

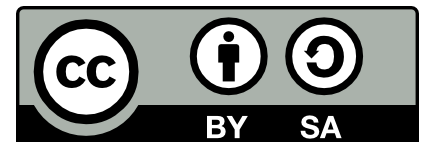
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Danilo G. Zutin

TA02

The VISIR System - Basics



Co-funded by the
Erasmus+ Programme
of the European Union

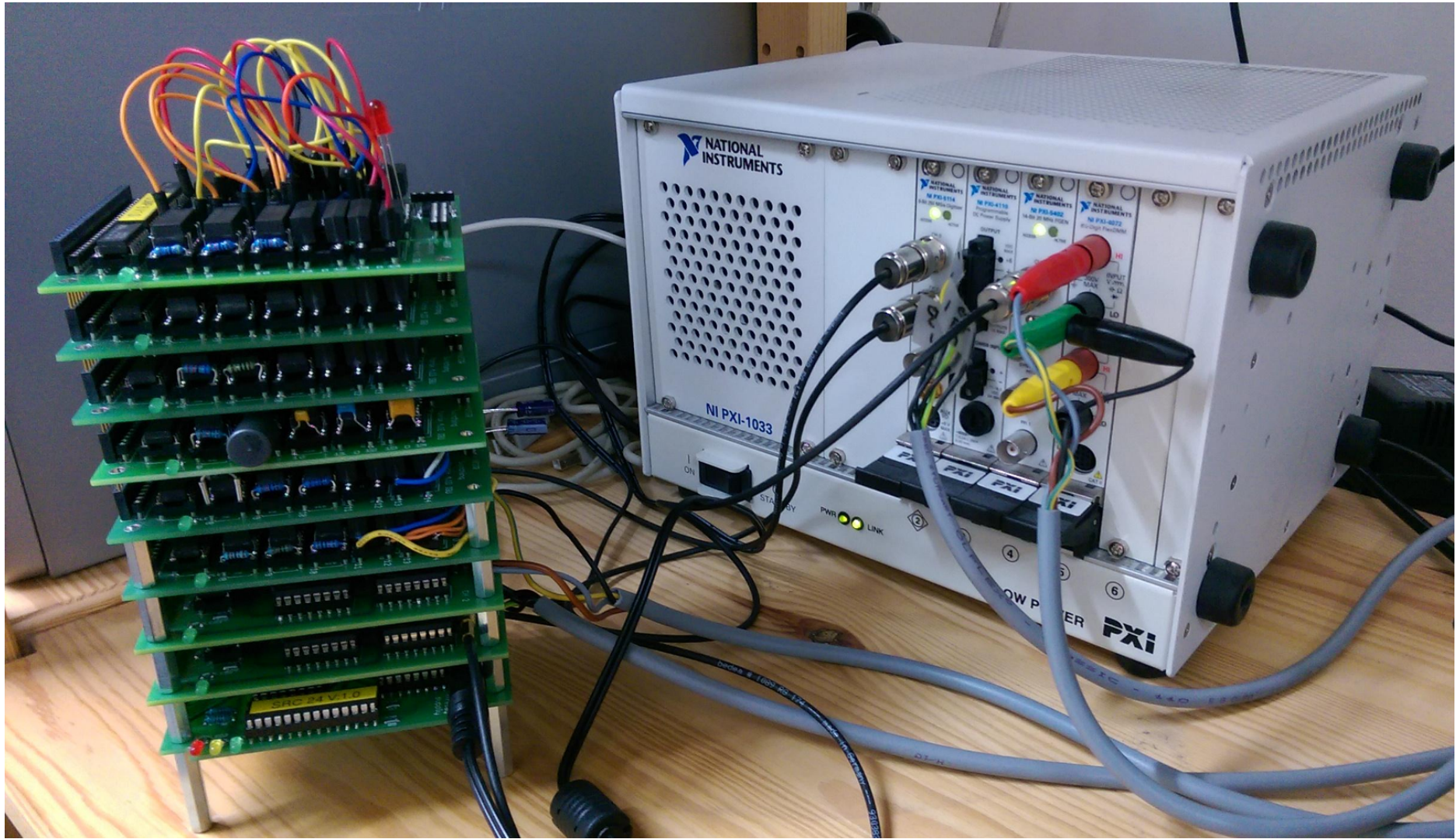


Day 1 – 05.09.2016

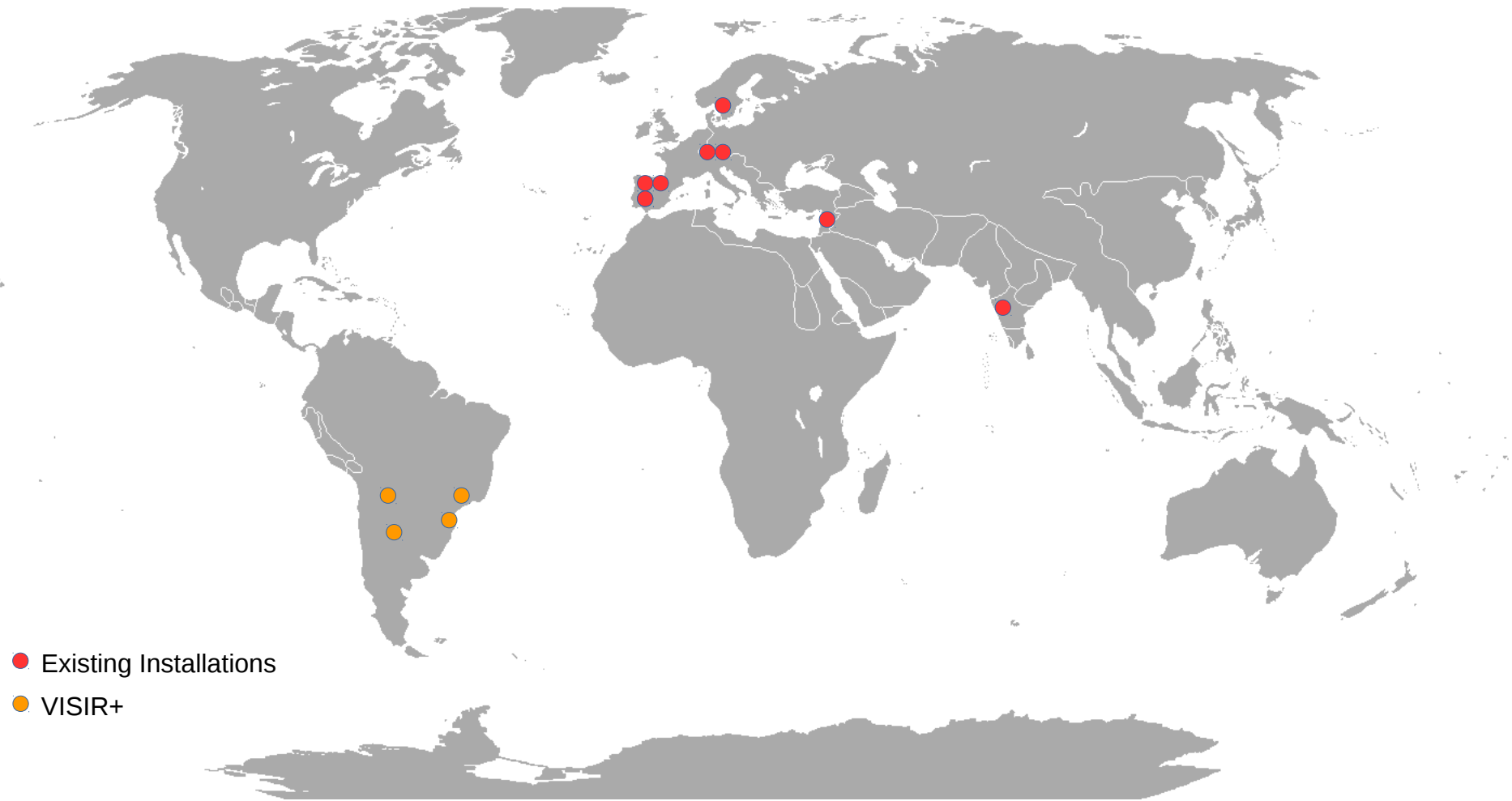
9:00h – 9:20h	Introduction
9:20h – 10:00h	Introduction to Remote Laboratories, Technologies and Examples
10:00h – 10:20h	Basics of VISIR (with some use cases)
10:20h – 10:40h	Examples of Usage of VISIR
10:40h – 12:00h	Hands-on Session
14:00h – 14:30h	Hands-On Session (continued)
14:30h – 15:30h	The VISIR Hardware and Software
15:30h – 16:00h	Wrap up & Discussions

