International Federation

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OpenLab & FIRE

Innovation pathways

Various paths to innovation, especially those related to exploring the *future internet*, using **experimentally driven research**, prototyping and living labs (user in the loop).

Eventually, enabling synergies between the various programs, stakeholders, namely …

… building the ecosystem:

- **Research**
- **Education**
- **Innovation**

- **… challenging the idea for building a platform for innovation**

Innovation Platform

- **How to stimulate the spin-off and avoid fragmentation**

- **International dimension**
  - Initiatives have matured (GENI, FIRE, …)
  - Cooperation, critical mass, standards
  - Competition (market)

- **The role of the funding agencies**

- **Success factors and risk**
  - Usage "outside" the testbed owners
  - R & D / R+D
  - What has been discovered?
  - Sustainability of the effort

Were do we stand today?

- **No** FI federated experimentation facility supports a broad range of experimenter communities covering Internet infrastructures and service & application platforms.

- A plethora of experimentation facilities are available but with limited overall convergence as they often **use different and proprietary tools and interfaces.**

- Many (overlapping) tools are available to support (parts of) the experiment lifecycle but there is no structured offering towards the **experimenters**.

- Associate **various communities**.

- There **is no real coordinated effort** at the international level to ease federation in the future.

International Federation Effort

- **Resources** (e.g. computation, network) and/or supporting software platforms that you could contribute to international collaborative experiments?

- Specific **researchers or projects** who are prepared to conduct near-term experiments that would benefit from such international collaborations?
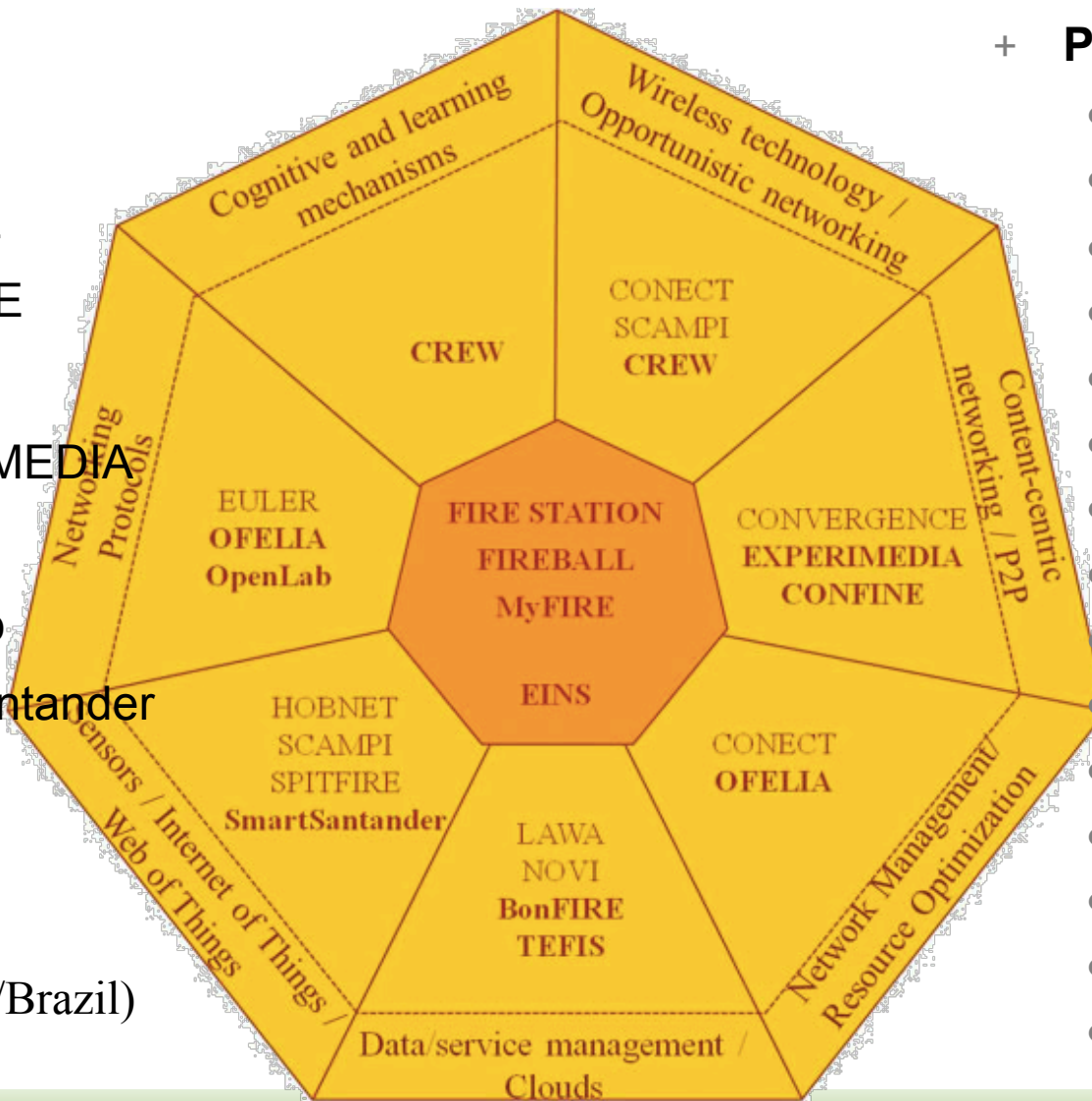
One candidate: FIRE Projects

