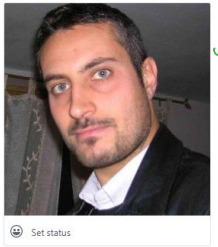
# State of GeoNode 2.10

Torino
2020-02-19

GeoNode

# This presentation is brought to you by




**Alessio Fabiani**
afabiani

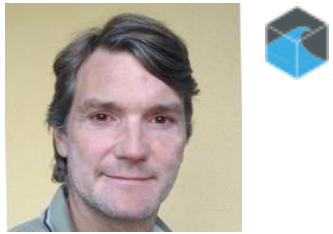
Co-founder and Senior SW Engineer @GeoSolutions, involved on GIS related Open Source projects since 2004. PSC member of GeoServer, PSC and OSGEO Project Officer of GeoNode.

**Francesco Bartoli**
francbartoli

Security and spatial IT geek with an opinionated mind to openness. Hugely addicted to rock and mountain climbing. GeoNode PSC member.

**Simone Dalmasso**
simod

Technical project officer at European Commission JRC in charge of the Copernicus EMS Rapid Mapping. Father of 1.5 children, former chef and GeoNode PSC member.



**Dr. Amedeo Fadini (Research Fellow)**
amefad

Work experience in computer science the field of Geographic Information Systems (GIS) planning and cartography, especially in the Public Sector.
Works as GIS Analyst and developer at CNR-ISMAR designing and managing Geonode based geoportals.

GeoNode

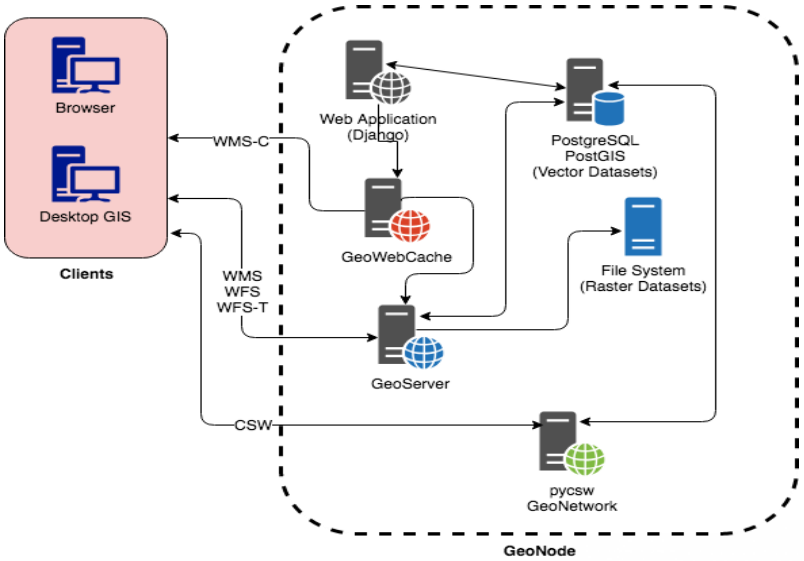
# GeoNode at a Glance

A web framework based on Python and Django to allow people to upload, describe, share and use their geospatial data.

We usually define GeoNode as a geospatial-CMS.

Core Components

- **Django**
- **SQLite/PotsgreSQL-PostGIS**
- **GeoServer/QGIS Server**
- **GeoWebCache**
- **pycsw / GeoNetwork**
- **(MapStore)**

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# Capabilities

- **Upload** geospatial datasets (by default shapefiles and GeoTIFFs)
- User with appropriate permissions can **edit layer metadata**, which are exposed by OGC CSW and REST, to provide search/discovery capability
- Create **thematic maps** accessible to general public
- Users with appropriate permissions can **edit layer styles** and features (for vector layers)
- **Granular permission systems**: viewing, downloading, metadata editing, styles and feature editing for a layer can be restricted to users or groups
- GeoNode exposes a number of **standards** for each layer: **OGC** (**WMS, WMS-C, WFS, WFS-T, WCS, CSW**) and mass market search standards (OAI-PMH, SRU, OpenSearch)

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# Release History

- **February 2020, GeoNode 2.10.2 (Django 1.11.29, GeoServer 2.15.4, pycsw 2.4.2)**
- June 2019, **GeoNode 2.10** (Django 1.11.20, GeoServer 2.14, pycsw 2.2.0)
- *April 2018*, **GeoNode 2.8** (Django 1.8.19, GeoServer 2.12.2, pycsw 2.0.2, group moderation and resources publication workflow, SLD upload, metadata wizard)
- *May 2017*, **GeoNode 2.6** (Django 1.8.7, GeoServer 2.9, pycsw 2.0.2, React client, QGIS server backend, ansible and docker setup, Ubuntu 16.04 support)
- *November 2015*, **GeoNode 2.4** (Django 1.6.11, GeoServer 2.7, pycsw 1.10.5, django-guardian, groups, remote services, responsive template, Ubuntu 14.04 support)
- *April 2014*, **GeoNode 2.0** (Django 1.5.5, GeoServer 2.5, pycsw 1.8.6, django-polymorphic, bootstrap, Ubuntu 12.04 support)
- *October 2012*, **GeoNode 1.2** (Django 1.4, GeoServer 2.3, South migrations, django-taggit, social features, comments and ratings, find/add layers widget)
- *May 2012*, **GeoNode 1.1.1** (Ubuntu 10.04 and 11.04 installer)
- *December 2010*, **GeoNode 1.0**, with major contributions from OpenGeo, the World Bank, GFDRR, UNISDR, and GEM
- *August 2010*, **GeoNode 1.0-beta**

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# Summits and code sprints

- **GeoNode Summit 2020**: Brunswick, Germany | 12 - 14 May, 2020 (hosted by THÜNEN INSTITUTE)
- **GeoNode Summit 2019**: Viareggio, Italy (hosted by GeoSolutions)
- **GeoNode Summit 2018**: Turin, Italy (hosted by ITHACA)
- **GeoNode Code Sprint 2016**: Bonn, Germany and New Orleans, LA, USA
- **GeoNode Summit 2016**: Rome, Italy (hosted by UN WFP)
- **GeoNode Code Sprint 2015**: New Orleans, LA, USA and Turin, Italy
- **GeoNode Summit 2012**: Cambridge, MA, USA (hosted by Harvard University)
- **GeoNode Summit 2011**: Washington DC (hosted by World Bank)

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# Community growth and adoption

**UN**, **The World Bank**, **OpenGeo**, **Resilience Academy (University of Turku)**, Australia Indonesia Facility for Disaster Reduction (AIFDR), MapStory, Global Earthquake Model (GEM) Foundation, Harvard WorldMap, ROGUE (US Army Corps of Engineers), South Pacific Applied Geoscience Commission (SOPAC), SERVIR (US National Aeronautics and Space Administration / NASA), Regional Centre for Mapping of Resources for Development (RCMRD, Kenya), Information Technology for Humanitarian Assistance Cooperation and Action (ITHACA, Italy), UN World Food Programme (WFP), Comision Permanente de Contingencias (COPECO, Honduras), Humanitarian Information Unit (HIU, US State Department), Marine Civil Information Management System (MARCIMS, US Marine Corps), National Geospatial-Intelligence Agency (US NGA), Office of Secretary of Defense (US), Pacific Disaster Center, Central Asian Institute for Applied Geosciences (CAIAG, Kyrgyzstan), National Research Council, Institute of Marine Sciences (Italy), European Commission Joint Research Centre (JRC), World Agroforestry Centre (ICRAF), Massachusetts Institute of Technology (MIT, US), National Oceanic and Atmospheric Administration Center for Weather and Climate Prediction (NOAA NCWCP, US Department of Commerce), Politecnico di Milano (Italy), Humanitarian Data Exchange (HDX, United Nations Office for the Coordination of Humanitarian Affairs), Agency for International Development (US AID), HABAKA Innovation Hub (Madagascar), GESP (Gestione Elaborazione Studio Pianificazione, Italy), Zhejiang University (China), Ritsumeika University (Japan), Intergovernmental Authority on Development (IGAD), (MapStand Ltd), (UNESCO IHP-WINS), Consiglio Nazionale delle Ricerche (CNR Italy), Uganda Bureau of Statistics – Uganda Boureau Of Statistics (UBOS), Istituto Superiore per la Protezione e la Ricerca Ambientale - (ISPRA Italy), Skeena Knowledge Trust - (SKT Canada) ...

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# Community and infrastructure

- Official **PSC** elected by the community and composed today by 5 members
- ~20 active core **committers** across several organizations
- ~500 members on the **users** list
- ~120 members on the **developers** list
- Mailing list traffic growing steadily
- Successfully onboarding new developers and contributing organizations
- ~350 **Pull Requests** Merged in the last year
- Continuous Integration + Automated Builds
- Working toward a regular release cycle

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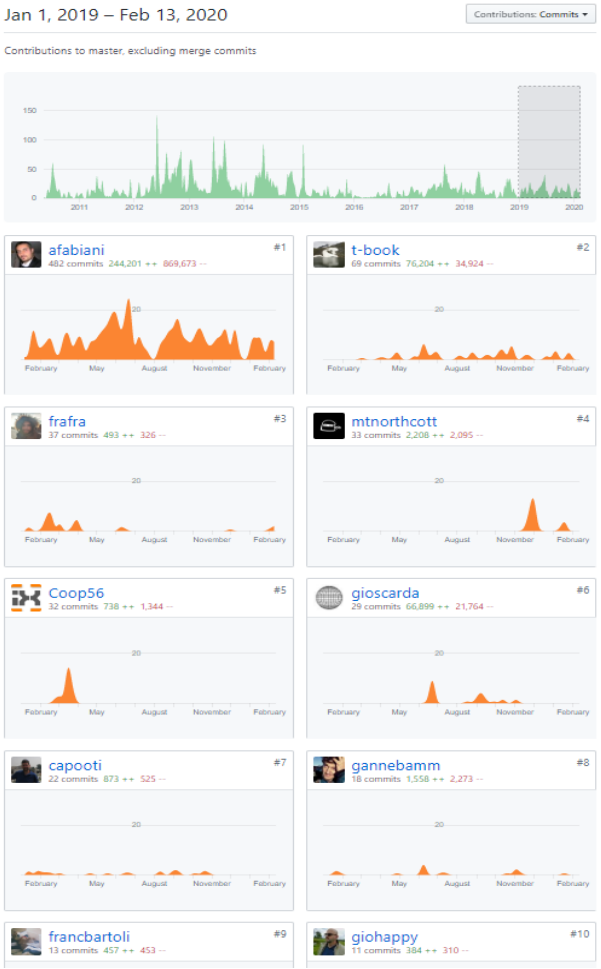
# Active contributors

