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LCA Collaboration Server: enhancing LCA data creation and sharing
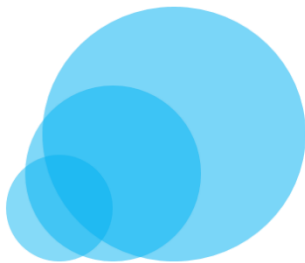
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GreenDelta GmbH

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
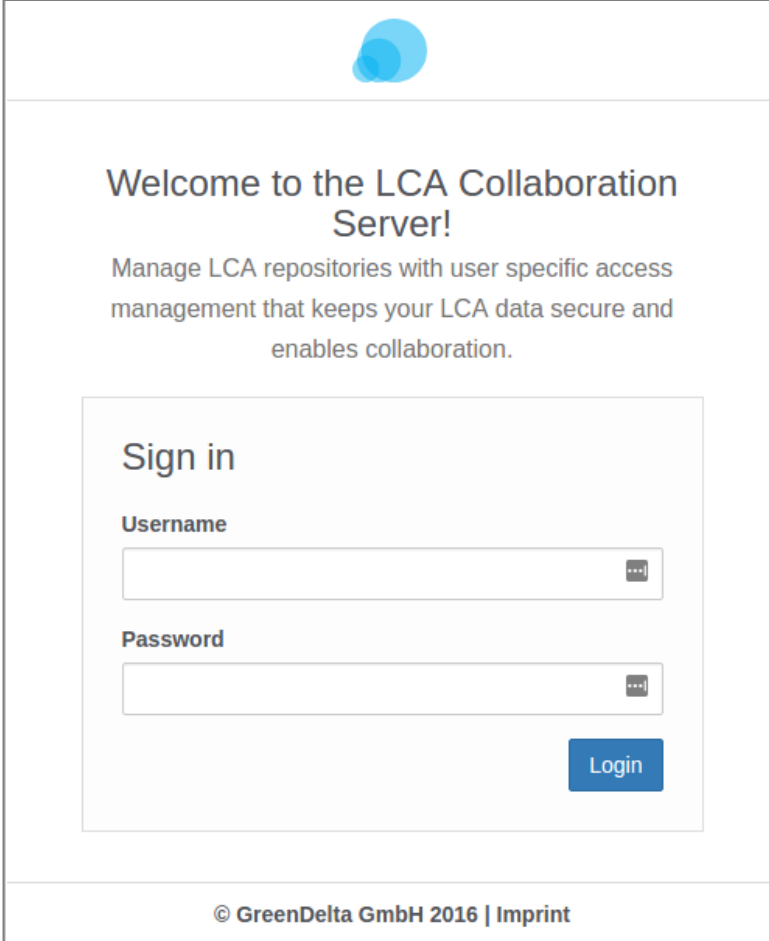
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Main functionalities

- 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

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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

Welcome to the LCA Collaboration Server!

Manage LCA repositories with user specific access management that keeps your LCA data secure and enables collaboration.

Sign in

Username

Password

Login

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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
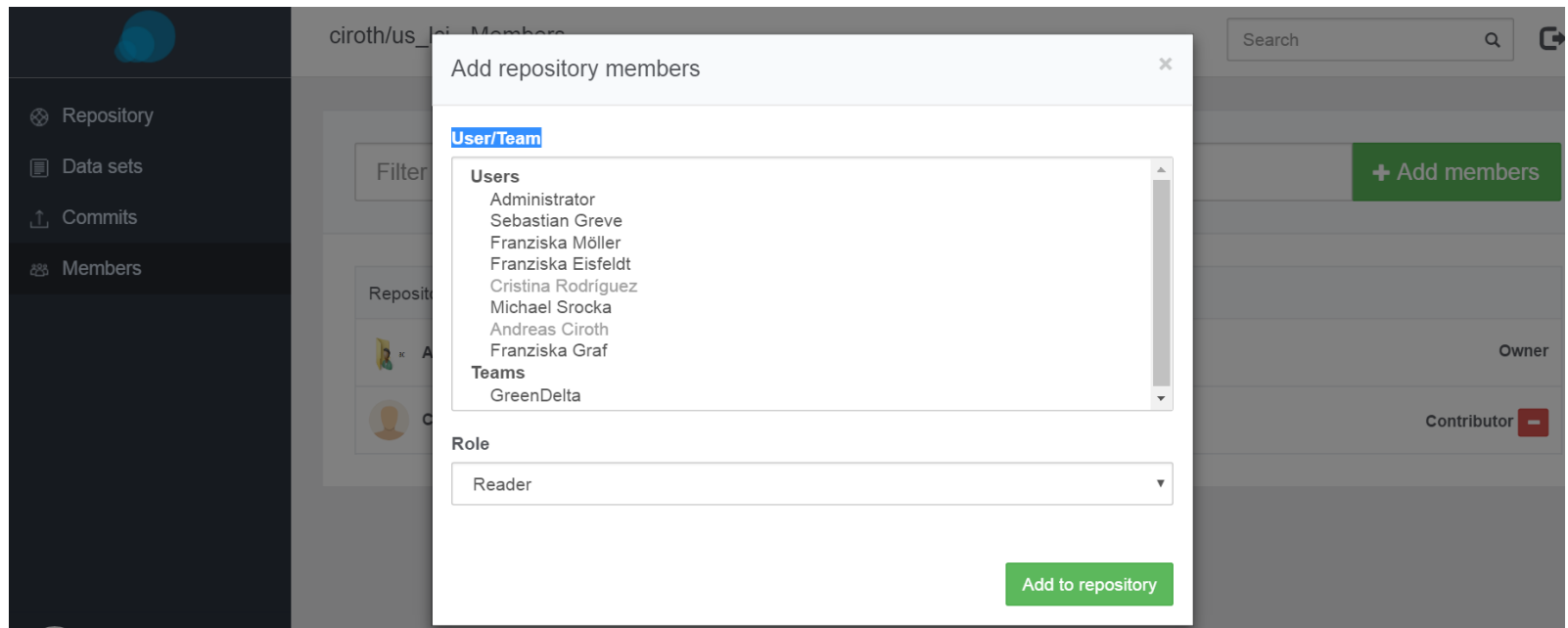
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Features: Repository management