Day 2 – 05.09.2016

9:00h – 11:00h	Creating Lab Exercises with VISIR
11:00h – 12:00h	Interactive Session (Hands-on)
14:00h - ..	Interactive Session (Continued)



VISIR Around the World



- Existing Installations
- VISIR+

VISIR Around the World

VISIR is present at 7 universities:

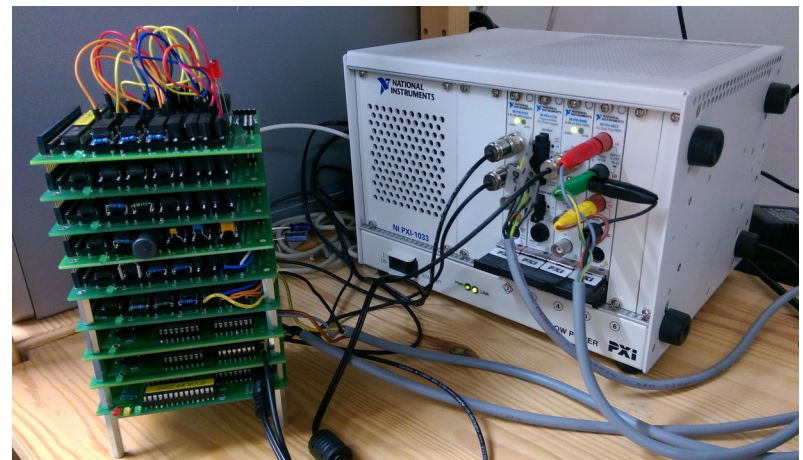
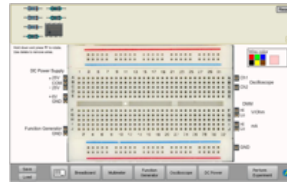
- Blekinge Institute of Technology (Sweden)
- Carinthia University of Applied Sciences (Austria)
- FH Campus Wien University of applied sciences (Austria)
- Superior Institute of Engineering of Porto (Portugal)
- University of Deusto (Spain)
- Spanish University for Distance Education (Spain)
- Institute of Technology Madras (India)
- Al-Quds University in Jerusalem (Palestine)

The VISIR System (1)

