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sustainability consulting + software

# LCA Collaboration Server: enhancing LCA data creation and sharing

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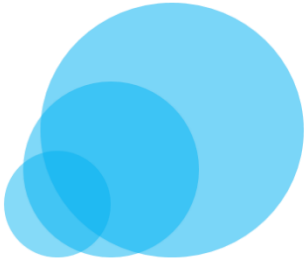
Charleston, LCA XVI, 28 September 2016

# What is the LCA Collaboration Server?

A platform to enable data creation and sharing

→Teams of users can work on the same data sets independently and merge their changes together



LCA Collaboration Server Web Service


LCA Collaboration Server features in openLCA

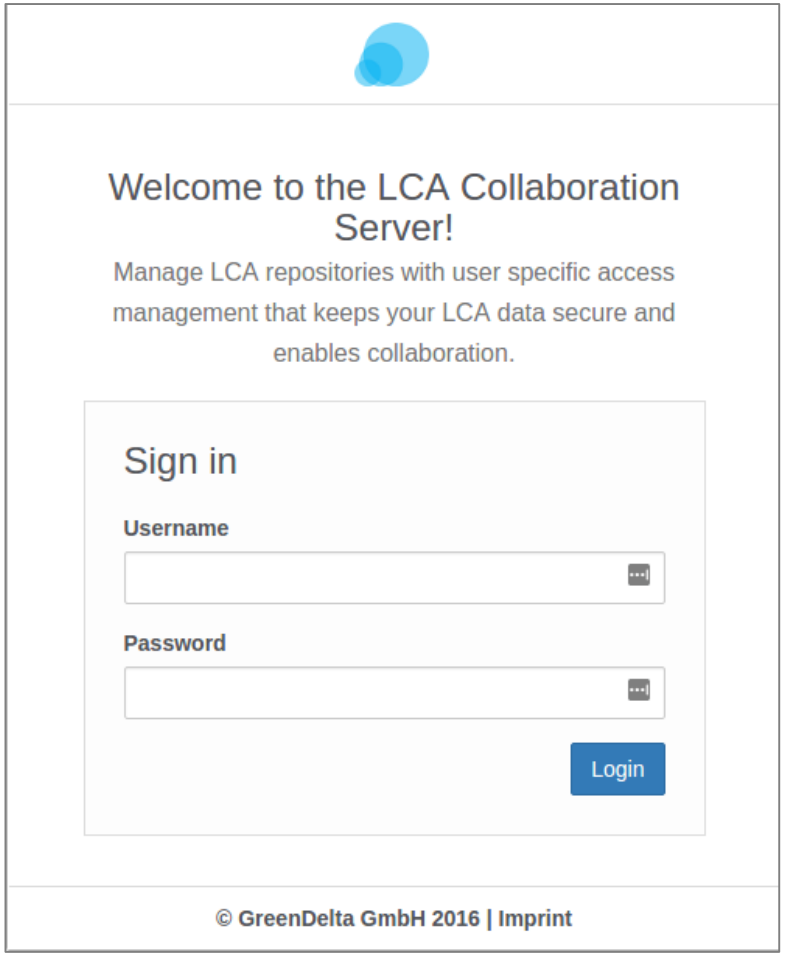
# Main functionalities

- Upload, download, synchronize LCA data between a local openLCA database and a server repository
- Merging (possibly conflicting) changes in data sets
- History of changes
- User friendly web view of data in the repositories

# LCA Collaboration Server Web UI

The LCA CS Web UI is the central access and management tool for LCA repositories

- RESTful web service for storing and providing LCA data in a uniform way
- Developed as a standalone web application
- Unlimited amount of servers possible → same application, different data



# Data format

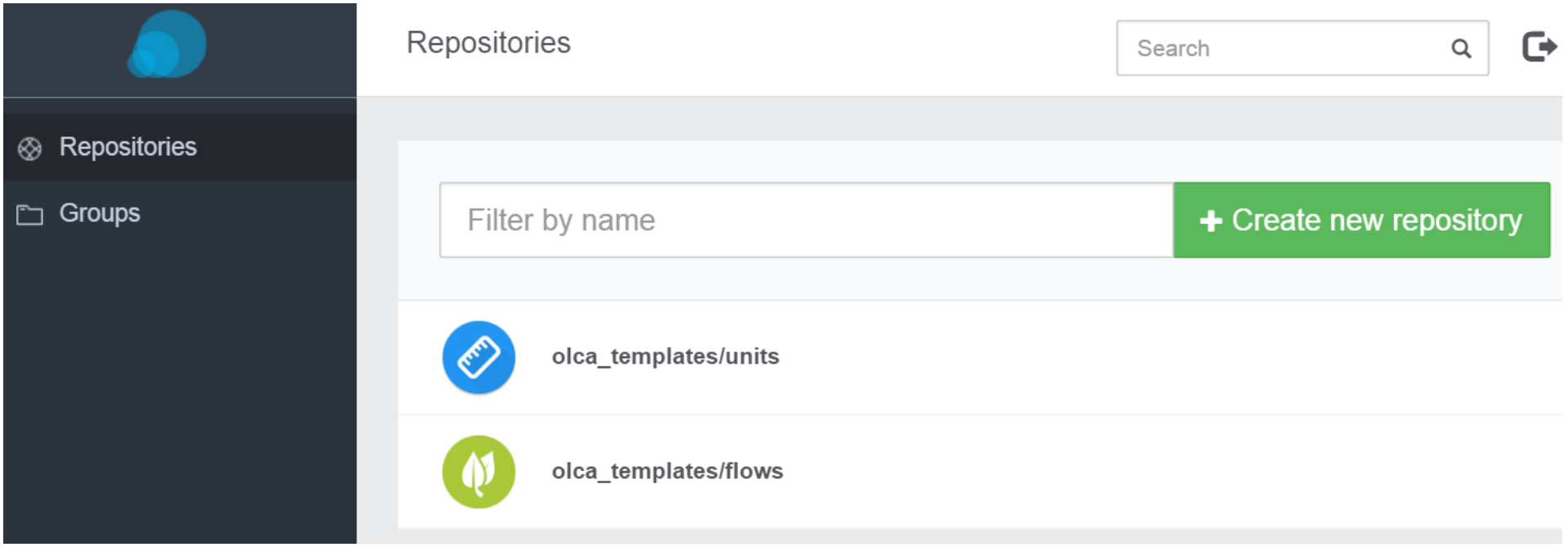
- Server runs the web application with a Derby database
- The JSON ld format is used for the exchange of data

  → Format recommended by W3C for linked data

  → It can directly be parsed as RDF triples and, therefore, be directly linked to ontologies

