TUDµNet:
a Metropolitan-Scale Federation of Sensor Network Testbeds

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DVS

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Context & Problem Statement

Software development for WSANs hard:

- wireless communication phenomena (interference, multipath reflection, fading, antenna diversity)
- complex sensing phenomena (magnetic fields, gas plumes, human behavior)
- experimentation logistics (batteries, flashing, etc.)
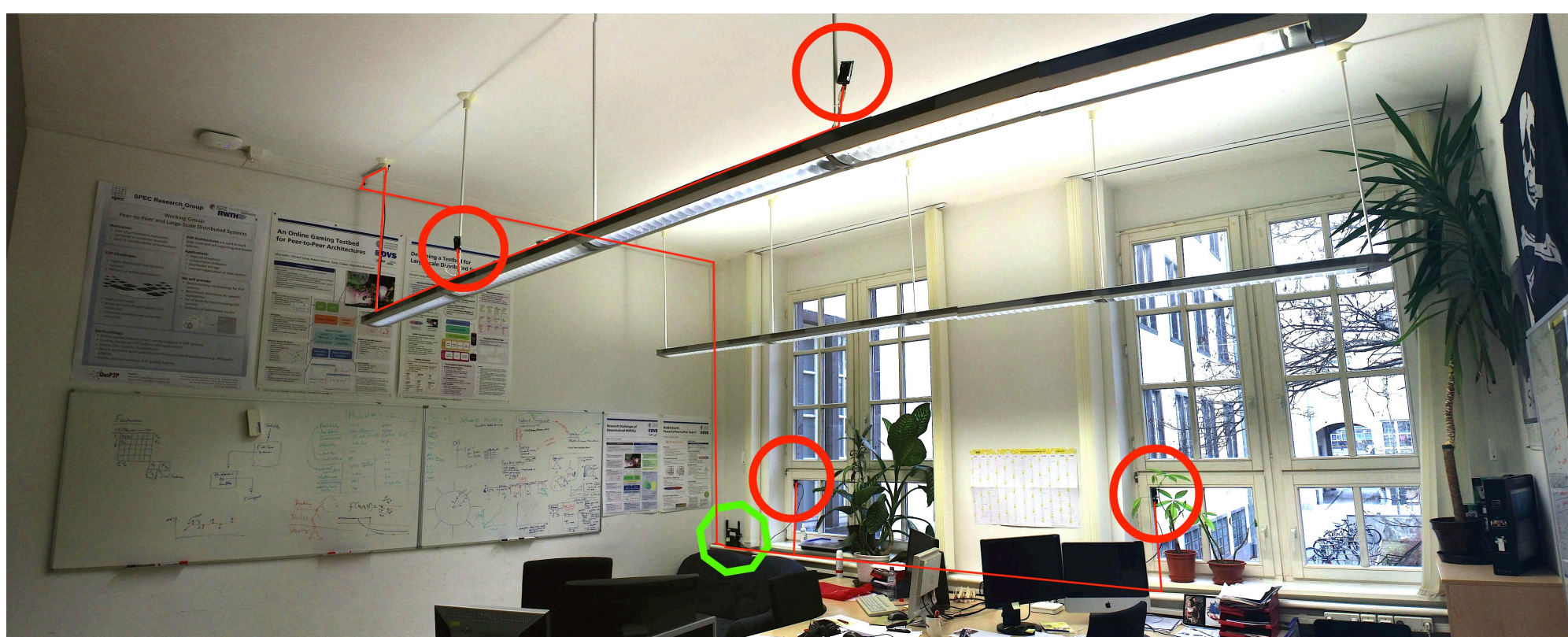
Proposed Approach