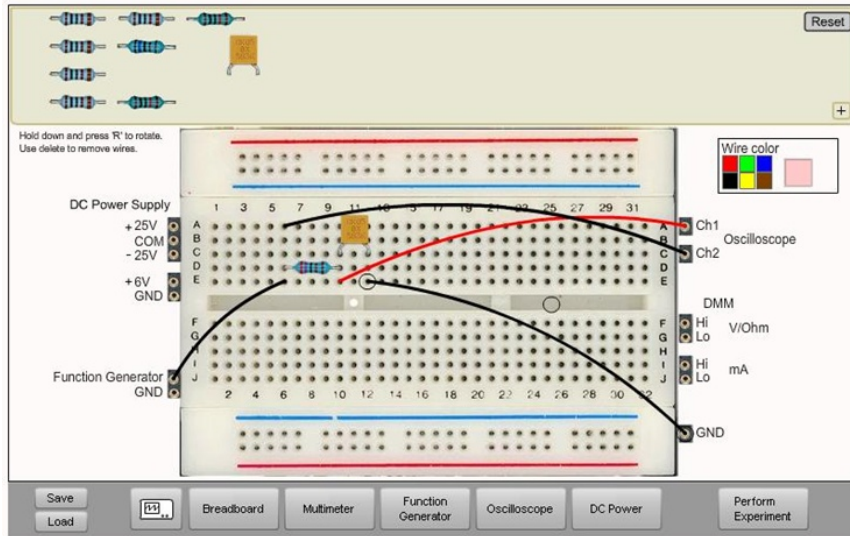
VISIR – Virtual Systems in Reality

The VISIR system features an online workbench where users can perform electronics experiments. The Platform offers:

- ❑ Virtual Breadboard
- ❑ Oscilloscope
- ❑ Function Generator
- ❑ Digital Multimeter
- ❑ Power Supply



The VISIR System (2)



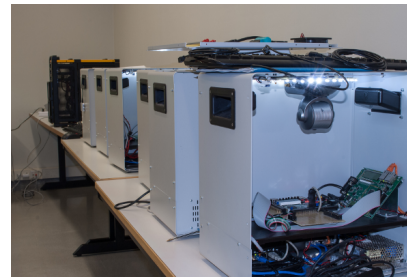
- Client delivered as HTML/JavaScript or Flash application
- Very interactive, resembles real instruments
- Circuit designed in the virtual breadboard will be wired in the switching matrix.