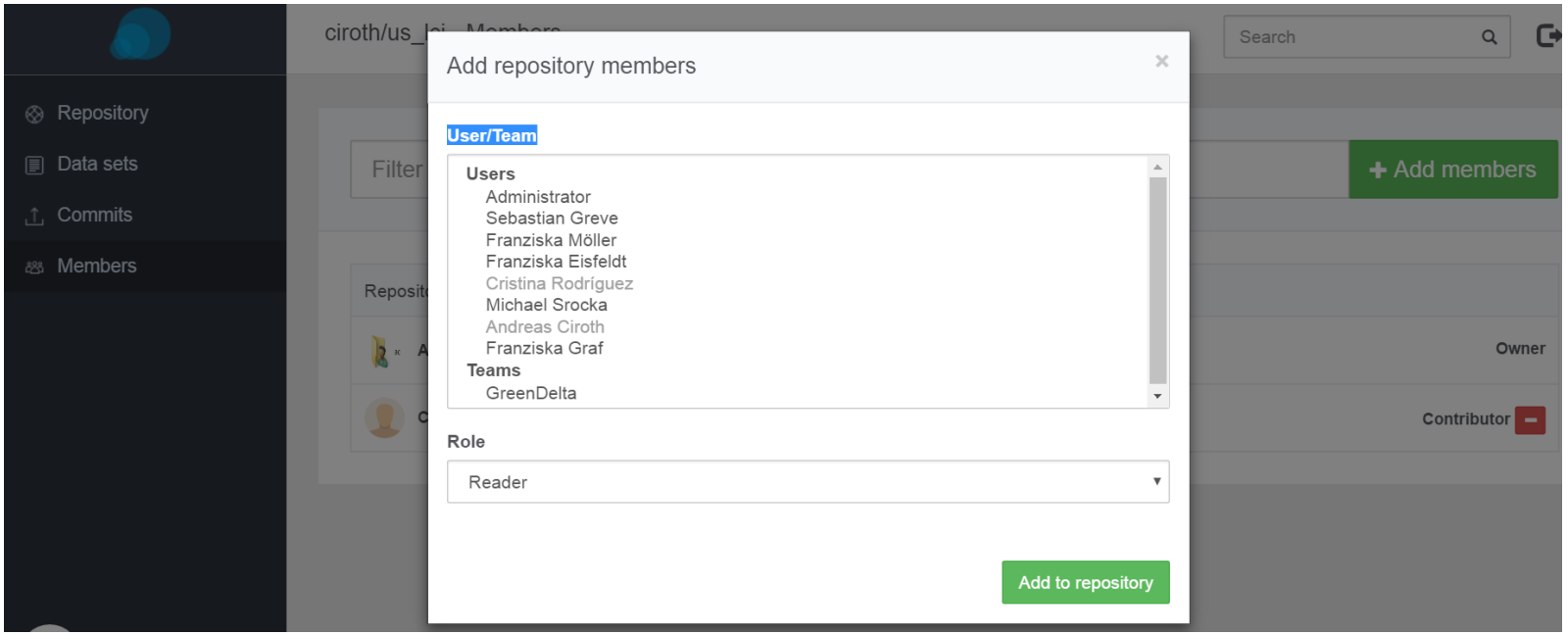
# Features: Repository management

- Create/delete repositories
- Create/delete groups of repositories
- Clone repositories in a specific state (i.e. commit)



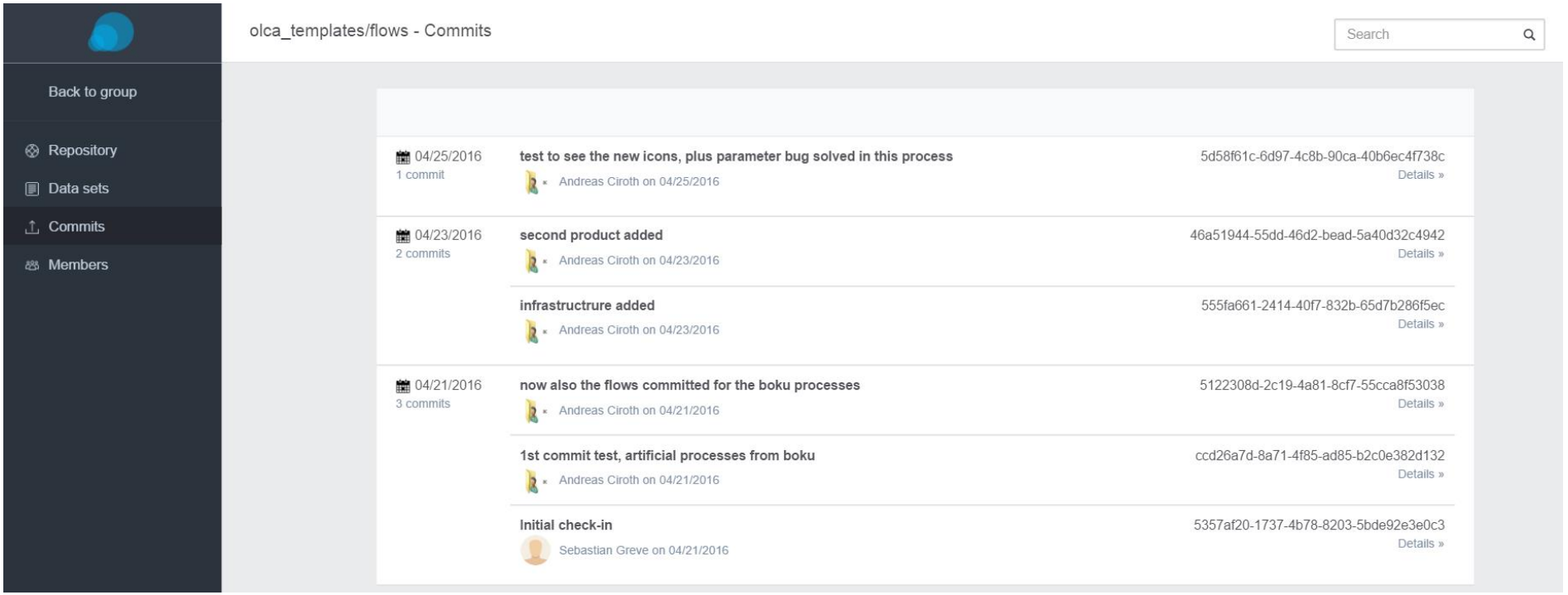
# Features: User management

- Create/delete users and teams of users
- Roles: Owner, Contributor, Reader
- Set permissions per repository/group of repositories
- User profile



