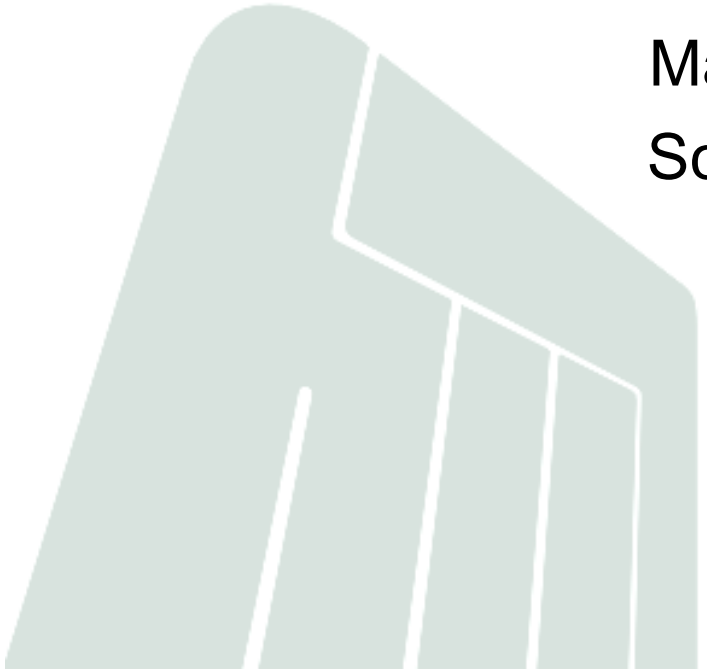
Finland-ICSI Center for Novel Internet Architectures