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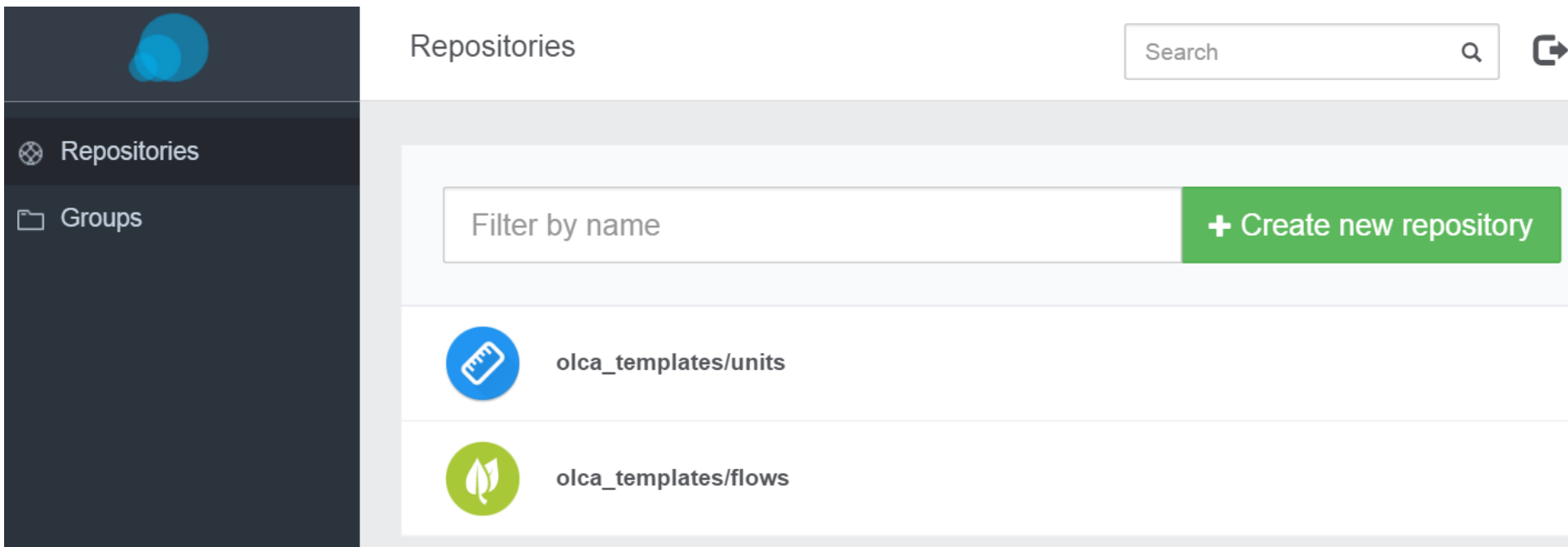
Features: User management

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

Features: **Commit history**
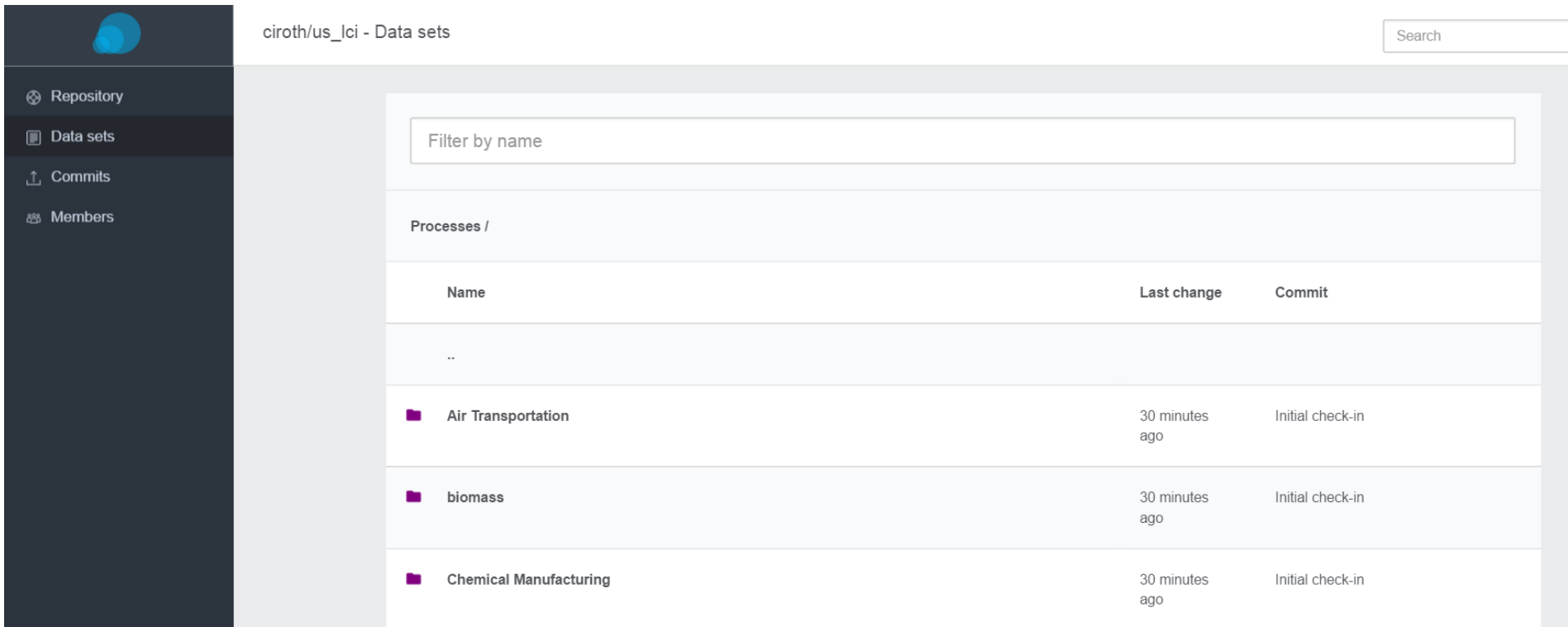
- View all changes per commit and navigate to the correspondent data sets