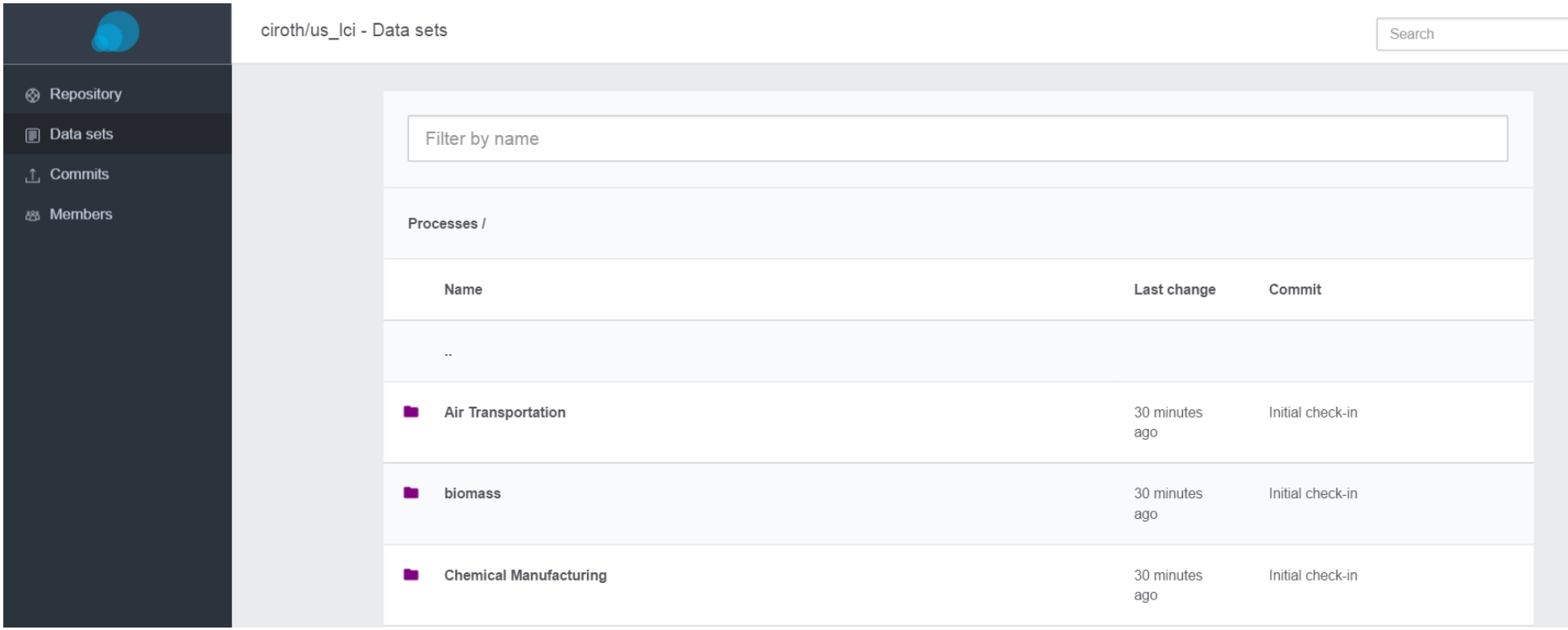
# Features: Commit history

- View all changes per commit and navigate to the correspondent data sets



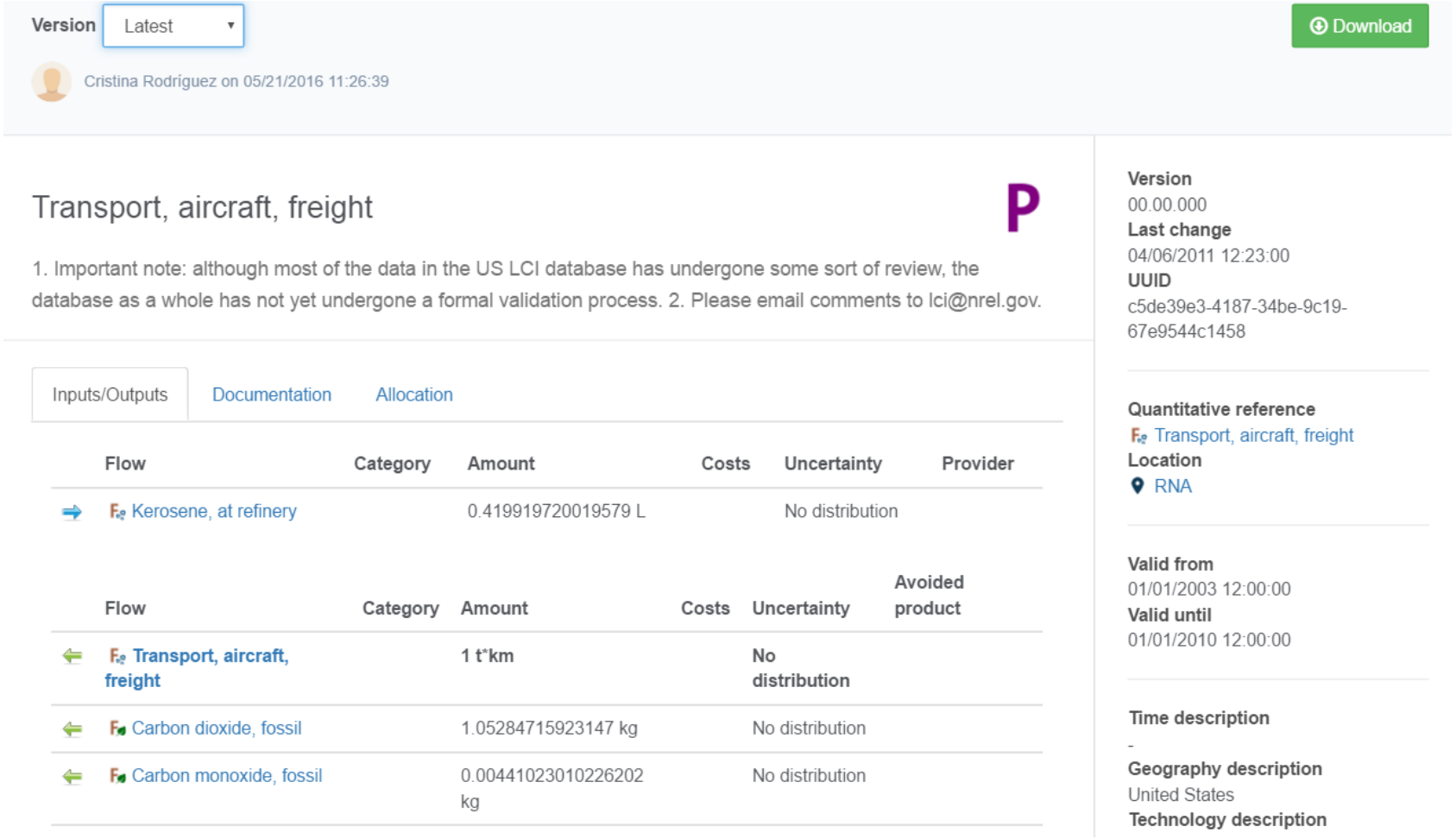
# Features: Data sets browser

- Browse through the current state of the repository data sets (Filters by type and name)



# Features: Data sets browser

- Download selected data sets as JSON format



# Integration into LCA software

- Third party applications are able to integrate the services via HTTP calls:
  - Right now LCA Collaboration Server features only integrated in openLCA, but
  - Documentation publicly available and openLCA code is open source

    → other LCA software could connect to it too

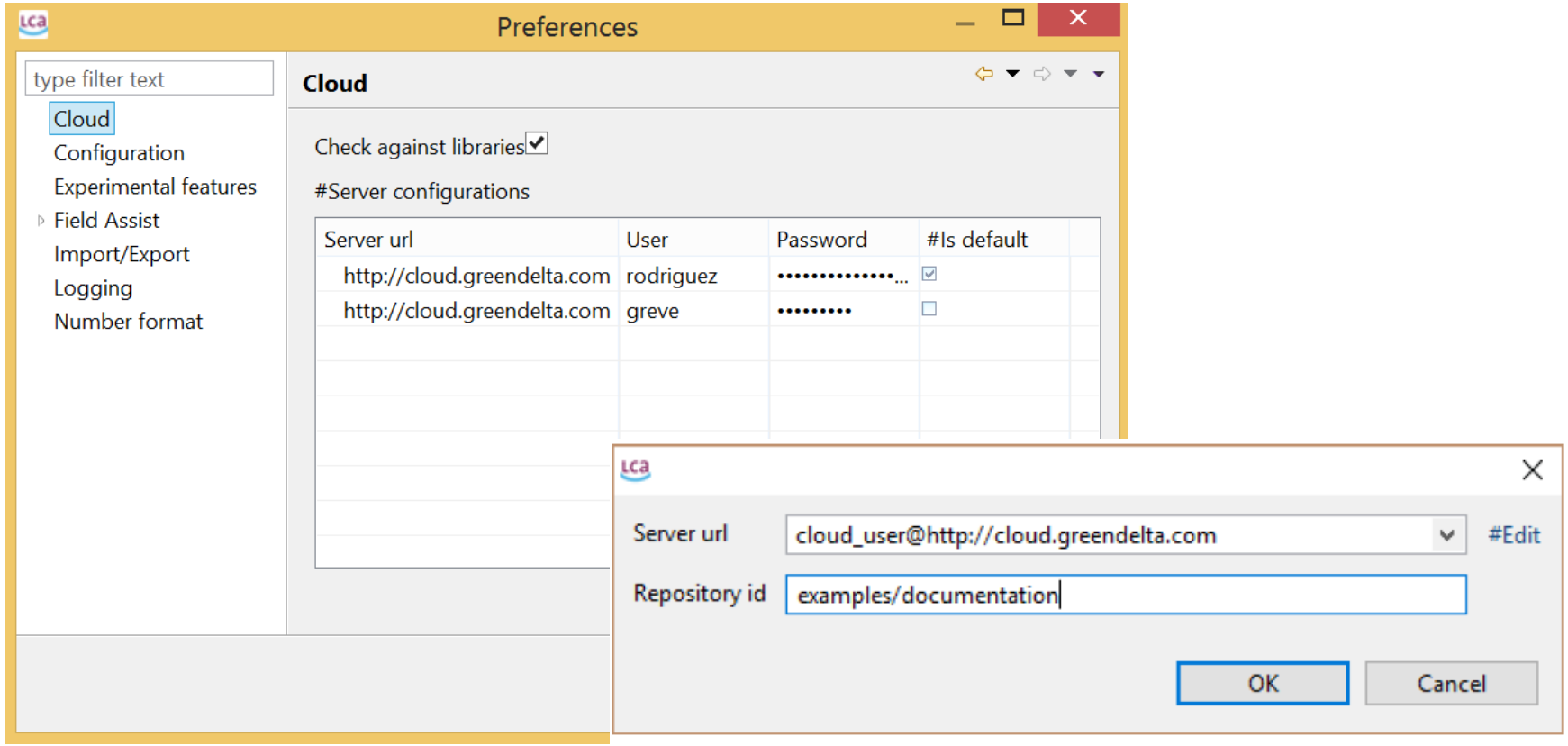
# LCA CS integration in openLCA

openLCA integrates the usage of the LCA Collaboration Server features:

- enabling users to share their data through LCA repositories
- adding additional tools to make the workflow more user friendly

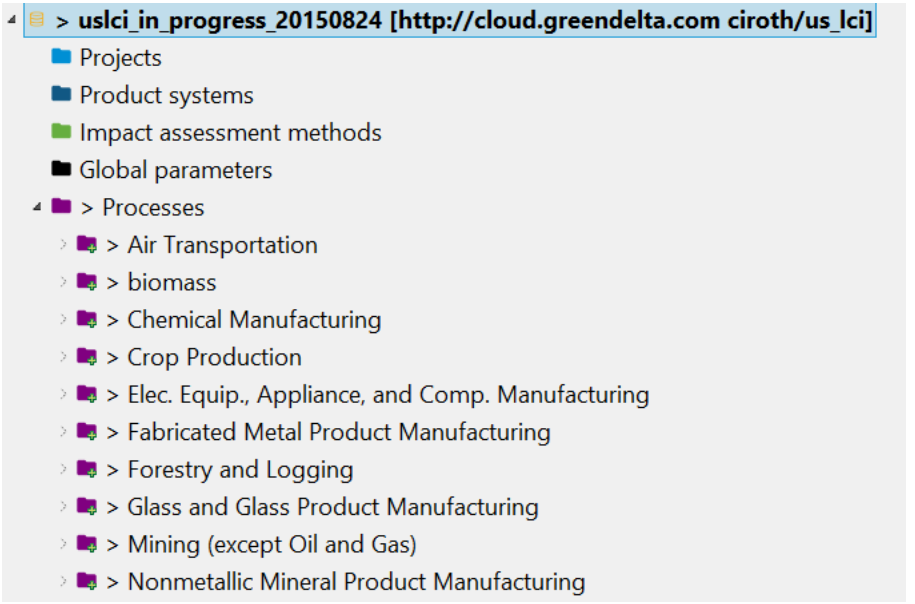
# Features: Connection to a repository

- Configure remote server accounts
- Connect a local database to a remote repository



