Tools, formats and services for efficient data management, collaboration and reproducibility in neuroscience

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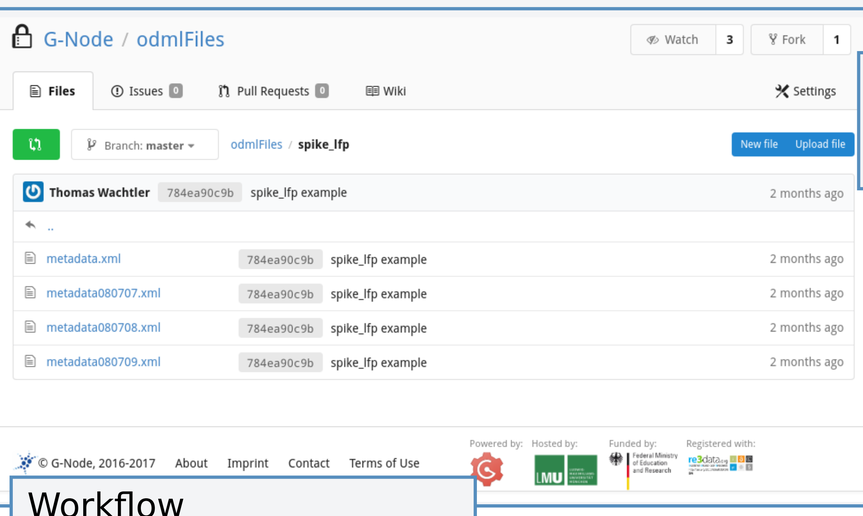
The G-Node Infrastructure (GIN) Services

GIN Web

https://gin.g-node.org



- Platform independent
- Secure access
- Public and private repositories

Main features
- Access data from any location
- Backup
- Built in versioning

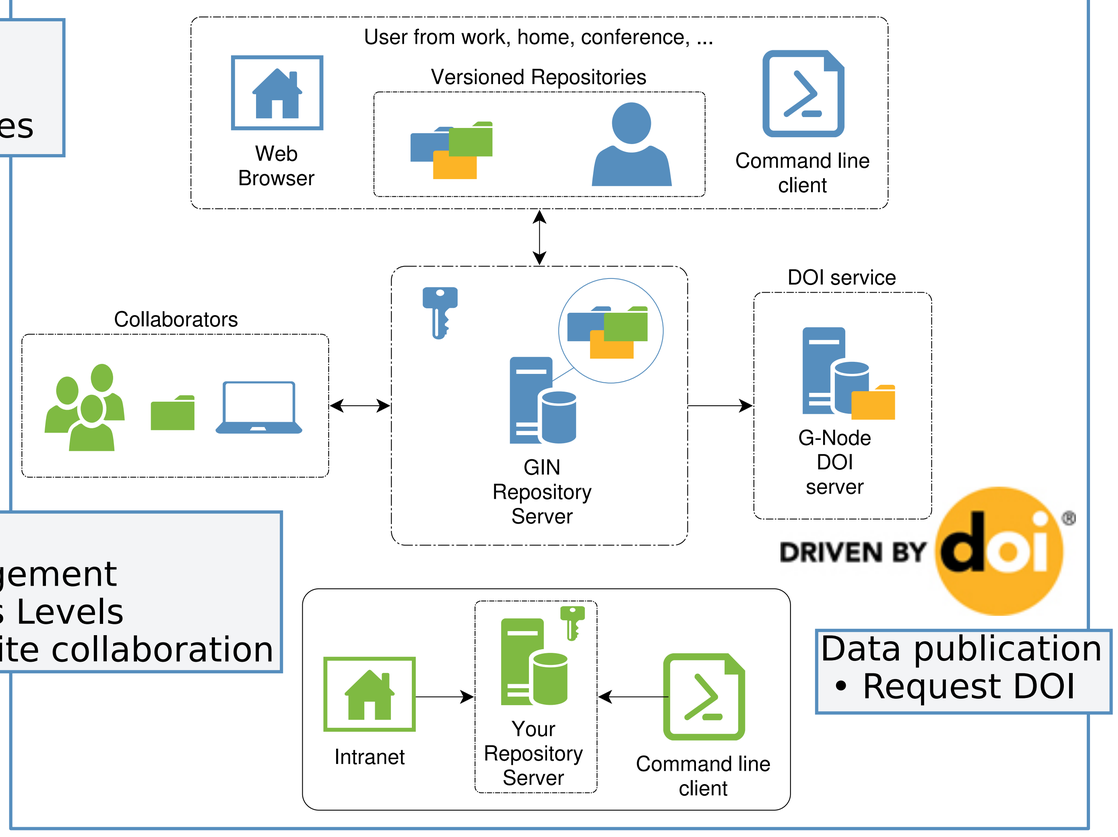
Workflow
- Manual access via web and command line
- Script automation