OpenLab

- **Facilities**
  - BonFIRE
  - CONFINE
  - CREW
  - EXPERIMEDIA
  - OFELIA
  - OpenLab
  - SmartSantander
  - TEFIS

International:

FIBRE (EU/Brazil)

+ **Projects**
  - CONECT
  - CONVERGENCE
  - EULER
  - HOBNET
  - LAWA
  - N4C
  - NanoDataCenters
  - NOVI
  - OPNEX
  - PERIMETER
  - Resume-Net
  - SCAMPI
  - Self-NET
  - Smart-Net
  - SPITFIRE

OpenLab offering
http://www.onelab.eu/index.php

Testbeds:
- PlanetLab Europe (PLE)
- NITOS (Orbit-like)
- w-iLab.t (iBBT)
- DOTSEL (DTN)
- SENSLAB (Large scale sensors)
- HEN (emulation)
- NGN Test Centre (WIT)
- University of Patras IMS testbed
- ETOMIC/SONoMA

Control plane tools:
- SFA
- MySlice
- Teagle
- RADL
- FSToolkit (FCI/FSDL)
- OMF/OMF Experiment Controller
- NEPI
- TOPHAT

Other tools:
- nmVO
- ns-3

Cooperation within OpenLab

Long history with the Onelab project/Facility –

PLC – PLE Federation (plus PPK, EmanicsLab, …)

OMF cooperation

MySlice GUI [http://www.myslice.info]

A convenient GUI for the SFA federation

Modular interface with support of measurements through TopHat

TopHat interconnection framework [http://www.top-hat.info]

