Web-based exchange of LCA data from the client side perspective

EnviroInfo 2011

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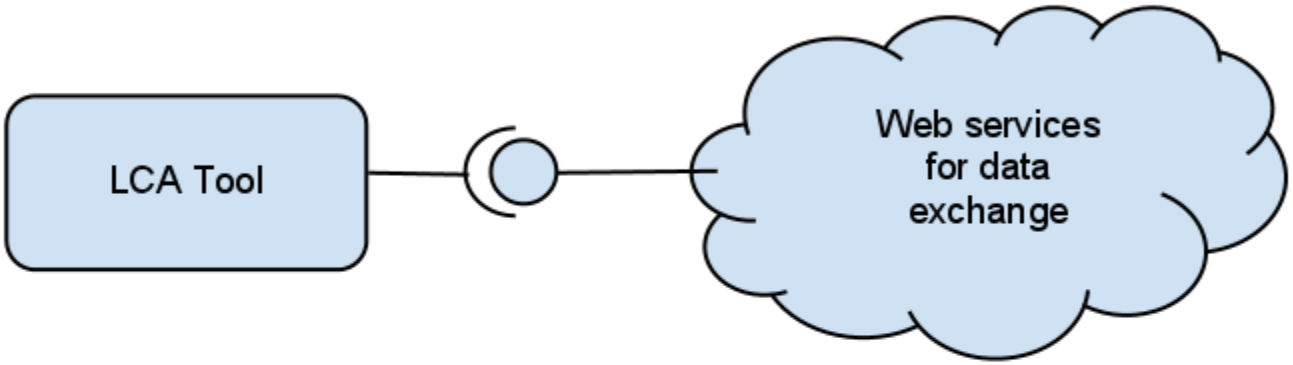
Motivation

(1) Web-based data exchange platform

- LCA data are increasingly available on the web
- Web-based exchange platforms for LCA data are in development
- Idea: use web-based data exchange platforms directly in the LCA tools

