

What researchers need from
experimental facilities

Tanja Zseby
Competence Center Network Research
Fraunhofer FOKUS



Fraunhofer Institute for Open
Communication Systems

Experimenter Demands

What experimenters want

- ⇒ Proof a theory
- ⇒ Investigate a phenomenon
- ⇒ Compare own approach to others

Experiments need to be

- ⇒ Controllable
- ⇒ Repeatable
- ⇒ Comparable

Experimental research

- ⇒ Good planning is crucial!
 - ⊗ Request precise experiment description as pre-requisite to use experimental facilities
- ⇒ Observation tools should be accurate and standardized
- ⇒ Sometimes an unexpected side effect is the real discovery



Future Internet Research

- ⇒ Broad range of approaches
 - ⊗ Evolutionary vs. Revolutionary
 - ⊗ Different layers (optical, network, services)
 - ⊗ Different key objectives (manageability, security, mobility, ...)
- ⇒ Different networks
 - ⊗ Different basis technology
 - ⊗ Different structures (dynamic/static, operator-driven/free)
 - ⊗ New disruptive concepts (AC kernel, CDN based..)
- ⇒ Lacking assessment metrics
 - ⊗ Standardized ways to compare approaches
 - ⊗ Means to measure autonomicity, decision quality, adaptability, etc.

Many additional challenges for experimental research

How Experimental Facilities Can Support Researchers

Experimenter Wish List

- ⇒ Provide possibility to control experiment and conditions
 - ⊗ Provide ability to bring environment in a specific state
 - ⊗ Provide wide range of changeable parameters
 - ⊗ Provide ability to fix variables which are not part of the investigation
- ⇒ Provide Observation Tools
 - ⊗ Capture and store results and conditions
 - ⊗ Provide standardized measurement tools
 - ⊗ Ensure reliable observations
 - ⊗ Provide accuracy statements
- ⇒ Provide Reference Data
 - ⊗ Reference settings
 - ⊗ Reference traffic
 - ⊗ Assessment metrics



Challenges

General Challenges

- ⇒ Uncontrollable parameters (weather, physical effects,...)
- ⇒ Resource limitations for data capturing
- ⇒ Privacy/Data Sharing

Specific Challenges with multiple experimenters using the same infrastructure

- ⇒ Prevent interference between experiments
- ⇒ Resource distribution
- ⇒ Access control

Specific Challenges in commercial environment

- ⇒ Security (e.g. prevent competitors from getting results first)
- ⇒ Sharing resources (anonymization, etc.)
- ⇒ Accounting for testbed usage



Onelab2 and P-II

Onelab Contribution

- ⇒ Operation and expansion of PlanetLab Europe
- ⇒ Provisioning of extensive and standardized measurements
- ⇒ Extension towards new structures (wireless, P2P,...)
- ⇒ Benchmarking methodology for experiment control
- ⇒ Support for disruptive research (AC and CDN-based NWs)
- ⇒ Access: by resource contribution

P-II Contribution

- ⇒ Exploitation and composition of existing testbeds
- ⇒ Testbed repository and testbed search (Teagle)
- ⇒ Focus on academic and industrial research
- ⇒ Considers commercial aspects of testbed sharing, deployment of PANLab concepts
- ⇒ Techno-socio-economic analysis to assess the model of federation
- ⇒ Access: revenue-based

Workshop: Open NGN Testbeds – Infrastructure as a Service:

www.fokus.fraunhofer.de/go/ims-event

Thank You!

Contact:

tanja.zseby@fokus.fraunhofer.de



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