEYWORDS_ENABLED': True,
'H_KEYWORDS_ENABLED': True,
'T_KEYWORS_ENABLED': True,
'DATE_ENABLED': True,
'REGION_ENABLED': True,
'EXTENT_ENABLED': True,
```

Enabled Search Filters for filtering resources.

SECURE_BROWSER_XSS_FILTER

Default: True
Env: SECURE_BROWSER_XSS_FILTER
If True, the SecurityMiddleware sets the X-XSS-Protection: 1; mode=block header on all responses that do not already have it. This is Django settings. https://docs.djangoproject.com/en/3.2/ref/settings/#secure-browser-xss-filter
SECURE_CONTENT_TYPE_NOSNIFF

Default: True
Env: SECURE_CONTENT_TYPE_NOSNIFF

If True, the SecurityMiddleware sets the X-Content-Type-Options: nosniff header on all responses that do not already have it. This is Django settings:

SECURE_HSTS_INCLUDE_SUBDOMAINS

Default: True
Env: SECURE_HSTS_INCLUDE_SUBDOMAINS

This is Django settings: https://docs.djangoproject.com/en/3.2/ref/settings/#secure-hsts-include-subdomains

SECURE_HSTS_SECONDS

Default: 3600
Env: SECURE_HSTS_SECONDS

This is Django settings: If set to a non-zero integer value, the SecurityMiddleware sets the HTTP Strict Transport Security header on all responses that do not already have it.

SECURE_SSL_REDIRECT

If True, the SecurityMiddleware redirects all non-HTTPS requests to HTTPS (except for those URLs matching a regular expression listed in SECURE_REDIRECT_EXEMPT). This is Django settings:

SERVICES_TYPE_MODULES

It’s possible to define multiple Service Types Modules for custom service type with it’s own Handler.

The variable should be declared in this way in settings.py:

\[
\text{SERVICES_TYPE_MODULES} = [ 'path.to.module1', 'path.to.module2', \ldots ]
\]

Default service types are already included

Inside each module in the list we need to define a variable:

```
`services_type` = {
    `<key_of_service_type>`: {
        "OWS": True/False, "handler": "<path.to.Handler>", "label": "<label to show in remote service page>",
        "management_view": "<path.to.view>"
    }
}
```

the key_of_service_type is just an identifier to assign at the service type. OWS is True if the service type is an OGC Service Compliant. The handler key must contain the path to the class who will provide all methods to manage the service type The label is what is shown in the service form when adding a new service. The management_view, if exists, must contain the path to the method where the management page is opened.
**SERVICE_UPDATE_INTERVAL**

Default: 0

The Interval services are updated.

**SESSION_COOKIE_SECURE**

Default: False

Env: SESSION_COOKIE_SECURE

This is a Django setting:

**SESSION_EXPIRED_CONTROL_ENABLED**

Default: True

Env: SESSION_EXPIRED_CONTROL_ENABLED

By enabling this variable, a new middleware `geonode.security.middleware.SessionControlMiddleware` will be added to the `MIDDLEWARE_CLASSES`. The class will check every request to GeoNode and it will force a log out whenever one of the following conditions occurs:

1. The OAuth2 Access Token is not valid anymore or it is expired.

   **Warning:** The Access Token might be invalid for various reasons. Usually a misconfiguration of the OAuth2 GeoServer application. The latter is typically installed and configured automatically at GeoNode bootstrap through the default fixtures.

2. The user has been deactivated for some reason; an Admin has disabled it or its password has expired.

Whenever the middleware terminates the session and the user forced to log out, a message will appear to the GeoNode interface.

**SHOW_PROFILE_EMAIL**

Default: False

A boolean which specifies whether to display the email in the user’s profile.

**SITE_HOST_NAME**

Default: localhost

Env: SITE_HOST_NAME

The hostname used for GeoNode.
SITE_HOST_PORT

Default: 8000
Env: SITE_HOST_PORT
The Site hostport.

SITEURL

Default: 'http://localhost:8000/
A base URL for use in creating absolute links to Django views and generating links in metadata.

SIZE_RESTRICTED_FILE_UPLOAD_ELEGIBLE_URL_NAMES

Default: '("data_upload", "uploads-upload", "document_upload",)'
Rappresent the list of the urls basename that are under file_size restriction

SKIP_PERMS_FILTER

Default: False
Env: SKIP_PERMS_FILTER
If set to true permissions prefiltering is avoided.

SOCIALACCOUNT_ADAPTER

Default: geonode.people.adapters.SocialAccountAdapter
This is a django-allauth setting It allows specifying a custom class to handle authentication for social accounts.

SOCIALACCOUNT_AUTO_SIGNUP

Default: True
Attempt to bypass the signup form by using fields (e.g. username, email) retrieved from the social account provider. This is a Django-allauth setting:

SOCIALACCOUNT_PROVIDERS

Default:

```python
{
    'linkedin_oauth2': {
        'SCOPE': [
            'r_emailaddress',
            'r_basicprofile',
        ],
    },
}
```
(continues on next page)
This is a Django-allauth setting. It should be a dictionary with provider specific settings.

### SOCIALACCOUNT_PROFILE_EXTRACTORS

Default:

```python
{
    "facebook": "geonode.people.profileextractors.FacebookExtractor",
    "linkedin_oauth2": "geonode.people.profileextractors.LinkedInExtractor",
}
```

A dictionary with provider ids as keys and path to custom profile extractor classes as values.
**SOCIAL_BUTTONS**

Default: True

A boolean which specifies whether the social media icons and JavaScript should be rendered in GeoNode.

**SOCIAL_ORIGINS**

Default:

```python
SOCIAL_ORIGINS = [{
    "label": "Email",
    "url": "mailto:?subject={name}&body={url}"
}, {
    "label": "Facebook",
}, {
    "label": "Twitter",
    "url": "https://twitter.com/share?url={url}"
}, {
    "label": "Google +",
    "url": "https://plus.google.com/share?url={url}"
}
]```

A list of dictionaries that are used to generate the social links displayed in the Share tab. For each origin, the name and URL format parameters are replaced by the actual values of the ResourceBase object (layer, map, document).

**SOCIALACCOUNT_WITH_GEONODE_LOCAL_SINGUP**

Default: True

Variable which controls displaying local account registration form. By default form is visible

**SRID**

Default:

```python
{
    'DETAIL': 'never',
}
```
SEARCH_RESOURCES_EXTENDED

Default: True

This will extend search with additional properties. By default its on and search engine will check resource title or purpose or abstract. When set to False just title lookup is performed.

SUPPORTED_DATASET_FILE_TYPES

Default:

SUPPORTED_DATASET_FILE_TYPES = [
    {
        "id": "shp", "label": "ESRI Shapefile", "format": "vector", "ext": ["shp"], "requires": ["shp", "prj", "dbf", "shx"], "optional": ["xml", "sld"]
    },
    {
        "id": "tiff", "label": "GeoTIFF", "format": "raster", "ext": ["tiff", "tif"], "mimeType": ["image/tiff"], "optional": ["xml", "sld"]
    },
    {
        "id": "csv", "label": "Comma Separated Value (CSV)", "format": "vector", "ext": ["csv"], "mimeType": ["text/csv"], "optional": ["xml", "sld"]
    },
    {
        "id": "zip", "label": "Zip Archive", "format": "archive", "ext": ["zip"], "mimeType": ["application/zip"], "optional": ["xml", "sld"]
    },
    {
        "id": "xml", "label": "XML Metadata File", "format": "metadata", "ext": ["xml"], "mimeType": ["application/json"], "needsFiles": ["shp", "prj", "dbf", "shx", "csv", "tiff", "zip", "xml"]
    },
    {
        "id": "sld", "label": "Styled Layer Descriptor (SLD)", "format": "metadata", "ext": ["sld"], "mimeType": ["application/json"], "needsFiles": ["shp", "prj", "dbf", "shx", "csv", "tiff", "zip", "xml"]
    }
]

Rappresent the list of the supported file type in geonode that can be ingested by the platform

For example. the following configuration is needed to add the GeoJSON as supported file:

Default:

```
{
    "id": "geojson", "label": "GeoJSON", "format": "metadata", "ext": ["geojson"], "mimeType": ["application/json"]
}
```
T

**TASTYPIE_DEFAULT_FORMATS**

Default: json

This setting allows you to globally configure the list of allowed serialization formats for your entire site. This is a tastypie setting:

**THEME_ACCOUNT_CONTACT_EMAIL**

Default: 'admin@example.com'

This email address is added to the bottom of the password reset page in case users have trouble unlocking their account.

**THESAURI**

Default = []

A list of Keywords thesauri settings: For example `THESAURI = [{‘name’:’inspire_themes’, ‘required’:True, ‘filter’:True}, {‘name’:’inspire_concepts’, ‘filter’:True}, ]`

**TOPICCATEGORY_MANDATORY**

Default: False

Env: TOPICCATEGORY_MANDATORY

If this option is enabled, Topic Categories will become strictly Mandatory on Metadata Wizard

**TWITTER_CARD**

Default:: True

A boolean that specifies whether Twitter cards are enabled.

**TWITTER_SITE**

Default:: '@GeoNode'

A string that specifies the site to for the twitter:site meta tag for Twitter Cards.
TWITTER_HASHTAGS

Default: ['geonode']

A list that specifies the hashtags to use when sharing a resource when clicking on a social link.

TINYMCE_DEFAULT_CONFIG

Default:

```
{
    "selector": "textarea#id_resource-featureinfo_custom_template",
    "theme": "silver",
    "height": 500,
    "plugins": 'print preview paste importcss searchreplace autolink autosave_-
    save directionality code visualblocks visualchars fullscreen image link_-
    media template codesample table charmap hr pagebreak nonbreaking anchor toc_-
    insertdatetime advlist lists wordcount imagetools textpattern noneditable_-
    help charmap quickbars emoticons',
    "imagetools_cors_hosts": ['picsum.photos'],
    "menubar": 'file edit view insert format tools table help',
    "toolbar": 'undo redo | bold italic underline strikethrough | fontselect_-
    fontsizeselect formatselect | alignleft aligncenter alignright alignjustify_-
    | outdent indent | numlist bullist | forecolor backcolor removeformat |␣-
    pagebreak | charmap emoticons | fullscreen preview save | insertfile image_-
    media template link anchor codesample | ltr rtl',
    "toolbar_sticky": "true",
    "autosave_ask_before_unload": "true",
    "autosave_interval": "30s",
    "autosave_prefix": "{path}{query}-{id}-",
    "autosave_restore_when_empty": "false",
    "autosave_retention": "2m",
    "image_advtab": "true",
    "content_css": '//www.tiny.cloud/css/codepen.min.css",
    "importcss_append": "true",
    "image_caption": "true",
    "quickbars_selection_toolbar": 'bold italic | quicklink h2 h3 blockquote_-
    quickimage quicktable',
    "noneditable_noneditable_class": "mceNonEditable",
    "toolbar_mode": 'sliding',
    "contextmenu": "link image imagetools table",
    "templates": [
        {
            "title": 'New Table',
            "description": 'creates a new table',
            "content": '<div class="mceTmpl"><table width="98%" border="0"_-
    cellspacing="0" cellpadding="0"><tr><th scope="col"> </th><th scope="col"> </th></tr><tr><td> </td><td> </td></tr></table></div>
    '},
        {
            "title": 'Starting my story',
            "description": 'A cure for writers block',
            "content": 'Once upon a time...'
        }
    ]
}
```

(continues on next page)
{,
  "title": 'New list with dates',
  "description": 'New List with dates',
  "content": '<div class="mceTmpl" cdate><span class="cdate">cdate</span><br /><span class="mdate">mdate</span><h2>My List</h2><ul><li></li><li></li></ul></div>'
}

"template_cdate_format": '[Date Created (CDATE): %m/%d/%Y : %H:%M:%S]',
"template_mdate_format": '[Date Modified (MDATE): %m/%d/%Y : %H:%M:%S]',
}

HTML WYSIWYG Editor (TINYMCE) Menu Bar Settings. For more info see:
- https://django-tinymce.readthedocs.io/en/latest/installation.html#configuration
- Customizing The Datasets’ GetFeatureInfo Templates

UI

UI_REQUIRED_FIELDS

If this option is enabled, the input selected (we are referring to the one present in the optional Metadata-Tab on the Metadata-Wizard) will become mandatory.

The fields that can be mandatory are:

- id_resource-edition => Label: Edition
- id_resource-purpose => Label: Purpose
- id_resource-supplemental_information => Label: Supplemental information
- id_resource-temporal_extent_start_pickers => Label: temporal extent start
- id_resource-temporal_extent_end => Label: temporal extent end
- id_resource-maintenance_frequency => Label: Maintenance frequency
- id_resource-spatial_representation_type => Label: Spatial representation type

If at least one on the above ids is set in this configuration, the panel header will change from Optional to Mandatory

Configuration Example:
UI_REQUIRED_FIELDS = ['id_resource-edition']

UNOCONV_ENABLE

Default: False
Env: UNOCONV_ENABLE

1.13. GeoNode Settings
UPLOADER

Default:

```python
{
    'BACKEND': 'geonode.importer',
    'OPTIONS': {
        'TIME_ENABLED': False,
    }
}
```

A dictionary of Uploader settings and their values.

- **BACKEND**
  
  Default: 'geonode.importer'

  The importer backend requires the GeoServer importer extension to be enabled.

- **OPTIONS**
  
  Default:

  ```python
  {'OPTIONS': {
    'TIME_ENABLED': False,
  }}
  ```

  - **TIME_ENABLED**
    
    Default: False

    A boolean that specifies whether the upload should allow the user to enable time support when uploading data.

**USER_MESSAGES_ALLOW_MULTIPLE_RECIPIENTS**

Default: True

Env: USER_MESSAGES_ALLOW_MULTIPLE_RECIPIENTS

Set to true to have multiple recipients in /message/create/

**USER_ANALYTICS_ENABLED**

Default: False

Env: USER_ANALYTICS_ENABLED

Set to true to anonymously collect user data for analytics. If true you have to set MONITOR-ING_DATA_AGGREGATION and MONITORING_SKIP_PATHS.

See Read-Only and Maintenance Mode to learn more about it.
**USER_ANALYTICS_GZIP**

Default: False  
Env: USER_ANALYTICS_GZIP  
To be used with USER_ANALYTICS_ENABLED. Compress gzip json messages before sending to logstash.

**UUID HANDLER**

Is possible to define an own uuidhandler for the Layer.  
To start using your own handler, is needed to add the following configuration:  
```
LAYER_UUID_HANDLER = "mymodule.myfile.MyObject"
```

The Object must accept as `init` the `instance` of the layer and have a method named `create_uuid()`

here is an example:

```python
class MyObject():
    def __init__(self, instance):
        self.instance = instance

    def create_uuid(self):
        # here your code
        pass
```

**X_FRAME_OPTIONS**

Default: `'ALLOW-FROM %s' % SITEURL`
This is a Django setting

### 1.14 Docker Environmental variables

**Docker Environmental variables**

**1.14.1 Docker Environmental variables**

This list reports the specific environmental variables required for the configuration and execution of GeoNode Docker services
GeoNode Documentation, Release 4.2.5

Geoserver

DATABASE_HOST

Default: db
Internal IP or hostname for the PosgreSQL (db) Docker container.

DATABASE_PORT

Default: django
Internal port for the PosgreSQL (db) Docker container.

GEONODE_LB_HOST_IP

Default: django
Internal IP or hostname for the GeoNode (django) Docker container.

GEONODE_LB_PORT

Default: 8000
Internal port for the GeoNode (django) Docker container.

GEONODE_GEODATABASE

Default: geonode_data
GeoNode geodatabase name.

GEONODE_GEODATABASE_USER

Default: geonode_data
GeoNode geodatabase user.

GEONODE_GEODATABASE_PASSWORD

Default: geonode_data
GeoNode geodatabase password.

GEONODE_GEODATABASE_SCHEMA

Default: publix
GeoNode geodatabase schema.

GEOSERVER_JAVA_OPTS

-Duser.timezone=GMT -Dorg.geotools.shapefile.datetime=false
-DGS-SHAPEFILE-CHARSET=UTF-8 -DGEOSERVER_CSRF_DISABLED=true
-DRINTER_BASE_URL={geoserver_ui}/geoserver/pdf -DALLOW_ENV_PARAMETRIZATION=true
-Xbootclasspath/a:/usr/local/tomcat/webapps/geoserver/WEB-INF/lib/marlin-0.9.3-Unsafe.jar -Dsun.java2d.renderer=org.marlin.pisces.MarlinRenderingEngine

Geoserver JAVA OPTS.

**GEOSERVER_LB_HOST_IP**

Default: geoserver

Internal IP or hostname for the GeoNode (geoserver) Docker container.

**GEOSERVER_LB_PORT**

Default: 8080

Internal port for the GeoNode (geoserver) Docker container.

**NGINX_BASE_URL**

Default: http(s):/localhost

Public URL of the nginx service. This value must match GeoNodes's SITEURL setting.

**OAUTH2_API_KEY**

Default: (empty)

Optional API Key for the communication between Geoserver and GeoNode Oauth2 services.

**OAUTH2_CLIENT_ID**

Default: (empty)

Geoserver Client ID for GeoNode Oauth2 server. Cannot be empty.

**OAUTH2_CLIENT_SECRET**

Default: (empty)

Geoserver Client secret for GeoNode Oauth2 server. Cannot be empty.

**Nginx**

**GEONODE_LB_HOST_IP**

Default: django

Internal IP or hostname for the GeoNode (django) Docker container.

**GEONODE_LB_PORT**

Default: 8000

Internal port for the GeoNode (django) Docker container.

1.14. Docker Environmental variables
GEOSERVER_LB_HOST_IP

Default: geoserver
Internal IP or hostname for the GeoNode (geoserver) Docker container.

GEOSERVER_LB_PORT

Default: 8080
Internal port for the GeoNode (geoserver) Docker container.

HTTPS_HOST

Default: localhost
The public hostname for HTTPS (without http:// scheme prefix).

HTTPS_HOST

Default: localhost
The public hostname for HTTPS (without https:// scheme prefix).

HTTP_PORT

Default: 80
Host port on which to expose the Nginx service for HTTP.

HTTPS_PORT

Default: 443
Host port on which to expose the Nginx service for HTTPS.

LETSENCRYPT_MODE

Default: disabled
Possible values: disabled (SSL disabled), staging (SSL local cert), production (SSL released by an ACME server)

PostgreSQL / PostGIS

GEONODE_DATABASE

Default: geonode
GeoNode database name.

GEONODE_DATABASE_USER

Default: geonode_data
GeoNode database user.
GEONODE_DATABASE_PASSWORD

Default: geonode_data
GeoNode database password.

GEONODE_GEODATABASE

Default: geonode_data
GeoNode geodatabase name.

GEONODE_GEODATABASE_USER

Default: geonode_data
GeoNode geodatabase user.

GEONODE_GEODATABASE_PASSWORD

Default: geonode_data
GeoNode geodatabase password.

POSTGRES_USER

Default: geonode_data
PostgreSQL admin user.

POSTGRES_USER

Default: geonode_data
PostgreSQL admin password.

1.15 Customize the Look and Feel

1.15.1 GeoNode Themes

We have already explained in Simple Theming how to change the GeoNode theme directly from the Admin Interface. This is an easy way for customizing GeoNode appearance but, in some cases, you might want to have more control on it.

In those cases, you have to venture into the code and it is highly recommended to use a GeoNode Project and customize it instead of the GeoNode default HTML/CSS code. See the following sections to learn more about that.
1.15.2 Theming your GeoNode Project

There are a range of options available to you if you want to change the default look and feel of your GeoNode Project.

Logos and graphics

GeoNode intentionally does not include a large number of graphics files in its interface. This keeps page loading time to a minimum and makes for a more responsive interface. That said, you are free to customize your GeoNode’s interface by simply changing the default logo, or by adding your own images and graphics to deliver a GeoNode experience the way you envision it.

Your GeoNode project has a directory already set up for storing your own images at <my_geonode>/static/img. You should place any image files that you intend to use for your project in this directory.

Let’s walk through an example of the steps necessary to change the default logo.

1. Change to the img directory:

   $ cd <my_geonode>/static/img

2. If you haven’t already, obtain your logo image. The URL below is just an example, so you will need to change this URL to match the location of your file or copy it to this location:

   $ wget https://upload.wikimedia.org/wikipedia/commons/thumb/a/ac/Service_mark.svg/500px-Service_mark.svg.png
   $ wget https://upload.wikimedia.org/wikipedia/commons/thumb/c/c8/Wikimapia_logo_without_label.svg/426px-Wikimapia_logo_without_label.svg.png -O logo.png

3. Create snippets directory:

   $ cd ../../..
   $ mkdir <my_geonode>/templates/geonode-mapstore-client/snippets
   $ cd <my_geonode>/templates/geonode-mapstore-client/snippets

4. Create a new HTML file named brand_navbar.html

   $ sudo vi brand_navbar.html

   {% extends "geonode-mapstore-client/snippets/brand_navbar.html" %}
   {% load static %}
   {% block extra_style %}
   <style>
     #gn-brand-navbar {
       background: transparent url("/static/img/500px-Service_mark.svg.png") no-repeat;
       background-size: 300px 70px;
       background-position: left center;
       background-position-x: 100px;
     }
   </style>
   {% endblock %}
   {% block logo_src %}
   {% static 'img/logo.png' %}
   {% endblock %}

5. Restart your GeoNode project and look at the page in your browser:
Visit your site at http://localhost/ or the remote URL for your site.

In the following sections you will learn how to customize this header to make it as you want.

**Note:** You should commit these changes to your repository as you progress through this section, and get in the habit of committing early and often so that you and others can track your project on GitHub. Making many atomic commits and staying in sync with a remote repository makes it easier to collaborate with others on your project.

### Cascading Style Sheets

In the last section you already learned how to override GeoNode’s default CSS rules to include your own logo. You are able to customize any aspect of GeoNode’s appearance this way. In the last screenshot, you saw that the main area in the homepage is covered up by the expanded header.

First, we’ll walk through the steps necessary to displace it downward so it is no longer hidden, then change the background color of the header to match the color in our logo graphic.

1. Reopen `<my_geonode>/static/css/brand_navbar.html` in your editor:

   ```bash
   $ cd <my_geonode>/static/css/
   $ sudo vi brand_navbar.html
   $ sudo service apache2 restart
   ```

   1. Append a rule to change the background color of the header to match the logo graphic:

   ```css
   .navbar {background-color: your_color;}
   ```

   1. Append a rule to change the background color of the header to match the logo graphic:
1. Create new file to manipulate hero section:

```bash
$ cd <my_geonode>/templates/geonode-mapstore-client/snippets
$ sudo vi hero.html
```

1. Add the following code to change the background image and font for the hero section:

```html
{% extends "geonode-mapstore-client/snippets/hero.html" %}
{% block extra_style %}
<style>
#gn-hero {
    background-size: cover;
    background-position: center center;
    background-repeat: no-repeat;
    background-color: rgb(156, 156, 156);
    background-blend-mode: multiply;
    background-size: 100%;
}
.msgapi .gn-hero .jumbotron .gn-hero-description h1 {
    font-weight: lighter;
    word-break: break-word;
    font-style: oblique;
    font-family: orbitron;
    font-size: 3.4rem;
}
</style>
{% endblock %}
```

1. Collect the static files into STATIC_ROOT, restart the development server and reload the page:

```bash
$ python manage.py collectstatic
$ sudo service apache2 restart
```

You can continue adding rules to this file to override the styles that are in the GeoNode base CSS file which is built from base.less.

**Note:** You may find it helpful to use your browser’s development tools to inspect elements of your site that you want to override to determine which rules are already applied. See the screenshot below.
Modify GeoNode Homepage

So far we learned how to modify some template sections of your GeoNode main page. You can do it individually per section template, adding a new page under `<my_geonode>/templates/geonode-mapstore-client/snippets` folder with the section name (ex: `brand_navbar.html`) or by extending the base template file `custom_theme.html` where you can add different theme settings in one place.

1. Remove the previous hero section `hero.html` file:

   ```bash
   $ rm <my_geonode>/templates/geonode-mapstore-client/snippets/hero.html
   ```

1. Create a new `custom_theme.html` file:

   ```bash
   $ cd <my_geonode>/templates/geonode-mapstore-client/snippets
   $ sudo vi custom_theme.html
   ```

1. Add the following content to this page:

   ```html
   {% load static %}
   {% block content %}
   <style>
   .msgapi .gn-theme {
     --gn-primary: #df7656;
     --gn-primary-contrast: #e3dcdc;
     --gn-link-color: #fcd823;
     --gn-focus-color: rgba(57, 122, 171, 0.4);
     --gn-footer-bg: #dbb051;
   }
   ```
   ```html
   (continues on next page)
   ```
1. Restart httpd server

```
$ python manage.py collectstatic
$ sudo service apache2 restart
```

1. Your customized layout should be similar to the next picture:

1. Edit title and intro message

Login as administrator on GeoNode and go to Admin page:

Create a new theme under GeoNode Themes Library and Themes:

Add a Name, Description and turn on Is enabled option. At the bottom, add a Jumbotron title and Jumbotron content. This will override the default GeoNode welcome title and message. Click Save at the bottom in the end.

After this, reload your GeoNode homepage. The output should be similar to this:
Welcome to GeoNode

Profile
Recent activity
Favorites
Inbox

Admin
GeoServer

Monitoring & Analytics
Help

Log out

GeoNode Themes Library

<table>
<thead>
<tr>
<th>Jumbotron theme slides</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Themes</td>
<td>+</td>
</tr>
</tbody>
</table>
1.15. Customize the Look and Feel
1.16 GeoNode permissions

1.16.1 Permissions

Permissions in GeoNode are set per resource, where a resource can be a dataset, a map, a document, a service or a geoapp. The way the permissions are set is the same for all of them.

**Warning:** GeoNode has a set of default permissions that are applied on resource creation when you don’t explicitly declare them. This is particularly relevant when creating and saving a map, where you won’t have the possibility to set the its permissions during the creation phase. GeoNode can be tuned to make sure that by default the new created resource are not public; this can be done by changing two settings, see Default view permissions and Default download permissions.

**Single Resource permissions**

Resource permissions can be generally set from the resource detail page. The detail page has a menu item Share which is visible to people who are permitted to set permissions on a resource.

The share link opens a page on the right with a provision to edit user and group permissions on the resource. see picture below

![Change Dataset Permissions](image)

*Fig. 223: Change Dataset Permissions*

The page for setting the permissions, allows addition of users/groups and selection of a permission to assign each of them.
You can set the following types of permissions:

- **View**: allows to view the resource;
- **Download**: allows to download the resource;
- **Edit**: allows to change attributes, properties of the datasets features, styles and metadata for the specified resource;
- **Manage**: allows to update, delete, change permissions, publish and unpublish the resource.

**Warning**: When assigning permissions to a group, all the group members will have those permissions. Be careful in case of editing permissions.

**Geo Limits permissions**

**Note**: This feature is available only when enabling `GeoServer` as geospatial backend. Also make sure that the properties `GEONODE_SECURITY_ENABLED`, `GEOFENCE_SECURITY_ENABLED` and `GEOFENCE_URL` are correctly set for the `OGC_SERVER`.

`Geo Limits` are an extension of the GeoNode standard permissions. `Geo Limits` allows the owner of the resource, or the administrator, to restrict users or groups to a specific geographical area, in order to limit the access to the dataset to only the portions contained within that geographic restriction, excluding data outside of it.

In order to be able to set `Geo Limits` you must be an `administrator` of the system or the `owner` of the resource or you must have `Manage Permissions` rights to the resource.

If you have the permissions to set the `Geo Limits`, you should be able to see the permissions section and the globe icon on each user or group.

You should be able to see an interactive preview of the resource along with few small drawing tools, that allows you to start creating limits on the map manually if you want.

This opens a map dialog, with 3 options at the top:

The icon allows you to draw limits on a map for which a user will be able to see. Click on it to start drawing on the map. Once you are done drawing, click on it again to deactivate drawing mode.

The icon enables you to remove the limits you have drawn. Click on the limit drawn, and then click the delete icon.

The icon removes all changes that are not saved.
1.16. GeoNode permissions

**Fig. 225: Geo Limits Icon**

**Fig. 226: Geo Limits: Preview Window with Drawing Tools**
Once you finished editing your geometries, save them into the DB using the Save link in the resource menu.
The user with the specified geometries won’t be able from now on to access the whole dataset data.

**Warning:** The Geo Limits will be persisted on GeoNode DB for that resource. That means that everytime you will update the general permissions, also the geospatial restrictions will be applied.

In order to remove the Geo Limits for a certain user or group, you can just Save an empty geometry. This will delete the entry from the DB also.

### 1.17 Read-Only and Maintenance Mode

#### 1.17.1 Read-Only and Maintenance Modes

**Overview**

GeoNode gives an option to operate in different modes, according to the needs and demands of the certain application system.

Changing the currently used mode can be done in the admin panel by the user with super-user privileges, by modifying Configuration singleton model in the BASE application:
Fig. 228: Geo Limits: Geospatial restrictions applies for the user

Fig. 229: Configuration change in the admin panel
Read-Only Mode

Activating the Read-Only Mode (by setting Read only True in the Configuration) activates a middleware rejecting all modifying requests (POST/PUT/DELETE), with an exception for:

- POST to login view
- POST to logout view
- POST to admin login view
- POST to admin logout view
- all requests to OWS endpoint
- all requests ordered by a super-user

Additionally, all UI elements allowing modifying GeoNode's content are hidden, so e.g. the button “Upload Layer” is not rendered in the templates.

In case a user tries to perform a forbidden request, they will be presented with a static HTML page informing them, the GeoNode is in the Read-Only mode and this action is currently forbidden.

Maintenance Mode

Activating the Maintenance Mode (by setting Maintenance True in the Configuration) activates the highest level middleware (the one executed as the first) rejecting all requests to the GeoNode instance, with an exception for:

- POST to admin login view
- POST to admin logout view
- all requests ordered by a super-user

In case a user tries to perform any request against the GeoNode (including GET requests), they will be presented with a static HTML page informing them, the maintenance actions are taken on the GeoNode instance, and asking them to try again soon.

The maintenance mode was implemented with a thought of the backup and restore procedures without a necessity to put down the instance, but at the same time with a restriction of any outer interference.

1.18 Harvesting resources from remote services

1.18.1 Harvesting resources from remote services

GeoNode is able to harvest resource metadata from multiple remote services.

Harvesting is the process by which a metadata catalogue, i.e. GeoNode, is able to connect to other remote catalogues and retrieve information about their resources. This process is usually performed periodically, in order to keep the local catalogue in sync with the remote.

When appropriately configured, GeoNode will contact the remote service, extract a list of relevant resources that can be harvested and create local resources for each remote resource. It will also keep the resources synchronized with the remote service by periodically updating them.

Out of the box, GeoNode ships with support for harvesting from:

1. Other remote GeoNode instances;
2. OGC WMS servers;
3. _ArcGIS REST services_.

Adding support for _additional harvesting sources_ is also possible.

**GeoNode harvesting concepts**

When a _harvester_ is configured, GeoNode is able to use its corresponding _harvester worker_ to contact the remote service and generate a list of _harvestable resources_. The user is then able to select which of those resources are of interest. Depending on its configured update frequency, sometime later, the _harvesting scheduler_ will create new _harvesting sessions_ in order to create local GeoNode resources from the remote harvestable resources that had been marked as relevant by the user.

The above description uses the following key concepts:

**harvester**
This is the configuration object that is used to parametrize harvesting of a remote service. It is configurable at runtime and is preserved in the GeoNode database.

Harvesters and their properties can be managed by visiting the Harvesting -> Harvesters section of the GeoNode admin area, or by visiting the api/v2/harvesters/ API endpoint with an admin user.

Among other parameters, a harvester holds:

- **remote_url**
  Base URL of the remote service being harvested, e.g. `https://stable.demo.geonode.org`

- **harvester_type**
  Type of harvester worker that will be used to perform harvesting. See the _Harvester worker concept_ and the _standard harvester workers_ sections below for more detail. Example: `geonode.harvesting.geonodeharvester.GeonodeUnifiedHarvesterWorker`.

- **scheduling_enabled**
  Whether harvesting shall be performed periodically by the _harvesting scheduler_ or not.

- **harvesting_session_update_frequency**
  How often (in minutes) should new _harvesting sessions_ be automatically scheduled?

- **refresh_harvestable_resources_update_frequency**
  How often (in minutes) should new _refresh sessions_ be automatically scheduled?

- **default_owner**
  Which GeoNode user shall be made the owner of harvested resources

- **harvest_new_resources_by_default**
  Should new remote resources be harvested automatically? When this option is selected, the user does not need to specify which _harvestable resources_ should be harvested, as all of them will be automatically marked for harvesting by GeoNode.

- **delete_orphan_resources_automatically**
  Orphan resources are those that have previously been created by means of a harvesting operation but that GeoNode can no longer find on the remote service being harvested. Should these resources be deleted from GeoNode automatically? This also applies to when a harvester configuration is deleted, in which case all of the resources that originated from that harvester are now considered to be orphan.

**harvester worker**
Harvester workers implement retrieval for concrete remote service types. Each harvester uses a specific worker, depending on the type of remote service that it gets data from. Harvester workers may accept their own additional configuration parameters.

Harvester workers are set as the _harvester_type_ attribute on a _harvester_. Their configuration is set as a JSON object on the _harvester_type_specific_configuration_ attribute of the harvester.
GeoNode ships with the following harvester workers:

1. **GeoNode** - Enables harvesting from other GeoNode deployments
2. **WMS** - Enables harvesting from OGC WMS servers
3. **ArcGIS REST services** - Enables harvesting from ArcGIS REST services

Adding new harvester workers is also possible. This allows custom GeoNode deployments to add support for harvesting from other remote sources.

**harvestable resource**

A resource that is available on the remote server. Harvestable resources are persisted in the GeoNode DB. They are created during refresh operations, when the harvester worker interacts with the remote service in order to discover which remote resources can be harvested.

Harvestable resources can be managed by visiting the Harvesting -> Harvestable resources section of the GeoNode admin area, or by visiting the api/v2/harvesters/{harvester-id}/harvestable-resources API endpoint with an admin user.

In order to be harvested by the harvesting scheduler, a harvestable resource must have its should_be_harvested attribute set to True. This attribute can be set manually by the user or it can be set automatically by the harvester worker, in case the corresponding harvester is configured with harvest_new_resources_by_default = True.

**harvesting session**

In GeoNode, discovering remote resources and harvesting them is always done under the scope of a harvesting session. These sessions are stored in the GeoNode DB and can be inspected by visiting the Harvesting -> Asynchronous harvesting sessions section of the GeoNode admin area.

Harvesting sessions are used to keep track of the progress of execution of the relevant harvesting operations. They are updated while each operation is running. There are two types of sessions:

**refresh session**

This session is created during the update of harvestable resources operation. It has type=discover-harvestable-resources. During a refresh session, the harvester worker discovers remote resources and creates their respective harvestable resources on the GeoNode DB. After such session is finished, the user can inspect the found harvestable resources and mark those that are relevant with should_be_harvested=True.

**harvesting session**

This session is created during the perform harvesting operation. It has type=harvesting. During a harvesting session, the harvester worker creates or updates new GeoNode resources based on the harvestable resources that have been configured with should_be_harvested=True.

In addition to the aforementioned type, harvesting sessions also carry the status attribute, which provides context on the current status of the session (and consequently of the underlying harvesting operation).

**harvesting scheduler**

The scheduler is responsible for initiating new harvesting operations in an automated fashion. Periodically, the scheduler goes through the list of existing harvesters, checking if it is time to dispatch one of the harvesting operations mentioned in the next section.

The scheduler’s operation frequency is configurable by defining a HARVESTER_SCHEDULER_FREQUENCY_MINUTES setting - the default is to trigger the scheduler every 30 seconds.

**Note:** Since the harvesting scheduler only checks if there is work to do once every x seconds (defaulting to 30 seconds, as mentioned above), there will usually be a delay between the time a harvesting operation is supposed to be scheduled and the actual time when it is indeed scheduled. Moreover, the harvesting scheduler is implemented
as a celery task. This means that, if the celery worker is busy, that may also cause a delay in scheduling harvesting operations, as the scheduler’s celery task may not be triggered immediately.

---

**Harvesting workflows**

There are two main possible harvesting workflows:

1. **Continuous harvesting**
2. **One-time harvesting**

**Continuous harvesting**

This workflow relies on the *harvesting scheduler* in order to ensure harvested resources are continuously kept up to date with their remote counterparts.

1. User creates harvester and sets its `scheduling_enabled` attribute to `True`;
2. When the time comes, the harvesting scheduler calls the *update list of harvestable resources operation*. Alternatively, the user may call this operation manually the first time.
3. When the previous operation is done, user goes through the list of generated *harvestable resources* and, for each relevant harvestable resource, sets its `should_be_harvested` attribute to `True`. Alternatively, if the harvester has its `harvest_new_resources_automatically` attribute set to `True`, the harvestable resources will already be marked as to be harvested, without requiring manual user intervention;
4. When the time comes, the harvesting scheduler calls the *perform harvesting operation*. This causes the remote resources to be harvested. These now show up as resources on the local GeoNode.

**One-time harvesting**

This workflow is mostly executed manually by the user.

1. User creates harvester and sets its `scheduling_enabled` attribute to `False`;
2. User calls the *update list of harvestable resources operation*;
3. When the previous operation is done, user goes through the list of generated *harvestable resources* and, for each relevant harvestable resource, sets its `should_be_harvested` attribute to `True`;
4. User then proceeds to call the *perform harvesting operation*. This causes the remote resources to be harvested. These now show up as resources on the local GeoNode.

**Harvester operations**

Each GeoNode harvester is able to perform a finite set of operations. These can be performed either:

1. In an *automated fashion*, being dispatched by the harvesting scheduler. Automated harvesting is only performed when the corresponding *harvester* has `scheduling_enabled=True`;
2. *On-demand*, by explicit request of the user. On-demand execution can be requested by one of two ways:
   1. By selecting the relevant harvester(s) in the Harvester section of the GeoNode admin area and then selecting and running an action from the drop-down menu;
2. By interacting with the GeoNode REST API. Harvester actions are requested by issuing HTTP PATCH requests to the /api/v2/harvesters/{harvester-id}/ endpoint. The payload of such requests must specify the corresponding status. For example, by issuing a request like:

```bash
curl -X PATCH http://localhost/api/v2/harvesters/1/ \
-H "Content-Type: application/json" \
-u "myuser:mypass" \
--data '{"status": "updating-harvestable-resources"}'
```

We are asking that the harvester’s status be changed to updating-harvestable-resources. If the server accepts this request, then the update list of harvestable resources operation is triggered.

**Note:** The server will not accept the API request if the harvester’s current status is not ready.

While performing an action, the harvester’s status property transitions from ready to whatever action-related status is appropriate (as indicated below). As the operation finishes execution, the harvester’s status transitions back to ready. If the harvester has any status other than ready, then it is currently busy. When a harvester is busy it cannot execute other operations, you’ll need to wait until the current operation finishes.

**Check if the remote service is available operation**

This operation causes the harvester to perform a simple health check on the remote service, in order to check whether it responds successfully. The response is stored in the harvester’s remote_available property. This operation is performed in the same process of the main GeoNode (i.e. it runs synchronously).

When triggered, this operation causes the harvester’s status to transition to checking-availability. As the operation finishes, the harvester’s status transitions back to ready.

Invocation via the GeoNode admin is performed by selecting the Check availability of selected harvesters command.

Invocation via the GeoNode REST API is performed by issuing an HTTP PATCH request with a payload that sets the harvester status.

**Update the list of harvestable resources operation**

This operation causes the harvester to interact with the remote service in order to discover which resources are available for being harvested. Existing remote resources are then saved as harvestable resources.

Since this operation can potentially take a long time to complete (as we don’t know how may resources may exist on the remote service), it is run using a background process. GeoNode creates a new refresh session and uses it to track the progress of this operation.

When triggered, this operation causes the harvester’s status to transition to updating-harvestable-resources. As the operation finishes, the harvester’s status transitions back to ready.

Invocation via the GeoNode admin is performed by selecting the Update harvestable resources for selected harvesters command.

Invocation via the GeoNode REST API is performed by issuing an HTTP PATCH request with a payload that sets the harvester status.
Perform harvesting operation

This operation causes the harvester to check which harvestable resources are currently marked as being harvestable and then, for each one, harvest the resource from the remote server.

Since this operation can potentially take a long time to complete (as we don’t know how many resources may exist on the remote service), it is run using a background process. GeoNode creates a new harvesting session and uses it to track the progress of this operation.

When triggered, this operation causes the harvester’s status to transition to harvesting-resources. As the operation finishes, the harvester’s status transitions back to ready.

Invocation via the GeoNode admin is performed by selecting the Perform harvesting on selected harvesters command.

Invocation via the GeoNode REST API is performed by issuing an HTTP PATCH request with a payload that sets the harvester status.

Abort update of harvestable resources operation

This operation causes the harvester to abort an on-going update list of harvestable resources operation.

When triggered, this operation causes the harvester’s status to transition to aborting-update-harvestable-resources. As the operation finishes, the harvester’s status transitions back to ready.

Invocation via the GeoNode admin is performed by selecting the Abort on-going update of harvestable resources for selected harvesters command.

Invocation via the GeoNode REST API is performed by issuing an HTTP PATCH request with a payload that sets the harvester status.

Abort harvesting operation

This operation causes the harvester to abort an on-going perform harvesting operation.

When triggered, this operation causes the harvester’s status to transition to aborting-performing-harvesting. As the operation finishes, the harvester’s status transitions back to ready.

Invocation via the GeoNode admin is performed by selecting the Abort on-going harvesting sessions for selected harvesters command.

Invocation via the GeoNode REST API is performed by issuing an HTTP PATCH request with a payload that sets the harvester status.

Reset harvester operation

This operation causes the harvester’s status to be reset back to ready. It is mainly useful for troubleshooting potential errors, in order to unlock harvesters that may get stuck in a non-actionable status when some unforeseen error occurs.

When triggered, this operation causes the harvester’s status to transition to ready immediately.

Invocation via the GeoNode admin is performed by selecting the Reset harvester status command.

This operation cannot be called via the GeoNode API.
Standard harvester workers

**Note:** Remember that, as stated above, a harvester worker is configured by means of setting the `harvester_type` and `harvester_type_specific_configuration` attributes on the `harvester`.

Moreover, the format of the `harvester_type_specific_configuration` attribute must be a JSON object.

**GeoNode harvester worker**

This worker is able to harvest remote GeoNode deployments. In addition to creating local resources by retrieving the remote metadata, this harvester is also able to copy remote datasets over to the local GeoNode. This means that this harvester can even be used in order to generate replicated GeoNode instances.

This harvester can be used by setting `harvester_type=geonode.harvesting.harvesters.geonodeharvester`. GeonodeUnifiedHarvesterWorker in the harvester configuration.

It recognizes the following `harvester_type_specific_configuration` parameters:

- **harvest_datasets**
  Whether to harvest remote resources of type `dataset` or not. Acceptable values: `true` (the default) or `false`.

- **copy_datasets**
  Whether to copy remote resources of type `dataset` over to the local GeoNode. Acceptable values: `true` or `false` (the default).

- **harvest_documents**
  Whether to harvest remote resources of type `document` or not. Acceptable values: `true` (the default) or `false`.

- **copy_documents**
  Whether to copy remote resources of type `document` over to the local GeoNode. Acceptable values: `true` or `false` (the default).

- **resource_title_filter**
  A string that must be present in the remote resources' `title` in order for them to be acknowledged as harvestable resources. This allows filtering out resources that are not relevant. Acceptable values: any alphanumeric value.

  Example: setting this to a value of "water" would mean that the harvester would generate harvestable resources for remote resources that are titled `water basins`, `Water territories`, etc. The harvester would not generate harvestable resources for remote resources whose title does not contain the word `water`.

- **start_date_filter**
  A string specifying a datetime that is used to filter out resources by their `start_date`. This is parsed with `dateutil.parser.parse()`, which means that it accepts many different formats (e.g. `2021-06-31T13:04:05Z`)

- **end_date_filter**
  Similar to `start_date_filter` but uses resources' `end_date` as a filter parameter.

- **keywords_filter**
  A list of keywords that are used to filter remote resources.

- **categories_filter**
  A list of categories that are used to filter remote resources.
WMS harvester worker

This worker is able to harvest from remote OGC WMS servers.

This harvester can be used by setting `harvester_type=geonode.harvesting.harvesters.wms.OgcWmsHarvester` in the harvester configuration.

It recognizes the following `harvester_type_specific_configuration` parameters:

**dataset_title_filter**
A string that is used to filter remote WMS layers by their `title` property. If a remote layer's title contains the string defined by this parameter, then the layer is recognized by the harvester worker.

ArcGIS REST Services harvester worker

This worker is able to harvest from remote ArcGIS REST Services catalogs.

This worker is able to recognize two types of `remote_url`:

1. URL of the ArcGIS REST services catalog. This URL usually ends in `rest/services`. A catalog may expose several different services. This harvester worker is able to descend into the available ArcGIS Rest services and retrieve their respective resources. Example:

   ```
   https://sampleserver6.arcgisonline.com/arcgis/rest/services
   ```

2. URL of the ArcGIS REST services Service. This URL usually takes the form `{base-url}/rest/services/{service-name}/{service-type}`. Example:

   ```
   ```

This harvester worker can be used by setting `harvester_type=geonode.harvesting.harvesters.arcgis.ArcgisHarvesterWorker` in the harvester configuration.

It recognizes the following `harvester_type_specific_configuration` parameters:

**harvest_map_services**
Whether services of type `MapServer` ought to be harvested. Defaults to True.

**harvest_image_services**
Whether services of type `ImageServer` ought to be harvested. Defaults to True.

**resource_name_filter**
A string that is used to filter remote WMS layers by their `title` property. If a remote layer's name contains the string defined by this parameter, then the layer is recognized by the harvester worker.

**service_names_filter**
A list of names that are used to filter the remote ArcGIS catalog.
Creating new harvesting workers

New harvesting workers can be created by writing classes derived from geonode.harvesting.harvesters.base.BaseGeonodeHarvesterWorker. This class defines an abstract interface that must be implemented. All methods decorated with abc.abstractmethod must be implemented in the custom harvester worker class. Study the implementation of the standard GeoNode harvester worker classes in order to gain insight on how to implement custom ones.

After writing a custom harvester worker class, it can be added to the list of known harvester workers by defining the HARVESTER_CLASSES GeoNode setting. This setting is a list of strings, containing the Python class path to each harvester worker class. It has a default value of:

```python
HARVESTER_CLASSES = [
    "geonode.harvesting.harvesters.geonodeharvester.GeonodeUnifiedHarvesterWorker",
    "geonode.harvesting.harvesters.wms.OgcWmsHarvester",
    "geonode.harvesting.harvesters.arcgis.ArcgisHarvesterWorker",
]
```

These are the standard harvester worker classes shipped by GeoNode. If this setting is defined, its value will simply extend the default list. This means that it is not possible to disable the standard worker classes, only to add new ones.

1.19 GeoNode Backup and Restore

1.19.1 Full GeoNode Backup & Restore

The admin command to backup and restore GeoNode, allows to extract consistently the GeoNode and GeoServer data models in a serializable meta-format which is being interpreted later by the restore procedure in order to exactly rebuild the whole structure.

In particular the tool helps developers and administrators to correctly extract and serialize the following resources:

- **GeoNode** (Resource Base Model):
  1. Layers (both raster and vectors)
  2. Maps
  3. Documents
  4. People with Credentials
  5. Permissions
  6. Associated Styles
  7. Static data and templates

- **GeoServer** (Catalog):
  1. OWS Services configuration and limits
  2. Security model along with auth filters configuration, users and credentials
  3. Workspaces
  4. Stores (both DataStores and CoverageStores)
  5. Layers
  6. Styles
The tool exposes two GeoNode Management Commands, ‘backup’ and ‘restore’.

The commands allow to:

1. Fully backup GeoNode data and fixtures on a zip archive
2. Fully backup GeoServer configuration (physical datasets - tables, shapefiles, geotiffs)
3. Fully restore GeoNode and GeoServer fixtures and catalog from the zip archive

The usage of those commands is quite easy and straightforward.