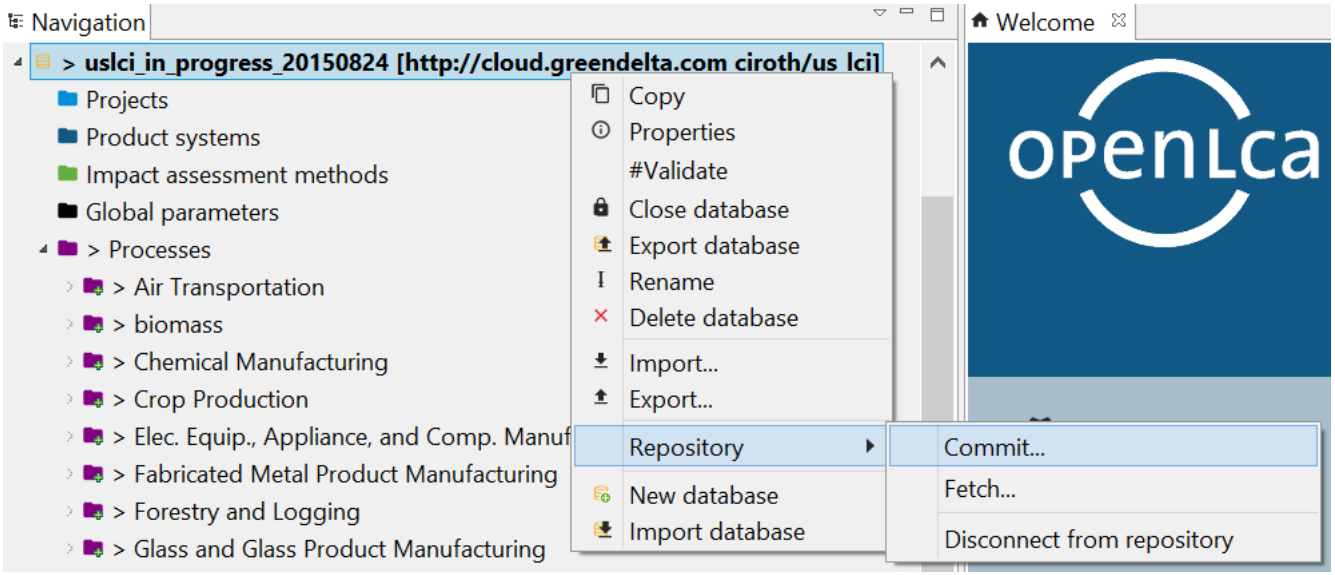
# Features: Display of changes

- The data in the local database and in the repository is compared after the connection:
  - > Indicates if a data set was changed
  - ✚ Indicates that there is new data in the local database



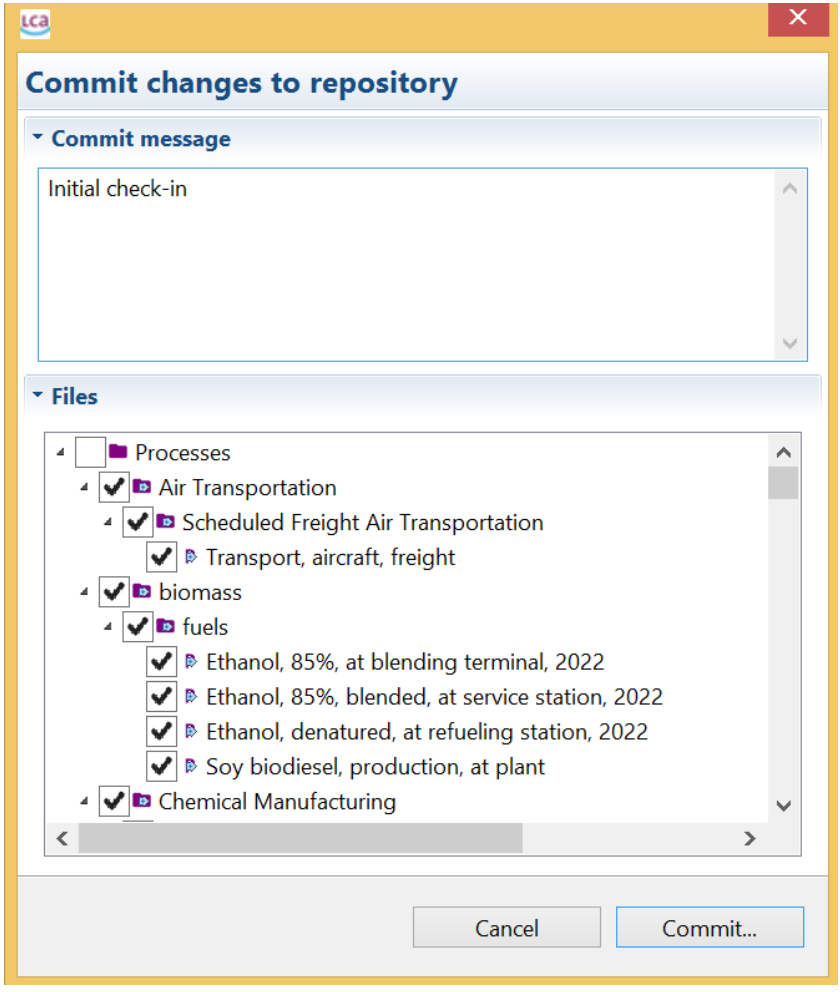
# Features: Commit data

- Synchronize local changes with the repository (Commit)



# Features: Commit data

- A subset of the changes can be selected

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# Features: Data integrity check

- Data integrity checks

  → Avoid deletion of linked data

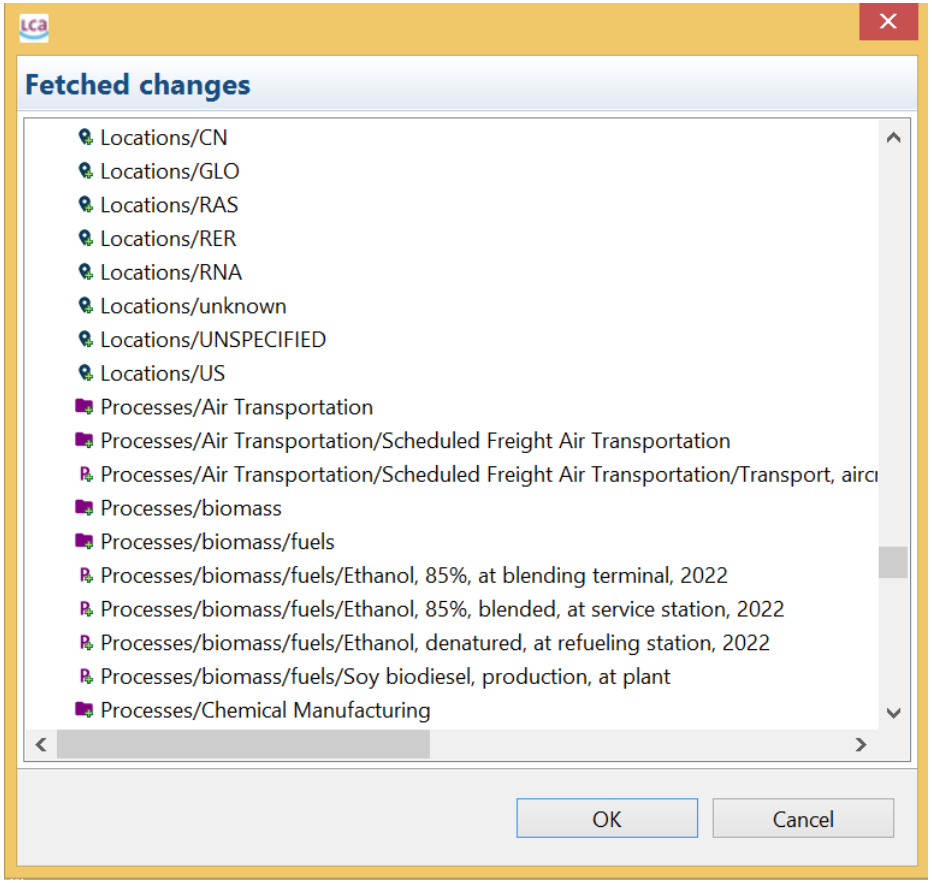
  → Avoid upload of incomplete data

- Protection of library data

  → Warning is shown when trying to commit changes

# Features: Fetch data

- Synchronize changes on the remote repository with your local database (Fetch)