Features: Data sets browser

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

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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

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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

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Features: **Connection to a repository**

- Configure remote server accounts
- Connect a local database to a remote repository
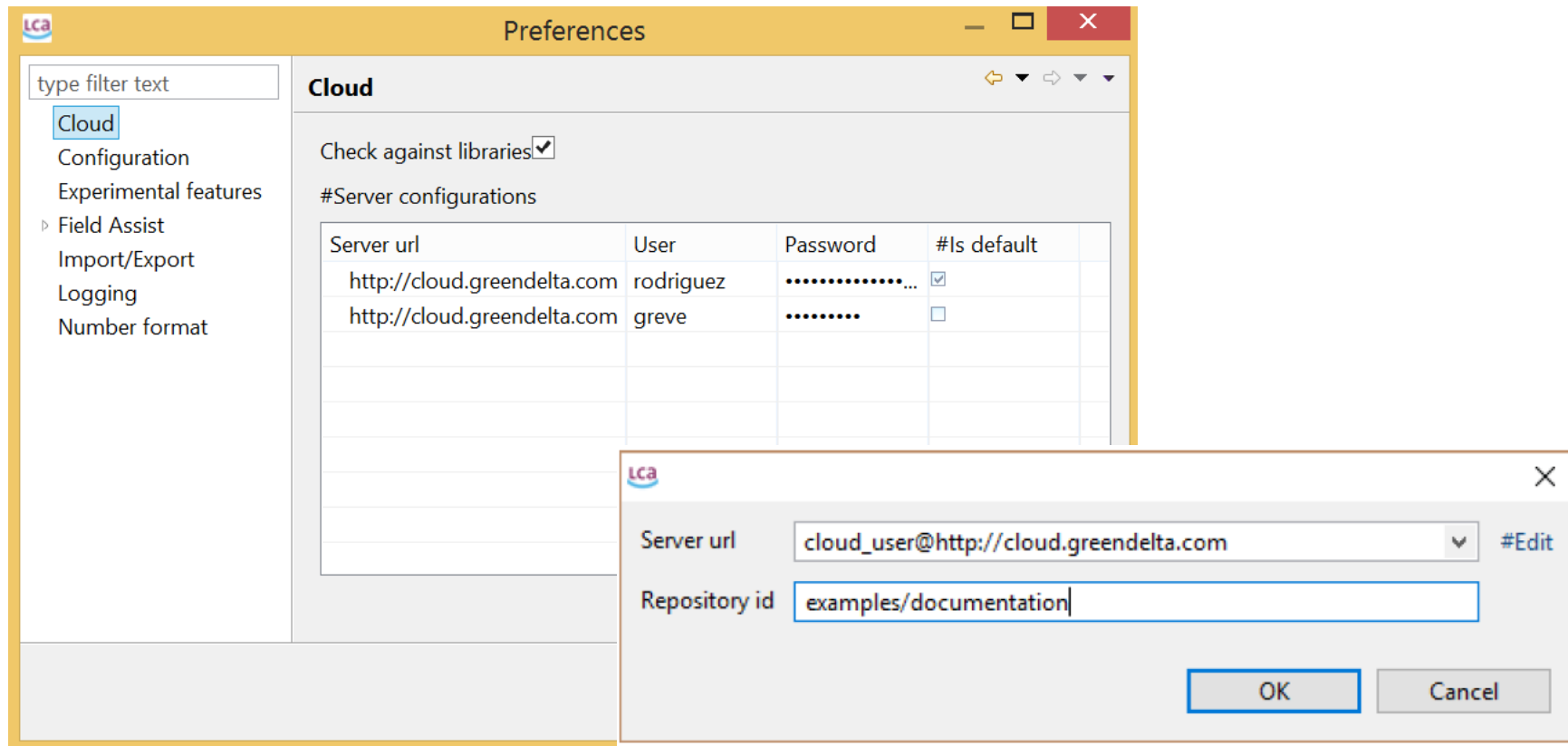
Features: Display of changes

- 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)