The first step is to ensure that everything is correctly configured and the requisites respected in order to successfully perform a backup and restore of GeoNode.

**Warning:** It is worth to notice that this functionality requires the latest GeoServer Extension (2.9.x or greater) for GeoNode in order to correctly work.

**Note:** GeoServer full documentation is also available here GeoServer Docs

**Requisites and Setup**

**Before** running a GeoNode backup / restore, it is necessary to ensure everything is correctly configured and setup.

**Settings**

Accordingly to the admin needs, the file `settings.ini` must be created before running a backup or restore.

The default files can be found at `geonode/br/management/commands/settings_sample.ini` and `geonode/br/management/commands/settings_docker_sample.ini` for the classic and Docker environments accordingly. The content is similar in both of them (an example from `settings_sample.ini`):

```
[database]
pgdump = pg_dump
pgrestore = pg_restore

[geoserver]
datadir = geoserver/data
dumpvectordata = yes
dumprasterdata = yes

[fixtures]
# NOTE: Order is important
apps = contenttypes,auth,people,groups,account,guardian,admin,actstream,announcements,
    avatar,base,dialogos,documents,geoserver,invitations,pinax_notifications,layers,maps,
    oauth2_provider,services,sites,socialaccount,taggit,tastypie,upload,user_messages
dumps = contenttypes,auth,people,groups,account,guardian,admin,actstream,announcements,
    avatar,base,dialogos,documents,geoserver,invitations,pinax_notifications,layers,maps,
    oauth2_provider,services,sites,socialaccount,taggit,tastypie,upload,user_messages
```

The `settings.ini` file can be created in any directory accessible by GeoNode, and it’s path can be passed to the backup / restore procedures using `-c (-config) argument.
There are few different sections of the configuration file, that must be carefully checked before running a backup / restore command.

**Settings: [database] Section**

```ini
[database]
pgdump = pg_dump
pgrestore = pg_restore
```

This section is quite simple. It contains only two properties:

- `pgdump`: the path of the `pg_dump` local command.
- `pgrestore`: the path of the `pg_restore` local command.

**Warning:** Those properties are ignored in case GeoNode is not configured to use a Database as backend (see `settings.py` and `local_settings.py` sections)

**Note:** Database connection settings (both for GeoNode and GeoServer) will be taken from `settings.py` and `local_settings.py` configuration files. Make sure they are correctly configured (on the target GeoNode instance, too) and the Database server is accessible while executing a backup / restore command.

**Settings: [geoserver] Section**

```ini
[geoserver]
datadir = /opt/gs_data_dir
datadir_exclude_file_path =
dumpvectordata = yes
dumprasterdata = yes
data_dt_filter =
data_layername_filter =
data_layername_exclude_filter =
```

This section allows to enable / disable a full data backup / restore of GeoServer.

- `datadir`: the full path of GeoServer Data Dir, by default `/opt/gs_data_dir`. The path **must** be accessible and **fully writable** by the geonode and / or httpd server users when executing a backup / restore command.

- `datadir_exclude_file_path`: comma separated list of paths to exclude from `geoserver_catalog.zip`; This list will be sent and managed directly by the GeoServer Backup REST API.

- `dumpvectordata`: a boolean flag enabling or disabling creation of a vector data dump from GeoServer (shapefiles or DB tables). If `false` (or `no`) vector data won’t be stored / re-stored.

- `dumprasterdata`: a boolean flag enabling or disabling creation of a raster data dump from GeoServer (geotiffs). If `false` (or `no`) raster data won’t be stored / re-stored.

- `data_dt_filter`: `{cmp_operator} {ISO8601}` e.g. > 2019-04-05T24:00 which means “include on backup archive only the files that have been modified later than 2019-04-05T24:00"
• `data_layername_filter`: comma separated list of layer names, optionally with glob syntax e.g.: tuscany_*,italy; Only RASTER original data and VECTORIAL table dumps matching those filters will be included into the backup ZIP archive.

• `data_layername_exclude_filter`: comma separated list of layer names, optionally with glob syntax e.g.: tuscany_*,italy; The RASTER original data and VECTORIAL table dumps matching those filters will be excluded from the backup ZIP archive.

**Warning:** Enabling these options requires the GeoServer Data Dir to be accessible and fully writable for the geonode and/or httpd server users when executing a backup/restore command.

### Settings: [fixtures] Section

```ini
[fixtures]
#NOTE: Order is important
apps   = people,account,avatar.avatar,base.backup,base.license,base.topiccategory,base.
    → region,base.resourcebase,base.contactrole,base.link,base.restrictioncodetype,base.
    → spatialrepresentationtype,guardian.userobjectpermission,guardian.groupobjectpermission,
    → layers.uploadsession,layers.style,layers.layer,layers.attribute,layers.layerfile,maps.
    → map,maps.maplayer,maps.mapsnapshot,documents.document,taggit

dumps = people,accounts,avatars,backups,licenses,topiccategories,regions,resourcebases,
    → contactroles,links,restrictioncodetypes,spatialrepresentationtypes,userpermissions,
    → grouppermissions,uploadsessions,styles,layers,attributes,layerfiles,maps,maplayers,
    → mapsnapshots,documents,tags
```

This section is the most complex one. Usually you don’t need to modify it. Only an expert user who knows Python and GeoNode model structure should modify this section.

What its properties mean:

• `apps`: an ordered list of GeoNode Django applications. The backup/restore procedure will dump/restore the fixtures in a portable format.

• `dumps`: this is the list of files associated to the Django applications. The order must be the same as in the `apps` property above. Each name represents the file name where to dump to/read from the single app’s fixtures.

### Executing from the CLI

The following sections shows instructions on how to perform backup/restore from the command line by using the Django Admin Management Commands.

In order to obtain a basic user guide for the management command from the command line, just run

```
python manage.py backup --help
python manage.py restore --help
```

`--help` will provide the list of available command line options with a brief description.

By default both procedures activate Read Only mode, disabling any content modifying requests, which is reverted to the previous state (from before the execution) after finish, regardless of the command’s result (success or failure). To disable activation of this mode, `--skip-read-only` argument can be passed to the command.
It is worth notice that both commands allows the following option

```
python manage.py backup --force / -f
python manage.py restore --force / -f
```

Which enables a non-interactive mode, meaning the user will not be asked for an explicit confirmation.

**Backup**

In order to perform a backup just run the command:

```
python manage.py backup --backup-dir=<target_bk_folder_path> --config=</path/to/settings.ini>
```

The management command will automatically generate a .zip archive file on the target folder in case of success. In the target directory .md5 file with the same name as backup will be created. It contains the MD5 hash of the backup file, which can be used to check archive’s integrity before restoration.

It is worth to mention that br (Backup & Restore GeoNode application) will not be dumped, even if specified in the settings.ini as its content is strictly related to the certain GeoNode instance.

Currently, GeoNode does not support any automatic extraction of the backup file. It should be manually transferred, if needed to the target instance environment.

**Restore**

The restore command has a number of arguments, modifying its execution:

# -c / --config: path to the settings.ini configuration file. If the Backup archive is provided with his settings, the latter will be used by the restore command and this option won’t be mandatory anymore

1. --skip-geoserver: the GeoServer backup restoration won’t be performed
2. --skip-geoserver-info: {Default: True} Skips GeoServer Global Infos, like the proxy base url and other global GeoServer metadata info
3. --skip-geoserver-security: {Default: True} Skips GeoServer all the Security Settings
4. --backup-file: (exclusive together with --backup-files-dir) path to the backup .zip archive
5. --backup-files-dir: (exclusive together with --backup-file) directory containing backup archives. The directory may contain a number of files, but only backup archives are allowed with a .zip extension. In case multiple archives are present in the directory, the newest one, created after the last already restored backup creation time, will be restored. This option was implemented with a thought of automated restores.
6. --recovery-file: Backup archive containing GeoNode data to restore in case of failure.
7. -l / --with-logs: the backup file will be checked against the restoration logs (history). In case this backup has already been restored (MD5 based comparision), RuntimeError is raised, preventing restore execution.
8. -n / --notify: the restore procedure outcome will be send by an e-mail notification to the superusers of the instance (note: notification will be sent to the superusers of the instance before restoration).
9. --skip-read-only: the restore procedure will be conducted without setting Read Only mode during execution.
10. --soft-reset: the restore procedure will preserve geoserver table / resources during the restore. By default the procedure will drop tables and resources
In order to perform a default backup restoration just run the command:

```bash
python manage.py restore --backup-file=<target_restore_file_path> --config=/path/to/settings.ini
```

For restore to run it requires either `--backup-file` or `--backup-files-dir` argument defined.

**Warning:** The Restore will **overwrite** the whole target instances of GeoNode (and by default GeoServer) including users, catalog and database, so be very careful.

**GeoNode Admin GUI Inspection**

The history of restored backups can be verified in the admin panel.

Login to the admin panel and select **Restored backups** table from BACKUP/RESTORE application.

A list will be displayed with a history of all restored backups. You can select a certain backup to view its data.

The detailed view of the restored backup shows backup archive's name, its MD5 hash, its creation/modification date (in the target folder), and the date of the restoration. Please note Restored Backup history cannot be modified.

**B/R in Docker environment**

When executing B/R in the Docker environment, creation backup to / restoration from should be executed in `/backup_restore` directory. It is a shared volume between Geoserver and Geonode images, created for this purpose only. Pointing at another location will fail, as one of the images won't have an access to the files.

**Warning:** When executing B/R in Docker environment **remember** to create `settings.ini` file basing on `settings_docker_sample.ini` to point at a proper Geoserver data directory! In other case configuration mismatch may cause unexpected errors.

**Warning:** The only other volume shared between images is `/geoserver_data/data`, but backup creation **should not** be performed there, as the recursive Geoserver backups may be created in such case.
B/R Jenkins Job in Docker environment

When installing GeoNode through the geonode-project Docker (see GeoNode Basic Installation), an instance of Jenkins CI/CD is also automatically deployed and available through http://<geonode_host>/jenkins.

Configure Jenkins at first startup

The very first time you try to access Jenkins, you will need to unlock it and generate a new administrator username and password.

In order to do that, you need to print the contents of the auto-generated file /var/jenkins_home/secrets/initialAdminPassword

1. First of all search for the Jenkins container ID, usually jenkins4{{project_name}} where {{project_name}} is the name of your geonode-project instance (e.g. my_geonode)

```
$> docker ps
```

```
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
---:---:-------------------:-------------------:------------------:
e9fc97a75d1a geonode/nginx:geoserver "/docker-entrypoint...." 2 hours ago Up 2 hours 0.0.0.0:80->80/tcp, 0.0.0.0:443->443/tcp nginx4my_geonode
c5496400b1b9 my_geonode_django "/bin/sh -c 'service..." 2 hours ago Up 2 hours my_geonode_django
cbc899f81fa28 my_geonode_celery "/bin/sh -c 'service..." 2 hours ago Up 2 hours my_geonode_celery
3b213400d630 geonode/geoserver:2.17.1 "/usr/local/tomcat/t..." 2 hours ago Up 2 hours 8080/tcp
```
Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

/var/jenkins_home/secrets/initialAdminPassword

Please copy the password from either location and paste it below.

Administrator password

Continue
1. Now just cat the file above inside the Jenkins container

```bash
$> docker container exec -u 0 -it jenkins4my_geonode sh -c 'cat /var/jenkins_home/secrets/initialAdminPassword'
```

```
b91e9d****************373834
```

1. Copy the hash code you just got form the print above, and copy-and-paste to the browser window

In the next step just install the Default Plugins. You can install more of them later on from the management page.

Provide the administrator credentials as requested

Confirm the Jenkins instance URL, this can be changed form the configuration later in case you will need to update the server address

Well done, Jenkins is ready now

The next step is to configure a Jenkins Job able to interact with the Django Docker container and run a full backup

### Configure a Jenkins Job to run a full backup on the Django Container

Before creating the new Jenkins job, we need to install and configure a new plugin, Publish over SSH

In order to do that, once logged in as admin, go to the Jenkins Management Page > Manage Plugins tab

Click on Available tab and search for SSH available plugins

Select and check the Publish over SSH one

Install the plugins and restart Jenkins

The next step is to configure the SSH Server Connection for the Publish over SSH plugin.

Move to Jenkins Configuration

Scroll down until you find the Publish over SSH plugin section

Depending on how your HOST SSH service has been configured, you might need several information in order to setup the connection.

Here below an example using a global host (master.demo.geonode.org) accepting SSH connections via RSA keys

1.9. GeoNode Backup and Restore
Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

/var/jenkins_home/secrets/initialAdminPassword

Please copy the password from either location and paste it below.

Administrator password

[password field]

[Continue button]
Customize Jenkins

Plugins extend Jenkins with additional features to support many different needs.

- **Install suggested plugins**
  Install plugins the Jenkins community finds most useful.

- **Select plugins to install**
  Select and install plugins most suitable for your needs.
# Getting Started

<table>
<thead>
<tr>
<th>Feature</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Folders</td>
<td>✔️</td>
</tr>
<tr>
<td>OWASP Markup</td>
<td>✔️</td>
</tr>
<tr>
<td>Art</td>
<td>✔️</td>
</tr>
<tr>
<td>Pipeline</td>
<td>✔️</td>
</tr>
<tr>
<td>Git</td>
<td>✔️</td>
</tr>
<tr>
<td>PAM Authentication</td>
<td>✔️</td>
</tr>
</tbody>
</table>

## GeoNode Backup and Restore

1.9. GeoNode Backup and Restore

323
Create First Admin User

Username: admin
Password: ***********
Confirm password: ***********
Full name: Jenkins Admin
E-mail address: alessio.fabiani@geo-solutions.it

Save and Continue
Getting Started

Instance Configuration

Jenkins URL:

http://localhost/jenkins/

The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the BUILD_URL environment variable provided to build steps.

The proposed default value shown is not saved yet and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.
Getting Started

Jenkins is ready!

Your Jenkins setup is complete.

Start using Jenkins
Welcome to Jenkins!

Create an agent or configure a cloud to set up distributed builds. Learn more

Create a job to start building your software project.
1.19. GeoNode Backup and Restore

Go back to the top page

(You can start using the installed plugins right away)

☑ Restart Jenkins when installation is complete and no jobs are running
1.19. GeoNode Backup and Restore
It is possible also to run and configure Jenkins to run locally, as an instance on localhost. In that case you will need to change few things in order to allow Jenkins to access your local network.

1. First of all, be sure OpenSSH Server is correctly installed and running on your PC. Eventually check any firewall rules.

```
$> sudo apt install openssh-server

# Test your connection locally
$> ssh -p 22 user@localhost
  user@localhost's password:
```

2. You will need to do some changed to your docker-compose.yml file in order to enable the host network configuration.
$$>$$ vim docker-compose.yml

...  
jenkins:
  image: jenkins/jenkins:lts
  # image: istresearch/jenkins:latest
  container_name: jenkins4$$\{COMPOSE\_PROJECT\_NAME\}$$
  user: jenkins
  ports:
    - '$${JENKINS\_HTTP\_PORT}$$:$${JENKINS\_HTTP\_PORT}$$'
    - '$${JENKINS\_HTTPS\_PORT}$$:$${JENKINS\_HTTPS\_PORT}$$'
    - '50000:50000'
  network_mode: "host"
  volumes:
    - jenkins_data:/var/jenkins_home
    - backup-restore:/backup_restore
    # - /var/run/docker.sock:/var/run/docker.sock
  environment:
    - 'JENKINS\_OPTS=--httpPort=${JENKINS\_HTTP\_PORT} --httpsPort=${JENKINS\_HTTPS\_PORT} --prefix=/jenkins'
...

$$>$$ docker-compose stop jenkins
$$>$$ docker-compose rm jenkins
$$>$$ docker-compose up -d jenkins

**Warning:** From now on, your local Jenkins instance will be accessible from http://localhost:9080/jenkins

3. Add localhost Server to the Publish over SSH plugin configuration
   Mode to http://localhost:9080/jenkins/configure and fill the required information

   **Note:** Before saving the configuration always ensure the connection is ok by using the Test Configuration button

We are now ready to create the Jenkins Job which will run a full backup & restore of our GeoNode dockerized instance.

1.19. GeoNode Backup and Restore
1. Move to the Jenkins Home and click on *Create a Job* button
2. Provide a name to the Job and select *Freestyle project*
3. Enable the *Log rotation* strategy if needed
4. Configure the *Job Parameters* which will be used by the script later on.
   Add three *String Parameters*
   as shown below
   1. **BKP_FOLDER_NAME**
   2. **SOURCE_URL**

     **Warning:** Provide the correct URL of your GeoNode instance

   3. **TARGET_URL**

     **Warning:** Provide the correct URL of your GeoNode instance

5. Enable the *Delete workspace before build starts* and *Add timestamps to the Console Output Build Environment* options
6. Finally let’s create the *SSH Build Step*
   Select the correct *SSH Server* and provide the *Exec Command* below
Welcome to Jenkins!

Create an agent or configure a cloud to set up distributed builds. Learn more.

Create a job to start building your software project.

Enter an item name
- Backup "testhost"

Freestyle project
This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in freestyle job type.

Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

Folder
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

GitHub Organization
Scans a GitHub organization (or user account) for all repositories matching some defined markers.

Multibranch Pipeline
Creates a set of Pipeline projects according to detected branches in one SCM repository.
1.19. GeoNode Backup and Restore
1.19. GeoNode Backup and Restore
Warning: Replace `{{project_name}}` with your geonode-project instance name (e.g. `my_geonode`)

```
# Replace {{project_name}} with your geonode-project instance name (e.g. my_geonode)
# docker exec -u 0 -it django{{project_name}} sh -c 'SOURCE_URL=$SOURCE_URL TARGET_URL=$TARGET_URL ./{{project_name}}/br/backup.sh $BKP_FOLDER_NAME'
```

Click on **Advanced** and change the parameters as shown below

Save! You are ready to run the Job…
1.19. GeoNode Backup and Restore
1.19. GeoNode Backup and Restore
**Link the backup_restore folder to a local folder on the HOST**

In the case you need to save the backup archives outside the docker container, there’s the possibility to directly link the backup_restore folder to a local folder on the HOST.

In that case you won’t need to `docker cp` the files everytime from the containers, they will be directly available on the host filesystem.

**Warning:** Always keep an eye to the disk space. Backups archives may be huge.

**Note:** You might want also to consider filtering the files through the backup dt filters on the `settings.ini` in order to reduce the size of the archive files, including only the new ones.

Modify the `docker-compose.override.yml` as follows in order to link the backup folders outside.

**Note:** `/data/backup_restore` is a folder physically located into the host filesystem.

```bash
$> vim docker-compose.override.yml
version: '2.2'
services:
django:
  build: .
  volumes:
    - './usr/src/my_geonode'
    - '/data/backup_restore:/backup_restore' # Link to local volume in the HOST
celery:
  volumes:
    - '/data/backup_restore:/backup_restore' # Link to local volume in the HOST
geoserver:
  volumes:
    - '/data/backup_restore:/backup_restore' # Link to local volume in the HOST
jenkins:
  volumes:
    - '/data/backup_restore:/backup_restore' # Link to local volume in the HOST

# Restart the containers
$> docker-compose up -d
```
1.20 GeoNode Components and Architecture

1.20.1 OAuth2 Security: Authentication and Authorization

GeoNode interacts with GeoServer through an advanced security mechanism based on OAuth2 Protocol and GeoFence. This section is a walk through of the configuration and setup of GeoNode and GeoServer Advanced Security.

What we will see in this section is:

- **Introduction**
- **GeoNode** (Security Backend):
  1. Django Authentication
  2. Django OAuth Toolkit Setup and Configuration
  3. Details on `settings.py` Security Settings
- **GeoServer** (Security Backend):
  1. GeoServer Security Subsystem
  2. Introduction to the GeoServer OAuth2 Security Plugin
  3. Configuration of the GeoNode REST Role Service
  4. Configuration of the GeoNode OAuth2 Authentication Filter
  5. The GeoServer Authentication Filter Chains
  6. Introduction to GeoFence Plugin, the Advanced Security Framework for GeoServer
- **Troubleshooting and Advanced Features**:
  1. Common Issues and Fixes
  2. How to setup HTTPS secured endpoints
  3. GeoFence Advanced Features

**Introduction**

GeoServer, i.e. the geospatial backend server of GeoNode, is a spatial server which needs authenticated users in order to access protected resources or administration functions.

GeoServer supports several kind of Authentication and Authorization mechanisms. Those systems are pluggable and GeoServer can use them at the same time by the use of a Filter Chain. Briefly this mechanism allows GeoServer to check for different A&A protocols one by one. The first one matching is used by GeoServer to authorize the users.

GeoNode Authentication is based by default on Django Security Subsystem. Django authentication allows GeoNode to manage its internal users, groups, roles and sessions.

GeoNode has some external components, like GeoServer or QGis Server, which are pluggable and stand-alone services, devoted to the management of geospatial data. Those external services have their own authentication and authorization mechanisms which must be synchronized somehow with the GeoNode one. Also, those external services maintain, in most of the cases and unless specific configuration does not disable this, alternative security access which for instance allow GeoNode to modify the geospatial catalog under the hood, or a system administrator to have independent and privileged access to the servers.

Before going deeply on how GeoServer/GeoNode A&A works and how it can be configured in order to work correctly with GeoNode, let’s quickly clarify the difference between the Authentication and Authorization concepts.
Authentication

Authentication is the process of verifying the identity of someone through the use of some sort of credentials and a handshake protocol. If the credentials are valid, the authorization process starts. Authentication process always proceeds to Authorization process (although they may often seem to be combined). The two terms are often used synonymously but they are two different processes.

For more details and explanation about the authentication concepts, take a look here.

Authorization

Authorization is the process of allowing authenticated users to access protected resources by checking its roles and rights against some sort of security rules mechanism or protocol. In other words it allows to control access rights by granting or denying specific permissions to specific authorized users.

GeoNode Security Backend

DJango Authentication

The Django authentication system handles both authentication and authorization.

The auth system consists of:

1. Users
2. Permissions: Binary (yes/no) flags designating whether a user may perform a certain task.
3. Groups: A generic way of applying labels and permissions to more than one user.
4. A configurable password hashing system
5. Forms and view tools for logging in users, or restricting content
6. A pluggable backend system

The authentication system in Django aims to be very generic and doesn’t provide some features commonly found in web authentication systems. Solutions for some of these common problems have been implemented in third-party packages:

1. Password strength checking
2. Throttling of login attempts
3. Authentication against third-parties (OAuth, for example)

Note: For more details on installation and configuration of Django authentication system, please refer to the official guide https://docs.djangoproject.com/en/3.2/topics/auth/.

GeoNode communicates with GeoServer through Basic Authentication under the hood, in order to configure the data and the GeoServer catalog.

In order to do this, you must be sure that GeoNode knows the internal admin user and password of GeoServer.

Warning: This must be an internal GeoServer user with admin rights, not a GeoNode one.

Make sure the credentials are correctly configured into the file settings.py
OGC_SERVER

Ensure that the OGC_SERVER settings are correctly configured.

Notice that the two properties LOGIN_ENDPOINj_spring_oauth2_geonode_login and T and LOGOUT_ENDPOINT must specify the GeoServer OAuth2 Endpoints (see details below). The default values 'j_spring_oauth2_geonode_login' and 'j_spring_oauth2_geonode_logout' work in most of the cases, unless you need some specific endpoints different from the later. In any case those values must be coherent with the GeoServer OAuth2 Plugin configuration.

If in doubt, please use the default values here below.

Default values are:

```
# OGC (WMS/WFS/WCS) Server Settings
# OGC (WMS/WFS/WCS) Server Settings
OGC_SERVER = {
    'default': {
        'BACKEND': 'geonode.geoserver',
        'LOCATION': GEOSERVER_LOCATION,
        'LOGIN_ENDPOINT': 'j_spring_oauth2_geonode_login',
        'LOGOUT_ENDPOINT': 'j_spring_oauth2_geonode_logout',
        # PUBLIC_LOCATION needs to be kept like this because in dev mode
        # the proxy won't work and the integration tests will fail
        # the entire block has to be overridden in the local_settings
        'PUBLIC_LOCATION': GEOSERVER_PUBLIC_LOCATION,
        'USER': 'admin',
        'PASSWORD': 'geoserver',
        'MAPFISH_PRINT_ENABLED': True,
        'GEONODE_SECURITY_ENABLED': True,
        'WMS_ENABLED': False,
        'BACKEND_WRITE_ENABLED': True,
        'WPS_ENABLED': False,
        'LOG_FILE': '%s/geoserver/data/logs/geoserver.log' % os.path.abspath(os.path.join(PROJECT_ROOT, os.pardir)),
        # Set to name of database in DATABASES dictionary to enable
        'DATABASE': '',
        'TIMEOUT': 10  # number of seconds to allow for HTTP requests
    }
}
```

GeoNode and GeoServer A&A Interaction

The GeoServer instance used by GeoNode, has a particular setup that allows the two frameworks to correctly interact and exchange informations on users credentials and permissions.

In particular GeoServer is configured with a Filter Chain for Authorization that makes use of the two following protocols:

1. Basic Authentication; this is the default GeoServer Authentication mechanism. This makes use of rfc2617 - Basic and Digest Access Authentication in order to check for user's credentials.
   In other words, GeoServer takes a username and a password encoded Base64 on the HTTP Request Headers and compare them against its internal database (which by default is an encrypted XML file on the
GeoServer Data Dir). If the user’s credentials match, then GeoServer checks for Authorization through its Role Services (we will see those services in details on the GeoServer (Security Backend) section below).

**Note:** GeoServer ships by default with admin and geoserver as the default administrator user name and password. Before putting the GeoServer on-line it is imperative to change at least the administrator password.

2. **OAuth2 Authentication**: this module allows GeoServer to authenticate against the OAuth2 Protocol. If the Basic Authentication fails, GeoServer falls back to this by using GeoNode as OAuth2 Provider by default.

**Note:** Further details can be found directly on the official GeoServer documentation at section “Authentication Chain”

From the GeoNode backend (server) side, the server will make use of Basic Authentication with administrator credentials to configure the GeoServer catalog. GeoServer must be reachable by GeoNode of course, and GeoNode must know the internal GeoServer admin credentials.

From the GeoNode frontend (browser and GUI) side, the Authentication goal is to allow GeoServer to recognize as valid a user which has been already logged into GeoNode, providing kind of an SSO mechanism between the two applications.

GeoServer must know and must be able to access GeoNode via HTTP/HTTPS. In other words, an external user connected to GeoNode must be authenticated to GeoServer with same permissions. This is possible through the OAuth2 Authentication Protocol.

**GeoNode / GeoServer Authentication Mechanism**

**GeoNode as OAuth2 Provider (OP)**

OpenID Connect is an identity framework built on OAuth 2.0 protocol which extends the authorization of OAuth 2.0 processes to implement its authentication mechanism. OpenID Connect adds a discovery mechanism allowing users to use an external trusted authority as an identity provider. From another point of view, this can be seen as a single sign on (SSO) system.

OAuth 2.0 is an authorization framework which is capable of providing a way for clients to access a resource with restricted access on behalf of the resource owner. OpenID Connect allows clients to verify the users with an authorization server based authentication.

As an OP, GeoNode will be able to act as trusted identity provider, thus allowing the system working on an isolated environment and/or allow GeoNode to authenticate private users managed by the local Django auth subsystem.

**GeoServer as OAuth2 Relying Party (RP)**

Thanks to the OAuth2 Authentication GeoServer is able to retrieve an end user’s identity directly from the OAuth2 Provider (OP).

With GeoNode acting as an OP, the mechanism will avoid the use of cookies relying, instead, on the OAuth2 secure protocol.

How the OAuth2 Protocol works:
1. The relying party sends the request to the OAuth2 provider to authenticate the end user
2. The OAuth2 provider authenticates the user
3. The OAuth2 provider sends the ID token and access token to the relying party
4. The relying party sends a request to the user info endpoint with the access token received from OAuth2 provider
5. The user info endpoint returns the claims.

**GeoNode / GeoServer Authorization Mechanism**

Allowing GeoServer to make use of a OAuth2 in order to act as an OAuth2 RP, is not sufficient to map a user identity to its roles though.

On GeoServer side we will still need to a RoleService which would be able to talk to GeoNode and transform the tokens into a User Principal to be used within the GeoServer Security subsystem itself.

In other words after a successful Authentication, GeoServer needs to Authorize the user in order to understand which resources he is enable to access or not. A REST based RoleService on GeoNode side, allows GeoServer to talk to GeoNode via REST to get the current user along with the list of its Roles.

Nevertheless knowing the Roles associated to a user is not sufficient. The complete GeoServer Authorization needs to catch a set of Access Rules, associated to the Roles, in order to establish which resources and data are accessible by the user.

The GeoServer Authorization is based on Roles only, therefore for each authenticated user we need also to know:

1. The Roles associated to a valid user session
2. The access permissions associated to a GeoServer Resource

The Authentication mechanism above allows GeoServer to get information about the user and his Roles, which addresses point 1.

About point 2, GeoServer makes use of the GeoFence Embedded Server plugin. GeoFence is a java web application that provides an advanced authentication / authorization engine for GeoServer using the interface described in [here](#). GeoFence has its own rules database for the management of Authorization rules, and overrides the standard GeoServer security management system by implementing a sophisticated Resource Access Manager. Least but not last, GeoFence implements and exposes a REST API allowing remote authorized clients to read / write / modify security rules.

The advantages using such plugin are multiple:

1. The Authorizations rules have a fine granularity. The security rules are handled by GeoFence in a way similar to the iptables ones, and allow to define security constraints even on sub-regions and attributes of layers.
2. GeoFence exposes a REST interface to its internal rule database, allowing external managers to update the security constraints programmatically
3. GeoFence implements an internal caching mechanism which improves considerably the performances under load.

**GeoNode interaction with GeoFence**

GeoNode itself is able to push/manage Authorization rules to GeoServer through the GeoFence REST API, acting as an administrator for GeoServer. GeoNode properly configures the GeoFence rules anytime it is needed, i.e. the permissions of a Resource / Layer are updated.
GeoServer must know and must be able to access GeoNode via HTTP/HTTPS. In other words, an external user connected to GeoNode must be authenticated to GeoServer with same permissions. This is possible through the GeoNodeCookieProcessingFilter.

Summarizing we will have different ways to access GeoNode Layers:

1. Through GeoNode via Django Authentication and GeoNodeCookieProcessingFilter; basically the users available in GeoNode are also valid for GeoServer or any other backend.

   **Warning:** If a GeoNode user has “administrator” rights, he will be able to administer GeoServer too.

2. Through GeoServer Security Subsystem; it will be always possible to access to GeoServer using its internal security system and users, unless explicitly disabled (**warning** this is dangerous, you must know what you are doing).

Let’s now see in details how the single pieces are configured and how they can be configured.

**DJango OAuth Toolkit Setup and Configuration**

As stated above, GeoNode makes use of the OAuth2 protocol for all the frontend interactions with GeoServer. GeoNode must be configured as an OAuth2 Provider and provide a **Client ID** and a **Client Secret** key to GeoServer. This is possible by enabling and configuring the Django OAuth Toolkit Plugin.

**Warning:** GeoNode and GeoServer won’t work at all if the following steps are not executed at the first installation.

**Default settings.py Security Settings for OAuth2**

Double check that the OAuth2 Provider and Security Plugin is enabled and that the settings below are correctly configured.

**AUTH_IP_WHITELIST**

AUTH_IP_WHITELIST property limits access to users/groups REST Role Service endpoints to the only whitelisted IP addresses. Empty list means ‘allow all’. If you need to limit ‘api’ REST calls to only some specific IPs fill the list like this: `AUTH_IP_WHITELIST = ['192.168.1.158', '192.168.1.159']`

Default values are:

```python
... 
AUTH_IP_WHITELIST = []
... 
```
INSTALLED_APPS

In order to allow GeoNode to act as an OAuth2 Provider, we need to enable the `oauth2_provider` Django application provided by the “Django OAuth Toolkit”.

Default values are:

```python
INSTALLED_APPS = (
    'modeltranslation',
    ...
    'guardian',
    'oauth2_provider',
    ...
) + GEONODE_APPS
```

MIDDLEWARE_CLASSES

Installing the `oauth2_provider` Django application is not sufficient to enable the full functionality. We need also GeoNode to include additional entities to its internal model.

Default values are:

```python
MIDDLEWARE_CLASSES = (
    'django.middleware.common.CommonMiddleware',
    'django.contrib.sessions.middleware.SessionMiddleware',
    'django.contrib.messages.middleware.MessageMiddleware',

    # The setting below makes it possible to serve different languages per
    # user depending on things like headers in HTTP requests.
    'django.middleware.locale.LocaleMiddleware',
    'pagination.middleware.PaginationMiddleware',
    'django.middleware.csrf.CsrfViewMiddleware',
    'django.contrib.auth.middleware.AuthenticationMiddleware',
    'django.middleware.clickjacking.XFrameOptionsMiddleware',

    # If you use SessionAuthenticationMiddleware, be sure it appears before...
    # OAuth2TokenMiddleware.
    # SessionAuthenticationMiddleware is NOT required for using django-oauth-toolkit.
    ...
) + GEONODE_APPS
```
AUTHENTICATION_BACKENDS

In order to allow GeoNode to act as an OAuth2 Provider, we need to enable the `oauth2_provider.backends.OAuth2Backend` Django backend provided by the “Django OAuth Toolkit”. Also notice that we need to specify the OAuth2 Provider scopes and declare which generator to use in order to create OAuth2 Client IDs.

Default values are:

```
# Replacement of default authentication backend in order to support
# permissions per object.
AUTHENTICATION_BACKENDS = (
    'oauth2_provider.backends.OAuth2Backend',
    'django.contrib.auth.backends.ModelBackend',
    'guardian.backends.ObjectPermissionBackend',
)

OAUTH2_PROVIDER = {
    'SCOPES': {
        'read': 'Read scope',
        'write': 'Write scope',
        'groups': 'Access to your groups'
    },
    'CLIENT_ID_GENERATOR_CLASS': 'oauth2_provider.generators.ClientIdGenerator',
}
```

Django OAuth Toolkit Admin Setup

Once the `settings.py` and `local_settings.py` have been correctly configured for your system:

1. Complete the GeoNode setup steps
   - Prepare the model
     ```
     python manage.py makemigrations
     python manage.py migrate
     python manage.py syncdb
     ```
   - Prepare the static data
     ```
     python manage.py collectstatic
     ```
   - Make sure the database has been populated with initial default data
     ```
     Warning: Deprecated this command will be replaced by migrations in the future, so be careful.
     ```
     ```
     python manage.py loaddata initial_data.json
     ```
   - Make sure there exists a superuser for your environment
2. Start the application

Start GeoNode accordingly on how the setup has been done; run debug mode through paver, or proxied by an HTTP Server like Apache2 HTTPD, Nginx or others.

3. Finalize the setup of the OAuth2 Provider

First of all you need to configure and create a new OAuth2 Application called GeoServer through the GeoNode Admin Dashboard

- Access the GeoNode Admin Dashboard
- Go to Django OAuth Toolkit > Applications
- Update or create the Application named GeoServer

**Warning:** The Application name **must** be GeoServer

- **Client id:** An alphanumeric code representing the OAuth2 Client Id. GeoServer OAuth2 Plugin will use this value.

  **Warning:** In a production environment it is **highly** recommended to modify the default value provided with GeoNode installation.

- **User:** Search for the admin user. Its ID will be automatically updated into the form.
- **Redirect uris:** It is possible to specify many URIs here. Those must coincide with the GeoServer instances URIs.
- **Client type:** Choose Confidential
- **Authorization grant type:** Choose Authorization code
- **Client secret:** An alphanumeric code representing the OAuth2 Client Secret. GeoServer OAuth2 Plugin will use this value.

  **Warning:** In a production environment it is **highly** recommended to modify the default value provided with GeoNode installation.

- **Name:** **Must** be GeoServer
Menu

- Upload Layers
- Profile
- Recent Activity
- Inbox
- Announcements
- Remote Services
- Invite User
- GeoServer
- Admin
- Help

Log out

Django OAuth Toolkit

<table>
<thead>
<tr>
<th>Access tokens</th>
<th>Add</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications</td>
<td>Add</td>
<td>Change</td>
</tr>
<tr>
<td>Grants</td>
<td>Add</td>
<td>Change</td>
</tr>
<tr>
<td>Refresh tokens</td>
<td>Add</td>
<td>Change</td>
</tr>
</tbody>
</table>
GeoServer has a robust security subsystem, modeled on Spring Security. Most of the security features are available through the Web administration interface.

For more details on how this works and how to configure and modify it, please refer to the official GeoServer guide http://docs.geoserver.org/stable/en/user/security/webadmin/index.html

By using the GeoServer Data Dir provided with GeoNode build, the following configuration are already available. You will need just to update them accordingly to your environment (like IP addresses and Host names, OAuth2 Keys, and similar things). However it is recommended to read carefully all the following passages in order to understand exactly how the different component are configured and easily identify any possible issue during the deployment.

The main topics of this section are:

1. Connection to the GeoNode REST Role Service
2. Setup of the GeoServer OAuth2 Authentication Filter
3. Configuration of the GeoServer Filter Chains
4. Setup and test of the GeoFence Server and Default Rules
Connection to the GeoNode REST Role Service

Preliminary checks

- GeoServer is up and running and you have admin rights
- GeoServer must reach the GeoNode instance via HTTP
- The GeoServer Host IP Address must be allowed to access the GeoNode Role Service APIs (see the section `AUTH_IP_WHITELIST` above)

Setup of the GeoNode REST Role Service

1. Login as admin to the GeoServer GUI

   Warning: In a production system remember to change the default admin credentials admin geoserver

2. Access the Security > Users, Groups, Roles section

3. If not yet configured the service geonode REST role service, click on Role Services > Add new

   Note: This passage is not needed if the geonode REST role service has been already created. If so it will be displayed among the Role Services list
Security
- Settings
- Authentication
- Passwords
- Users, Groups, Roles
- User Groups and Roles
  - WPS security
  - GeoFence
  - GeoFence Data Rules
  - GeoFence Admin Rules

Role Services
- Add new
- Remove selected

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Administrator Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
<td>Default XML role service</td>
<td>ADMIN</td>
</tr>
<tr>
<td>geonode REST role service</td>
<td>Auththin REST Role Service</td>
<td>ROLE_ADMIN</td>
</tr>
</tbody>
</table>

Results 1 to 2 (out of 2 items)

Users, Groups, and Roles
Manage user group and role services

User Group Services
- Add new
- Remove selected

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
<td>Default XML user/group service</td>
</tr>
</tbody>
</table>

Results 1 to 1 (out of 1 item)

Role Services
- Add new
- Remove selected
4. **If not yet configured** the service geonode REST role service, choose AuthKEY REST - Role service from REST endpoint

**New Role Service**

Create and configure a new Role Service

- **XML** - Default role service stored as XML
- **J2EE** - Role service extracting roles from web.xml
- **AuthKEY REST** - Role service from REST endpoint
- **JDBC** - Role service stored in database
- **LDAP** - Role service stored in LDAP repository

5. Create / update the geonode REST role service accordingly

- **Name**: Must be geonode REST role service
- **Base Server URL**: Must point to the GeoNode instance base URL (e.g. `http://<geonode_host_url>`)  
- **Roles REST Endpoint**: Enter `/api/roles`  
- **Admin Role REST Endpoint**: Enter `/api/adminRole`  
- **Users REST Endpoint**: Enter `/api/users`  
- **Roles JSON Path**: Enter `$.groups`  
- **Admin Role JSON Path**: Enter `$.adminRole`  
- **Users JSON Path**: Enter `$.users[0].groups`

Once everything has been setup and it is working, choose the Administrator role and Group administrator role as ROLE_ADMIN

**Allow GeoFence to validate rules with ROLES**

**Warning:** The following instruction are different accordingly to the GeoServer version you are currently using.

**GeoServer 2.9.x and 2.10.x**

1. Access the Security > Settings section

2. Choose the geonode REST role service as Active role service
AuthKEY REST Role Service

Role service from REST endpoint

**Settings**

Name

**geonode REST role service**

Administrator role

**ROLE_ADMIN**

Group administrator role

**ROLE_ADMIN**

**REST Role Service Settings**

Base Server URL

http://geonode_host_url>

Roles REST Endpoint

/api/roles

Admin Role REST Endpoint

/api/adminRole

Users REST Endpoint

/api/users

Roles JSON Path

$.groups

Admin Role JSON Path

$.adminRole

Users JSON Path

---
Security Settings

Configure security settings

Active role service

- geonode REST role service
- default
- geonode REST role service

Encrypt web admin URL parameters
Password encryption

Weak PBE

⚠️ No strong cryptography available

GeoServer 2.12.x and above

With the latest updates to GeoFence Plugin, the latter no more recognizes the Role Service from the default settings but from the geofence-server.properties file.

That said, it is important that the Security > Settings role service will be set to default, in order to allow GeoServer following the standard authorization chain.

On the other side, you will need to be sure that the geofence-server.properties file under the $GEOSERVER_DATA_DIR/geofence folder, contains the two following additional properties:

```
gwc.context.suffix=gwc
org.geoserver.rest.DefaultUserGroupServiceName=geonode REST role service
```

Setup of the GeoServer OAuth2 Authentication Filter

It is necessary now check that GeoServer can connect to OAuth2 Providers (specifically to GeoNode OP), and being able to Authenticate users through it.

Preliminary checks

- GeoServer is up and running and you have admin rights
- GeoServer must reach the GeoNode instance via HTTP
- OAuth2 Client ID and Client Secret have been generated on GeoNode and known
Setup of the GeoNode OAuth2 Security Filter

1. Access the Security > Authentication section

   Security
   - Settings
   - Authentication
   - Passwords
   - Use Authentication providers and set
   - Data

2. If not yet configured the Authentication Filter geonode-oauth2 - Authentication using a GeoNode OAuth2, click on Authentication Filters > Add new

   Note: This passage is not needed if the geonode-oauth2 - Authentication using a GeoNode OAuth2 has been already created. If so it will be displayed among the Authentication Filters list

   Authentication Filters
   - Add new
   - Remove selected

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>anonymous</td>
<td>Anonymous authentication</td>
</tr>
<tr>
<td>basic</td>
<td>Basic HTTP authentication</td>
</tr>
<tr>
<td>form</td>
<td>Form authentication</td>
</tr>
<tr>
<td>geonode-oauth2</td>
<td>Authentication using a GeoNode OAuth2</td>
</tr>
<tr>
<td>geonodeAnonymousFilter</td>
<td>org.geonode.security.GeoNodeAnonymousProcessingFilter</td>
</tr>
<tr>
<td>geonodeCookieFilter</td>
<td>org.geonode.security.GeoNodeCookieProcessingFilter</td>
</tr>
<tr>
<td>rememberme</td>
<td>Remember me authentication</td>
</tr>
</tbody>
</table>

   Authentication Filters
   - Add new
   - Remove selected

3. If not yet configured the Authentication Filter geonode-oauth2 - Authentication using a GeoNode OAuth2, choose GeoNode OAuth2 - Authenticates by looking up for a valid GeoNode OAuth2 access_token key sent as URL parameter

4. Create / update the geonode-oauth2 - Authentication using a GeoNode OAuth2 accordingly
   - Name: Must be geonode-oauth2
New Authentication Filter

Create and configure a new Authentication Filter

- J2EE - Delegates to servlet container for authentication
  - GeoNode CAuth2 - Authenticates by looking up for a valid GeoNode

Authentication using a GeoNode OAuth2 geonode-oauth2

<table>
<thead>
<tr>
<th>None</th>
<th>geonode-oauth2</th>
</tr>
</thead>
</table>

**OAuth2 provider connection**

**Enable Redirect Authentication Entry Point**

<table>
<thead>
<tr>
<th>Login Authentication Endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>/j_spring_oauth2_geonode_login</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Logout Authentication Endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>/j_spring_oauth2_geonode_logout</td>
</tr>
</tbody>
</table>

**Force Access Token URI HTTPS Secured Protocol**

<table>
<thead>
<tr>
<th>Access Token URI</th>
</tr>
</thead>
</table>

- **Enable Redirect Authentication Entry Point**: It is recommended to put this to False, otherwise GeoServer won't allow you to connect to its Admin GUI through the Form but only through GeoNode.

- **Login Authentication Endpoint**: Unless you have specific needs, keep the default value `/j_spring_oauth2_geonode_login`

- **Logout Authentication Endpoint**: Unless you have specific needs, keep the default value `/j_spring_oauth2_geonode_logout`

- **Force Access Token URI HTTPS Secured Protocol**: This must be False unless you enabled a Secured Connection on GeoNode. In that case you will need to trust the GeoNode Certificate on the GeoServer JVM Keystore. Please see details below.

- **Access Token URI**: Set this to http://<geonode_host_base_url>/o/token/

- **Force User Authorization URI HTTPS Secured Protocol**: This must be False unless you enabled a Secured Connection on GeoNode. In that case you will need to trust the GeoNode Certificate on the GeoServer JVM Keystore. Please see details below.

- **User Authorization URI**: Set this to http://<geonode_host_base_url>/o/authorize/

- **Redirect URI**: Set this to http://<geoserver_host>/geoserver. This address must be present on the Redirect uris of GeoNode OAuth2 > Applications > GeoServer (see above).

- **Check Token Endpoint URL**: Set this to http://<geonode_host_base_url>/api/o/v4/tokeninfo/

- **Logout URI**: Set this to http://<geonode_host_base_url>/account/logout/
• Scopes: Unless you have specific needs, keep the default value read, write, groups

• Client ID: The Client id alphanumeric key generated by the GeoNode OAuth2 > Applications > GeoServer (see above)

• Client Secret: The Client secret alphanumeric key generated by the GeoNode OAuth2 > Applications > GeoServer (see above)

• Role source: In order to authorize the user against GeoNode, choose Role service > geonode REST role service

**Configuration of the GeoServer Filter Chains**

The following steps ensure GeoServer can adopt more Authentication methods. As stated above, it is possible to Authenticate to GeoServer using different protocols.

GeoServer scans the authentication filters chain associated to the specified path and tries them one by one sequentially. The first one matching the protocol and able to grant access to the user, breaks the cycle by creating a User Principal and injecting it into the GeoServer SecurityContext. The Authentication process, then, ends here and the control goes to the Authorization one, which will try to retrieve the authenticated user’s Roles through the available GeoServer Role Services associated to the Authentication Filter that granted the access.

**Preliminary checks**

• GeoServer is up and running and you have admin rights

• GeoServer must reach the GeoNode instance via HTTP

• The geonode-oauth2 - Authentication using a GeoNode OAuth2 Authentication Filter and the geonode REST role service have been correctly configured

**Setup of the GeoServer Filter Chains**

1. Access the Security > Authentication section

2. Identify the section Filter Chains

3. Make sure the web Filter Chain is configured as shown below

```
Warning: Every time you modify a Filter Chain, don't forget to save the Authentication settings. This must be done for each change.
```
## Filter Chains

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>↓</td>
<td>web</td>
<td>/web/<strong>,/gwc/rest/web/</strong>,/</td>
</tr>
<tr>
<td>↑ ↓</td>
<td>webLogin</td>
<td>/j_spring_security_check,/j_spring_security_check,/</td>
</tr>
<tr>
<td>↑ ↓</td>
<td>webLogout</td>
<td>/j_spring_security_logout,/j_spring_security_logout,/</td>
</tr>
<tr>
<td>↑ ↓</td>
<td>rest</td>
<td>/rest/**</td>
</tr>
<tr>
<td>↑ ↓</td>
<td>gwc</td>
<td>/gwc/rest/**</td>
</tr>
<tr>
<td>↑</td>
<td>default</td>
<td>/**</td>
</tr>
</tbody>
</table>

Results 1 to 6 (out of 6 items)
4. Make sure the `rest` Filter Chain is configured as shown below

```
Available
geonodeAnonymousFilter
geonodeCookieFilter

Selected
basic
geonode-auth2
anonymous
```

**Warning:** Every time you modify a Filter Chain, **don't forget to save** the Authentication settings. This **must** be done for each change.
5. Make sure the gwc Filter Chain is configured as shown below

*Warning:* Every time you modify a Filter Chain, *don’t forget to save* the Authentication settings. This *must* be done for each change.
6. Make sure the default Filter Chain is configured as shown below

The `geonodeAuthProvider` is shown as available.

