



Future Internet Assembly in Stockholm

Kista Science City – A World Leading ICT Cluster

November 23–24, 2009

Session I.3

What does it mean to conduct experimentally driven research?

Moderator: Prof. Nancy Alonistioti, Univ. of Athens
PM of SELFNET (<https://www.ict-selfnet.eu/>)

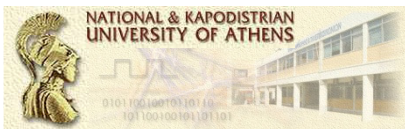


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Session Scope

- The experimentally driven research, based on large scale federated experimental infrastructures is quite a challenge. The mere benefits appear to be :
 - The engagement in a validation and assessment loop early in the R&D process. In this way in complex systems, experimentation could be the key for discovery and validation throughout the research process.
 - Potential involvement of end users participating as active testers at an early stage of the R&D cycle. They could become key indicators of several metrics related to the realization of theoretical approaches in tangible real life scenarios.
 - Indicative metrics that could be assessed: the scalability of solutions, performance, usability, robustness and security of the tested functionality.
 - Reduced time to market of tested products could be the imminent outcome of the whole process.
- Relevant topics to be addressed:
 - Experimentation as a methodology to achieve concrete results: where, how, when?
 - The experimentation facilities as a service offered to R&D
 - What are the metrics relevant to experimentations?
 - The impact to standardization
 - Large scale experimentation: requirements and limitations

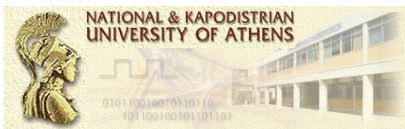


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Planning of the session

Intro on Experimentation methodology and speakers	Nancy Alonistioti	10 min
Necessity for experimentation from the PPP point of view	Didier Bourse	15 min
Presentation on the methodology issues and how to experiment	Martin May	15 min
How the methodology could facilitate the shorter time to product development	Vania Conan	15 min
Experimentation as a methodology to achieve concrete results: where, how, when	Dimitri Papadimitriou	15 min



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FI PPP Initiative Experimentation

“ FIRE-like ” Experimentation – Open Questions (1/2)

- What is the **most appropriate FOT approach** in the context of **short-medium terms Industry impact**?
 - PlanetLab / PlanetLab Europe? OneLab2? G-Lab?...
 - LivingLabs? European Network of LivingLabs (ENoLL)?
 - Federica? (VITAL++? Wisebed?) - GEANT? NREN? DANTE? TERENA?
 - PanLab2?
 - CoreLab? GENI Spiral1?
 - PPPLab?
- Are these **experimentation facilities interoperable** (meta-level) or should the facilities be **considered as standalone** (one facility family per specific objective)?
- **What can Industry not test** on “FIRE-like” experimental facilities as compared to “real” Internet
- How can we take benefit from **EU and National pilots and testbeds**?
- What can be **leveraged from GEANT and DANTE**?



Reflecting presenter views



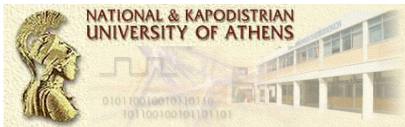
FI PPP Initiative Experimentation

“ FIRE-like ” Experimentation – Open Questions (2/2)

- Where is the **right balance** between **bottom-up** (availabilities) and **top-down** (use requirements) experimental facilities design/development
 - Who are the “**customers**”/users of the current experimental facilities?
 - Are the **FP7 projects** taking benefit of the experimental facilities?
- Is this possible to guarantee **reproducible and verifiable results** from experimentations?
- Is this **secure enough environment** for experimentations?
- What are the **standardization contributions** expected from the experimental facilities work, towards IETF, ETSI, ITU...?
- What are/will be the **tangible industrial achievements/benefits** from the experimental facilities (e.g. from PII, OneLab2...)?

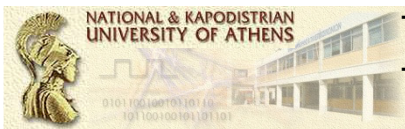
Lessons learned...

- The devil is in the detail
- Choose the right platform
 - (and don't stick to the wrong one for too long)
- Be aware of difficulties in publishing results
- Make results available
 - Hagle and ANA are part of OneLab2
 - Experimental facilities will be available through OneLab2 infrastructure
 - Publish traces if collected (of course after a grace period)
- Always plan for multiple trials
 - Hagle performed 2 experiments per year – 2003 to now
- Allocate more time for experiment preparation