- World Bank
- GeoSolutions
- Catalyst
- Harvard University
- NINA - Norsk institutt for naturforskning
- GeoBeyond
- Terranodo
- Boundless
- Joint Research Centre
- UN WFP
- ITHACA
- MapStory
- The Pacific Community
- CSGIS
- CartoLogic

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# Active contributors

CoderStats(GeoNode)

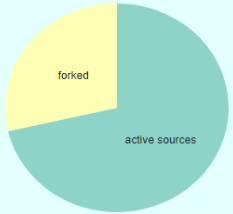
GitHub user name | Get Stats

**GeoNode Development Team**

Joined GitHub 29 Sep 2009

GeoNode
geonode.org
Global

**Repo types**




| Pushed to repos | Main languages | Total issues | Total forks | Total stars | Followers | Following |
|---|---|---|---|---|---|---|
| 49 | 8 | 220 | 1222 | 1039 | 0 | 0 |

## Summary

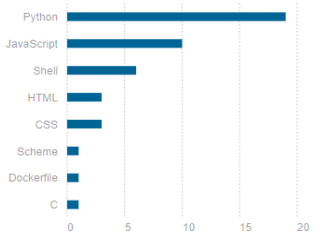
GeoNode Development Team has 50 repositories on GitHub, the latest 50 with user activity were loaded from GitHub's web service for this evaluation. GeoNode Development Team has pushed to **49** of these repositories. This is a high ratio congratulations!

**8** different main languages were identified across all repos pushed to. The main language is the one with the largest amount of code in a given repository, as identified by GitHub's linguist. Assuming a basic level of proficiency in all these languages GeoNode Development Team can be considered hyperpolyglot in the world of computer languages. **Python** occurs most frequently – 19 times – as the main repo language.

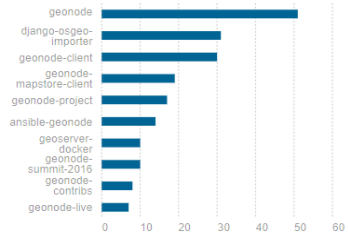
The total number of forks across all pushed to repositories indicates that the GitHub projects GeoNode Development Team contributes to are actually used by other people.

## Rankings

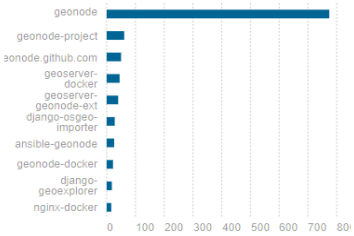
### Languages



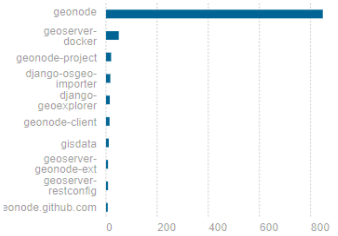

### Issues




### Forks




### Stars

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# GeoNode 2019/20

What's in a year?

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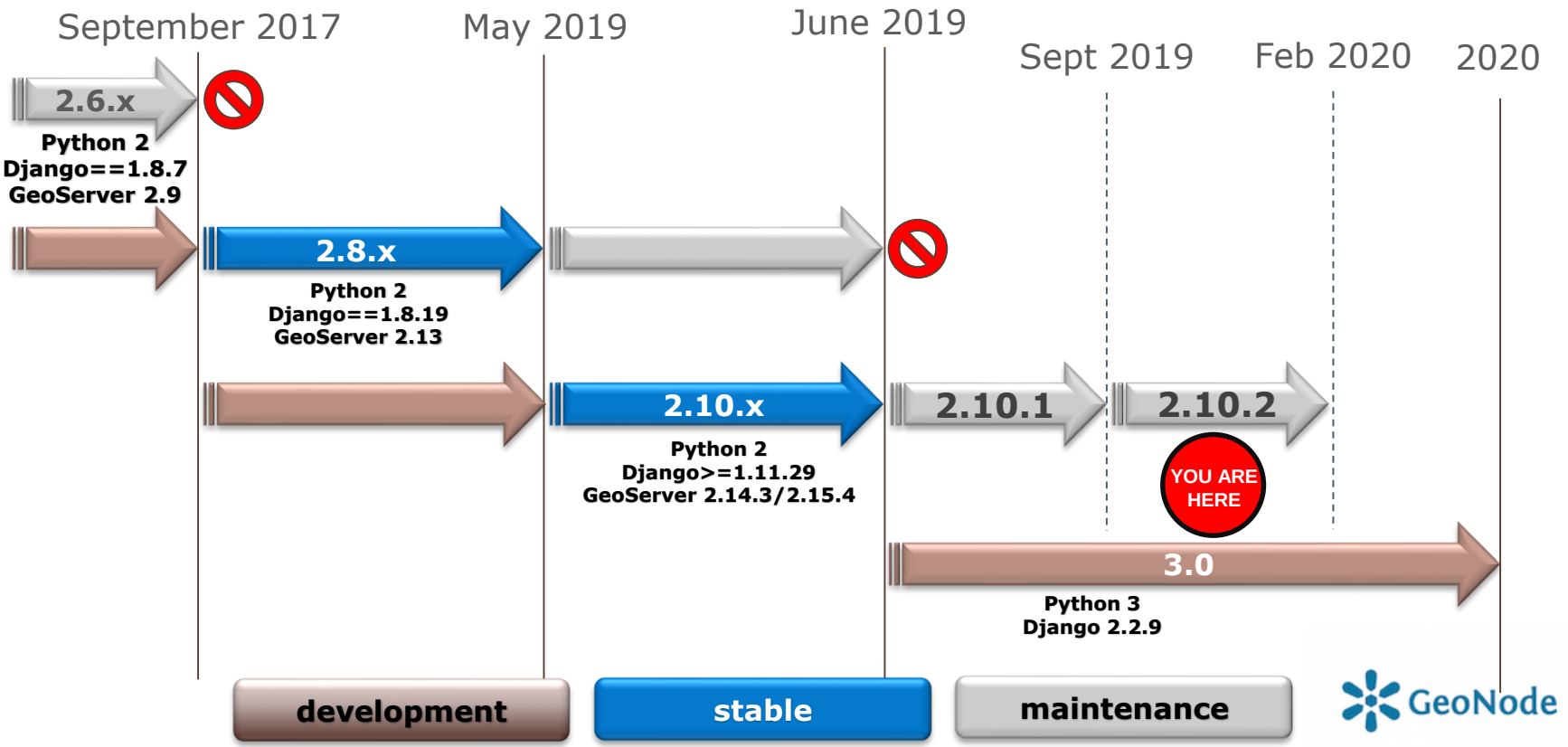
# Releases covered by this presentation



# Are you using a older version? Upgrade!

- User/Developer lists and Gitter tipically covers only supported versions
  - Today it means 2.10.x and 3.0.x
  - From 2021 it will mean 3.0.x
- Security fixes and installation support on new OSs being added to supported versions only!
- Moving data from old versions will be much harder if not impossible
- Web interfaces and GIS clients will be much different. No one will be able to backport fixes or improvements to the old ones.
- Please upgrade your GeoNode installations!!!

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# What's new?

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# Upgrade? What's in it for me?

- Let's check what's new in 2.10.2 / 3.0 upcoming release
- Check the bottom of each slide to see who sponsored a certain feature, who implemented it, and what version contains it

Sponsor | Author | Version

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# Upgrade to Python3 and Django 2.2 (GeoNode 3)

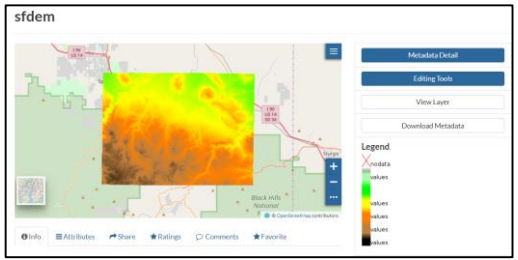
- Important Security and performance fixes
- Support Python 3.5+ and Django 2.2.9

# Upgrade to GeoServer 2.15.4

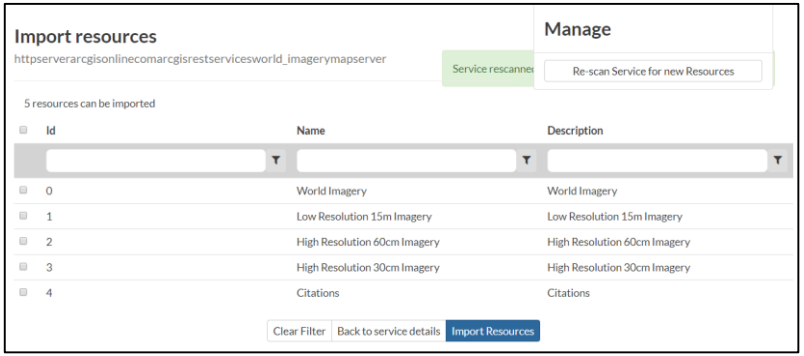
- Important Security and performance fixes
- Updated versions of community modules:
  - ✓ *Backup & Restore*
  - ✓ *OAuth2*
  - ✓ *GeoFence*
  - ✓ *GeoWebCache*
- Support for more styles and improved compatibility with QGIS SLD export
- Support 2.15.x and 2.16.x

# Remote Services Improvements

- Import Legends and as much as metadata fields as possible
- Allows remote resource filtering and exposure to the catalogue




- Improved stability on harvesting
- Support for more endpoints, WMS, ArcGIS REST, GeoNode OWS APIs