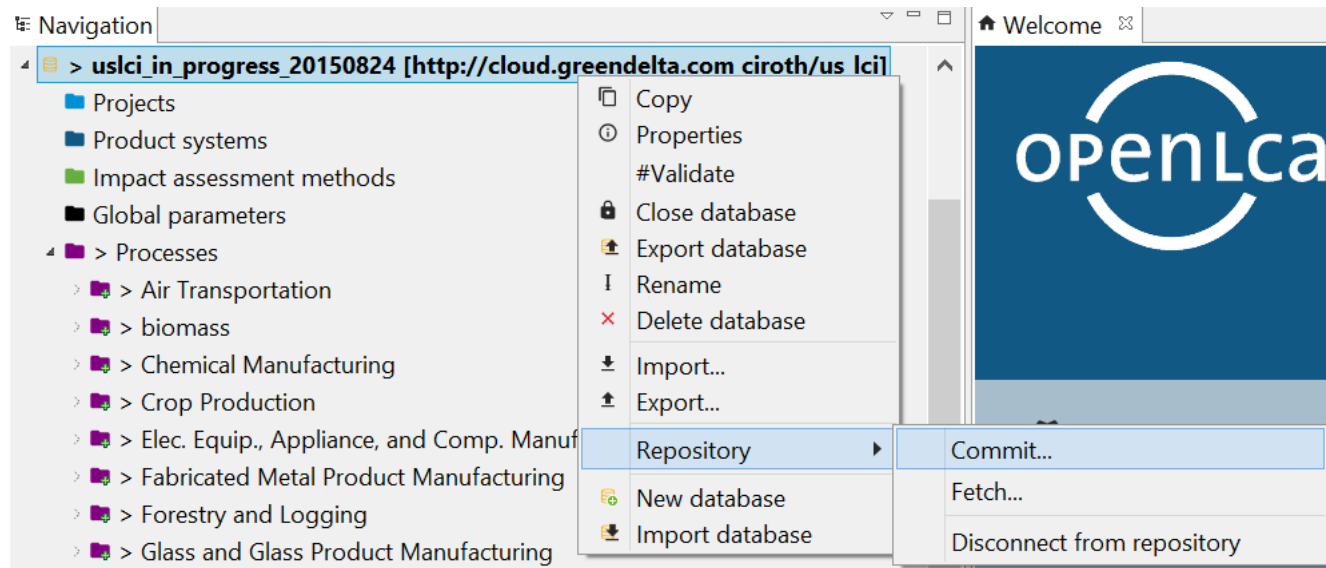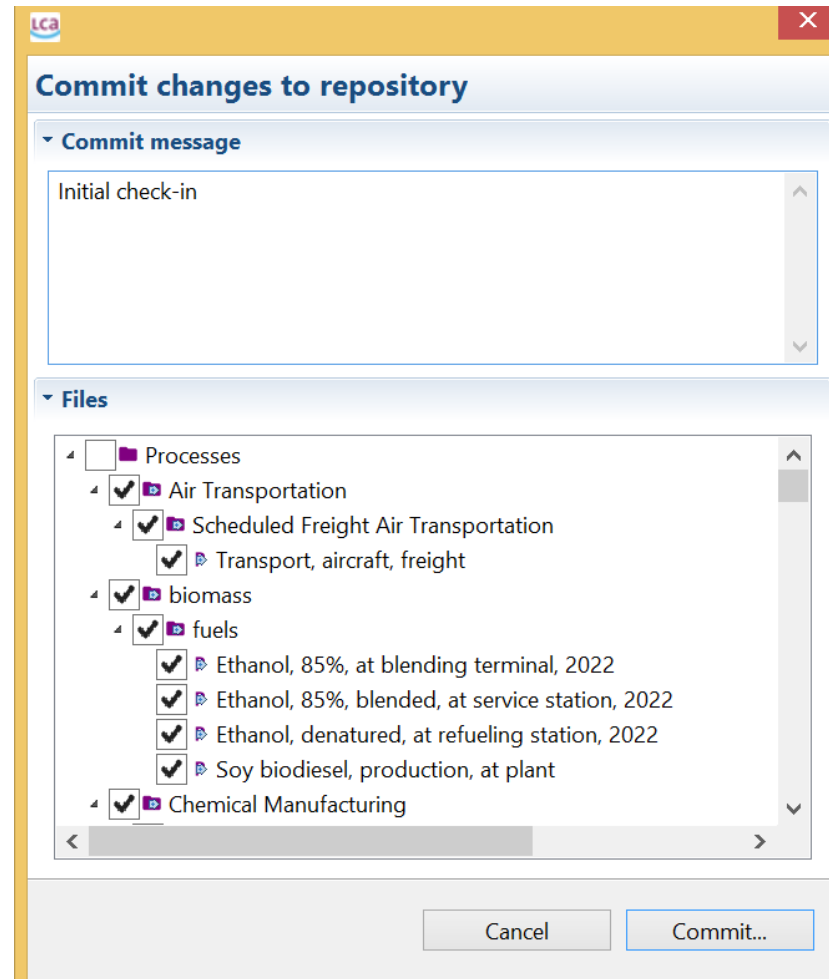# Features: Commit data

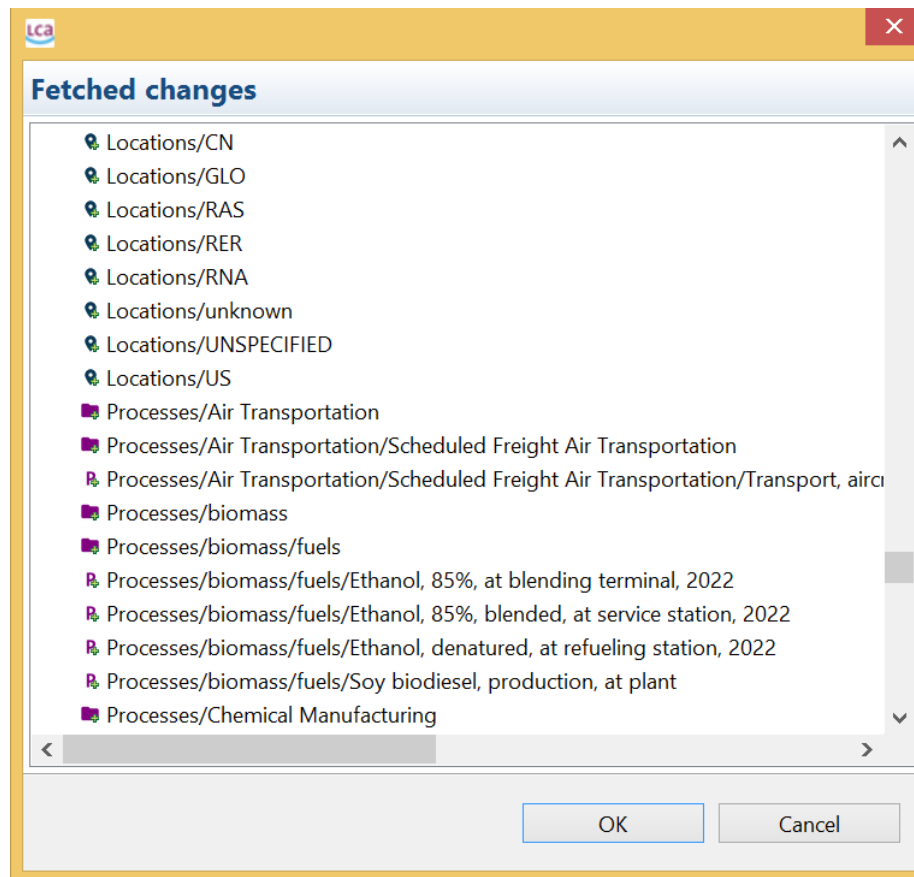- A subset of the changes can be selected