Martti Mäntylä, HIIT

Scott Shenker, ICSI

FI-SHOK



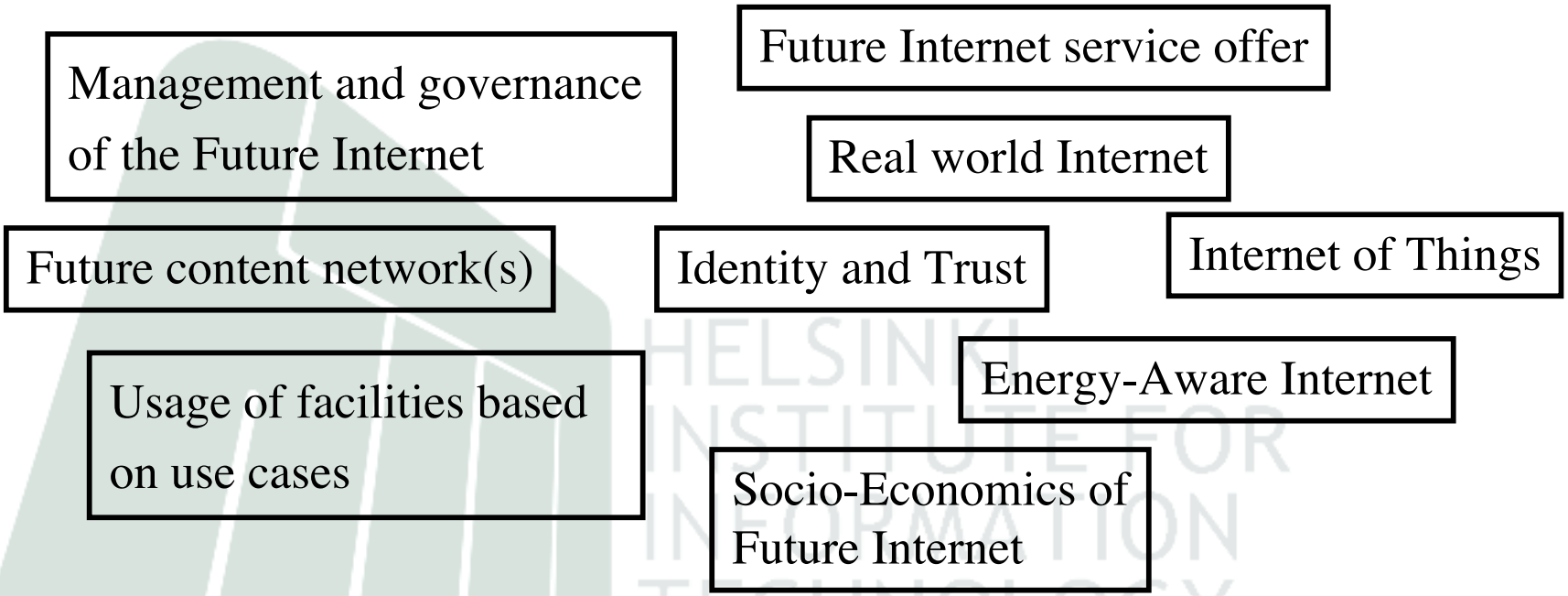
HELSINKI INSTITUTE FOR INFORMATION TECHNOLOGY

Background

- As the demands on the Internet continue to grow, researchers are seeking to make the Internet more secure, reliable and flexible. Making substantial and qualitative changes in these properties may require radical, as opposed to incremental, change.
- The aim of the Finland-ICSI Center for Novel Internet Architectures (FICNIA) is to combine the efforts of Finnish Internet research with the research conducted in the Internet research community in the USA through the International Computer Science Institute (ICSI) affiliated with the University of California Berkeley.

Mission

- *Conduct fundamental research in novel Internet architectures, aiming at a significant contribution towards the future development of the Internet that addresses its present problems*.



Research Agenda

- Fundamental New Paradigms
  - E.g., publish-subscribe paradigm
- Fundamentals of Internet Security, Privacy, and Trust
  - Including microeconomics, game theory, cryptographic protocols, graph theory, ...
- New Routing and Addressing Architectures
  - Identifier/locator split, network measurement, multicast, congestion control, web caching, ...
- Future Network Management
  - Deployment and management scenarios
- Networking Research Infrastructure
  - In liaison with GENI and FIRE
- Socio-Economics of the Future Internet

Modus Operandi

- Timespan: 5 years (first period)
- Two sites, two co-directors
- Joint Steering Board with ICT SHOK FI SRA
- Core researchers (senior, postdoc, doctoral students)
- Affiliate researchers (also from industry)
- 2-way research visits
  - Every visitor must be capable of contributing to the research agenda
- Joint seminars, meetings, public events

Modus Operandi

- Teaching
  - Short courses
  - Internships for M.Sc. thesis
- Funding model
  - HIIT: TEKES
  - ICSI: NSF and industrial funding
  - Joint funding: EU, industrial

An Example

- Teemu Koponen at ICSI 2007-08 with Scott Shenker
  - a dissertation "*A Data-Oriented (and Beyond) Network Architecture*" October 2008
  - Publications:
    - Martin Casado, Teemu Koponen, Daekyeong Moon, and Scott Shenker. *Rethinking Packet Forwarding Hardware*, in Proc. of the 7th ACM SIGCOMM Workshop on Hot Topics in Networks (HotNets-VII), Calgary, Alberta, Canada, October 2008.
    - David Andersen, Hari Balakrishnan, Nick Feamster, Teemu Koponen, Daekyeong Moon, and Scott Shenker. *Accountable Internet Protocol*, in Proc. of ACM SIGCOMM'08, Seattle, WA, August 2008.
    - Natasha Gude, Martin Casado, Teemu Koponen, Nick McKeown, Justin Pettit, Ben Pfaff, and Scott Shenker. *NOX: Towards an Operating System for Networks*, in ACM Computer Communications Review, Editorial Zone, July 2008.
    - Michael Demmer, Kevin Fall, Teemu Koponen, and Scott Shenker. *Towards a Modern Communications API*, in Proc. of the 6th ACM SIGCOMM Workshop on Hot Topics in Networks (HotNets-VI), Atlanta, GA, November 2007.
    - David Andersen, Hari Balakrishnan, Nick Feamster, Teemu Koponen, Daekyeong Moon, and Scott Shenker. *Holding the Internet Accountable*, in Proc. of the 6th ACM SIGCOMM Workshop on Hot Topics in Networks (HotNets-VI), Atlanta, GA, November 2007.
    - Teemu Koponen, Mohit Chawla, Byung-Gon Chun, Andrey Ermolinskiy, Kye Hyun Kim, Scott Shenker, and Ion Stoica. *A Data-Oriented (and Beyond) Network Architecture*, in Proc. of ACM SIGCOMM'07, Kyoto, Japan, August 2007.

Roadmap

- Kick-off 27.9.2007 at ICSI Berkeley
- Joined with ICT SHOK FI SRA WP 5 in September 08
- Current visitors & cooperation:
  - Boris Nechaev, Networking Research Group, HIIT
    - Vern Paxson
  - Teemu Koponen, TKK
    - Scott Shenker
- Next steps?