RLMS/LMS and VISIR

iLABS
Remote Lab Access



 weblabdeusto



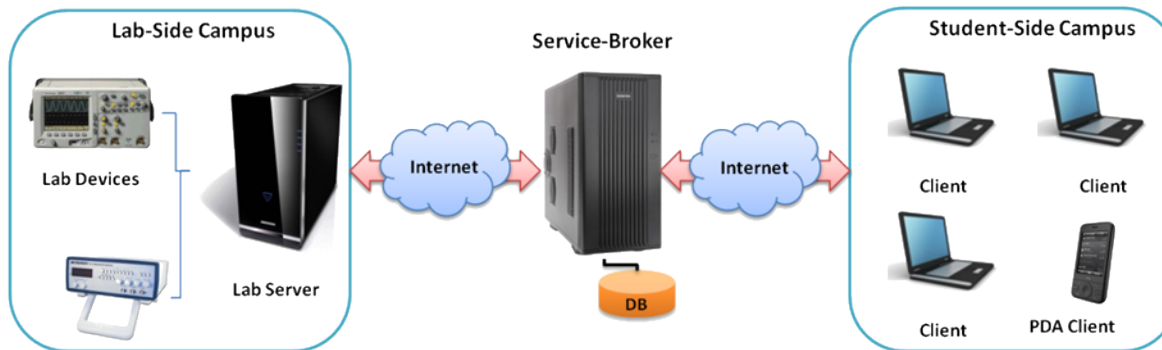
lab:share



The iLab Shared Architecture

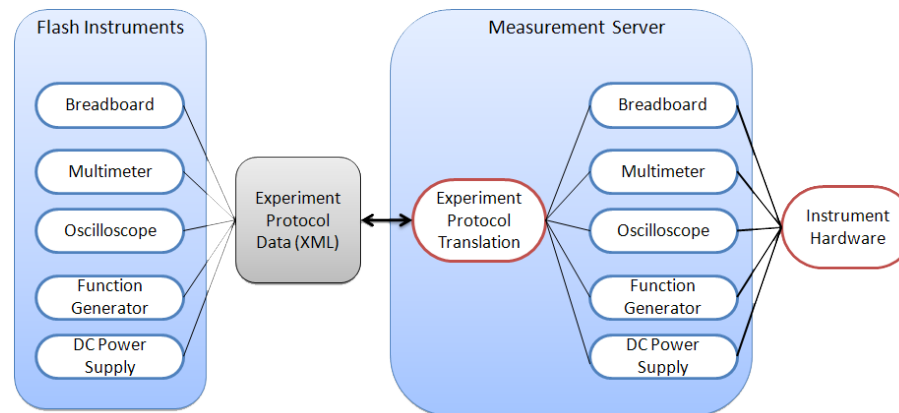
MIT ISA

- A software architecture developed at the MIT
- Offers a common framework for sharing online labs
- Provides a platform-independent API based on Web services
- User management
- Experiment session maintenance (scheduling, execution)
- Supports Batched and Interactive Experiments



The VISIR System (3)

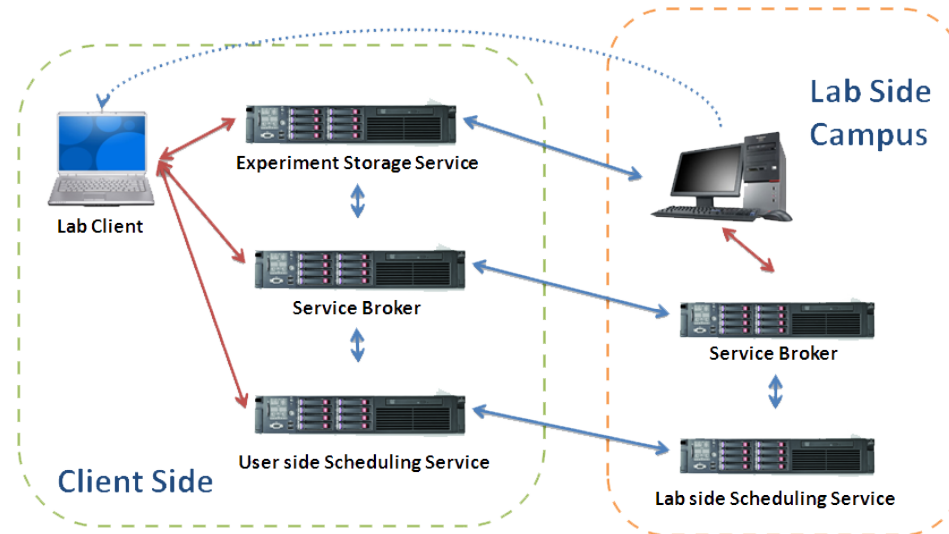
- A Lab Client that communicates with measurement server
- Measurement Server handles requests from clients and checks for the correctness of the parameters submitted by the client.
- Equipment server that works as a proxy translating commands received from the measurement server to hardware operations.
- A Web Application that handles the user management, lab session scheduling and maintenance and other functions specific for a lab experiment (**RLMS**)



- VISIR offers a very modular platform

ISA (2)

- Interactive Services and Service Broker to manage a lab session (scheduling services, storage service, user management)
- Lab Server (Execution of experiments)
- Interactive Lab Clients communicate with Lab Servers via an specific protocol.



