



Smartgateway: Interconnection of remote labs and learning tools



Group Meeting, 14 Feb 2014
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Background

- Existence of **legacy labs**.
- Existence of Remote Laboratory Management Systems (**RLMS**) which can handle a large number of laboratories.
 - RLMSs provide (among other features):
 - ✓ Authorisation, Authentication, and Accounting (AAA) for labs.
 - ✓ Federation of laboratories, mainly using the same RLMS.
 - Examples of RLMSs:
 - ✓ Weblab-Deusto, Labshare Sahara, MIT iLabs



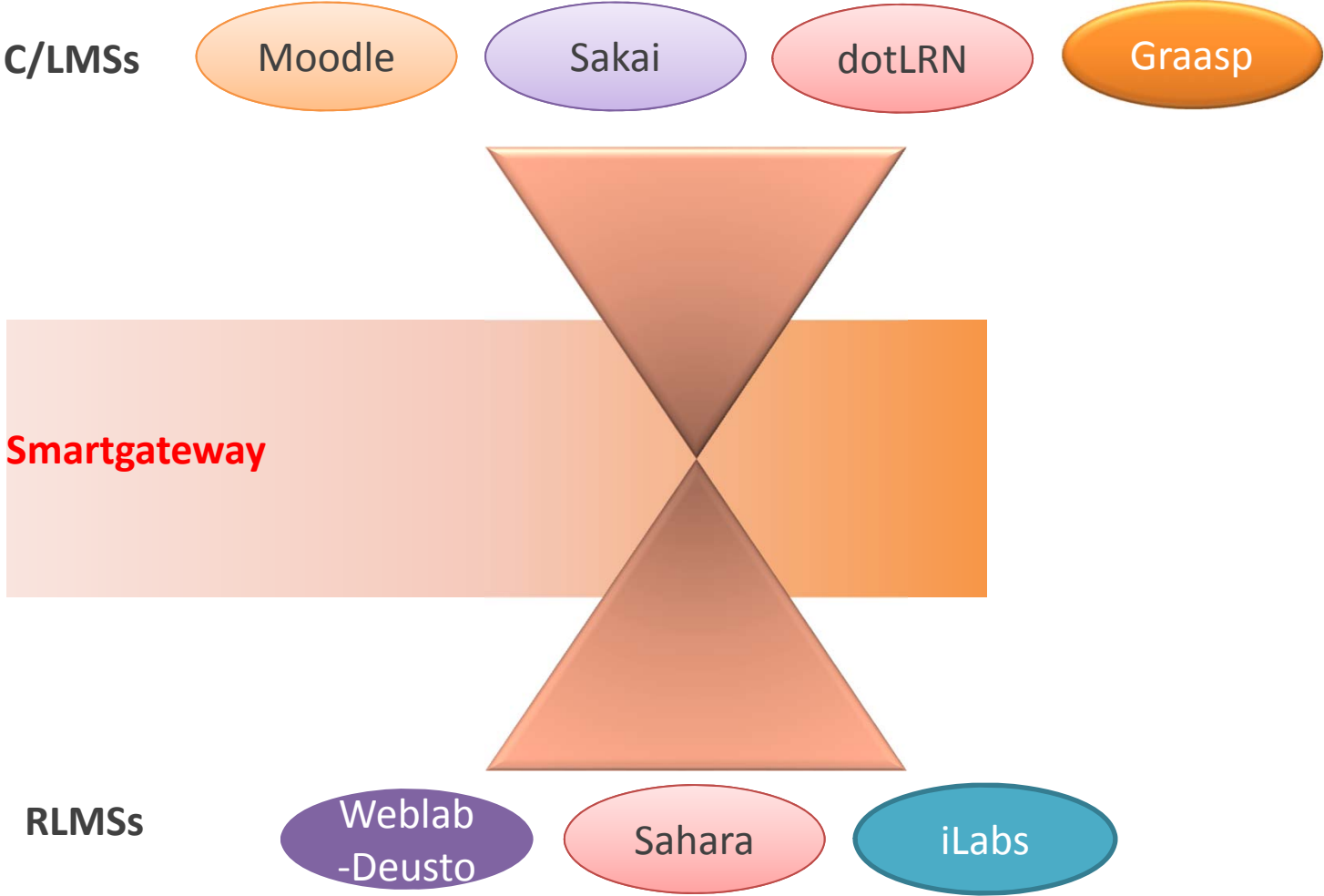
Go-Lab project objectives and requirements



- Golab project strives at:
 - allowing teacher/students from many primary/secondary schools the access to a federation of real heterogeneous scientific laboratories.
- The inclusion of existing laboratories in the Golab project would require:
 - **in-depth re-implementations** in the existing legacy labs and RLMSs.
 - development of **plugins** for RLMSs (one for each pair of RLMSs).
- The **smartgateway** fills the gap between existing legacy labs (isolated or handled by RLMSs) and learning tools (e.g. C/LMSs), so that legacy labs can be used in the context of the Golab project.
 - The smartgateway is a **hourglass** that connects a variety of labs and learning tools.