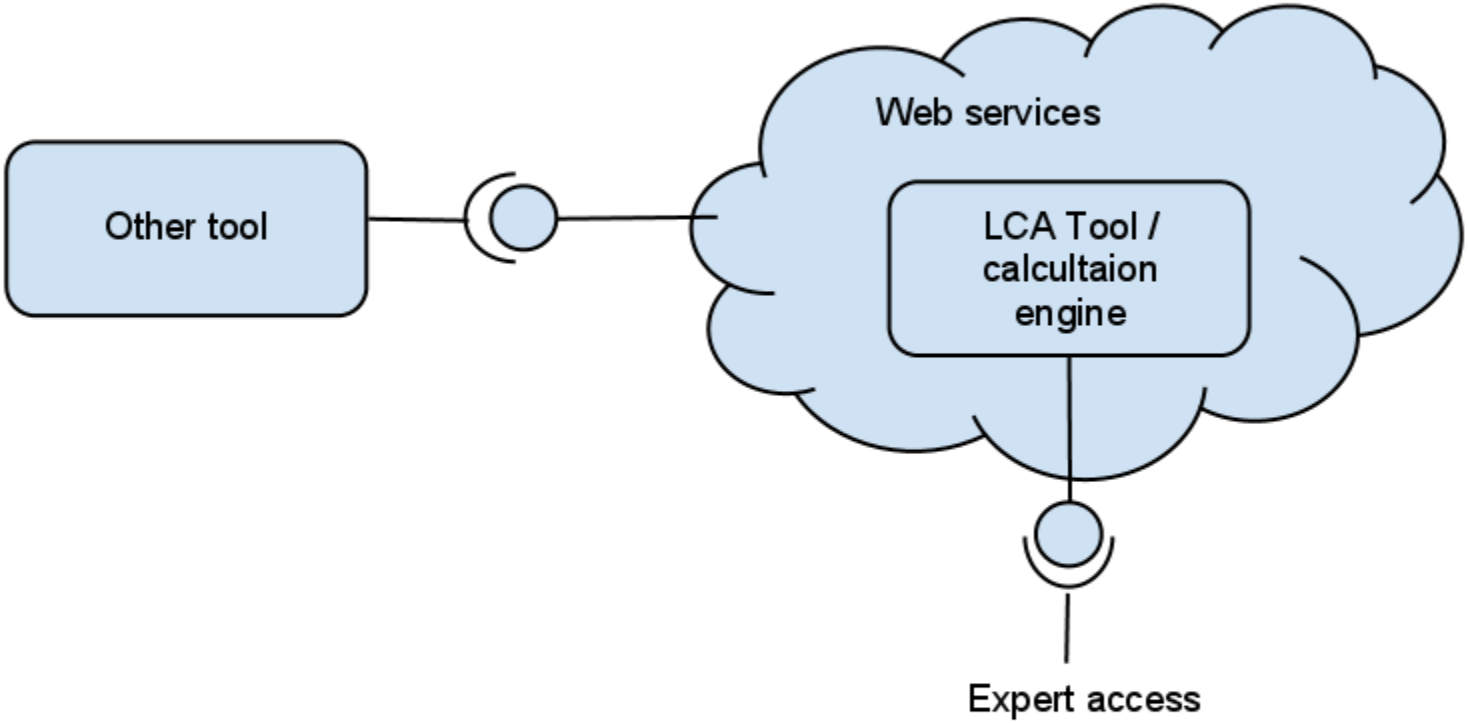
(1) Web-based data exchange platforms



(2) LCA tool “as a service”

- Directly use (dynamically calculated) LCA data in other tools (e.g. engineering or product design tools)
- Provide this information as a web-service

(2) LCA tool “as a service”

