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/
**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

**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
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](http://bowl.net.t-labs.tu-berlin.de)

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The battery lifetime for various devices in sleep mode:

- Lithium coin
- AA
- Lithium
- NiCD

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Note: Low-power sleeping costs.
Gregor Maier

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

- **Research Interests:**
  - Network Security (Network Intrusion Detection Systems, TimeMachine)
  - Network Measurements

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
  - ...
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

Benefits of P2P oracle for topology

- without oracle
- with oracle
Teaching

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

PGT: Project Group Meeting
(Doktorandenseminar)

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)
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

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
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)