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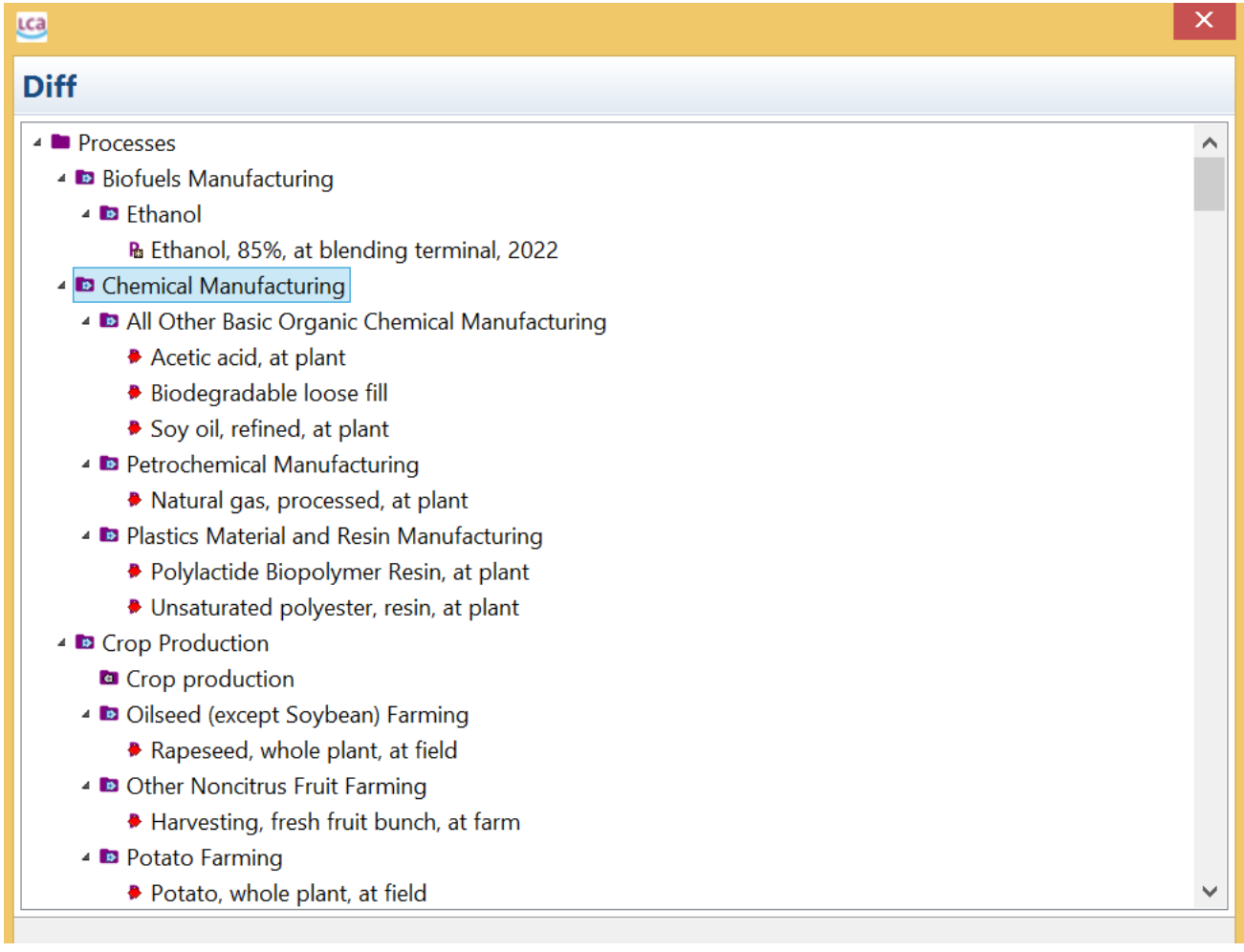
# Features: Fetch data (Diff tool)

- Merge conflicting changes (Diff tool)



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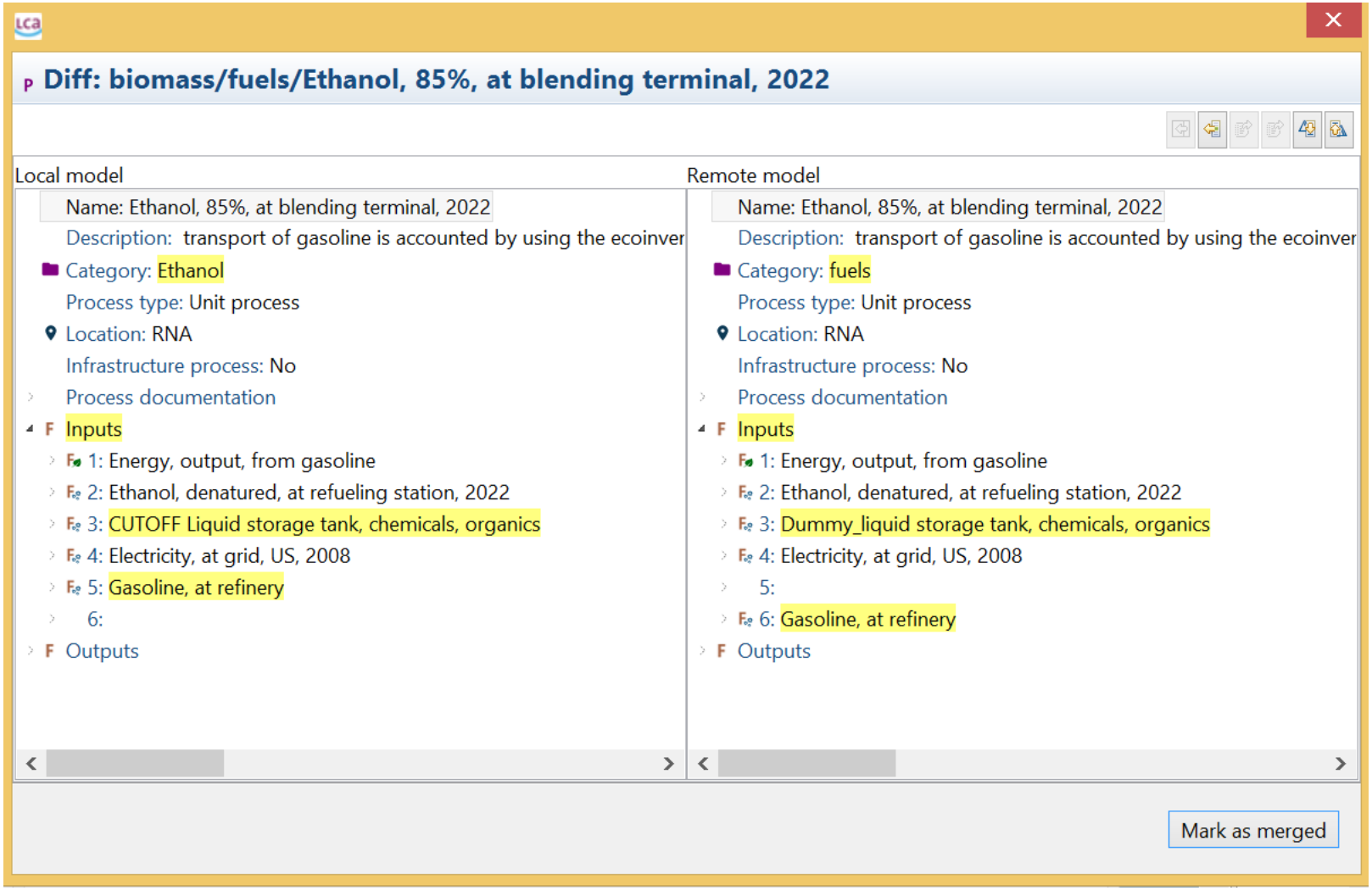