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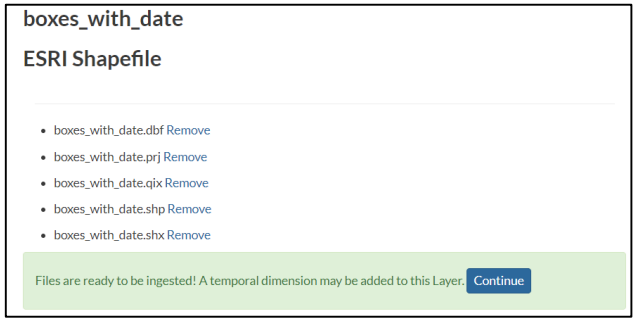
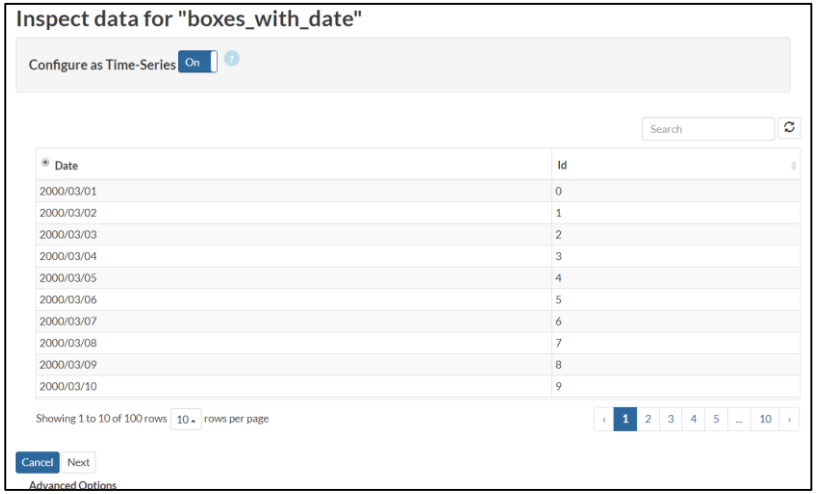
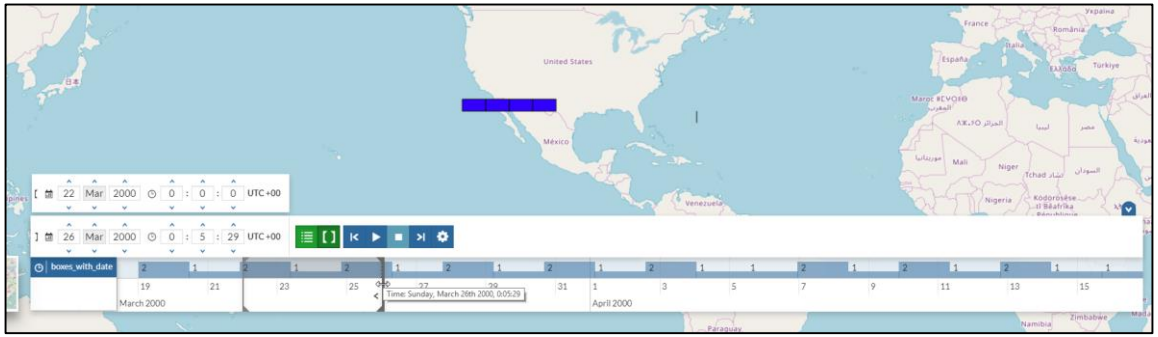
# Support to Temporal Series

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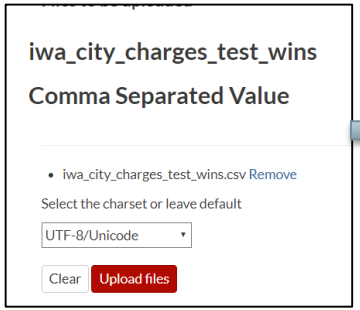
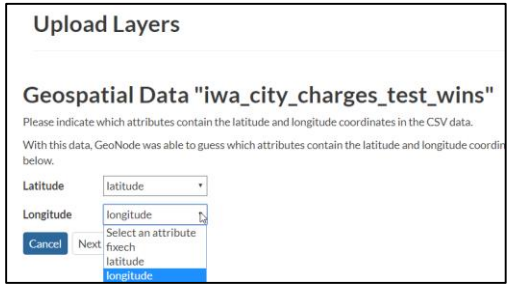
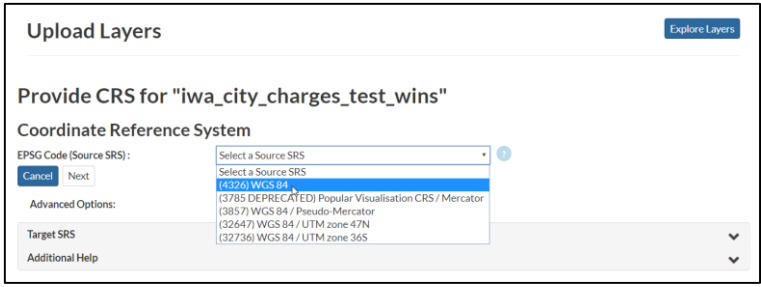
# Improvements to Uploaders and data formats

- **SLDs** and metadata **XML** can be included directly on a **ZIP** file
- Supports: **CSV, KML, KMZ (Ground Overlays), JSON**



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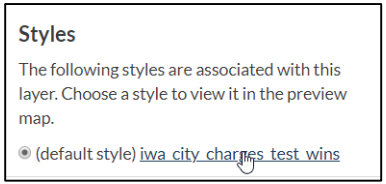
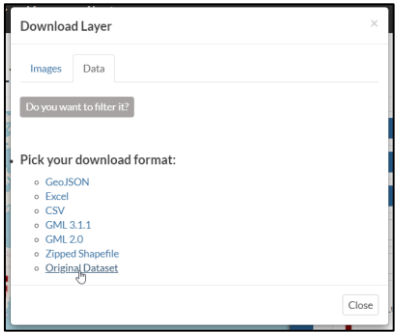
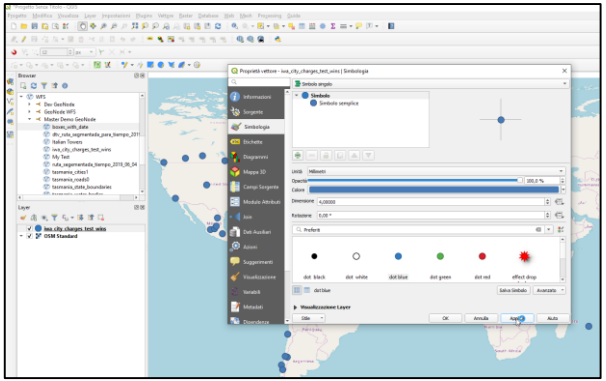
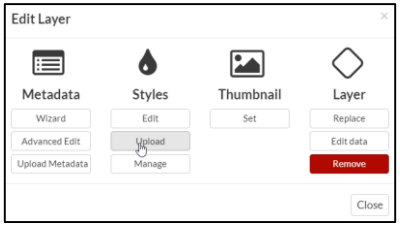
# SLD Export and Upload

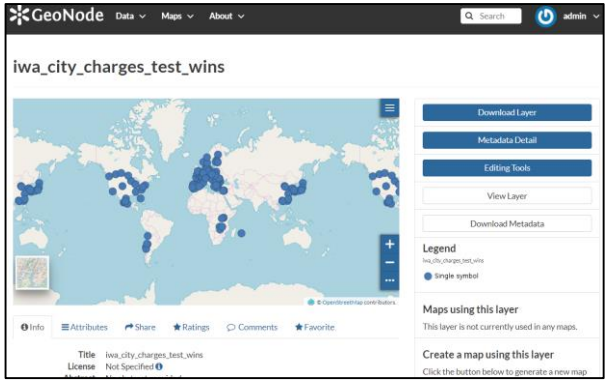
- Direct download of available styles and original dataset
- Still needs work and improvements; for the moment supports well only simple styles



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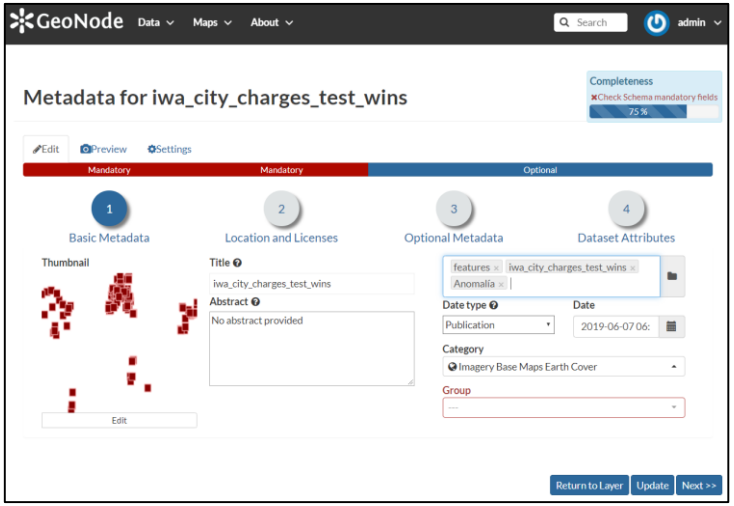
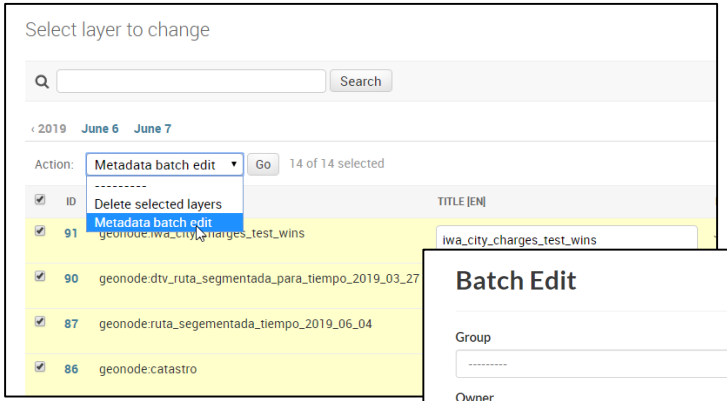
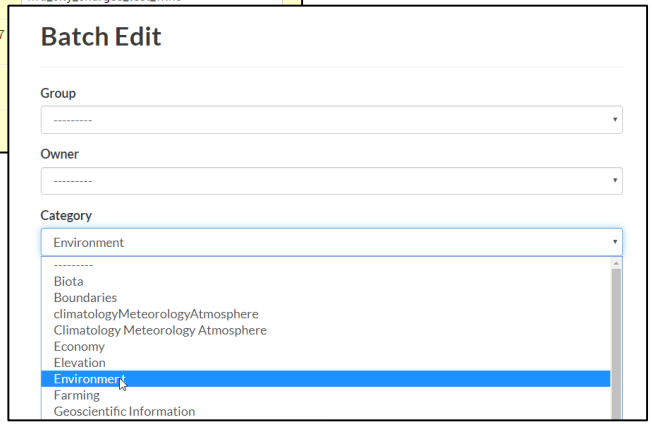
# Metadata Improvements and Batch Update

