

# OneLab: Tools for Future Internet Research

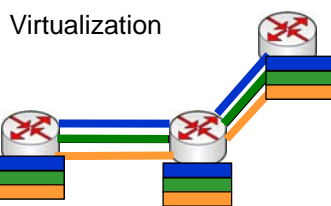
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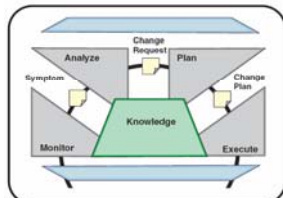
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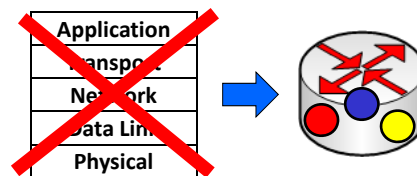
## Future Internet



SAC



Functional Composition



DTNs/Pocket Switched Networks



More degrees of freedom → Decision cycles

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## Support in Testbeds

- **Decisions require Situation Awareness**
  - Cross-layer situation analysis
  - Interfaces for information provisioning
  - Support for information pre-processing
- **Support for Heterogeneous Environments**
  - Translation of data formats from different approaches
  - Common Standards
- **Assessment Methodology**
  - Comparison of different approaches

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## Observation Tools

- **Basis for Experimental Research**
  - Investigate metrics of interest
  - Supervise environment conditions
- **Service to Experimenters**
  - Final result data
  - Input for decision cycles (adaptation, learning)
- **Support for Testbed Operation**
  - Control compliance of experiments
  - Prevent damage to other experiments or platform



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## OneLab

- **Open federated laboratory based on PlanetLab**
- **Mission: Operate and Extend PlanetLab Europe**
- **Integration of variety of technologies**
  - Wireless testbeds
  - Disruptive environments (Autonomic Networking, Pocket Switched networks, DTNs,...)
- **Provisioning of Different Tools**
  - Topology Discovery
  - Packet Tracking
  - Benchmarking methodology

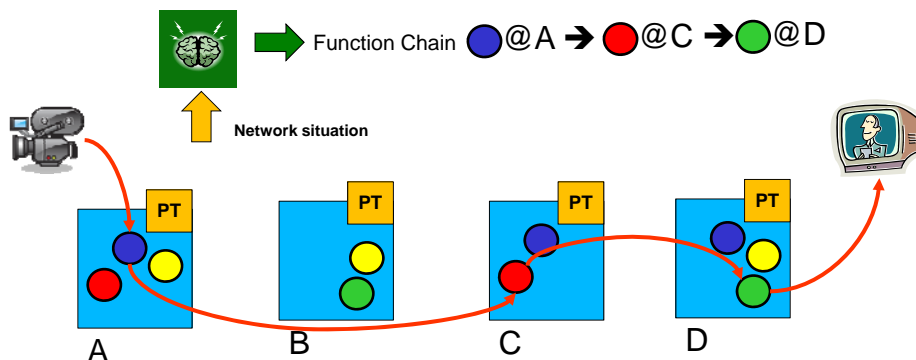
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## OneLab Example

### Experiment: Functional Composition for Video Transfer

1. Establishment of function chain based on input from TD, PT



2. Control Experiment Operation by PT: path of packets, experienced QoS
3. (optional) Optimize function chain based on continuous PT

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## Federation Issues

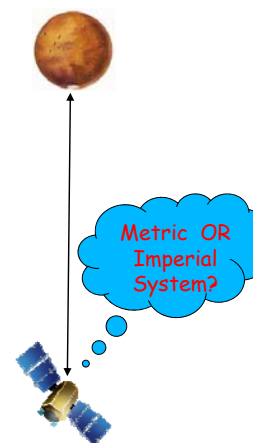
- **Interconnection of heterogeneous facilities**
    - Various observation methods
    - Correlation of data from different technologies
    - Tech.-specific problems (wireless, SAC, DTNs,...)
  - **Different Authorities and Policies**
    - Different rules for traffic observation
    - Different things to supervise
- ➔ **Observation rules as part of experiment description**
- ➔ **Standards!**

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## Standards are Crucial

- **Provide comparability of results**
  - Allow comparison of results
  - Provide reference data
- **Reduce Costs**
  - Common interfaces for analysis tools
  - Re-usage of archived data
- **Reduce errors**
  - Avoid error-prone conversion steps
  - Gain experiences with only one format



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## Assessment: FOKUS Future Internet Tournament



- **“Robocup” for Computer Networks**
  - Competition of different Future Internet solutions
  - Based on Assessment Framework developed by FOKUS
  - Preparation in progress by technical core team
- **Further Information**
  - To join the core team → contact me
  - Open discussion of the first challenge at FI workshop **November 11, 2009** in Berlin
  - Register at [www.fokus.fraunhofer.de/go/ims-event](http://www.fokus.fraunhofer.de/go/ims-event)

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*An Open Federated Laboratory Supporting Network  
Research for the Future Internet*



## Thank You!

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