**Warning:** Every time you modify a Filter Chain, don't forget to save the Authentication settings. This must be done for each change.
7. Add the GeoNode Login Endpoints to the comma-delimited list of the webLogin Filter Chain

Filter chain

Configure an individual filter chain

Chain settings

Name
webLogin

Comma delimited list of ANT patterns (with optional query string)

[jth2_geonode_login, j_spring_oauth2_geonode_login]

- Disable security for this chain
- Allow creation of an HTTP session for storing the authentication token
- Accept only SSL requests

Role filter

**Warning:** Every time you modify a Filter Chain, **don't forget to save** the Authentication settings. This **must** be done for **each** change.
8. Add the GeoNode Logout Endpoints to the comma-delimited list of the webLogout Filter Chain

**Filter chain**

Configure an individual filter chain

**Chain settings**

Name:
webLogout

Comma delimited list of ANT patterns (with optional query string):

```
2_geonode_logout/j_i_spring_oauth2_geonode_logout
```

- [ ] Disable security for this chain
- [ ] Allow creation of an HTTP session for storing the auth
- [ ] Accept only SSL requests

**Warning:** Every time you modify a Filter Chain, **don't forget to save** the Authentication settings. This **must** be done for **each** change.
9. Add the GeoNode Logout Endpoints to the comma-delimited list of the `formLogoutChain` XML node in `<GEOSERVER_DATA_DIR>/security/filter/formLogout/config.xml`

You will need a text editor to modify the file.

**Note:** If the `<formLogoutChain>` XML node does not exist at all, create a **new one** as specified below.

```xml
<logoutFilter>
  ...
  <redirectURL>/web/</redirectURL>
  <formLogoutChain>/j_spring_security_logout,/j_spring_security_logout;/j_spring_oauth2_geonode_logout;/j_spring_oauth2_geonode_logout/</formLogoutChain>
</logoutFilter>
```

**Warning:** The value `j_spring_oauth2_geonode_logout` **must** be the same specified as Logout Authentication EndPoint in the geonode-oauth2 - Authentication using a GeoNode OAuth2 above.
Setup and test of the GeoFence Server and Default Rules

In order to work correctly, GeoServer needs the GeoFence Embedded Server plugin to be installed and configured on the system.

The GeoServer configuration provided for GeoNode, has the plugin already installed with a default configuration. In that case double check that the plugin works correctly and the default rules have been setup by following the next steps.

Preliminary checks

- GeoServer is up and running and you have admin rights
- The GeoFence Embedded Server plugin has been installed on GeoServer

Setup of the GeoServer Filter Chains

1. Access the Security > Authentication section

   ![Security Configuration](image)

   - **Settings**
   - **Authentication**
   - **P&H Words**
   - **User Authentication Providers and Settings**

2. Identify the section Authentication Providers and make sure the geofence Authentication Provider is present

   ![Authentication Providers](image)

   - Name: default
     - Type: Basic username/password authentication
   - Name: geofence
     - Type: org.geoserver.security.geofence.authentication.auth.GeoFenceAuthProvider
   - Name: geonodeAuthProvider
     - Type: org.geonode.security.GeoNodeAuthProvider

3. Make sure the Provider Chain is configured as shown below

   **Warning:** Every time you modify an Authentication Providers, don’t forget to save the Authentication settings. This must be done for each change.
Setup of the GeoFence Server and Rules

1. Make sure GeoFence server works and the default settings are correctly configured
   - Access the Security > GeoFence section
   - Make sure the Options are configured as follows and the server works well when performing a Test Connection
     - Allow remote and inline layers in SLD; Set it to True
     - Allow SLD and SLD_BODY parameters in requests; Set it to True
**Security**
- Settings
- Authentication
- Passwords
- Users, Groups, Roles
- Data
- Services
- WPS security
- GeoFence
- GeoFence Data Rules
- GeoFence Admin Page

Connection successful

**GeoFence Admin Page**
GeoFence options Administration Page

**General settings**
GeoServer Instance name for GeoFence
```
default-gs
```
GeoFence services URL (GeoServer restart is required if changed)
```
internal:/
```

![Test Connection](button)

**Options**
- Allow remote and inline layers in SLD
- Allow SLD and SLD_BODY parameters in requests
- Authenticated users can write
- Use GeoServer roles to get authorizations
- Authenticated users can write; Set it to True
- Use GeoServer roles to get authorizations; Set it to False

2. Check the GeoFence default Rules

- Access the Security > GeoFence Data Rules section

  **Security**
  📋 Settings
  🌐 Authentication
  🛡️ Passwords
  🏛️ Users, Groups, Roles
  🌐 Data
  🛡️ Services
  🗝️ WPS security
  🏛️ GeoFence
  📡 GeoFence Data Rules
  🛡️ GeoFence Admin Rules
  
  Configure data rules for the internal GeoFence server.

- Make sure the DENY ALL Rule is present by default, otherwise your data will be accessible to everyone

  **Note:** This rule is *always* the last one

**GeoFence Data Rules**

Configure data rules for the internal GeoFence server.

- 🌋 Add new rule
- 🗑️ Remove selected rules

<table>
<thead>
<tr>
<th>P</th>
<th>Role</th>
<th>User</th>
<th>Service</th>
<th>Request</th>
<th>Workspace</th>
<th>Layer</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>DENY</td>
</tr>
</tbody>
</table>

**Warning:** If that rule does not exists at the very bottom (this rule is *always* the last one), add it manually.

- Access the Security > GeoFence Admin Rules section

- No Rules needed here
Common Issues and Fixes

- GeoServer/GeoNode OAuth2 does not authenticate as Administrator even using GeoNode admin users

  Symptoms
  
  When trying to authenticate with an admin user using OAuth2, the process correctly redirects to GeoServer page but I’m not a GeoServer Administrator.

  Cause
  
  That means that somehow GeoServer could not successfully complete the Authorization and Authentication process.

  The possible causes of the problem may be the following ones:

  1. The OAuth2 Authentication fails on GeoServer side

     This is usually due to an exception while trying to complete the Authentication process.

     – A typical cause is that GeoServer tries to use HTTPS connections but the GeoNode certificate is not trusted;

     In that case please refer to the section below. Also take a look at the logs (in particular the GeoServer one) as explained in debug_geonode. The GeoServer logs should contain a detailed Exception explaining the cause
of the problem. If no exception is listed here (even after raised the log level to DEBUG), try to check for the GeoNode Role Service as explained below.

- Another possible issue is that somehow the OAuth2 handshake cannot complete successfully;
  1. Login into GeoServer as administrator through its WEB login form.
  2. Double check that all the geonode-oauth2 Authentication using a GeoNode OAuth2 parameters are correct. If everything is ok, take a look at the logs (in particular the GeoServer one) as explained in debug_geonode. The GeoServer logs should contain a detailed Exception explaining the cause of the problem. If no exception is listed here (even after raised the log level to DEBUG), try to check for the GeoNode Role Service as explained below.

2. GeoServer is not able to retrieve the user Role from a Role Service

Always double check both HTTP Server and GeoServer log as specified in section debug_geonode. This might directly guide you to the cause of the problem.

- Check that the GeoServer host is granted to access GeoNode Role Service REST APIs in the AUTH_IP_WHITELIST of the settings.py
- Check that the geonode REST role service is the default Role service and that the GeoServer OAuth2 Plugin has been configured to use it by default
- Check that the GeoNode REST Role Service APIs are functional and produce correct JSON.

This is possible by using simple cUrl GET calls like

```
curl http://localhost/api/adminRole
>$> {"adminRole": "admin"}

curl http://localhost/api/users
>$> {"users": [{"username": "AnonymousUser", "groups": ["anonymous"]}, {"username": "afabiani", "groups": ["anonymous", "test"]}, {"username": "admin", "groups": ["anonymous", "test", "admin"]}]}  

curl http://localhost/api/roles
>$> {"groups": ["anonymous", "test", "admin"]}

curl http://localhost/api/users/admin
>$> {"users": [{"username": "admin", "groups": ["anonymous", "test", "admin"]}]}  
```
How to setup HTTPS secured endpoints

In a production system it is a good practice to encrypt the connection between GeoServer and GeoNode. That would be possible by enabling HTTPS Protocol on the GeoNode REST Role Service APIs and OAuth2 Endpoints.

Most of the times you will rely on a self-signed HTTPS connection using a generated certificate. That makes the connection *untrusted* and you will need to tell to the GeoServer Java Virtual Machine to trust it.

This can be done by following the steps below.

For any issue take a look at the logs (in particular the GeoServer one) as explained in debug_geonode. The GeoServer logs should contain a detailed Exception explaining the cause of the problem.

SSL Trusted Certificates

When using a custom Keystore or trying to access a non-trusted or self-signed SSL-protected OAuth2 Provider from a non-SSH connection, you will need to add the certificates to the JVM Keystore.

In order to do this you can follow the next steps:

In this example we are going to

1. Retrieve SSL Certificate from GeoNode domain:

   “Access Token URI” = https://<geonode_host_base_url>/o/token/ therefore we need to trust https://<geonode_host_base_url> or (<geonode_host_base_url>:443)

   **Note:** You will need to get and trust certificates from every different HTTPS URL used on OAuth2 Endpoints.

2. Store SSL Certificates on local hard-disk

3. Add SSL Certificates to the Java Keystore

4. Enable the JVM to check for SSL Certificates from the Keystore

1. Retrieve the SSL Certificate from GeoNode domain

   Use the `openssl` command in order to dump the certificate

   `openssl s_client -connect <geonode_host_base_url>:443`

2. Store SSL Certificate on local hard-disk

   Copy-and-paste the section `-BEGIN CERTIFICATE-`, `-END CERTIFICATE-` and save it into a `.cert` file

   **Note:** `.cert` file are plain text files containing the ASCII characters included on the `-BEGIN CERTIFICATE-`, `-END CERTIFICATE-` sections

   `geonode.cert` (or whatever name you want with `.cert` extension)

3. Add SSL Certificates to the Java Keystore

   You can use the Java command `keytool` like this

   `geonode.cert` (or whatever name you want with `.cert` extension)
1.20. GeoNode Components and Architecture

GeoNode Documentation, Release 4.2.5

---

Certificate chain:
0: s:/US/ST-California/L-Mountain View/O=Google Inc/CN=accounts.google.com
1: s:/US/O=Google Inc/CN=Google Internet Authority G2
2: s:/US/O=GeoTrust Inc./CN=GeoTrust Global CA

Server certificate:

---BEGIN CERTIFICATE-----
MIIEcTCCAdigAwIBAgIiGEsxeEPBPcCN1BoU0Y9rZ1hvcNAoFEMBOAwSTMAkGA1UE
BhMCVUVUxERjAOgWdMBsGEkGA1UdIwQxMBABoAARoIBCAwNibzgSYyC20Kgg4gMIIE
cAcIBi3DExb+3j5HgH8rz9Z3WxMTy6MNTc=x1Jv95OfHcNHTc=MTc=x1Jv95Of
vz3VbbfOF02HlvhacN9Be00BQgAQFADCCQwCgEJ
AK1x1IDug7OHrvX5a2z7o767Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7Llnz
3z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7Llnz
K2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7L
z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7Llnz
K2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7L
z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7Llnz
K2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7L
z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7Llnz
K2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7L
z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7Llnz
K2z5Oc7z7z7Qb7LlnzK2z5Oc7z7z7Qb7L
---END CERTIFICATE-----
keytool -import -noprompt -trustcacerts -alias geonode -file geonode.cert -keystore ${KEYSTOREFILE} -storepass ${KEYSTOREPASS}

or, alternatively, you can use some graphic tool which helps you managing the SSL Certificates and Keystores, like Portecle

java -jar c:\apps\portecle-1.9\portecle.jar

4. Enable the JVM to check for SSL Certificates from the Keystore

In order to do this, you need to pass a JAVA_OPTION to your JVM:

-Djavax.net.ssl.trustStore=F:\tmp\keystore.key

5. Restart your server

Note: Here below you can find a bash script which simplifies the Keystore SSL Certificates importing. Use it at your convenience.
Import Trusted Certificate

- Look In: \tmp

- File Name: google.cert

- Files of Type: X.509 Certificate Files (*.cer, *.crt, *.pem)

Keystore type: JKS, provider: SUN, size: 3 entries
Import Trusted Certificate

Do you want to accept the certificate as trusted?

Yes  No

Keystore type: JKS, provider: SUN, size: 3 entries
### Trusted Certificate Entry Alias

**Enter Alias:** 1 (google internet authority g2)

- **OK**
- **Cancel**

---

Keystore type: JKS, provider: SUN, size: 3 entries
Save the loaded keystore to disk
HOST=myhost.example.com
PORT=443
KEYSTOREFILE=dest_keystore
KEYSTOREPASS=changeme

# get the SSL certificate
openssl s_client -connect ${HOST}:${PORT} </dev/null \
| sed -ne '/-BEGIN CERTIFICATE-/,/-END CERTIFICATE-/p' > ${HOST}.cert

# create a keystore and import certificate
keytool -import -noprompt -trustcacerts \ 
-alias ${HOST} -file ${HOST}.cert \ 
-keystore ${KEYSTOREFILE} -storepass ${KEYSTOREPASS}

# verify we've got it.
keytool -list -v -keystore ${KEYSTOREFILE} -storepass ${KEYSTOREPASS} -alias ${HOST}

GeoFence Advanced Features

GeoFence Rules Management and Tutorials

• This tutorial shows how to install and configure the Geofence Internal Server plug-in. It shows how to create rules in two ways: using the GUI and REST methods.
• GeoFence Rules can be created / updated / deleted through a REST API, accessible only by a GeoServer Admin user. You can find more details on how the GeoFence REST API works here.

GeoFence Rules Storage Configuration

By default GeoFence is configured to use a filesystem based DB stored on the GeoServer Data Dir <GEOSERVER_DATA_DIR/geofence.

• It is possible also to configure GeoFence in order to use an external PostgreSQL / PostGIS Database. For more details please refer to the official GeoFence documentation here.

1. Add Java Libraries to GeoServer

```
wget --no-check-certificate "https://maven.geo-solutions.it/org/hibernatespatial/hibernate-spatial-postgis/1.1.3.2/hibernate-spatial-postgis-1.1.3.2.jar" -O hibernate-spatial-postgis-1.1.3.2.jar
wget --no-check-certificate "https://repo1.maven.org/maven2/org/postgis/postgis-jdbc/1.3.3/postgis-jdbc-1.3.3.jar" -O postgis-jdbc-1.3.3.jar

cp hibernate-spatial-postgis-1.1.3.2.jar <GEOSERVER_WEBAPP_DIR>/WEB-INF/lib
cp postgis-jdbc-1.3.3.jar <GEOSERVER_WEBAPP_DIR>/WEB-INF/lib
```

2. Either create a DB with the updated schema here https://github.com/geoserver/geofence/blob/master/doc/setup/sql/002_create_schema_postgres.sql or enable the hbm2ddl auto creation through the configuration file (see step 3)
Note: Notice that “update” also creates the tables if they do not exist. In production, however, I would suggest to change it to “validate”

```bash
# If you want to create a new DB for GeoFence
sudo -u postgres createdb -O geonode geofence; \
sudo -u postgres psql -d geofence -c 'CREATE EXTENSION postgis;'; \
sudo -u postgres psql -d geofence -c 'GRANT ALL ON geometry_columns TO PUBLIC;'; \
sudo -u postgres psql -d geofence -c 'GRANT ALL ON spatial_ref_sys TO PUBLIC;'; \
sudo -u postgres psql -d geofence -c 'GRANT ALL PRIVILEGES ON ALL TABLES IN SCHEMA public TO geonode;'
```

3. Add configuration similar to `geofence-datasource-ovr.properties` sample below (if loaded as GeoServer extension)

```properties
<GEOSERVER_DATA_DIR>/geofence/geofence-datasource-ovr.properties
```

```properties
# /* (c) 2019 Open Source Geospatial Foundation - all rights reserved
# * This code is licensed under the GPL 2.0 license, available at the root
# * application directory.
# */
#
geofenceVendorAdapter.databasePlatform=org.hibernatespatial.postgis.PostgisDialect
geofenceDataSource.driverClassName=org.postgresql.Driver
geofenceDataSource.url=jdbc:postgresql://localhost:5432/geofence
geofenceDataSource.username=postgres
geofenceDataSource.password=postgres
geofenceEntityManagerFactory.jpaPropertyMap[hibernate.default_schema]=public

###########################################################################
## Other setup entries
###########################################################################
```

(continues on next page)
geofenceEntityManagerFactory.jpaPropertyMap[hibernate.validator.˓
autoregister_listeners]=false

## ShowSQL is set to true in the configuration file; putting showsql=false in this file, you can easily check that this override file has been properly applied.

# geofenceVendorAdapter.generateDdl=false
# geofenceVendorAdapter.showSql=false

## Set to "true" in specific use cases
# workspaceConfigOpts.showDefaultGroups=false

###########################################################################
##### Disable second level cache.
##### This is needed in a geofence-clustered environment.

#geofenceEntityManagerFactory.jpaPropertyMap[hibernate.cache.use_second_˓
level_cache]=false

###########################################################################
##### Use external ehcache configuration file.
##### Useful to change cache settings, for example diskStore path.
#geofenceEntityManagerFactory.jpaPropertyMap[hibernate.cache.provider_˓
configuration_file_resource_path]=file:/path/to/geofence-ehcache-override.xml

1.21 Hardening GeoNode

1.21.1 Publish on other than HTTP port (for e.g. 8082)

By default geonode will be installed in the port 80 (i.e. HTTP port). But what if you want to change the port of the geonode to other than HTTP port (For this example, I am taking 8082 port)? We need to edit couple of things in the web configuration. First things is, we need to update the /etc/uwsgi/apps-enabled/geonode.ini file,

```bash
sudo vi /etc/uwsgi/apps-enabled/geonode.ini
```

Edit the following lines,

```ini
env = SITE_HOST_NAME=localhost:8082
env = SITEURL=http://localhost:8082
SITE_HOST_NAME=localhost
SITE_HOST_PORT=8082
```

(continues on next page)
After that we need to update the `/etc/nginx/sites-enabled/geonode` file.

```bash
sudo vi /etc/nginx/sites-enabled/geonode
```

Edit the following lines,

```nginx
server {
    listen 8082 default_server;
    listen [::]:8082 default_server;
}
```

## 1.22 Social Login

### 1.22.1 GeoNode Social Accounts

---

**GeoNode Social Accounts**

- *Allow GeoNode to Login through Social Accounts (OIDC)*
  - *Introduction*
  - *Usage*
  - *Quick Configuration*
  - *Advanced Configuration*

---

**Allow GeoNode to Login through Social Accounts (OIDC)**

**Introduction**

Through the so-called “social accounts,” GeoNode allows authentication through external providers that support the OIDC (OpenID Connect) protocol, such as Google and Microsoft Azure.

How does it work? Once the authentication provider is configured, GeoNode’s sign-on will display a new login button that redirects the user to the external authentication page. After successfully authenticating with the external provider and accepting privacy consents, the browser will redirect the user back to the GeoNode page, prompting them to enter any missing information the first time and automatically authenticating them on subsequent occasions.
Usage

Once the provider has been correctly configured (see below), GeoNode will allow the user to login through it.

The first time you login you will probably need to confirm your e-mail and other fields of the profile.

Note:

If you want a user to be automatically signed as a member of a group, you will need to:

1. Create the GroupProfile in GeoNode
2. Provide the groups or roles the user belongs to through the id_token or user_info metadata from the OIDC provider itself.

Notice that, in the case you would like to benefit from this functionality:

1. Every time the user signs in again, the groups will be automatically re-assigned by GeoNode, and therefore it won’t be possible to assign them manually anymore.
2. If you need a user to be recognized as a manager of the groups declared from the provider, you will need to send a claim is_manager: True on the user info metadata.

Quick Configuration

Currently GeoNode comes with two predefined configurations that you can use to enable either Google or Microsoft Azure.

Google

1. Add to your .env the following settings

   SOCIALACCOUNT_OIDC_PROVIDER_ENABLED=True
   SOCIALACCOUNT_PROVIDER=google

2. Login into GeoNode as an admin, go to the Social Account settings, create a new geonode_openid_connect provider and insert the

   Client ID
   Client Secret

Microsoft Azure

1. Add to your .env the following settings

   MICROSOFT_TENANT_ID=<the_tenant_id>
   SOCIALACCOUNT_OIDC_PROVIDER_ENABLED=True
   SOCIALACCOUNT_PROVIDER=azure

2. Login into GeoNode as an admin, go to the Social Account settings, create a new geonode_openid_connect provider and insert the

   Client ID
   Client Secret
Advanced Configuration

In the case you need to change the default behavior of GeoNode or add a new/custom OIDC provider, you will need to update the settings manually as follows.

```python
SOCIALACCOUNT_PROVIDERS = {
    SOCIALACCOUNT_OIDC_PROVIDER: {
        "NAME": "Your Custom Provider",
        "SCOPE": [# Custom scopes comma-separated
        ],
        "AUTH_PARAMS": { # Custom AUTH PARAMS
        },
        "COMMON_FIELDS": {"email": "email", "last_name": "family_name", "first_
˓→name": "given_name"}, # Custom common fields mappings
        "IS_MANAGER_FIELD": "the_custom_manager_claim", # This is optional
        "ACCOUNT_CLASS": "the_custom_account_class",
        "ACCESS_TOKEN_URL": "the_custom_token_uri",
        "AUTHORIZE_URL": "the_custom_auth_uri",
        "ID_TOKEN_ISSUER": "the_custom_uri", # or "PROFILE_URL": "the_custom_
˓→user_info_uri"; if you specify the "ID_TOKEN_ISSUER" this will take
˓→precedence
        "OAUTH_PKCE_ENABLED": True,
    }
}
```

Note: If you specify the “ID_TOKEN_ISSUER” this will take precedence trying to fetch the user info metadata from the id_token.

If the id_token won’t be available, it will try to fallback to the “PROFILE_URL” uri.

In the case you will need to customize how the Adapter works and manages the Groups registration, you can inject a new class through the settings:

```python
SOCIALACCOUNT_ADAPTER="geonode.people.adapters.
˓→GenericOpenIDConnectAdapter" # This is the default value
```

1.23 GeoNode Django Contrib Apps

1.23.1 Geonode auth via LDAP

This package provides utilities for using LDAP as an authentication and authorization backend for geonode.

The django_auth_ldap package is a very capable way to add LDAP integration with django projects. It provides a lot of flexibility in mapping LDAP users to geonode users and is able to manage user authentication.

However, in order to provide full support for mapping LDAP groups with geonode’s and enforce group permissions on resources, a custom geonode authentication backend is required. This contrib package provides such a backend, based on django_auth_ldap.
## Installation

Installing this contrib package is a matter of:

1. Installing geonode
2. Installing system LDAP libraries (development packages needed)
3. Cloning this repository locally
4. Change to the `ldap` directory and install this contrib package

### # 1. install geonode (not shown here for brevity)
### # 2. install systemwide LDAP libraries

```
sudo apt install
   libldap2-dev
   libssl-dev
```

### # 3. get geonode/contribs code

```
git clone https://github.com/GeoNode/geonode-contribs.git
```

### # 4. install geonode ldap contrib package

```
cd geonode-contribs/ldap
pip install .
```

## Configuration

1. Add `geonode_ldap.backend.GeonodeLdapBackend` as an additional auth backend.

   ```
   # e.g. by updating your settings.py or local_settings.py
   AUTHENTICATION_BACKENDS += ('geonode_ldap.backend.GeonodeLdapBackend',)
   
   You may use additional auth backends, the django authentication framework tries them all according to the order listed in the settings. This means that geonode can be setup in such a way as to permit internal organization users to login with their LDAP credentials, while at the same time allowing for casual users to use their facebook login (as long as you enable facebook social auth provider).
   
   **Note:** The django's `django.contrib.auth.backends.ModelBackend` must also be used in order to provide full geonode integration with LDAP. However this is included by default on GeoNode settings

   ```
   # The GeoNode default settings are the following
   AUTHENTICATION_BACKENDS = ('oauth2_provider.backends.OAuth2Backend',
                             'django.contrib.auth.backends.ModelBackend',
                             'guardian.backends.ObjectPermissionBackend',
                             'allauth.account.auth_backends.AuthenticationBackend',
                           )
   ```

2. Set some additional configuration values. Some of these variables are prefixed with `AUTH_LDAP` (these are used directly by `django_auth_ldap`) while others are prefixed with `GEONODE_LDAP` (these are used by `geonode_ldap`). The geonode custom variables are:
- **GEONODE_LDAP_GROUP_PROFILE_FILTERSTR** - This is an LDAP search fragment with the filter that allows querying for existing groups. See example below.

- **GEONODE_LDAP_GROUP_NAME_ATTRIBUTE** - This is the name of the LDAP attribute that will be used for deriving the geonode group name. If not specified it will default to `cn`, which means that the LDAP object’s _common name_ will be used for generating the name of the geonode group.

- **GEONODE_LDAP_GROUP_PROFILE_MEMBER_ATTR** - This is the name of the LDAP attribute that will be used for deriving the geonode membership. If not specified it will default to `member`.

Example configuration:

```python
# add these import lines to the top of your geonode settings file
from django_auth_ldap import config as ldap_config
from geonode_ldap.config import GeonodeNestedGroupOfNamesType
import ldap

# enable logging
import logging
logger = logging.getLogger('django_auth_ldap')
logger.addHandler(logging.StreamHandler())
logger.setLevel(logging.DEBUG)

# add both standard ModelBackend auth and geonode.contrib.ldap auth
AUTHENTICATION_BACKENDS += ('geonode_ldap.backend.GeonodeLdapBackend',)

# django_auth_ldap configuration
AUTH_LDAP_SERVER_URI = os.getenv("LDAP_SERVER_URL")
AUTH_LDAP_BIND_DN = os.getenv("LDAP_BIND_DN")
AUTH_LDAP_BIND_PASSWORD = os.getenv("LDAP_BIND_PASSWORD")
AUTH_LDAP_USER_SEARCH = ldap_config.LDAPSearch(
    os.getenv("LDAP_USER_SEARCH_DN"),
    ldap.SCOPE_SUBTREE,
    os.getenv("LDAP_USER_SEARCH_FILTERSTR"))

# should LDAP groups be used to spawn groups in GeoNode?
AUTH_LDAP_MIRROR_GROUPS = strtobool(os.getenv("LDAP_MIRROR_GROUPS", 'True'))
AUTH_LDAP_GROUP_SEARCH = ldap_config.LDAPSearch(
    os.getenv("LDAP_GROUP_SEARCH_DN"),
    ldap.SCOPE_SUBTREE,
    os.getenv("LDAP_GROUP_SEARCH_FILTERSTR"))

AUTH_LDAP_GROUP_TYPE = GeonodeNestedGroupOfNamesType()
AUTH_LDAP_USER_ATTR_MAP = {
    "first_name": "givenName",
    "last_name": "sn",
    "email": "mailPrimaryAddress"
}

AUTH_LDAP_FIND_GROUP_PERMS = True
AUTH_LDAP_MIRROR_GROUPS_EXCEPT = [
    "test_group"
]
```

(continues on next page)
# these are not needed by django_auth_ldap - we use them to find and match
# GroupProfiles and GroupCategories
GEONODE_LDAP_GROUP_NAME_ATTRIBUTE = os.getenv("LDAP_GROUP_NAME_ATTRIBUTE", default="cn")
GEONODE_LDAP_GROUP_PROFILE_FILTERSTR = os.getenv("LDAP_GROUP_SEARCH_FILTERSTR", default='(ou=research group)')
GEONODE_LDAP_GROUP_PROFILE_MEMBER_ATTR = os.getenv("LDAP_GROUP_PROFILE_MEMBER_ATTR", default='member')

Example environment variables:

```
LDAP_SERVER_URL=ldap://<the_ldap_server>
LDAP_BIND_DN=uid=ldapinfo,cn=users,dc=ad,dc=example,dc=org
LDAP_BIND_PASSWORD=<something_secret>
LDAP_USER_SEARCH_DN=dc=ad,dc=example,dc=org
LDAP_USER_SEARCH_FILTERSTR=(&(uid=%(user)s)(objectClass=person))
LDAP_MIRROR_GROUPS=True
LDAP_GROUP_SEARCH_DN=cn=groups,dc=ad,dc=example,dc=org
LDAP_GROUP_SEARCH_FILTERSTR=(|(cn=abt1)(cn=abt2)(cn=abt3)(cn=abt4)(cn=abt5)(cn=abt6))
LDAP_GROUP_PROFILE_MEMBER_ATTR=uniqueMember
```

The configuration seen in the example above will allow LDAP users to login to geonode with their LDAP credentials.

On first login, a geonode user is created from the LDAP user and its LDAP attributes **cn** and **sn** are used to populate the geonode user's **first_name** and **last_name** profile fields.

Any groups that the user is a member of in LDAP (under the **cn=groups,dc=ad,dc=example,dc=org** search base and belonging to one of **(|(cn=abt1)(cn=abt2)(cn=abt3)(cn=abt4)(cn=abt5)(cn=abt6))** groups) will be mapped to the corresponding geonode groups, even creating these groups in geonode in case they do not exist yet. The geonode user is also made a member of these geonode groups.

Upon each login, the user’s geonode group memberships are re-evaluated according to the information extracted from LDAP. The **AUTH_LDAP_MIRROR_GROUPS_EXCEPT** setting can be used to specify groups whose memberships will not be re-evaluated.

If no LDAP groups shall be mirrored **LDAP_MIRROR_GROUPS** and **LDAP_MIRROR_GROUPS_EXCEPT** must be set to False.

**Note:** Users mapped from LDAP will be marked with an **ldap** tag. This will be used to keep them in sync.

**Warning:** If you remove the **ldap** tag, the users will be threaten as pure internal GeoNode ones.

You may also manually generate the geonode groups in advance, before users login. In this case, when a user logs in and the mapped LDAP group already exists, the user is merely added to the geonode group

Be sure to check out **django_auth_ldap** for more information on the various configuration options.
Keep Users and Groups Synchronized

In order to constantly keep the remote LDAP Users and Groups synchronized with GeoNode, you will need to run periodically some specific management commands.

```
*/10 * * * * /opt/geonode/my-geonode/manage.sh updateldapgroups >> /var/log/cron.log 2>&1
*/10 * * * * /opt/geonode/my-geonode/manage.sh updateldapusers >> /var/log/cron.log 2>&1
```

Where the `manage.sh` is a bash script similar to the following one:

```
manage.sh

export $(grep -v '^#' /opt/geonode/my-geonode/.env | xargs -d '
')
/home/<my_user>/virtualenvs/geonode/bin/python /opt/geonode/my-geonode/manage.py $@
```

and the `/opt/geonode/my-geonode/.env` is something similar to the following one:

```
DEBUG=False
DJANGO_ALLOWED_HOSTS=<geonode_public_host>,localhost,127.0.0.1
DJANGO_DATABASE_URL=postgresql://my_geonode:**********@localhost:5432/my_geonode_db
DEFAULT_BACKEND_UPLOADER=geonode.importer
DEFAULT_FROM_EMAIL=geonode@example.org
DJANGO_EMAIL_HOST=smtp.example.org
DJANGO_EMAIL_HOST_PASSWORD=**********
DJANGO_EMAIL_HOST_USER=geonode
DJANGO_EMAIL_PORT=465
DJANGO_EMAIL_USE_SSL=True
DJANGO_SETTINGS_MODULE=my_geonode.settings
DJANGO_SECRET_KEY=**********
OAUTH2_API_KEY=**********
PROXY_URL=/proxy/?url=
EXIF_ENABLED=True
EMAIL_ENABLE=True
TIME_ENABLE=True
ACCOUNT_OPEN_SIGNUP=True
ACCOUNT_APPROVAL_REQUIRED=True
ACCOUNT_EMAIL_REQUIRED=True
ACCOUNT_EMAIL_VERIFICATION=optional
AVATAR_GRAVATAR_SSL=True
GEONODE_DB_URL=postgresql://my_geonode:**********@localhost:5432/my_geonode_data
GEOSERVER_ADMIN_PASSWORD=**********
GEOSERVER_LOCATION=https://<geonode_public_host>/geoserver/
GEOSERVER_PUBLIC_HOST=<geonode_public_host>
GEOSERVER_PUBLIC_LOCATION=https://<geonode_public_host>/geoserver/
GEOSERVER_WEB_UI_LOCATION=https://<geonode_public_host>/geoserver/
LDAP_SERVER_URL=ldap:///<the_ldap_server>
LDAP_BIND_DN=uid=ldapinfo,cn=users,dc=ad,dc=example,dc=org
LDAP_BIND_PASSWORD=**********
LDAP_USER_SEARCH_DN=dc=ad,dc=example,dc=org
LDAP_USER_SEARCH_FILTERSTR=(uid=%(user)s)(objectClass=person))
LDAP_MIRROR_GROUPS=True
```

(continues on next page)
LDAP_GROUP_SEARCH_DN=cn=groups,dc=ad,dc=example,dc=org
LDAP_GROUP_SEARCH_FILTERSTR=|(cn=abt1)(cn=abt2)(cn=abt3)(cn=abt4)(cn=abt5)(cn=abt6)
LDAP_GROUP_PROFILE_MEMBER_ATTR=uniqueMember
OGC_REQUEST_MAX_RETRIES=3
OGC_REQUEST_POOL_CONNECTIONS=100
OGC_REQUEST_POOL_MAXSIZE=100
OGC_REQUEST_TIMEOUT=60
SITEURL=https://<geonode_public_host>/
SITE_HOST_NAME=<geonode_public_host>
FREETEXT_KEYWORDS_READONLY=False

# Advanced Workflow Settings
ADMIN_MODERATE_UPLOADS=False
GROUP_MANDATORY_RESOURCES=False
GROUP_PRIVATE_RESOURCES=False
RESOURCE_PUBLISHING=False

Note: You might want to use the same /opt/geonode/my-geonode/.env for your UWSGI configuration too:

[uwsgi]
socket = 0.0.0.0:8000
uid = <my_user>
gid = www-data

plugins = python3
virtualenv = /home/<my_user>/.virtualenvs/geonode

# set environment variables from .env file
eqv LANG=en_US.utf8
eqv LC_ALL=en_US.UTF-8
eqv LC_LANG=en_US.UTF-8

for readline = /opt/geonode/my-geonode/.env
   env = %(_)
endfor =

chdir = /opt/geonode/my-geonode
module = my_geonode.wsgi:application

processes = 12
threads = 2
enable-threads = true
master = true

# logging
# path to where uwsgi logs will be saved
logto = /storage/my_geonode/logs/geonode.log
daemonize = /storage/my_geonode/logs/geonode.log
touch-reload = /opt/geonode/my-geonode/my_geonode/wsgi.py
buffer-size = 32768
max-requests = 500
harakiri = 300 # respawn processes taking more than 5 minutes (300 seconds)
# limit-as = 1024 # avoid Errno 12 cannot allocate memory
harakiri-verbose = true
vacuum = true
thunder-lock = true

1.23.2 Geonode Logstash for centralized monitoring/analytics

This contrib app, along with the GeoNode internal monitoring app, lets administrators to configure a service for sending metrics data to a centralized server which comes with Logstash.

So it will be possible to visualize stats and charts about one or more GeoNode instances outside the application. Having a server configured with the ELK stack, it is possible to visualize those information on a Kibana dashboard for example.

If you manage more than one GeoNode instances, that server can receive data from many GeoNode(s) so it can make available both single-instance dashboards (referred to individual instances) and global dashboards (stats calculated on the whole set of instances).

**Warning:** The centralized monitoring service cannot be active if the settings variables `USER_ANALYTICS_ENABLED` and monitoring-enabled are set to `False`.

**Overview**

By default, GeoNode will send data to the centralized server every **3600 seconds** (1 hour) so, if enabled, the monitoring app will collect 1-hour-aggregated data. This time interval can be configured, see the next paragraphs to know how.

Formatted and compressed data will be sent on a TCP connection (on the **443** standard port by default) through a scheduled celery task which basically logs information via python-logstash-async.

**Warning:** This feature requires python-logstash-async.

**Data and events formats**

Each time the centralized monitoring service is called, 4 types of JSON formatted events are sent to the server:

1. Instance overview

```json
{
    "format_version": "1.0",
    "instance": {
        "name": geonode instance HOSTNAME,
        "ip": geonode instance IP
    },
    "time": {
        "startTime": UTC now - 1 hour (default)
    },
    "hits": total number of requests,
}
```
"unique_visits": total number of unique sessions,
"unique_visitors": total number of unique users,
"registered_users": total number of registered users at the end time,
"layers": total number of layers at the end time,
"documents": total number of documents at the end time,
"maps": total number of maps at the end time,
"errors": total number of errors
}

2. Resources details

```
{
  "format_version": "1.0",
  "instance": {
    "name": geonode instance HOSTNAME,
    "ip": geonode instance IP
  },
  "time": {
    "startTime": UTC now - 1 hour (default)
    "endTime": UTC now
  },
  "resources": [
    ...
    {
      "type": resource type,
      "name": resource name,
      "url": resource URL,
      "hits": total number of requests about this resource,
      "unique_visits": total number of unique sessions about this resource,
      "unique_visitors": total number of unique users about this resource,
      "downloads": total number of resource downloads,
      "ogcHits": total number of OGC service requests about this resource,
      "publications": total number of publication events
    },
    ...
  ]
}
```

3. Countries details

```
{
  "format_version": "1.0",
  "instance": {
    "name": geonode instance HOSTNAME,
    "ip": geonode instance IP
  },
  "time": {
    "startTime": UTC now - 1 hour (default)
    "endTime": UTC now
  },
  "countries": [
    ...
  ]
}
```
4. UA (User Agent) Family details

```
{
    "format_version": "1.0",
    "instance": {
        "name": geonode instance HOSTNAME,
        "ip": geonode instance IP
    },
    "time": {
        "startTime": UTC now - 1 day
    },
    "ua_families": [
        ...
    ]
}
```

These messages will be gzip compressed in order to improve transport performances and they should be parsed by a logstash filter on the server side (see Logstash configuration).

**Configuration**

The centralized monitoring service is disabled by default because it needs the internal monitoring to be active and service-specific configurations.

**GeoNode configuration**

On the GeoNode side, all needed configurations can be set up from the Django admin interface. If enabled, the `GEONODE LOGSTASH` section will show the Centralized servers feature:

```
 GEONODE LOGSTASH

Centralized servers

Change
```

123. GeoNode Django Contrib Apps
Let’s add one:

![Django administration interface](image)

The **Host** IP address and the **Port** number are mandatory as well as the time **Interval** (3600 seconds by default) which defines the service invocation polling (so the time range on which data should be aggregated).

**Note:** Once the service configured, the user can test the configuration by clicking on **Test connection**. It will test the connection with the centralized server without saving the configuration.

Other settings come with a default value:

- **Db path** –> the local Spatialite database to cache events between emitting and transmission to the Logstash server (log events are cached even across process restarts and crashes);
- **Socket timeout** –> timeout in seconds for TCP connections;
- **Queue check interval** –> interval in seconds to check the internal queue for new messages to be cached in the database;
- **Queue events flush interval** –> interval in seconds to send cached events from the database to Logstash;
- **Queue events flush count** — count of cached events to send from the database to Logstash;
- **Queue events batch size** — maximum number of events to be sent to Logstash in one batch;
- **Logstash db timeout** — timeout in seconds to ‘connect’ the Spatialite database.

To better understand what these variables mean, it is recommended to read the python-logstash-async options for the asynchronous processing and formatting.

Other three read-only fields will be visible:
- **Last successful deliver** — timestamp of the last successful deliver (if exists);
- **Next scheduled deliver** — timestamp of the next scheduled deliver;
- **Last failed deliver** — timestamp of the last failed deliver (if exists).

**Logstash configuration**

On the server side, a proper Logstash configuration should be set up.

Some events formats contain arrays (see *Data and events formats*) so Logstash should be able to retrieve a single event for each element of the array. The Split filter plugin helps to correctly parse those messages.

As mentioned above, events messages will be gzip compressed so the Gzip_lines codec plugin should be installed along with Logstash and the “gzip_lines” codec should be used for the tcp input.

An example of the logstash configuration:

```plaintext
input {
  tcp {
    port => <logstash_port_number>
    codec => "gzip_lines"
  }
}

filter {
  json {
    source => "message"
  }
  if [format_version] == "1.0" {
    if [countries] {
      split {
        field => "countries"
      }
    }
    if [resources] {
      split {
        field => "resources"
      }
    }
    if [ua_families] {
      split {
        field => "ua_families"
      }
    }
    mutate {
      
    }
  }
  if [countries] {
    split {
      field => "countries"
    }
  }
  if [resources] {
    split {
      field => "resources"
    }
  }
  if [ua_families] {
    split {
      field => "ua_families"
    }
  }
  mutate {
```
remove_field => "message"
}
}
geoi {  
  source => "[instance][ip]"
}
}

go {  
}

output {  
  elasticsearch {  
    hosts => "elasticsearch:<elastic_port_number>"
    index => "logstash-%{[instance][name]}-%{+YYYY.MM.dd}"
    user => "elastic"
    password => "changeme"
  }
  stdout { codec => rubydebug }
}

Usage

When saving the service configuration, if monitoring enabled, GeoNode will create/update a celery Periodic Task which will be executed at regular intervals based on the interval configured.

You can check this behavior on the Periodic Tasks section of the admin UI:

<table>
<thead>
<tr>
<th>Periodic Tasks</th>
<th>Add</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crontabs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodic tasks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar events</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The dispatch-metrics-task task:
The task details:
Warning: When disabling monitoring is a good practice to disable the corresponding Periodic Task too.

Management command

In addition to the scheduled task, this contrib app makes also available the dispatch_metrics command to manually send metrics to the server. Obviously the time interval considered will start at the last successful delivery and will finish at the current time.

When the monitoring plugin is enabled (USER_ANALYTICS_ENABLED and monitoring-enabled are set to True) and a Geonode Logstash for centralized monitoring/analytics configured, Geonode sends (hourly by default) metrics data to an external server (which comes with Logstash) for stats visualization and analysis.

The command can be launched using the manage.py script. No options are required.

$ DJANGO_SETTINGS_MODULE=<your_settings_module> python manage.py dispatch_metrics

Possible exceptions raised during the execution will be reported to GeoNode log.

1.23.3 Geonode Subsites

Enable creating subsites in GeoNode without deploying additional instances. The subsite is virtual, no additional code is required.

For example

http://localhost:8000/ # <-- geonode homepage
http://localhost:8000/subsite_1/ # <--- same geonode, but it can be used as a different...
    → geonode
http://localhost:8000/subsite_2/ # <--- same geonode, but it can be used as a different...
    → geonode
http://localhost:8000/subsite_3/ # <--- same geonode, but it can be used as a different...
    → geonode
http://localhost:8000/subsite_4/ # <--- same geonode, but it can be used as a different...
    → geonode

Installation

The subsite application should be added to the project's requirements.txt file as an add-on.

git+https://github.com/geosolutions-it/geonode-subsites@main#egg=geonode-subsites

To make changes to the Django project settings, open the settings.py file and add the following lines of code

```python
INSTALLED_APPS += ("subsites"),
ENABLE_SUBSITE_CUSTOM_THEMES=True/False
SUBSITE_READ_ONLY=True/False
ENABLE_CATALOG_HOME_REDIRECTS_TO
```

- INSTALLED_APPS (required): include the app in the Django application registry
- `ENABLE_SUBSITE_CUSTOM_THEMES` (optional): If True can be set a different GeoNode theme for each subsite
- `SUBSITE_READ_ONLY` (optional): If True the subsite will be in read-only mode
- `ENABLE_CATALOG_HOME_REDIRECTS_TO` (optional): If True the user is not allowed to see the catalog but will be redirected to the home page

The last step is to add in the `urls.py` file the registration of the subsite urls

```python
url(r'\'', include("subsites.urls")),
```

If the file is not available, you can create it in the path `src/<project_name>/urls.py`

```python
from geonode.urls import urlpatterns
from django.conf.urls import url, include

# You can register your own urlpatterns here

urlpatterns += [
    url(r'\'', include("subsites.urls")),
]
```

**NOTE:** never forget to run the migration to ensure the correct installation of the library.

