



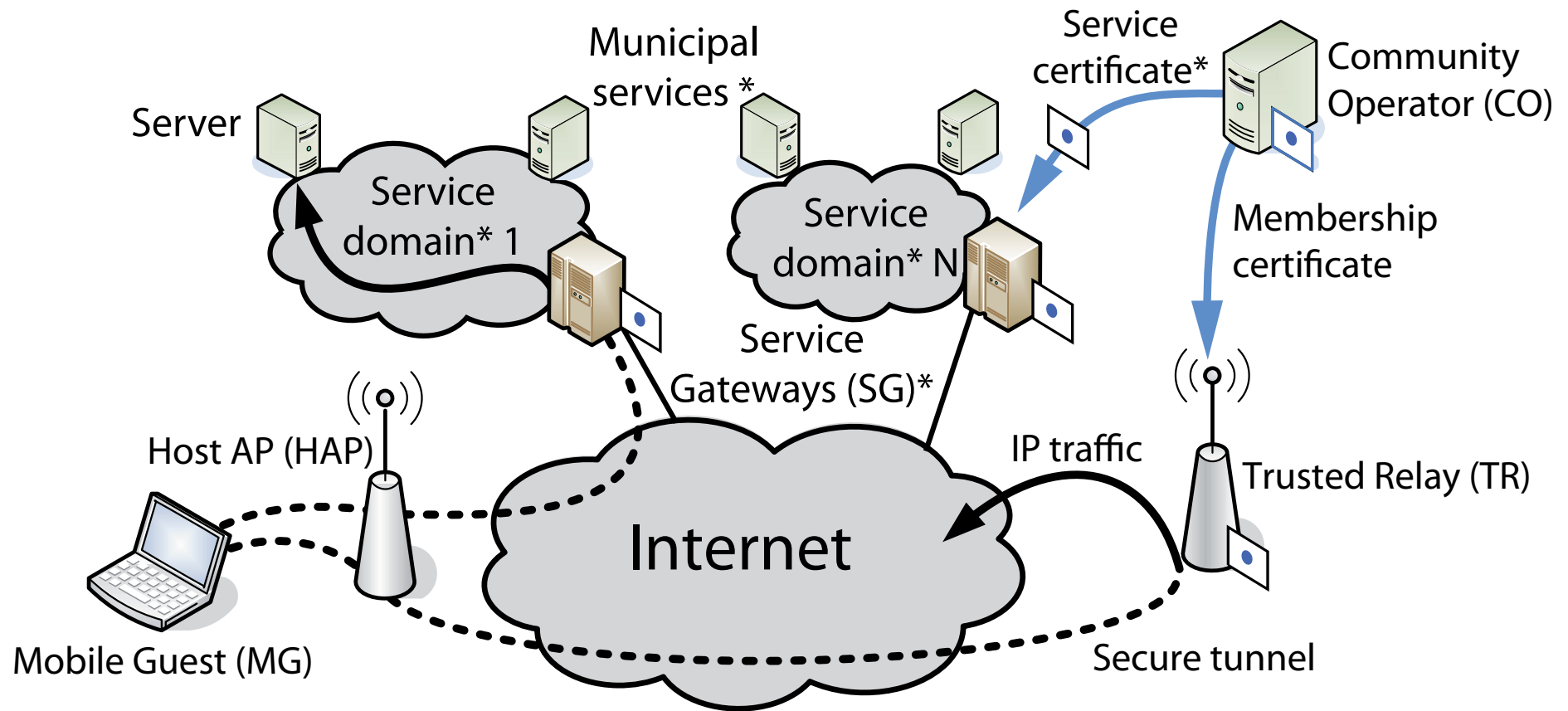
# PiSA and Mobile ACcess Project

Tobias Heer, Klaus Wehrle  
Distributed Systems Group  
RWTH Aachen University

# Goal

- Ubiquitous Wi-Fi access in the cities of Aachen and Monschau
- Private participation and collaborative networking (Wi-Fi sharing as basis)
  - Security and mobility
- Location-aware services
  - Navigation
  - 3D visualization