GIN Client

```
$ gin login
Login: achilleas
Password: **********************
Hello achilleas. You are now logged in.

$ gin get G-Node/odmlFiles
Fetching repository 'G-Node/odmlFiles'... done.

$ gin ls
Synced:

        metadata.xml
        metadata080707.xml
        metadata080708.xml
        metadata080709.xml

$ |
```

Collaboration
- User management
- User Access Levels
- On and offsite collaboration

GIN services diagram

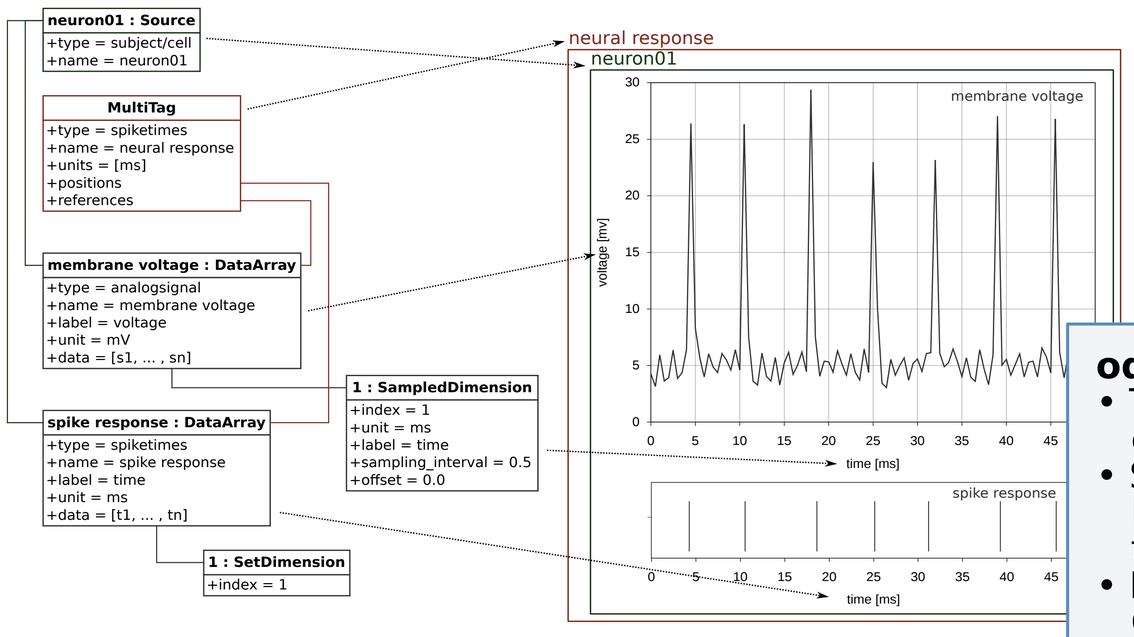


Data publication
- Request DOI

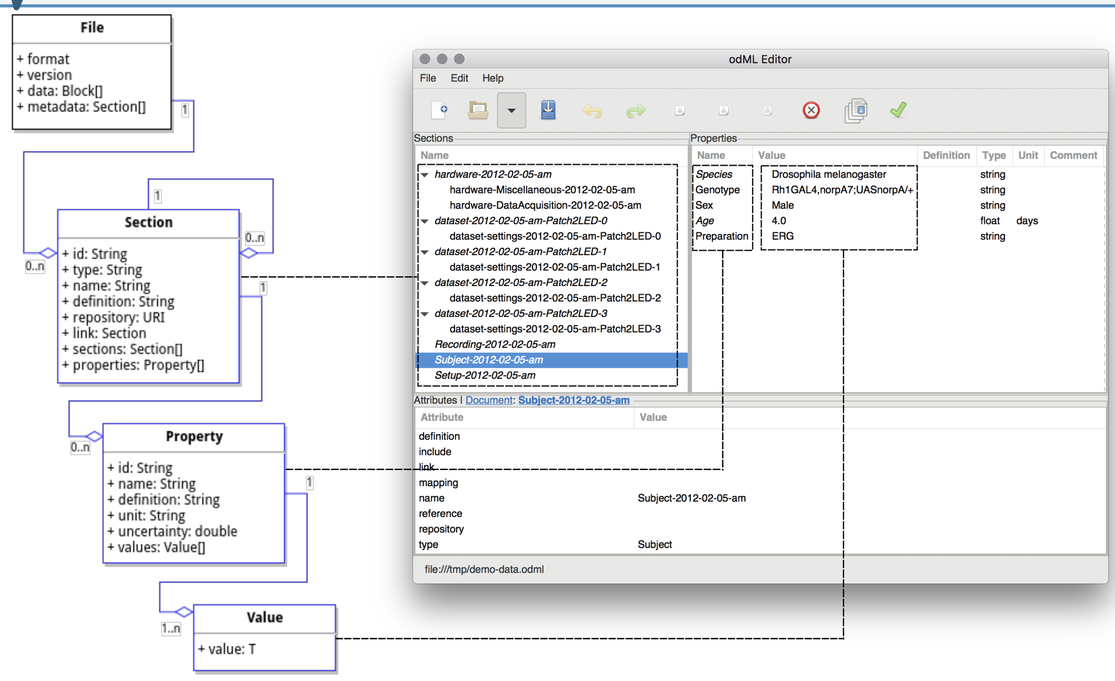
Formats and Data models

The NIX format
- Open data format
- Store data, analysis results, and metadata conveniently in the same file
- Descriptive associations between data, analysis results, and metadata

The NIX data model