```bash
python src/manage.py migrate
```

**Configuration via admin**

After completing the installation procedure, you can begin creating the subsites.

The homepage of geonode, with the subsite enabled, has a different look and feel compared to the default installation. Instead of displaying the catalog on the homepage, a list of configured subsites is displayed.

Let’s configure a new subsite.

1. Login as administrator in the django admin panel top-right
2. Scroll down until the subsite application is shown
3. After clicking on it, the subsite panel is shown
4. on the top-right click on the `add sub-site` button
5. The page below is displayed. Let’s examine its objectives in detail.

- **SITE NAME**: (required) is a unique identifier. This is going to be used as a path to navigate to the subsite. It is saved as a slug, so space is not allowed.

For example

```json
Slug: subsite_1
subsite_url: 'http://{host}/subsite_1/
```

```json
Slug: Italy
subsite_url: 'http://{host}/italy/
```
**Fig. 230:** Example of homepage with subsite configured

**Fig. 231:** Subsite topic
Fig. 232: *add subsite page*
• **THEME**: (optional) assign a theme to the subsite. The theme can be created in the GeoNode Themes. More information about themes.

• Contributor can add resource (optional): boolean filed if TRUE the add resource the user receives the add_resourcebase permissions.

• Logo (optional): Let the user upload a specific logo for the subsite. The logo is used in the homepage to show the subsite. In the example above, is (for example) the desert.

• Types (optional): Filter resources by assigned resource type. For example, if Dataset is selected, only the resources with that specific resource_type are shown.

• Region (optional): Filter resources by assigned region via Metadata editor or automatically via the geonode.resource.regions_storer.spatial_predicate_region_assignor.

• Keyword (optional): Filter resources by assigned keyword. Add keywords via Metadata editor.

• Groups (optional): Filter resources by assigned group via Metadata editor.

• Allowed Permissions (optional): Configuration of which permission the user will have while navigating in the subsite. By default view and download are given.

### Subsite filtering logic

The filter works in OR if multiple fields of the same kind are selected, and in AND between all the filters:

\[
(category==x || category==y || ...) && (keyword==x || keyword==y || ...) && (region==x|| region==y| | ...) \]

Example 1

subsite name: subsite_1
filter selected:
  - type -> Dataset

Result: the catalog is going to be pre-filtered, by including ONLY the resource with Dataset as the resource type.

NOTE: the filter is valid only for that specific subsite.

Example 2

subsite name: subsite_2
filter selected:
  - type -> Dataset, Document
  - region -> Europe

Result: The catalog is going to be pre-filtered, by including ONLY the resource with Dataset OR Document as resource type and with have EUROPE in the regions assigned

NOTE: the filter is valid only for that specific subsite.

Example 3

subsite name: subsite_3
filter selected:
  - region -> Europe
  - keyword -> country
  - Allowed permissions -> View

Result: The catalog is going to be pre-filtered, by including ONLY the resource with a...
region equal to EUROPE and with a keyword with the value COUNTRY.
Plus the users which will navigate the subsite will have ONLY the view permission, so,
they will not be able to download any dataset

NOTE: the filter is valid only for that specific subsite

NOTE:
This logic is applied to ALL the geonode APIv2 then a subsite is called.
In a few words, the catalog is going to be pre-filtered. Only the resources that match the subsite filtering are going to be shown in the API response

Advanced: Cache

To improve the performance, the subsite configuration is cached in memory.
The cache is cleaned if one of the following actions is taken:
• The subsite configuration is updated via the Django admin panel
• The expiration time of the cache is reached (300 seconds)
• The subsite is deleted so that, the cache related to that specific subsite is deleted along with the subsite

```
settings.CACHES["subsite_cache"] = {
    "BACKEND": "django.core.cache.backends.locmem.LocMemCache",
    "TIMEOUT": 300,
    "OPTIONS": {"MAX_ENTRIES": 10000},
}
```

Advanced: How to override a specific URL

Not all the GeoNode URLs are eligible to be used in the subsite. If a new url is required to work with the subsite, it must added manually to the subsite codebase.
The URLs that support the subsite are listed in the file subsites/urls.py which briefly are:
• All the API v2
• user info
• token info
• facets
• catalog listing
• homepage
To register a new URL is enough to modify the subsites/urls.py. Follow an example of a URL:

```
re_path(r"^(?P<subsite>[/\^]*)", views.subsite_home, name="subsite_home")
```

NOTE: All the URLs must have the subsite parameter, otherwise the system is not able to retrieve the subsite information.
The view will be defined as follows:
Advanced: template rendering logic

The `geonode-subsite` provides two different way to override the default templates:

- subsite specific
- subsite common

Subsite specific:
Let the developer define a specific set of templates that are going to be used only for a specific subsite. The templates are rendered only when the subsite is called.

Subsite common:
Let the developer define a common template used by **ALL** the subsites. These templates are ignored by the default geonode instance but will have an effect only in the subsites.

But how these templates are rendered?

The backend follows this logic to render the templates following this order:

1. subsite specific template
2. common subsite template
3. geonode project override
4. default geonode deplete

To let this work, is required that all the new views will use the custom `subsite_render` function and not the django default `render` function.

For example:

```python
def subsite_home(request, subsite):
    slug = extract_subsite_slug_from_request(request, return_object=False)
    if not slug:
        raise Http404
    return subsite_render(request, "index.html", slug=slug)
```
Advanced: template configuration

One of the most important features that geonode-subsite provides is the ability to customize the template for each subsite, allowing for unique designs for each one.

However, the process of making template changes can be a bit complicated and requires familiarity with Django and its template system.

To help make this process easier, we have provided an example folder that demonstrates how to organize the subsite template folder. This will enable you to create a custom template for each subsite.

How to create the correct template subsite folder

1. Navigate to the templates folder of the project
2. Create a new folder named subsites
3. inside subsite, create a new folder that is named as the subsite. The subsite-slug and the folder name must match
4. Use the normal geonode project template folder structure to override the template. The folder structure must be repeated for each subsite

Let’s make an example.

We have a subsite called “desert” and we want to override the navbar.html template for that specific subsite.

The default geonode project view is the following

```
templates/
    └── geonode-mapstore-client/
        └── _geonode_config.html
```

Let’s create the subsites folder

```
templates/
    └── geonode-mapstore-client/
        └── _geonode_config.html
        └── subsites/
```

Now is time to create the folder for our specific subsite:

```
templates/
    └── geonode-mapstore-client/
        └── _geonode_config.html
        └── subsites/
            └── desert/
```

Once the subsite folder is created, we can replicate the default template structure to override the geonode-mapstore-client templates

```
templates/
    └── geonode-mapstore-client/
        └── _geonode_config.html
        └── subsites/
            └── desert/
                └── geonode-mapstore-client/
                    └── snippets/
                        └── topbar.html
```

In this way, ONLY the subsite named desert will use the specific topbar.html
**Advanced: common template override**

It is also possible to define a common template folder where all the subsites will check for any template override.

The folder for the common template is the following:

```plaintext
templates/
  └── geonode-mapstore-client/
      │   └── _geonode_config.html
      │   └── index.html
      │   └── snippets/
      │         └── brand_navbar.html
      └── subsites/
           └── common/
                └── geonode-mapstore-client
                      └── snippets
                          └── topbar.html
```

All the subsites defined in the administration panel will use the template defined in the `common` folder.

### 1.24 GeoNode Admins Guide

GeoNode has an administration panel, based on the Django admin, which can be used to do some database operations. Although most of the operations can and should be done through the normal GeoNode interface, the admin panel provides a quick overview and management tool over the database.

The following sections will explain more in depth what functionalities the admin panel makes available to you. It should be highlighted that the sections not covered in this guide are meant to be managed through GeoNode UI.

#### 1.24.1 Accessing the panel

The *Admin Panel* is a model-centric interface where trusted users can manage content on GeoNode. Only the staff users can access the admin interface.

---

**Note:** The “staff” flag, which controls whether the user is allowed to log in to the admin interface, can be set by the admin panel itself.

The panel can be reached from *Admin* link of the *User Menu* in the navigation bar (see the picture below) or through this URL: `http://<your_geonode_host>/admin`.

When clicking on that link the Django-based *Admin Interface* page opens and shows you all the Django models registered in GeoNode.
1.24.2 Reset or Change the admin password

From the Admin Interface you can access the Change password link by clicking on the username on the right side of the navigation bar, which will open a dropdown.

It allows you to access the Change Password Form through which you can change your password.

Once the fields have been filled out, click on Change my password to perform the change.

1.24.3 Simple Theming

GeoNode provides by default some theming options manageable directly from the Administration panel. Most of the times those options allows you to easily change the GeoNode look and feel without touching a single line of HTML or CSS.

As an administrator go to http://<your_geonode_host>/admin/geonode_themes/geonodethemecustomization/.

The panel shows all the available GeoNode themes, if any, and allows you to create new ones.

**Warning:** Only one theme at a time can be activated (aka enabled). By disabling or deleting all the available themes, GeoNode will turn the gui back to the default one.

Editing or creating a new Theme, will actually allow you to customize several properties.

At least you’ll need to provide a Name for the Theme. Optionally you can specify also a Description, which will allow you to better identify the type of Theme you created.

Just below the Description field, you will find the Enabled checkbox, allowing you to toggle the Theme.
Fig. 235: *The GeoNode Admin Interface*

Fig. 236: *The Change Password Link*
1.24. GeoNode Admins Guide

Fig. 237: The Change Password Form

Fig. 238: List of available Themes

Fig. 239: Theme Name and Description
Jumbotron and Get Started link

**Note:** Remember, everytime you want to apply some changes to the Theme, you **must** save the Theme and reload the GeoNode browser tab. In order to quickly switch back to the Home page, you can just click the VIEW SITE link on the top-right corner of the Admin dashboard.

The next section, allows you to define the first important Theme properties. This part involves the GeoNode main page sections.

By changing those properties as shown above, you will easily change your default home page from this
to this

It is possible to optionally **hide** the Jumbotron text.

**Slide show**

To switch between a slide show and a jumbotron, flip the value of the welcome theme from “slide show” to “jumbotron” and vice versa to either display a jumbotron with content or a slide show in the home page.

For example, to display a slide show, change the welcome theme from jumbotron background to slide show.

Before creating a slide show, make sure you have slides to select from (in the multi-select widget) to make up the slide show.

If no slides exist, click the plus (+) button beside the slide show multi-select widget to add a new slide.
Fig. 241: *Jumbotron and Logo options*

Fig. 242: *GeoNode Default Home*
Fig. 243: *Updating Jumbotron and Logo*

Jumbotron background

- **Browse...** No file selected.
- **Check this if the jumbotron background image already contains text.**

**Welcome theme**

- **jumbotron background**
  - Choose between using jumbotron background and slide show.

Fig. 244: *Hide Jumbotron text*

**Welcome theme**

- **jumbotron background**
  - Choose between using jumbotron background and slide show.

**Welcome theme**

- **slide show**
  - Choose between using jumbotron background and slide show.

**Jumbotron slide show**

- *Hold down "Control", or "Command" on a Mac, to select more than one.*
Fill in the slide name, slide content using markdown formatting, and upload a slide image (the image that will be displayed when the slide is in view).

**Add jumbotron theme slide**

<table>
<thead>
<tr>
<th>Slide name</th>
<th>New Slide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumbotron slide background</td>
<td>Choose file</td>
</tr>
<tr>
<td>Jumbotron slide content</td>
<td>Write Markdown Here To Format Slide Content</td>
</tr>
<tr>
<td>This is a paragraph in a slide content</td>
<td></td>
</tr>
<tr>
<td>Fill in this section with markdown</td>
<td></td>
</tr>
<tr>
<td>Hide text in the jumbotron slide</td>
<td>Check this if the jumbotron background image already contains text</td>
</tr>
<tr>
<td>Is enabled</td>
<td>Disabling this slide will hide it from the slide show</td>
</tr>
</tbody>
</table>

For slide images that already contain text, hide slide content by checking the checkbox labeled “Hide text in the jumbotron slide” as shown below, then save the slide.

It is also possible to hide a slide from all slide show themes that use it by unchecking the checkbox labeled “Is enabled” as shown below.

Selecting the above slide in a slide show and enabling slide show (using the “welcome theme” configuration) will create a slide show with a slide as shown below:
Switching between different themes

In the case you have defined more Themes, switching between them is as easy as enabling one and disabling the others.

Remember to save the Themes everytime and refresh the GeoNode home page on the browser to see the changes.

It is also important that there is only one Theme enabled at a time.

In order to go back to the standard GeoNode behavior, just disable or delete all the available Themes.

1.24.4 Add a new user

In GeoNode, administrators can manage other users. For example, they can Add New Users through the following form.

The form above can be reached from the Admin Panel at the following path: Home > People > Users. Click on + Add user to open the form page.

It is also available, in the GeoNode UI, the Add User link of the About menu in the navigation bar.

To perform the user creation fill out the required fields (username and password) and click on Save. You will be redirected to the User Details Page which allows to insert further information about the user.

The user will be visible into the Users List Page of the Admin Panel and in the People Page (see Viewing other users information).
**Django administration**

**Add user**

- Username: Joe
- Password: ********
- Password confirmation: ********

**Fig. 245: Adding New Users**

**Django administration**

**Users**

<table>
<thead>
<tr>
<th>ID</th>
<th>Username</th>
<th>Organization Name</th>
<th>Email address</th>
<th>First name</th>
<th>Last name</th>
<th>Staff status</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>1142</td>
<td>@Libary</td>
<td>-</td>
<td><a href="mailto:admin@library.tech">admin@library.tech</a></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1302</td>
<td>@AllNautalPendanaPutra</td>
<td>-</td>
<td><a href="mailto:naufalpendana@students.unees.ac.id">naufalpendana@students.unees.ac.id</a></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1127</td>
<td>@ThaynneFrees</td>
<td>-</td>
<td>thaynnetqué<a href="mailto:iroz@brasil.ps">iroz@brasil.ps</a></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Fig. 246: The Add User button in the Users List page**

**About**

- People
- Groups
- Invite users
- Add user
- Create group

**Fig. 247: Add User Link**
Fig. 248: The User Details Page
1.24.5 Activate/Disable a User

When created, new users are *active* by default. You can check that in the *User Details Page* from the *Admin Panel* (see the picture below).

Active users can interact with other users and groups, can manage resources and, more in general, can take actions on the GeoNode platform.

Untick the *Active* checkbox to disable the user. It will be not considered as user by the GeoNode system.

1.24.6 Change a User password

GeoNode administrators can also change/reset the password for those users who forget it. As shown in the picture below, click on this form link from the *User Details Page* to access the *Change Password Form*.

The *Change User Password Form* should looks like the following one. Insert the new password two times and click on *CHANGE PASSWORD*. 

---

*Fig. 249: The User in the People page*
Fig. 250: *New Users Active by default*

Fig. 251: *Disabled Users*
Fig. 252: Changing Users Passwords

Fig. 253: Changing Users Passwords
1.24.7 Promoting a User to Staff member or superuser

Active users have not access to admin tools. GeoNode makes available those tools only to Staff Members who have the needed permissions. Superusers are staff members with full access to admin tools (all permissions are assigned to them).

Administrators can promote a user to Staff Member by ticking the Staff status checkbox in the User Details Page. To make some user a Superuser, the Superuser status checkbox should be ticked. See the picture below.

![Staff and Superuser permissions](image)

**Fig. 254: Staff and Superuser permissions**

1.24.8 Creating a Group

In GeoNode is possible to create new groups with set of permissions which will be inherited by all the group members.

The creation of a Group can be done both on the GeoNode UI and on the Admin Panel, we will explain how in this paragraph.

The Create Groups link of About menu in the navigation bar allows administrators to reach the Group Creation Page. The following form will open.

Fill out all the required fields and click Create to create the group. The Group Details Page will open.

The new created group will be searchable in the Groups List Page.

**Note:** The Create a New Group button on the Groups List Page allows to reach the Group Creation Form.

As already mentioned above, groups can also be created from the Django-based Admin Interface of GeoNode.
The Groups link of the AUTHENTICATION AND AUTHORIZATION section allows to manage basic Django groups which only care about permissions.

To create a GeoNode group you should take a look at the GROUPS section.

As you can see, GeoNode provides two types of groups. You will learn more about that in the next paragraph.

**Types of Groups**

In GeoNode users can be grouped through a Group Profile, an enhanced Django group which can be enriched with some further information such as a description, a logo, an email address, some keywords, etc. It also possible to define some Group Categories based on which those group profiles can be divided and filtered.

A new Group Profile can be created as follow:

- click on the Group Profile + Add button
- fill out all the required fields (see the picture below), Group Profiles can be explicitly related to group categories
- click on Save to perform the creation, the new created group profile will be visible in the Group Profiles List

**Group Categories**

Group Profiles can also be related to Group Categories which represents common topics between groups. In order to add a new Group Category follow these steps:

- click on the Group Categories + Add group category button
- fill out the creation form (type name and description)
- click on Save to perform the creation, the new created category will be visible in the Group Categories List
Create a Group

Title

Logo

Choose File No file chosen

Description

Email

Email used to contact one or all group members, such as a mailing list, shared email, or exchange group.

Keywords

A space or comma-separated list of keywords

Access

Public

Public: Any registered user can view and join a public group. Public (invite-only): Any registered user can view the group. Only invited users can join. Private: Registered users cannot see any details about the group, including membership. Only invited users can join.

Categories

test group category

Create

Fig. 256: The Group Creation Form
Cartographers

Last Modified: Nov, 29, 2021, 9:56 a.m.

This group consists of GeoNode Cartographers

This group is Public (invite-only)
Anyone may view this group but membership is by invitation only.

Managers
admin
No Group

Fig. 257: The Group Details Page
Fig. 258: The Groups List Page

Fig. 259: The Groups Section on the Admin Panel
Fig. 260: A new Group Profile
Fig. 261: *The Group Profiles List*

Fig. 262: *A new Group Category*
1.24.9 Managing a Group

Through the Groups link of About menu in the navigation bar, administrators can reach the Groups List Page.

In that page all the GeoNode Group Profiles are listed. For each group some summary information (such as the title, the description, the number of members and managers) are displayed near the Group Logo.

Administrators can manage a group from the Group Profile Details Page which is reachable by clicking on the title of the group.

As shown in the picture above, all information about the group are available on that page:

- the group Title;
- the Last Editing Date which shows a timestamp corresponding to the last editing of the group properties;
- the Keywords associated with the group;
Fig. 265: Group Profiles List Page
Cartographers

Last Modified: Nov. 29, 2021, 9:56 a.m.

This group consists of GeoNode Cartographers

cartography

cartographers@gmail.com

test group category

Edit Group Details
Manage Group Members
Delete this Group
Group Activities
Permissions
This group is Public (invite-only)
Anyone may view this group but membership is by invitation only.

Managers

admin
No Group

Members

admin
No Organization info

Fig. 266: Group Profile Details Page
• Permissions on the group (Public, Public(invite-only), Private);

• Members who join the group;

• Managers who manage the group.

There are also four links:

• The Edit Group Details link opens the Group Profile Form through which the following properties can be changed:
  – Title.
  – Logo (see next paragraphs).
  – Description.
  – Email, to contact one or all group members.
  – Keywords, a comma-separated list of keywords.
  – Access, which regulates permissions:
    * Public: any registered user can view and join a public group.
    * Public (invite-only): only invited users can join, any registered user can view the group.
    * Private: only invited users can join the group, registered users cannot see any details about the group, including membership.
  – Categories, the group categories the group belongs to.

• Manage Group Members (see next paragraphs).

• the Delete this Group, click on it to delete the Group Profile. GeoNode requires you to confirm this action.

![Confirm Group Deletion](image)

Fig. 267: Confirm Group Deletion

• the Group Activities drives you to the Group Activities Page where you can see all datasets, maps and documents associated with the group. There is also a Comments tab which shows comments on those resources.

Group Logo

Each group represents something in common between its members. So each group should have a Logo which graphically represents the idea that identify the group.

On the Group Profile Form page you can insert a logo from your disk by click on Browse.

Click on Update to apply the changes.

Take a look at your group now, you should be able to see that logo.
Activity Feed for Cartographers

No actions yet

Fig. 268: Group Activities

Update Group

Title
Cartographers

Logo
Currently: people_group/carto.jpeg □ Clear
Change:
Choose File thumb.png

Description
This group consists of Geonode Cartographers

Fig. 269: Editing the Group Logo
Managing Group members

The Manage Group Members link opens the Group Members Page which shows Group Members and Group Managers. Managers can edit group details, can delete the group, can see the group activities and can manage memberships. Other Members can only see the group activities.

In Public Groups, users can join the group without any approval. Other types of groups require the user to be invited by the group managers.

Only group managers can Add new members. In the picture below, you can see the manager can search for users by typing their names into the User Identifiers search bar. Once found, he can add them to the group by clicking the Add Group Members button. The Assign manager role flag implies that all the users found will become managers of the group.

The following picture shows you the results.

If you want to change the role of group members after adding them, you can use the “promote” button to make a member into a manager, and the “demote” button to make a manager into a regular member.
Fig. 271: *Adding a new Member to the Group*

Fig. 272: *New Members of the Group*
1.24.10 Group based advanced data workflow

By default GeoNode is configured to make every resource suddenly available to everyone, i.e. publicly accessible even from anonymous/non-logged in users.

It is actually possible to change few configuration settings in order to allow GeoNode to enable an advanced publication workflow.

With the advanced workflow enabled, your resources won’t be automatically published (i.e. made visible and accessible for all, contributors or simple users).

For now, your item is only visible by yourself, the manager of the group to which the resource is linked (this information is filled in the metadata), the members of this group, and the GeoNode Administrators.

Before being published, the resource will follow a two-stage review process, which is described below:

![Diagram: From upload to publication: the review process on GeoNode]

**How to enable the advanced workflow**

You have to tweak the GeoNode settings accordingly.

Please see the details of the following GeoNode Settings:

- RESOURCE_PUBLISHING
- ADMIN_MODERATE_UPLODS
- GROUP_PRIVATE_RESOURCES

Summarizing, when all the options above of the Advanced Workflow are enabled, upon a new upload we will have:

- The “unpublished” resources will be hidden to anonymous users only. The registered users will be still able to access the resources (if they have the rights to do that, of course).
- The “unpublished” resources will remain hidden to users if the permission (see Admin Guide section: ‘Manage Permissions’) will be explicitly removed.
• During the upload, whenever the advanced workflow is enabled, the owner’s Groups are automatically allowed to access the resource, even if the “anonymous” flag has been disabled. Those permissions can be removed later on.

• During the upload, “managers” of the owner’s Groups associated to the resource, are always allowed to edit the resource, the same as they are admin for that resource.

• “managers” of the owner’s Groups associated to the resource are allowed to “publish” also the resources, not only to “approve” them.

Change the owner rights in case of advanced workflow is on

After switching ADMIN_MODERATE_UPLOADS to True and resource is approved owner is no longer able to modify it. He will see new button on the resource detail page: Request change. After clicking this, view with short form is shown. On this view user can write short message why he want to modify the resource.

This message will be sent through messaging and email system to administrators:

After administrator unapprove the resource owner is again able to modify it.

The group Manager approval

Here, the role of the Manager of the group to which your dataset, document or map is linked is to check that the uploaded item is correct. Particularly, in the case of a dataset or a map, it consists of checking that the chosen cartographic representation and the style are fitting but also that the discretization is appropriate.

The Manager must also check that the metadata are properly completed and that the mandatory information (Title, Abstract, Edition, Keywords, Category, Group, Region) are filled.

If needed, the Manager can contact the contributor responsible of the dataset, document or map in order to report potential comments or request clarifications.

Members of the group can also take part in the reviewing process and give some potential inputs to the responsible of the dataset, document or map.

When the Manager considers that the resource is ready to be published, he should approve it. To do so, the Manager goes to the resource detail page, then opens the Edit Metadata. In the Settings tab, the manager checks the Approved box, and then updates the metadata and saves the changes:

Following this approval, the GeoNode Administrators receive a notification informing them that an item is now waiting for publication.

The publication by the GeoNode Administrator

Prior to the public release of an approved resource, the Administrator of the platform performs a final validation of the item and its metadata, notably to check that it is in line with license policies.

If needed, the GeoNode Administrator can contact the Manager who has approved the resource, as well as its responsible.

Once the resource is validated, the item is made public by the Administrator. It can now be viewed, accessed, and downloaded in accordance with the Permissions set by the responsible contributor.
**Promotion, Demotion and Removal of Group Members**

If the owner is a group Manager, they have permissions to edit, approve, and publish the resource.

When a group member is promoted to a manager role, they gain permissions to edit, approve and publish the resource.

When a group manager is demoted to a member role, they lose edit permissions of the resource and only remain with view and download permissions.

When a member is removed from the group, they cannot access the unpublished resource anymore.

**1.24.11 Manage profiles using the admin panel**

So far GeoNode implements two distinct roles, that can be assigned to resources such as datasets, maps or documents:

- party who authored the resource
- party who can be contacted for acquiring knowledge about or acquisition of the resource

These two profiles can be set in the GeoNode interface by accessing the metadata page and setting the **Point of Contact** and **Metadata Author** fields respectively.

It is possible for an administrator to add new roles if needed, by clicking on the **Add contact role** button in the **Base -> Contact Roles** section:

![](image)

Clicking on the **People** section (see figure) will open a web form with some personal information plus a section called **Users**.

![](image)

It is important that this last section is not modified here unless the administrator is very confident in that operation.
1.24.12 Manage datasets using the admin panel

Some of the datasets information can be edited directly through the admin interface although the best place is in the Dataset -> Metadata Edit in GeoNode.

Clicking on the Admin > Dataset > Datasets link will show the list of available datasets.

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Attributes</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Datasets</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Styles</td>
<td>+</td>
</tr>
</tbody>
</table>

**Warning:** It is not recommended to modify the Datasets’ Attributes or Styles directly from the Admin dashboard unless you are aware of your actions.

The Metadata information can be changed for multiple datasets at once through the Metadata batch edit action. Select the datasets you want to edit in the batch and at the bottom, enter the Metadata batch edit action then click Go.

This will open a form with the information you can edit in a batch. see picture below.

By clicking over one Dataset link, it will show a detail page allowing you to modify some of the resource info like the metadata, the keywords, the title, etc.

**Note:** It is strongly recommended to always use the GeoNode resource Edit Metadata or Advanced Metadata tools in order to edit the metadata info.

The Permissions can be changed also for multiple Datasets at once through the Set permissions action.

By clicking over one Dataset link, it will show a detail page allowing you to modify the permissions for the selected resources.
Batch Edit

Group
--------

Owner
--------

Category
--------

License
--------

Regions
--------

Date

Language
--------

Keywords

Cancel  Submit
1.24.13 Manage the maps using the admin panel

Similarly to the Datasets, it is possible to manage the available GeoNode Maps through the Admin panel also. Move to Admin > Maps to access the Maps list.

Notice that by enabling the **Featured** option here, will allow GeoNode to show the Map thumbnail and the Map detail link at the top under featured resources on the **Home Page**.

1.24.14 Manage the documents using the admin panel

Similarly to the Datasets and Maps, it is possible to manage the available GeoNode Documents through the Admin panel also. Move to Admin > Documents to access the Documents list. By clicking over one Document link, it will show a detail page allowing you to modify some of the resource info like the metadata, the keywords, the title, etc.
1.24.15 Manage the base metadata choices using the admin panel

Admin > Base contains almost all the objects you need to populate the resources metadata choices.

Fig. 274: Admin dashboard Base Panel

In other words the options available from the select-boxes of the resource Edit Metadata and Advanced Metadata forms.

**Note:** When editing the resource metadata through the Edit Metadata, some fields are marked as mandatory and by filling those information the Completeness progress will advance accordingly.

Fig. 277: Metadata Completeness

Even if not all the fields have been filled, the system won’t prevent you to update the metadata; this is why the Mandatory fields are mandatory to be fully compliant with an ISO 19115 metadata schema, but are only recommended to be compliant with GeoNode.

Also the Completeness indicates how far the metadata is to be compliant with an ISO 19115 metadata schema.
Of course, it is highly recommended to always fill as much as possible at least all the metadata fields marked as Mandatory. This will improve not only the quality of the data stored into the system, but will help the users to easily search for them on GeoNode.

All the Search & Filter panels and options of GeoNode are, in fact, based on the resources metadata fields. Too much generic descriptions and too empty metadata fields, will give highly un-precise and very wide search results to the users.

**Hierarchical keywords**

Through the Admin > Base > Hierarchical keywords panel it will be possible to manage all the keywords associated to the resources.

- The *Name* is the human readable text of the keyword, what users will see.
- The *Slug* is a unique label used by the system to identify the keyword; most of the times it is equal to the name.

Notice that through the *Position* and *Relative to* selectors, it is possible to establish a hierarchy between the available keywords. The hierarchy will be reflected in the form of a tree from the metadata panels.

By default each user with editing metadata rights on any resource, will be able to insert new keywords into the system by simply typing a free text on the keywords metadata field.

It is possible to force the user to select from a fixed list of keywords through the FREE-TEXT_KEYWORDS_READONLY setting.
Fig. 276: Advanced Metadata Form
Fig. 278: Hierarchical keywords list

Fig. 279: Hierarchical keywords edit
When set to `True` keywords won’t be writable from users anymore. Only admins can will be able to manage them through the `Admin > Base > Hierarchical keywords` panel.

**Licenses**

Through the `Admin > Base > Licenses` panel it will be possible to manage all the licenses associated to the resources.

**Warning:** It is strongly recommended to not publish resources without an appropriate license. Always make sure the data provider specifies the correct license and that all the restrictions have been honored.
Metadata Regions

Through the Admin > Base > Metadata Regions panel it will be possible to manage all the admin areas associated to the resources.

![Resource Metadata Regions](image)

Notice that those regions are used by GeoNode to filter search results also through the resource list view.

**Note:** GeoNode tries to guess the Regions intersecting the data bounding boxes when uploading a new dataset. Those should be refined by the user dataset on anyway.

Metadata Restriction Code Types and Spatial Representation Types

Through the Admin > Base > Metadata Restriction Code Types and Admin > Base > Metadata Spatial Representation Types panels, it will be possible to **update only** the metadata descriptions for restrictions and spatial representation types.

Such lists are **read-only** by default since they have been associated to the specific codes of the ISO 19115 metadata schema. Changing them would require the system to provide a custom dictionary through the metadata catalog too. Such functionality is not supported actually by GeoNode.
**Metadata Topic Categories**

Through the Admin > Base > Metadata Topic Categories panel it will be possible to manage all the resource metadata categories available into the system.

Notice that by default, GeoNode provides the standard topic categories available with the ISO 19115 metadata schema. Changing them means that the system won’t be compliant with the standard ISO 19115 metadata schema anymore. ISO 19115 metadata schema extensions are not currently supported natively by GeoNode.

It is worth notice that GeoNode allows you to associate Font Awesome Icons to each topic category through their fa-icon code. Those icons will be used by GeoNode to represent the topic category on both the Search & Filter menus and Metadata panels.

**Warning:** The list of the Metadata Topic Categories on the home page is currently fixed. To change it you will need to update or override the GeoNode index.html HTML template.

By default the Metadata Topic Categories are writable. Meaning that they can be removed or created by the Admin panel.

It is possible to make them fixed (it will be possible to update their descriptions and icons only) through the MODIFY_TOPICCATEGORY setting.

### 1.24.16 Announcements

As an Administrator you might need to broadcast announcements to the world about your portal or simply to the internal contributors.

GeoNode Announcements allow actually to do that; an admin has the possibility to create three types of messages, accordingly to their severity, decide their validity in terms of time period (start date and expiring date of the announcement), who can view them or not (everyone or just the registerd members) and whenever a user can hide the message or not and how long.

There are three types of announcements accordingly to their severity level: General, Warning and Critical. The difference is mainly the color of the announcement box.

Only administrators and staff members can create and manage announcements.

Currently there two ways to access and manage the announcements list:

1. Via the GeoNode interface, from the Profile panel
   
   **Note:** Those are accessible by both admins and staff members.

2. Via the GeoNode Admin panel
   
   **Note:** Those are accessible by admins only.

The functionalities are almost the same for both the interfaces, except that from the Admin panel it is possible to manage the dismissals too.

Dismissals are basically records of members that have read the announcement and closed the message box. An announcement can have one dismissal type among the three below:

1. **No Dismissal Allowed** it won’t be possible to close the announcement’s message box at all.
2. *Session Only Dismissal* (*) the default one, it will be possible to close the announcement’s message box for the current browser session. It will show up again at next access.

3. *Permanent Dismissal Allowed* once the announcement’s message box is closed, it won’t appear again for the current member.

**How to create and manage Announcements**

From the *Profile* panel, click on *Announcements* link

Click either on *New Announcement* to create a new one or over a title of an existing one to manage its contents.

Create a new announcement is quite straight; you have to fill the fields provided by the form.

**Warning:** In order to be visible, you will need to check the *Site wide* option in any case. You might want to hide the message to *anonymous* users by enabling the *Members only* option too.

Managing announcements form the *Admin* panel, is basically the same; the fields for the form will be exactly the same.

Accessing announcements options from the *Admin* panel, allows you to manage dismissals also. Through this interface you will be able to selectively decide members which can or cannot view a specific announcement, or force them to visualize the messages again by deleting the dismissals accordingly.
Fig. 283: Announcements from the Admin panel

Fig. 284: Announcements List from the Profile panel
Create Announcement

Title

Level
General

Content

- Site wide
- Members only

Dismissal type
Session Only Dismissal

Publish_start

Publish_end

Cancel  Save

Fig. 285: Create Announcement from the Profile panel
Fig. 286: Create Announcement from the Admin panel

Fig. 287: Create Dismissal from the Admin panel
1.24.17 Menus, Items and Placeholders

GeoNode provides some integrated functionalities allowing you to quickly and easily customize the top-bar menu (see the example below).

With minor changes of the basic.html template, potentially, it could be possible to use the same approach for a more complex customization. Let’s start with the simple one.

By default GeoNode provides custom placeholders already defined into the basic.html template, called CARDS_MENU, TOPBAR_MENU_RIGHT, TOPBAR_MENU_LEFT, TOPBAR_MENU.

From the Admin > Base panel, it is possible to access to the Menu, Menu Items and Menu Placeholder options.

The hierarchical structure of a custom Menu is the following one:

1. Menu Placeholder; first of all you need to define a placeholder both into the Admin > Base panel and the basic.html template, using the same keyword.

   By default GeoNode provides already defined menus.

2. Menu; second thing to do is to create a new menu associated to the corresponding placeholder.

   This is still possible from the Admin > Base panel

   You will need to provide:

   • A Title, representing the name of the Menu visible by the users

   Warning: By using this approach, internationalization won’t be supported. For the time being GeoNode does not support this for menus created from the Admin > Base panel.

   • A Menu Placeholder from the existing ones.

   • A Order in the case you’ll create more menus associated to the same placeholder.
<table>
<thead>
<tr>
<th>Base</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration</td>
<td>+</td>
</tr>
<tr>
<td>Contact roles</td>
<td>+</td>
</tr>
<tr>
<td>Curated thumbnails</td>
<td>+</td>
</tr>
<tr>
<td>Hierarchical keywords</td>
<td>+</td>
</tr>
<tr>
<td>Licenses</td>
<td>+</td>
</tr>
<tr>
<td>Links</td>
<td>+</td>
</tr>
<tr>
<td>Menu items</td>
<td>+</td>
</tr>
<tr>
<td>Menu placeholders</td>
<td>+</td>
</tr>
<tr>
<td>Menus</td>
<td>+</td>
</tr>
<tr>
<td>Metadata Regions</td>
<td>+</td>
</tr>
<tr>
<td>Metadata Restriction Code Types</td>
<td></td>
</tr>
<tr>
<td>Metadata Spatial Representation Types</td>
<td></td>
</tr>
<tr>
<td>Metadata Topic Categories</td>
<td>+</td>
</tr>
<tr>
<td>Thesauri</td>
<td>+</td>
</tr>
<tr>
<td>Thesaurus Keyword Labels</td>
<td>+</td>
</tr>
<tr>
<td>Thesaurus Keywords</td>
<td>+</td>
</tr>
<tr>
<td>Thesaurus Labels</td>
<td>+</td>
</tr>
<tr>
<td>Celery Results</td>
<td></td>
</tr>
<tr>
<td>Group results</td>
<td>+</td>
</tr>
<tr>
<td>Task results</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 289: *Menu, Menu Items and Menu Placeholder options on the Admin panel*
Fig. 290: The default "TOPBAR_MENU" Menu Placeholder on the Admin panel

Fig. 291: Create a new Menu from the Admin panel
3. **Menu Item**: finally you will need to create voices belonging to the *menu*. For the time being, GeoNode allows you to create only [href](#) links.

![Create a new Menu Item from the Admin panel](image)

**Warning**: The *Menu* won’t be visible until you add more than one *Menu Item*. If you have 1 item, the item will be showed (but not under the menu).

### 1.24.18 OAuth2 Access Tokens

This small section won’t cover entirely the GeoNode OAuth2 security integration, this is explained in detail in other sections of the documentation (refer to oauth2_fixtures_and_migration and oauth2_tokens_and_sessions).

Here we will focus mainly on the *Admin > DJANGO/GEONODE OAUTH TOOLKIT* panel items with a specific attention to the *Access tokens* management.

The *Admin > DJANGO/GEONODE OAUTH TOOLKIT* panel (as shown in the figure below) allows an admin to manage everything related to GeoNode OAuth2 grants and permissions.

As better explained in other sections of the documentation, this is needed to correctly handle the communication between GeoNode and GeoServer.

Specifically from this panel an admin can create, delete or extend OAuth2 *Access tokens*.

The section oauth2_tokens_and_sessions better explains the concepts behind OAuth2 sessions; we want just to refresh the mind here about the basic concepts:

- If the `SESSION_EXPIRED_CONTROL_ENABLED` setting is set to `True` (by default it is set to `True`) a registered user cannot login to neither GeoNode nor GeoServer without a valid *Access token*.
- When logging-in into GeoNode through the sign-up form, GeoNode checks if a valid *Access token* exists and it creates a new one if not, or extends the existing one if expired.
- New *Access tokens* expire automatically after `ACCESS_TOKEN_EXPIRE_SECONDS` setting (by default 86400)
- When an **Access token** expires, the user will be kicked out from the session and forced to login again

**Create a new token or extend an existing one**

It is possible from the *Admin > DJANGO/GEONODE OAUTH TOOLKIT* panel to create a new **Access token** for a user.

In order to do that, just click on the *Add* button beside **Access tokens** topic

On the new form, select the followings:

1. **User**; use the search tool in order to select the correct user. The form want the user PK, which is a number, and **not** the username. The search tool will do everything for you.

2. **Source refresh token**; this is not mandatory, leave it blank.

3. **Token**; write here any alphanumeric string. This will be the **access_token** that the member can use to access the OWS services. We suggest to use a service like [https://passwordsgenerator.net/](https://passwordsgenerator.net/) in order to generate a strong token string.

4. **Application**; select **GeoServer**, this is mandatory

5. **Expires**; select an expiration date by using the *date-time* widgets.

6. **Scope**; select **write**, this is mandatory.

Do not forget to *Save*.

From now on, GeoNode will use this **Access Token** to control the user session (notice that the user need to login again if closing the browser session), and the user will be able to access the OWS Services by using the new **Access Token**, e.g.:
Fig. 294: *Add a new "Access token"

Fig. 295: *Create an "Access token"*
Fig. 296: Select a User

Fig. 297: Select a Token
**Add access token**

![Image of Add access token form](image)

**Fig. 298: Select the GeoServer Application**

![Image of Select the GeoServer Application](image)

**Fig. 299: Select the Token Expiration**

![Image of Select the Application Scope](image)

**Fig. 300: Select the Application Scope**
**Force a User Session to expire**

Everything said about the creation of a new Access Token, applies to the deletion of the latter.

From the same interface an admin can either select an expiration date or delete all the Access Tokens associated to a user, in order to force its session to expire.

Remember that the user could activate another session by logging-in again on GeoNode with its credentials.

In order to be sure the user won’t force GeoNode to refresh the token, reset first its password or de-activate it.

### 1.25 GeoNode Management Commands

Management commands are utility functions for GeoNode maintenance tasks. They are usually run from an SSH/bash shell on the server running GeoNode. Any call to python is prepended with a configuration parameter to indicate the GeoNode settings module to be used.

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py migrate_baseurl --help
```

**Note:** If you have enabled local_settings.py the command will change as follows:

```
DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py migrate_baseurl --help
```

#### 1.25.1 Migrate GeoNode Base URL

The migrate_baseurl Management Command allows you to fix all the GeoNode Links whenever, for some reason, you need to change the Domain Name of IP Address of GeoNode.

This must be used also in the cases you’ll need to change the network schema from HTTP to HTTPS, as an instance.

First of all let’s take a look at the --help option of the migrate_baseurl management command in order to inspect all the command options and features.

Run

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py migrate_baseurl --help
```

This will produce output that looks like the following

```
```

(continues on next page)
Migrate GeoNode VM Base URL

optional arguments:
-h, --help show this help message and exit
--version show program's version number and exit
-v {0,1,2,3}, --verbosity {0,1,2,3} Verbose output level; 0=minimal output, 1=normal output, 2=verbose output, 3=very verbose output
--settings SETTINGS The Python path to a settings module, e.g. "myproject.settings.main". If this isn't provided, the DJANGO_SETTINGS_MODULE environment variable will be used.
--pythonpath PYTHONPATH A directory to add to the Python path, e.g. "/home/djangoprojects/myproject".
--traceback Raise on CommandError exceptions
--no-color Don't colorize the command output.
-f, --force Forces the execution without asking for confirmation.
--source-address SOURCE_ADDRESS Source Address (the one currently on DB e.g. http://192.168.1.23)
--target-address TARGET_ADDRESS Target Address (the one to be changed e.g. http://my-public.geonode.org)

- Example 1: I want to move my GeoNode instance from http:\127.0.0.1 to http:\example.org

Warning: Make always sure you are using the correct settings

DJANGO_SETTINGS_MODULE=geonode.settings python manage.py migrate_baseurl --source-address=127.0.0.1 --target-address=example.org

- Example 2: I want to move my GeoNode instance from http:\example.org to https:\example.org

Warning: Make always sure you are using the correct settings

DJANGO_SETTINGS_MODULE=geonode.settings python manage.py migrate_baseurl --source-address=http:\example.org --target-address=https:\example.org

- Example 3: I want to move my GeoNode instance from https:\example.org to https:\geonode.example.org

Warning: Make always sure you are using the correct settings

DJANGO_SETTINGS_MODULE=geonode.settings python manage.py migrate_baseurl --source-address=example.org --target-address=geonode.example.org
1.25.2 Update Permissions, Metadata, Legends and Download Links

The following three utility Management Commands, allow to fix up:

1. Users/Groups Permissions on Datasets; those will be refreshed and synchronized with the GIS Server ones also
2. Metadata, Legend and Download links on Datasets and Maps
3. Cleanup Duplicated Links and Outdated Thumbnails

Management Command sync_geonode_datasets

This command allows to sync already existing permissions on Datasets. In order to change/set Datasets’ permissions refer to the section Batch Sync Permissions

The options are:

- **filter**: Only update data the Dataset names that match the given filter.
- **username**: Only update data owned by the specified username.
- **updatepermissions**: Update the Dataset permissions; synchronize it back to the GeoSpatial Server. This option is also available from the Layer Details page.
- **updateattributes**: Update the Dataset attributes; synchronize it back to the GeoSpatial Server. This option is also available from the Layer Details page.
- **updatethumbnails**: Update the Dataset thumbnail. This option is also available from the Layer Details page.
- **updatebbox**: Update the Dataset BBOX and LotLan BBOX. This option is also available from the Layer Details page.
- **remove-duplicates**: Removes duplicated Links.

First of all let’s take a look at the –help option of the sync_geonode_datasets management command in order to inspect all the command options and features.

Run

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py sync_geonode_datasets --help
```

**Note**: If you enabled local_settings.py the command will change as following:

```
DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py sync_geonode_datasets --help
```

This will produce output that looks like the following

```
usage: manage.py sync_geonode_datasets [-h] [--version] [-v {0,1,2,3}] 
  [--settings SETTINGS] 
  [--pythonpath PYTHONPATH] [--traceback] 
  [--no-color] [-i] [-d] [-f FILTER]
```

(continues on next page)
Update the GeoNode Datasets: permissions (including GeoFence database), statistics, thumbnails

optional arguments:
  -h, --help            show this help message and exit
  --version            show program's version number and exit
  -v {0,1,2,3}, --verbosity {0,1,2,3}
                        Verbosity level; 0=minimal output, 1=normal output,
                        2=verbose output, 3=very verbose output
  --settings SETTINGS   The Python path to a settings module, e.g.
                        "myproject.settings.main". If this isn't provided, the
                        DJANGO_SETTINGS_MODULE environment variable will be
                        used.
  --pythonpath PYTHONPATH
                        A directory to add to the Python path, e.g.
                        "/home/djangoprojects/myproject".
  --traceback
                        Raise on CommandError exceptions
  --no-color            Don't colorize the command output.
  -i, --ignore-errors   Stop after any errors are encountered.
  -d, --remove-duplicates
                        Remove duplicates first.
  -f FILTER, --filter FILTER
                        Only update data the Datasets that match the given
                        filter.
  -u USERNAME, --username USERNAME
                        Only update data owned by the specified username.
  --updatepermissions   Update the Dataset permissions.
  --updatethumbnails    Update the Dataset styles and thumbnails.
  --updateattributes    Update the Dataset attributes.
  --updatebbox          Update the Dataset BBOX.

- Example 1: I want to update/sync all Datasets permissions and attributes with the GeoSpatial Server

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py sync_geonode_datasets --updatepermissions --updateattributes
```

- Example 2: I want to regenerate the Thumbnails of all the Datasets belonging to afabiani

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py sync_geonode_datasets -u afabiani --updatethumbnails
```
Management Command sync_geonode_maps

This command is basically similar to the previous one, but affects the Maps; with some limitations.

The options are:

- **filter**: Only update data the maps titles that match the given filter.
- **username**: Only update data owned by the specified username.
- **updatethumbnails**: Update the map styles and thumbnails. This option is also available from the Map Details page.
- **remove-duplicates**: Removes duplicated Links.

First of all let's take a look at the --help option of the sync_geonode_maps management command in order to inspect all the command options and features.

Run

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py sync_geonode_maps --help
```

Note: If you enabled local_settings.py the command will change as following:

```
DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py sync_geonode_maps --help
```

This will produce output that looks like the following

```
usage: manage.py sync_geonode_maps [-h] [--version] [-v {0,1,2,3}] 
    [--settings SETTINGS] 
    [--pythonpath PYTHONPATH] [--traceback] 
    [--no-color] [-i] [-d] [-f FILTER] 
    [-u USERNAME] [--updatethumbnails]

Update the GeoNode maps: permissions, thumbnails

optional arguments:
-h, --help            show this help message and exit
--version             show program's version number and exit
-v {0,1,2,3}, --verbosity {0,1,2,3}
    Verbosity level; 0=minimal output, 1=normal output, 
    2=verbose output, 3=very verbose output
--settings SETTINGS   The Python path to a settings module, e.g.
    "myproject.settings.main". If this isn't provided, the
    DJANGO_SETTINGS_MODULE environment variable will be 
    used.
--pythonpath PYTHONPATH
    A directory to add to the Python path, e.g.
    
    "/home/djangoprojects/myproject".
--traceback           Raise on CommandError exceptions
--no-color            Don't colorize the command output.
-i, --ignore-errors   Stop after any errors are encountered.
-d, --remove-duplicates
    Remove duplicates first.
-f FILTER, --filter FILTER
```

(continues on next page)
Only update data the maps that match the given filter.
- `USERNAME`, `--username` `USERNAME`
  Only update data owned by the specified username.
- `--updatethumbnails`
  Update the map styles and thumbnails.

- **Example 1:** I want to regenerate the Thumbnail of the Map *This is a test Map*

  ```bash
  Warning: Make always sure you are using the correct settings
  DJANGO_SETTINGS_MODULE=geonode.settings python manage.py sync_geonode_maps
  → --updatethumbnails -f 'This is a test Map'
  ```

**Management Command set_all_datasets_metadata**

This command allows to reset **Metadata Attributes** and **Catalogue Schema** on Datasets. The command will also update the CSW **Catalogue XML** and Links of GeoNode.

The options are:

- **filter:** Only update data the Datasets that match the given filter.
- **username:** Only update data owned by the specified username.
- **remove-duplicates:** Update the map styles and thumbnails.
- **delete-orphaned-thumbs:** Removes duplicated Links.
- **set-uuid:** will refresh the UUID based on the UUID_HANDLER if configured (Default False).
- **set_attrib:** If set will refresh the attributes of the resource taken from Geoserver. (Default True).
- **set_links:** If set will refresh the links of the resource. (Default True).

First of all let’s take a look at the `--help` option of the *set_all_datasets_metadata* management command in order to inspect all the command options and features.

Run

```bash
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py set_all_datasets_metadata --help
```

**Note:** If you enabled `local_settings.py` the command will change as following:

```bash
DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py set_all_datasets_metadata --help
```

This will produce output that looks like the following
usage: manage.py set_all_datasets_metadata [-h] [--version] [-v {0,1,2,3}]  
    [--settings SETTINGS]  
    [--pythonpath PYTHONPATH]  

Resets Metadata Attributes and Schema to All Datasets

optional arguments:
-h, --help show this help message and exit
--version show program's version number and exit
-v {0,1,2,3}, --verbosity {0,1,2,3}  
    Verbosity level; 0=minimal output, 1=normal output, 2=verbose output, 3=very verbose output
--settings SETTINGS The Python path to a settings module, e.g.
    "myproject.settings.main". If this isn't provided, the
    DJANGO_SETTINGS_MODULE environment variable will be
    used.
--pythonpath PYTHONPATH A directory to add to the Python path, e.g.
    "/home/djangoprojects/myproject".
--traceback Raise on CommandError exceptions
--no-color Don't colorize the command output.
-i, --ignore-errors Stop after any errors are encountered.
-d, --remove-duplicates Remove duplicates first.
-t, --delete-orphaned-thumbs Delete Orphaned Thumbnails.
-f FILTER, --filter FILTER Only update data the Datasets that match the given
    filter
-u USERNAME, --username USERNAME Only update data owned by the specified username

• Example 1: After having changed the Base URL, I want to regenerate all the Catalogue Schema and eventually remove all duplicates.

  Warning: Make always sure you are using the correct settings

  DJANGO_SETTINGS_MODULE=geonode.settings python manage.py set_all_datasets_metadata -d
1.25.3 Loading Data into GeoNode

There are situations where it is not possible or not convenient to use the *Upload Form* to add new Datasets to GeoNode via the web interface. For instance:

- The dataset is too big to be uploaded through a web interface.
- Import data from a mass storage programmatically.
- Import tables from a database.

This section will walk you through the various options available to load data into your GeoNode from GeoServer, from the command-line or programmatically.

**Warning:** Some parts of this section have been taken from the GeoServer project and training documentation.

**Management Command importlayers**

The `geonode.geoserver` Django app includes 2 management commands that you can use to load data in your GeoNode.

Both of them can be invoked by using the `manage.py` script.

First of all let’s take a look at the `--help` option of the `importlayers` management command in order to inspect all the command options and features.

Run

```bash
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py importlayers --help
```

**Note:** If you enabled `local_settings.py` the command will change as following:

```bash
DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py importlayers --help
```

This will produce output that looks like the following:

```
usage: manage.py importlayers [-h] [-hh HOST] [-u USERNAME] [-p PASSWORD]
                               [-v {0,1,2,3}] [---settings SETTINGS]
                               [---pythonpath PYTHONPATH] [---traceback] [---no-color]
                               [---force-color] [---skip-checks]
                               [path [path ...]]