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
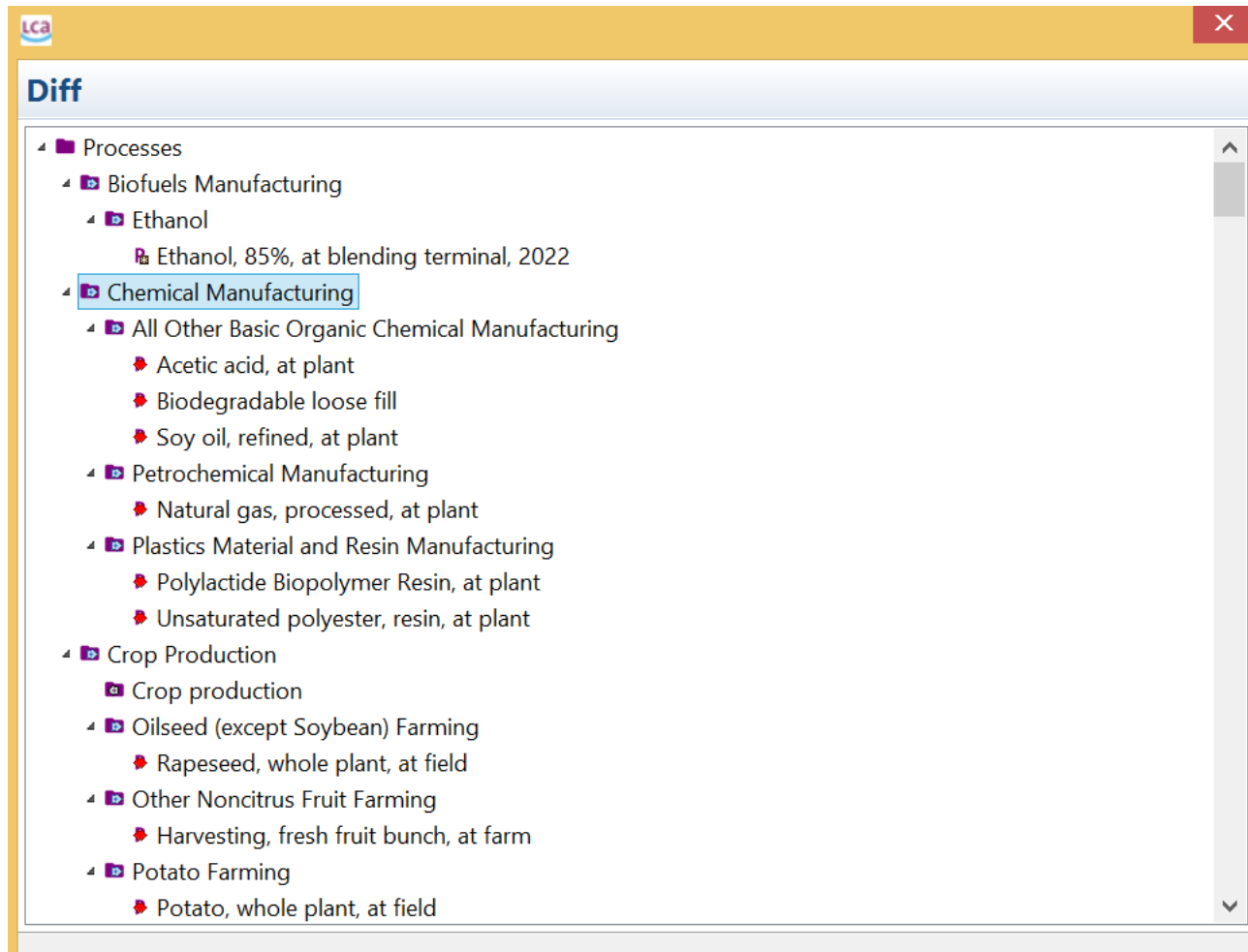
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Features: Fetch data

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

Features: Fetch data (Diff tool)

- Merge conflicting changes (Diff tool)

Features: Fetch data (Diff tool)