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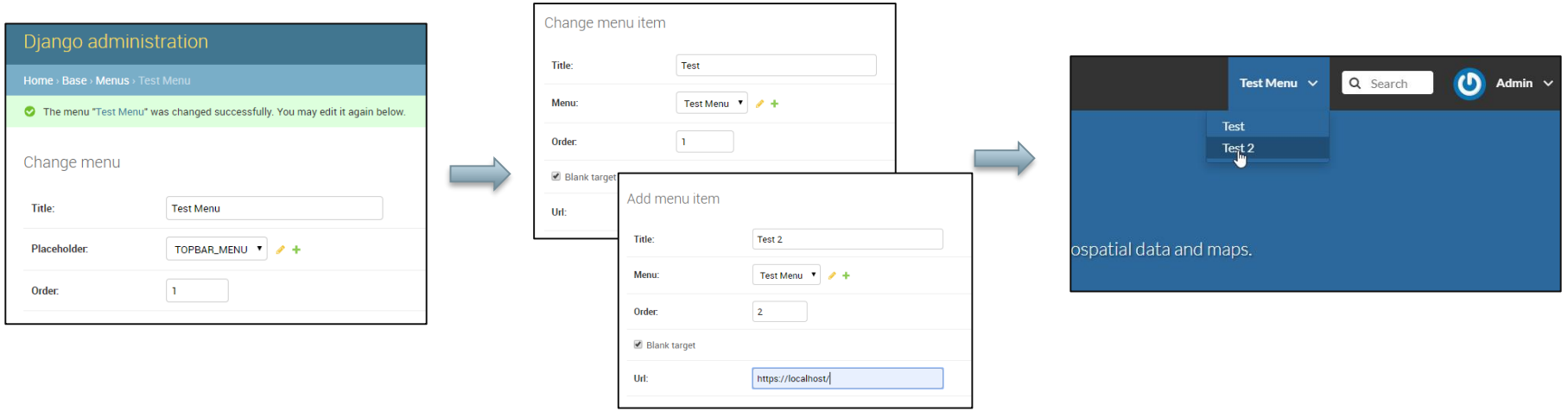
# Menu Management

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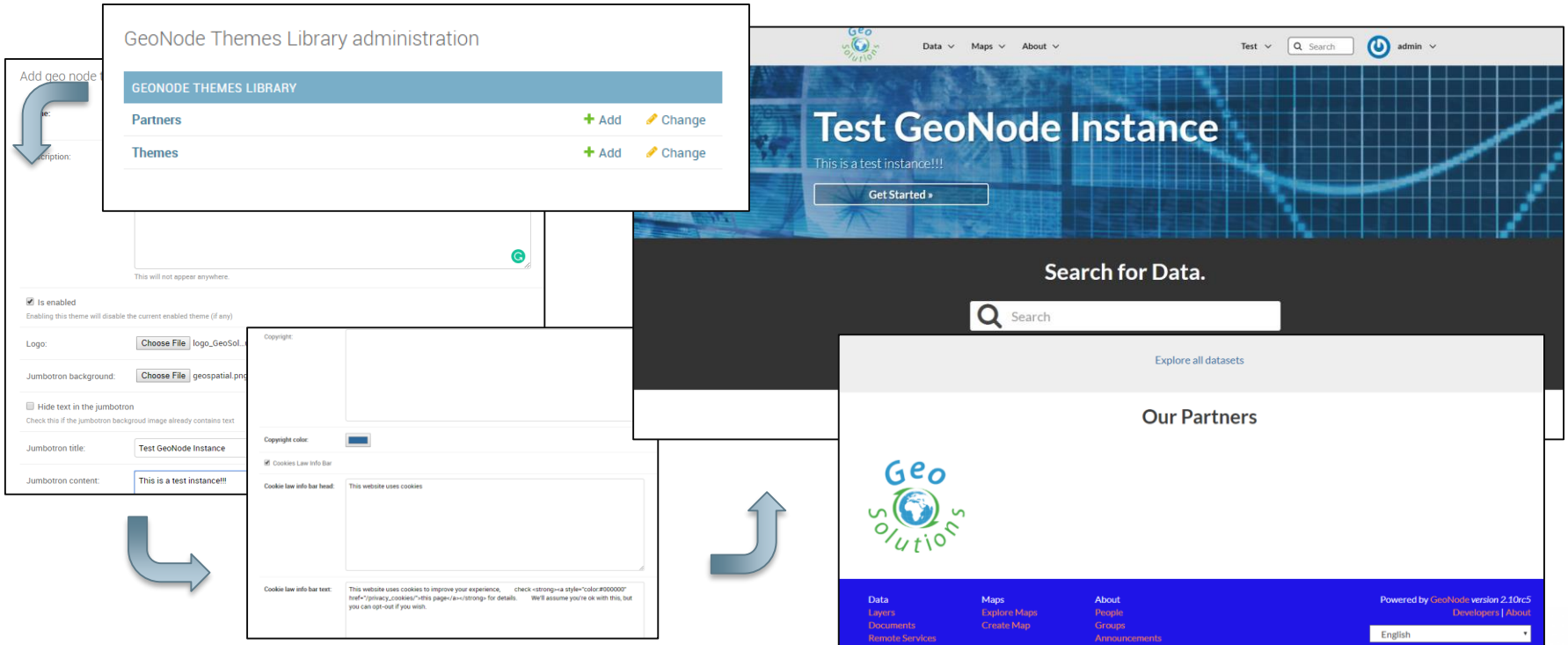
# Theme and Privacy Policy Management

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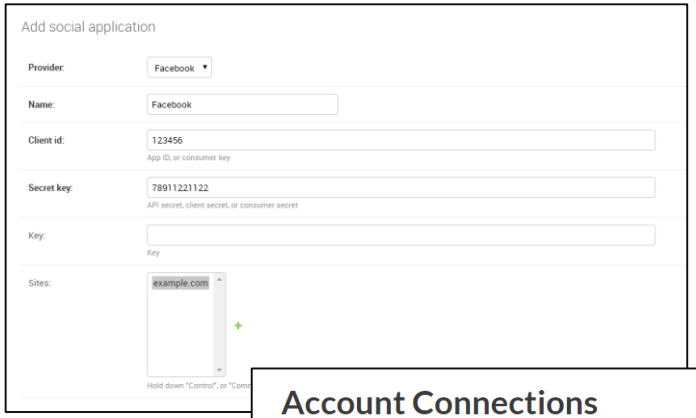
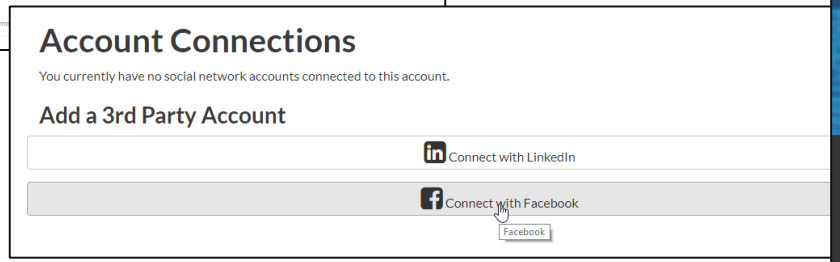
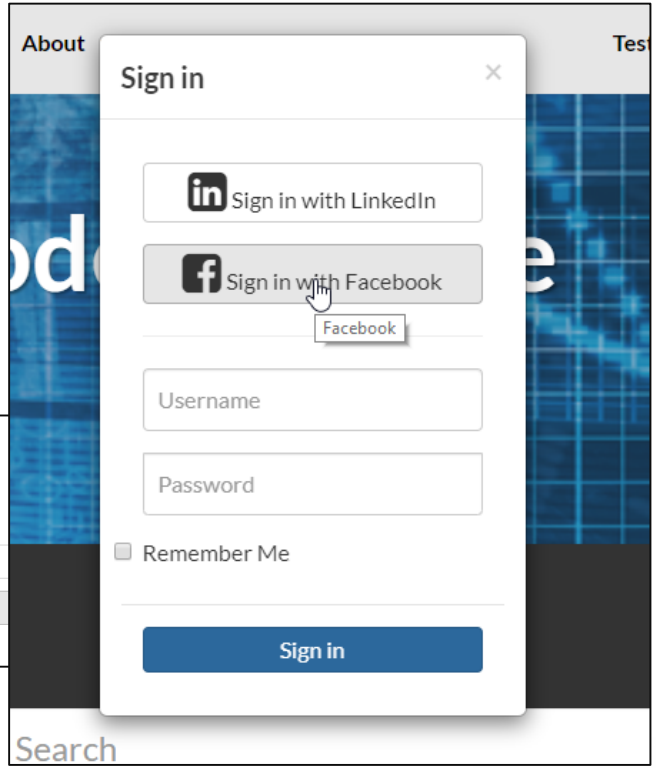
# Social Account Login

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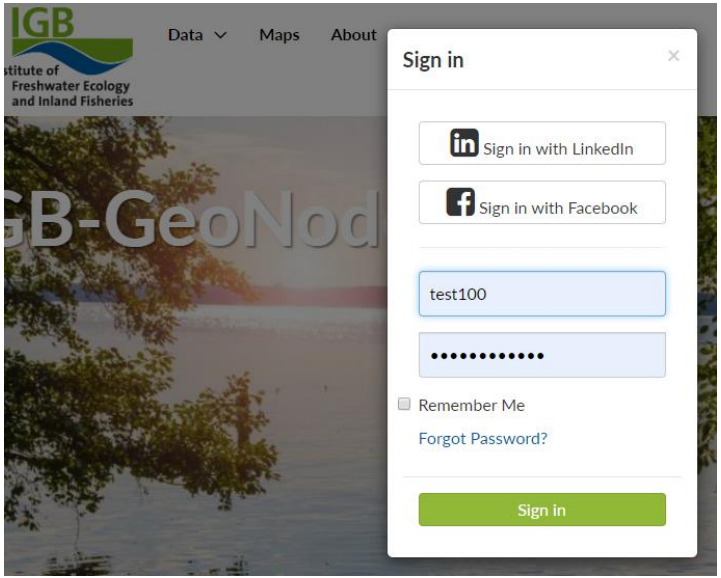
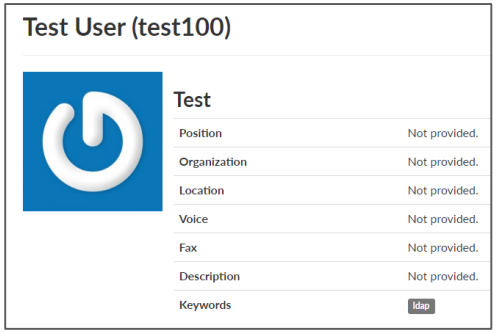
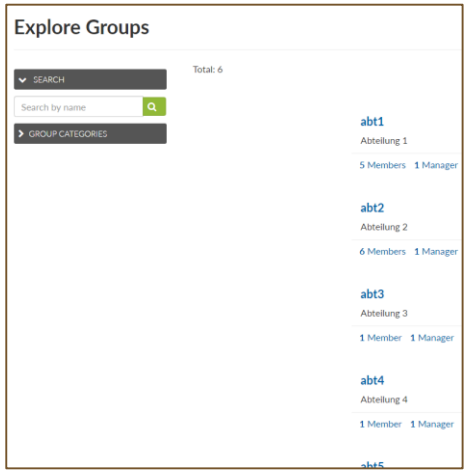
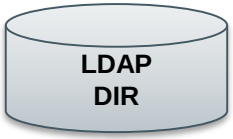
# LDAP Authentication