# Basic Network Components



# Challenges

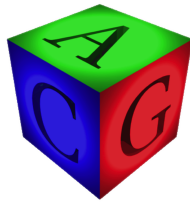
- Make a patchwork-like system appear homogeneous
  - Private and company access points
  - No homogeneous trust and network structure
  - Need to separate different networks
- Suboptimal AP placement
  - Indoor – APs are placed to serve needs of residents
  - No outdoor usage considered
  - → Limited range and QoS is challenging
- Management and Trust
  - Membership management
  - Legal issues
- Legacy support for non-HIP clients
  - Infrastructure-based mobility in homogeneous networks

# Why HIP?

- HIP provides required key features
  - E2E Authentication
  - E2M Authentication
  - Tunnel
  - Mobility
- HIP provides the complete security solution for Mobile ACcess
  - Client and service authentication
  - Authentication of CO and between other components

# Partners

- 9 Partners from Industry and Academia
- Coordination: RWTH Aachen University



RedTeam Pentesting GmbH  
Seeing your network from the attacker's perspective

regio it aachen



LANCOM  
Systems



weiss://inter.media

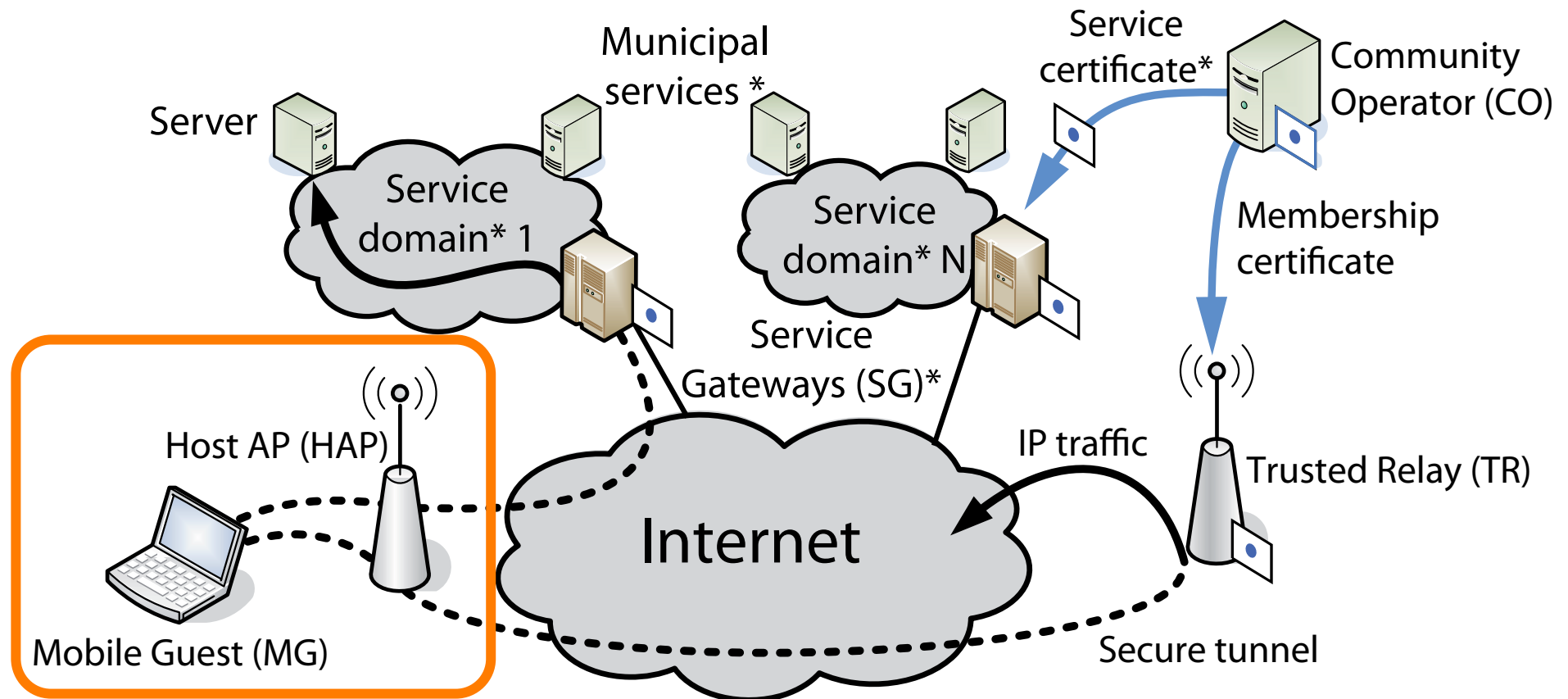
Tobias Heer, RWTH Aachen University



# Early Results

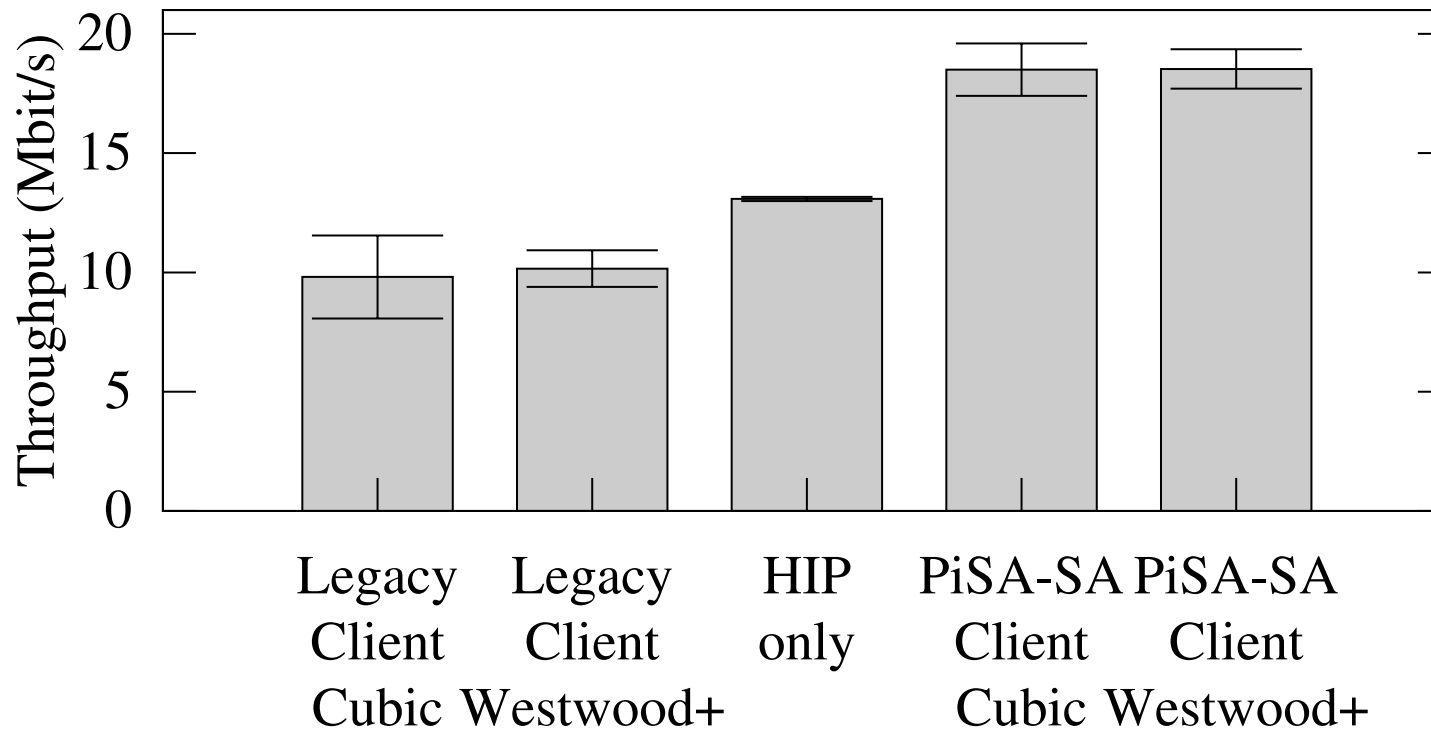
- Prototype implementation
  - Userspace
  - Tradeoff: Development time vs. performance
  - Custom packet handling by tunnel manager
- Support for:
  - Native clients (HIP + middlebox authentication)
  - Legacy clients (off-the-shelf devices)
  - openWRT routers

