State of GeoNode
2.10

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This presentation is brought to you by

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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/PostgreSQL-PostGIS
- GeoServer/QGIS Server
- GeoWebCache
- pycsw / GeoNetwork
- (MapStore)
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)
Release History

- **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
Summits and code sprints

- **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)
Community growth and adoption

The World Bank, OpenGeo, 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 Bureau Of Statistics (UBOS), Istituto Superiore per la Protezione e la Ricerca Ambientale - (ISPRA Italy), Skeena Knowledge Trust - (SKT Canada)

...
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
Active contributors

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

GeoNode Development Team

Summary

GeoNode Development Team has 45 repositories on GitHub, the latest 45 with user activity were loaded from GitHub's web service for this evaluation. GeoNode Development Team has pushed to 43 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 ~ 16 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

<table>
<thead>
<tr>
<th>Languages</th>
<th>Python</th>
<th>Javascript</th>
<th>HTML</th>
<th>CSS</th>
<th>SQL</th>
<th>Nginx</th>
<th>Java</th>
<th>PHP</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Issues</th>
<th>geonode</th>
<th>django</th>
<th>geoserver</th>
<th>geoserver-importer</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Forks</th>
<th>geonode</th>
<th>geonode-docker</th>
<th>geonode-project</th>
<th>geoserver</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Stars</th>
<th>geonode</th>
<th>geonode-docker</th>
<th>geonode-project</th>
<th>geoserver</th>
</tr>
</thead>
</table>

active contributors
GeoNode 2018/19

What’s in a year?

OSGeo Project

GeoNode Summit 2019
Releases covered by this presentation

- **September 2017**
  - 2.6.x
    - Python 2
    - Django==1.8.7
    - GeoServer 2.9

- **May 2019**
  - 2.8.x
    - Python 2
    - Django==1.8.19
    - GeoServer 2.13
  - 2.10.x
    - Python 2
    - Django==1.11.20
    - GeoServer 2.14.3

- **June 2019**
  - 3.0.x
    - Python 3
    - Django 2

Development: 2.6.x
Stable: 2.8.x, 2.10.x
Maintenance: 3.0.x
Are you using a older version? Upgrade!

- User/Developer lists and Gitter typically covers only supported versions
  - Today it means 2.8.x and 2.10.x
  - From June it will mean 2.10.x and 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!!!
What’s new?
Upgrade? What’s in it for me?

- Let’s check what’s new in 2.10 upcoming release
- Check the bottom of each slide to see who sponsored a certain feature, who implemented it, and what version contains it
Upgrade to GeoServer 2.14.3

- 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
- Almost ready to support 2.15.x and 2.16.x
Remote Services Improvements

- Improved stability on harvesting
- Support for more endpoints, WMS, ArcGIS REST, GeoNode OWS APIs
- Import Legends and as much as metadata fields as possible
- Allows remote resource filtering and exposure to the catalogue
Support to Temporal Series

```
boxes_with_date
ESRI Shapefile

- boxes_with_date.dbf Remove
- boxes_with_date.shp Remove
- boxes_with_date.shx Remove
- boxes_with_date.prj Remove
```

- Files are ready to be ingested! A temporal dimension may be added to this layer. Continue.

```
Inspect data for "boxes_with_date"

Configure as Time-Series On

<table>
<thead>
<tr>
<th>Date</th>
<th>Id</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000/01/01</td>
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<tr>
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<td>2000/01/09</td>
<td>8</td>
</tr>
<tr>
<td>2000/01/10</td>
<td>9</td>
</tr>
</tbody>
</table>

Showing 1 to 10 of 100 rows; 10* rows per page.

Cancel  Next
Advanced Options
```

IGAD
UNESCO
GeoSolutions

2.8.2 - 2.10
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

![Image of Upload Layers and Geospatial Data](image)

**Upload Layers**

Geospatial Data "iwa_city_charges_test_wins"

Please indicate which attributes contain the latitude and longitude coordinates in the CSV data.

With this data, GeoNode was able to guess which attributes contain the latitude and longitude coordinates.

![Image of Map with iwa_city_charges_test_wins](image)
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
Metadata Improvements and Batch Update

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WB
GeoSolutions

2.8.2 - 2.10
Menu Management
Theme and Privacy Policy Management
Social Account Login

Add social application

Provider: Facebook

Client ID: 123456

Secret key: 789123456

Scope: read

Account Connections

You currently have no social network accounts connected to this account.

Add a 3rd Party Account

Connect with LinkedIn

Connect with Facebook

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GeoSolutions

2.8.2 - 2.10
Data Upload Advanced Workflow

# Each uploaded layer must be approved by an Admin before becoming visible
ADMIN_MODERATE_UPLOADED = ast.literal_eval(os.environ.get('ADMIN_MODERATE_UPLOADED'))

# Option to enable/disable resource unpublishing for administrators
RESOURCE_PUBLISHING = ast.literal_eval(os.environ.get('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_PRIVATE_RESOURCES'))

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

UNESCO GeoSolutions

GeoSolutions

2.8.2 - 2.10
GeoNode Integrated Monitoring

Software Performance
- Average Response Time: 23 ms
- Max Response Time: 736 ms
- Total Requests: 1896

Hardware Performance
- Average CPU: 29%
- Average Memory: 19496 MB

Number of requests
- Total Requests: 2325

Health Check
- 0 alerts
- 489 errors

Uptime
- 0 days

Alerts
- 0 Alerts to show

Errors
- 489 Errors occurred

GeoNode Analytics
Response Time
- Latest Response Time: 15 ms
- Max Response Time: 736 ms
- Average Response Time: 23 ms

W'S Analytics
Response Time
- Latest Response Time: 15 ms
- Max Response Time: 644 ms
- Average Response Time: 30 ms

Throughput
- Total Count: 1.1210
- Average: 3.74

Errors Rate
Total Count: 33
GIS Clients (maps and layer details) can be plugged in as external libraries thanks to the **CLIENT HOOKSETS**

- You can add your ones
MapStore2 Client Hookset

MapStand Ltd GeoSolutions

GeoSolutions 2.10
Harvard WorldMap Client Hookset

GeoSolutions

2.10
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
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.
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 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 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...
Contrib Apps Promotion

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

https://github.com/GeoNode/contribs
Contrib Apps Promotion

 Favorites

 EXIF support for Document Images
Contrib Apps Promotion

✓ Create Empty Layer

![Create an empty layer]

✓ WMS GetCapabilities for single Layers

![WMS GetCapabilities document]
Contrib Apps Promotion

✓ Metadata XSL Renderer

✓ Original Dataset Download Link

Download Layer

Pick your download format:
- GeoJSON
- Excel
- CSV
- GML 3.1.1
- GML 2.0
- Zipped Shapefile
- Original Dataset
Test Frameworks and Code-coverage

- Test framework on Travis has been completely refactored
- Thanks to NINA we have now also support for “Selenium” tests
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
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
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](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](https://github.com/GeoNode/geonode/issues) with steps on how to reproduce the problem and labels
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
Thanks

OSGeo Project

GeoNode Summit 2019