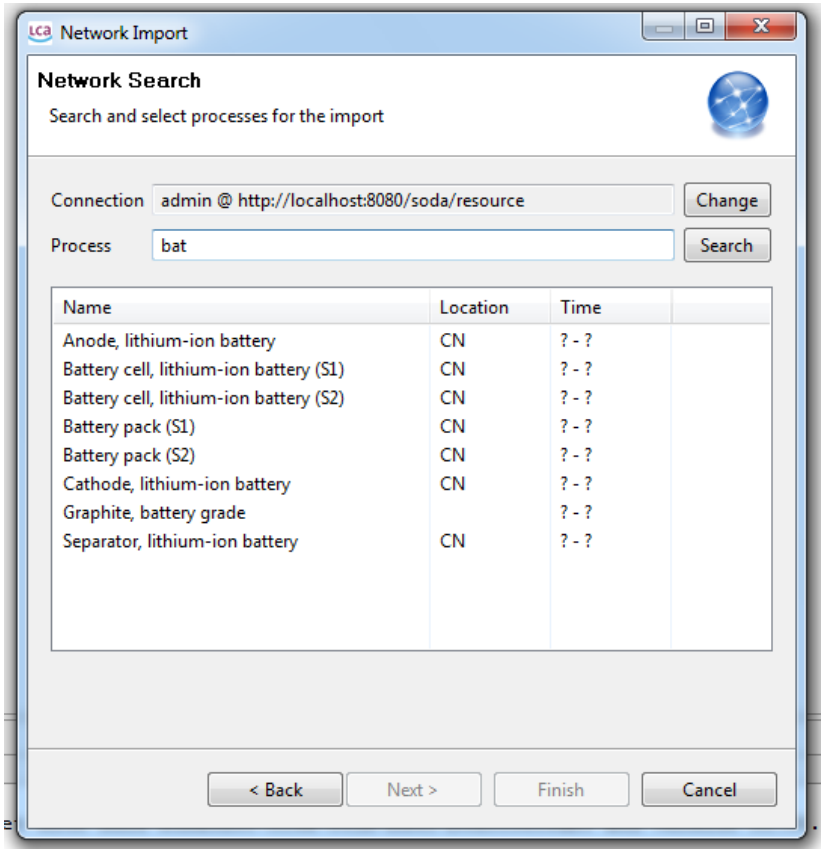


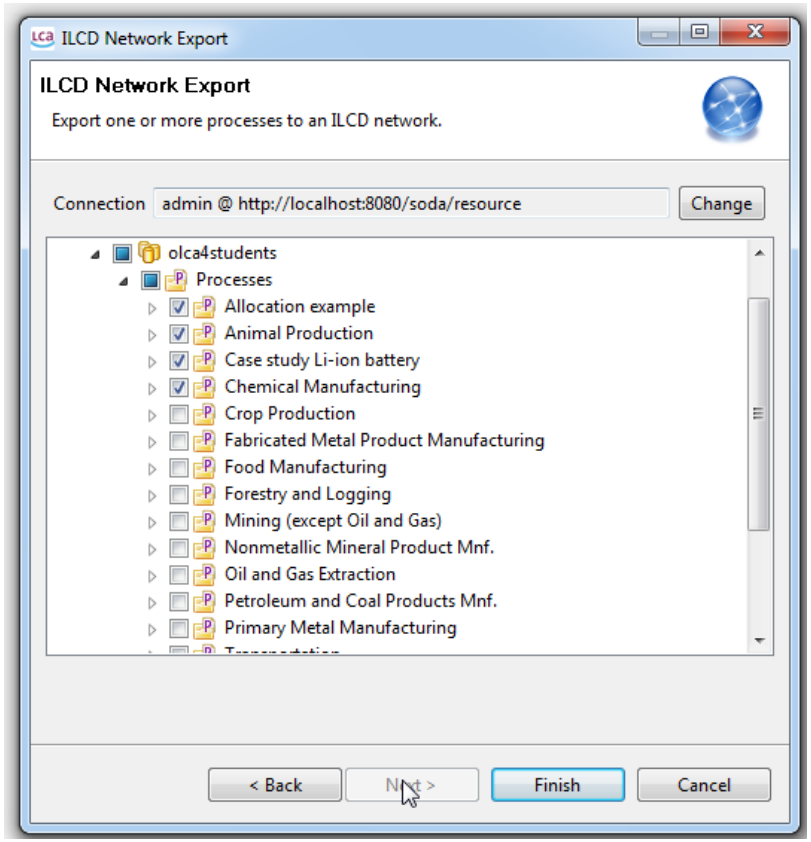
Examples

Example for use case 1: openLCA & soda4LCA

- openLCA = open source LCA tool developed by GreenDeltaTC
- soda4LCA = open source LCA data store developed by IAI (KIT)
- linked in the BioEnergieDat project