Brings files from a local directory, including subfolders, into a GeoNode site.
The datasets are added to the Django database, the GeoServer configuration, and the
pycsw metadata index. At this moment only files of type Esri Shapefile (.shp) and
GeoTiff (.tif) are supported.
In order to perform the import, GeoNode must be up and running.

positional arguments:
path     path [path...]

optional arguments:
-h, --help  show this help message and exit
```

(continues on next page)
While the description of most of the options should be self explanatory, its worth reviewing some of the key options a bit more in details.

- The `-hh` Identifies the GeoNode server where we want to upload our Datasets. The default value is `http://localhost:8000`.

- The `-u` Identifies the username for the login. The default value is `admin`.

- The `-p` Identifies the password for the login. The default value is `admin`.

The import Datasets management command is invoked by specifying options as described above and specifying the path to a directory that contains multiple files. For purposes of this exercise, let's use the default set of testing Datasets that ship with geonode. You can replace this path with a directory to your own shapefiles.

This command will produce the following output to your terminal

```bash
san_andres_y_providencia_poi.shp: 201
san_andres_y_providencia_location.shp: 201
san_andres_y_providencia_administrative.shp: 201
san_andres_y_providencia_coastline.shp: 201
san_andres_y_providencia_highway.shp: 201
single_point.shp: 201
san_andres_y_providencia_water.shp: 201
san_andres_y_providencia_natural.shp: 201

1.7456605294117646 seconds per Dataset
```

Output data:

```json
{  
  "success": [  
    "san_andres_y_providencia_poi.shp",  
    "san_andres_y_providencia_location.shp",  
    "san_andres_y_providencia_administrative.shp",  
    "san_andres_y_providencia_coastline.shp",  
    "san_andres_y_providencia_highway.shp",  
    "single_point.shp",  
    "san_andres_y_providencia_water.shp",  
    "san_andres_y_providencia_natural.shp"
  ]
}```
As output the command will print:

The status code, is the response coming from GeoNode. For example 201 means that the Dataset has been correctly uploaded

If you encounter errors while running this command, please check the GeoNode logs for more information.

Management Command `updatelayers`

While it is possible to import Datasets directly from your server's filesystem into your GeoNode, you may have an existing GeoServer that already has data in it, or you may want to configure data from a GeoServer which is not directly supported by uploading data.

GeoServer supports a wide range of data formats and connections to database, some of them may not be supported as GeoNode upload formats. You can add them to your GeoNode by following the procedure described below.

GeoServer supports 4 types of data: **Raster**, **Vector**, **Databases** and **Cascaded**.

For a list of the supported formats for each type of data, consult the following pages:

- [https://docs.geoserver.org/latest/en/user/data/raster/index.html](https://docs.geoserver.org/latest/en/user/data/raster/index.html)
- [https://docs.geoserver.org/latest/en/user/data/cascaded/index.html](https://docs.geoserver.org/latest/en/user/data/cascaded/index.html)

**Note:** Some of these raster or vector formats or database types require that you install specific plugins in your GeoServer in order to use the. Please consult the GeoServer documentation for more information.

Data from a PostGIS database

Let's walk through an example of configuring a new PostGIS database in GeoServer and then configuring those Datasets in your GeoNode.

First visit the GeoServer administration interface on your server. This is usually on port 8080 and is available at [http://localhost:8080/geoserver/web/](http://localhost:8080/geoserver/web/)

1. You should login with the superuser credentials you setup when you first configured your GeoNode instance.

   Once you are logged in to the GeoServer Admin interface, you should see the following.

   **Note:** The number of stores, Datasets and workspaces may be different depending on what you already have configured in your GeoServer.

2. Next you want to select the “Stores” option in the left hand menu, and then the “Add new Store” option. The following screen will be displayed.
1.25. GeoNode Management Commands
3. In this case, we want to select the PostGIS store type to create a connection to our existing database. On the next screen you will need to enter the parameters to connect to your PostGIS database (alter as necessary for your own database).

Note: If you are unsure about any of the settings, leave them as the default.

4. The next screen lets you configure the Datasets in your database. This will of course be different depending on the Datasets in your database.

5. Select the “Publish” button for one of the Datasets and the next screen will be displayed where you can enter metadata for this Dataset. Since we will be managing this metadata in GeoNode, we can leave these alone for now.
### GeoNode Management Commands

#### New Layer

Add a new layer

**Choose One**

- GeoNode: GeoServer
- GeoNode: PDD Annual Average 1972-2014
- GeoNode: 20160430_NDVI
- GeoNode: 20160430_carnivorous
- GeoNode: https://maps.earthdata.nasa.gov/users/glospatialdata
- GeoNode: https://maps.earthdata.nasa.gov/users/glospatialdata
- GeoNode: https://maps.earthdata.nasa.gov/users/glospatialdata
- GeoNode: https://maps.earthdata.nasa.gov/users/glospatialdata
- GeoNode: orthophoto

---

<table>
<thead>
<tr>
<th>Published</th>
<th>Layer name</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>toppings</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>trial_Trial_DMacros</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>trial_Trial_DMacros</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>uu_sow</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>veger</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>veger3</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>viole_pee</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>waterways</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>waterways2</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>_1_SARVENTO_ENERO_0158</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>cambodia_infika5</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>kappo</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>mmmapm2</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>study01_medix_Sepal_Buffer</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>study_sep_gunou_7Kly</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>study_sep_logitude_lettuce</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>study_sep_logitude_luton</td>
<td>Publish</td>
</tr>
<tr>
<td></td>
<td>study_sep_logitude_luton2</td>
<td>Publish</td>
</tr>
</tbody>
</table>

---

**1.25. GeoNode Management Commands**
6. The things that must be specified are the Declared SRS and you must select the “Compute from Data” and “Compute from native bounds” links after the SRS is specified.

7. Click save and this Dataset will now be configured for use in your GeoServer.

8. The next step is to configure these Datasets in GeoNode. The `updatelayers` management command can be used for this purpose. As with `importlayers`, it’s useful to look at the command line options for this command by passing the `--help` option.

Run

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py updatelayers --help
```

**Note:** If you enabled `local_settings.py` the command will change as following:

```
DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py updatelayers --help
```
Keywords
Current Keywords
- _1_SARMIENTO_ENERO_2018

New Keyword

Vocabulary

Add Keyword

Metadata links
No metadata links so far

Add link

Note only FGDC and TC211 metadata links show up in WMS 1.1.1 capabilities

Data links
No data links so far

Add link

Coordinate Reference Systems
Native SRS
EPSG:4326

Declared SRS
EPSG:4326

Find... EPSG:WGS 84...

SRS handling
Force declared

Bounding Boxes
Native Bounding Box
Min X Min Y Max X Max Y
-69.078485273 -45.00003889 -69.057923671999 -45.579902872

Compute from data
Compute from SRS bounds

lon/lat Bounding Box
Min X Min Y Max X Max Y
-69.078485273 -45.00003889 -69.057923671999 -45.579902872

Compute from native bounds

Curved geometries control
This will produce output that looks like the following

```
usage: manage.py updatelayers [-h] [--version] [-v {0,1,2,3}]
                             [--settings SETTINGS] [--pythonpath PYTHONPATH]
                             [--traceback] [--no-color] [-i]
                             [--skip-unadvertised]
                             [--skip-geonode-registered] [--remove-deleted]
                             [-u USER] [-f FILTER] [-s STORE] [-w WORKSPACE]
                             [-p PERMISSIONS]

Update the GeoNode application with data from GeoServer

optional arguments:
    -h, --help            show this help message and exit
    --version             show program's version number and exit
    -v {0,1,2,3}, --verbosity {0,1,2,3}
                          Verbosity level; 0=minimal output, 1=normal output,
                          2=verbose output, 3=very verbose output
    --settings SETTINGS   The Python path to a settings module, e.g.
                          "myproject.settings.main". If this isn't provided,
                          the DJANGO_SETTINGS_MODULE environment variable will be
                          used.
    --pythonpath PYTHONPATH
                          A directory to add to the Python path, e.g.
                          "/home/djangoprojects/myproject".
    --traceback           Raise on CommandError exceptions
    --no-color             Don't colorize the command output.
    -i, --ignore-errors   Stop after any errors are encountered.
    --skip-unadvertised   Skip processing unadvertised Datasets from GeoSever.
    --skip-geonode-registered
                          Just processing GeoServer Datasets still not in GeoNode.
    -u USER, --user USER  Name of the user account which should own the
                          imported Datasets
    -f FILTER, --filter FILTER
                          Only update data the Datasets that match the given filter
    -s STORE, --store STORE
                          Only update data the Datasets for the given geoserver
    -w WORKSPACE, --workspace WORKSPACE
                          Only update data on specified workspace
    -p PERMISSIONS, --permissions PERMISSIONS
                          Permissions to apply to each Dataset
```

The update procedure includes the following steps:

1. GeoNode Management Commands
The process fetches from GeoServer the relevant WMS layers (all, by store or by workspace)

If a filter is defined, the GeoServer layers are filtered

For each of the layers, a GeoNode dataset is created based on the metadata registered on GeoServer (title, abstract, bounds)

New layers are added, existing layers are replaced, unless the --skip-geonode-registered option is used

The GeoNode layers, added in previous runs of the update process, which are no longer available in GeoServer are removed, if the --remove-delete option is set

**Warning:** One of the --workspace or --store must be always specified if you want to ingest Datasets belonging to a specific Workspace. As an instance, in order to ingest the Datasets present into the geonode workspace, you will need to specify the option --w geonode.

9. Let's ingest the Dataset geonode:_1_SARMIENTO_ENERO_2018 from the geonode workspace.

```bash
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py updatelayers -w geonode -f _1_SARMIENTO_ENERO_2018
```

Inspecting the available Datasets in GeoServer ...

Found 1 Datasets, starting processing

```
Finding metadata ...  [FutureWarning]: the .identification and .serviceidentification properties will merge into .identification being a list of properties. This is currently implemented in .identificationinfo. Please see https://github.com/geopython/OWSLib/issues/38 for more information
```

```
Finding keywords and keywords2 ...  [FutureWarning]: The .keywords and .keywords2 properties will merge into the .keywords property in the future, with .keywords becoming a list of MD_Keywords instances. This is currently implemented in .keywords2. Please see https://github.com/geopython/OWSLib/issues/301 for more information
```

Content-Type: text/html; charset="utf-8"
MIME-Version: 1.0
Content-Transfer-Encoding: 7bit
Subject: [master.demo.geonode.org] A new Dataset has been uploaded
From: webmaster@localhost
To: mapadeldelito@chubut.gov.ar
Reply-To: webmaster@localhost
Date: Tue, 08 Oct 2019 12:26:17 -0000
Message-ID: <20191008122617.28801.94967@d3cf85425231>

```
<body>
You have received the following notice from master.demo.geonode.org:
<p>
The user <a href="http://master.demo.geonode.org/people/profile/admin">admin</a> uploaded the following Dataset:<br/>
<strong>_1_SARMIENTO_ENERO_2018</strong><br/>
You can visit the Dataset's detail page here: http://master.demo.geonode.

(continues on next page)
To change how you receive notifications, please go to http://master.demo.geonode.org.

You can visit the Dataset's detail page here: http://master.demo.geonode.org/Datasets/geonode:_1_SARMIENTO_ENERO_2018

To change how you receive notifications, please go to http://master.demo.geonode.org.
You have received the following notice from master.demo.geonode.org:

The user <i><a href="http://master.demo.geonode.org/people/profile/admin">admin</a></i> uploaded the following Dataset:<br/>
<br/>You can visit the Dataset's detail page here: http://master.demo.geonode.org/Datasets/geonode:_1_SARMIENTO_ENERO_2018

To change how you receive notifications, please go to http://master.demo.geonode.org

Found geoserver resource for this Dataset: _1_SARMIENTO_ENERO_2018
... Creating Default Resource Links for Layer [geonode:_1_SARMIENTO_ENERO_2018]
-- Resource Links[Prune old links]...
-- Resource Links[Prune old links]...done!
-- Resource Links[Compute parameters for the new links]...
-- Resource Links[Create Raw Data download link]...
-- Resource Links[Create Raw Data download link]...done!
-- Resource Links[Set download links for WMS, WCS or WFS and KML]...
-- Resource Links[Set download links for WMS, WCS or WFS and KML]...done!
-- Resource Links[Legend link]...
-- Resource Links[Legend link]...done!
-- Resource Links[Thumbnail link]...
-- Resource Links[Thumbnail link]...done!
-- Resource Links[OWS Links]...
-- Resource Links[OWS Links]...done!

Content-Type: text/html; charset="utf-8"
MIME-Version: 1.0
Content-Transfer-Encoding: 7bit
Subject: [master.demo.geonode.org] A Dataset has been updated
From: webmaster@localhost
To: mapadeldelito@chubut.gov.ar
Reply-To: webmaster@localhost
Date: Tue, 08 Oct 2019 12:26:20 -0000
Message-ID: <20191008122620.28801.81598@d3cf85425231>

You have received the following notice from master.demo.geonode.org:

The following Dataset was updated:<br/>
<br/>_1_SARMIENTO_ENERO_2018, owned by <i><a href="http://master.demo.geonode.org/people/profile/admin">admin</a></i>
You can visit the Dataset's detail page here: http://master.demo.geonode.org/Datasets/geonode:_1_SARMIENTO_ENERO_2018

To change how you receive notifications, please go to http://master.demo.geonode.org

You have received the following notice from master.demo.geonode.org:

The following Dataset was updated:

You can visit the Dataset's detail page here: http://master.demo.geonode.org/Datasets/geonode:_1_SARMIENTO_ENERO_2018

To change how you receive notifications, please go to http://master.demo.geonode.org
You have received the following notice from master.demo.geonode.org:

The following Dataset was updated:

**_1_SARMIENTO_ENERO_2018**, owned by <i><a href="http://master.demo.geonode.org/people/profile/admin">admin</a></i>

You can visit the Dataset's detail page here: http://master.demo.geonode.org/Datasets/geonode:_1_SARMIENTO_ENERO_2018

To change how you receive notifications, please go to http://master.demo.geonode.org

---

Found geoserver resource **for** this Dataset: _1_SARMIENTO_ENERO_2018

```
|_1_SARMIENTO_ENERO_2018|usr/local/lib/python2.7/site-packages/geoserver/style.py:80:␣
|FutureWarning: The behavior of this method will change in future._
|versions. Use specific 'len(elem)' or 'elem is not None' test instead.
|if not user_style:
|/usr/local/lib/python2.7/site-packages/geoserver/style.py:84:␣
|FutureWarning: The behavior of this method will change in future._
|versions. Use specific 'len(elem)' or 'elem is not None' test instead.
|if user_style:
|... Creating Default Resource Links **for** Layer [geonode:_1_SARMIENTO_ENERO_2018]
|-- Resource Links[Prune old links]...
|-- Resource Links[Prune old links]...done!
|-- Resource Links[Compute parameters **for** the new links]...
|-- Resource Links[Create Raw Data download link]...
|-- Resource Links[Create Raw Data download link]...done!
|-- Resource Links[Set download links **for** WMS, WCS or WFS and KML]...
|-- Resource Links[Set download links **for** WMS, WCS or WFS and KML]...done!
|-- Resource Links[Legend link]...
|-- Resource Links[Legend link]...done!
|-- Resource Links[Thumbnail link]...
|-- Resource Links[Thumbnail link]...done!
|-- Resource Links[OWS Links]...
|-- Resource Links[OWS Links]...done!
[created] Layer _1_SARMIENTO_ENERO_2018 (1/1)
```

Finished processing 1 Datasets in 5.0 seconds.

1 Created Datasets
0 Updated Datasets

(continues on next page)
Note: In case you don't specify the -f option, the Datasets that already exists in your GeoNode will be just updated and the configuration synchronized between GeoServer and GeoNode.

Warning: When updating from GeoServer, the configuration on GeoNode will be changed!

Using GDAL and OGR to convert your Data for use in GeoNode

GeoNode supports uploading data in ESRI shapefiles, GeoTIFF, CSV, GeoJSON, ASCII-GRID and KML/KMZ formats (for the last three formats only if you are using the geonode.importer backend).

- If your data is in other formats, you will need to convert it into one of these formats for use in GeoNode.
- If your Raster data is not correctly processed, it might be almost unusable with GeoServer and GeoNode. You will need to process it using GDAL.

You need to make sure that you have the GDAL library installed on your system. On Ubuntu you can install this package with the following command:

```
sudo apt-get install gdal-bin
```

OGR (Vector Data)

OGR is used to manipulate vector data. In this example, we will use MapInfo .tab files and convert them to shapefiles with the ogr2ogr command. We will use sample MapInfo files from the website linked below.

http://services.land.vic.gov.au/landchannel/content/help?name=sampledata

You can download the Admin;(Postcode) Dataset by issuing the following command:

```
```

You will need to unzip this dataset by issuing the following command:

```
$ unzip admin_postcode_vm.zip
```

This will leave you with the following files in the directory where you executed the above commands:

```
|-- ANZV10803003025.htm
|-- DSE_Data_Access_Licence.pdf
|-- VMADMIN_POSTCODE_POLYGON.xml
|-- admin_postcode_vm.zip
   |-- vicgrid94
      |-- mif
         |-- lga_polygon
         |-- macedon\ ranges
            |-- EXTRACT_POLYGON.mif
            |-- EXTRACT_POLYGON.mid
```

(continues on next page)
First, let's inspect this file set using the following command:

```
$ ogrinfo -so vicgrid94/mif/lga_polygon/macedon\ ranges/VMADMIN/POSTCODE_POLYGON.mid
```

The output will look like the following:

```
Had to open data source read-only.
INFO: Open of `vicgrid94/mif/lga_polygon/macedon ranges/VMADMIN/POSTCODE_POLYGON.mid'
using driver `MapInfo File' successful.
Layer name: POSTCODE_POLYGON
Geometry: 3D Unknown (any)
Feature Count: 26
Extent: (2413931.249367, 2400162.366186) - (2508952.174431, 2512183.046927)
Layer SRS WKT:
PROJCS["unnamed",
    GEOGCS["unnamed",
        DATUM["GDA94",
            SPHEROID["GRS 80",6378137,298.257222101],
            TOWGS84[0,0,0,-0,-0,-0,0]],
        PRIMEM["Greenwich",0],
        UNIT["degree",0.0174532925199433]],
    PROJECTION["Lambert_Conformal_Conic_2SP"],
    PARAMETER["standard_parallel_1",-36],
    PARAMETER["standard_parallel_2",-38],
    PARAMETER["latitude_of_origin",-37],
    PARAMETER["central_meridian",145],
    PARAMETER["false_easting",2500000],
    PARAMETER["false_northing",2500000],
    UNIT["Meter",1]]
PFI: String (10.0)
POSTCODE: String (4.0)
FEATURE_TYPE: String (6.0)
FEATURE_QUALITY_ID: String (20.0)
PFI_CREATED: Date (10.0)
UFI: Real (12.0)
UFI_CREATED: Date (10.0)
UFI_OLD: Real (12.0)
```

This gives you information about the number of features, the extent, the projection and the attributes of this Dataset.

Next, let's go ahead and convert this Dataset into a shapefile by issuing the following command:

```
$ ogr2ogr -t_srs EPSG:4326 postcode_polygon.shp vicgrid94/mif/lga_polygon/macedon\ ranges/VMADMIN/POSTCODE_POLYGON.mid POSTCODE_POLYGON
```

Note that we have also reprojected the Dataset to the WGS84 spatial reference system with the -t_srs ogr2ogr option.

The output of this command will look like the following:

1.25. GeoNode Management Commands
Warning 6: Normalized/laundered field name: 'FEATURE_TYPE' to 'FEATURE_TY'
Warning 6: Normalized/laundered field name: 'FEATURE_QUALITY_ID' to 'FEATURE_QU'
Warning 6: Normalized/laundered field name: 'PFI_CREATED' to 'PFI_CREATE'
Warning 6: Normalized/laundered field name: 'UFI_CREATED' to 'UFI_CREATE'

This output indicates that some of the field names were truncated to fit into the constraint that attributes in shapefiles are only 10 characters long.

You will now have a set of files that make up the postcode_polygon.shp shapefile set. We can inspect them by issuing the following command:

```bash
$ ogrinfo -so postcode_polygon.shp postcode_polygon
```

The output will look similar to the output we saw above when we inspected the MapInfo file we converted from:

```
INFO: Open of `postcode_polygon.shp'
    using driver `ESRI Shapefile' successful.

Layer name: postcode_polygon
Geometry: Polygon
Feature Count: 26
Extent: (144.030296, -37.898156) - (145.101137, -36.888878)
Layer SRS WKT:
GEOGCS["GCS_WGS_1984",
    DATUM["WGS_1984",
        SPHEROID["WGS_84",6378137,298.257223563]],
    PRIMEM["Greenwich",0],
    UNIT["Degree",0.017453292519943295]]
PFI: String (10.0)
POSTCODE: String (4.0)
FEATURE_TY: String (6.0)
FEATURE_QU: String (20.0)
PFI_CREATE: Date (10.0)
UFI: Real (12.0)
UFI_CREATE: Date (10.0)
UFI_OLD: Real (12.0)
```

These files can now be loaded into your GeoNode instance via the normal uploader.

Visit the upload page in your GeoNode, drag and drop the files that composes the shapefile that you have generated using the GDAL ogr2ogr command (postcode_polygon.dbf, postcode_polygon.prj, postcode_polygon.shp, postcode_polygon.shx). Give the permissions as needed and then click the “Upload files” button.

As soon as the import process completes, you will have the possibility to go straight to the Dataset info page (“Layer Info” button), or to edit the metadata for that Dataset (“Edit Metadata” button), or to manage the styles for that Dataset (“Manage Styles”).
GDAL (Raster Data)

Let's see several examples on how to either convert raster data into different formats and/or process it to get the best performances.

References:

a) https://geoserver.geo-solutions.it/edu/en/raster_data/processing.html

b) https://geoserver.geo-solutions.it/edu/en/raster_data/advanced_gdal/

Raster Data Conversion: Arc/Info Binary and ASCII Grid data into GeoTIFF format.

Let's assume we have a sample ASCII Grid file compressed as an archive.

```bash
# Un-tar the files
tar -xvf sample_asc.tar
```

You will be left with the following files on your filesystem:

```
|-- batemans_ele
  |-- dblbnd.adf
  |-- hdr.adf
  |-- metadata.xml
  |-- prj.adf
  |-- sta.adf
  |-- w001001.adf
  |-- w001001x.adf
|-- batemans_elevation.asc
```

The file `batemans_elevation.asc` is an Arc/Info ASCII Grid file and the files in the `batemans_ele` directory are an Arc/Info Binary Grid file.

You can use the `gdalinfo` command to inspect both of these files by executing the following command:

```bash
gdalinfo batemans_elevation.asc
```

The output should look like the following:

```
Driver: AAIGrid/Arc/Info ASCII Grid
Files: batemans_elevation.asc
Size is 155, 142
Coordinate System is ""
Origin = (239681.000000000000000, 6050551.000000000000000)
Pixel Size = (100.000000000000000,-100.000000000000000)
Corner Coordinates:
Upper Left ( 239681.000, 6050551.000)
Lower Left ( 239681.000, 6036351.000)
Upper Right ( 255181.000, 6050551.000)
Lower Right ( 255181.000, 6036351.000)
Center ( 247431.000, 6043451.000)
Band 1 Block=155x1 Type=Float32, ColorInterp=Undefined
NoData Value=-9999
```

You can then inspect the `batemans_ele` files by executing the following command:
GeoNode Documentation, Release 4.2.5

gdalinfo batemans_ele

And this should be the corresponding output:

```
Driver: AIG/Arc/Info Binary Grid
Files: batemans_ele
   batemans_ele/dblbnd.adf
   batemans_ele/hdr.adf
   batemans_ele/metadata.xml
   batemans_ele/prj.adf
   batemans_ele/sta.adf
   batemans_ele/w001001.adf
   batemans_ele/w001001x.adf
Size is 155, 142
Coordinate System is:
PROJCS["unnamed",
   GEOCS["GDA94",
      DATUM["Geocentric_Datum_of_Australia_1994",
         SPHEROID["GRS 1980",6378137,298.257222101,
            AUTHORITY["EPSG","7019"]],
         TOWGS84[0,0,0,0,0,0,0],
            AUTHORITY["EPSG","6283"]],
         PRIMEM["Greenwich",0,
            AUTHORITY["EPSG","8901"]],
         UNIT["degree",0.0174532925199433,
            AUTHORITY["EPSG","9122"]],
            AUTHORITY["EPSG","4283"]],
         PROJECTION["Transverse_Mercator"],
         PARAMETER["latitude_of_origin",0],
         PARAMETER["central_meridian",153],
         PARAMETER["scale_factor",0.9996],
         PARAMETER["false_easting",500000],
         PARAMETER["false_northing",1000000],
         UNIT["METERS",1]]
Origin = (239681.000000000000000,6050551.000000000000000)
Pixel Size = (100.000000000000000,-100.000000000000000)
Corner Coordinates:
Upper Left ( 239681.000, 6050551.000) (150d 7'28.35"E, 35d39'16.56"S)
Lower Left ( 239681.000, 6036351.000) (150d 7'11.78"E, 35d46'56.89"S)
Upper Right ( 255181.000, 6050551.000) (150d17'44.07"E, 35d39'30.83"S)
Lower Right ( 255181.000, 6036351.000) (150d17'28.49"E, 35d47'11.23"S)
Center ( 247431.000, 6043451.000) (150d12'28.17"E, 35d43'13.99"S)
Band 1 Block=256x4 Type=Float32, ColorInterp=Undefined
   Min=-62.102 Max=142.917
NoData Value=-3.4028234663852886e+38
```

You will notice that the batemans_elevation.asc file does not contain projection information while the batemans_ele file does. Because of this, let's use the batemans_ele files for this exercise and convert them to a GeoTiff for use in GeoNode. We will also reproject this file into WGS84 in the process. This can be accomplished with the following command.

gdalwarp -t_srs EPSG:4326 batemans_ele batemans_ele.tif

The output will show you the progress of the conversion and when it is complete, you will be left with a batemans_ele.
tif file that you can upload to your GeoNode.

You can inspect this file with the gdalinfo command:

```bash
gdalinfo batemans_ele.tif
```

Which will produce the following output:

```
Driver: GTiff/GeoTIFF
Files: batemans_ele.tif
Size is 174, 130
Coordinate System is:
GEOGCS["WGS 84",

   DATUM["WGS_1984",
   SPHEROID["WGS 84",6378137,298.257223563,
   AUTHORITY["EPSG","7030"],
   AUTHORITY["EPSG","6326"],
   PRIMEM["Greenwich",0],
   UNIT["degree",0.0174532925199433],
   AUTHORITY["EPSG","4326"],
   ORIGIN = (150.119938943722502,-35.654598806259330)
   Pixel Size = (0.001011114155919,-0.001011114155919)
Metadata:
   AREA_OR_POINT=Area
Image Structure Metadata:
   INTERLEAVE=BAND
Corner Coordinates:
   Upper Left ( 150.1199389, -35.6545988) (150d 7'11.78"E, 35d39'16.56"S)
   Lower Left ( 150.1199389, -35.7860436) (150d 7'11.78"E, 35d47' 9.76"S)
   Upper Right ( 150.2958728, -35.6545988) (150d17'45.14"E, 35d39'16.56"S)
   Lower Right ( 150.2958728, -35.7860436) (150d17'45.14"E, 35d47' 9.76"S)
   Center ( 150.2079059, -35.7203212) (150d12'28.46"E, 35d43'13.16"S)
Band 1 Block=174x11 Type=Float32, ColorInterp=Gray
```

**Raster Data Optimization: Optimizing and serving big raster data**

(ref: https://geoserver.geo-solutions.it/edu/en/raster_data/advanced_gdal/example5.html)

When dealing with big raster datasets it could be very useful to use tiles.

Tiling allows large raster datasets to be broken-up into manageable pieces and are fundamental in defining and implementing a higher level raster I/O interface.

In this example we will use the original dataset of the `chiangMai_ortho_optimized` public raster Dataset which is currently available on the Thai CHIANG MAI Urban Flooding GeoNode platform.

This dataset contains an orthorectified image stored as RGBA GeoTiff with 4 bands, three bands for the RGB and one for transparency (the alpha channel).

Calling the gdalinfo command to see detailed information:

```bash
gdalinfo chiangMai_ortho.tif
```

It will produce the following results:
Driver: GTiff/GeoTIFF
Files: chiangMai_ortho.tif
Size is 63203, 66211
Coordinate System is:
PROJCS["WGS 84 / UTM zone 47N",
   GEOGCS["WGS 84",
      DATUM["WGS_1984",
         SPHEROID["WGS 84",6378137.298,257223563,
            AUTHORITY["EPSG","7030"]],
         AUTHORITY["EPSG","6326"]],
      PRIMEM["Greenwich",0,
         AUTHORITY["EPSG","8901"]],
      UNIT["degree",0.0174532925199433,
         AUTHORITY["EPSG","9122"]],
      AUTHORITY["EPSG","4326"]],
   PROJECTION["Transverse_Mercator"],
   PARAMETER["latitude_of_origin",0],
   PARAMETER["central_meridian",99],
   PARAMETER["scale_factor",0.9996],
   PARAMETER["false_easting",500000],
   PARAMETER["false_northing",0],
   UNIT["metre",1,
      AUTHORITY["EPSG","9001"]],
   AXIS["Easting",EAST],
   AXIS["Northing",NORTH],
   AUTHORITY["EPSG","32647"]]
Origin = (487068.775, 2057413.890)
Pixel Size = (0.028850000000000,-0.028850000000000)
Metadata:
AREA_OR_POINT=Area
TIFFTAG_SOFTWARE=pix4dmapper
Image Structure Metadata:
COMPRESSION=LZW
INTERLEAVE=PIXEL
Corner Coordinates:
Upper Left ( 487068.775, 2057413.890) ( 98d52'38.72"E, 18d36'27.34"N)
Lower Left ( 487068.775, 2055593.782) ( 98d52'38.77"E, 18d35'25.19"N)
Upper Right ( 488892.181, 2057413.890) ( 98d53'40.94"E, 18d36'27.38"N)
Lower Right ( 488892.181, 2055593.702) ( 98d53'40.98"E, 18d35'25.22"N)
Center ( 487980.478, 2056458.796) ( 98d53' 9.85"E, 18d35'56.28"N)
Band 1 Block=63203x1 Type=Byte, ColorInterp=Red
NoData Value=-10000
Mask Flags: PER_DATASET ALPHA
Band 2 Block=63203x1 Type=Byte, ColorInterp=Green
NoData Value=-10000
Mask Flags: PER_DATASET ALPHA
Band 3 Block=63203x1 Type=Byte, ColorInterp=Blue
NoData Value=-10000
Mask Flags: PER_DATASET ALPHA
Band 4 Block=63203x1 Type=Byte, ColorInterp=Alpha
NoData Value=-10000

As you can see, this GeoTIff has not been tiled. For accessing subsets though, tiling can make a difference. With tiling,
data are stored and compressed in blocks (tiled) rather than line by line (stripped).

In the command output above it is visible that each band has blocks with the same width of the image (63203) and a unit length. The grids in the picture below show an image with equally sized tiles (left) and the same number of strips (right). To read data from the red subset, the intersected area will have to be decompressed.

In the tiled image we will have to decompress only 16 tiles, whereas in the stripped image on the right we’ll have to decompress many more strips.

Drone images data usually have a stripped structure so, in most cases, they need to be optimized to increase performances.

Let’s take a look at the gdal_translate command used to optimize our GeoTiff:

```
gdal_translate -co TILED=YES -co COMPRESS=JPEG -co PHOTOMETRIC=YCBCR
--config GDAL_TIFF_INTERNAL_MASK YES -b 1 -b 2 -b 3 -mask 4
chiangMai_ortho.tif
chiangMai_ortho_optimized.tif
```

**Note:** For the details about the command parameters see https://geoserver.geo-solutions.it/edu/en/raster_data/advanced_gdal/example5.html

Once the process ended, call the gdalinfo command on the resulting tif file:

```
gdalinfo chiangMai_ortho_optimized.tif
```

The following should be the results:

```
Driver: GTiff/GeoTIFF
Files: chiangMai_ortho_optimized.tif
Size is 63203, 66211
Coordinate System is:
PROJCS["WGS 84 / UTM zone 47N",
    GEOGCS["WGS 84"],
    DATUM["WGS_1984"],
(continues on next page)```
Our GeoTiff is now tiled with 256x256 tiles, has 3 bands and a 1-bit mask for nodata.

We can also add internal overviews to the file using the gdaladdo command:

```
gdaladdo -r average chiangMai_ortho_optimized.tif 2 4 8 16 32 64 128 256 512
```

Overviews are duplicate versions of your original data, but resampled to a lower resolution, they can also be compressed with various algorithms, much in the same way as the original dataset.

By default, overviews take the same compression type and transparency masks of the input dataset (applied through

### 1.25. GeoNode Management Commands

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the gdal_translate command), so the parameters to be specified are:

- \textbf{-r average}: computes the average of all non-NODATA contributing pixels
- \textbf{2 4 8 16 32 64 128 256 512}: the list of integral overview levels to build (from gdal version 2.3 levels are no longer required to build overviews)

Calling the gdalinfo command again:

```
$ gdalinfo chiangMai_ortho_optimized.tif
```

It results in:

```
Driver: GTiff/GeoTIFF
Files: chiangMai_ortho_optimized.tif
Size is 63203, 66211
Coordinate System is:
PROJCS["WGS 84 / UTM zone 47N",
    GEOGCS["WGS 84",
        DATUM["WGS_1984",
            SPHEROID["WGS 84",6378137.298,257223563,
                AUTHORITY["EPSG","7030"]],
            AUTHORITY["EPSG","6326"]],
        PRIMEM["Greenwich",0,
            AUTHORITY["EPSG","8901"]],
        UNIT["degree",0.0174532925199433,
            AUTHORITY["EPSG","9122"]],
        AUTHORITY["EPSG","4326"]],
    PROJECTION["Transverse_Mercator"],
    PARAMETER["latitude_of_origin",0],
    PARAMETER["central_meridian",99],
    PARAMETER["scale_factor",0.9996],
    PARAMETER["false_easting",500000],
    PARAMETER["false_northing",0],
    UNIT["metre",1,
        AUTHORITY["EPSG","9001"]],
    AXIS["Easting",EAST],
    AXIS["Northing",NORTH],
    AUTHORITY["EPSG","32647"]]
Origin = (487068.775, 2057413.890) ( 98d52'38.72"E, 18d36'27.34"N)
Pixel Size = (0.0288500000000000,-0.0288500000000000)
Metadata:
AREA_OR_POINT=Area
TIFFTAG_SOFTWARE=pix4dmapper
Image Structure Metadata:
COMPRESSION=YCbCr JPEG
INTERLEAVE=PIXEL
SOURCE_COLOR_SPACE=YCbCr
Corner Coordinates:
Upper Left ( 487068.775, 2057413.890) ( 98d52'38.72"E, 18d36'27.34"N)
Lower Left ( 487068.775, 2055503.702) ( 98d52'38.77"E, 18d35'25.19"N)
Upper Right ( 488892.181, 2057413.890) ( 98d53'40.94"E, 18d36'27.38"N)
Lower Right ( 488892.181, 2055503.702) ( 98d53'40.98"E, 18d35'25.22"N)
Center ( 487980.478, 2056458.796) ( 98d53'9.85"E, 18d35'56.28"N)
Band 1 Block=256x256 Type=Byte, ColorInterp=Red
```

(continues on next page)
NoData Value=-10000
Overviews: 31602x33106, 15801x16553, 7901x8277, 3951x4139, 1976x2070, 988x1035, 494x518, 247x259, 124x130
Mask Flags: PER_DATASET
Overviews of mask band: 31602x33106, 15801x16553, 7901x8277, 3951x4139, 1976x2070, 988x1035, 494x518, 247x259, 124x130
Band 2 Block=256x256 Type=Byte, ColorInterp=Green
NoData Value=-10000
Overviews: 31602x33106, 15801x16553, 7901x8277, 3951x4139, 1976x2070, 988x1035, 494x518, 247x259, 124x130
Mask Flags: PER_DATASET
Overviews of mask band: 31602x33106, 15801x16553, 7901x8277, 3951x4139, 1976x2070, 988x1035, 494x518, 247x259, 124x130
Band 3 Block=256x256 Type=Byte, ColorInterp=Blue
NoData Value=-10000
Overviews: 31602x33106, 15801x16553, 7901x8277, 3951x4139, 1976x2070, 988x1035, 494x518, 247x259, 124x130
Mask Flags: PER_DATASET
Overviews of mask band: 31602x33106, 15801x16553, 7901x8277, 3951x4139, 1976x2070, 988x1035, 494x518, 247x259, 124x130

Notice that the transparency masks of internal overviews have been applied (their compression does not show up in the file metadata).

UAVs usually provide also two other types of data: DTM (Digital Terrain Model) and DSM (Digital Surface Model).

Those data require different processes to be optimized. Let’s look at some examples to better understand how to use gdal to accomplish that task.

From the CHIANG MAI Urban Flooding GeoNode platform it is currently available the chiangMai_dtm_optimized Dataset, let’s download its original dataset.

This dataset should contain the DTM file chiangMai_dtm.tif.

Calling the gdalinfo command on it:

```
gdalinfo chiangMai_dtm.tif
```

The following information will be displayed:

```
Driver: GTiff/GeoTIFF
Files: chiangMai_dtm.tif
Size is 12638, 13240
Coordinate System is:
PROJCS["WGS 84 / UTM zone 47N",
   GEOGCS["WGS 84",
      DATUM["WGS_1984",
         SPHEROID["WGS 84",6378137,298.257223563,
            AUTHORITY["EPSG","7030"]],
         AUTHORITY["EPSG","6326"]],
      PRIMEM["Greenwich",0,
         AUTHORITY["EPSG","8901"]],
      UNIT["degree",0.0174532925199433,
         AUTHORITY["EPSG","9122"]],
```

(continues on next page)
AUTHORITY["EPSG","4326"],
PROJECTION["Transverse_Mercator"],
PARAMETER["latitude_of_origin",0],
PARAMETER["central_meridian",99],
PARAMETER["scale_factor",0.9996],
PARAMETER["false_easting",500000],
PARAMETER["false_northing",0],
UNIT["metre",1,
    AUTHORITY["EPSG","9001"],
AXIS["Easting",EAST],
AXIS["Northing",NORTH],
AUTHORITY["EPSG","32647"]
Origin = (487068.775, 2057413.890) ( 98d52'38.72"E, 18d36'27.34"N)
Pixel Size = (0.144270000000000,-0.144270000000000)
Metadata:
AREA_OR_POINT=Area
TIFFTAG_SOFTWARE=pix4dmapper
Image Structure Metadata:
COMPRESSION=LZW
INTERLEAVE=BAND
Corner Coordinates:
Upper Left ( 487068.775, 2057413.890) ( 98d52'38.72"E, 18d36'27.34"N)
Lower Left ( 487068.775, 2055503.755) ( 98d52'38.77"E, 18d35'25.19"N)
Upper Right ( 488892.059, 2057413.890) ( 98d53'40.94"E, 18d36'27.37"N)
Lower Right ( 488892.059, 2055503.755) ( 98d53'40.98"E, 18d35'25.22"N)
Center ( 487980.417, 2056458.822) ( 98d53'9.85"E, 18d35'56.28"N)
Band 1 Block=12638x1 Type=Float32, ColorInterp=Gray
NoData Value=-10000

Reading this image could be very slow because it has not been tiled yet. So, as discussed above, its data need to be stored and compressed in tiles to increase performances.

The following gdal_translate command should be appropriate for that purpose:

```
gdal_translate -co TILED=YES -co COMPRESS=DEFLATE chiangMai_dtm.tif chiangMai_dtm_optimized.tif
```

When the data to compress consists of imagery (es. aerial photographs, true-color satellite images, or colored maps) you can use lossy algorithms such as JPEG. We are now compressing data where the precision is important, the band data type is Float32 and elevation values should not be altered, so a lossy algorithm such as JPEG is not suitable. JPEG should generally only be used with Byte data (8 bit per channel) so we have chosen the lossless DEFLATE compression through the COMPRESS=DEFLATE creation option.

Calling the gdalinfo command again:

```
gdalinfo chiangMai_dtm_optimized.tif
```

We can observe the following results:

```
Driver: GTiff/GeoTIFF
Files: chiangMai_dtm_optimized.tif
Size is 12638, 13240
Coordinate System is:
PROJCS["WGS 84 / UTM zone 47N",
```
GEOGCS["WGS 84",  
  DATUM["WGS_1984",  
    SPHEROID["WGS 84", 6378137.295,257223563,  
      AUTHORITY["EPSG","7030"],  
      AUTHORITY["EPSG","6326"],  
      PRIMEM["Greenwich",0,  
        AUTHORITY["EPSG","8901"],  
        UNIT["degree",0.0174532925199433,  
          AUTHORITY["EPSG","9122"],  
          AUTHORITY["EPSG","4326"],  
          AUTHORITY["EPSG","32647"]],  
        PROJECTION["Transverse_Mercator"],  
        PARAMETER["latitude_of_origin",0],  
        PARAMETER["central_meridian",99],  
        PARAMETER["scale_factor",0.9996],  
        PARAMETER["false_easting",500000],  
        PARAMETER["false_northing",0],  
        UNIT["metre",1,  
          AUTHORITY["EPSG","9001"],  
          AXIS["Easting",EAST],  
          AXIS["Northing",NORTH],  
          AUTHORITY["EPSG","32647"]]]],  
  ORIGIN = (487068.774750000040513,2057413.889810000080615)  
  Pixel Size = (0.144270000000000,-0.144270000000000)  
  Metadata:  
    AREA_OR_POINT=Area  
    TIFFTAG_SOFTWARE=pix4dmapper  
    Image Structure Metadata:  
      COMPRESSION=DEFLATE  
      INTERLEAVE=BAND  
    Corner Coordinates:  
      Upper Left ( 487068.775, 2057413.890) ( 98d52'38.72"E, 18d36'27.34"N)  
      Lower Left ( 487068.775, 2055503.755) ( 98d52'38.77"E, 18d35'25.19"N)  
      Upper Right ( 488892.059, 2057413.890) ( 98d53'40.94"E, 18d36'27.37"N)  
      Lower Right ( 488892.059, 2055503.755) ( 98d53'40.98"E, 18d35'25.22"N)  
      Center ( 487980.417, 2056458.822) ( 98d53' 9.85"E, 18d35'56.28"N)  
    Band 1 Block=256x256 Type=Float32, ColorInterp=Gray  
    NoData Value=-10000

We need also to create overviews through the gdaladdo command:

```
$ gdaladdo -r nearest chiangMai_dtm_optimized.tif 2 4 8 16 32 64
```

Unlike the previous example, overviews will be created with the **nearest resampling algorithm**. That is due to the nature of the data we are representing: we should not consider the average between two elevation values but simply the closer one, it is more reliable regarding the conservation of the original data.

Calling the gdalinfo command again:

```
$ gdalinfo chiangMai_dtm_optimized.tif
```

We can see the following information:

---

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Driver: GTiff/GeoTIFF
Files: chiangMai_dtm_optimized.tif
Size is 12638, 13240
Coordinate System is:
PROJCS["WGS 84 / UTM zone 47N",
  GEOGCS["WGS 84",
    DATUM["WGS_1984",
      SPHEROID["WGS 84",6378137.298,257223563,
        AUTHORITY["EPSG","7030"]],
      AUTHORITY["EPSG","6326"]],
    PRIMEM["Greenwich",0,
      AUTHORITY["EPSG","8901"]],
    UNIT["degree",0.0174532925199433,
      AUTHORITY["EPSG","9122"]],
    AUTHORITY["EPSG","4326"]],
  PROJECTION["Transverse_Mercator"],
  PARAMETER["latitude_of_origin",0],
  PARAMETER["central_meridian",99],
  PARAMETER["scale_factor",0.9996],
  PARAMETER["false_easting",500000],
  PARAMETER["false_northing",0],
  UNIT["metre",1,
    AUTHORITY["EPSG","9001"]],
  AXIS["Easting",EAST],
  AXIS["Northing",NORTH],
  AUTHORITY["EPSG","32647"]]
Origin = (487068.774750000040513,2057413.889810000080615)
Pixel Size = (0.144270000000000,-0.144270000000000)
Metadata:
AREA_OR_POINT=Area
TIFFTAG_SOFTWARE=pix4dmapper
Image Structure Metadata:
COMPRESSION=DEFLATE
INTERLEAVE=BAND
Corner Coordinates:
Upper Left ( 487068.775, 2057413.890) ( 98d52'38.72"E, 18d36'27.34"N)
Lower Left ( 487068.775, 2055593.755) ( 98d52'38.77"E, 18d36'25.19"N)
Upper Right ( 488892.059, 2057413.890) ( 98d53'40.94"E, 18d36'27.37"N)
Lower Right ( 488892.059, 2055593.755) ( 98d53'40.98"E, 18d36'25.22"N)
Center ( 487980.417, 2056458.822) ( 98d53' 9.87"E, 18d36'56.28"N)
Band 1 Block=256x256 Type=Float32, ColorInterp=Gray
NoData Value=-10000
Overviews: 6319x6620, 3160x3310, 1580x1655, 790x828, 395x414, 198x207

Overviews have been created. By default, they inherit the same compression type of the original dataset (there is no evidence of it in the gdalinfo output).
Other Raster Data Use Cases

- Serving a large number of GrayScale GeoTiff with Palette
- Serving a large number of DTM ASCII Grid Files
- Serving a large number of Cartographic Black/White GeoTiff with Palette
- Serving a large number of satellite/aerial RGB GeoTiff with compression
- Optimizing and serving UAV data
- Optimizing and serving 16-bits satellite/aerial RGB GeoTiff

Process Raster Datasets Programmatically

In this section we will provide a set of shell scripts which might be very useful to batch process a lot of raster datasets programmatically.

1. process_gray.sh

   ```bash
   for filename in *.tif*; do echo gdal_translate -co TILED=YES -co
   -COMPRESS=DEFLATE $filename ${filename//.tif/.optimized.tif}; done > gdal_translate.sh
   chmod +x gdal_translate.sh
   ./gdal_translate.sh
   ```

2. process_rgb.sh

   ```bash
   for filename in *.tif*; do echo gdal_translate -co TILED=YES -co
   -COMPRESS=JPEG -co PHOTOMETRIC=YCBCR -b 1 -b 2 -b 3 $filename ${filename//.tif/.optimized.tif}; done > gdal_translate.sh
   chmod +x gdal_translate.sh
   ./gdal_translate.sh
   ```

3. process_rgb_alpha.sh

   ```bash
   for filename in *.tif*; do echo gdal_translate -co TILED=YES -co
   -COMPRESS=JPEG -co PHOTOMETRIC=YCBCR --config GDAL_TIFF_INTERNAL_MASK YES
   ```

(continues on next page)
→-b 1 -b 2 -b 3 -mask 4 $filename ${filename//.tif/.optimized.tif}; done >
→ gdal_translate.sh
chmod +x gdal_translate.sh
./gdal_translate.sh

for filename in *.optimized.tif*; do echo gdaladdo -r average $filename 2-
→4 8 16 32 64 128 256 512; done > gdaladdo.sh
for filename in *.optimized.tif*; do echo mv "$filename" "$filename//.
→-optimized.tif/.tif"; done > rename.sh
chmod +x *.sh
./rename.sh

4. process_rgb_palette.sh

for filename in *.tif*; do echo gdal_translate -co TILED=YES -co,
→COMPRESS=DEFLATE $filename ${filename//.tif/.optimized.tif}; done > gdal_
→translate.sh
chmod +x gdal_translate.sh
./gdal_translate.sh

1.25.4 Thesaurus Import and Export

See Import via the load_thesaurus command and Exporting a thesaurus as RDF via the dump_thesaurus command.

1.25.5 Create Users and Super Users

Your first step will be to create a user. There are three options to do so, depending on which kind of user you want to create you may choose a different option. We will start with creating a superuser, because this user is the most important. A superuser has all the permissions without explicitly assigning them.

The easiest way to create a superuser (in linux) is to open your terminal and type:

$ DJANGO_SETTINGS_MODULE=geonode.settings python manage.py createsuperuser

Note: If you enabled local_settings.py the command will change as following:

$ DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py,
→createsuperuser
You will be asked a username (in this tutorial we will call the superuser you now create your_superuser), an email address and a password.

Now you’ve created a superuser you should become familiar with the Django Admin Interface. As a superuser you are having access to this interface, where you can manage users, Datasets, permission and more. To learn more detailed about this interface check this LINK. For now it will be enough to just follow the steps. To attend the Django Admin Interface, go to your geonode website and sign in with your_superuser. Once you’ve logged in, the name of your user will appear on the top right. Click on it and the following menu will show up:

Menu

- Upload Layers
- Profile
- Recent Activity
- Inbox
- Announcements
- Remote Services
- Invite User
- GeoServer
- Admin
- Help

Clicking on Admin causes the interface to show up.

Go to Auth -> Users and you will see all the users that exist at the moment. In your case it will only be your_superuser. Click on it, and you will see a section on Personal Info, one on Permissions and one on Important dates. For the moment, the section on Permissions is the most important.

As you can see, there are three boxes that can be checked and unchecked. Because you’ve created a superuser, all three boxes are checked as default. If only the box active would have been checked, the user would not be a superuser.
Django administration

Site administration

Account
Account deletions + Add  Change
Accounts + Add  Change
Signup codes + Add  Change

Actstream
Actions + Add  Change
Follows + Add  Change

Announcements
Announcements + Add  Change
Dismissals + Add  Change

Auth
Groups + Add  Change
Users + Add  Change

Avatar
Avatars + Add  Change

Base
Contact roles + Add  Change
Links + Add  Change
Metadata Regions + Add  Change

Permissions

Active
Designates whether this user should be treated as active. Unselect this instead of deleting accounts.

Staff status
Designates whether the user can log into this admin site.

Superuser status
Designates that this user has all permissions without explicitly assigning them.
and would not be able to access the Django Admin Interface (which is only available for users with the staff status). Therefore keep the following two things in mind:

- a superuser is able to access the Django Admin Interface and he has all permissions on the data uploaded to GeoNode.
- an ordinary user (created from the GeoNode interface) only has active permissions by default. The user will not have the ability to access the Django Admin Interface and certain permissions have to be added for him.

Until now we’ve only created superusers. So how do you create an ordinary user? You have two options:

1. Django Admin Interface

First we will create a user via the Django Admin Interface because we’ve still got it open. Therefore go back to Auth -> Users and you should find a button on the right that says Add user.

Click on it and a form to fill out will appear. Name the new user test_user, choose a password and click save at the right bottom of the site.

Now you should be directed to the site where you could change the permissions on the user test_user. As default only active is checked. If you want this user also to be able to attend this admin interface you could also check staff status. But for now we leave the settings as they are!

To test whether the new user was successfully created, go back to the GeoNode web page and try to sign in.

2. GeoNode website

To create an ordinary user you could also just use the GeoNode website. If you installed GeoNode using a release, you should see a Register button on the top, beside the Sign in button (you might have to log out before).

Hit the button and again a form will appear for you to fill out. This user will be named geonode_user

By hitting Sign up the user will be signed up, as default only with the status active.
1.25.6 Batch Sync Permissions

GeoNode provides a very useful management command `set_layers_permissions` allowing an administrator to easily add / remove permissions to groups and users on one or more Datasets.

The `set_layers_permissions` command arguments are:

- **permissions** to set/unset → read, download, edit, manage

```python
READ_PERMISSIONS = [
    'view_resourcebase'
]
DOWNLOAD_PERMISSIONS = [
    'view_resourcebase',
    'download_resourcebase'
]
EDIT_PERMISSIONS = [
    'view_resourcebase',
    'change_dataset_style',
    'download_resourcebase',
    'change_resourcebase_metadata',
    'change_dataset_data',
    'change_resourcebase'
]
MANAGE_PERMISSIONS = [
    'delete_resourcebase',
    'change_resourcebase',
    'view_resourcebase',
    'change_resourcebase_permissions',
    'change_dataset_style',
    'change_resourcebase_metadata',
    'publish_resourcebase',
]
```

(continues on next page)
NB: the above permissions list may change with the ADVANCED_WORKFLOW enabled. For additional info: https://docs.geonode.org/en/master/admin/admin_panel/index.html#how-to-enable-the-advanced-workflow

- **resources** (Datasets) which permissions will be assigned on –> type the Dataset id, multiple choices can be typed with comma separator, if no ids are provided all the Datasets will be considered
- **users** who permissions will be assigned to, multiple choices can be typed with a comma separator
- **groups** who permissions will be assigned to, multiple choices can be typed with a comma separator
- **delete** flag (optional) which means the permissions will be unset

**Usage examples:**

1. Assign **edit** permissions on the Datasets with id **1** and **2** to the users **username1** and **username2** and to the group **group_name1**.

   ```
   python manage.py set_layers-permissions -p edit -u username1,username2 -g group_name1 -r 1,2
   ```

2. Assign **manage** permissions on all the Datasets to the group **group_name1**.

   ```
   python manage.py set_layers-permissions -p manage -g group_name1
   ```

3. Unset **download** permissions on the Dataset with id **1** for the user **username1**.

   ```
   python manage.py set_layers-permissions -p download -u username1 -r 1 -d
   ```

The same functionalities, with some limitations, are available also from the Admin Dashboard >> Users or Admin Dashboard >> Groups >> Group profiles.

An action named Set layer permissions is available from the list, redirecting the administrator to a form to set / unset read, edit, download permissions on the selected Users/group profile.

Is enough to select the dataset and press “Submit”. If the async mode is activated, the permission assign is asynchronous.

### 1.25.7 Delete Certain GeoNode Resources

The delete_resources Management Command allows to remove resources meeting a certain condition, specified in a form of a serialized django Q() expression.

First of all let’s take a look at the --help option of the delete_resources management command in order to inspect all the command options and features.

Run

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py delete_resources --help
```

**Note:** If you enabled local_settings.py the command will change as following:
Batch Edit

Layers
- stations
- stations0
- stations1
- stations2

Permission type
- Read
- Edit
- Download

Mode
- Set
- Unset

Cancel Submit

DJANGO_SETTINGS_MODULE=geonode.local_settings python manage.py delete_resources --help

This will produce output the following output:

usage: manage.py delete_resources [-h] [-c CONFIG_PATH] 
[-l LAYER_FILTERS [LAYER_FILTERS ...]] 
[-m MAP_FILTERS [MAP_FILTERS ...]] 
[-d DOCUMENT_FILTERS [DOCUMENT_FILTERS ...]] 
[--version] [-v {0,1,2,3}] 
[--settings SETTINGS] 
[--pythonpath PYTHONPATH] [--traceback] 
[--no-color] [--force-color]

Delete resources meeting a certain condition

optional arguments:
- h, --help show this help message and exit 
- c CONFIG_PATH, --config CONFIG_PATH
  Configuration file path. Default is: delete_resources.json 
- l LAYER_FILTERS [LAYER_FILTERS ...], --layer_filters LAYER_FILTERS [LAYER_FILTERS ...] 
- m MAP_FILTERS [MAP_FILTERS ...], --map_filters MAP_FILTERS [MAP_FILTERS ...] 
- d DOCUMENT_FILTERS [DOCUMENT_FILTERS ...], --document_filters DOCUMENT_FILTERS ...
  --version show program's version number and exit 
- v {0,1,2,3}, --verbosity {0,1,2,3}

(continues on next page)
Verbosity level; 0=minimal output, 1=normal output, 2=verbose output, 3=very verbose output

--settings SETTINGS
The Python path to a settings module, e.g. "myproject.settings.main". If this isn't provided, the DJANGO_SETTINGS_MODULE environment variable will be used.

