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lab2go – A Repository to Locate Online Laboratories

Agenda

- Introduction
- Description Model
- Ontology & Properties
- Lab2Go – Main functionalities
- Demonstration
- Future Outlook
- Conclusion
- Hands-on session & discussion

Current Scenario

- ❑ Many online laboratory developers and providers
- ❑ Many different laboratory types
- ❑ Many potential online laboratory users
- ❑ Growing research community
- ❑ Currently no generic description model available

Motivation

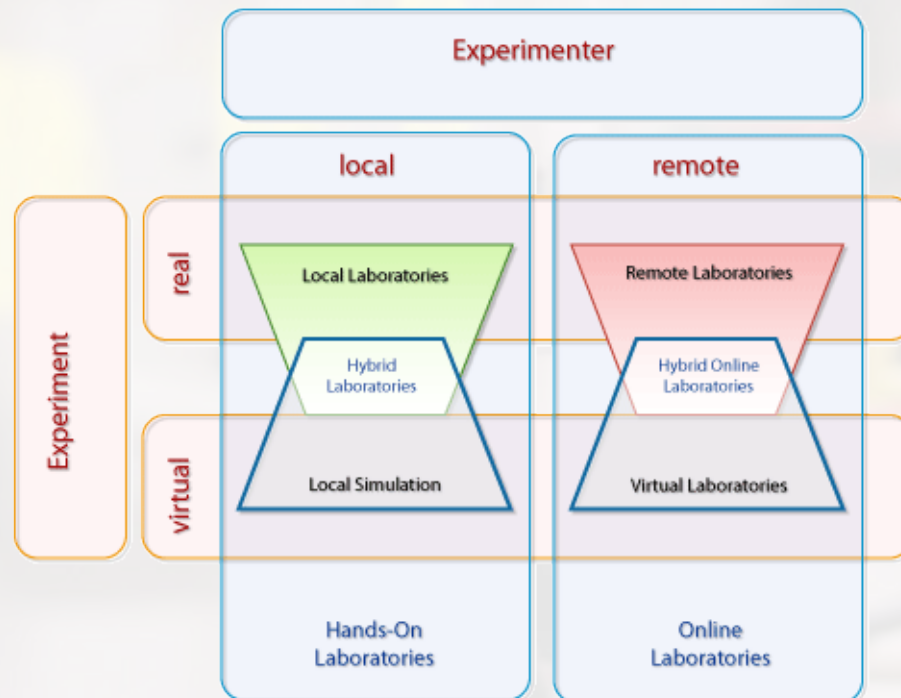
- ❑ Develop a generic description model for online laboratories
- ❑ Provide communication channels and community information for researches and users of this domain
- ❑ Improve search mechanisms
- ❑ Facilitate the access to online laboratories

- ❑ Creation of a Repository for online laboratories
- ❑ Make online laboratory information available in Web 3.0 technology
- ❑ Creation of a simple Framework to manage online laboratory metadata
- ❑ Provide information about the developer community:
 - ❑ who knows whom
 - ❑ who is in which project
 - ❑ who uses which architecture
 - ❑ ...

➤ Domain terminology and classification

Mostly well known by the online laboratory community – published in many papers.

➤ Overview:



Each laboratory can be divided in two main elements:

- **Online Laboratory**

Is an environment which allows a user to perform hardware based experiments or software based simulations over the Internet.

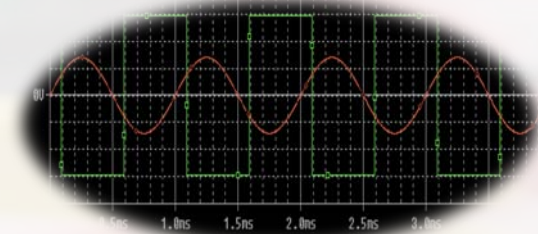
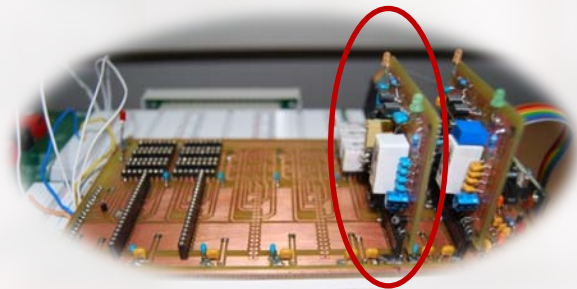
- **Experiment**

An experiment can be seen as smallest enclosed unit and will be executed by an online laboratory to observe the input/output behavior of a system.

Online Laboratory



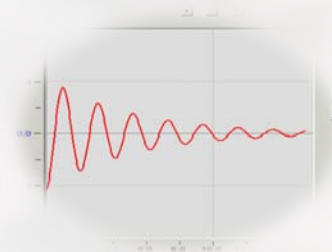
Experiments



Different type of experiments :

□ Observation experiment

Environment and parameters are fixed, only an observation is possible



□ Fixed experiment

Fixed environment, but parameters and measurement options can be changed remotely