Integration of monitoring tools and interface with MySlice

Sensing testbeds, heterogeneous federation

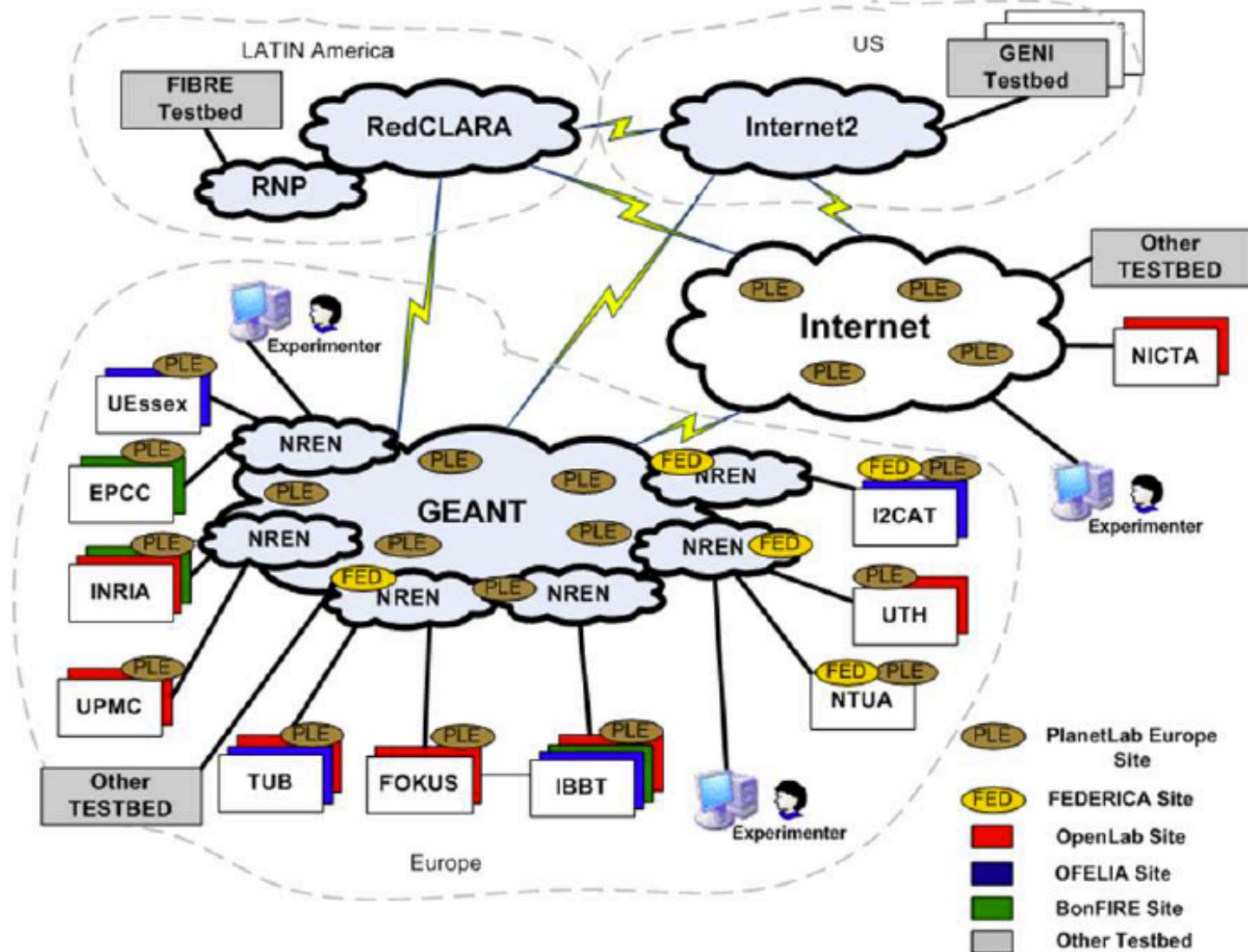**Scheduling and resource management**

Governance

Another Candidate: Fed4Fire

- **New EU FIRE funded project (8M€)**

- "Last" FP7 FIRE call (alike GENI Spiral)

- **Objective**: Federate the EU FIRE facilities

  - Main players in Europe (not exclusive)

  - Key testbeds from Social to Physical

- Funding possibility for **International cooperation** exist in the project budget

- **Coordinated** approach ready on the EU side

Experimentation Facilities

Take Away

- Initiatives **mature** enough to orchestrate coordination of efforts

- Challenge requires a **large amount of resources** to develop and operate tools and testbeds

- Contributes to **sustainability**

- Address **standardization** and **interconnection**

- Seek for **use cases**:

  - Research, Education

- EU side now better organized …