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
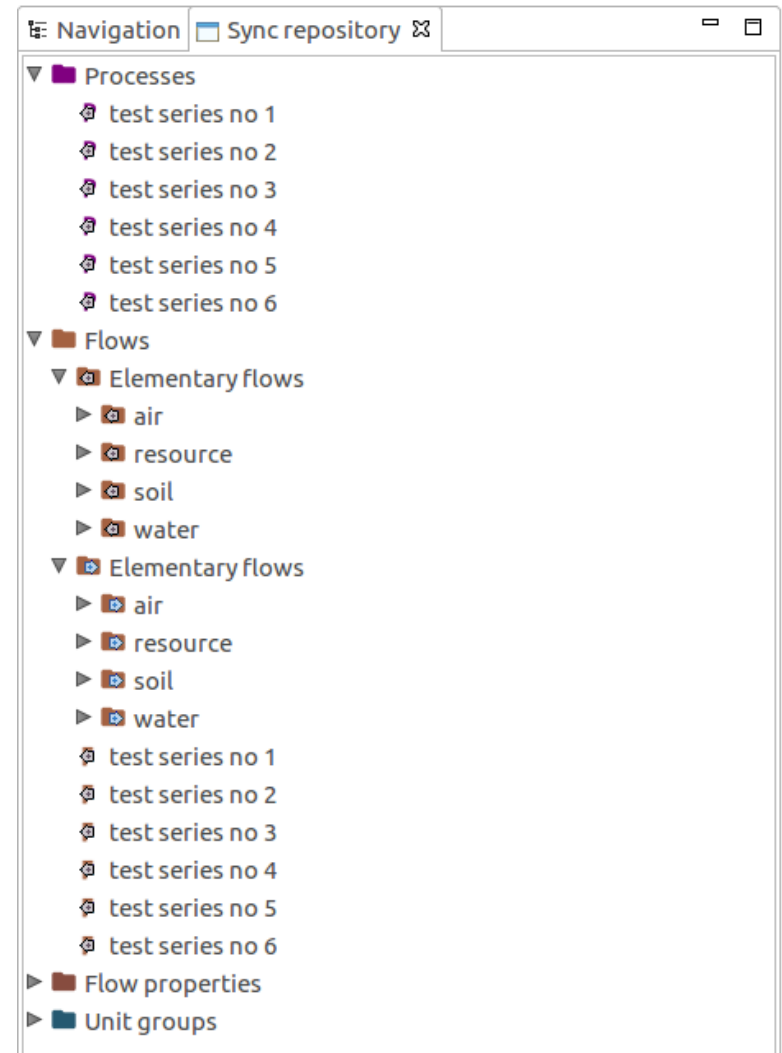
Use case scenario I: Data collaboration

Collaboration
server

User 1,
with local
openLCA
database 1

Commits data

Tries to
commit data

User 2,
with local
openLCA
database 2

Rejected because it is
not up to date with
the repository

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Use case scenario I: **Data collaboration**