□ Adaptive Experiment

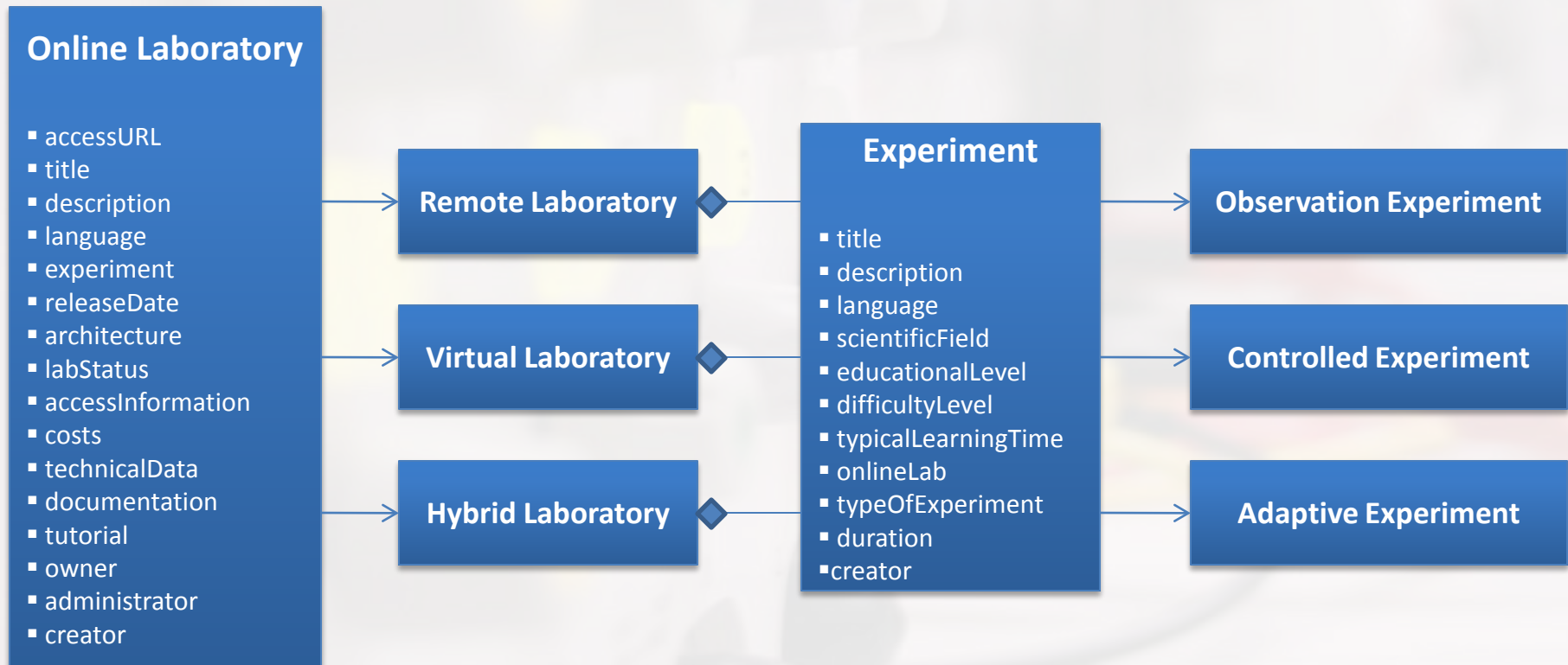
Hardware environment and parameters can be changed remotely



Interesting description properties:

Type	Properties
General	Title, Description, Language
Online Laboratory	Access URL, Access information, Architecture, Lab Status, Costs, Owner, Creator, Administrator, release Date, Documentation, Tutorials, included Experiments
Online Experiment	Key words, Scientific field, educational level, difficulty level, typical learning time, experiment type, duration, creator, link to online lab

Resultant class-diagram with description properties and connections:

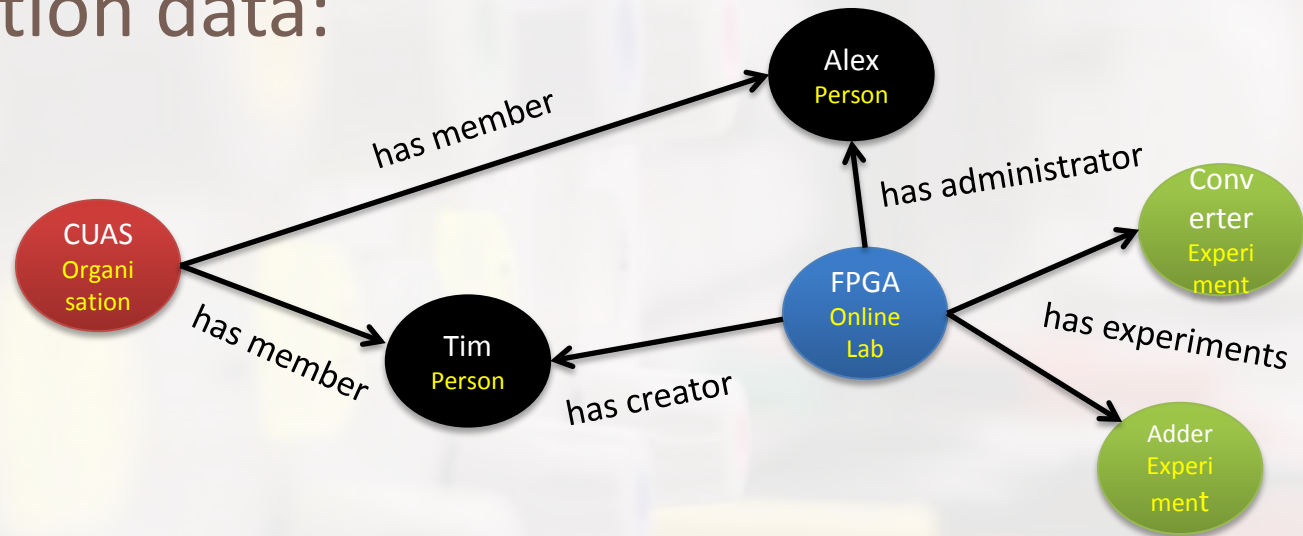


All laboratories and experiments are described according to the following standards:

- ❑ Dublin Core
- ❑ Friend of a Friend (FOAF)
- ❑ World Geodetic System (WGS84)
- ❑ Terminology adapted from LOM (e.g. difficulty level)
- ❑ Some own, domain-specific definitions

Properties	Standard
Title, description, language, hasPart, contributor, creator, rightsHolder, created, requires, isPartOf, subject, duration	DC
Agent and Project Class	FOAF
Latitude, Longitude	WGS84
DifficultyLevel, Scientificfield, ExperimentType, EducationLevel, AccessRequirements, LabStatus, Depiction, media, AccessURL, Costs, Architecture, Document,	none

A graphical representation of semantic description data:



□ The result is a Graph with lots of triples



- “OntoWiki is a tool supporting agile Knowledge Engineering in a pure Web environment. It enables intuitive authoring of semantic content with an inline editing mode for editing RDF content and enhances the browsing and retrieval by offering semantically enhanced search strategies”
- Semantic Data Wiki

OntoWiki
User Extras Help
Search Text
☐ Search all Knowledge Bases
Submit
POWERED BY VIRTUOSO

Knowledge Bases
Conference Model
Online Laboratory

Classes
Type to search ...
► Requirement for a Lab Client
► Document
► LinguisticSystem
Access Requirements
► Online Laboratory

News

Leipziger Semantic Web Tag on 29th of April
In the context of our recently started BmBF funded WK-Potential project LE4SW we organize a Leipziger Semantic Web Tag (LSWT) in order to get more in touch with enterprises from Saxony and to raise awareness about the opportunities Semantic Web technologies offer for small and medium sized companies. The day will take place at the [...]

OntoWiki 0.8.6 released
This is a bugfix release with minor enhancements. We fixed some issues from the user community. The most important enhancement is the support for HTTPS now. For a list of all issues, have a look at the Changelog.

OntoWiki 0.8.5 released
The AKSW research group is pleased to announce that OntoWiki 0.8.5 is now available for download. Changes in this release include A plug-in and event architecture A file / document manager Rest webservices for login / query / export databases WebDAV support for browsing and exporting



OntoWiki provides the following advantages:

- ❑ Modular MVC architecture
 - ❑ Based on Zend framework
 - ❑ Flexible - extensions can be developed individually
 - ❑ Supports different back ends
(actually virtuoso is used as triple store)

Following features are actually implemented:

- ☐ Facet based browsing
- ☐ Customized view of resources
- ☐ Simple search mechanism
- ☐ Editor to add and edit resources
- ☐ Rating of resources
- ☐ Commenting of resources
- ☐ User management with different group policies

The main user interface:

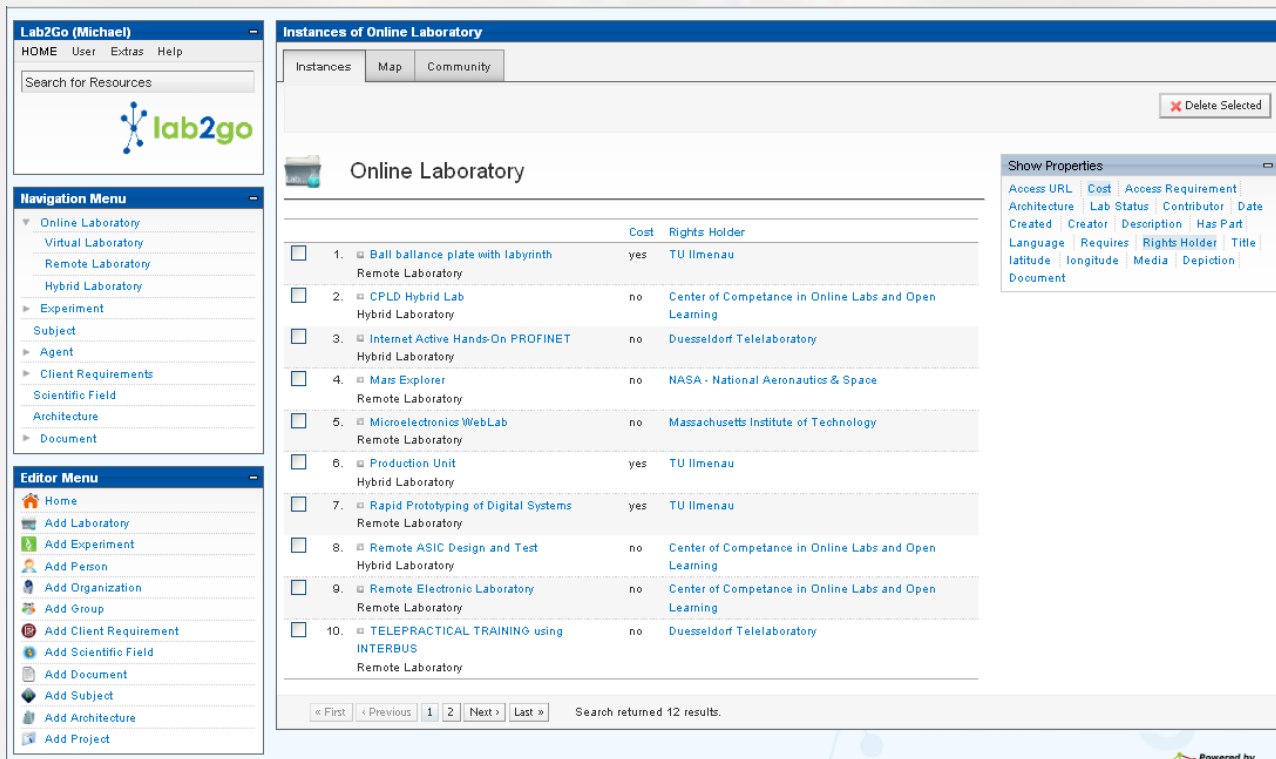


The screenshot displays the Lab2Go web portal interface. On the left, a sidebar contains a navigation menu with links for Online Laboratory, Experiment, Subject, Agent, Client Requirements, Scientific Field, Architecture, and Document. Below the menu is a login section with fields for Username and Password, a 'Remember me' checkbox, and 'Login' and 'Register' buttons. The main content area features a 'Welcome to Lab2go' header with the lab2go logo and a tagline: '...the semantically enriched repository of online labs.' Below this, a paragraph describes the portal's purpose: 'Lab2go is a Web portal that aims at bringing online lab developers, researchers, professors and students a bit closer together by offering a common Web environment where people can share expertise and experience in the field. Online lab developers can describe their labs by using our own model and can furthermore search for specific laboratory more precisely. What makes Lab2go different from other existing Web applications is that it makes use of Semantic Web technologies to describe and search for data. Adding semantics to the data allows for the description of relationship between resources in a machine processable way. It allows therefore for an easier and more precise search for a desired online laboratory, experiment and other resources described by the model.' Below the text is a banner image showing laboratory equipment. On the right, there are two sections: 'Latest Discussions' with user comments and 'Newest Laboratories' listing various labs like MIT Microele...onics WebLab, Mars Explore...over Mission, TELEPRACTICA...ing INTERBUS, WebLab-DEUSTO, and Rapid Protot...ital Systems.

User management:

- ❑ Anonymous
 - ❑ Can browse through the repository
- ❑ Standard user
 - ❑ Can browse the repository and leave comments/ratings
- ❑ Editor
 - ❑ Can browse, evaluate and add new laboratories
- ❑ Administrator

Browse repository (1):




The screenshot displays the Lab2Go web application interface. The top navigation bar includes 'HOME', 'User', 'Extras', and 'Help'. A search bar is present with the text 'Search for Resources'. The left sidebar contains a 'Navigation Menu' with categories like 'Online Laboratory', 'Experiment', 'Subject', 'Agent', 'Client Requirements', 'Scientific Field', 'Architecture', and 'Document'. Below this is an 'Editor Menu' with options like 'Home', 'Add Laboratory', 'Add Experiment', 'Add Person', 'Add Organization', 'Add Group', 'Add Client Requirement', 'Add Scientific Field', 'Add Document', 'Add Subject', 'Add Architecture', and 'Add Project'.

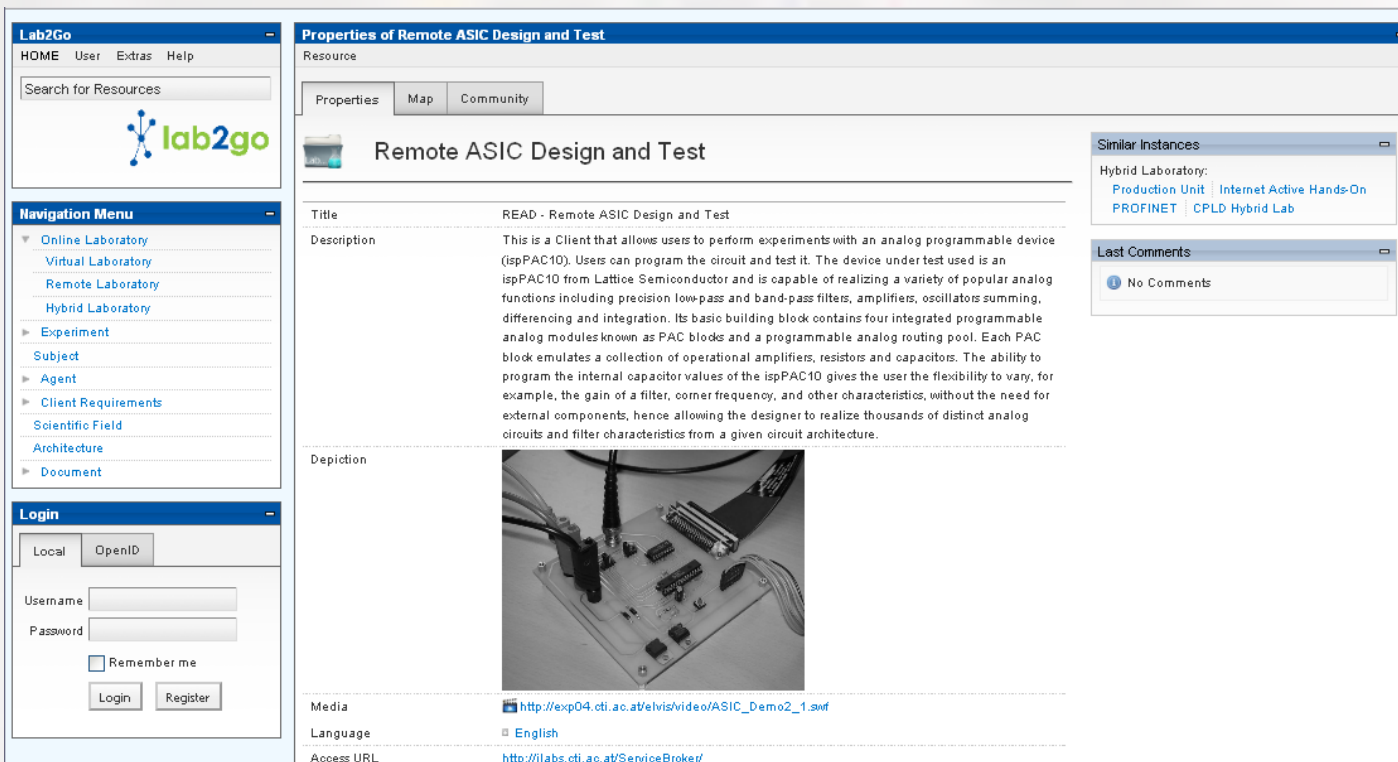
The main content area is titled 'Instances of Online Laboratory' and features tabs for 'Instances', 'Map', and 'Community'. A 'Delete Selected' button is visible. Below the tabs, there is a section for 'Online Laboratory' with a table listing various laboratories. The table has columns for 'Cost' and 'Rights Holder'. A 'Show Properties' dialog box is open on the right, displaying fields for 'Access URL', 'Cost', 'Access Requirement', 'Architecture', 'Lab Status', 'Contributor', 'Date', 'Created', 'Creator', 'Description', 'Has Part', 'Language', 'Requires', 'Rights Holder', 'Title', 'Latitude', 'Longitude', 'Media', 'Depiction', and 'Document'.