- deployment of several sensor nets
- development of support software for managing the software testing phase
- testbed interconnection via Ethernet-backbone
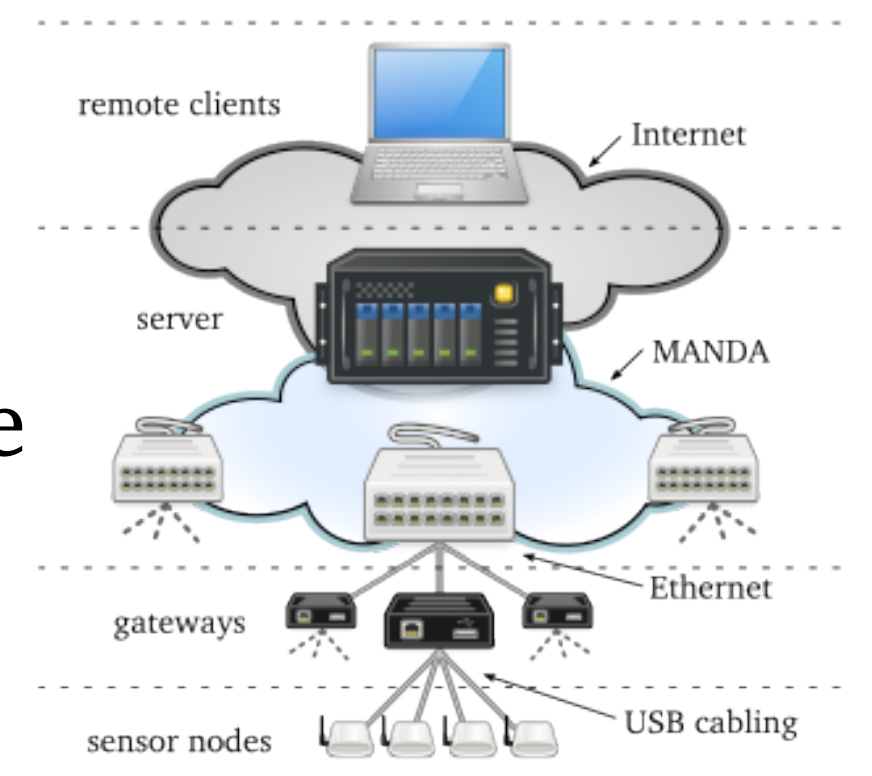
## Current Status

Construction of TUDµNet:

- **testbed**: hybrid between simulator and target deployment
- **federation**: integrates multiple, autonomous WSNs

Web interface to manage experiments:

- hierarchical zones (enable division of areas)
- parallel job execution
- centralized coordination
- access control
- heterogeneity
  - sensors (light, humidity, CO, CO_2, temp., etc.)
  - nodes (TelosBs, Z1s, JCreates)
- basic system health monitoring

TUDµNet

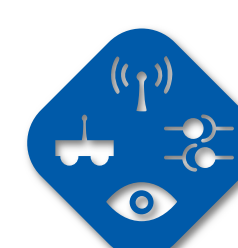| Site	Focus	Size
CS Dept.	networking, sensing & actuation	32 + 30 + 20
GKmM Lab	gas plume detection	50
surPLUShome	environmental monitoring	20
total (2012)		152
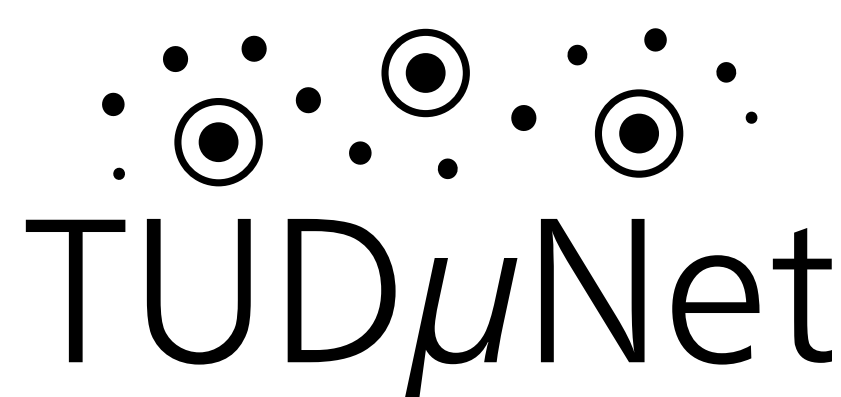
Ongoing Work

- extended health monitoring and healing
- emulation of node faults, fine grain control of node liveness
- extension to human-worn and robot-transported nodes
- support for further platforms (e.g., EconoTAGs)

References:
1. Guerrero, P. E., Buchmann, P. A., Khelil, A., Van Laerhoven, K. *TUDuNet, a Metropolitan-Scale Federation of Wireless Sensor Network Testbeds*. 9th European Conference on Wireless Sensor Networks, Trento, February 2012

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