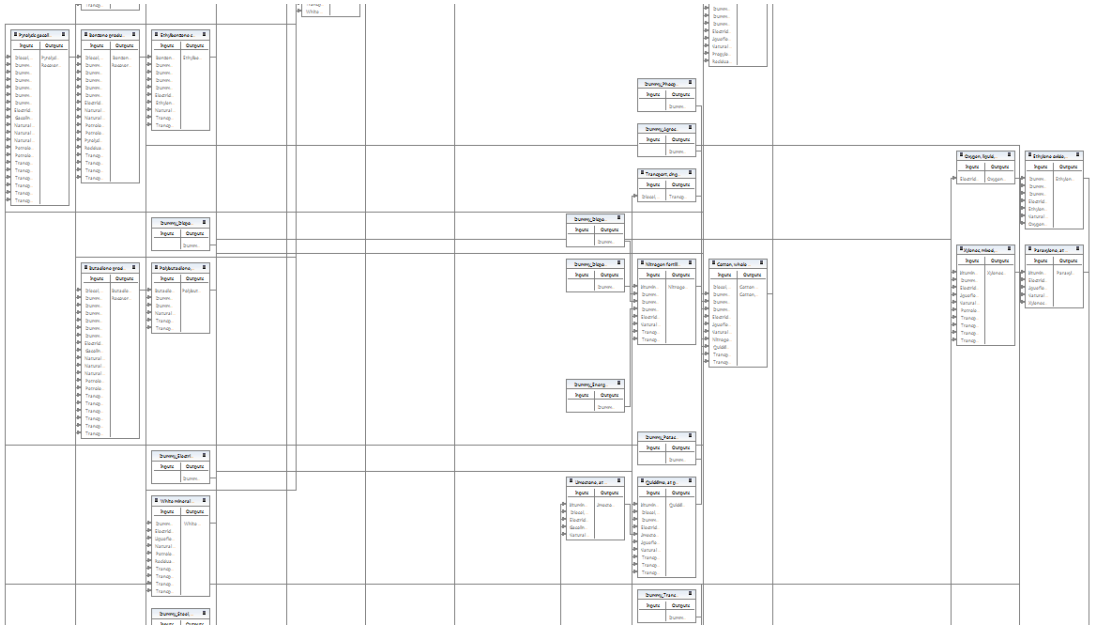
Example 1: openLCA & soda4LCA





openLCA & soda4LCA: features

- Exchange of process, flow, … data sets
- Exchange of complete product systems beginning of next year
- User roles
- Data search
- Versioning
- …



openLCA & soda4LCA: technical details

- Based ILCD format -> uses mechanism of data set references for an efficient data exchange and synchronisation with the client database

```
<exchange…
        <flowDataSet uuid="…" uri="…"
                version="…" >…
```

- soda4LCA provides a RESTful web-service

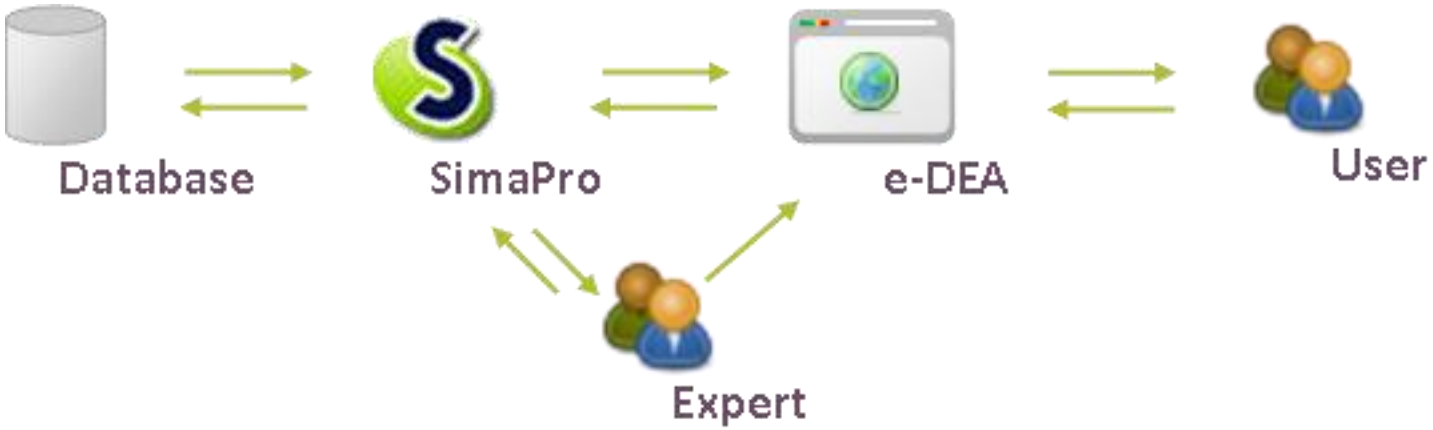
RESTful Webservice

- Simply HTTP (GET, PUT, HEAD, POST, DELETE, OPTIONS), stateless, and concept of resources
- Platform and language independent