What we need

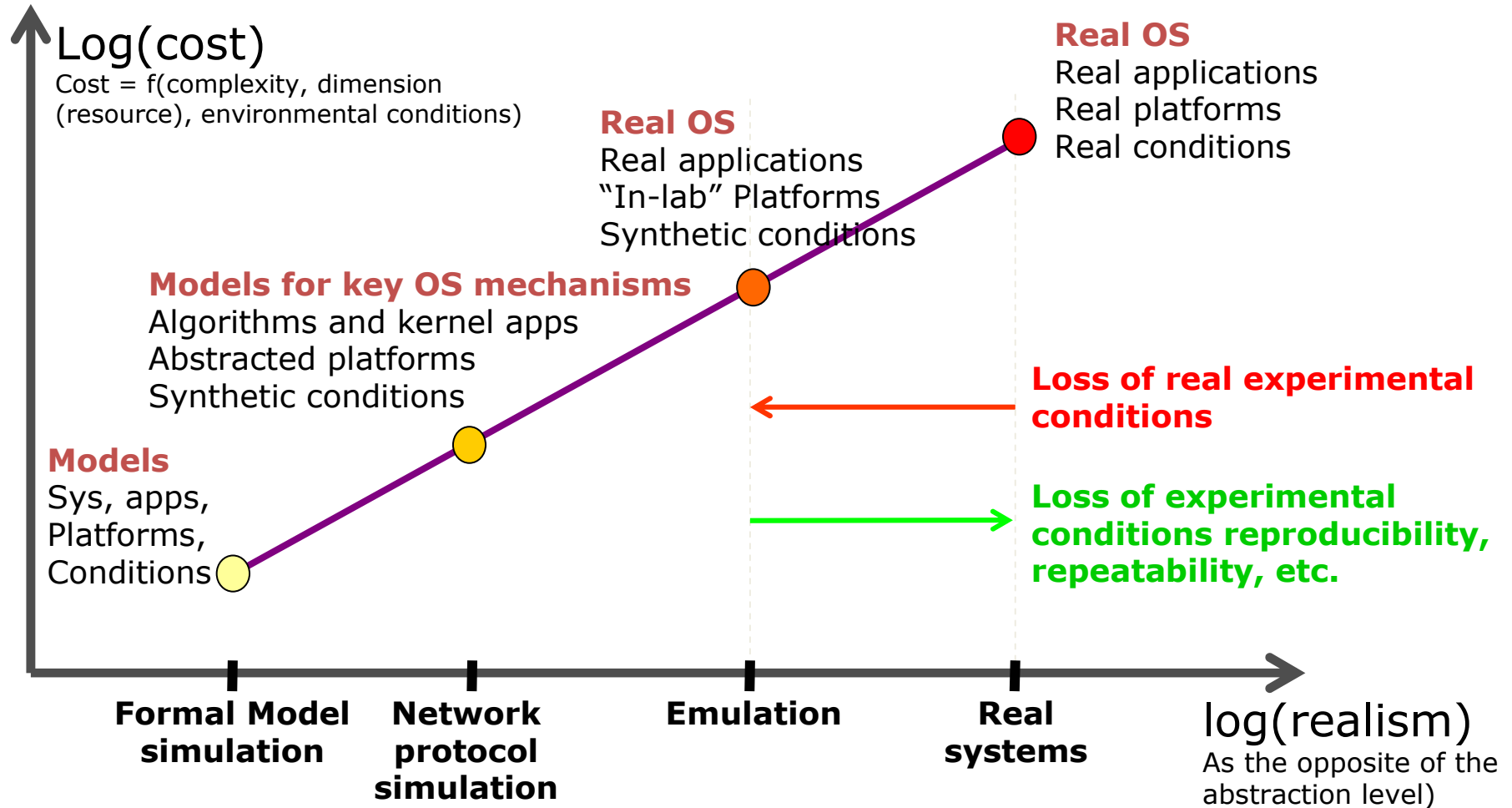
- Address full-development cycles of Future Internet services and applications
- Work toward the definition of Testbed-as-a-Service (TaaS)
 - Model for standardized and service-based access to Testbeds and Experimental facilities.
- That would include
 - Ambitious large-scale development and deployment of Future Internet services
 - Innovative experimental facilities which could span from network components (Onelab,...) to service-oriented facilities.
 - A common OPEN components or Testing toolkit (open source)



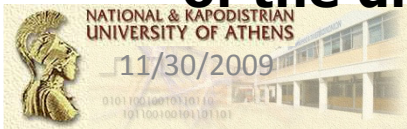
- Including middleware on the nodes to run experiments
- Including tools for defining and monitoring experiments



Cost vs Level of Realism



Abstraction and Cost vs Realism of the different experimental tools in network research



Conclusions

- Lively discussions on the presented approaches
- Derivation of Action points:
 - The terms used for the methodology formulation should be elaborated and clearly specified – contribute to the experimentation vocab....
 - The user selection process for the involvement in the experimentation should be addressed per use case class
 - The methodology will encompass several iterations
 - The methodology will be complementary to e.g., benchmarking, prototyping etc.
 - Potential position paper to reach consensus