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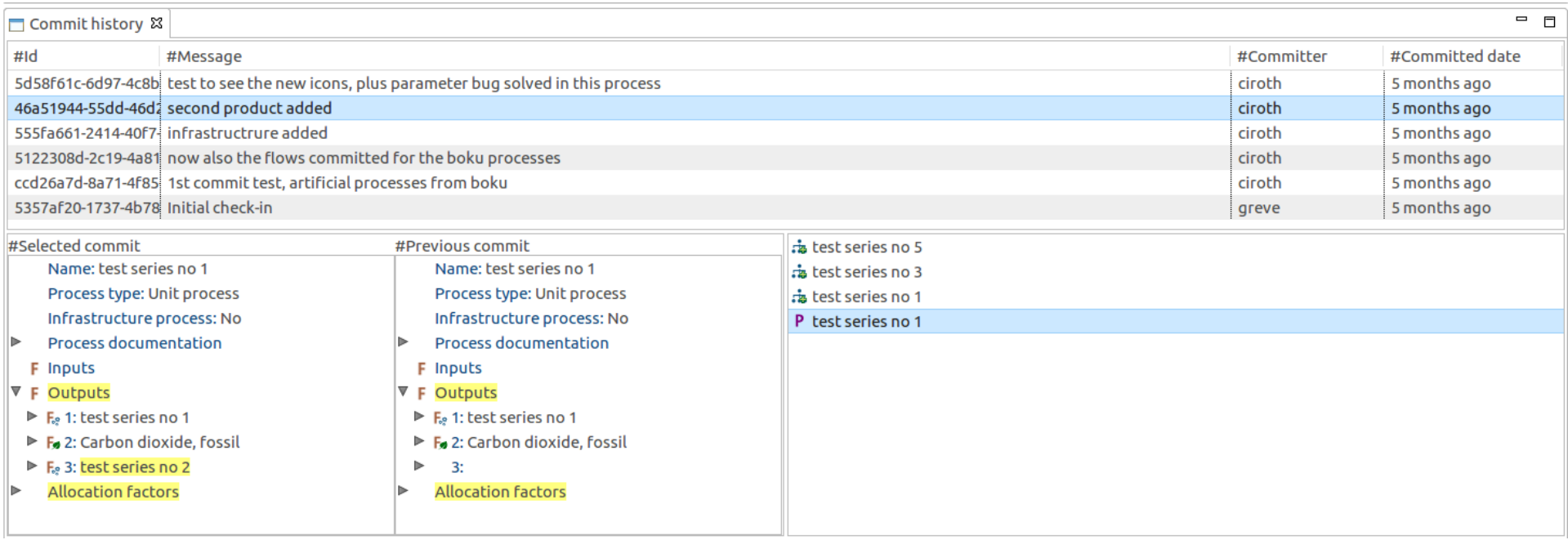
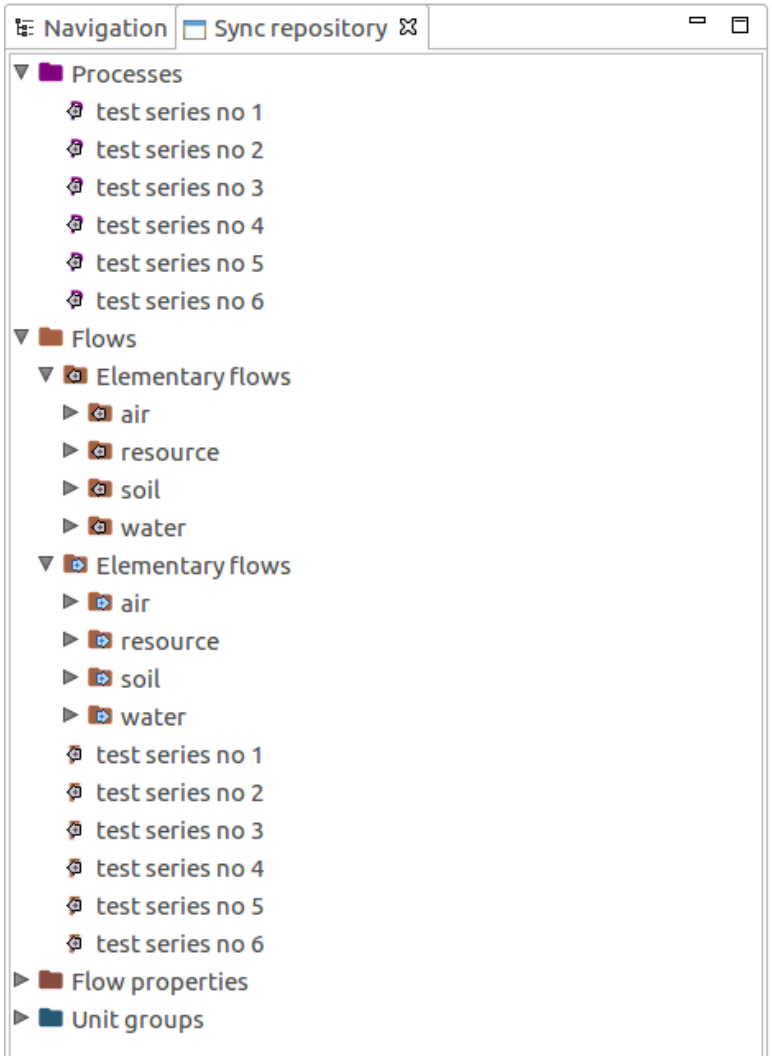
# Features: Commit history

- View commit history
- Check out at specific commit states

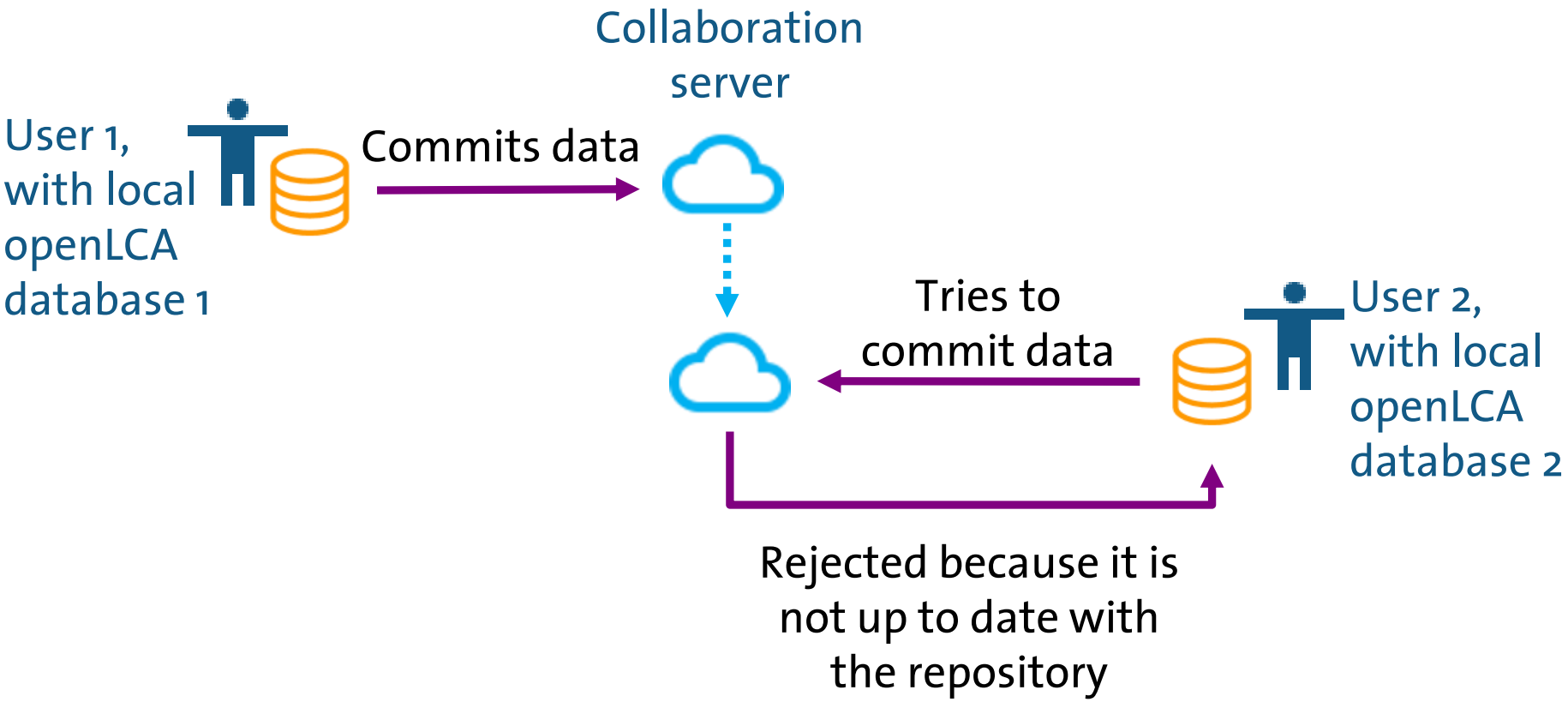


# Features: Sync view

- Compare local state with the state at a specific commit
- Overwrite local model with the one at a specific commit state and commit it back



