



FIREWORKS



Report on GENI - FIRE Workshop on July 22, 2009

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1 Summary

Background

This report compiles the first GENI-FIRE meeting was held in Madrid in December 2008, the follow-on was organized on US side, in connection with the 5th GENI Engineering Conference. In Seattle Washington in July 2009. Serge Fdida and Joseph Evans chaired the meeting presenting bilateral cooperation progress between FIRE and GENI funded projects.

Main Conclusions

Several project 'couples' had been identified previously and their cooperation status eight months later monitored.

- OneLab-PlanetLab link is on an everyday collaboration level by nature and has continued the same way, developing the common global federation of experimental resources and tools
- FEDERICA proceeds in developing to host OneLab nodes
- Panlab had started identifying possibilities to share efforts with ORCA concerning Teagle development
- ResumeNet in its turn has a link to GpENI infrastructure

It was mutually agreed to develop the bi-annual meeting structure into a) more technical discussions, collecting engineers on both sides of Atlantic into the same table solving shared design challenges cross projects; b) more training oriented by involving also students in e.g. joint summer schools.

All presentations can be found at: <http://www.ict-fireworks.eu/events/fire-events/geni-fire-workshop.html>

Programme

Seattle, 22 July 2009, 11:30 - 18:00

11:30-12:00 Lunch

12:00-12:30 Greetings from the NSF (Suzi Iacono and Ty Znati) and EC (Per Blixt)

12:30-12:45 GENI Overview and latest developments (Aaron Falk, BBN / GPO)

12:45-13:30 Federation in GENI (5 presentations) – moderated by Joe Evans

Speakers

- Larry Peterson (Princeton / PlanetLab)
- Robert Ricci (Utah / Emulab)
- Max Ott (NiCTA / ORBIT)
- Yufeng Xin (RENCI / ORCA)
- James Sterbenz (KU / GpENI)

* Progress to date for the federation of GENI testbeds, and attempts at GENI / FIRE

14:30-14:45 Break

14:45-15:00 FIRE Overview (Serge Fdida)

15:00-16:45 Federation approaches in FIRE (4 presentations) – moderated by Serge Fdida

Speakers

- Thierry Parmentelat (INRIA / Onelab2)
- Anastasius Gavras (Eurescom / PII) & Thomas Magedanz (Fokus – PII)
- Wim de Waele (IBBT)
- Mauro Campanella (GARR / Federica)

* Federation in the FIRE projects, short and long term issues?

16:45-17:00 Break

17:00-17:30 Enabling New Research (2 presentations) - moderated by Susanna Avéssta

Speakers

- Martin May (Thomson)
- Guru Parulkar (Stanford)

* What research might we enable by federation? Who are the users?

* Presentation of Use Cases for collaboration across the Atlantic– what could we fruitfully do in the next year to implement GENI / FIRE federation, what is already underway, what specific actions are needed from researchers and government?

17:30-18:00 What Next? (moderated by Joe Evans)

- What have we collectively learned?
- What kind of GENI / FIRE federation do we need to enable experiments?
- Current and future plans

2 GENI Progress

GENI is being designed and prototyped in a series of quick, one-year “spirals.” The First GPO Awards The GPO issued its first solicitation in December 2007, six months after the office was created, seeking proposals for GENI Spiral 1 prototyping. The goal was to fund multiple competing projects in core areas such as resource discovery, control framework implementations, and wireless and optical networks. At that point the GENI design was still immature, and the GPO encouraged the science and engineering community to flesh it out.

In September 2008, the GPO awarded subcontracts to 29 academic/industrial teams to start designing and prototyping Spiral 1. Each group has been formulating and testing experimental prototypes that will enable at-scale research in network science and engineering. GENI projects are listed at www.geni.net.

When GENI’s first Development and Prototyping awards were announced, the teams faced a formidable goal: to create a suite of experimental infrastructure in which all components (compute servers, switches, storage, sensor networks, and so on) would be:

- Highly programmable, so that each component could be uniquely configured for a particular experiment. Researchers would have free rein, from programming how bits are physically represented in a Radio Frequency environment to programming how servers are to be distributed through the network
- Virtualizable, so a researcher could reserve an end-to-end virtual space across diverse heterogeneous components. An experiment’s end-to-end virtual space would be called a slice.
- Federated, so any organization with compliant infrastructure would be able to attach that infrastructure (to federate) to GENI. GENI is being built and operated as a federation of smaller, semi-autonomous suites of infrastructure. The community believes this approach was a critical enabler for the Internet’s success, both in its earliest days and as it transitioned from initial government funding to a world-wide utility, and therefore the GPO intends to follow this model closely.

All key technical goals were met in GENI Spiral 1. The following progress has been reported after Spiral 1:

- Multi-project clusters created in Spiral 1 are demonstrating results in linking many kinds of GENI prototypes with their control and data interfaces;
- Initial deployment of prototypes has been completed with compute resources and programmable network gear now running in campus and backbone networks across the United States.
- A steady march of integrated demos have been performed, each showcasing increasing capability and strawman experiments, many of which span multiple prototypes.

With GENI starting to take shape, the GENI Project Office is now particularly interested in engaging researchers who wish to try out research experiments on the GENI suite of infrastructure.

In October 2009, GENI was ready to take the next step for Spiral 2: a nationwide “meso-scale” build-out of prototype infrastructure spanning more than a dozen campus, regional, and backbone networks, and interconnected to form a very early version of the GENI infrastructure. Each employs “GENI-enabled” commercial hardware, thus paving the way to widespread deployment in the next few spirals.

The GPO encourages collaboration and friendly competition among the various GENI prototyping teams. Competition broadens the field of participants and encourages teams to provide better

technology faster and at a lower cost. Design competition also makes it clear that GENI is being developed in an open and transparent fashion by the whole community, rather than by a single entity.

At the fifth GENI Engineering conference Live demos in the GENI plenary session included demonstrations of OpenFlow and WiMAX network technologies with the PlanetLab and ProtoGENI control frameworks. Also prototypes were introduced that will be built out and integrated in US campuses in Spiral 2.