

FG INET: Intelligent Networks

An-Institut Deutsche Telekom Laboratories

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INET: Research Group

- ❑ Location
 - Telefunkenhochhaus, 16. Stock
- ❑ Office hours
 - Tuesday 12:30 – 13:00
 - After the lecture or per e-mail
- ❑ Contact
 - Best per e-mail ☺
- ❑ Teaching contact
 - Fabian Schneider
- ❑ Web site
 - <http://www.net.t-labs.tu-berlin.de/>

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T-Labs

- ❑ Institute at TU Berlin funded by Deutsche Telekom AG
- ❑ Co-locates researchers from TU Berlin and project managers of Deutsche Telekom
- ❑ Two parts
 - Strategic research
 - 4 Research Groups + 30 Researchers + 40 Ph.D. students so far: INET, Quality and Usability (QU Lab), Security in Telecommunications (SecT)
 - Innovation development
 - Project work, e.g., IP-TV, Overarching AAA

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Research interests

- ❑ Internet in general
- ❑ Clean slate network architectures
- ❑ Traffic measurement and characterization
- ❑ Wireless mesh networks
- ❑ Peer to peer and social networks
- ❑ Network security, e.g., intrusion detection

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Çiğdem Şengül, Ph.D.

□ Biography:

- Control and Computer Engineering @ Tech. Uni. Istanbul, Turkey
- Computer Science @ Uni. Of Illinois Urbana-Champaign, USA
(MS/PhD advisor: Robin Kravets)
- Distributed Systems and Networking @ INRIA, France
(Postdoc in ASAP led by Anne-Marie Kermarrec)
- Networking @ Deutsche Telekom Laboratories
(Senior Research Scientist)

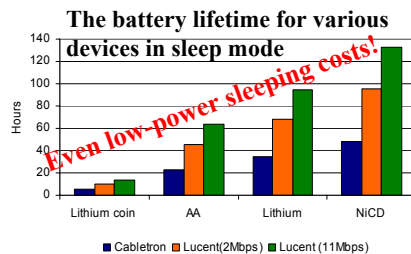
□ Research Interests:

- Adaptive operation in self-organized networks
(mobile, sensor, delay-tolerant, peer-to-peer, ..)
- Energy management in wireless networks
- Routing, topology management, cross-layer design
(mac/routing/transport)

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Wireless Networks: Energy management

- Communication “any time, anywhere” is becoming a reality but at what cost?
- Can we reduce the cost of being “on all the time” for both
 - Users – Phones, PDAs ...
 - Infrastructure – Wireless APs, sensors ...
- How can we support increasing communication demands but lower energy consumption?
 - Adaptive models and self-organization
(e.g., local detection and reaction to varying traffic and energy conditions; turn off a device, if traffic load is currently low)
- How can we evaluate different approaches in a realistic manner?
 - BOWL (Berlin Open Wireless Lab) Network –
<http://bowl.net.t-labs.tu-berlin.de>



Gregor Maier

□ Biography:

- Informatik (Diplom) @ TU München
- Research Assistant / PhD candidate @ TU Berlin

□ Research Interests:

- Network Security (Network Intrusion Detection Systems, TimeMachine)
- Network Measurements

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Example of a research topic: Evaluating the benefits of re-routing

□ Scenarios

- P2P systems
- Community networks
- Traffic engineering via traffic redistribution
- Wide area migration of virtual machines
- ...

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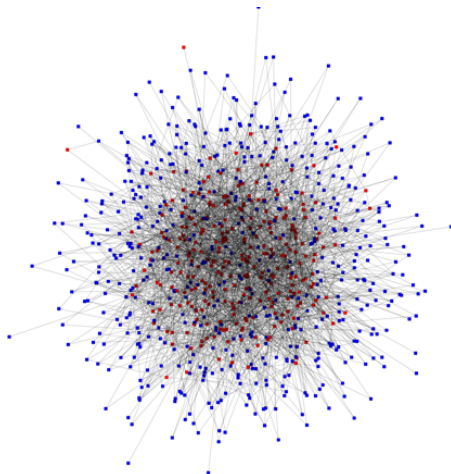
Example: Peer-to-Peer networks

- ❑ Can ISPs and P2P users cooperate?
- ❑ Goal:
 - Improved performance for users
 - Enable traffic control for ISP
- ❑ Idea:
 - ISPs: offer oracle that provides network distance info
 - P2P: use oracle to build P2P neighborhoods
- ❑ P2P oracle concept:
 - Service of AS / ISP
 - Input: list of possible dst IP addr. and src IP addr
 - Output: ranked list of dst IP addr.
e.g. according to distances between src IP and dst IPs

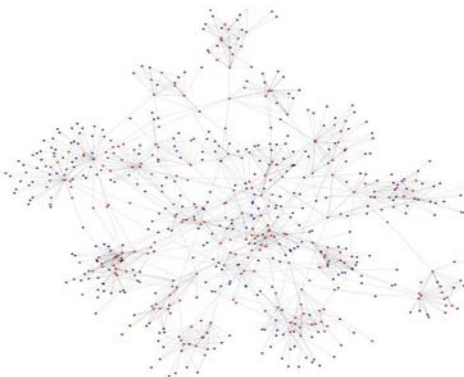
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Benefits of P2P oracle for topology

❑ without oracle



❑ with oracle



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Teaching

- ❑ Lectures (Vorlesungen)
- ❑ Seminars (Seminare)
- ❑ Lab course (Praktika)
- ❑ Projects (Projekte)
- ❑ Theses (Diplom / Master / Bachelor)

- ❑ PGT: Project Group Meeting
(Doktorandenseminar)

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Lectures

- ❑ **Network protocols and architectures (VL+UE)**
 - How does the Internet work
 - Base for all other INET classes

- ❑ Internet Routing (VL)
- ❑ Internet Security (VL)
- ❑ Internet Measurement (VL)

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Seminars

- Network architectures
 - Emphasising:
 - Internet Routing
 - **Internet Security**
 - Internet Measurement
 - Topic: Current research papers
 - Task:
 - Summary paper + presentation
 - Participation in discussion during the seminar
 - Typically en block after the end of term

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Lab courses

- Hands on exercises
- **Mesh Lab**
 - Understanding various wireless concepts (e.g., interference, MAC layer, multi-hop routing)
Experiments with mesh routers in the BOWL indoor network
- Router Lab
 - Configuring and managing networks
 - Internet experiments in a Lab

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Projects and Theses

□ Topic:

- See Web pages
- Talk to members of INET
- Suggest your own topic

□ Work flow:

- Literature/background search
- Presentation of idea at students' talks series (20 minutes 😊)
- Execution of idea / preparation of thesis document
- Presentation of results at students' talks (20 minutes)