GET http://<base url>/processes/59df8da0-edc8-11e0-be50-0800200c9a66

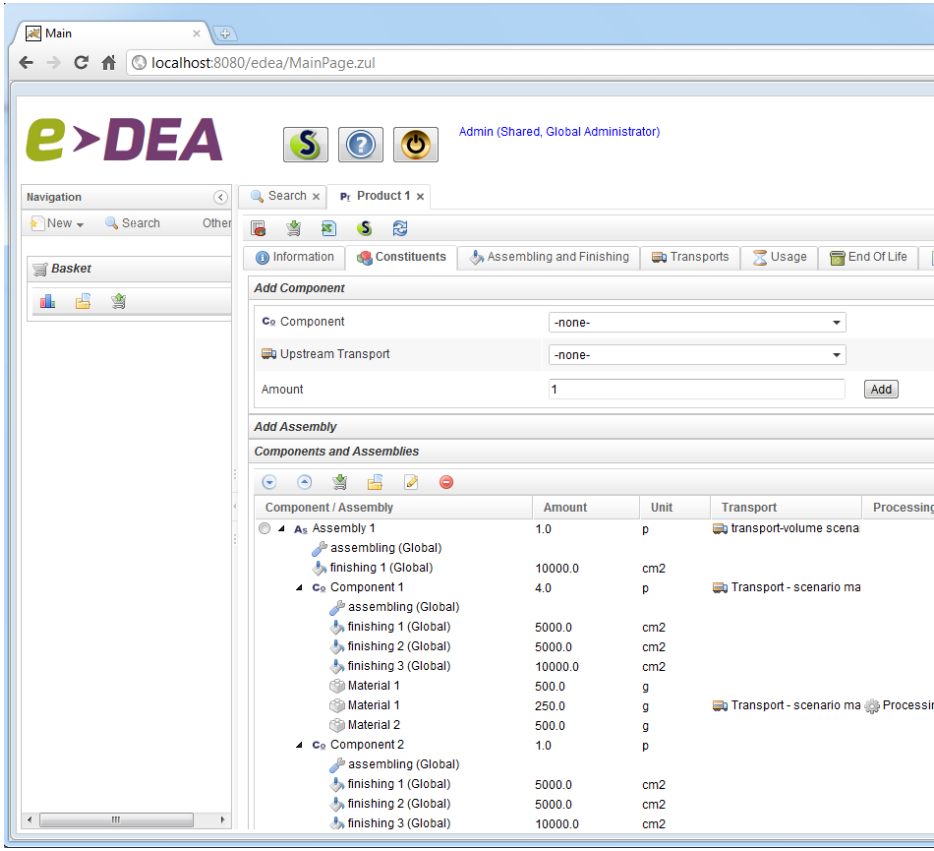
Example for use case 2: e-DEA

- Eco-design tool which uses SimaPro on the server side
- Developed together with evea



e-DEA: features

- Rich Internet Application
- Fast design prototyping with real LCA data
- User roles & collaboration
- Reporting
- …



e-DEA: technical details

- SimaPro provides a COM interface, we built a service wrapper around SimaPro using this interface
- e-DEA has its own database to store design models, SimaPro processes can be used in these models via references
- LCA experts can build LCA models directly in SimaPro

Conclusions

(RESTful) Web services

- allow loose coupling of tools and components written in different languages and running on different platforms
- In combination with object de-/serialization techniques for XML / JSON this is the ideal pair for the implementation in client tools

Data format

- Exchange between LCA tools and databases
  - use a standard format EcoSpold or ILCD (XML)
  - better: support both formats
- Exchange between LCA tools / services and other tools
  - “Keep it short and simple”
  - Just text! (JSON, XML)

```
Gson gson = new Gson();
Flow flow = gson.fromJson(json, Flow.class);
…
```

Data mapping and references

- Most important issue to connect tools and databases to identify model instances (e.g. elementary flows, processes)
- Important for an efficient data exchange between the tools
- Open point: provide such mappings via services

Thank you!

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