Collaboration
server

User 1,
with local
openLCA
database 1

Commits data

User 2,
with local
openLCA
database 2

Fetches changes,

merges with
local data

Commits
merged data

Fetches
changes

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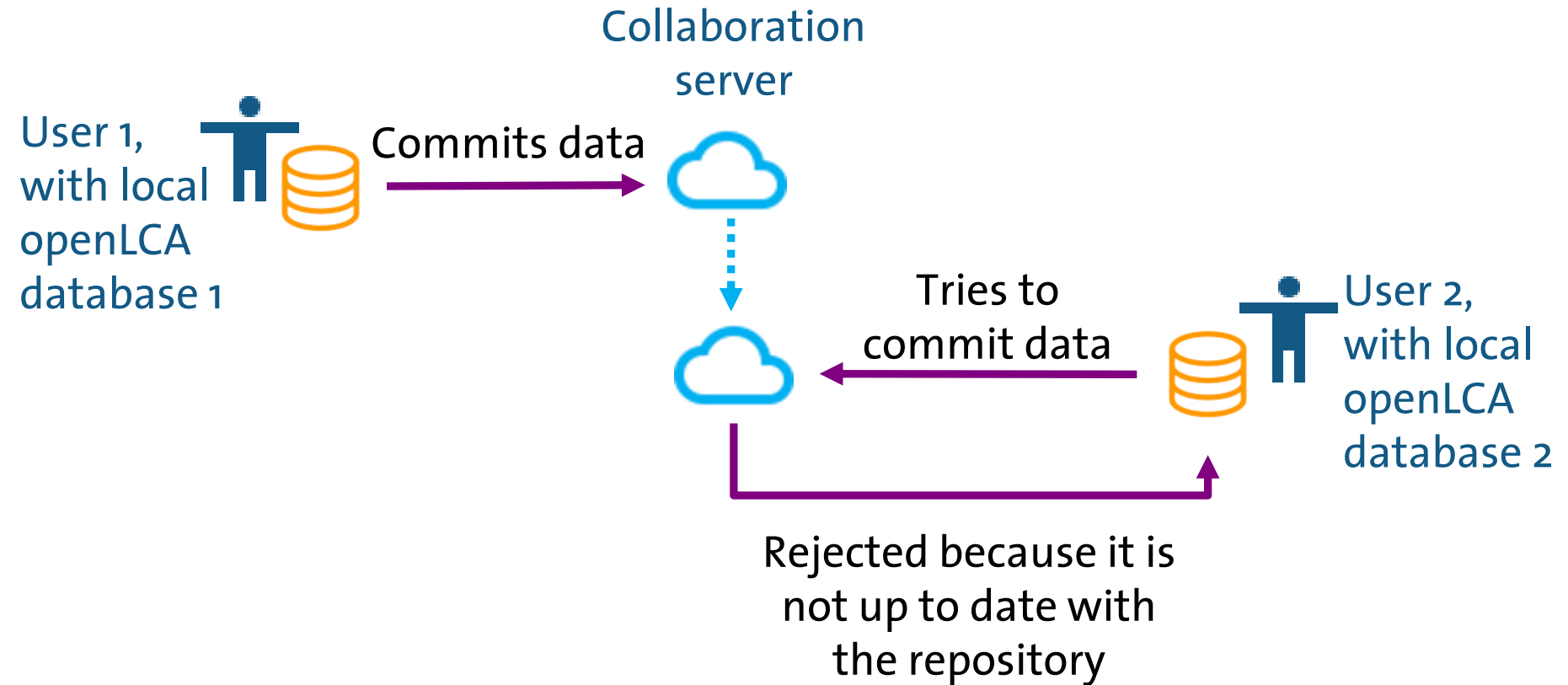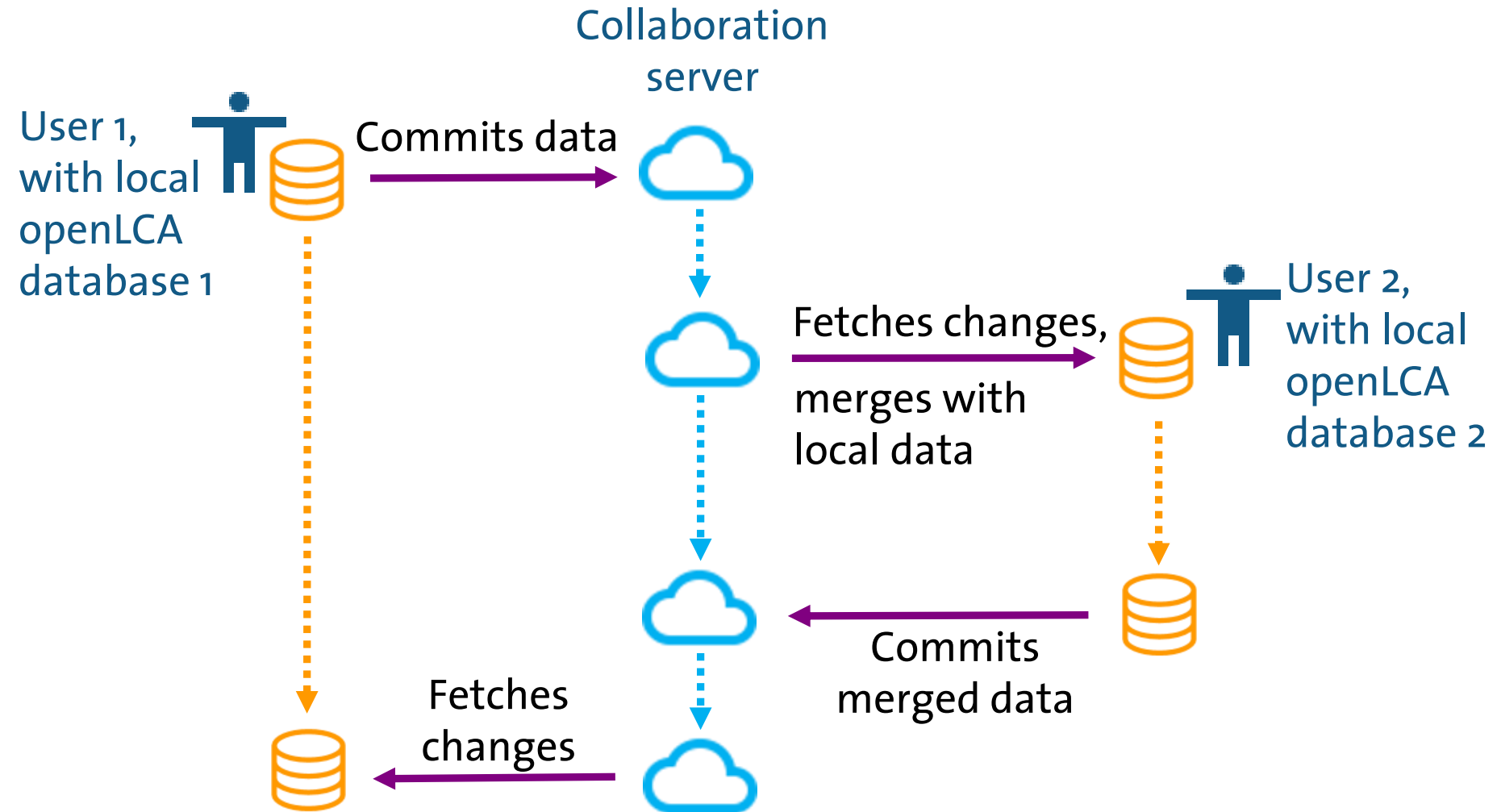
Use case scenario II: **Editorial**