# Use case scenario I: Data collaboration



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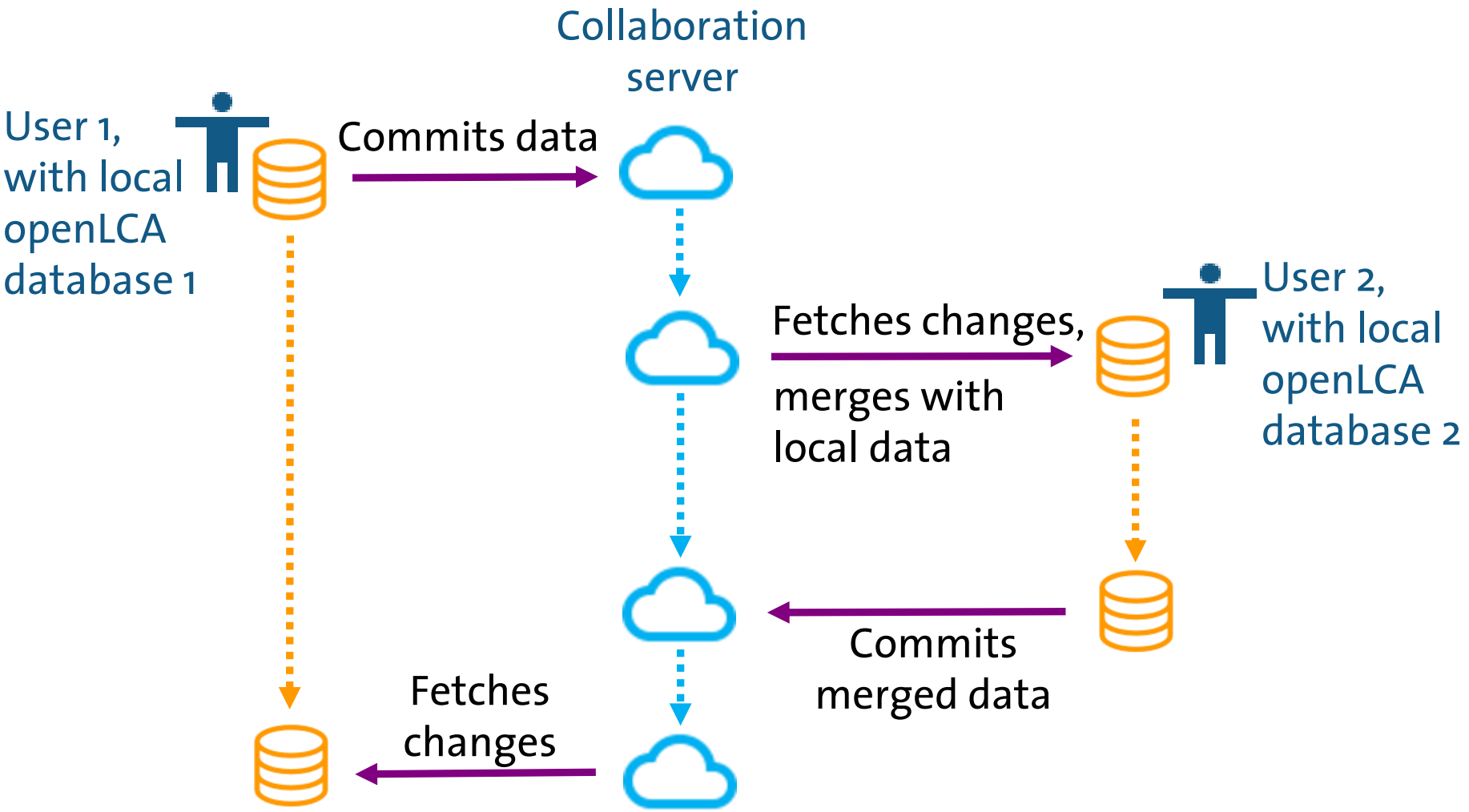
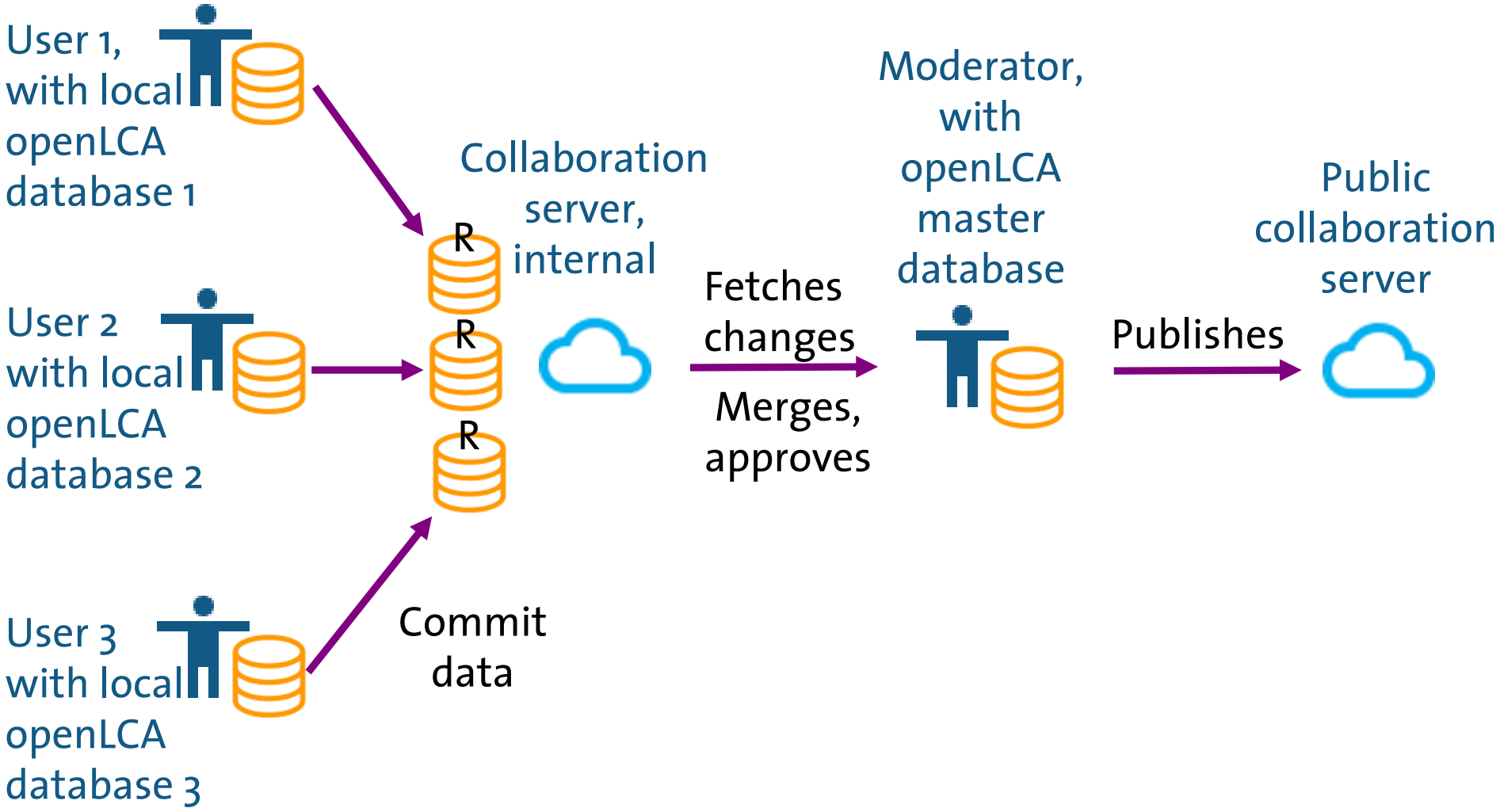