Smartgateway functionalities

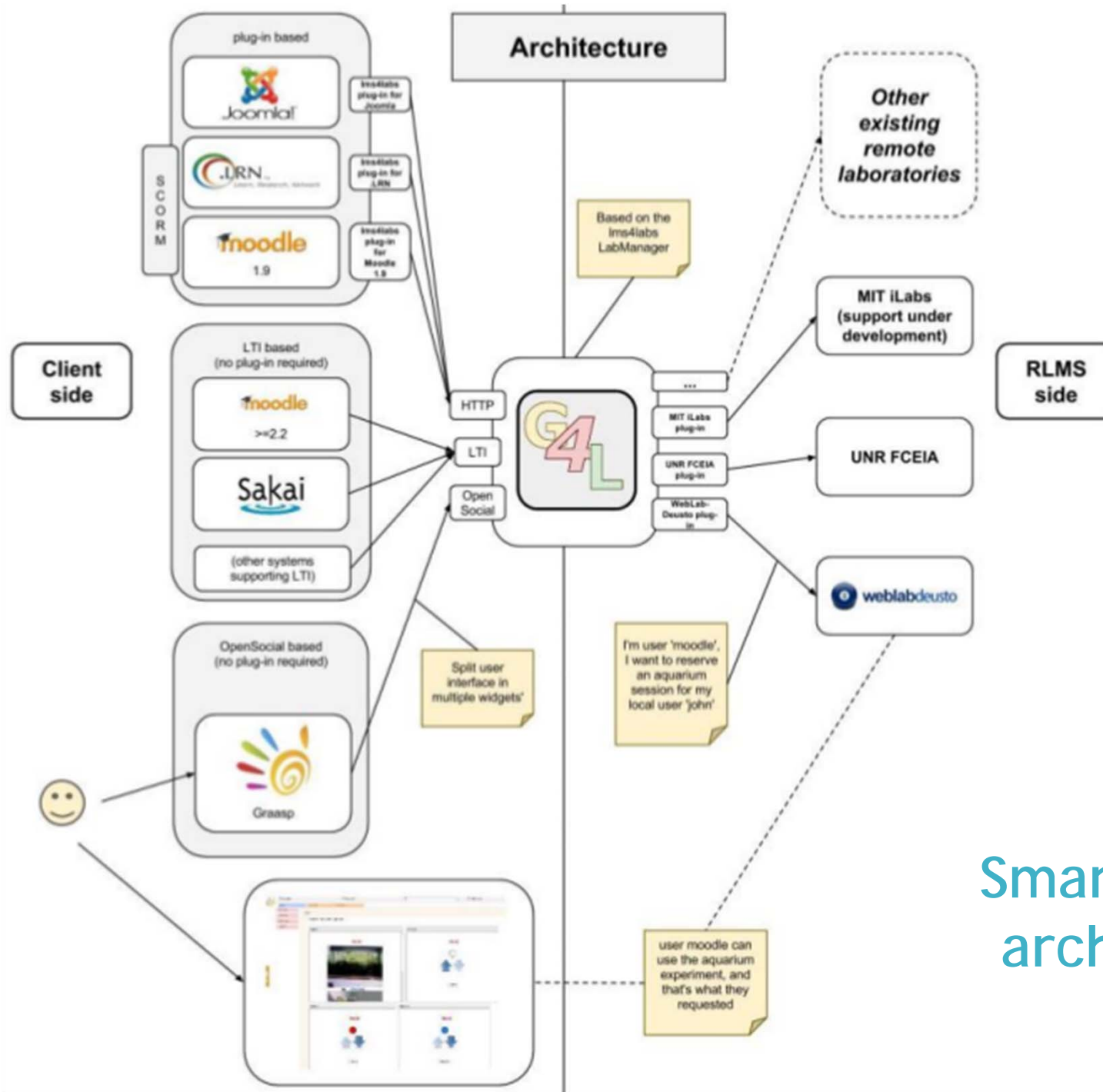




Smartgateway functionalities



- The Smartgateway provides a way to allow ...
 - the **federation** of heterogeneous labs (e.g. labs from a variety of RLMSs) that can be accessed by a variety of C/LMSs.
 - ✓ Only one plugin per RLMS is needed.
 - wrap the authentication and authorisation processes of the laboratory (or RLMS).
 - ✓ Request/accept/reject the use of a lab, publish labs for open use, publish labs for restricted use...
 - act as a **bridge** to request reservations to the laboratory (or RLMS).
 - interact with the laboratory (or RLMS) to enable the proper separation of the service into different apps as requested by the user.
 - translate the data provided by the particular laboratories to the specifications defined (WS + JSON).



Smartgateway architecture



Smartgateway screenshots



Google Calendar | Graasp © - Resource, Go-La... | Welcome to gateway4labs'... | ReLMS Management - Regi... | Labs - Request new labs - P...

weblab.ieec.uned.es/golab/labmanagers/agustin/admin/rlms/labs/

Lab Manager Home LT Management ReLMS Management Users Log out

List (2) With selected

<input type="checkbox"/>		Rlms	Name	Laboratory Id	Visibility	Availability	Public Availability
<input type="checkbox"/>		WebLab-Deusto on Bilbao, Spain	robot-movement@Robot experiments	robot-movement@Robot experiments	private	Default local identifier: <input type="text" value="robot"/> <input type="button" value="Make not available"/>	Public identifier: <input type="text"/> <input type="button" value="Make publicly available"/>
<input type="checkbox"/>		FCEIA-UNR on Rosario, Argentina	unr-physics	unr-physics	private	Default local identifier: <input type="text"/> <input type="button" value="Make available"/>	Public identifier: <input type="text"/> <input type="button" value="Make publicly available"/>



Smartgateway screenshots



The screenshot shows a web browser window with the following elements:

- Browser tabs: Google Calendar, Graasp © - Resource, Go-La..., Welcome to gateway4labs'..., Spaces - New - PLE admin
- Address bar: `weblab.ieec.uned.es/golab/labmanagers/agustin/ple_admin/spaces/create/`
- Navigation menu: PLE admin, Home, Labs, Spaces (selected), Users, Log out
- Section header: **Add a new space:**