		Cost	Rights Holder
<input type="checkbox"/>	1. Ball balance plate with labyrinth Remote Laboratory	yes	TU Ilmenau
<input type="checkbox"/>	2. CPLD Hybrid Lab Hybrid Laboratory	no	Center of Competence in Online Labs and Open Learning
<input type="checkbox"/>	3. Internet Active Hands-On PROFINET Hybrid Laboratory	no	Duesseldorf Telelaboratory
<input type="checkbox"/>	4. Mas Explorer Remote Laboratory	no	NASA - National Aeronautics & Space
<input type="checkbox"/>	5. Microelectronics WebLab Remote Laboratory	no	Massachusetts Institute of Technology
<input type="checkbox"/>	6. Production Unit Hybrid Laboratory	yes	TU Ilmenau
<input type="checkbox"/>	7. Rapid Prototyping of Digital Systems Remote Laboratory	yes	TU Ilmenau
<input type="checkbox"/>	8. Remote ASIC Design and Test Hybrid Laboratory	no	Center of Competence in Online Labs and Open Learning
<input type="checkbox"/>	9. Remote Electronic Laboratory Remote Laboratory	no	Center of Competence in Online Labs and Open Learning
<input type="checkbox"/>	10. TELEPRACTICAL TRAINING using INTERBUS Remote Laboratory	no	Duesseldorf Telelaboratory

« First < Previous 1 2 Next > Last » Search returned 12 results.

Powered by 

Browse repository (2):