--pythonpath PYTHONPATH
A directory to add to the Python path, e.g. "/home/djangoprojects/myproject".

--traceback
Raise on CommandError exceptions

--no-color
Don't colorize the command output.

--force-color
Force colorization of the command output.

There are two ways to declare Q() expressions filtering which resources should be deleted:

1. With a JSON configuration file: passing -c argument specifying the path to the JSON configuration file.
   - Example 1: Relative path to the config file (to manage.py)

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py delete_resources -c geonode/base/management/commands/delete_resources.json
```

   - Example 2: Absolute path to the config file

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py delete_resources -c /home/User/Geonode/configs/delete_resources.json
```

2. With CLI: passing -l -d -m list arguments for each of resources (Datasets, documents, maps)
   - Example 3: Delete resources without configuration file

```
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py delete_resources -l 'Q(pk__in: [1, 2]) | Q(title__icontains:"italy")' -d '*' -m "Q(pk__in=[1, 2])"
```

Configuration File

The JSON configuration file should contain a single filters object, which consists of Dataset, map and document lists. Each list specifies the filter conditions applied to a corresponding queryset, defining which items will be deleted. The filters are evaluated and directly inserted into Django .filter() method, which means the filters occurring as separated list items are treated as AND condition. To create OR query | operator should be used. For more info please check Django documentation(https://docs.djangoproject.com/en/3.2/topics/db/queries/#complex-lookups-with-q-objects)). The only exception is passing a list with '*' which will cause deleting all the queryset of the resource.

- Example 4: Example content of the configuration file, which will delete Datasets with ID's 1, 2, and 3, those owned by admin user, along with all defined maps.

```
{
    "filters": {
        "Dataset": [
            "Q(pk__in=[1, 2, 3]) | Q(title__icontains='italy')",
            "Q(owner__name=admin)"
        ],
```

(continues on next page)
CLI

The CLI configuration can be specified with `-l` `-d` `-m` list arguments, which in fact are a translation of the configuration JSON file. `-l` `-d` `-m` arguments are evaluated in the same manner as filters.Dataset, filters.map and filter.document accordingly from the Example 4. The following example’s result will be equivalent to Example 4:

- **Example 5**: Example CLI configuration, which will delete Datasets with ID’s 1, 2, and 3, along with all maps.

```bash
DJANGO_SETTINGS_MODULE=geonode.settings python manage.py delete_resources -l Q(pk__in: [1, 2, 3]) | Q(title__icontains:"italy")' 'Q(owner__name=admin)' -m '*'
```

1.25.8 Async execution over http

It is possible to expose and run management commands over http.

To run custom django management commands usually we make make use of the command line:

```bash
python manage.py ping_mngmt_commands_http
$> pong
```

The management_commands_http app allows us to run commands when we have no access to the command line. It’s possible to run a command using the API or the django admin GUI.

For security reasons, only admin users can access the feature and the desired command needs to be explicitly exposed. By default the following commands are exposed: ping_mngmt_commands_http, updatelayers, sync_geonode_datasets, sync_geonode_maps, importlayers and set_all_datasets_metadata.

To expose more command you can change the environment variable MANAGEMENT_COMMANDS_EXPOSED_OVER_HTTP and the added commands will be exposed in your application.

The list of exposed commands is available by the endpoint list_management_commands and also presented by the form in the admin page create management command job.

**Note:** To use the commands in an asynchronous approach ASYNC_SIGNALS needs to be set to True and celery should be running.
Manage using django admin interface

Creating a job

Access the admin panel: http://<your_geonode_host>/admin and go to “Management command jobs”.

![Management command admin section](image1.png)

You will arrive at http://<your_geonode_host>/en/admin/management_commands_http/managementcommandjob/, then click on the button + Add management command job (http://<your_geonode_host>/en/admin/management_commands_http/managementcommandjob/add/).

![Add management command job](image2.png)

Select the command and fill the form, with the arguments and/or key-arguments if needed. Save you job and in the list select the **start** action, alternantively you can mark the **autostart** option and the command will be automatic started when created.

Starting a job

To start a job:

1. Select the job to be started.
2. Select the **start** action.
3. Click in **Go**.
Fig. 303: Creating a management command job form

Fig. 304: Starting a job
4. The page will refresh and the job status will have changed. If it takes a long to run, refresh the page to see the updated status.

5. A stop option is also available.

**Note:** If it takes too long to load the page, ASYNC_SIGNALS may not be activated. If its status gets stuck at QUEUED, verify if celery is running and properly configured.

## Job status

Clicking at the link in the ID of a job, we can see the details of this job. For the job we just created, we can verify the output message and celery job status.

![Example job status](image)

**Fig. 305: Example job status**

When we have an error during execution the traceback message will be available in the Celery traceback. In the next image a ping_mgmt_commands_http job was created with the arguments `['--force_exception', true]`. Checking the text in this field can be useful when troubleshooting errors.

![Example job traceback message](image)

**Fig. 306: Example job traceback message**
Manage using API endpoints

The execution of the management commands can be handled by http requests to an API: http://<your_geonode_host>/api/v2/management/.

All the requests need to be authenticated with administrative permissions (superuser).

You can find here a postman collection with all the examples listed here and other available endpoints:

geonode_mngmt_commands.postman_collection.json

List exposed commands

Getting a list of the exposed commands:

```
curl --location --request GET 'http://<your_geonode_host>/api/v2/management/commands/' --header 'Authorization: Basic YWRtaW46YWRtaW4='
```

Response:

```json
{
  "success": true,
  "error": null,
  "data": [
    "ping_mngmt_commands_http",
    "updatelayers",
    "set_all_datasets_metadata",
    "sync_geonode_maps",
    "importlayers",
    "sync_geonode_datasets"
  ]
}
```

**Note:** You should change the header Authorization (Basic YWRtaW46YWRtaW4=) to your Auth token, in this example I am using a token for admin as username and admin as password.

Creating a job

Optionally, before creating the job you can get its help message with the following call:

```
curl --location --request GET 'http://<your_geonode_host>/api/v2/management/commands/ping_mngmt_commands_http/' --header 'Authorization: Basic YWRtaW46YWRtaW4='
```

Creating a job for running ping_mngmt_commands_http with 30 seconds of sleep time:

```
  "args": ["--sleep", 30],
}
```

(continues on next page)
"kwargs": {},
"autostart": false
}

Response:

```json
{
  "success": true,
  "error": null,
  "data": {
    "id": 8,
    "command": "ping_mngmt_commands_http",
    "app_name": "geonode.management_commands_http",
    "user": 1000,
    "status": "CREATED",
    "created_at": "2021-10-08T18:25:045.752Z",
    "start_time": null,
    "end_time": null,
    "args": [
      "--sleep",
      30
    ],
    "kwargs": {},
    "celery_result_id": null,
    "output_message": null
  }
}
```

Note: Alternatively you can omit the jobs part of the url to create a job. (Using `http://<your_geonode_host>/api/v2/management/commands/ping_mngmt_commands_http/` as url)

**Start/Stop actions**

To start the created job:

```bash
curl --location --request PATCH 'http://<your_geonode_host>/api/v2/management/jobs/8/start' --header 'Authorization: Basic YWRtaW46YWRtaW4='
```

Response:

```json
{
  "success": true,
  "error": null,
  "data": {
    "id": 8,
    "command": "ping_mngmt_commands_http",
    "app_name": "geonode.management_commands_http",
    "user": 1000,
    "status": "QUEUED",
    "created_at": "2021-10-08T18:25:045.752Z",
```
"start_time": null,
"end_time": null,
"args": [  
  "--sleep",
  30
],
"kwars": {},
"celery_result_id": null,
"output_message": null
}

Note: During execution the job can be interrupted using the following call:

```
```

Note that the status changed from **CREATED** to **QUEUED**, during execution it will be **STARTED** and at the end **FINISHED**.

### Jobs list and status

You can verify your job status and details with the following call:

```
curl --location --request GET http://<your_geonode_host>/api/v2/management/jobs/8/ →status/ --header 'Authorization: Basic YWRtaW46YWRtaW4='
```

Response:

```
{
  "id": 8,
  "command": "ping_mngmt_commands_http",
  "app_name": "geonode.management_commands_http",
  "user": 1000,
  "status": "FINISHED",
  "created_at": "2021-10-08T18:17:25.045752Z",
  "start_time": "2021-10-08T18:20:02.761475Z",
  "end_time": "2021-10-08T18:20:32.802007Z",
  "args": [  
    "--sleep",
    30
  ],
  "kwars": {},
  "celery_result_id": "fe7359a6-5f8c-47bf-859a-84351b5ed80c",
  "output_message": "Sleeping for 30.0 seconds...
pong",
  "celery_task_meta": {
    "date_done": "2021-10-08T18:20:32.810649Z",
    "status": "SUCCESS",
    "traceback": null,
    "worker": "worker1@4f641ffa9c0b"
  }
}
```
When running multiple jobs and to audit already ran jobs. A list of jobs can be retrieved using the following call:

```
curl --location --request GET 'http://<your_geonode_host>/api/v2/management/jobs/' --
--header 'Authorization: Basic YWRtaW46YWRtaW4='
```

Response:

```
{
    "links": {
        "next": null,
        "previous": null
    },
    "total": 1,
    "page": 1,
    "page_size": 10,
    "data": [
        {
            "id": 1,
            "command": "ping_mngmt_commands_http",
            "app_name": "geonode.management_commands_http",
            "user": 1000,
            "status": "FINISHED",
            "created_at": "2021-10-08T18:17:25.045752Z"
        }
    ]
}
```

Note: This list can be filtered by the fields “celery_result_id”, “command”, “app_name”, “status”, “user” and “user__username”.

### 1.26 Changing the default Languages

#### 1.26.1 Changing the Default Language

GeoNode’s default language is English, but GeoNode users can change the interface language with the pulldown menu at the top-right of most GeoNode pages. Once a user selects a language GeoNode remembers that language for subsequent pages.
1.26.2 GeoNode Configuration

As root edit the geonode config file /home/geonode/geonode/geonode/settings.py (or /etc/geonode/
settings.py if GeoNode has been installed using apt-get) and change LANGUAGE_CODE to the desired default lan-
guage.

Note: A list of language codes can be found in the global django config file /usr/local/lib/
python2.7/dist-packages/django/conf/global_settings.py (or /var/lib/geonode/lib/python2.7/
site-packages/django/conf/global_settings.py if GeoNode has been installed using apt-get).

For example, to make French the default language use:

```
LANGUAGE_CODE = 'fr'
```

Unfortunately Django overrides this setting, giving the language setting of a user’s browser priority. For example,
if LANGUAGE_CODE is set to French, but the user has configured their operating system for Spanish they may see the
Spanish version when they first visit GeoNode.

1.26.3 Additional Steps

If this is not the desired behaviour, and all users should initially see the default LANGUAGE_CODE, regardless of their
browser’s settings, do the following steps to ensure Django ignores the browser language settings. (Users can always
use the pulldown language menu to change the language at any time.)

As root create a new directory within GeoNode’s site packages

```
mkdir /usr/lib/python2.7/dist-packages/setmydefaultlanguage
```
or

```
mkdir /var/lib/geonode/lib/python2.7/site-packages/setmydefaultlanguage
```

if GeoNode has been installed using apt-get.

As root create and edit a new file /usr/lib/python2.7/dist-packages/setmydefaultlanguage/__init__.py
and add the following lines

```
class ForceDefaultLanguageMiddleware(object):
    """
    Ignore Accept-Language HTTP headers
    This will force the I18N machinery to always choose settings.LANGUAGE_CODE
    as the default initial language, unless another one is set via sessions or cookies
    Should be installed *before* any middleware that checks request.META['HTTP_ACCEPT_...
    """
    
def process_request(self, request):
        if request.META.has_key('HTTP_ACCEPT_LANGUAGE'):
            del request.META['HTTP_ACCEPT_LANGUAGE']
```

1.26. Changing the default Languages
At the end of the GeoNode configuration file /home/geonode/geonode/geonode/settings.py (or /etc/geonode/settings.py if GeoNode has been installed using `apt-get`) add the following lines to ensure the above class is executed:

```python
MIDDLEWARE_CLASSES += (
    'setmydefaultlanguage.SetDefaultLanguageMiddleware',
)
```

### 1.26.4 Restart

You will need to restart GeoNode accordingly to the installation method you have chosen.

As an instance in case you are using **NGINX** with **UWSGI**, as root you will need to run the following commands:

```
service uwsgi restart
service nginx restart
```

Please refer to Translating GeoNode for information on editing GeoNode pages in different languages and create new GeoNode Translations.

### 1.27 GeoNode Upgrade from older versions

#### 1.27.1 Upgrade from 3.2.x / 3.3.x

1. Upgrade the dependencies
2. Perform the migrations management command; in case some attribute is conflicting, remove it manually from the DB
3. Perform the `collectstatic` management command

**Upgrade the instance dependencies**

Check the 1. Install the dependencies and 2. GeoNode Installation sections in order to upgrade your Python environment.

Also, make sure the code is Python 3.8 compatible and that you switched and aligned the source code and the `requirements.txt` to the master branch.

This must be done manually and with particular attention.

```
workon <project environment>
cd <project_name>
pip install -r requirements.txt

cd /<full_path_to_geonode>
pip install pip --upgrade
pip install -r requirements.txt --upgrade
pip install -e . --upgrade
pip install pygdal=="gdal-config --version\.*"
./manage.sh collectstatic --noinput
```
Run GeoNode migrations

Activate your GeoNode virtualenv and set the env vars:

```
. env/bin/Activate
export vars_210
```

Here are the variables to export - update them to your environment settings:

```
export DATABASE_URL=postgis://user:***@localhost:5432/dbname
export DEFAULT_BACKEND_DATASTORE=data
export GEODATABASE_URL=postgis://user:***@localhost:5432/geonode_data
export ALLOWED_HOSTS=['localhost', '192.168.100.10']
export STATIC_ROOT=~/www/geonode/static/
export GEOSERVER_LOCATION=http://localhost:8080/geoserver/
export GEOSERVER_PUBLIC_LOCATION=http://localhost:8080/geoserver/
export GEOSERVER_ADMIN_PASSWORD=geoserver
export SESSION_EXPIRED_CONTROL_ENABLED=False
```

Apply migrations and apply basic fixtures:

```
./manage.py migrate --fake-initial
paver sync
```

**Note:** Incase of an error of `django.db.utils.ProgrammingError: column “colum-name” of relation “table-name” already exists` on running migrations, you can backup the field data with the following steps.

```
./manage.sh dbshell

ALTER TABLE <table> ADD COLUMN <colum-name>_bkp varchar;
UPDATE <table> SET <colum-name>_bkp = colum-name;
ALTER TABLE <table> DROP COLUMN <colum-name>;
\q

Run migration then:

```
./manage.sh dbshell

UPDATE <table> SET <colum-name> = <colum-name>_bkp;
ALTER TABLE <table> DROP COLUMN <colum-name>_bkp;
\q
```

1.27. GeoNode Upgrade from older versions
Create superuser

To create a superuser you should drop the following constraints (they can be re-enabled if needed):

```
alter table people_profile alter column last_login drop not null;
```

```
./manage createsuperuser
```

Update Templates

Update available templates to use `{% load static %}` instead of `{% load staticfiles %}`

1.28 GeoNode Async Signals

1.28.1 Supervisord and Systemd

1.28.2 Celery

1.28.3 Rabbitmq and Redis

1.28.4 How to: Async Upload via API

In geonode it is possible to upload resources via API in async/sync way.

Here is available a full example of upload via API: https://github.com/GeoNode/geonode/blob/582d6efda74adb8042d1d897004bbf764e6e0285/geonode/upload/api/tests.py#L416

**Step 1**

Create a common client session, this is fundamental due the fact that geonode will check the request session. For example with requests we will do something like:

```
import requests
client = requests.session()
```

Note: in Django this part is already managed

**Step 2**

Call the `api/v2/uploads/upload` endpoint in PUT (is a form-data endpoint) by specifying in files a dictionary with the names and the files that we want to uploads and a data payload with the required informations. For example:

```
params = {
    "permissions": '{"users": {"AnonymousUser": ["view_resourcebase"], "groups":{}}}',
    # layer permissions
    "time": "false",
    "layer_title": "layer_title",
    "time": "false",
    "charset": "UTF-8",
```

(continues on next page)
files = {
    "filename":<_io.BufferedReader name="filename">}
}

client.put(
    auth=HTTPBasicAuth(username, password),
    data=params,
    files=files,
)

Returns:
- dict with import id of the resource

Step 3

Call in the final upload page in order to trigger the actual import. If correctly set, GeoServer will manage the upload asynchronously.

```python
client.get("http://localhost:8000/upload/final?id={import_id}")
```

The `import_id` is returned from the previous step

Step 4

The upload has been completed on GeoNode, we should check until GeoServer has completed its part. To do so, is enough to call the detailed information about the upload that we are performing.

```python
client.get(f"http://localhost:8000/api/v2/uploads/{upload_id}")
```

When the status is `PROCESSED` and the completion is 100% we are able to see the resource in geonode and geoserver

1.29 GeoNode Add a thesaurus

1.29.1 Introduction

GeoNode can import a thesaurus (or multiple thesauri) in order to index resources against subject terms or keywords. Thesauri can be managed manually in the admin panel, or imported as SKOS RDF using either the admin panel or the command-line:
1.29.2 Upload via the Admin panel

Navigate to the thesaurus page in the admin panel http://<your_geonode_host>/admin/base/thesaurus. On the top-right of the page a button named *Upload thesaurus* will be available:

After clicking on it, a simple form for the upload will be shown which will allow you to select your desired RDF file:

By clicking on *Upload RDF*, the system will load the thesaurus and assign it a “slugified” name based on the file name. The name can be easily change later in the edit page.

If everything goes fine, a success message will be shown:

Otherwise the UI will show the error message:

1.29.3 Import via the `load_thesaurus` command

A thesaurus can also be loaded into GeoNode by using the `load_thesaurus` management command:

```
python manage.py load_thesaurus --help
```

```
-d, --dry-run          Only parse and print the thesaurus file, without perform insertion in the DB.
--name=NAME            Identifier name for the thesaurus in this GeoNode instance.
--file=FILE            Full path to a thesaurus in RDF format.
```

For example, in order add the INSPIRE Spatial Data Themes thesaurus into a GeoNode instance, download it as file *inspire-theme.rdf* with the command:

and then issue the command:

```
python manage.py load_thesaurus --file inspire-theme.rdf --name inspire_themes
```

The **name** is the identifier you’ll use to refer to this thesaurus in your GeoNode instance.

If you only want to make sure that a thesaurus file will be properly parsed, give the `--dry-run` parameter, so that nothing will be added to the DB.

*Note:* if the **name** starts with the string **fake**, the file will not be accessed at all, and some test keywords will be added to a fake new thesaurus. In this case the `dry-run` param will not be used.

### 1.29.4 Configure a thesaurus in GeoNode

#### Configuration from Admin

After you loaded a thesaurus into GeoNode, it should be configured in the **Admin** panel.

The panel can be reached from **Admin** link of the **User Menu** in the navigation bar or through this URL: `http://<your_geonode_host>/admin/base/thesaurus`

Once you are on the Thesaurus lists, select one thesaurus to open the Edit page

- **identifier**: (mandatory string) the identifier you used in the `load_thesaurus` commands.
- **title**: (mandatory string) The title of the thesaurus, set initially by the `load_thesaurus` command.
- **date**: (mandatory date) The Date of the thesaurus, set initially by the `load_thesaurus` command.
- **description**: (mandatory string) The description of the thesaurus, set initially by the `load_thesaurus` command.
- **slug**: (mandatory string) The slug of the thesaurus, set initially by the `load_thesaurus` command.
- **about**: (optional string) The about of the thesaurus, set initially by the `load_thesaurus` command.
- **card_min**: (optional integer) The minimum cardinality, default = 0
- **card_max**: (optional integer) The maximum cardinality, default = -1
- **facet**: (boolean) Decide if the thesaurus will be shown in the facet list, default: True
- **order**: (integer) Decide the listing order of the thesaurus in the facet list and in the metadata editor, default: 0, asc order from 0 to N

Cardinality:
Change thesaurus

<table>
<thead>
<tr>
<th>Identifier</th>
<th>thesaurus_unique_identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Thesaurus Title</td>
</tr>
<tr>
<td>Data</td>
<td>2010-05-23T00:25:55</td>
</tr>
<tr>
<td>Description</td>
<td>Thesaurus description</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Slug</th>
<th>slug</th>
</tr>
</thead>
<tbody>
<tr>
<td>About</td>
<td><a href="http://about-thesaurus.com">http://about-thesaurus.com</a></td>
</tr>
</tbody>
</table>

| Card min | 1 |
| Card max | 0 |

Fig. 307: *The GeoNode Thesaurus edit Interface*

- \( \text{card}_\text{max}=0 \rightarrow \) Disabled, The Thesaurus will not appear in the GUI
- \( \text{card}_\text{max}=1 \& \text{card}_\text{min}=0 \rightarrow \) Single choice, optional.
- \( \text{card}_\text{max}=1 \& \text{card}_\text{min}=1 \rightarrow \) Single choice, required
- \( \text{card}_\text{max}=-1 \& \text{card}_\text{min}=0 \rightarrow \) \([0..N]\) Multiple choices, optional
- \( \text{card}_\text{max}=-1 \& \text{card}_\text{min}=1 \rightarrow \) \([1..N]\) Multiple choices, required

After the setup, in *Editing Tools -> Metadata -> Wizard* the thesaurus block will be shown like the following image:

**Thesaurus with multiple choices**

\( \times \text{keyword1} \times \text{keyword2} \)

**Thesaurus with single choice**

\( \text{keyword} \)

Fig. 308: *The metadata interface with the Thesaurus enabled*
Configuration via settings.py

**Warning:** Deprecated The Thesaurus configuration via settings is deprecated, will be removed in the future.

After you loaded a thesaurus into GeoNode, it should be configured in the settings.py file (or in the local_settings) in this way:

```python
THESAURUS = {'name': 'THESAURUS NAME', 'required': True|False, 'filter': True|False,}
```

- **name**: (mandatory string) the identifier you used in the load_thesaurus commands.
- **required**: (optional boolean) if True, a keyword of this thesaurus is mandatory to complete the metadata. 
  *Currently not implemented.*
- **filter**: (optional boolean) if True, a faceted list of keywords of this thesaurus will be presented on the search page.

So, in order to set up the INSPIRE themes thesaurus you may set the THESAURUS value as:

```python
THESAURUS = {'name': 'inspire_themes', 'required': True, 'filter': True}
```

### 1.29.5 Apply a thesaurus to a resource

After you’ve finished the setup you should find a new input widget in each resource metadata wizard allowing you to choose a thesaurus for your resource.

After applying a thesaurus to resources those should be listed in the filter section in GeoNode’s resource list views:

- Atmospheric conditions
- Coordinate reference syst...
- Sea regions

### 1.29.6 Exporting a thesaurus as RDF via the dump_thesaurus command

GeoNode thesauri can be exported as RDF using the dump_thesaurus command:

```bash
python manage.py dump_thesaurus --help
```

- `-n NAME, --name NAME` Dump the thesaurus with the given name
- `-f FORMAT, --format FORMAT` Format string supported by rdflib, e.g.: `pretty-xml` (default), `json-ld, n3, nt, pretty-xml, trig, ttl, xml`

(continues on next page)
--default-lang LANG  Default language code for untagged string literals
-l, --list        List available thesauri

The --name argument refers, like the load_thesaurus command, to the thesaurus’s identifier in GeoNode, as opposed to its title. If uploaded via the admin interface this is derived automatically from its file name. Information about thesauri can be shown on the command-line using dump_thesaurus with just the --list option.

1.30  Participate in the Discussion

1.30.1 Join the community, ask for help or report bugs

In case of general questions the GeoNode Community is present at following channels

  • User Mailing List: https://lists.osgeo.org/cgi-bin/mailman/listinfo/geonode-users
  • Developer Mailing List: https://lists.osgeo.org/cgi-bin/mailman/listinfo/geonode-devel
  • Gitter Chat: https://gitter.im/GeoNode/general

For reporting bugs please open a ticket at Github issues:

  • https://github.com/GeoNode/geonode/issues

1.31  Write Documentation

1.31.1 How to contribute to GeoNode’s Documentation

If you feel like adding or changing something in the GeoNode documentation you are very welcome to do so. The documentation always needs improvement as the development of the software is going quite fast.

To contribute to the GeoNode documentation you should:

  • Read the GeoServer Style Guidelines
  • Create an account on GitHub
  • Fork the GeoNode repository
  • Edit the files
  • Submit pull requests

All these things can generally be done within your browser, you won’t need to download anything. However, if you need to add images or planning bigger changes working locally is recommended.
Style Guidelines

While we do not have strict rules for writing docs, we encourage you to read GeoServer Style Guidelines before you start writing: https://docs.geoserver.org/latest/en/docguide/style.html

Create an account on GitHub

The first step is to create an account on GitHub. Just go to Github, find a username that suits you, enter your email and a password and hit Sign up for GitHub. After you’ve signed in, visit the geonode_documentation repository https://github.com/geonode/documentation.

Fork the documentation repository

In order to make changes, you first have to fork the repository. On the top right of the website, you will find a button named “fork” to do so.

If you want to read more about forking please visit the official GitHub docs: https://help.github.com/articles/fork-a-repo.

Edit files on Github

For smaller changes you can use the GitHub website. Navigate your Browser to your forked repository. To make changes to files, navigate to the file in question and hit the edit button on the right top.

Note: The documentation is written in reStructuredText, a lightweight markup language. To learn how to use it see: https://docutils.sourceforge.net/docs/user/rst/quickref.html.

By hitting the preview button you will be able to see how your changes will look like. To save your changes, click on Commit Changes at the bottom of the site.

To ask the documentation maintainers to integrate your changes the creation of a Pull Request is needed. Therefore use the new pull request button to start the process. Find more about Pull requests at the official GitHub documentation: https://help.github.com/en/github/collaborating-with-issues-and-pull-requests/about-pull-requests.

Edit files locally

If you’re planning bigger changes on the structure of the documentation, it is advisable to make your changes locally. Further, while you can work on your master branch, it is recommended to create a dedicated branch for your changes.

Start by navigating to a folder where you like to keep your repository locally and install the needed dependencies

$ cd /opt
$ git clone https://github.com/your_documentation_repository
$ git remote add upstream https://github.com/geonode/documentation
# add the GeoNode documentation repository as "upstream" source

$ cd your_documentation_repository
$ git fetch upstream;
# get last commits from upstream

$ git merge upstream/master master

(continues on next page)
# merge the upstream with your fork
# if you like, you can also use 'git pull', which is nothing else than fetching and _merging_ in one step

$ git push
# update your repository at GitHub (origin)

Your repository should now be up to date! For more information on those commands go to https://git-scm.com/docs.

Let’s install the dependencies

$ pip install virtualenv
$ virtualenv docs_env
$ source docs_env/bin/activate
$ pip install sphinx sphinx_rtd_theme sphinx-autobuild

You can now start the sphinx development server which will serve and live-reload your docs at https://localhost:8000

$ sphinx-autobuild . _build

When finished create a build with following command

$ make html
# for a last check you can open the index.html in _build subdirectory

## Create a pull request

As with directly editing files in your browser, you will need to create a Pull request to ask for integrating your changes into the main repository.

$ git status
# will list all changed files

$ git add ...
# add the files of interest

$ git commit -m 'Fixes #1234 Updated docs for ...'
# choose a meaningful commit message

$ git push <branch>

After running these commands, navigate your browser to your GitHub repository and create a pull request as explained above.
1.32 Provide Translations

1.32.1 Contribute to Translations

Behind the scenes, GeoNode is using a software called GNU gettext further text-based translation files (django.po and djangojs.po) for translating content. If you’d like to know more about how all of this works you’ll find a full description at the Django Docs. Following will concentrate on what is needed for edit existing or contribute a new translation.

Download the translation File

All language files live in a specific subfolder called after their iso code within the locale folder. For example, for French, the main translation file called django.po can be downloaded from here.

Next, to download the language file, we need to install an OpenSource Editor called “poedit” for editing from: https://poedit.net/download

Translation process

Make a copy of the file before starting the translation so that you can revert in case of errors.

After installing ‘poedit’, you should be able to double click on the ‘.po’ file to open it. Poedit’s interface should look similar to the one shown in the picture below:
Identifying translation issues

From the ‘poedit’ menu ‘View’, make sure that ‘Entries with Errors first’ is checked:

![View menu with Entries with Errors first option highlighted]

Next click on ‘Validate Translations’ from the ‘Catalogue’ menu:

‘Poedit’ will place translations which may require additional consideration on top of the list. A warning mark means that the interpretation might be not entirely consistent with the original phrase. This is not necessarily an error, just a warning asking the user to double check.

Following to marked phrases, ‘Poedit’ will show untranslated sentences. When clicking on one, it can be translated through the bottom panel.

During translation pay special attention to the button saying ‘needs work’. In case this button is checked, the phrase will be marked as ‘fuzzy’ and ignored in GeoNode.
1.32. Provide Translations
Saving translations

As soon as the translation is complete, it must be saved and compiled. Saving is straightforward. All you have to do is clicking the ‘Save’ button from the top menu.

As a last step we compile the file. Compiling the translation means to create a binary “.mo” file out of the edited “.po” file. To do so, click on “Compile to MO”.

Poedit will ask where to write the “.mo” file to, by default, this is the same folder as the edited “.po” resides in. The ‘.mo’ file can be overwritten if necessary.
Push translations to the repository

For sharing our updates, we must upload the files to GeoNode’s GitHub repository. Go to the correct file position which, in case for French is: https://github.com/GeoNode/geonode/tree/master/geonode/locale/fr/LC_MESSAGES

Click on “Upload Files”

Drag the updated files into the Upload form, and write a title/description of the changes

Click on “Create a new branch for this commit...” and then click on the green button.

The last step will create a PULL REQUEST which can be reviewed and then approved by a developer.
Activate updated translation at your server

Once the files have been pushed to GitHub, it will be necessary to update your server to respect changed files.

At this time, this can be done only by an administrator. From the server’s shell following commands need to be executed:

```
workon geonode
cd /opt/geonode
DJANGO_SETTINGS_MODULE=geonode.settings python -W ignore manage.py collectstatic --noinput
sudo service uwsgi restart
```

Texts not listed in .po files

In case you find a template output without corresponding translation you can add it as follows:

Identify the corresponding template file which is responsible for outputting the text. Add a `{% trans "TEXT" %}` tag.

Save the template file and run the following:

```
django-admin makemessages --no-location -l en -d django "html,txt,py" -i docs
django-admin makemessages --no-location -l en -d djangojs "js" -i docs -i node_modules -i lib
```

This will update the english .po file. Also to update the language which should be edited by settings the `-l fr` parameter. Continue with updating the .po file as described above.
1.33 Write Code

1.34 Frontend Development

1.34.1 Frontend development

Knowledge of handling node/npm is required.

The GeoNode frontend dependencies can be found in ./geonode/static. To manage dependencies, we recommend the use of yarn package manager (https://yarnpkg.com/lang/en).

First steps:

yarn install
Installs the required libraries to ./node_modules

yarn install <package>@version [--dev]
Installs a package with a defined version. Using --dev installs a dependency that is only available for the build process (see: package.json devDependencies).

yarn remove <package>
Removes a package.

yarn outdated
Shows version information.

yarn why <package>
Get information on why this package was installed.

For further information on how to install or use please visit the official yarn documentation.

File/Folder overview:

./static_dependencies.json
includes all dependencies associated with each file. For example all files which should be minified to assets.min.js are named as values. All files that should be copied to lib folder (for DEBUG_STATIC) are values of key other_dependencies and so on. Before you can use a dependency it has to be added to package.json by use of yarn.

./Gruntfile.js
reads the dependencies from static_dependencies.json and contains all workflows.
**geonode/static/geonode**

The ./geonode folder contains GeoNode's stylesheets and javascript files. The CSS files are generated via less. CSS files should therefore never be changed directly but it’s corresponding less file. Further this folder should never be deleted!

**geonode/static/lib**

The ./lib folder contains all the third-party files. This folder can be deleted as it will be fully generated by use of grunt.

**Example 1 – Change styling:**

1. In your settings set DEBU_STATIC=True. This will load unminified assets in your template.
2. Start the development server with paver start.
3. Use grunt watch to watch all less files for change.
4. Change styling in ./geonode/static/geonode/less
5. If our changes are as expected create a new build with grunt development (files are not minimized) or grunt production (files are minimized)

**Example 2 – add/update a new library:**

1. In your settings set DEBU_STATIC=True. This will load unminified assets in your template.
2. yarn add angular@1.7
3. `vim static_dependencies.json` Edit the file and add your dependency to its fitting destination. For example, assets.min.js
4. Check if some Django template (for example, base.html) includes the file and add it or adjust the version
5. use grunt production to build the package

For further tasks have a look at gruntfile.js or ask for help in the development mailing list

**Note:** Please make maintainers work easier and add a message to your commit why a library has been added. (For example, commit -m 'select2 added for permissions form on layer detail page')

---

### 1.35 GeoNode API

#### 1.35.1 API v2 - Schema

OpenAPI 3.0 Schema

GET /api/v2/

**Status Codes**

- 200 OK – No response body
**GET /api/v2/categories/**

API endpoint that lists categories.

**Query Parameters**

- **ordering** *(string)* – Which field to use when ordering the results.
- **page** *(integer)* – A page number within the paginated result set.
- **page_size** *(integer)* – Number of results to return per page.
- **search** *(string)* – A search term.

**Status Codes**

- **200 OK** –

**GET /api/v2/categories/{id}/**

API endpoint that lists categories.

**Parameters**

- **id** *(integer)* – A unique integer value identifying this topic category.

**Status Codes**

- **200 OK** –

**GET /api/v2/datasets/**

API endpoint that allows layers to be viewed or edited.

**Query Parameters**

- **ordering** *(string)* – Which field to use when ordering the results.
- **page** *(integer)* – A page number within the paginated result set.
- **page_size** *(integer)* – Number of results to return per page.
- **search** *(string)* – A search term.

**Status Codes**

- **200 OK** –

**PATCH /api/v2/datasets/**

API endpoint that allows layers to be viewed or edited.

**Status Codes**

- **200 OK** –

**GET /api/v2/datasets/{id}/**

API endpoint that allows layers to be viewed or edited.

**Parameters**

- **id** *(integer)* – A unique integer value identifying this dataset.

**Status Codes**

- **200 OK** –
PUT /api/v2/datasets/{id}/

Update one or more model instances.

If ENABLE_BULK_UPDATE is set, multiple previously-fetched records may be updated in a single call, provided their IDs.

If ENABLE_PATCH_ALL is set, multiple records may be updated in a single PATCH call, even without knowing their IDs.

**WARNING**: ENABLE_PATCH_ALL should be considered an advanced feature and used with caution. This feature must be enabled at the viewset level and must also be requested explicitly by the client via the “patch-all” query parameter.

This parameter can have one of the following values:

- **true (or 1)**: records will be fetched and then updated in a transaction loop
  - The *Model.save* method will be called and model signals will run
  - This can be slow if there are too many signals or many records in the query
  - This is considered the more safe and default behavior
- **query**: records will be updated in a single query
  - The *QuerySet.update* method will be called and model signals will not run
  - This will be fast, but may break data constraints that are controlled by signals
  - This is considered unsafe but useful in certain situations

The server’s successful response to a patch-all request will NOT include any individual records. Instead, the response content will contain a “meta” object with an “updated” count of updated records.

Examples:

Update many dogs by ID:

```
PATCH /dogs/ 
  [ 
    {'id': 1, 'fur': 'white'}, {'id': 2, 'fur': 'black'}, {'id': 3, 'fur': 'yellow'} 
  ]
```

Update all dogs in a query:

```
PATCH /dogs/?filter{fur.contains}=brown&patch-all=true 
  { 
    'fur': 'gold' 
  }
```

**Parameters**

- **id** (*integer*) – A unique integer value identifying this dataset.

**Status Codes**

- **200 OK** –
PATCH /dataset/[id]/ {
    '{metadata_1_name}': '{metadata_1_value}', '{metadata_n_name}': '{metadata_n_value}'
}

Parameters
- **id (integer)** – A unique integer value identifying this dataset.

Status Codes
- **200 OK** –

**GET /api/v2/datasets/[id]/[field_name]/**
Fetch related object(s), as if sideloaded (used to support link objects).

This method gets mapped to /<resource>/pk/<field_name>/ by DynamicRouter for all DynamicRelation-Field fields. Generally, this method probably shouldn’t be overridden.

An alternative implementation would be to generate reverse queries. For an exploration of that approach, see: https://gist.github.com/ryochiji/54687d675978c7d96503

Parameters
- **field_name (string)** –
- **id (integer)** – A unique integer value identifying this dataset.

Status Codes
- **200 OK** –

**GET /api/v2/datasets/[id]/maplayers/**
API endpoint allowing to retrieve the MapLayers list.

Parameters
- **id (integer)** – A unique integer value identifying this dataset.

Query Parameters
- **ordering (string)** – Which field to use when ordering the results.
- **page (integer)** – A page number within the paginated result set.
- **page_size (integer)** – Number of results to return per page.
- **search (string)** – A search term.

Status Codes
- **200 OK** –

**GET /api/v2/datasets/[id]/maps/**
API endpoint allowing to retrieve maps using the dataset.

Parameters
- **id (integer)** – A unique integer value identifying this dataset.

Query Parameters
- **ordering (string)** – Which field to use when ordering the results.
• **page** *(integer)* – A page number within the paginated result set.
• **page_size** *(integer)* – Number of results to return per page.
• **search** *(string)* – A search term.

**Status Codes**

- **200 OK** –

**GET /api/v2/documents/**

API endpoint that allows documents to be viewed or edited.

**Query Parameters**

- **ordering** *(string)* – Which field to use when ordering the results.
- **page** *(integer)* – A page number within the paginated result set.
- **page_size** *(integer)* – Number of results to return per page.
- **search** *(string)* – A search term.

**Status Codes**

- **200 OK** –

**PUT /api/v2/documents/{id}/**

Update one or more model instances.

If **ENABLE_BULK_UPDATE** is set, multiple previously-fetched records may be updated in a single call, provided their IDs.

If **ENABLE_PATCH_ALL** is set, multiple records may be updated in a single PATCH call, even without knowing their IDs.
WARNING: ENABLE_PATCH_ALL should be considered an advanced feature and used with caution. This feature must be enabled at the viewset level and must also be requested explicitly by the client via the “patch-all” query parameter.

This parameter can have one of the following values:

**true (or 1): records will be fetched and then updated in a transaction loop**
- The `Model.save` method will be called and model signals will run
- This can be slow if there are too many signals or many records in the query
- This is considered the more safe and default behavior

**query: records will be updated in a single query**
- The `QuerySet.update` method will be called and model signals will not run
- This will be fast, but may break data constraints that are controlled by signals
- This is considered unsafe but useful in certain situations

The server’s successful response to a patch-all request will NOT include any individual records. Instead, the response content will contain a “meta” object with an “updated” count of updated records.

Examples:
Update one dog:
```bash
PATCH /dogs/1/ {
    'fur': 'white'
}
```

Update many dogs by ID:
```bash
PATCH /dogs/ [ { ‘id’: 1, ‘fur’: ‘white’}, {‘id’: 2, ‘fur’: ‘black’}, {‘id’: 3, ‘fur’: ‘yellow’} ]
```

Update all dogs in a query:
```bash
PATCH /dogs/?filter{fur.contains}=brown&patch-all=true { ‘fur’: ‘gold’ }
```

**Parameters**
- `id (integer)` – A unique integer value identifying this document.

**Status Codes**
- 200 OK –
GET /api/v2/documents/{id}/linked_resources/

API endpoint allowing to retrieve the DocumentResourceLink(s).

Parameters

- **id** (integer) – A unique integer value identifying this document.

Query Parameters

- **ordering** (string) – Which field to use when ordering the results.
- **page** (integer) – A page number within the paginated result set.
- **page_size** (integer) – Number of results to return per page.
- **search** (string) – A search term.

Status Codes

- **200 OK** –

GET /api/v2/geoapps/

API endpoint that allows geoapps to be viewed or edited.

Query Parameters

- **ordering** (string) – Which field to use when ordering the results.
- **page** (integer) – A page number within the paginated result set.
- **page_size** (integer) – Number of results to return per page.
- **search** (string) – A search term.

Status Codes

- **200 OK** –

POST /api/v2/geoapps/

Either create a single or many model instances in bulk using the Serializer’s many=True ability from Django REST >= 2.2.5.

The data can be represented by the serializer name (single or plural forms), dict or list.

Examples:

POST /dogs/ {
    “name”: “Fido”, “age”: 2
}

POST /dogs/ {
    “dog”: {
        “name”: “Lucky”, “age”: 3
    }
}

POST /dogs/ {
    “dogs”: [
        {“name”: “Fido”, “age”: 2}, {“name”: “Lucky”, “age”: 3}
    ]
}
POST /dogs/ [ 
  {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3} 
] 

Status Codes
• 201 Created – 

PATCH /api/v2/geoapps/
API endpoint that allows geoapps to be viewed or edited.

Status Codes
• 200 OK – 

GET /api/v2/geoapps/{id}/
API endpoint that allows geoapps to be viewed or edited.

Parameters
• id (integer) – A unique integer value identifying this geo app.

Status Codes
• 200 OK – 

PUT /api/v2/geoapps/{id}/
Update one or more model instances.

If ENABLE_BULK_UPDATE is set, multiple previously-fetched records may be updated in a single call, provided their IDs.

If ENABLE_PATCH_ALL is set, multiple records may be updated in a single PATCH call, even without knowing their IDs.

WARNING: ENABLE_PATCH_ALL should be considered an advanced feature and used with caution. This feature must be enabled at the viewset level and must also be requested explicitly by the client via the “patch-all” query parameter.

This parameter can have one of the following values:

true (or 1): records will be fetched and then updated in a transaction loop
• The Model.save method will be called and model signals will run
• This can be slow if there are too many signals or many records in the query
• This is considered the more safe and default behavior

query: records will be updated in a single query
• The QuerySet.update method will be called and model signals will not run
• This will be fast, but may break data constraints that are controlled by signals
• This is considered unsafe but useful in certain situations

The server’s successful response to a patch-all request will NOT include any individual records. Instead, the response content will contain a “meta” object with an “updated” count of updated records.

Examples:
Update one dog:
PATCH /dogs/1/ {
    'fur': 'white'
}

Update many dogs by ID:

PATCH /dogs/ [
    {'id': 1, 'fur': 'white'}, {'id': 2, 'fur': 'black'}, {'id': 3, 'fur': 'yellow'}
]

Update all dogs in a query:

PATCH /dogs/?filter{fur.contains}=brown&patch-all=true {
    'fur': 'gold'
}

Parameters

- **id (integer)** – A unique integer value identifying this geo app.

Status Codes

- **200 OK** –

PATCH /api/v2/geoapps/{id}/

API endpoint that allows geoapps to be viewed or edited.

Parameters

- **id (integer)** – A unique integer value identifying this geo app.

Status Codes

- **200 OK** –

GET /api/v2/geoapps/{id}/{field_name}/

Fetch related object(s), as if sideloaded (used to support link objects).

This method gets mapped to /<resource>/<pk>/<field_name>/ by DynamicRouter for all DynamicRelation-Field fields. Generally, this method probably shouldn’t be overridden. An alternative implementation would be to generate reverse queries. For an exploration of that approach, see:

https://gist.github.com/ryochiji/54687d675978c7d96503

Parameters

- **field_name (string)** –
- **id (integer)** – A unique integer value identifying this geo app.

Status Codes

- **200 OK** –

GET /api/v2/groups/

API endpoint that allows groups to be viewed or edited.

Query Parameters

- **ordering (string)** – Which field to use when ordering the results.
• **page** (*integer*) – A page number within the paginated result set.
• **page_size** (*integer*) – Number of results to return per page.
• **search** (*string*) – A search term.

**Status Codes**

• **200 OK** –

**POST /api/v2/groups/**

Either create a single or many model instances in bulk using the Serializer’s many=True ability from Django REST >= 2.2.5.

The data can be represented by the serializer name (single or plural forms), dict or list.

Examples:

```json
POST /dogs/ {
   "name": "Fido", "age": 2
}
POST /dogs/ {
   "dog": {
      "name": "Lucky", "age": 3
   }
}
POST /dogs/ {
   "dogs": [
      {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3}
   ]
}
POST /dogs/ {
   {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3}
}
```

**Status Codes**

• **201 Created** –

**PATCH /api/v2/groups/**

API endpoint that allows groups to be viewed or edited.

**Status Codes**

• **200 OK** –

**DELETE /api/v2/groups/**

Either delete a single or many model instances in bulk

DELETE /dogs/ {
   "dogs": [
      {"id": 1}, {"id": 2}
   ]
}
DELETE /dogs/ [ {“id”: 1}, {“id”: 2} ]

Status Codes
• 204 No Content – No response body

GET /api/v2/groups/{id}/
API endpoint that allows groups to be viewed or edited.

Parameters
• id (integer) – A unique integer value identifying this group profile.

Status Codes
• 200 OK –

PUT /api/v2/groups/{id}/
Update one or more model instances.

If ENABLE_BULK_UPDATE is set, multiple previously-fetched records may be updated in a single call, pro-
vided their IDs.

If ENABLE_PATCH_ALL is set, multiple records may be updated in a single PATCH call, even without knowing
their IDs.

WARNING: ENABLE_PATCH_ALL should be considered an advanced feature and used with caution. This
feature must be enabled at the viewset level and must also be requested explicitly by the client via the “patch-all”
query parameter.

This parameter can have one of the following values:

true (or 1): records will be fetched and then updated in a transaction loop
• The Model.save method will be called and model signals will run
• This can be slow if there are too many signals or many records in the query
• This is considered the more safe and default behavior

query: records will be updated in a single query
• The QuerySet.update method will be called and model signals will not run
• This will be fast, but may break data constraints that are controlled by signals
• This is considered unsafe but useful in certain situations

The server’s successful response to a patch-all request will NOT include any individual records. Instead, the
response content will contain a “meta” object with an “updated” count of updated records.

Examples:
Update one dog:

PATCH /dogs/1/ {
  ‘fur’: ‘white’
}

Update many dogs by ID:
PATCH /dogs/ [
    {'id': 1, 'fur': 'white'}, {'id': 2, 'fur': 'black'}, {'id': 3, 'fur': 'yellow'}
]

Update all dogs in a query:
PATCH /dogs/?filter{fur.contains}=brown&patch-all=true {
    'fur': 'gold'
}

Parameters
- **id** (integer) – A unique integer value identifying this group profile.

Status Codes
- **200 OK** –

PATCH /api/v2/groups/{id}/

API endpoint that allows groups to be viewed or edited.

Parameters
- **id** (integer) – A unique integer value identifying this group profile.

Status Codes
- **200 OK** –

DELETE /api/v2/groups/{id}/

Either delete a single or many model instances in bulk

DELETE /dogs/ {
    “dogs”: [
        {“id”: 1}, {“id”: 2}
    ]
}

DELETE /dogs/ [
    {“id”: 1}, {“id”: 2}
]

Parameters
- **id** (integer) – A unique integer value identifying this group profile.

Status Codes
- **204 No Content** – No response body

GET /api/v2/groups/{id}/managers/

API endpoint allowing to retrieve the Group managers.

Parameters
- **id** (integer) – A unique integer value identifying this group profile.

Query Parameters
• **ordering** *(string)* – Which field to use when ordering the results.
• **page** *(integer)* – A page number within the paginated result set.
• **page_size** *(integer)* – Number of results to return per page.
• **search** *(string)* – A search term.

Status Codes

• **200 OK** –

**GET /api/v2/groups/{id}/members/**
API endpoint allowing to retrieve the Group members.

Parameters

• **id** *(integer)* – A unique integer value identifying this group profile.

Query Parameters

• **ordering** *(string)* – Which field to use when ordering the results.
• **page** *(integer)* – A page number within the paginated result set.
• **page_size** *(integer)* – Number of results to return per page.
• **search** *(string)* – A search term.

Status Codes

• **200 OK** –

**GET /api/v2/groups/{id}/resources/**
API endpoint allowing to retrieve the Group specific resources.

Parameters

• **id** *(integer)* – A unique integer value identifying this group profile.

Query Parameters

• **ordering** *(string)* – Which field to use when ordering the results.
• **page** *(integer)* – A page number within the paginated result set.
• **page_size** *(integer)* – Number of results to return per page.
• **search** *(string)* – A search term.

Status Codes

• **200 OK** –

**GET /api/v2/harvesters/**
A viewset that can support dynamic API features.

Attributes:

- **features**: A list of features supported by the viewset.
- **meta**: Extra data that is added to the response by the DynamicRenderer.

Query Parameters

• **ordering** *(string)* – Which field to use when ordering the results.
• **page** *(integer)* – A page number within the paginated result set.
• **page_size** *(integer)* – Number of results to return per page.
Status Codes

- **200 OK** –

**POST /api/v2/harvesters/**

Either create a single or many model instances in bulk using the Serializer’s many=True ability from Django REST >= 2.2.5.

The data can be represented by the serializer name (single or plural forms), dict or list.

Examples:

POST /dogs/ {
    "name": "Fido", "age": 2
}

POST /dogs/ {
    "dog": {
        "name": "Lucky", "age": 3
    }
}

POST /dogs/ {
    "dogs": [
        {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3}
    ]
}

POST /dogs/ {
    {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3}
}

Status Codes

- **201 Created** –

**GET /api/v2/harvesters/{harvester_id}/harvestable-resources/**

Adds the `update_list` method to a viewset

`update_list` is used by `api.routers.ListPatchRouter` in order to allow performing PATCH requests against a viewset’s `list` endpoint

Parameters

- **harvester_id (integer)** –

Status Codes

- **200 OK** – No response body

**PATCH /api/v2/harvesters/{harvester_id}/harvestable-resources/**

Adds the `update_list` method to a viewset

`update_list` is used by `api.routers.ListPatchRouter` in order to allow performing PATCH requests against a viewset’s `list` endpoint

Parameters
- **harvester_id** *(integer)* –

**Status Codes**
- **200 OK** – No response body

**GET** /api/v2/harvesters/{id}/

A viewset that can support dynamic API features.

**Attributes:**
- `features`: A list of features supported by the viewset.
- `meta`: Extra data that is added to the response by the DynamicRenderer.

**Parameters**
- **id** *(integer)* – A unique integer value identifying this harvester.

**PUT** /api/v2/harvesters/{id}/

Update one or more model instances.

If ENABLE_BULK_UPDATE is set, multiple previously-fetched records may be updated in a single call, provided their IDs.

If ENABLE_PATCH_ALL is set, multiple records may be updated in a single PATCH call, even without knowing their IDs.

**WARNING**: ENABLE_PATCH_ALL should be considered an advanced feature and used with caution. This feature must be enabled at the viewset level and must also be requested explicitly by the client via the “patch-all” query parameter.

This parameter can have one of the following values:

**true (or 1): records will be fetched and then updated in a transaction loop**
- The `Model.save` method will be called and model signals will run
- This can be slow if there are too many signals or many records in the query
- This is considered the more safe and default behavior

**query: records will be updated in a single query**
- The `QuerySet.update` method will be called and model signals will not run
- This will be fast, but may break data constraints that are controlled by signals
- This is considered unsafe but useful in certain situations

The server’s successful response to a patch-all request will NOT include any individual records. Instead, the response content will contain a “meta” object with an “updated” count of updated records.

**Examples:**

Update one dog:

```
PATCH /dogs/1/ {
    'fur': 'white'
}
```

Update many dogs by ID:
PATCH /dogs/ [  
  {'id': 1, 'fur': 'white'}, {'id': 2, 'fur': 'black'}, {'id': 3, 'fur': 'yellow'}  
]

Update all dogs in a query:
  PATCH /dogs/?filter{fur.contains}=brown&patch-all=true {  
    'fur': 'gold'  
  }

Parameters
  • **id** *(integer)* – A unique integer value identifying this harvester.

Status Codes
  • 200 OK –

PATCH /api/v2/harvesters/{id}/
  A viewset that can support dynamic API features.

Attributes:
  features: A list of features supported by the viewset. meta: Extra data that is added to the response by the DynamicRenderer.

Parameters
  • **id** *(integer)* – A unique integer value identifying this harvester.

Status Codes
  • 200 OK –

DELETE /api/v2/harvesters/{id}/
  Either delete a single or many model instances in bulk
  DELETE /dogs/ [   
    “dogs”: [      
      {“id”: 1}, {“id”: 2}    
    ]  
  ]
  DELETE /dogs/ [   
    {“id”: 1}, {“id”: 2}  
  ]

Parameters
  • **id** *(integer)* – A unique integer value identifying this harvester.

Status Codes
  • 204 No Content – No response body
GET /api/v2/harvesting-sessions/
A viewset that can support dynamic API features.

Attributes:
  features: A list of features supported by the viewset. meta: Extra data that is added to the response by the DynamicRenderer.

Query Parameters
  • ordering (string) – Which field to use when ordering the results.
  • page (integer) – A page number within the paginated result set.
  • page_size (integer) – Number of results to return per page.

Status Codes
  • 200 OK –

GET /api/v2/harvesting-sessions/{id}/
A viewset that can support dynamic API features.

Attributes:
  features: A list of features supported by the viewset. meta: Extra data that is added to the response by the DynamicRenderer.

Parameters
  • id (integer) – A unique integer value identifying this asynchronous harvesting session.

Status Codes
  • 200 OK –

GET /api/v2/keywords/
API endpoint that lists hierarchical keywords.

Query Parameters
  • ordering (string) – Which field to use when ordering the results.
  • page (integer) – A page number within the paginated result set.
  • page_size (integer) – Number of results to return per page.
  • search (string) – A search term.

Status Codes
  • 200 OK –

GET /api/v2/keywords/{id}/
API endpoint that lists hierarchical keywords.

Parameters
  • id (integer) – A unique integer value identifying this hierarchical keyword.

Status Codes
  • 200 OK –
GET /api/v2/management/commands/

Handle the exposed management commands usage:

• GET: List of exposed commands
• GET detail: Help for a specific command
• POST: Create a job (and automatic runs) for a specific command.

Status Codes
• 200 OK –

POST /api/v2/management/commands/

Creates and runs a management command job. Expects application/json content type in a following shape: {
    “args”: [<arg1>, <arg2>], “kwargs”: {<key1>: <val1>, <key2>: <val2>}, “autostart”: bool
} By default, autostart is set to true.

Status Codes
• 200 OK –

GET /api/v2/management/commands/{cmd_name}/

Handle the exposed management commands usage:

• GET: List of exposed commands
• GET detail: Help for a specific command
• POST: Create a job (and automatic runs) for a specific command.

Parameters
• cmd_name (string) –

Status Codes
• 200 OK –

POST /api/v2/management/commands/{cmd_name}/

Creates and runs a management command job. Expects application/json content type in a following shape: {
    “args”: [<arg1>, <arg2>], “kwargs”: {<key1>: <val1>, <key2>: <val2>}, “autostart”: bool
} By default, autostart is set to true.

Parameters
• cmd_name (string) –

Status Codes
• 200 OK –

GET /api/v2/management/commands/{cmd_name}/jobs/

Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters
• cmd_name (string) –

Query Parameters
• `app_name`(string) –
• `celery_result_id`(string) –
• `command`(string) –
• `page`(integer) – A page number within the paginated result set.
• `page_size`(integer) – Number of results to return per page.
• `status`(string) –
• `user`(integer) –
• `user__username`(string) –

Status Codes

• 200 OK –

**POST** /api/v2/management/commands/{cmd_name}/jobs/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters

• `cmd_name`(string) –

Status Codes

• 201 Created –

**GET** /api/v2/management/commands/{cmd_name}/jobs/{id}/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters

• `cmd_name`(string) –
• `id`(integer) – A unique integer value identifying this management command job.

Status Codes

• 200 OK –

**PATCH** /api/v2/management/commands/{cmd_name}/jobs/{id}/start/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters

• `cmd_name`(string) –
• `id`(integer) – A unique integer value identifying this management command job.

Status Codes

• 200 OK –

**GET** /api/v2/management/commands/{cmd_name}/jobs/{id}/status/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters

• `cmd_name`(string) –
• `id`(integer) – A unique integer value identifying this management command job.

Status Codes

• 200 OK –
PATCH /api/v2/management/commands/{cmd_name}/jobs/{id}/stop/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters

- **cmd_name** (string) –
- **id** (integer) – A unique integer value identifying this management command job.

Status Codes

- **200 OK** –

GET /api/v2/management/jobs/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Query Parameters

- **app_name** (string) –
- **celery_result_id** (string) –
- **command** (string) –
- **page** (integer) – A page number within the paginated result set.
- **page_size** (integer) – Number of results to return per page.
- **status** (string) –
- **user** (integer) –
- **user__username** (string) –

Status Codes

- **200 OK** –

POST /api/v2/management/jobs/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Status Codes

- **201 Created** –

GET /api/v2/management/jobs/{id}/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters

- **id** (integer) – A unique integer value identifying this management command job.

Status Codes

- **200 OK** –

PATCH /api/v2/management/jobs/{id}/start/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters

- **id** (integer) – A unique integer value identifying this management command job.

Status Codes

- **200 OK** –
GET /api/v2/management/jobs/{id}/status/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters
- id (integer) – A unique integer value identifying this management command job.

Status Codes
- 200 OK –

PATCH /api/v2/management/jobs/{id}/stop/
Create, List, Retrieve, Start, Stop and Get Status of a Management Command Job.

Parameters
- id (integer) – A unique integer value identifying this management command job.

Status Codes
- 200 OK –

GET /api/v2/maps/
API endpoint that allows maps to be viewed or edited.

Query Parameters
- ordering (string) – Which field to use when ordering the results.
- page (integer) – A page number within the paginated result set.
- page_size (integer) – Number of results to return per page.
- search (string) – A search term.

Status Codes
- 200 OK –

POST /api/v2/maps/
Changes in the m2m maplayers are committed before object changes. To protect the db, this action is done within an atomic transaction.

Status Codes
- 201 Created –

PATCH /api/v2/maps/
API endpoint that allows maps to be viewed or edited.

Status Codes
- 200 OK –

GET /api/v2/maps/{id}/
API endpoint that allows maps to be viewed or edited.

Parameters
- id (integer) – A unique integer value identifying this map.

Status Codes
- 200 OK –
PUT /api/v2/maps/{id}/
Changes in the m2m maplayers are committed before object changes. To protect the db, this action is done within an atomic transaction.

Parameters
• id (integer) – A unique integer value identifying this map.

Status Codes
• 200 OK –

PATCH /api/v2/maps/{id}/
API endpoint that allows maps to be viewed or edited.

Parameters
• id (integer) – A unique integer value identifying this map.

Status Codes
• 200 OK –

GET /api/v2/maps/{id}/{field_name}/
Fetch related object(s), as if sideloaded (used to support link objects).
This method gets mapped to /<resource>/<pk>/<field_name>/ by DynamicRouter for all DynamicRelation-Field fields. Generally, this method probably shouldn't be overridden.

An alternative implementation would be to generate reverse queries. For an exploration of that approach, see: https://gist.github.com/ryochiji/54687d675978c7d96503

Parameters
• field_name (string) –
• id (integer) – A unique integer value identifying this map.

Status Codes
• 200 OK –

GET /api/v2/maps/{id}/datasets/
API endpoint allowing to retrieve the local MapLayers.

Parameters
• id (integer) – A unique integer value identifying this map.

Query Parameters
• ordering (string) – Which field to use when ordering the results.
• page (integer) – A page number within the paginated result set.
• page_size (integer) – Number of results to return per page.
• search (string) – A search term.

Status Codes
• 200 OK –
GET /api/v2/maps/{id}/maplayers/
API endpoint allowing to retrieve the MapLayers list.

Parameters
- id (integer) – A unique integer value identifying this map.

Query Parameters
- ordering (string) – Which field to use when ordering the results.
- page (integer) – A page number within the paginated result set.
- page_size (integer) – Number of results to return per page.
- search (string) – A search term.

Status Codes
- 200 OK –

GET /api/v2/owners/
API endpoint that lists all possible owners.

Query Parameters
- ordering (string) – Which field to use when ordering the results.
- page (integer) – A page number within the paginated result set.
- page_size (integer) – Number of results to return per page.
- search (string) – A search term.

Status Codes
- 200 OK –

GET /api/v2/owners/{id}/
API endpoint that lists all possible owners.

Parameters
- id (integer) – A unique integer value identifying this user.

Status Codes
- 200 OK –

GET /api/v2/regions/
API endpoint that lists regions.

Query Parameters
- ordering (string) – Which field to use when ordering the results.
- page (integer) – A page number within the paginated result set.
- page_size (integer) – Number of results to return per page.
- search (string) – A search term.

Status Codes
- 200 OK –
GET /api/v2/regions/{id}/
API endpoint that lists regions.

Parameters
- **id** *(integer)* – A unique integer value identifying this region.

Status Codes
- **200 OK** –

GET /api/v2/resource-service/execution-status/{execution_id}
Main dispatcher endpoint to follow an API request status progress

- GET input: <str: execution id>
- output: <ExecutionRequest>

Parameters
- **execution_id** *(string)* –

Status Codes
- **200 OK** – No response body

GET /api/v2/resources/
API endpoint that allows base resources to be viewed or edited.

Query Parameters
- **ordering** *(string)* – Which field to use when ordering the results.
- **page** *(integer)* – A page number within the paginated result set.
- **page_size** *(integer)* – Number of results to return per page.
- **search** *(string)* – A search term.

Status Codes
- **200 OK** –

POST /api/v2/resources/
Either create a single or many model instances in bulk using the Serializer’s many=True ability from Django REST >= 2.2.5.

The data can be represented by the serializer name (single or plural forms), dict or list.

Examples:
POST /dogs/ {
    “name”: “Fido”, “age”: 2
}

POST /dogs/ {
    “dog”: {
        “name”: “Lucky”, “age”: 3
    }
}

POST /dogs/
{
    "dogs": [
        {
            "name": "Fido", "age": 2
        },
        {
            "name": "Lucky", "age": 3
        }
    ]
}

POST /dogs/ {
    "dogs": [
        {
            "name": "Fido", "age": 2
        },
        {
            "name": "Lucky", "age": 3
        }
    ]
}

Status Codes

- 201 Created –

PATCH /api/v2/resources/
API endpoint that allows base resources to be viewed or edited.

Status Codes

- 200 OK –

DELETE /api/v2/resources/
Either delete a single or many model instances in bulk

DELETE /dogs/ {
    "dogs": [
        {
            "id": 1
        },
        {
            "id": 2
        }
    ]
}

DELETE /dogs/ {
    {
        "id": 1
    },
    {
        "id": 2
    }
}

Status Codes

- 204 No Content – No response body

GET /api/v2/resources/{id}/
API endpoint that allows base resources to be viewed or edited.

Parameters

- id (integer) – A unique integer value identifying this resource base.

Status Codes

- 200 OK –

PUT /api/v2/resources/{id}/
Update one or more model instances.

If ENABLE_BULK_UPDATE is set, multiple previously-fetched records may be updated in a single call, pro-
vided their IDs.

If ENABLE_PATCH_ALL is set, multiple records may be updated in a single PATCH call, even without knowing
their IDs.
WARNING: ENABLE_PATCH_ALL should be considered an advanced feature and used with caution. This feature must be enabled at the viewset level and must also be requested explicitly by the client via the “patch-all” query parameter.

This parameter can have one of the following values:

- **true (or 1): records will be fetched and then updated in a transaction loop**
  - The Model.save method will be called and model signals will run
  - This can be slow if there are too many signals or many records in the query
  - This is considered the more safe and default behavior

- **query: records will be updated in a single query**
  - The QuerySet.update method will be called and model signals will not run
  - This will be fast, but may break data constraints that are controlled by signals
  - This is considered unsafe but useful in certain situations

The server’s successful response to a patch-all request will NOT include any individual records. Instead, the response content will contain a “meta” object with an “updated” count of updated records.

Examples:

Update one dog:

```
PATCH /dogs/1/ {
   'fur': 'white'
}
```

Update many dogs by ID:

```
PATCH /dogs/ [{
   'id': 1, 'fur': 'white'}, {
   'id': 2, 'fur': 'black'}, {
   'id': 3, 'fur': 'yellow'}]
```

Update all dogs in a query:

```
PATCH /dogs/?filter{fur.contains}=brown&patch-all=true {
   'fur': 'gold'
}
```

**Parameters**

- **id (integer)** – A unique integer value identifying this resource base.

**Status Codes**

- **200 OK** –

**PATCH /api/v2/resources/{id}/**

API endpoint that allows base resources to be viewed or edited.

**Parameters**

- **id (integer)** – A unique integer value identifying this resource base.

**Status Codes**

- **200 OK** –
DELETE /api/v2/resources/{id}/

Either delete a single or many model instances in bulk

DELETE /dogs/ {
    “dogs”: [
    {“id”: 1}, {“id”: 2}
    ]
}
DELETE /dogs/ [
    {“id”: 1}, {“id”: 2}
]

Parameters
• id (integer) – A unique integer value identifying this resource base.

Status Codes
• 204 No Content – No response body

GET /api/v2/resources/{id}/{field_name}/

Fetch related object(s), as if sideloaded (used to support link objects).

This method gets mapped to /<resource>/<pk>/<field_name>/ by DynamicRouter for all DynamicRelation-Field fields. Generally, this method probably shouldn’t be overridden.

An alternative implementation would be to generate reverse queries. For an exploration of that approach, see:
https://gist.github.com/ryochiji/54687d675978c7d96503

Parameters
• field_name (string) –
• id (integer) – A unique integer value identifying this resource base.

Status Codes
• 200 OK –

PUT /api/v2/resources/{id}/copy/

Instructs the Async dispatcher to execute a ‘COPY’ operation over a valid ‘uuid’.

Parameters
• id (integer) – A unique integer value identifying this resource base.

Status Codes
• 200 OK –

DELETE /api/v2/resources/{id}/delete/

Instructs the Async dispatcher to execute a ‘DELETE’ operation over a valid ‘uuid’.

Parameters
• id (integer) – A unique integer value identifying this resource base.

Status Codes
• 200 OK –
GET /api/v2/resources/{id}/extra_metadata/
Get/Update/Delete/Add extra metadata for resource

Parameters
- **id** (integer) – A unique integer value identifying this resource base.

Status Codes
- **200 OK** –

POST /api/v2/resources/{id}/extra_metadata/
Get/Update/Delete/Add extra metadata for resource

Parameters
- **id** (integer) – A unique integer value identifying this resource base.

Status Codes
- **200 OK** –

PUT /api/v2/resources/{id}/extra_metadata/
Get/Update/Delete/Add extra metadata for resource

Parameters
- **id** (integer) – A unique integer value identifying this resource base.

Status Codes
- **200 OK** –

DELETE /api/v2/resources/{id}/extra_metadata/
Get/Update/Delete/Add extra metadata for resource

Parameters
- **id** (integer) – A unique integer value identifying this resource base.

Status Codes
- **204 No Content** – No response body

POST /api/v2/resources/{id}/favorite/
API endpoint allowing to retrieve the favorite Resources.

Parameters
- **id** (integer) – A unique integer value identifying this resource base.

Query Parameters
- **ordering** (string) – Which field to use when ordering the results.
- **page** (integer) – A page number within the paginated result set.
- **page_size** (integer) – Number of results to return per page.
- **search** (string) – A search term.

Status Codes
- **200 OK** –
DELETE /api/v2/resources/{id}/favorite/

API endpoint allowing to retrieve the favorite Resources.

Parameters

- **id (integer)** – A unique integer value identifying this resource base.

Query Parameters

- **ordering (string)** – Which field to use when ordering the results.
- **page (integer)** – A page number within the paginated result set.
- **page_size (integer)** – Number of results to return per page.
- **search (string)** – A search term.

Status Codes

- **200 OK** –

GET /api/v2/resources/{id}/permissions/

Sets an object’s the permission levels based on the perm_spec JSON.

the mapping looks like:

```

`users`: {
    'AnonymousUser': ['view'], <username>: ['perm1','perm2','perm3'], <username2>: ['perm1','perm2','perm3']...
}, 'groups': {
    <groupname>: ['perm1','perm2','perm3'], <groupname2>: ['perm1','perm2','perm3'], ...
}
```

Parameters

- **id (integer)** – A unique integer value identifying this resource base.

Status Codes

- **200 OK** – No response body

PUT /api/v2/resources/{id}/permissions/

Sets an object’s the permission levels based on the perm_spec JSON.

the mapping looks like:

```

`users`: {
    'AnonymousUser': ['view'], <username>: ['perm1','perm2','perm3'], <username2>: ['perm1','perm2','perm3']...
}, 'groups': {
    <groupname>: ['perm1','perm2','perm3'], <groupname2>: ['perm1','perm2','perm3'], ...
}
```

Parameters

- **id (integer)** – A unique integer value identifying this resource base.
Status Codes

- **200 OK** – No response body

**PATCH /api/v2/resources/{id}/permissions/**

Sets an object's the permission levels based on the perm_spec JSON.

the mapping looks like:

```
{
    'users': {
        'AnonymousUser': ['view'],
        <username>: ['perm1','perm2','perm3'],
        <username2>: ['perm1','perm2','perm3']...
    },
    'groups': {
        <groupname>: ['perm1','perm2','perm3'],
        <groupname2>: ['perm1','perm2','perm3'],...
    }
}
```

**Parameters**

- **id (integer)** – A unique integer value identifying this resource base.

**Status Codes**

- **200 OK** – No response body

**DELETE /api/v2/resources/{id}/permissions/**

Sets an object's the permission levels based on the perm_spec JSON.

the mapping looks like:

```
{
    'users': {
        'AnonymousUser': ['view'],
        <username>: ['perm1','perm2','perm3'],
        <username2>: ['perm1','perm2','perm3']...
    },
    'groups': {
        <groupname>: ['perm1','perm2','perm3'],
        <groupname2>: ['perm1','perm2','perm3'],...
    }
}
```

**Parameters**

- **id (integer)** – A unique integer value identifying this resource base.

**Status Codes**

- **200 OK** – No response body

**GET /api/v2/resources/{id}/ratings/**

API endpoint allowing to rate and get overall rating of the Resource.

**Parameters**

- **id (integer)** – A unique integer value identifying this resource base.

**Status Codes**

- **200 OK** –
POST /api/v2/resources/{id}/ratings/
API endpoint allowing to rate and get overall rating of the Resource.

Parameters
- **id** (integer) – A unique integer value identifying this resource base.

Status Codes
- 200 OK –

PUT /api/v2/resources/{id}/set_thumbnail/
API endpoint allowing to set thumbnail of the Resource.

Parameters
- **id** (integer) – A unique integer value identifying this resource base.

Status Codes
- 200 OK –

PUT /api/v2/resources/{id}/update/
Instructs the Async dispatcher to execute a ‘UPDATE’ operation over a valid ‘uuid’.

Parameters
- **id** (integer) – A unique integer value identifying this resource base.

Status Codes
- 200 OK –

POST /api/v2/resources/{resource_id}/set_thumbnail_from_bbox/
API endpoint allowing to set the thumbnail url for an existing dataset.

Parameters
- **resource_id** (string) –

Status Codes
- 200 OK –

GET /api/v2/resources/approved/
API endpoint allowing to retrieve the approved Resources.

Query Parameters
- **ordering** (string) – Which field to use when ordering the results.
- **page** (integer) – A page number within the paginated result set.
- **page_size** (integer) – Number of results to return per page.
- **search** (string) – A search term.

Status Codes
- 200 OK –

POST /api/v2/resources/create/{resource_type}/
Instructs the Async dispatcher to execute a ‘CREATE’ operation.

Parameters
- **resource_type** (string) –
Status Codes

• 200 OK –

GET /api/v2/resources/favorites/
API endpoint allowing to retrieve the favorite Resources.

Query Parameters

• ordering (string) – Which field to use when ordering the results.
• page (integer) – A page number within the paginated result set.
• page_size (integer) – Number of results to return per page.
• search (string) – A search term.

Status Codes

• 200 OK –

GET /api/v2/resources/featured/
API endpoint allowing to retrieve the featured Resources.

Query Parameters

• ordering (string) – Which field to use when ordering the results.
• page (integer) – A page number within the paginated result set.
• page_size (integer) – Number of results to return per page.
• search (string) – A search term.

Status Codes

• 200 OK –

POST /api/v2/resources/ingest/{resource_type}/
Instructs the Async dispatcher to execute a ‘INGEST’ operation.

Parameters

• resource_type (string) –

Status Codes

• 200 OK –

GET /api/v2/resources/published/
API endpoint allowing to retrieve the published Resources.

Query Parameters

• ordering (string) – Which field to use when ordering the results.
• page (integer) – A page number within the paginated result set.
• page_size (integer) – Number of results to return per page.
• search (string) – A search term.

Status Codes

• 200 OK –
GET /api/v2/resources/resource_types/

Returns the list of available ResourceBase polymorphic_ctypes.
the mapping looks like: 
```
{
    "resource_types": [
        {
            "name": "layer", "count": <number of layers>
        }, {
            "name": "map", "count": <number of maps>
        }, {
            "name": "document", "count": <number of documents>
        }, {
            "name": "geostory", "count": <number of geostories>
        }
    ]
}
```

Status Codes
• 200 OK –

GET /api/v2/schema/

OpenApi3 schema for this API. Format can be selected via content negotiation.

• YAML: application/vnd.oai.openapi
• JSON: application/vnd.oai.openapi+json

Query Parameters
• format (string) –
• lang (string) –

Status Codes
• 200 OK –

GET /api/v2/tkeywords/

API endpoint that lists Thesaurus keywords.

Query Parameters

• ordering (string) – Which field to use when ordering the results.
• page (integer) – A page number within the paginated result set.
• page_size (integer) – Number of results to return per page.
• search (string) – A search term.

Status Codes
• 200 OK –
GET /api/v2/tkeywords/{id}/
API endpoint that lists Thesaurus keywords.

Parameters

• **id** *(integer)* – A unique integer value identifying this thesaurus keyword.

Status Codes

• **200 OK** –

GET /api/v2/upload-parallelism-limits/
A viewset that can support dynamic API features.

Attributes:

  * features: A list of features supported by the viewset.
  * meta: Extra data that is added to the response by the DynamicRenderer.

Query Parameters

• **ordering** *(string)* – Which field to use when ordering the results.
• **page** *(integer)* – A page number within the paginated result set.
• **page_size** *(integer)* – Number of results to return per page.

Status Codes

• **200 OK** –

POST /api/v2/upload-parallelism-limits/
Either create a single or many model instances in bulk using the Serializer’s many=True ability from Django REST >= 2.2.5.

The data can be represented by the serializer name (single or plural forms), dict or list.

Examples:

POST /dogs/ {
  "name": "Fido", "age": 2
}

POST /dogs/ {
  "dog": {
    "name": "Lucky", "age": 3
  }
}

POST /dogs/ {
  "dogs": [
    {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3}
  ]
}

POST /dogs/ {
  {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3}
}
Status Codes

- **200 OK**

GET /api/v2/upload-parallelistm-limits/{slug}/
A viewset that can support dynamic API features.

Attributes:
- **features**: A list of features supported by the viewset.
- **meta**: Extra data that is added to the response by the DynamicRenderer.

Parameters
- **slug** (`string`): A unique value identifying this upload parallelism limit.

Status Codes

- **200 OK**

GET /api/v2/upload-size-limits/
A viewset that can support dynamic API features.

Attributes:
- **features**: A list of features supported by the viewset.
- **meta**: Extra data that is added to the response by the DynamicRenderer.

Query Parameters
- **ordering** (`string`): Which field to use when ordering the results.
- **page** (`integer`): A page number within the paginated result set.
- **page_size** (`integer`): Number of results to return per page.

Status Codes

- **200 OK**

POST /api/v2/upload-size-limits/
Either create a single or many model instances in bulk using the Serializer’s many=True ability from Django REST >= 2.2.5.

The data can be represented by the serializer name (single or plural forms), dict or list.

Examples:

POST /dogs/ {
  "name": "Fido", "age": 2
}

POST /dogs/ {
  "dog": {
    "name": "Lucky", "age": 3
  }
}

POST /dogs/ {
“dogs”: [
    {“name”: “Fido”, “age”: 2}, {“name”: “Lucky”, “age”: 3}
]

POST /dogs/ [
    {“name”: “Fido”, “age”: 2}, {“name”: “Lucky”, “age”: 3}
]

Status Codes
• 201 Created –

GET /api/v2/upload-size-limits/{slug}/
A viewset that can support dynamic API features.

Attributes:
features: A list of features supported by the viewset. meta: Extra data that is added to the response by the DynamicRenderer.

Parameters
• slug (string) – A unique value identifying this upload size limit.

Status Codes
• 200 OK –

GET /api/v2/uploads/
API endpoint that allows uploads to be viewed or edited.

Query Parameters
• ordering (string) – Which field to use when ordering the results.
• page (integer) – A page number within the paginated result set.
• page_size (integer) – Number of results to return per page.
• search (string) – A search term.

Status Codes
• 200 OK –

POST /api/v2/uploads/
Either create a single or many model instances in bulk using the Serializer’s many=True ability from Django REST >= 2.2.5.

The data can be represented by the serializer name (single or plural forms), dict or list.

Examples:
POST /dogs/ {
    “name”: “Fido”, “age”: 2
}
POST /dogs/ 

1.35. GeoNode API
“dog”: {
    “name”: “Lucky”, “age”: 3
}

POST /dogs/ {
    “dogs”: [
        {“name”: “Fido”, “age”: 2}, {“name”: “Lucky”, “age”: 3}
    ]
}

POST /dogs/ {
    {“name”: “Fido”, “age”: 2}, {“name”: “Lucky”, “age”: 3}
}

Status Codes
- 201 Created –

GET /api/v2/uploads/{id}/
API endpoint that allows uploads to be viewed or edited.

Parameters
- id (integer) – A unique integer value identifying this upload.

Status Codes
- 200 OK –

POST /api/v2/uploads/upload/
Starts an upload session based on the Dataset Upload Form.
the form params look like: 
```
```

Status Codes
- 201 Created – No response body

GET /api/v2/users/
API endpoint that allows users to be viewed or edited.

Query Parameters
- ordering (string) – Which field to use when ordering the results.
- page (integer) – A page number within the paginated result set.
- page_size (integer) – Number of results to return per page.
- search (string) – A search term.

Status Codes
• 200 OK –

**POST /api/v2/users/**

Either create a single or many model instances in bulk using the Serializer’s many=True ability from Django REST >= 2.2.5.

The data can be represented by the serializer name (single or plural forms), dict or list.

Examples:

```plaintext
POST /dogs/ {
    "name": "Fido", "age": 2
}

POST /dogs/ {
    "dog": {
        "name": "Lucky", "age": 3
    }
}

POST /dogs/ {
    "dogs": [
        {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3}
    ]
}

POST /dogs/ {
    {"name": "Fido", "age": 2}, {"name": "Lucky", "age": 3}
}
```

**Status Codes**

• 201 Created –

**PATCH /api/v2/users/**

API endpoint that allows users to be viewed or edited.

**Status Codes**

• 200 OK –

**DELETE /api/v2/users/**

Either delete a single or many model instances in bulk

```plaintext
DELETE /dogs/ {
    "dogs": [
        {"id": 1}, {"id": 2}
    ]
}

DELETE /dogs/ {
    {"id": 1}, {"id": 2}
}
```
Status Codes

- 204 No Content – No response body

GET /api/v2/users/{id}/

API endpoint that allows users to be viewed or edited.

Parameters

- **id** *(integer)* – A unique integer value identifying this user.

Status Codes

- 200 OK –

PUT /api/v2/users/{id}/

Update one or more model instances.

If ENABLE_BULK_UPDATE is set, multiple previously-fetched records may be updated in a single call, provided their IDs.

If ENABLE_PATCH_ALL is set, multiple records may be updated in a single PATCH call, even without knowing their IDs.

**WARNING:** ENABLE_PATCH_ALL should be considered an advanced feature and used with caution. This feature must be enabled at the viewset level and must also be requested explicitly by the client via the “patch-all” query parameter.

This parameter can have one of the following values:

true (or 1): records will be fetched and then updated in a transaction loop

- The `Model.save` method will be called and model signals will run
- This can be slow if there are too many signals or many records in the query
- This is considered the more safe and default behavior

query: records will be updated in a single query

- The `QuerySet.update` method will be called and model signals will not run
- This will be fast, but may break data constraints that are controlled by signals
- This is considered unsafe but useful in certain situations

The server’s successful response to a patch-all request will NOT include any individual records. Instead, the response content will contain a “meta” object with an “updated” count of updated records.

Examples:

Update one dog:

```
PATCH /dogs/1/ {
    ‘fur’: ‘white’
}
```

Update many dogs by ID:

```
PATCH /dogs/ [
    {'id': 1, ‘fur’: ‘white’}, {'id': 2, ‘fur’: ‘black’}, {'id': 3, ‘fur’: ’yellow’}
]
```

Update all dogs in a query:
PATCH /dogs/?filter{fur.contains}=brown&patch-all=true {
    ‘fur’: ‘gold’
}

Parameters

- **id (integer)** – A unique integer value identifying this user.

Status Codes

- **200 OK** –

PATCH /api/v2/users/{id}/

API endpoint that allows users to be viewed or edited.

Parameters

- **id (integer)** – A unique integer value identifying this user.

Status Codes

- **200 OK** –

DELETE /api/v2/users/{id}/

Either delete a single or many model instances in bulk

DELETE /dogs/ {
    “dogs”: [
        {“id”: 1}, {“id”: 2}
    ]
}

DELETE /dogs/ {
    {“id”: 1}, {“id”: 2}
}

Parameters

- **id (integer)** – A unique integer value identifying this user.

Status Codes

- **204 No Content** – No response body

GET /api/v2/users/{id}/groups/

API endpoint allowing to retrieve the Groups the user is member of.

Parameters

- **id (integer)** – A unique integer value identifying this user.

Query Parameters

- **ordering (string)** – Which field to use when ordering the results.
- **page (integer)** – A page number within the paginated result set.
- **page_size (integer)** – Number of results to return per page.
- **search (string)** – A search term.
Status Codes

- **200 OK** –

GET /api/v2/users/{id}/resources/

API endpoint allowing to retrieve the Resources visible to the user.

Parameters

- **id** *(integer)* – A unique integer value identifying this user.

Query Parameters

- **ordering** *(string)* – Which field to use when ordering the results.
- **page** *(integer)* – A page number within the paginated result set.
- **page_size** *(integer)* – Number of results to return per page.
- **search** *(string)* – A search term.

Status Codes

- **200 OK** –

### 1.35.2 API usage examples

In this section, we are going to demonstrate how GeoNode API can be utilized/integrated with other applications using Python.

Resource Listing and Details

As mentioned in previous chapters, GeoNode resources are categorized in different types e.g. datasets, maps, documents. Etc. All available resources can be listed with API GET /api/v2/resources.

To obtain a single resource, a primary key is provided in the url. Eg GET /api/v2/resources/{resource.pk}.

Example Requests:

1. Listing

```python
import requests

url = "https://master.demo.geonode.org/api/v2/resources"
response = requests.request("GET", url)
```

2. Detail

```python
import requests

url = "https://master.demo.geonode.org/api/v2/resources/1797"
response = requests.request("GET", url)
```

**Note:** The above requests work for publicly visible resources. If a resource is private either the Basic Auth or the Bearer token must be included inside the headers.
3. Listing with basic auth:

```python
import requests

url = "https://master.demo.geonode.org/api/v2/resources"
headers = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("GET", url, headers=headers)
```

A token can be used in place of Basic Auth by setting 'Authorization': 'Bearer <token>'.

**Resource Download**

The download URL for a resource can be obtained from `resource.download_url`. This URL executes the synchronous download of a resource in its default download format (ESRI Shapefile for vector, Geotiff for rasters and the original format for documents). Additional export formats for datasets are available through the UI. At the moment the API doesn’t expose them.

**Resource Links**

From the resource detail response, URIs and links to services can be obtained from the `resource.links[]` array value. The purpose of each link is defined by its `link_type`. The “name” also can specify additional information about the linked resource.

1. **Metadata**

Links to each metadata format can be obtained from links with `link_type = "metadata"

2. **OGC services**

OGC requests can be built by taking: the OGC base url from links from `resource.links[]` with "link_type"= ("OGC:WMS | OGC:WFS | OGC:WCS) the OGC service layername obtained from the `resource.alternate` property

1. **Embedding**

A resource can be embedded inside a third party website. The “embed view” of a resource is suitable to be placed inside an iframe. The URL for the embedded view can be obtained from the `resource.embed_url` property.
### Resource Searching and Filtering

GeoNode resources can be filtered with the following query parameters:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>title and abstract</strong> (paginated free text search)</td>
<td>/api/v2/resources?page=1&amp;search=text-to-search&amp;search_fields=title&amp;search_fields=abstract</td>
</tr>
<tr>
<td><strong>resource_type</strong> (dataset, map, document, service, geostory, dashboard)</td>
<td>/api/v2/resources?filter{resource_type}=map</td>
</tr>
<tr>
<td><strong>subtype</strong> (raster, vector, vector_time, remote)</td>
<td>/api/v2/resources?filter{resource_type}=vector</td>
</tr>
<tr>
<td><strong>favorite</strong> (Boolean True)</td>
<td>/api/v2/resources?favorite=true</td>
</tr>
<tr>
<td><strong>featured</strong> (Boolean True or False)</td>
<td>/api/v2/resources?filter{featured}=true</td>
</tr>
<tr>
<td><strong>published</strong> (Boolean True or False)</td>
<td>/api/v2/resources?filter{is_published}=true</td>
</tr>
<tr>
<td><strong>approved</strong> (Boolean True or False)</td>
<td>/api/v2/resources?filter{is_approved}=true</td>
</tr>
<tr>
<td><strong>category</strong></td>
<td>api/v2/resources?filter{category.identifier}=example</td>
</tr>
<tr>
<td><strong>keywords</strong></td>
<td>api/v2/resources?filter{keywords.name}=example</td>
</tr>
<tr>
<td><strong>regions</strong></td>
<td>api/v2/resources?filter{regions.name}=global</td>
</tr>
<tr>
<td><strong>owner</strong></td>
<td>api/v2/resources?filter{owner.username}=test_user</td>
</tr>
<tr>
<td><strong>extent</strong> (Four corner separated coordinates)</td>
<td>/api/v2/resources?extent=-180,-90,180,90</td>
</tr>
</tbody>
</table>

#### Examples:

1. Filter with a single value

```python
import requests
url = "https://master.demo.geonode.org/api/v2/resources/?filter{resource_type}=map"
response = requests.request("GET", url, headers=headers, data=payload)
```

2. Filter with multiple values

```python
import requests
url = "https://master.demo.geonode.org/api/v2/resources/?filter{resource_type.in}=map&filter{resource_type.in}=dataset"
response = requests.request("GET", url, headers=headers, data=payload)
```
Note: With filter APIs of format `/api/v2/resources?filter{filter_key}=value`, additional methods (`in` and `icontains`) can be used on them to provide extensively filtered results. Eg `/api/v2/resources?filter{regions.name.icontains}=global /api/v2/resources?filter{regions.name.in}=global`.

It’s important to note that other methods are case sensitive except the `icontains`.

### Obtaining Available Resource Types

The list of available resource types can be obtained from API GET `/api/v2/resources/resource_types`

Example:

```python
import requests
url = "https://master.demo.geonode.org/api/v2/resources/resource_types"
response = requests.request("GET", url, headers=headers, data=payload)
```

### Dataset Get standardized Metadata

Get the metadata of uploaded datasets with:

- API: GET `/api/v2/datasets/{id}`
- Status Code: 200

Note: This is very similar to `GET /api/v2/resources` but provides additional metadata specifically for datasets like `featureinfo_custom_template` or `attribute_set`

Example:

```python
import requests
DATASET_ID = "the dataset id"
url = f"https://master.demo.geonode.org/api/v2/datasets/{DATASET_ID}"
headers = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("GET", url, headers=headers)
```

### Resource Upload

GeoNode allows upload of datasets and documents.

1. Datasets

   The dataset upload form accepts file formats of ESRI Shapefile, GeoTIFF, Comma Separated Value (CSV), Zip Archive, XML Metadata File, and Styled Layer Descriptor (SLD). For a successful upload, the form requires `base_file`, `dbf_file`, `shx_file`, and `prj_file`. The `xml_file`, and `Sld_file` are optional.

   - API: POST `/api/v2/uploads/upload`
   - Status Code: 200
Example:

```python
import requests

url = "https://master.demo.geonode.org/api/v2/uploads/upload"
files = [
    ('sld_file', ('BoulderCityLimits.sld', open('/home/myuser/BoulderCityLimits.sld', 'rb'), 'application/octet-stream')),
    ('base_file', ('BoulderCityLimits.shp', open('/home/BoulderCityLimits.shp', 'rb'), 'application/octet-stream')),
    ('dbf_file', ('BoulderCityLimits.dbf', open('/home/BoulderCityLimits.dbf', 'rb'), 'application/octet-stream')),
    ('shx_file', ('BoulderCityLimits.shx', open('/home/BoulderCityLimits.shx', 'rb'), 'application/octet-stream'))
]
headers = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("POST", url, headers=headers, files=files)
```

2. Documents

Documents can be uploaded as form data.

- API: POST /api/v2/documents
- Status Code: 200

Example:

```python
import requests

url = "http://localhost:8000/api/v2/documents"
payload = {
    'title': 'An example image'
}
files = [
    ('doc_file', ('image.jpg', open('/home/myuser/image.jpg', 'rb'), 'image/jpeg'))
]
headers = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("POST", url, headers=headers, data=payload, files=files)
```

Documents can also be created to reference remote resources. In this case the doc_url parameter must be used to set the URL of the remote document.

- API: POST /api/v2/documents
- Status Code: 200

Example:

```python
import requests

url = "http://localhost:8000/api/v2/documents"
payload ={
(continues on next page)
Notice that if the URL doesn’t end with a valid doc extension, the extension parameter must be used (e.g. extension: 'jpeg').