# Focus of the Evaluation



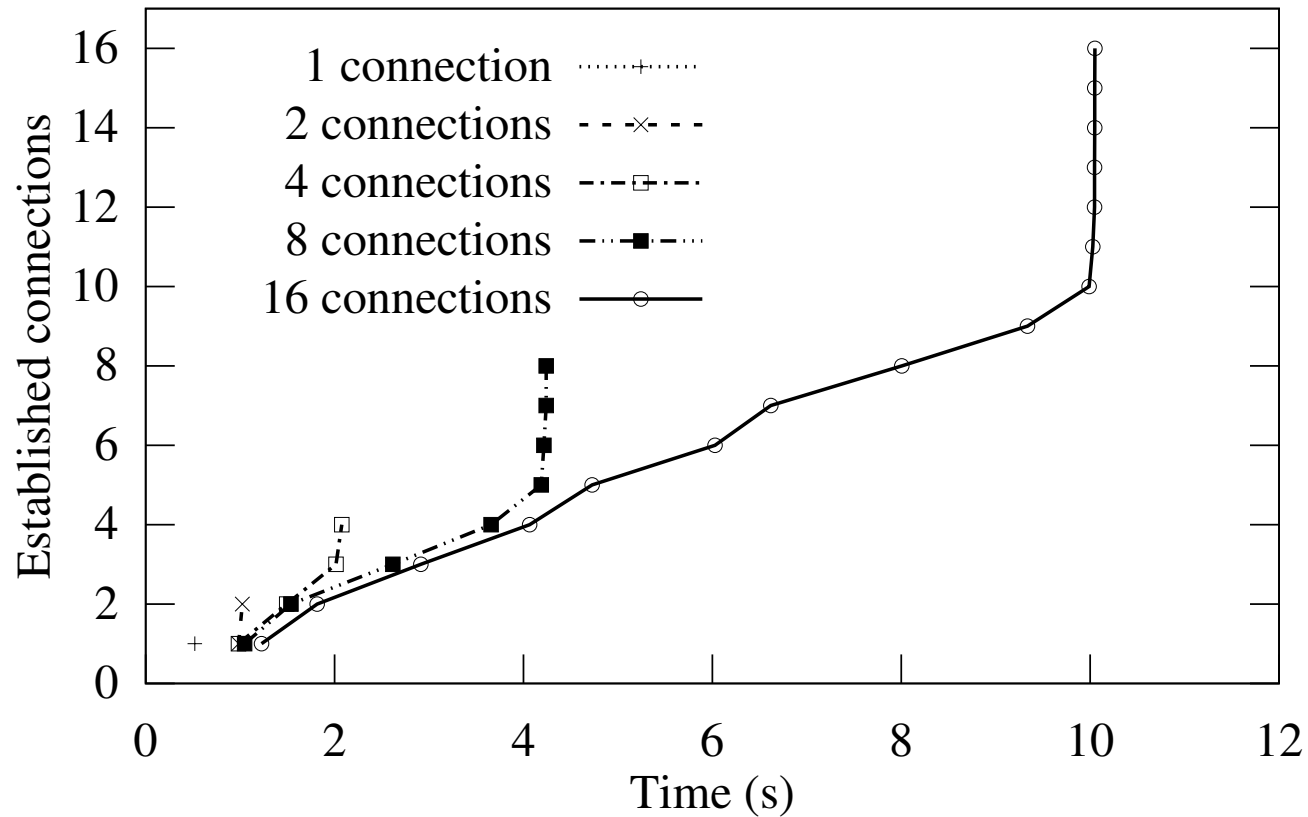


# Prototype – Router Throughput



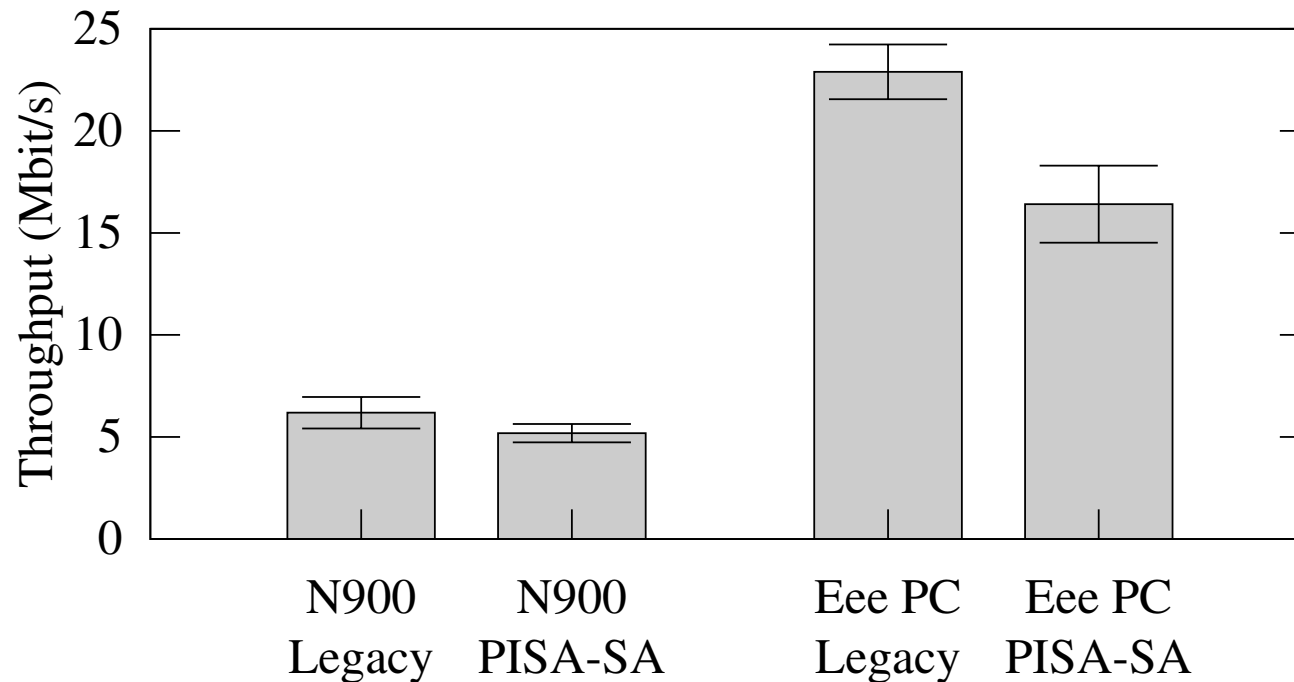
Throughput of a PISA prototype running on a WRT160NL commodity wireless router

# Prototype – Connection Delay



Connection delay for establishing an on-demand service connection between a WRT160NL router and a service gateway.

# Prototype – Client Throughput



E2E TCP throughput for a Nokia N900 (600 MHz) mobile phone and an Asus Eee PC T91 (1.3Ghz) in native and legacy mode.