- LDAP login
- Sync LDAP Group Membership

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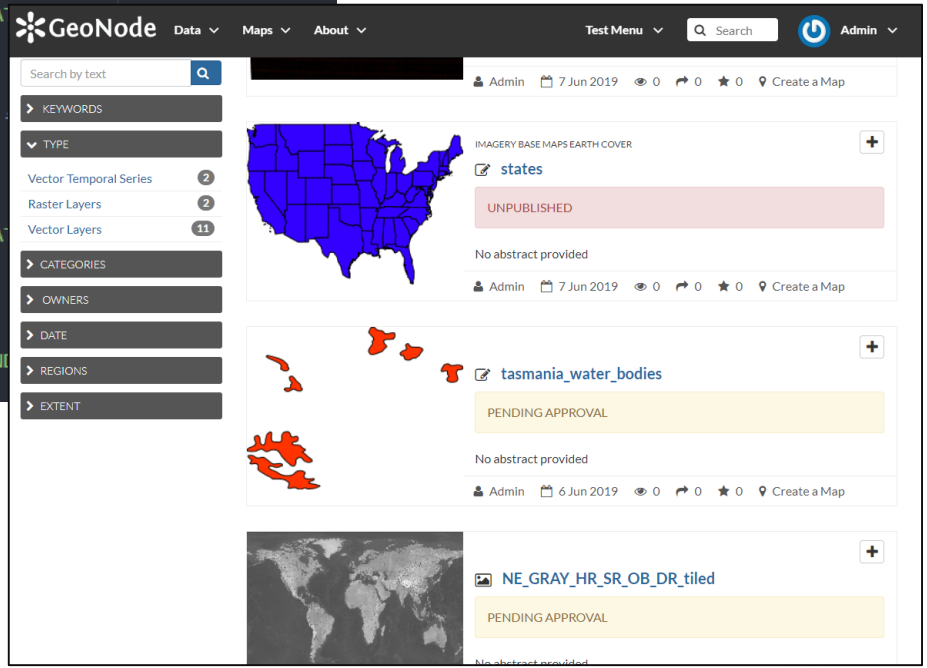
# Data Upload Advanced Workflow

```
# Each uploaded Layer must be approved by an Admin before becoming visible
ADMIN_MODERATE_UPLOADS = ast.literal_eval(os.environ.get('ADMIN_MODERA

# option to enable/disable resource unpublishing for administrators
RESOURCE_PUBLISHING = ast.literal_eval(os.getenv('RESOURCE_PUBLISHING'

# If this option is enabled, Resources belonging to a Group won't be
# visible by others
GROUP_PRIVATE_RESOURCES = ast.literal_eval(os.environ.get('GROUP_PRIVA

# If this option is enabled, Groups will become strictly Mandatory on
# Metadata Wizard
GROUP_MANDATORY_RESOURCES = ast.literal_eval(os.environ.get('GROUP_MAN
```

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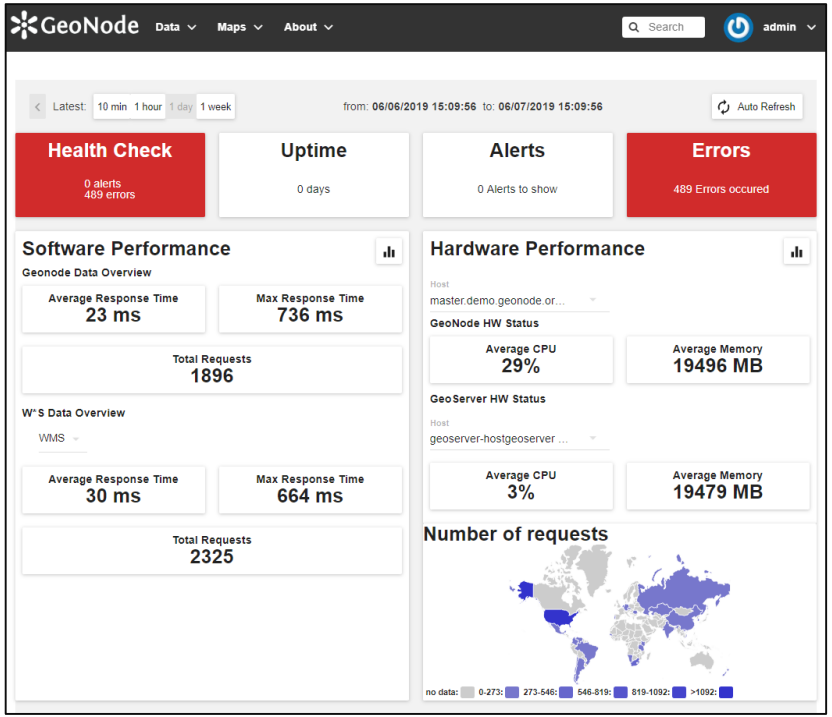
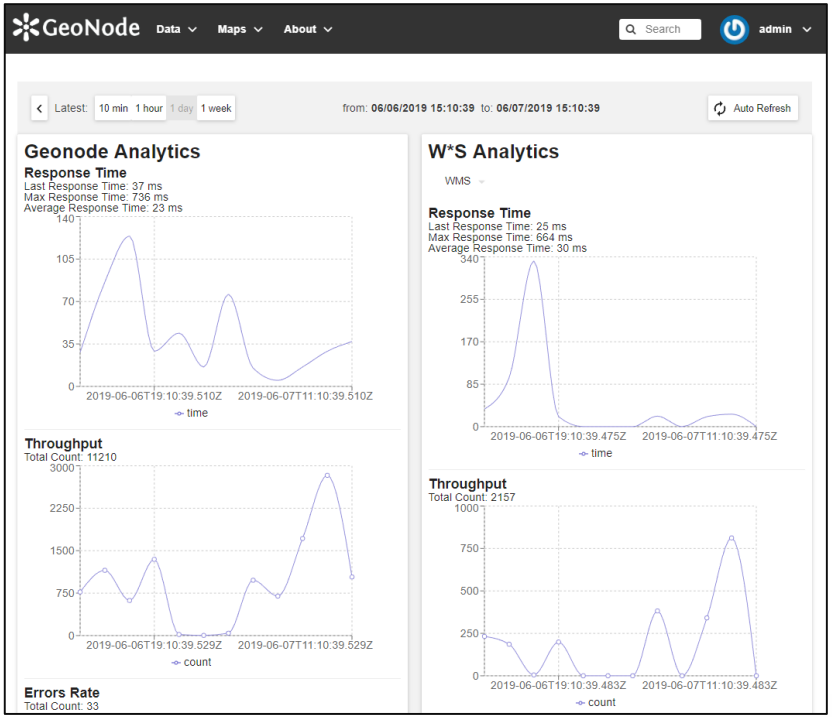
# GeoNode Integrated Monitoring

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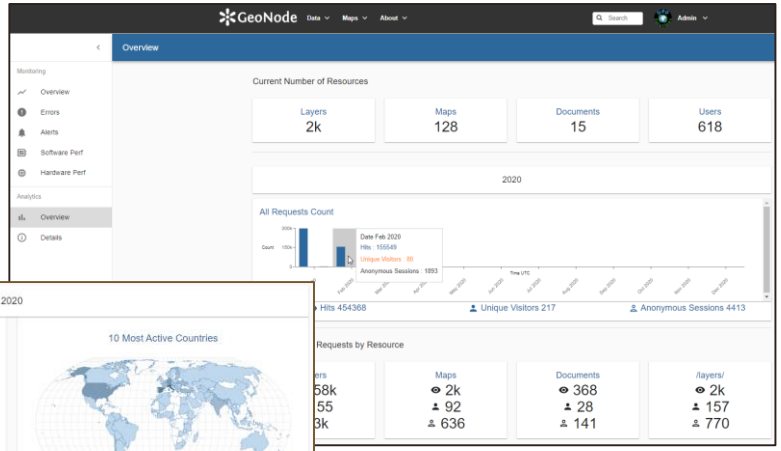
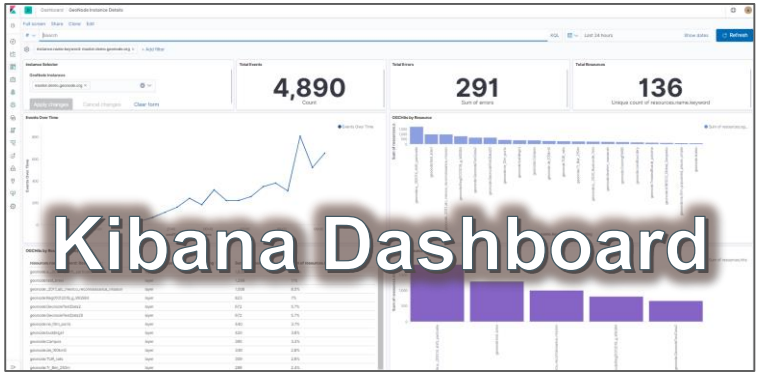
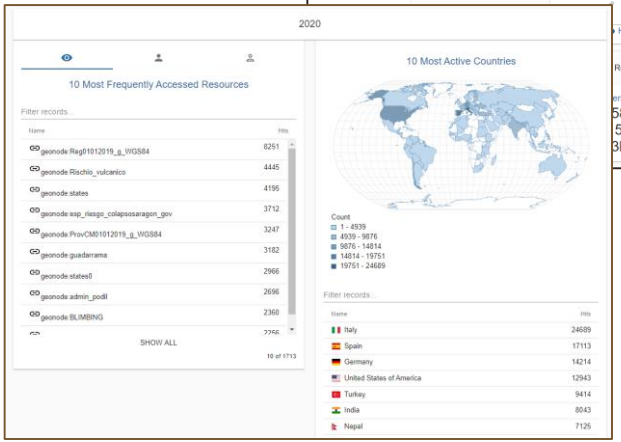
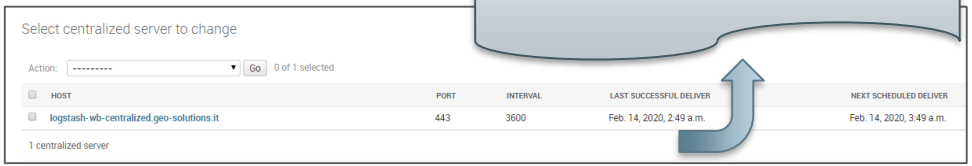
# GeoNode Analytics and Centralized Dahsboard