# Use case scenario II: Editorial

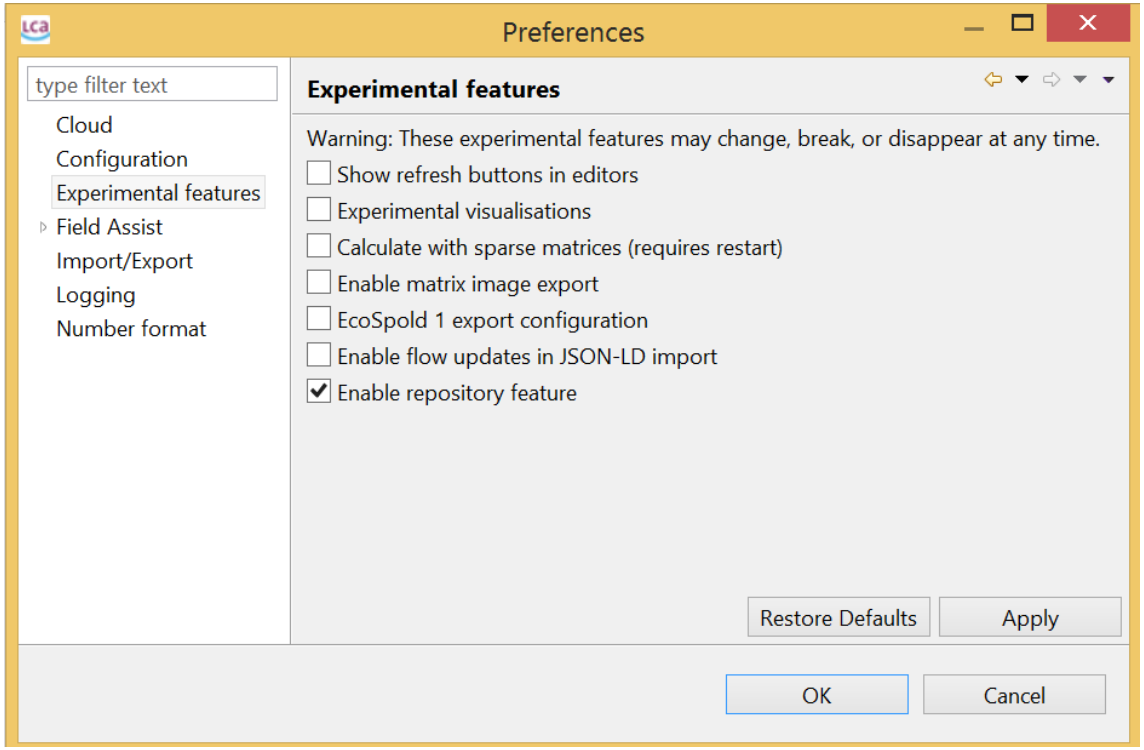


# Status of LCA Collaboration Server

- Basic functionalities included as “Experimental feature” in:

  → openLCA 1.5.0 beta 1, January 2016

  → openLCA 1.5.0, September 2016

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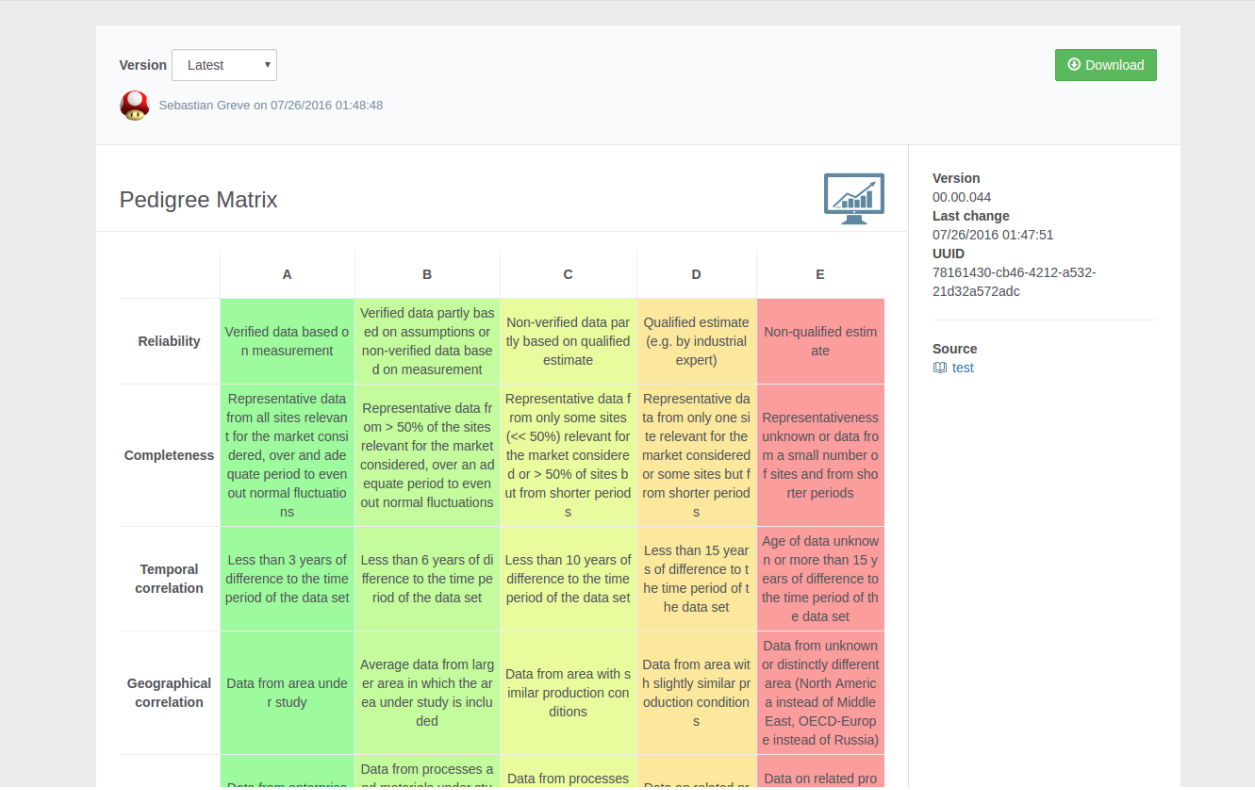
# Outlook

- Fall 2016: new openLCA version 1.6 with advanced features (sync view, data quality systems)




| | A | B | C | D | E |
|---|---|---|---|---|---|
| Reliability | Verified data based on measurement | Verified data partly based on assumptions or non-verified data based on measurement | Non-verified data partly based on qualified estimate | Qualified estimate (e.g. by industrial expert) | Non-qualified estimate |
| Completeness | Representative data from all sites relevant for the market considered, over and adequate period to even out normal fluctuations | Representative data from > 50% of the sites relevant for the market considered, over an adequate period to even out normal fluctuations | Representative data from only some sites (<< 50%) relevant for the market considered or > 50% of sites but from shorter periods | Representative data from only one site relevant for the market considered or some sites but from shorter periods | Representativeness unknown or data from a small number of sites and from shorter periods |
| Temporal correlation | Less than 3 years of difference to the time period of the data set | Less than 6 years of difference to the time period of the data set | Less than 10 years of difference to the time period of the data set | Less than 15 years of difference to the time period of the data set | Age of data unknown or more than 15 years of difference to the time period of the data set |
| Geographical correlation | Data from area under study | Average data from larger area in which the area under study is included | Data from area with similar production conditions | Data from area with slightly similar production conditions | Data from unknown or distinctly different area (North America instead of Middle East, OECD-Europe instead of Russia) |
| | | Data from processes a | Data from processes | | Data on related pro |

# Outlook

- 2017: new project planned to extend features, e.g.:
  - Review process of datasets
  - Adding new elements in the Collaboration Server (product system view, calculation results, etc.)
  - Chat/messaging system in the web application
  - Optional 2-Factor authentication (more secure login)
  - Export of datasets in common LCA formats (ILCD) in the web service
  - Public Access to repository
  - Make posible to limit the amount of space available for each user in the repository

# Conclusions

- Very powerful and complete tool for group work and data sharing:
  - Independent repositories and group of repositories
  - User/Team roles per repository/group
  - Data integrity: linear workflow, validity checks
  - Web-view of repositories and download of data sets
- Very flexible:
  - Selection of data to commit
  - Merging of conflicting changes
  - All features in openLCA open source

# Acknowledgments

Thanks to the US Department of Agriculture (USDA), National Agricultural Library for their support in the development and implementation of the openLCA LCA Collaboration Server under cooperative agreement number 58-8220-2-112F.


United States Department of Agriculture
National Agricultural Library

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*Thank you!*

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