3. Metadata

A complete metadata file conforming to ISO-19115 can be uploaded for a dataset.

- API: PUT /api/v2/datasets/{dataset_id}/metadata
- Status Code: 200

Example:

```python
import requests
title = 'An example image',
doc_url = 'http://examples.com/image.jpg'
headers = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("POST", url, headers=headers, data=payload, files=files)
```

Tracking dataset upload progress

When an upload request is executed, GeoNode creates an “Execution request” and keeps updating its state and progress (it’s a property attribute, calculated on getting the response) attributes as the resource is being created and configured in Geoserver. An execution can be in one of the following status:

- ready
- running
- failed
- finished

When the dataset is successfully uploaded, the final state of the upload is set to finished.

In order to view status of the execution, the API method GET /api/v2/executionrequest/{execution_id} where {execution_id} is the value returned by the initial call to the upload API.

The returned object contains, beyond all the information related to the execution, the inputs that were passed to the execution request, and output params specific to the type of execution. In the case of a dataset upload, the output params contain the URL of the catalog page for the new dataset.
"output_params": {
    "detail_url": [
        "/catalogue/#/dataset/9881"
    ]
},

You can also filter executions by status. Eg GET /api/v2/executionrequest?
filter{action}=import&filter{source}=upload&filter{status}=finished

Example:

```python
import requests

url = "https://stable.demo.geonode.org/api/v2/executionrequest/5f640b6b-8c51-4514-a054-...
headers = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("GET", url, headers=headers)
```

**Overwrite dataset**

Uploading a resource will create by default a new dataset. This behaviour can be changed by setting the
overwrite_existing_layer parameter to True. In this case the upload procedure will overwrite a resource whose
name matches with the new one.

**Skip dataset**

If the parameter skip_existing_layers is set to true True the upload procedure will ignore files whose name matched
with already existing resources.

**Dataset Update Metadata**

**Update individual metadata:**

- API: PATCH /api/v2/datasets/{id}
- Status Code: 200

Example:

This example changes the title and the license of a dataset.

```python
import requests

url = ROOT + "api/v2/datasets/" + DATASET_ID
auth = (LOGIN_NAME, LOGIN_PASSWORD)

data = {
    "title": "a new title",
    "license": 4,
}
response = requests.patch(url, auth=auth, json=data)
```
Note: `bbox_polygon` and `ll_bbox_polygon` are derived values which cannot be changed.

**Resource Delete**

- API: DELETE /api/v2/resources/{pk}/delete
- Status Code: 204

Example:

**Resource Download**

GeoNode offers a download option to resources of resource_type dataset and document. For datasets, the download option is available for only datasets with uploaded files.

1. Datasets
   - API: GET /datasets/{resource.alternate}/dataset_download
   - Status Code: 200

Example:

```python
import requests
url = "https://master.demo.geonode.org/datasets/geonode:BoulderCityLimits3/dataset_download"
response = requests.request("GET", url)
```

2. Documents
   - API: GET /documents/{resource.pk}/download
   - Status Code: 200

Example:

```python
import requests
url = "https://master.demo.geonode.org/documents/1781/download"
response = requests.request("GET", url)
```

**Users, Groups and Permissions**

**Users**

1. Listing
   - API: POST /api/v2/users
   - Status Code: 200

Example:
import requests
url = "https://master.demo.geonode.org/api/v2/users"
hdr = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("GET", url, headers=hdr)

1. Detail
   • API: POST /api/v2/users/{pk}
   • Status Code: 200

Example:
import requests
url = "https://master.demo.geonode.org/api/v2/users/1000"
hdr = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("GET", url, headers=hdr)

3. List user groups
   • API: POST /api/v2/users/{pk}/groups
   • Status Code: 200

Example:
import requests
url = "https://master.demo.geonode.org/api/v2/users/1000/groups"
hdr = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("GET", url, headers=hdr)

Groups

In GeoNode, on listing groups, the API returns groups which have group profiles. Therefore for Django groups which are not related to a group profile are not included in the response. However, these can be accessed in the Django Administration panel.

   • API: POST /api/v2/groups
   • Status Code: 200

Example:
import requests
url = "https://master.demo.geonode.org/api/v2/groups"
hdr = {
  #
Permissions

Permissions in GeoNode are set per resource and per user or group. The following are general permissions that can be assigned:

- **View**: allows to view the resource. [view_resourcebase]
- **Download**: allows to download the resource specifically datasets and documents. [view_resourcebase, download_resourcebase]
- **Edit**: allows to change attributes, properties of the datasets features, styles and metadata for the specified resource. [view_resourcebase, download_resourcebase, change_resourcebase, change_dataset_style, change_dataset_data, change_resourcebase_metadata]
- **Manage**: allows to update, delete, change permissions, publish and unpublish the resource. [view_resourcebase, download_resourcebase, change_resourcebase, change_dataset_style, change_dataset_data, publish_resourcebase, delete_resourcebase, change_resourcebase_metadata, change_resourcebase_permissions]

Obtaining permissions on a resource

On listing the resources or on resource detail API, GeoNode includes perms attribute to each resource with a list of permissions a user making the request has on the respective resource.

GeoNode also provides an API to get an overview of permissions set on a resource. The response contains users and groups with permissions set on them. However this API returns 200 if a requesting user has manage permissions on the resource otherwise it will return 403 (Forbidden).

- **API**: GET /api/v2/resources/1791/permissions

Example:

```python
import requests
url = "https://master.demo.geonode.org/api/v2/resources/1791/permissions"
headers = {
    'Authorization': 'Basic dXNlcjpwYXNzd29yZA=='
}
response = requests.request("GET", url, headers=headers)
```
Changing permissions on a resource

Permissions are configured with a so called `perms spec`, which is a JSON structured where permissions for single users and groups can be specified.

The example below shows a perm specification for following rules:

- user1 can edit
- user2 can manage
- group1 can edit
- anonymous users (public) can view
- registered members can download

**NOTE:** The id of the “anonymous” and “registered members” groups can be obtained from the permissions of the resource. They are not listed inside the groups API, since these are special internal groups

```json
{
    "users": [
        {
            "id": <id_of_user1>,
            "permissions": "edit"
        },
        {
            "id": <id_of_user2>,
            "permissions": "manage"
        }
    ],
    "organizations": [
        {
            "id": <id_of_group1>,
            "permissions": "edit"
        }
    ],
    "groups": [
        {
            "id": <id_of_anonymous_group>,
            "permissions": "view"
        },
        {
            "id": <id_of_regisdtered-members_group>,
            "permissions": "download"
        }
    ]
}
```

The perm spec is sent as JSON, with application/json Content-Type, inside a PUT request.

```python
import requests
import json

url = "https://master.demo.geonode.org/api/v2/resources/1791/permissions"
payload = json.dumps(
    "users": [
```
This is an asynchronous operation which returns a response similar to the following:

```json
{
    "status": "ready",
    "execution_id": "7ed578c2-7db8-47fe-a3f5-6ed3ca545b67",
    "status_url": "https://master.demo.geonode.org/api/v2/resource-service/execution-status/7ed578c2-7db8-47fe-a3f5-6ed3ca545b67"
}
```

The `status_url` property returns the URL to track the progress of the request. Querying the URL a result similar to the following will be returned:

```json
{
    "user": "admin",
    "status": "running",
    "func_name": "set_permissions",
    "created": "2022-07-08T11:16:32.240453Z",
    "finished": null,
    "last_updated": "2022-07-08T11:16:32.240485Z",
}
```

(continues on next page)
"input_params": {
    ...
}
}

The operation will be completed once the status property is updated with the value finished.

**Linked Resources Listing and Details**

All available linked_resources can be listed with API GET /api/v2/resources/{pk}/linked_resources. where
pk Resource base id

**Example Requests:**

1. List all resource links

```python
import requests
url = "https://master.demo.geonode.org/api/v2/resources/{pk}/linked_resources"
response = requests.request("GET", url)
```

## 1.36 How to Develop

### 1.36.1 Start to develop with Docker

**How to run the instance for development**

There are two options to develop using Docker containers:

- **Alternative A**: Running by command line and editing the code using your preferred editor (usually harder).
- **Alternative B**: Using the vscode remote containers extension (easier).

**Alternative A: Building and running Docker for development**

Build (first time only):

```
docker-compose --project-name geonode -f docker-compose-dev.yml -f .devcontainer/docker-compose.yml build
```

Running:

```
docker-compose --project-name geonode -f docker-compose-dev.yml -f .devcontainer/docker-compose.yml up
```

**Note:** If you are running postgresql and tomcat9 services, you need to stop them, docker-compose will take care of running the database and geonode service.

Otherwise, you will get the following error:
ERROR: for db: Cannot start service db: driver failed programming external connectivity
  on endpoint db4geonode: Error starting userland proxy: listen tcp4 0.0.0.0:5432: bind:
  address already in use
ERROR: Encountered errors while bringing up the project.

Running the geonode application in debug mode:

docker exec -it django4geonode bash -c "python manage.py runserver 0.0.0.0:8000"

When running, you can debug the application using your preferred method. For example, you can edit a file, save it
and see your modifications. You can also use ipdb to add breakpoints and inspect your code (Writing import ipdb;
ipdb.set_trace() in the line you want your breakpoint).

Another option is to use debugpy alongside with vscode, for this you have to enable debugpy inside your
django4geonode container:

docker exec -it django4geonode bash -c "pip install debugpy -t /tmp && python /tmp/
  debugpy --wait-for-client --listen 0.0.0.0:5678 manage.py runserver 0.0.0.0:8000 --
  nothreading --noreload"

Select “Run and Debug” in vscode and use the following launch instruction in your .vscode/launch.json file:

launch.json

Alternative B: Using vscode extension

Alternatively, you can develop using the vscode remote containers extension. In this approach you need to:

- Install the extension in your vscode: ms-vscode-remote.remote-containers
- On your command pallet, select: “Remote-Containers: Reopen in Container”
- If it’s the first time, vscode will take care of building the images. This might take some time.
- Then a new vscode window will open, and it’ll be connected to your docker container.
- The message “Dev Container: Debug Docker Compose” will appear in the bottom-left corner of that window.
- In the vscode terminal, you’re going to see something similar to root@77e80acc89b8:/usr/src/geonode#.
- To run your application, you can use the integrated terminal (./manage.py runserver 0.0.0.0:8000) or
  the vscode “Run and Debug” option. For launching with “Run and Debug”, use the following instruction file:
  launch.json

For more information, take a read at vscode remote containers help page.
1.36.2 How to Install GeoNode-Core for development

Summary of installation

This section demonstrates a summarization of the steps to be followed in order to install GeoNode-Core for development using Ubuntu 18.04. The following steps will be customized to fit both GeoNode-Project and GeoNode-Core for development purpose.

The steps to be followed are:

1- Install build tools and libraries
2- Install dependencies and supporting tools
3- Setup Python virtual environment
4- Clone and install GeoNode from Github
5- Install and start Geoserver
6- Start GeoNode

Note: The following commands/steps will be executed on your terminal

Warning: If you have a running GeoNode service, you will need to stop it before starting the following steps. To stop GeoNode you will need to run:

```
service apache2 stop # or your installed server
service tomcat7 stop # or your version of tomcat
```

Install GeoNode-Core for development

GeoNode-Core installation is considered the most basic form of GeoNode. It doesn’t require any external server to be installed and it can run locally against a file-system based Spatialite database.

Installation steps

1- Install build tools and libraries

   Warning: Those instructions might be outdated. Please refer to 1. Install the dependencies

   $ sudo apt-get install -y build-essential libxml2-dev libxslt1-dev libpq-dev zlib1g-dev

2- Install dependencies and supporting tools

   Install python native libraries and tools
Warning: Those instructions might be outdated. Please refer to 1. Install the dependencies

$ sudo apt-get install -y python3-dev python3-pil python3-lxml python3-pyproj python3-shapely python3-nose python3-httplib2 python3-pip software-properties-common

Install python virtual environment

Warning: Those instructions might be outdated. Please refer to 2. GeoNode Installation

$ sudo pip install virtualenvwrapper

Install postgresql and postgis

Warning: Those instructions might be outdated. Please refer to 3. Postgis database Setup

$ sudo apt-get install postgresql-10 postgresql-10-postgis-2.4

Change postgres password expiry and set a password

$ sudo passwd -u postgres # change password expiry information
$ sudo passwd postgres # change unix password for postgres

Create geonode role and database

$ su postgres
$ createdb geonode_dev
$ createdb geonode_dev-imports
$ psql
$ postgres=#
$ postgres=# CREATE USER geonode_dev WITH PASSWORD 'geonode_dev'; # should be same as -
             -password in setting.py
$ postgres=# GRANT ALL PRIVILEGES ON DATABASE "geonode_dev" to geonode_dev;
$ postgres=# GRANT ALL PRIVILEGES ON DATABASE "geonode_dev-imports" to geonode_dev;
$ postgres=# \
$ psql -d geonode_dev-imports -c 'CREATE EXTENSION postgis;'
$ psql -d geonode_dev-imports -c 'GRANT ALL ON geometry_columns TO PUBLIC;'
$ psql -d geonode_dev-imports -c 'GRANT ALL ON spatial_ref_sys TO PUBLIC;'
$ exit

Edit PostgreSQL configuration file

sudo gedit /etc/postgresql/10/main/pg_hba.conf

Scroll to the bottom of the file and edit this line

# "local" is for Unix domain socket connections only
local all all peer

To be as follows
# "local" is for Unix domain socket connections only
local all all trust

Then restart PostgreSQL to make the changes effective

```
sudo service postgresql restart
```

Java dependencies

```
$ sudo apt-get install -y openjdk-11-jdk --no-install-recommends
```

Install supporting tools

```
$ sudo apt-get install -y ant maven git gettext
```

3- Setup Python virtual environment (Here is where Geonode will be running)

Add the virtualenvwrapper to your new environment.

Since we are using Ubuntu, you can add the following settings to your .bashrc file. Please note that the Ubuntu account here is called “geonode”. So you will need to change it according to the name you picked.

```
$ echo export VIRTUALENVWRAPPER_PYTHON=/usr/bin/python >> ~/.bashrc
$ echo export WORKON_HOME=/home/geonode/dev/.venvs >> ~/.bashrc
$ echo source /usr/local/bin/virtualenvwrapper.sh >> ~/.bashrc
$ echo export PIP_DOWNLOAD_CACHE=$HOME/.pip-downloads >> ~/.bashrc
```

And reload the settings by running

```
$ source ~/.bashrc
```

Set up the local virtual environment for Geonode

```
$ vim ~/.bashrc
# add the following line to the bottom
$ source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
```

```
$ source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
$ mkvirtualenv --python=/usr/bin/python3 geonode
$ workon geonode # or $ source /home/geonode/dev/.venvs/geonode/bin/activate
```

This creates a new directory where you want your project to be and creates a new virtual environment.

Alternatively you can also create the virtual env like below

```
$ python3.8 -m venv /home/geonode/dev/.venvs/geonode
$ source /home/geonode/dev/.venvs/geonode/bin/activate
```

4- Download/Clone GeoNode from Github

To download the latest geonode version from github, the command “git clone” is used

Note: If you are following the GeoNode training, skip the following command. You can find the cloned repository in /home/geonode/dev
$ git clone https://github.com/GeoNode/geonode.git -b 4.1.x

Install Nodejs PPA and other tools required for static development

This is required for static development

**Note:** If you are following GeoNode’s training, nodejs is already installed in the Virtual Machine skip the first three command and jump to cd geonode/geonode/static

```
$ sudo apt-get install nodejs npm
$ cd geonode/geonode/static
$ npm install --save-dev
```

**Note:** Every time you want to update the static files after making changes to the sources, go to geonode/static and run ‘grunt production’.

---

**Warning:** Starting from the following step, you have to make sure that you installed GDAL correctly according to the documentation page “Install GDAL for Development”

Install GeoNode in the new active local virtualenv

```
$ cd /home/geonode/dev  # or to the directory containing your cloned GeoNode
$ pip install -e geonode
$ cd geonode/geonode
```

Create local_settings.py

Copy the sample file /home/geonode/dev/geonode/geonode/local_settings.py.geoserver.sample and rename it to be local_settings.py

```
$ cd /home/geonode/dev/geonode
$ cp geonode/local_settings.py.geoserver.sample geonode/local_settings.py
$ gedit geonode/local_settings.py
```

In the local_settings.py file, add the following line after the import statements:

```
SITEURL = "http://localhost:8000/"
```

In the DATABASES dictionary under the ‘default’ key, change only the values for the keys NAME, USER and PASSWORD to be as follows:

```
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'geonode_dev',
        'USER': 'geonode_dev',
        'PASSWORD': 'geonode_dev',
        .........
        .......
        .......
    }
```

(continues on next page)
In the DATABASES dictionary under the ‘datastore’ key, change only the values for the keys NAME, USER and PASSWORD to be as follows:

```python
# vector datastore for uploads
'datastore': {
    'ENGINE': 'django.contrib.gis.db.backends.postgis',
    # Empty ENGINE name disables
    'NAME': 'geonode_dev-imports',
    'USER': 'geonode_dev',
    'PASSWORD': 'geonode_dev',
    ........
    ........
    ....
    ...
}
```

In the CATALOGUE dictionary under the ‘default’ key, uncomment the USER and PASSWORD keys to activate the credentials for GeoNetwork as follows:

```python
CATALOGUE = {
    'default': {
        # The underlying CSW implementation
        # default is pycsw in local mode (tied directly to GeoNode Django DB)
        'ENGINE': 'geonode.catalogue.backends.pycsw_local',
        # pycsw in non-local mode
        # 'ENGINE': 'geonode.catalogue.backends.pycsw_http',
        # GeoNetwork opensource
        # 'ENGINE': 'geonode.catalogue.backends.geonetwork',
        # deegree and others
        # 'ENGINE': 'geonode.catalogue.backends.generic',
        # The FULLY QUALIFIED base url to the CSW instance for this GeoNode
        'URL': urljoin(SITEURL, '/catalogue/csw'),
        # 'URL': 'http://localhost:8080/geonetwork/srv/en/csw',
        # 'URL': 'http://localhost:8080/deegree-csw-demo-3.0.4/services',
        # login credentials (for GeoNetwork)
        'USER': 'admin',
        'PASSWORD': 'admin',
        # 'ALTERNATES_ONLY': True,
    }
}
```

5- Install and Start Geoserver

From the virtual environment, first you need to align the database structure using the following command:

```
$ cd /home/geonode/dev/geonode
$ python manage.py migrate
```
then setup GeoServer using the following command:

```
$ paver setup
$ paver sync
```

6- Now we can start our geonode instance

```
service apache2 stop
service tomcat7 stop
```

```
$ paver start
```

The starting process will take around 20 seconds (depends on your machine) and at the end it shows the following message:

```
[tasks]
  geonode.documents.tasks.create_document_thumbnail
  geonode.documents.tasks.delete_orphaned_document_files
  geonode.documents.tasks.delete_orphaned_thumbnails
  geonode.geoserver.tasks.geoserver_update_layers
  geonode.layers.tasks.delete_layer
  geonode.maps.tasks.delete_map
  geonode.security.tasks.synch_guardian
  geonode.services.tasks.update.harvest_resource
  geonode.tasks.email.send_mail
  geonode.tasks.notifications.send_queued_notifications
  imagekit.cachefiles.backends._generate_file

Performing system checks...

System check identified no issues (1 silenced).
January 21, 2020 - 22:49:50
Django version 1.11.27, using settings 'geonode.settings'
Starting development server at http://0.0.0.0:8000/
Quit the server with CONTROL-C.
GeoNode is now available.
```

Now you can visit the geonode site by typing `http://0.0.0.0:8000` into your browser window
Install GeoNode-Project for development after installing GeoNode-Core

GeoNode-Project gives the user flexibility to customize the installation of the GeoNode. Geonode itself will be installed as a requirement of your project. Inside the project structure it is possible to extend, replace or modify all geonode components (e.g. css and other static files, templates, models..) and even register new django apps without touching the original Geonode code. In order to install GeoNode-Project, the following steps need to be executed alongside the previous GeoNode-Core installation steps.

1- Use django-admin.py to create a project “my_geonode” from a GeoNode-Project template as follows:

```bash
django-admin.py startproject my_geonode --template=https://github.com/GeoNode/geonode-project/archive/master.zip -e py,rst,json,yml,ini,env,sample -n Dockerfile
```

```bash
ds /home/geonode/dev    # should output: geonode  my_geonode
```

**Note:** Before running the following command, make sure that you are currently working on the virtual environment and just outside geonode directory. The command will create a new project called “my_geonode” which should be located at the level of geonode-core installation directory “inside /home/geonode/dev”

2- Install all the required packages/tools for GeoNode-Project as follows:

```bash
pip install -e my_geonode
```

**Note:** Although the following command might show that the majority of requirements are already satisfied “because GeoNode-Core was already installed”, it is recommended to still execute it as it might update or install any missing package.
Install GeoNode-Project directly from scratch

If you didn’t install GeoNode-Core earlier and you wanted to install GeoNode-Project directly, please follow these steps:

1. Create a virtual environment as follows:
   
   $ vim ~/.bashrc
   # add the following line to the bottom
   $ source /usr/share/virtualenvwrapper/virtualenvwrapper.sh

   $ source /usr/share/virtualenvwrapper/virtualenvwrapper.sh
   $ mkvirtualenv --python=/usr/bin/python3 my_geonode

   Alternatively you can also create the virtual env like below
   $ python3.8 -m venv /home/geonode/dev/.venvs/my_geonode
   $ source /home/geonode/dev/.venvs/my_geonode/bin/activate

2. Clone the geonode-project repo from Github
   
   $ git clone https://github.com/GeoNode/geonode-project.git -b 4.1.x

3. Install Django framework as follows
   
   $ pip install Django==3.2.13

4. Use django-admin.py to create a project “my_geonode” from a GeoNode-Project template as follows:
   
   $ django-admin startproject --template=./geonode-project -e py,sh,md,rst,json,yml,ini,env,sample,properties -n monitoring-cron -n Dockerfile my_geonode

5. Install all the requirements for the GeoNode-Project and install the GeoNode-Project using pip
   
   $ cd my_geonode
   $ pip install -r requirements.txt --upgrade
   $ pip install -e . --upgrade

6. Install GDAL Utilities for Python
   
   $ pip install pygdal="\gdal-config --version\".*" # or refer to the link <Install GDAL for Development <https://training.geonode.geo-solutions.it/005_dev_workshop/004_devel_env/gdal_install.html>

7. Install GeoServer and Tomcat using paver
   
   $ paver setup
   $ paver sync
   $ paver start

1.36.3 How to run GeoNode Core for development

In order to start GeoNode Core for development, you need to make sure that no GeoNode instance is running first. This can be done by running the following commands:

```bash
$ cd /home/user/geonode
$ paver stop_geoserver
$ paver stop_django
```

Then you need to start both geoserver and django services as follows:

```bash
$ paver start_geoserver
$ paver start_django
```

Now you can visit your GeoNode GUI by typing http://localhost:8000 into your browser window.

1.36.4 How to run GeoNode Project for development

In order to run a project for development, the following steps have to be followed:

1- Make sure there is no running instance of GeoNode first by running the following command:

```bash
$ cd /home/user/my_geonode
$ paver stop
```

The above command will stop all services related to GeoNode if running.

2- Start the servers by running paver start as follows:

```bash
$ paver start
```

Now you can visit your GeoNode project site by typing http://localhost:8000 into your browser window.

1.36.5 Start MapStore2 client in development mode

**Pre-requisites**

1. You need a running instance of GeoNode somewhere; in this specific example we assume GeoNode is running on http://localhost:8000
Install needed packages

```
sudo apt install nodejs npm
```

Prepare the source code

```
git clone --recursive https://github.com/GeoNode/geonode-mapstore-client.git geonode-mapstore-client-dev
```

Compile MapStore2 Client

```
cd geonode-mapstore-client/geonode_mapstore_client/client/
npm update
npm install
npm run compile
```

Edit the file `env.json`

```
vim env.json
```

```
{
   "DEV_SERVER_HOST": "localhost:8000",
   "DEV_SERVER_HOST_PROTOCOL": "http"
}
```

Run MapStore2 in Development mode

```
npm run start
```

Connect to `http://localhost:8081`

This is a proxied version of GeoNode form MapStore2 client. **To upload new layers user the original GeoNode.**

Everytime you render a map, from GeoNode layers details page or map creation, you will access to the MapStore2 dev mode runnig code.

You can now update the code on the fly.
Example 1: Disable the PrintPlugin from the Layer Details small map

```javascript
BurgerMenuPlugin: require('..//MapStore2/web/client/plugins/BurgerMenu'),
ScaleBoxPlugin: require('..//MapStore2/web/client/plugins/ScaleBox'),
MapFooterPlugin: require('..//MapStore2/web/client/plugins/MapFooter'),
// PrintPlugin: require('..//MapStore2/web/client/plugins/Print'),
TimelinePlugin: require('..//MapStore2/web/client/plugins/Timeline'),
PlaybackPlugin: require('..//MapStore2/web/client/plugins/Playback'),
...```

Example 2: Disable the MousePositionPlugin from the big maps

```javascript
SaveAsPlugin: require('..//MapStore2/web/client/plugins/SaveAs').default,
MetadataExplorerPlugin: require('..//MapStore2/web/client/plugins/MetadataExplorer'),
GridContainerPlugin: require('..//MapStore2/web/client/plugins/GridContainer'),
StyleEditorPlugin: require('..//MapStore2/web/client/plugins/StyleEditor'),
TimelinePlugin: require('..//MapStore2/web/client/plugins/Timeline'),
PlaybackPlugin: require('..//MapStore2/web/client/plugins/Playback'),
// MousePositionPlugin: require('..//MapStore2/web/client/plugins/MousePosition'),
SearchPlugin: require('..//MapStore2/web/client/plugins/Search'),
SearchServicesConfigPlugin: require('..//MapStore2/web/client/plugins/SearchServicesConfig
˓
...```

1.36.6 Workshops

The workshops documentation demonstrates few examples on how to utilize GeoNode-Project in order to extend/customize GeoNode’s functionalities according to your business. The covered topics include the following:

1- Customize your GeoNode with the geonode-project
2- Customize the look and feel
3- Create your ResourceBase Metadata
4- Create your own django app
5- Add a custom model
6- Permissions and APIs
7- Deploy your GeoNode
1. Customize your GeoNode with the geonode-project

In this example, GeoNode-Project is cloned to create a template instance in which the rest of the examples will be building on top of it.

1. Assuming you already installed GeoNode-Core, firstly we need to create a GeoNode-Project template and this can be achieved from the following command:

   ```
   $ django-admin.py startproject my_geonode --template=https://github.com/GeoNode/geonode-project/archive/master.zip -e py,rst,json,yml,ini,env,sample -n Dockerfile
   
   Here, django-admin is used with startproject option to create my_geonode project copying the template which is passed as GeoNode-project Github repo. It also includes “py,rst,json,yml,ini,env,sample” extensions
   
   2. Once the cloning finished, the next step is to install the GeoNode-Project we just downloaded as follows:

   ```
   $ pip install -e my_geonode
   
   3. Install geoserver using paver as follows

   ```
   $ cd /home/geonode/my_geonode/src
   $ paver setup
   ```

   4. Note the GeoNode database connection parameters mentioned in the .env.sample.py file. Rename it to .env then use psql to create the required user and grant the required privileges as follows:

   ```
   $ su postgres
   $ createdb geonode
   $ psql
   postgres=# CREATE USER geonode WITH PASSWORD 'geonode';
   CREATE ROLE
   postgres=# GRANT ALL PRIVILEGES ON DATABASE "geonode" to geonode;
   GRANT
   postgres=# \q
   ```

   **Warning:** Don’t forget to exit from postgres user before executing the following commands

   5. Run GeoNode using paver

   ```
   $ cd /home/geonode/my_geonode/src
   $ paver start
   ```

   **Note:** You may find this warning message: You have 132 unapplied migration(s). Your project may not work properly until you apply the migrations for app(s): account, actstream, admin, agon_ratings, announcements, auth, avatar, base, contenttypes, dialogos, documents, favorite, geonode_client, geonode_themes, groups, guardian, invitations, layers, maps, mapstore2_adapter, monitoring, oauth2_provider, people, pinax_notifications, services, sessions, sites, socialaccount, taggit, tastypie, upload, user_messages. Which means you have some sql statements not executed yet and you need to run the “migrate” to sync your database first then “paver start” again as follows:

   ```
   $ python manage.py migrate
   $ paver start
Warning: If encountered this message: (Invalid HTTP_HOST header: '0.0.0.0:8000'). You may need to add u'0.0.0.0' to ALLOWED_HOSTS) It can be fixed in the settings.py file. You will need to add:
ALLOWED_HOSTS = ['0.0.0.0'] in settings.py

6- Once the previous step is done, you can visit 0.0.0.0:8000 to view the GUI of GeoNode. However, we still don’t have an account in order to login from the GUI. This can be done using “paver sync”. The command will create sync with latest fixtures and also creates a superuser “admin” with default password “admin”

7- Use the created account to login from the GUI through localhost:8000 or 0.0.0.0:8000

2- Customize the look and feel

In this section we will change the look and feel of GeoNode, in particular we will do some customization to help understanding how the template inheritance works and how to add new stuff to your GeoNode. The changes will include the home page, the top menu, the footer and a generic GeoNode page.

Homepage:
The geonode-project provides some predefined templates to change the home page and the general site content.
In the “my_geonode/src/my_geonode/templates/geonode-mapstore-client/snippets” directory we can files with similar names as the geonode-mapstore-client. This way we can override the different parts of the site eg the header, menu, body content and the footer.
Create a file name hero.html and add the following.

The theme:
To change the theme of our geonode-project we can act on the site_base.css file available in the “my_geonode/my_geonode/static/css” folder.

The file is empty so we can inspect elements of the home page with the browser’s developer tools and define css rules in there.

For example, if we want to change the background of the jumbotron, in this file we can add

```css
.msgapi .gn-hero .jumbotron { background: red }
```

Then once we refreshed the browser, we should see the change as follows:

![My GeoNode](image)

The top menu:

Now we can make some changes that will apply to the whole site. We can add an item to both the left and right side of the top menu bar.

This can be done by creating a get_menu_json.py under templatetags folder to override GeoNodes default menu.

```python
@register.simple_tag(takes_context=True)
def get_base_right_topbar_menu(context):
    is_mobile = _is_mobile_device(context)

    if is_mobile:
        return []

    return [
        {
            "type": "link",
            "href": "/",
            "label": "Custom 3"
        },
        {
            "type": "link",
            "href": "/",
            "label": "Custom 4"
        },
    ]

@register.simple_tag(takes_context=True)
def get_base_left_topbar_menu(context):
    is_mobile = _is_mobile_device(context)
```

(continues on next page)
return [
    
    
    "type": "link",
    "href": "/",
    "label": "Custom 1"
    },
    
    "type": "link",
    "href": "/",
    "label": "Custom 2"
    },
]

On browser refresh you will see a new entry in the nav bar which is persistent to the whole site.

Modify functionality

In this section, we will patch the ResourceBase of GeoNode and update the Templates in order to add one more field to the Metadata Schema.

We will add a DOI field to the ResourceBase model and modify the Templates in order to show the new field both into the Metadata Wizard page.

**Note:** Make sure to be inside “my_geonode” directory to execute the following commands

Customizing metadata can be achieved from the model which is defined in the core at “geonode/geonode/base/models.py” as follows:

```python
# internal fields
uuid = models.CharField(max_length=36)
owner = models.ForeignKey(
    settings.AUTH_USER_MODEL,
    blank=True,
    null=True,
    related_name='owned_resource',
    verbose_name=_("Owner"))
contacts = models.ManyToManyField(
    settings.AUTH_USER_MODEL,
    through='ContactRole')
```
title = models.CharField(_('title'), max_length=255, help_text=_('name by which the cited resource is known'))
alternate = models.CharField(max_length=128, null=True, blank=True)
date = models.DateTimeField(_('date'), default=now, help_text=date_help_text)
date_type = models.CharField(_('date type'), max_length=255, choices=VALID_DATE_TYPES, default='publication', help_text=date_type_help_text)
abstract = models.TextField(_('abstract'), max_length=2000, blank=True, help_text=abstract_help_text)
purpose = models.TextField(_('purpose'), max_length=500, null=True, blank=True, help_text=purpose_help_text)
maintenance_frequency = models.CharField(_('maintenance frequency'), max_length=255, choices=UPDATE_FREQUENCIES, blank=True, null=True, help_text=maintenance_frequency_help_text)

To add fields directly to the ResourceBase Class without actually modifying it, this can be done from “my_geonode/src/my_geonode/apps.py” file

The “ready” method is invoked at initialization time and can be currently used to tweak your app in several ways

```python
class AppConfig(BaseAppConfig):

    name = "my_geonode"
    label = "my_geonode"

    def ready(self):
        super(AppConfig, self).ready()
        run_setup_hooks()
```

Now we will add the “patch_resource_base” method to the AppConfig and execute it from the ready method as follows:
from django.db import models
from django.utils.translation import ugettext_lazy as _

class AppConfig(BaseAppConfig):
    name = "my_geonode"
    label = "my_geonode"

    def _get_logger(self):
        import logging
        return logging.getLogger(self.__class__.__module__)

    def patch_resource_base(self, cls):
        self._get_logger().info("Patching Resource Base")
        doi_help_text = _("a DOI will be added by Admin before publication.")
        doi = models.TextField(_("DOI"), blank=True, null=True, help_text=doi_help_text)
        cls.add_to_class('doi', doi)

def ready(self):
    super(AppConfig, self).ready()
    run_setup_hooks()

    from geonode.base.models import ResourceBase
    self.patch_resource_base(ResourceBase)

Note: you will need to perform migrations as follows: - Add field doi to resourcebase

Once you run python manage.py migrate:

Running migrations:
Applying announcements.0002_auto_20200119_1257... OK
Applying base.0031_resourcebase_doi... OK
Applying people.0027_auto_20200119_1257... OK

Till now, we have patched the DB. however, it is not yet sufficient as we still need to display the added field.

Let’s extend the default templates so that we can show the newly added field

1.36. How to Develop
3- Create your own django app

In this section, we will demonstrate how to create and setup the skeleton of a custom app using the django facilities. The app will add a geocollections functionality to our GeoNode.

The Geocollections app allows to present in a single page, resources and users grouped by a GeoNode Group. We can assign arbitrary resources to a Geocollection, a Group and a name that will be also used to build a dedicated URL.

Note: Make sure to be inside “my_geonode” directory to execute the following commands

Create the django app

Django gives us an handy command to create apps. We already used startproject to create our geonode-project, now we can use startapp to create the app.

```
python manage.py startapp geocollections
```

This will create a folder named geocollections that contains empty models and views.

We need to add the new app to the INSTALLED_APPS of our project. inside “my_geonode/src/my_geonode/settings.py”:

```
INSTALLED_APPS += (PROJECT_NAME,) to be: INSTALLED_APPS += (PROJECT_NAME, 'geocollections',)
```

Add a custom model

In this section, we will add a custom model and the related logic as follows:

- Add a new model
- Add urls and views
- Add admin panel
- Add the template

```
vim geocollections/models.py
```

```python
from django.db import models

from geonode.base.models import ResourceBase
from geonode.groups.models import GroupProfile

class Geocollection(models.Model):
    """
    A collection is a set of resources linked to a GeoNode group
    """
    group = models.ForeignKey(GroupProfile, related_name='group_collections')
    resources = models.ManyToManyField(ResourceBase, related_name='resource_collections')
    name = models.CharField(max_length=128, unique=True)
    slug = models.SlugField(max_length=128, unique=True)

    def __unicode__(self):
        return self.name
```

At this point we need to ask django to create the database table. Django since version 1.8 has embedded migrations mechanism and we need to use them in order to change the state of the db.

**Note:** Make sure to be inside “my_geonode” directory to execute the following commands

```bash
python manage.py makemigrations
# the above command informs you with the migrations to be executed on the database
python manage.py migrate
```

Next we will use django generic view to show the collections detail. Add the following code in the views.py file:

```python
from django.views.generic import DetailView
from .models import Geocollection

class GeocollectionDetail(DetailView):
    model = Geocollection
```

Add url configuration

In order to access the created view we also need url mapping. We can create a urls.py file containing a url mapping to our generic view:

```python
from django.conf.urls import url
from .views import GeocollectionDetail

urlpatterns = [
    url(r'^(?P<slug>[-\w]+)/$', GeocollectionDetail.as_view(), name='geocollection-detail'),
]
```

We also need to register the app urls in the project urls. So let’s modify the “my_geonode” urls.py file adding the following:

```python
...urlpatterns += [
    url(r'^geocollections/', include('geocollections.urls')),
] ...
```

Enable the admin panel
We need a user interface where we can create geocollections. Django makes this very easy, we just need the admin.py file as follows:

```python
def geocollections/admin.py

from django.contrib import admin
from .models import Geocollection

class GeocollectionAdmin(admin.ModelAdmin):
    prepopulated_fields = {"slug": ("name",)}
    filter_horizontal = ("resources",)

admin.site.register(Geocollection, GeocollectionAdmin)
```

Now we can visit the admin page and create a geocollection from there as follows:

Adding the template

Now we need the template where the geocollection detail will be rendered. Let’s create a geocollections directory inside the “my_geonode/templates” directory with a file named geocollection_detail.html:

```bash
mkdir -p my_geonode/templates/geocollections/
vim my_geonode/templates/geocollections/geocollection_detail.html
```
To check the results, create a group in the geonode ui interface and load one or more layers/documents login into the admin panel -> geocollections and create a geocollections Visit http://localhost:8000/geocollections/<the-name-of-the-created-geocollection> and view the results.

Now that you know how to customize an html template, you can tune the page as you prefer.

**Permissions and APIs**

In this section we will add some more advanced logic like permissions and APIs. The permissions in GeoNode are managed with django-guardian, a library which allow to set object level permissions (django has table level authorization).

The APIs are implemented through django-tastypie.

The topics to be covered include:

- Permissions on who can view the geocollection
- How to add templated and js to embed a permission ui in our geocollection detail page
- API to serve json serialized searchable endpoint

Permissions logic (permissions objects)

We need to add the permissions object to the database. We can do this by adding the following meta class to our Geocollection model, guardian will take care of creating the objects for us.

```python
from django.contrib.auth.models import Group
from django.contrib.auth import get_user_model

class Meta:
    permissions = (
        ('view_geocollection', 'Can view geocollection'),
    )
```

Then run “python manage.py makemigrations” and “python manage.py migrate” to install them

Permissions logic (set_default)

Let’s add a method that will be used to set the default permissions on the Geocollections. We can add this logic to the Geocollection model but could also be a generic Mix-in similar to how it is implemented in GeoNode.

```python
from django.contrib.auth.models import Group
from django.contrib.auth import get_user_model

(continues on next page)"
from django.contrib.contenttypes.models import ContentType
from django.conf import settings
from guardian.shortcuts import assign_perm

def set_default_permissions(self):
    """
    Set default permissions.
    """

    self.remove_object_permissions()

    # default permissions for anonymous users
    anonymous_group, created = Group.objects.get_or_create(name='anonymous')
    if settings.DEFAULT_ANONYMOUS_VIEW_PERMISSION:
        assign_perm('view_geocollection', anonymous_group, self)

    # default permissions for group members
    assign_perm('view_geocollection', self.group, self)

Permissions logic (methods)

Now we need a method to add generic permissions, we want to be able to assign view permissions to groups and single users. We can add this to our Geocollection model

```python
vim geocollections/models.py
```

def set_permissions(self, perm_spec):
    anonymous_group = Group.objects.get(name='anonymous')
    self.remove_object_permissions()
    if 'users' in perm_spec and "AnonymousUser" in perm_spec['users']:
        assign_perm('view_geocollection', anonymous_group, self)
    if 'users' in perm_spec:
        for user, perms in perm_spec['users'].items():
            user = get_user_model().objects.get(username=user)
            assign_perm('view_geocollection', user, self)
    if 'groups' in perm_spec:
        for group, perms in perm_spec['groups'].items():
            group = Group.objects.get(name=group)
            assign_perm('view_geocollection', group, self)

def remove_object_permissions(self):
    from guardian.models import UserObjectPermission, GroupObjectPermission
    UserObjectPermission.objects.filter(content_type=ContentType.objects.get_for_model(self),
                                         object_pk=self.id).delete()
    GroupObjectPermission.objects.filter(content_type=ContentType.objects.get_for_model(self),
                                          object_pk=self.id).delete()

Permissions logic (views.py)

We can add now a view to receive and set our permissions, in views.py:
Permissions logic (url)

Lastly we need a url to map our client to our view, in urls.py

```python
def geocollection_permissions(request, collection_id):
    collection = Geocollection.objects.get(id=collection_id)
    user = User.objects.get(id=request.user.id)

    if user.has_perm('view_geocollection', collection):
        return HttpResponse('You have the permission to view. please customize a template for this view',
                            content_type='text/plain')

    if request.method == 'POST':
        success = True
        message = "Permissions successfully updated!
        try:
            permission_spec = json.loads(request.body)
            collection.set_permissions(permission_spec)
        
            return HttpResponse(json.dumps({'success': success, 'message': message}),
                                status=200,
                                content_type='text/plain')
        except:
            success = False
            message = "Error updating permissions :(
            return HttpResponse(json.dumps({'success': success, 'message': message}),
                                status=500,
                                content_type='text/plain')
```

Permissions logic (url)

Lastly we need a url to map our client to our view, in urls.py

```python
from django.conf.urls import url
from .views import GeocollectionDetail, geocollection_permissions

urlpatterns = [
    url(r'^(?P<slug>[-\w]+)/$',
```
This url will be called with the id of the geocollection, the id will be passed to the view in order to get the permissions.

**Warning:** A note on the client part, the server side logic is just one part necessary to implement permissions.

A checklist of what is necessary:

- A template snippet that can be embedded in the geocollection_detail.html, you can copy and simplify: _permissions_form.html and _permissions.html (in geonode/templates)
- A javascript file that will collect permissions settings and send them to the server, you can copy and simplify: _permissions_form_js.html (in geonode/templates)

**API**

The GeoNode API system easily allows to plug in new APIs. This section demonstrates the required steps:

We need first to create an api.py file in our geocollection app.

```python
import json
from tastypie.resources import ModelResource
from tastypie import fields
from tastypie.constants import ALL_WITH_RELATIONS, ALL

from geonode.api.api import ProfileResource, GroupResource
from geonode.api.resourcebase_api import ResourceBaseResource

from .models import Geocollection

class GeocollectionResource(ModelResource):

    users = fields.ToManyField(ProfileResource, attribute=lambda bundle: bundle.obj.
                               ->group.group.user_set.all(), full=True)
    group = fields.ToOneField(GroupResource, 'group', full=True)
    resources = fields.ToManyField(ResourceBaseResource, 'resources', full=True)

    class Meta:
```

(continues on next page)
queryset = Geocollection.objects.all().order_by('-group')
ordering = ['group']
allowed_methods = ['get']
resource_name = 'geocollections'
filtering = {
    'group': ALL_WITH_RELATIONS,
    'id': ALL
}

API authorization
We want the API to respect our custom permissions, we can easily achieve this by adding the following to the beginning of api.py:

```
vim geocollections/api.py
```

```python
from tastypie.authorization import DjangoAuthorization
from guardian.shortcuts import get_objects_for_user

class GeocollectionAuth(DjangoAuthorization):
    def read_list(self, object_list, bundle):
        permitted_ids = get_objects_for_user(
            bundle.request.user,
            'geocollections.view_geocollection').values('id')

        return object_list.filter(id__in=permitted_ids)

    def read_detail(self, object_list, bundle):
        return bundle.request.user.has_perm(
            'view_geocollection',
            bundle.obj)
```

And this to the GeocollectionResource Meta class:

```
authorization = GeocollectionAuth()
```

Add a url for our API
In order to publish our API we need a url and we want that url to appear under the GeoNode’s /api domain.
The final url for our API has to be /api/geocollections.
We can inject the url into the GeoNode API by adding the following lines to “my_geonode/urls.py” file:

```
vim my_geonode/urls.py
```

```python
from geonode.api.urls import api

from geocollections.api import GeocollectionResource
api.register(GeocollectionResource())
```

And add the following in the urlpatterns:
url(r'', include(api.urls)),

The final result will be:

```python
from django.conf.urls import url, include
from django.views.generic import TemplateView
from geonode.urls import urlpatterns
from geonode.api.urls import api
from geocollections.api import GeocollectionResource

api.register(GeocollectionResource())
urlpatterns += [
    # include your urls here
    url(r'', include(api.urls)),
    url(r'^geocollections/', include('geocollections.urls')),
]
```

Let’s test permissions on API

We can test the permissions on API by manually set a permission from the command line and check that the API respects it.

With running python manage.py shell from inside our “my_geonode” folder, it opens a geonode shell.

A perm spec could look like this:

```python
perms = {
    'users': {
        'AnonymousUser': ['view_geocollection'],
        'alessio': ['view_geocollection']
    }
}
```

and we can assign the permissions with:

```python
from geocollections.models import Geocollection
Geocollection.objects.first().set_permissions(perms)
```

our http://localhost:8000/api/geocollections should now list the geocollection.

If you remove the ‘AnonymousUser’ line from perms and assign again the permissions it will disappear.

```python
perms = {
    'users': {
        'alessio': ['view_geocollection']
    }
}
```

Deploy your GeoNode

So far we demonstrated how to modify, extend and style our GeoNode in dev mode but now it’s time to go on production. In this section we will clarify how to:

- commit your work on GitHub
- setup your server
• setup your GeoNode for production

Push to GitHub It is always a good practice to keep your code in a remote repository, GitHub is one of the options and is indeed the most used.

It is assumed that you already have a GitHub account and that you have git installed and configured with your name and email.

We will push only the my_geonode folder to GitHub and as we knew earlier, GeoNode for us is a dependency and we’ll just reinstall it as it is on the server.

Steps to push your code to GitHub:

• Create an empty repository in GitHub and copy it's address
• In my_geonode, run git init to initialize an empty repository
• Add your remote repository address with git remote add yourname yourremoteaddress
• edit .gitignore adding all *.pyc files
• git add * to add all content of my_geonode
• git commit -m 'initial import' to make the initial commit
• git push yourname master to push the code to the GitHub repository

Setup the server

There are several options for deploying GeoNode projects on servers. In this section, we explain how to deploy it on Ubuntu server 18.04 using system-wide installation

Note: For quick installation, follow the INSTALLING documentation at http://docs.geonode.org/en/master/install/core/index.html

Setup our my_geonode

We need now to install the developed “my_geonode” project following these steps:

• git clone from your repository (in the folder of your preference)
• sudo pip install -e my_geonode
• edit the settings where needed
• edit /etc/apache2/sites-enabled/geonode.conf replacing the wsgi path to the my_geonode/my_geonode/wsgi.py file
• add the apache rights to the “my_geonode” folder with a directory like

```
<Directory "/path/to/my_geonode/">
    Order allow,deny
    Require all granted
</Directory>
```

• Test your server.

This documentation helps developers to install GeoNode-Core and GeoNode-Project from different scenarios. GeoNode-Project can be installed on top of GeoNode-Core if already installed. Also GeoNode-Project can be installed from scratch as it has GeoNode-Core as a prerequisit.
## HTTP Routing Table

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<th>Method</th>
<th>Description</th>
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<tbody>
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