Logstash Async

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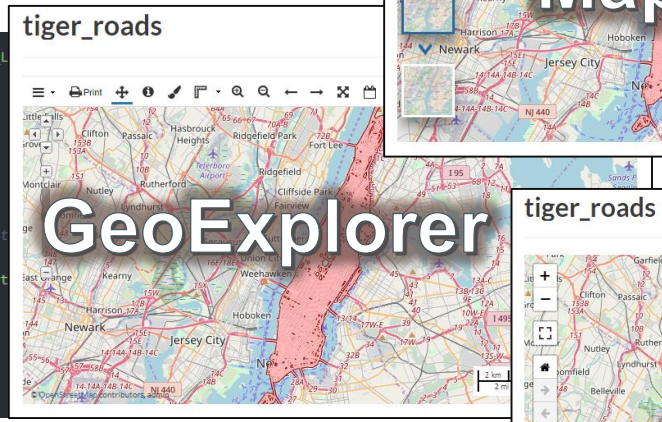
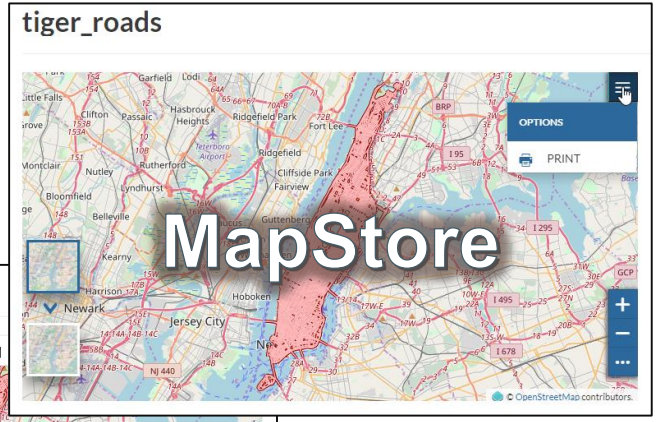
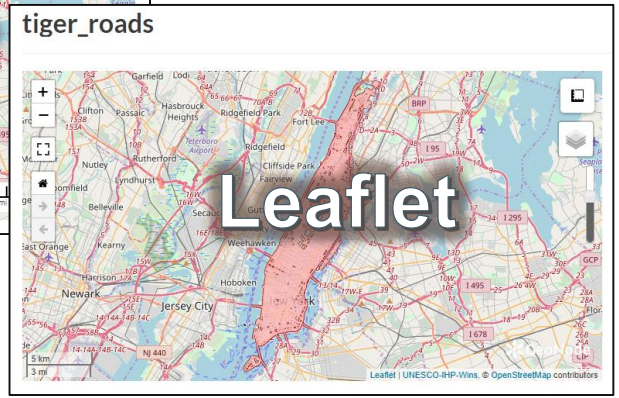
# GeoNode GIS-Client Hooksets

- GIS Clients (maps and layer details) can be plugged in as external libraries thanks to the **CLIENT HOOKSETS**

```
GEONODE_CLIENT_LAYER_PREVIEW_LIBRARY = os.getenv('GEONODE_CLIENT_LAYER_PREVIEW_L

"""
To enable the GeoExt based Client:
1. pip install django-geoexplorer==4.0.42
2. add 'geoexplorer' to INSTALLED_APPS
3. enable those:
"""
# GEONODE_CLIENT_LAYER_PREVIEW_LIBRARY = 'geoext'  # DEPRECATED use HOOKSET inst
if GEONODE_CLIENT_LAYER_PREVIEW_LIBRARY == 'geoext':
    GEONODE_CLIENT_HOOKSET = os.getenv('GEONODE_CLIENT_HOOKSET', 'geonode.client

    if 'geoexplorer' not in INSTALLED_APPS:
        INSTALLED_APPS += ('geoexplorer', )

    # MAP_BASELAYERS += [
    # {
```




- You can add your ones

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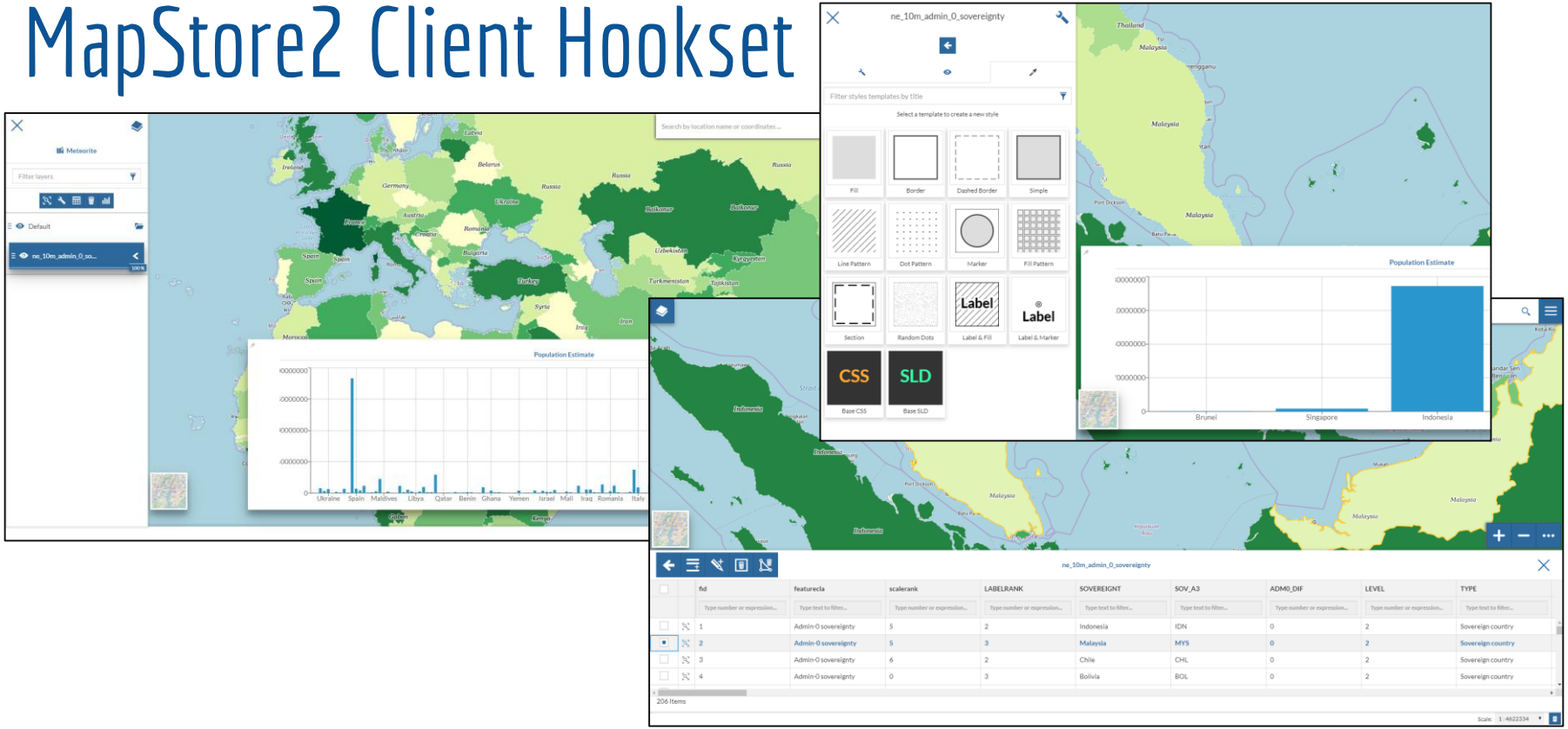
# MapStore2 Client Hookset

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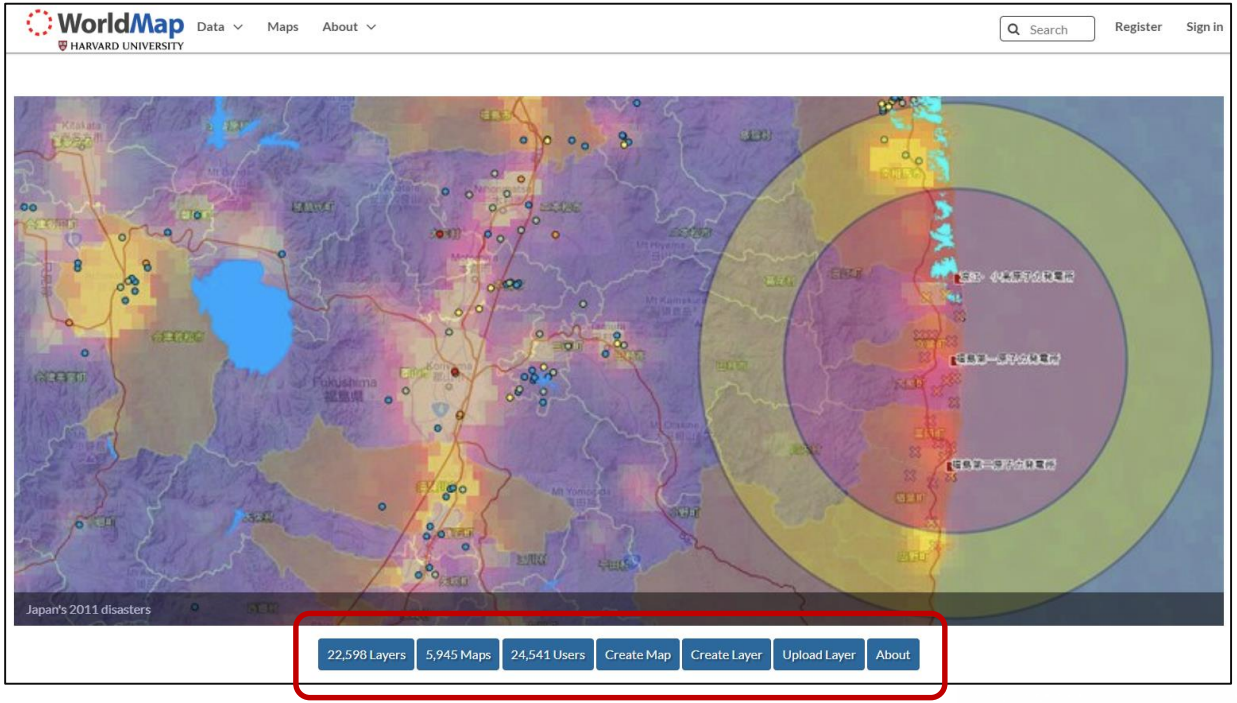
# GeoNode and GeoFence Performance Optimizations