- Form field: Space URL (Note: the input contains a typo from the image)
- Text: Drop here the URL of the Space.
- Section header: **Add permissions to the following labs:**
- Form field: robot
- Text: Permission on robot-movement@Robot experiments
- Button: Add space



Smartgateway screenshots



	Rlms	Name	Laboratory Id	Local Identifier	Widgets	Accessible ⓘ
	WebLab-Deusto on Bilbao, Spain	robot-movement@Robot experiments	robot-movement@Robot experiments	robot	list	This lab is NOT accesible Make accessible



Smartgateway screenshots



Labs - Request new labs - x

weblab.ieec.uned.es/golab/labmanagers/agustin/ple_admin/labs/request/

PLE admin Home Labs Spaces Users Log out

List (1)

Rlms	Name	Laboratory Id	Request Access ⓘ
WebLab-Deusto on Bilbao, Spain	robot-movement@Robot experiments	robot-movement@Robot experiments	Available for request Request laboratory



Implementation



- Python Flask framework
- Documentation:
 - <http://gateway4labs.readthedocs.org/en/latest/>

The screenshot shows a web browser window with the URL `gateway4labs.readthedocs.org/en/latest/installation_debug.html`. The page title is "gateway4labs v0.1" and the main heading is "Testing and debugging the Labmanager". The content includes a paragraph about debugging new developments, a section for "Labmanager quick installation for testing" with instructions for Ubuntu 12.04, and a list of dependencies to install. A code block contains the following commands:

```
sudo apt-get install build-essential
sudo apt-get install libmysqlclient-dev
sudo apt-get install libsasl2-dev libldap2-dev
sudo apt-get install libxml2-dev libxslt1-dev
```

On the right side, there are sections for "On this Page" (listing "Testing and debugging the Labmanager", "Labmanager quick installation for testing", and "Debugging with Eclipse") and "This Page" (with a "Show Source" link). A "Fork me on GitHub" banner is visible in the top right corner.

- Deliverable 4.1 Specifications of the lab-owner services and cloud services - Initial
 - Available at:
<http://graasp.epfl.ch/attachment/download/file/6011>

- TAEF 2014 (first review process succeeded, in writing status right now)
 - On the integration of remote laboratories in collaborative social media platforms.



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