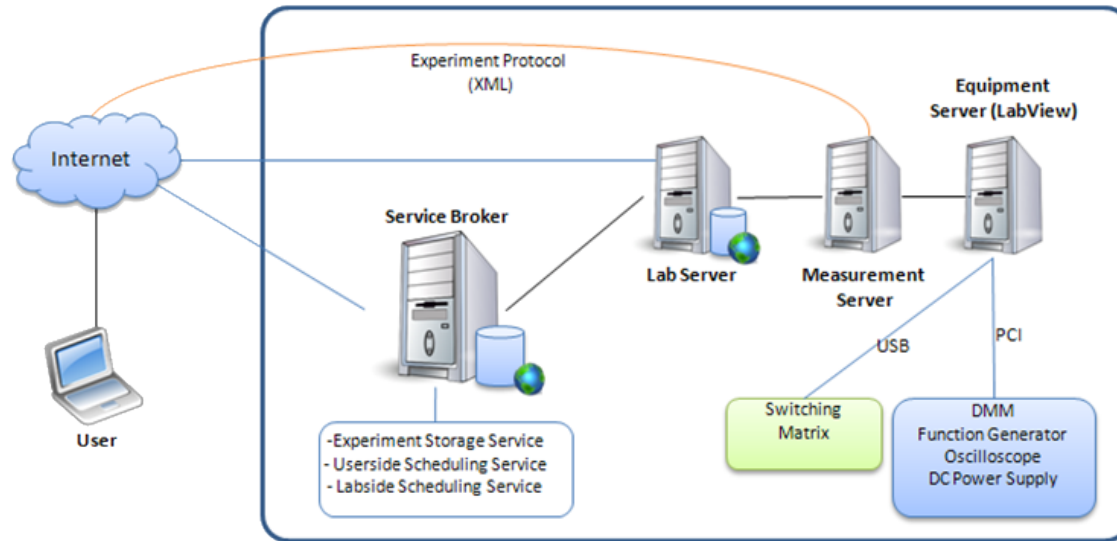
- VISIR Web Application -> Interactive Services and Service Broker

The Lab Server (1)

Desired features:

- Use ISA services for the creation and maintenance of the VISIR lab session
 - User Side Scheduling
 - Server Side Scheduling
 - Experiment Storage Service (future implementation)
- Provide the HTML5 or Flash client with information about the Flash modules to load, components available and necessary credentials for the client authentication on the measurement server
- Use Existing VISIR Flash Client, experiment and equipment servers
- Do not change the experiment protocol
- New User Interface to create experiment setups (integrate with RLMS for user management)
- Keep the main characteristics of the OpenLabs Web Application

The Lab Server (2)



- User reserves a time slot and redeems a reservation
- User launches the lab and is redirected to the lab client
- Service broker forwards the credentials to the Lab Server
- Lab Server uses the credentials to validate the ticket and check if user is authorized to carry out experiments
- Lab Server launches the client and forwards a coupon ID (BTH)
- Measurement server uses the coupon ID to authenticate the client (BTH)

Management of Experiments

- Development platform: .NET (ASP.NET with C#)
 - (uses iLabs Libraries from the iLab APIs)
 - Based on the Time of Day Lab Server from MIT
- Manage Lab Server: Teachers can save prepared experiments for students
- The same concept of an “experiment” was kept from the original platform
- Access via a Service Administration Group

Run Experiment with VISIR Lab Client

VISIR Interactive Lab Server.