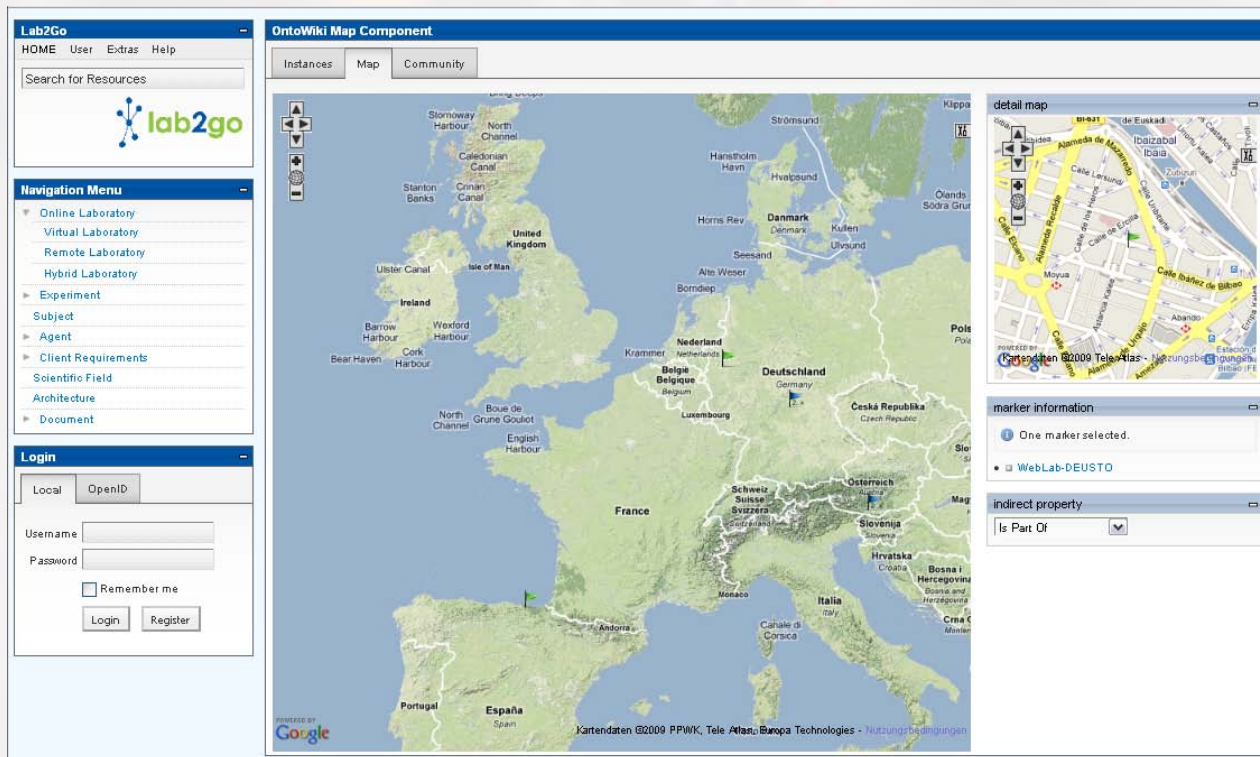


The screenshot displays the Lab2Go web application interface. On the left, there is a sidebar with a 'Lab2Go' header, a search bar, and a 'Navigation Menu' containing links like 'Online Laboratory', 'Virtual Laboratory', 'Remote Laboratory', 'Hybrid Laboratory', 'Experiment', 'Subject', 'Agent', 'Client Requirements', 'Scientific Field', 'Architecture', and 'Document'. Below the menu is a 'Login' section with 'Local' and 'OpenID' tabs, username and password fields, a 'Remember me' checkbox, and 'Login' and 'Register' buttons.

The main content area is titled 'Properties of Remote ASIC Design and Test'. It features a 'Resource' tab and sub-tabs for 'Properties', 'Map', and 'Community'. The title 'Remote ASIC Design and Test' is prominently displayed. Below the title, the 'Title' is 'READ - Remote ASIC Design and Test'. The 'Description' section contains a detailed paragraph about the ispPAC10 device and its capabilities. The 'Depiction' section shows a photograph of a circuit board with various components and cables. At the bottom, there are fields for 'Media' (with a video link), 'Language' (set to English), and 'Access URL' (http://labs.cti.ac.at/ServiceBroker/).

On the right side of the main content area, there are two additional sections: 'Similar Instances' listing 'Hybrid Laboratory', 'Production Unit', 'Internet Active Hands-On', 'PROFINET', and 'CPLD Hybrid Lab'; and 'Last Comments' showing 'No Comments'.

Browse repository by map (3):




The screenshot displays the Lab2Go web application interface. On the left, there is a navigation menu with options like 'Online Laboratory', 'Virtual Laboratory', 'Remote Laboratory', 'Hybrid Laboratory', 'Experiment', 'Subject', 'Agent', 'Client Requirements', 'Scientific Field', 'Architecture', and 'Document'. Below the menu is a 'Login' section with fields for 'Username' and 'Password', and buttons for 'Login' and 'Register'. The main area is titled 'OntoWiki Map Component' and features a map of Europe. A 'detail map' on the right shows a zoomed-in view of a specific location, with a 'marker information' section below it indicating 'One marker selected' and 'WebLab-DEUSTO'. The 'indirect property' section shows 'Is Part Of'.

Rate & Comment

Properties of CPLD Hybrid Lab

Resource

Properties Map Community

 **CPLD Hybrid Lab**

Title	Altera CPLD Hybrid Lab
Description	The presented lab is a system for remote prototyping and testing of digital systems that allows users to perform tests on real devices remotely over the Internet as well as design digital systems with the Altera Max+PlusII development environment. The access to this software is delivered via a Citrix Presentation Server. LabView was used to deliver the user interface and control the data acquisition and data generation with a DAQ card from National Instruments. Such systems are specially suited for manufacturing process monitoring, control and for learning purposes.
Deplition	
Language	<input type="checkbox"/> English
Access URL	http://exp01.cti.ac.at/CPLD/
Has Part	<input type="checkbox"/> 4 bit ALU <input type="checkbox"/> 4 bit ader <input type="checkbox"/> stopwatch digital circuit
Contributor	<input type="checkbox"/> Center of Competance in Online Labs and Open Learning <input type="checkbox"/> Univeristy Transilvania of Brasov
Creator	<input type="checkbox"/> Christian Maier <input type="checkbox"/> Danilo Garbi Zutin <input type="checkbox"/> Diana Pop <input type="checkbox"/> Michael Niedertätter
Rights Holder	<input type="checkbox"/> Center of Competance in Online Labs and Open Learning
Date Created	2009-05-31
Lab Status	<input type="checkbox"/> available
Requires	<input type="checkbox"/> LabView Runtime Engine
Access Requirement	<input type="checkbox"/> access upon request
Cost	no
Architecture	<input type="checkbox"/> Independent

Similar Instances


Hybrid Laboratory:
[Production Unit](#) | [Internet Active Hands-On](#)
[PROFINET](#) | [Remote ASIC Design and Test](#)

Rating

Current Rating
★★★★☆ 3.5 votes (2)

Your Vote:
★★★★☆
[Change](#)


Last Comments

 Michael (5 days ago): Hehe, this lab works very... good! Well done Diana :)

[more ...](#)