- Performance improvements and hardening to support a huge number of resources and maps, 10k+ layers!
- The possibility to activate `DELAYED SECURITY` signals in order to allow GeoNode and GeoFence align asynchronously

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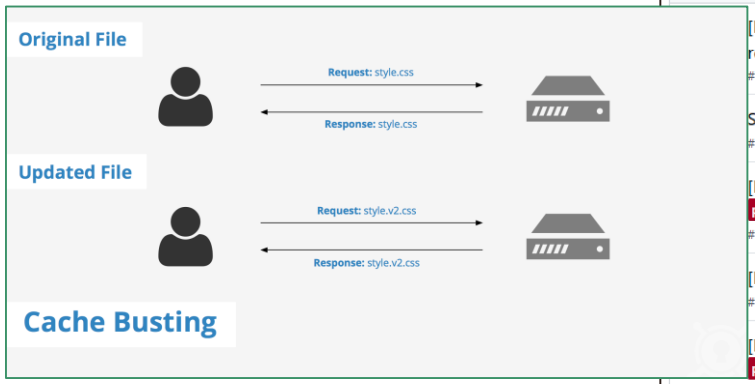
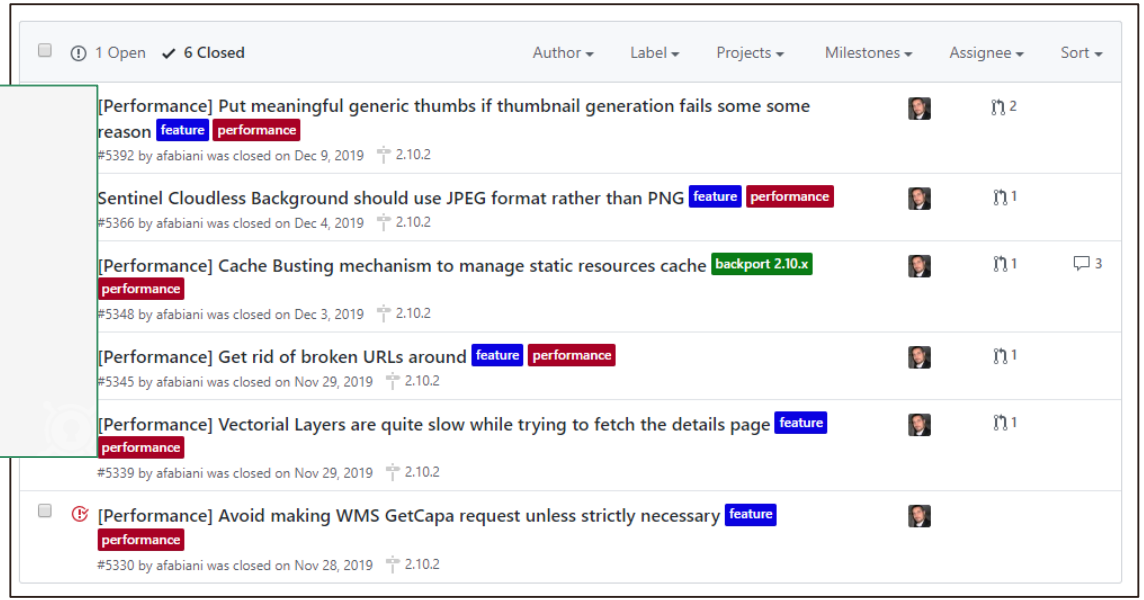
# GeoNode GUI/Caching Performance Optimizations

- Cache Busting




- Broken links / images checks
- Get rid of un-useful GeoServer calls

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GeoNode

# Docker Improvements / SPCgeonode Compose

- Docker Compose installation has been simplified a lot, both on GeoNode core and GeoNode-Project
- SPCgeonode is a setup for Geonode deployment at SPC. It makes it easy to deploy a production ready Geonode. The setup aims for simplicity over flexibility, so that it will only apply for typical small scale Geonode installations.
- The setup is also usable for Geonode development or customization.
- https://github.com/GeoNode/geonode/tree/master/scripts/spcgeonode

# Security and Hardening - MIDDLEWAREs

- GeoNode 2.10 is based on Django framework v.1.11. The framework offers a strong and battle-tested security mechanism inherited and extended by GeoNode's own security layer and integrations. The general security features of Django are well described in its own documents: https://docs.djangoproject.com/en/1.11/topics/security

✓ ***LockDown Middleware*** *(GeoNode) a Middleware class which forces authentication for every non-authorized URL*

✓ ***SessionControl Middleware*** *(GeoNode) a Middleware class looking for Token expiration and session validity. Accordingly to the settings, it will either force the user to log in again or refresh/extend the token validity.*

✓ ***Cors Middleware*** *A Django App that adds CORS (Cross-Origin Resource Sharing) headers to responses. Although JSON-P is useful, it is strictly limited to GET requests. CORS builds on top of XmlHttpRequest to allow developers to make cross-domain requests, similar to same-domain requests. http://www.html5rocks.com/en/tutorials/cors*

✓ ***CsrfView Middleware*** *ref. https://docs.djangoproject.com/en/2.2/ref/csrf*

✓ ***XFrameOptions Middleware*** *ref. https://docs.djangoproject.com/en/2.2/ref/clickjacking*

✓ ***Security Middleware*** *ref. https://django-secure.readthedocs.io/en/latest/middleware.html*

✓ ***OAuth2Token Middleware*** *ref. https://django-oauth-toolkit.readthedocs.io/en/latest/tutorial/tutorial_03.html*

# Security and Hardening – OWS Internal Proxy

- Fixed users dangerous privileges escalation; internally requests to the backend were always done as "ADMIN"
- GeoNode Proxied OWS Endpoints

✓ *The proxy automatically searches for the user OAUth2 Token and injects the correct BEARER AUTH Headers transparently*

✓ ***/gs/ows** Accepts BASIC AUTH headers but still allows anonymous users to fetch OWS documents*

✓ ***/gs/w*s** Forces the users to perform BASIC AUTH first*

# Fixes and Improvements

- Well known 2.6/2.8 issues:

✓ *Thumbnails generation*

✓ *Wrong BBOX coordinates on Download Links*

✓ *Wrong BBOX coordinates for projections different from WGS84 or EPSG:3857*

✓ *Glitches on Map Zoom levels*

✓ *Errors on Metadata Editor, especially after updating an existing resource*

✓ *Upload Encoding errors on input data*

✓ *Misbehavior on GeoServer data-store creation*

✓ *Filtering errors on Vectorial Data Download*

✓ *and many more…*

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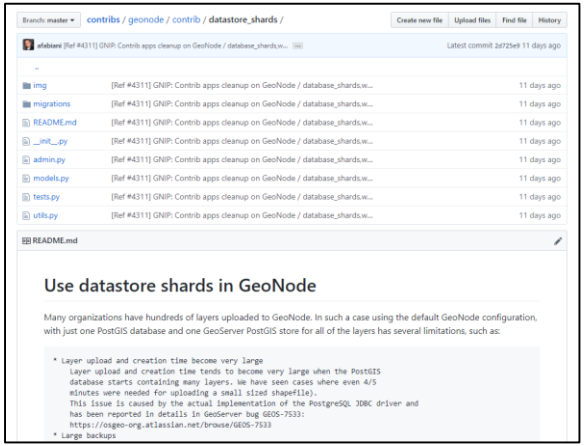
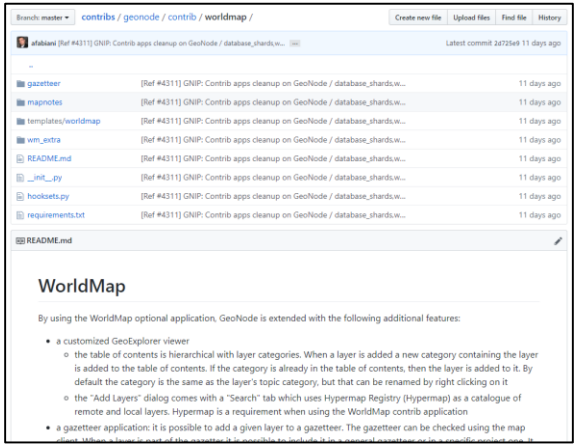
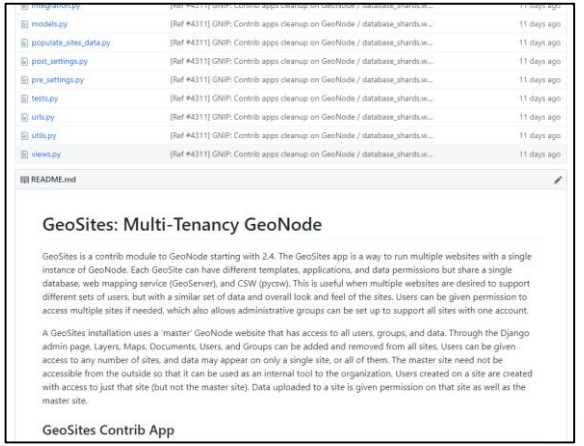
# Contrib Apps Promotion