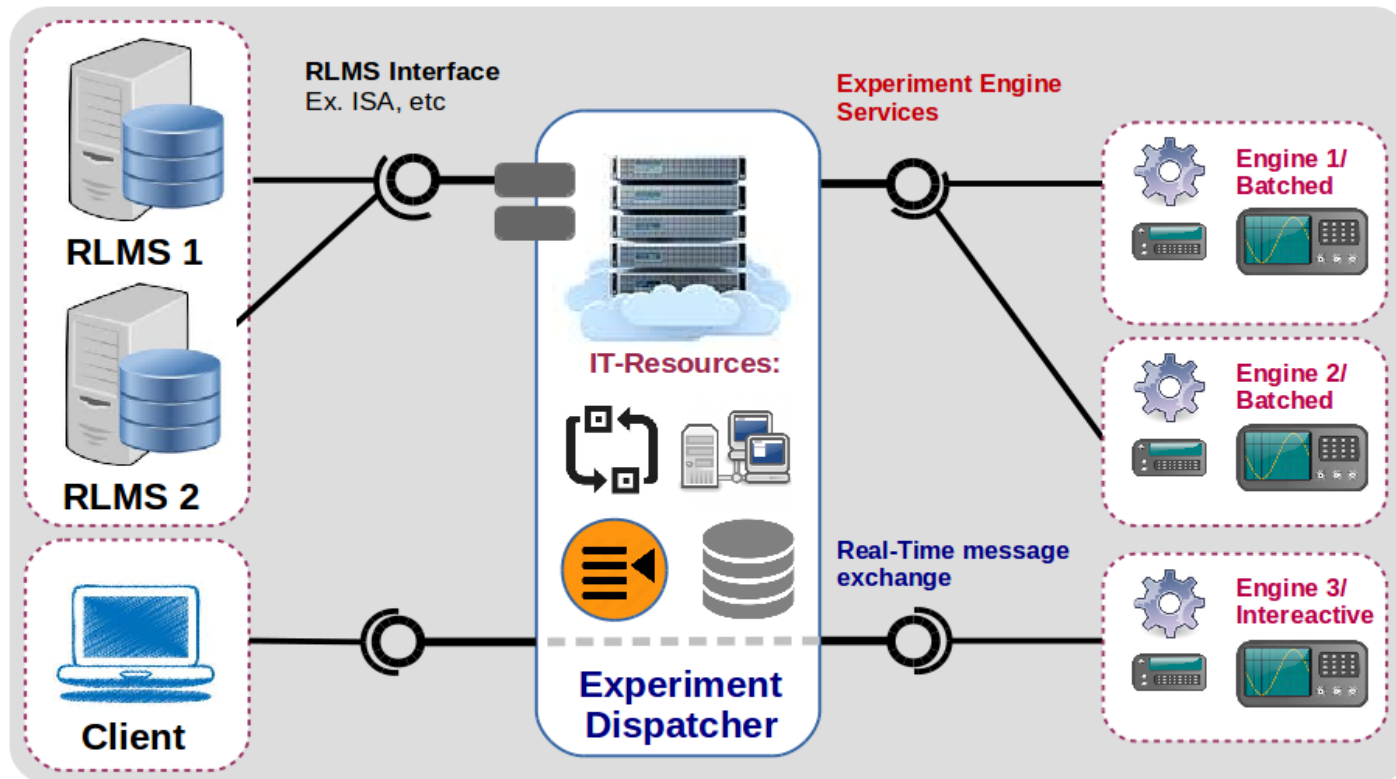
The screenshot displays the VISIR Lab Client interface. On the left, there is a breadboard simulation with various components connected. A DC Power Supply is connected to the breadboard, and a Function Generator is also connected. The breadboard has a grid of pins labeled A through J and 1 through 31. A wire color legend is visible on the right. Below the breadboard, there are buttons for 'Save', 'Load', 'Breadboard', 'Multimeter', 'Function Generator', 'Oscilloscope', and 'DC Power'. On the right side, there is a list of 'Available Experiments' with links for Lab 01, Lab 02, Lab 03, Lab 04, Op Amp, and RC Circuit.

Manage Laboratory Experiments for VISIR

The screenshot shows the 'Manage Laboratory Experiments for VISIR' web interface. It has two main sections: 'Available Experiments' and 'Experiment Information'. The 'Available Experiments' section lists Lab 1, Lab 2 (selected), Lab 3, Lab 4, Op Amp 2, Test, Test Laboratory, Test Circuit, and circuit45666.cir. The 'Experiment Information' section shows the Experiment Name as 'Lab 2'. There is a 'Circuit File' field with a 'Durchsuchen...' button and an 'Upload Circuit' button. The 'Experiment Data' section contains XML code for the circuit configuration. At the bottom, there is a 'Lab Tutorial URL' field and buttons for 'Save Experiment', 'New Experiment', and 'Remove Experiment'. A checkbox for 'Experiment is Active' is checked.