Discussion about CPLD Hybrid Lab

Properties Map Community

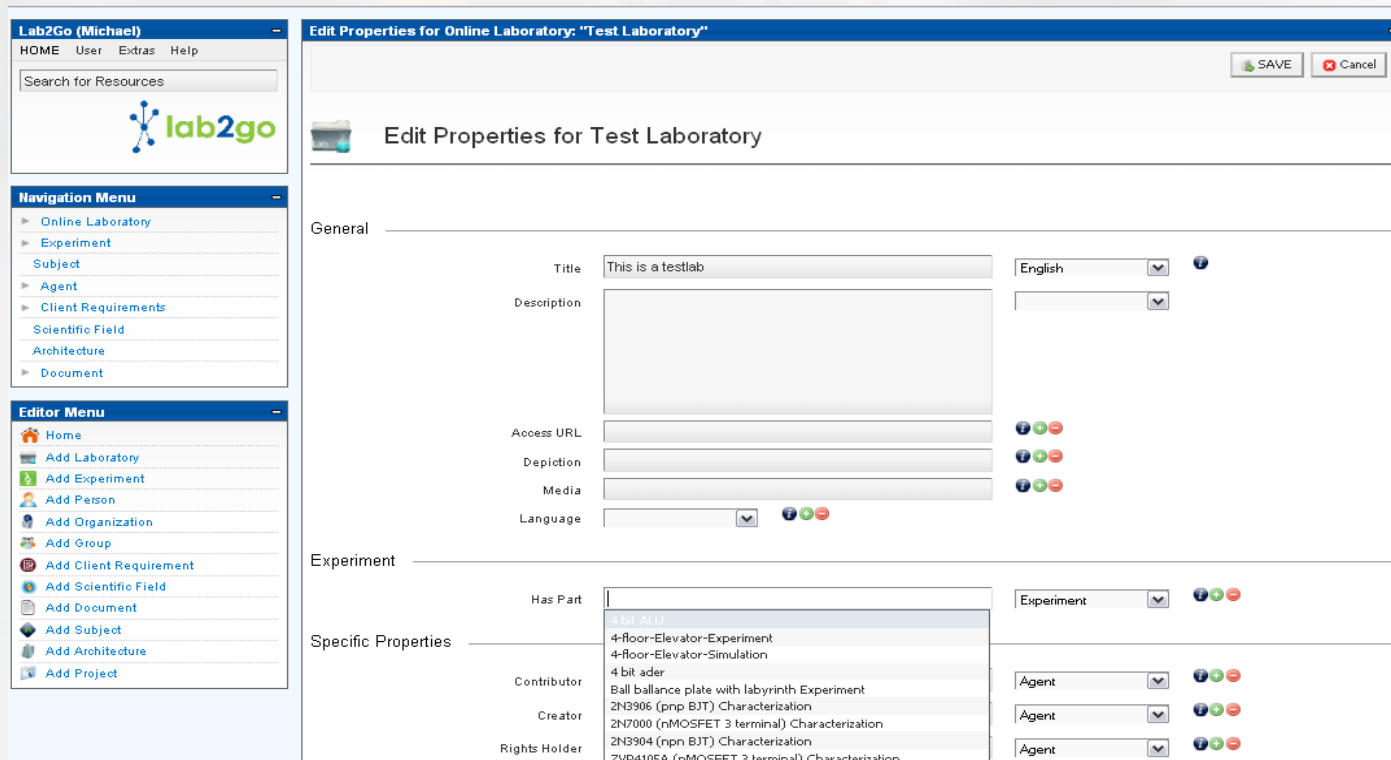
Author	Comment
 Michael (5 days ago)	Hehe, this lab works very good! Well done Diana :)

Comment

add a new comment here
...

 Post Comment

Add a new laboratory:



The screenshot shows the 'Edit Properties for Online Laboratory: "Test Laboratory"' window. The interface is divided into a left sidebar and a main content area. The sidebar contains a 'Navigation Menu' with links like 'Online Laboratory', 'Experiment', 'Subject', 'Agent', 'Client Requirements', 'Scientific Field', 'Architecture', and 'Document'. Below it is an 'Editor Menu' with options like 'Home', 'Add Laboratory', 'Add Experiment', 'Add Person', 'Add Organization', 'Add Group', 'Add Client Requirement', 'Add Scientific Field', 'Add Document', 'Add Subject', 'Add Architecture', and 'Add Project'. The main content area has a title bar 'Edit Properties for Online Laboratory: "Test Laboratory"' with 'SAVE' and 'Cancel' buttons. Below the title bar is a section 'Edit Properties for Test Laboratory'. The 'General' tab is active, showing fields for 'Title' (This is a testlab), 'Description' (a large text area), 'Access URL', 'Depiction', 'Media', and 'Language'. To the right of these fields are dropdown menus for 'English' and another language, and social media icons. The 'Experiment' tab is also visible, showing a 'Has Part' dropdown with a list of experiments: '4 bit ALU', '4-floor-Elevator-Experiment', '4-floor-Elevator-Simulation', '4 bit ader', 'Ball balance plate with labyrinth Experiment', '2N3906 (pnp BJT) Characterization', '2N7000 (nMOSFET 3 terminal) Characterization', '2N3904 (npn BJT) Characterization', and 'ZVP4105A (pMOSFET 3 terminal) Characterization'. To the right of the 'Has Part' dropdown is an 'Experiment' dropdown and social media icons. The 'Specific Properties' section shows fields for 'Contributor', 'Creator', and 'Rights Holder', each with a dropdown menu and social media icons.