- Most of the “contrib apps” have been ported to core
- “contribs” have now their onw repository with dedicated docs

https://github.com/GeoNode/contribs

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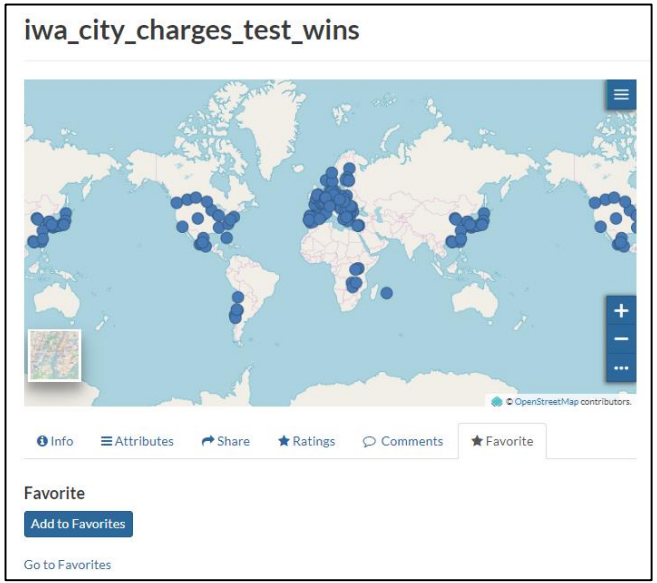
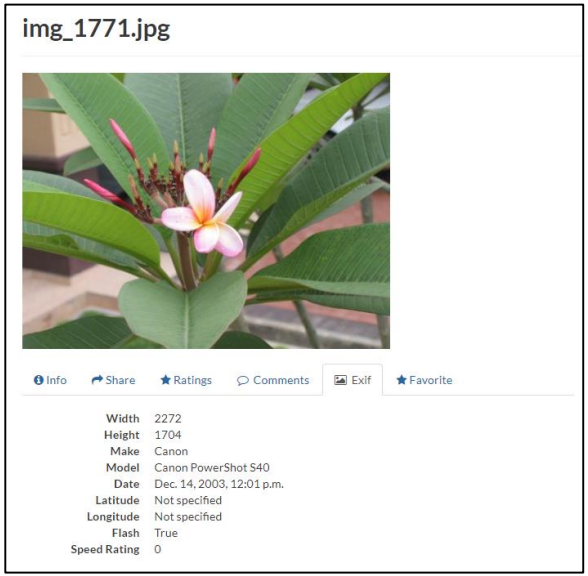
# Contrib Apps Promotion

✓ *Favorites*




✓ *EXIF support for Document Images*

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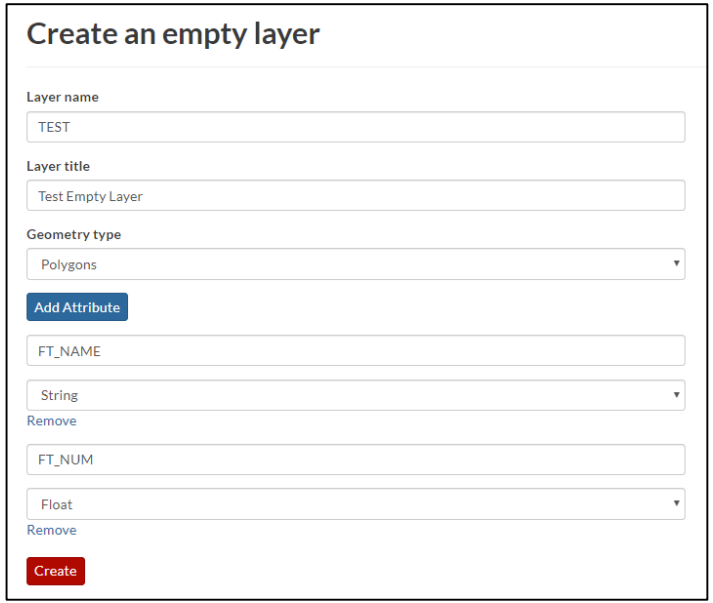
# Contrib Apps Promotion

✓ *Create Empty Layer*




✓ *WMS GetCapabilities for single Layers*

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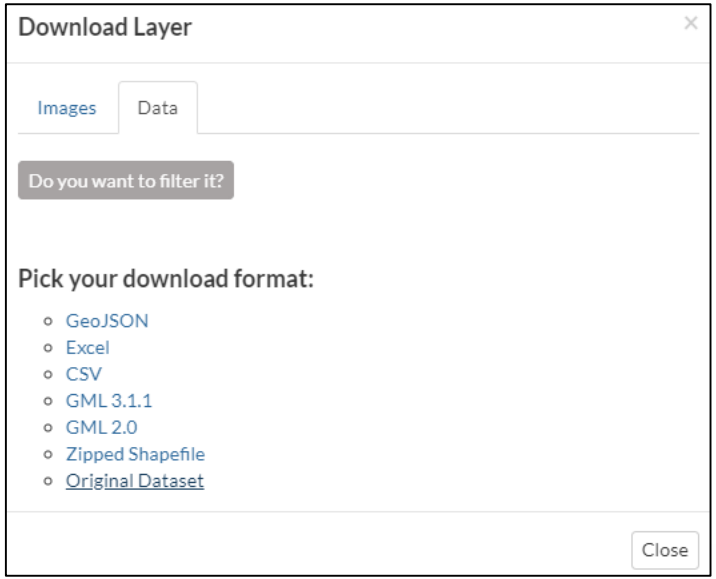
# Contrib Apps Promotion

✓ *Metadata XSL Renderer*

✓ *Original Dataset Download Link*

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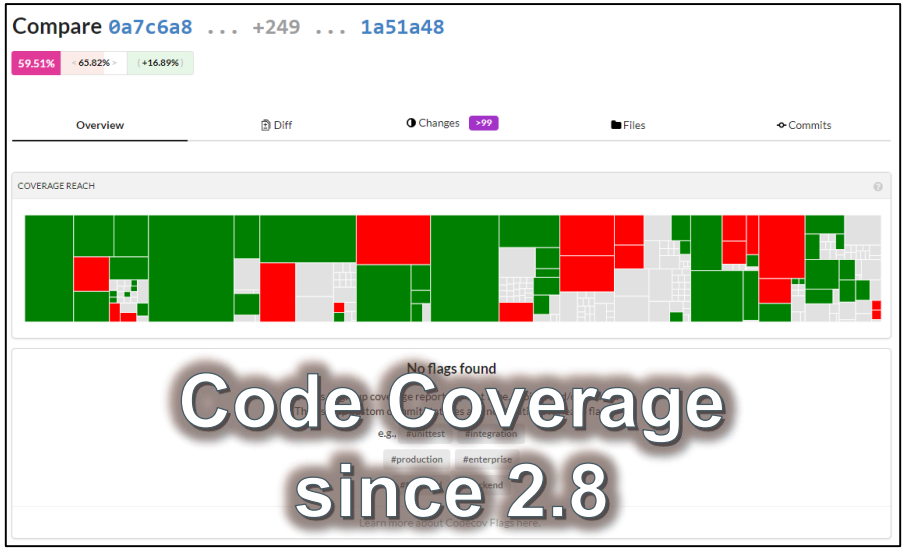
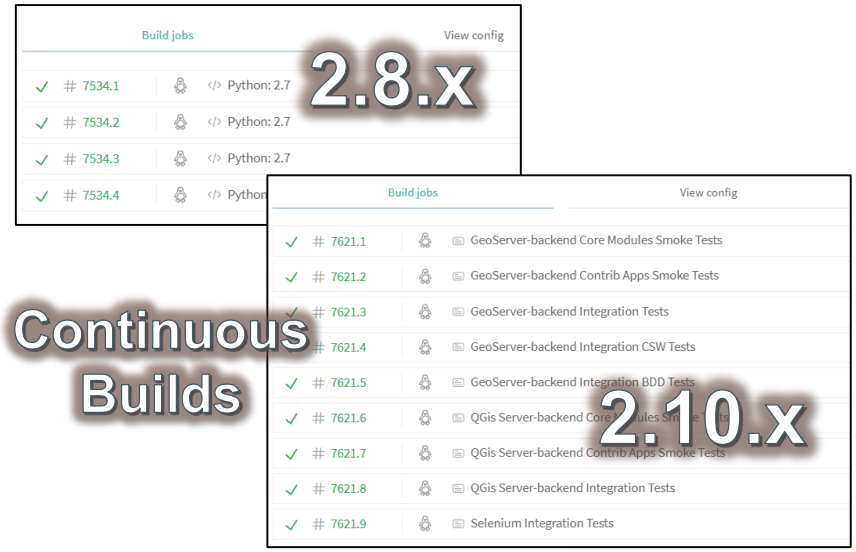
# Test Frameworks and Code-coverage

- Test framework on Travis has been completely refactored
- Thanks to NINA we have now also support for “Selenium” tests

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# Internationalization and Documentation

- Internationalization has been improved, we have almost 90% coverage for 5 main languages
- Completely revised and updated Documentation, preview at

  http://docs.geonode.org/en/new-docs/

- Help is very welcome here from the community. To participate jump into the following threads

  *Docs: Rework TOC* https://github.com/GeoNode/geonode/issues/4394

  *Docs: Replace Transifex with manual build Instructions*
  https://github.com/GeoNode/geonode/issues/4387

# Help us help you

GeoNode

# User Lists Participation

- Answering users questions relies on a low number of people
- We lack “testers”; this kind of project would need also a lot of manual testing for all its functionalities on a regular basis
- Developers are very few and Pull Requests often do not respect the contribution policies.

In particular:

- ✓ *There’s no GitHub issue describing the problem linked to the Pull Request*
- ✓ *GitHub issues are plain requests often without a good description of the use case and how to reproduce it*
- ✓ *Lack of test cases and documentation*
- ✓ *History of commits is usually messed up*

GeoNode

# Steps to get in touch with developers

1. If you need for clarification first of all try to describe the issue as well as possible through the official mailing lists; **IMPORTANT:** always specify

- ✓ *Which versions of GeoNode and GeoServer you are using*
- ✓ *Which Operative System and hardware you are using*
- ✓ *How you installed the framework*

2. If you need to get in touch directly with developers, consider using the official "gitter" chat https://gitter.im/GeoNode/general

3. If the issue has been confirmed and there's no easy or immediate resolution, open a ticket on GitHub https://github.com/GeoNode/geonode/issues with steps on how to reproduce the problem and labels

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# In case you stumble into a vulnerability: Responsible Disclosure

- Keep exploit details out of issue report.
- Mark the issue as a vulnerability.
- Be prepared to work with Project Steering Committee (PSC) on a solution.
- Keep in mind PSC members are volunteers and an extensive fix may require fundraising / resources.

If you are not in position to communicate in public please consider commercial support, contacting a PSC member, or reaching us via the Open Source Geospatial Foundation at info@osgeo.org

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# Thanks

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