User 1, with local openLCA database 1

User 2 with local openLCA database 2

User 3 with local openLCA database 3

Commit data

Collaboration server, internal

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Fetches changes

Merges, approves

Moderator, with openLCA master database

Publishes

Public collaboration server

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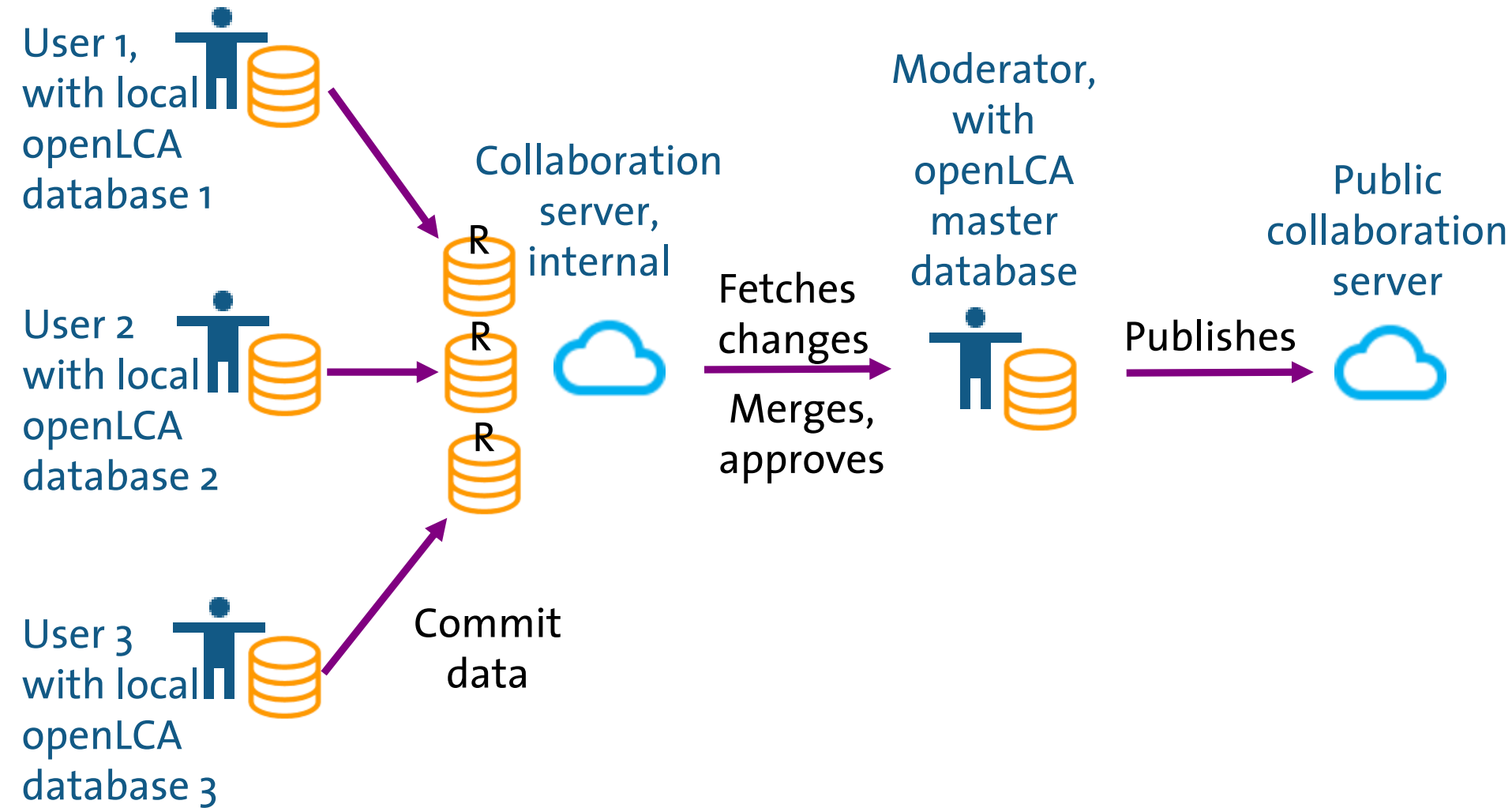
Status of LCA Collaboration Server

- Basic functionalities included as "Experimental feature" in:
  → openLCA 1.5.0 beta 1, January 2016
  → openLCA 1.5.0, September 2016

Outlook

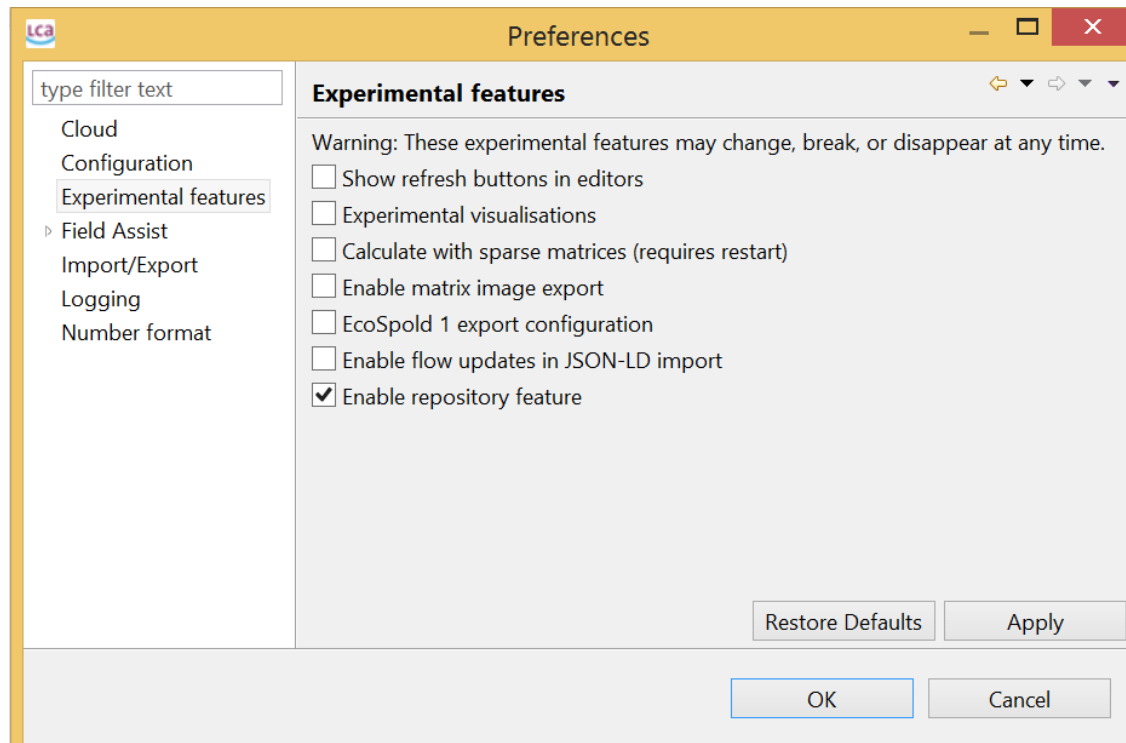- Fall 2016: new openLCA version 1.6 with advanced features (sync view, data quality systems)

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

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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

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Acknowledgments

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USDA United States Department of Agriculture
National Agricultural Library

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Thank you!

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