Experiment Dispatcher

- A generic framework to connect lab equipment to an RLMS.
- In the case of VISIR, it abstracts the communication with the RLMS to authenticate the user



Our Experience with the VISIR System & Examples of usage

VISIR in Moodle (Gateway4Labs)

 / [Dashboard](#) / [CUAS Campus](#) / [2015SS](#) / [EngIT](#) / [MB_B_0606](#) / [2015SS-B2-GET](#) / [Basic Laws](#) / [Grundgesetze](#) / [Lab 2.1: DC Measurements with an Online Laboratory \(optional\)](#)

2015SS-B2-Elektrotechnik Grundlagen

Lab 2.1: DC Measurements with an Online Laboratory (optional)

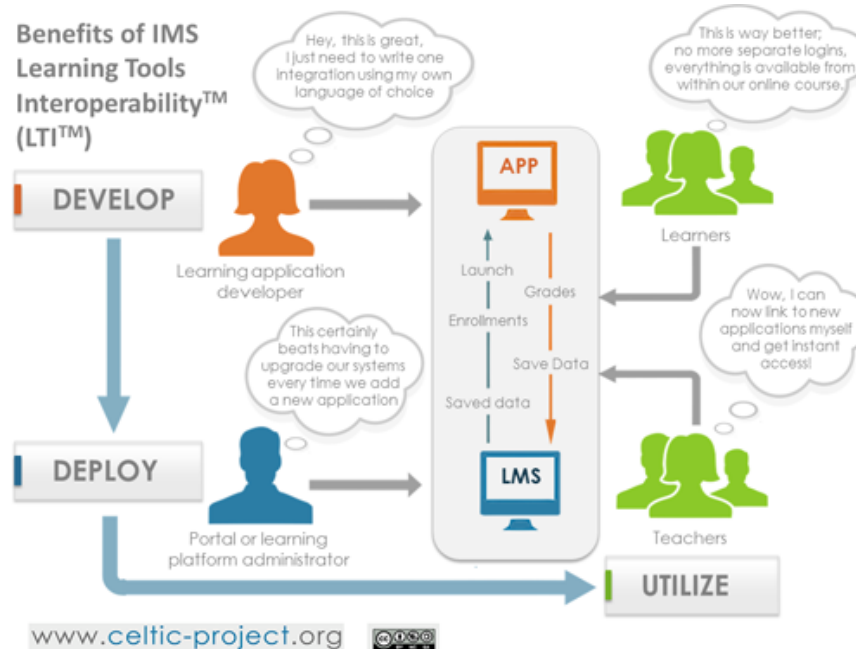
Access the laboratory *visir*

Property	Value
Laboratory	VISIR Lab Client
RLMS	iLabs
RLMS Location	Villach, Austria

[Click here to use the lab](#)

LTI – Learning Tools Interoperability

- LTI is a standard way of integrating rich learning applications (often remotely hosted and provided through third-party services) with platforms like learning management systems, portals, learning object repositories, or other educational environments



Source (text and figure): <https://www.imsglobal.org/activity/learning-tools-interoperability>

External Learning Tool in Moodle

* ?

* ?

* ?

Vorkonfiguriertes Tool ?

URL für Tool oder Cartridge ?

Sichere Start-URL* ?

Startcontainer* ?

Anwenderschlüssel* ?

Öffentliches Kennwort* ?

Angepasste Parameter* ?

Icon URL* ?

Sichere Icon-URL* ?

Beschreibung im Kurs zeigen

Aktivitätenname bei Start anzeigen

Beschreibung bei Start anzeigen

Automatisch, entsprechend der Start-URL ▾ + ⚙ ×

▾

Klartext

Demonstration

<http://moodle.fh-kaernten.at/>

<http://www.golabz.eu/lab/visir>

Go-Labz: Repository for Online Labs, Apps and Inquiry Spaces



GO-LAB

Questions?