Lab2Go (Michael)

HOME User Extras Help

Search for Resources

lab2go

Navigation Menu

- Online Laboratory
- Experiment
- Subject
- Agent
- Client Requirements
- Scientific Field
- Architecture
- Document

Editor Menu

- Home
- Add Laboratory
- Add Experiment
- Add Person
- Add Organization
- Add Group
- Add Client Requirement
- Add Scientific Field
- Add Document
- Add Subject
- Add Architecture
- Add Project

Edit Properties for Online Laboratory: "Test Laboratory"

SAVE Cancel

Edit Properties for Test Laboratory

General

Title: This is a testlab

Description:

Access URL:

Depiction:

Media:

Language:

English

Experiment

Has Part:

- 4 bit ALU
- 4-floor-Elevator-Experiment
- 4-floor-Elevator-Simulation
- 4 bit ader
- Ball balance plate with labyrinth Experiment
- 2N3906 (pnp BJT) Characterization
- 2N7000 (nMOSFET 3 terminal) Characterization
- 2N3904 (npn BJT) Characterization
- ZVP4105A (pMOSFET 3 terminal) Characterization

Contributor:

Creator:

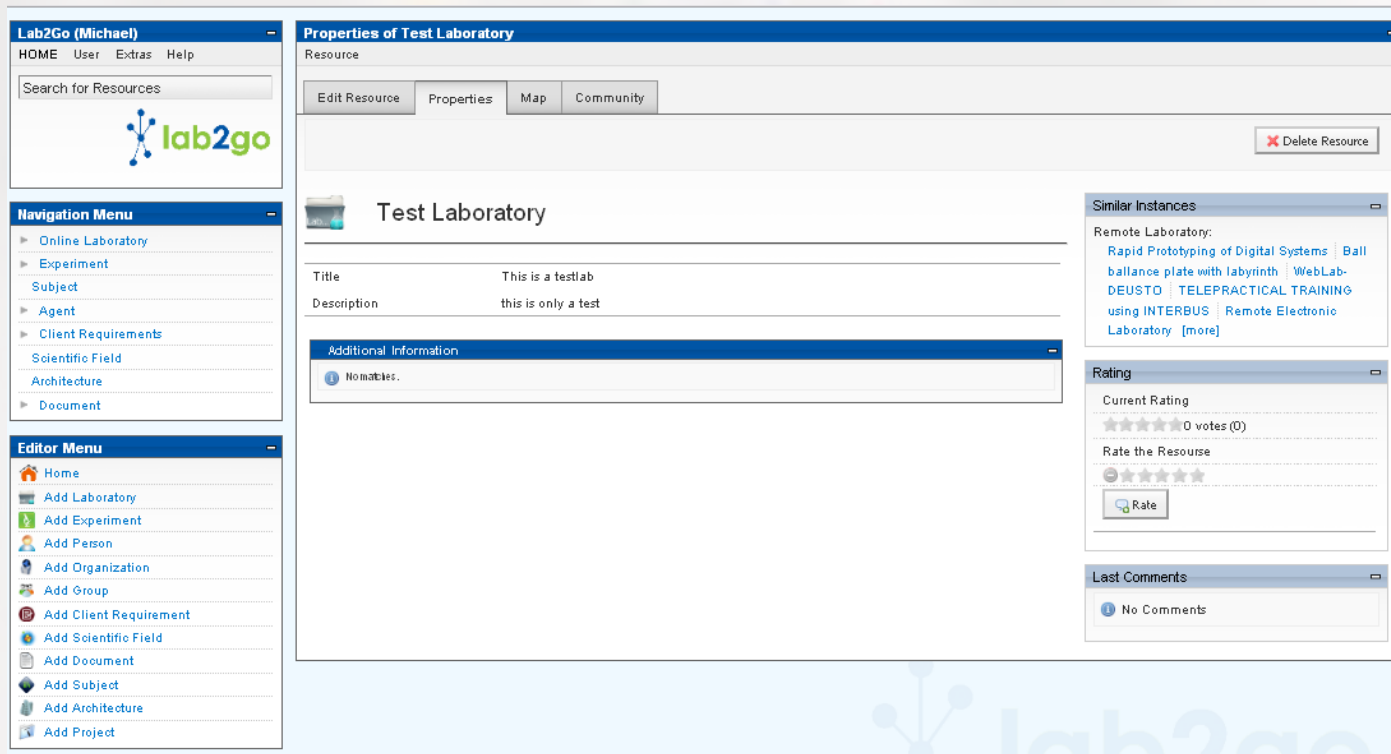
Rights Holder:

Agent

Agent

Agent

Edit laboratory:



The screenshot displays the 'Edit laboratory' interface in Lab2Go. The interface is divided into several sections:

- Lab2Go (Michael) Header:** Includes links for HOME, User, Extras, and Help, along with a search bar and the Lab2Go logo.
- Navigation Menu:** A sidebar menu with categories like Online Laboratory, Experiment, Subject, Agent, Client Requirements, Scientific Field, Architecture, and Document.
- Editor Menu:** A sidebar menu with options such as Home, Add Laboratory, Add Experiment, Add Person, Add Organization, Add Group, Add Client Requirement, Add Scientific Field, Add Document, Add Subject, Add Architecture, and Add Project.
- Properties of Test Laboratory:** The main content area with tabs for Edit Resource, Properties, Map, and Community. It shows the title 'Test Laboratory' and a description 'this is only a test'. Below this is an 'Additional Information' section with a 'Nomables' entry.
- Similar Instances:** A section on the right showing related resources like 'Remote Laboratory: Rapid Prototyping of Digital Systems' and 'Ball balance plate with labyrinth'.
- Rating:** A section on the right showing the current rating (0 votes) and a 'Rate the Resource' button.
- Last Comments:** A section on the right showing 'No Comments'.

Demonstration:

www.lab2go.net

Planned improvements and further functionalities:

- ❑ Stable version without bugs
- ❑ Improved Search mechanisms
- ❑ Tagging
- ❑ Data Wrapper
 - ❑ Data like geo-coordinates from dbpedia
 - ❑ Labs in other systems
- ❑ Advanced right management

- ❑ Semantic description model of online laboratories is available
- ❑ General framework to collect main information of the online laboratory domain will be available soon
- ❑ The community will grow further

Thank you for your attention!



Questions?