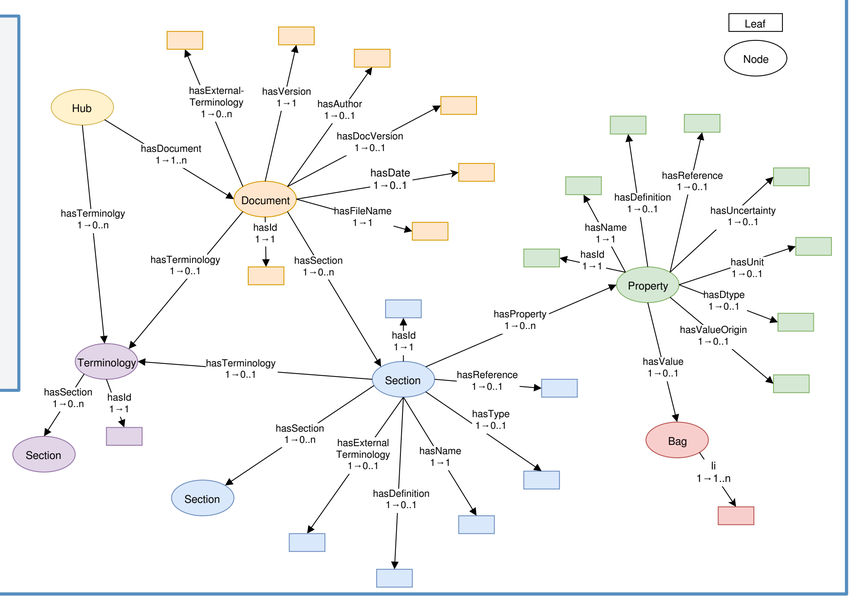


odML Metadata format: Schema and GUI



RDF schema for the odML data model

odML
- The metadata format embedded in NIX
- Standalone metadata can be written and read using the odML library
- Export odML data to RDF: Query metadata using semantic web technologies



W3C RDF

C++ python MATLAB Java elephant neo

Libraries
- Free open source libraries for: C++, Python, Matlab, Java
- NIX IO for Neo: Saving and loading fully supported

Resources

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https://gin.g-node.org
https://github.com/G-Node/nix
https://github.com/G-Node/python-odml
https://github.com/G-Node/gin-cli
https://github.com/G-Node/gogs
http://neuralensemble.org/neo
http://neuralensemble.org/elephant

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