Access to Sensor Networks using “Janus”

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Wireless Sensor Networks

• A typical scenario, “wildlife monitoring”.

[Map with legend: Beach (hatched), Field (white), Forest (stippled), Sensor (black dot)]
Sensor Characteristics

- simple functionality
- wireless communication
- sensing physical phenomena (motion/temperature)
- limited energy supply
Sensing Tasks

• High level and abstract
  “notify me when birds land on the beach”

• Satisfying such queries requires
  – participation of many sensors
  – merging of data
  – communication of the result
The Research Problem

• Sensor networks seldom run in isolation
  - configuration
  - sensing tasks often imply external contact

• Internet-type networks and Sensor networks operate on different principles

• Existing access high level access approaches are typically application specific
Approach

• An “overlay” or “middleware” architecture to provide flexible and lightweight access to sensor networks.
"Janus"

- flexible signalling mechanism
- RPC-like access to sensor network functionality
- dynamic negotiation supporting deployment of new functionality
Experimental Setup

• sensors from FU Berlin
  - MSP 430, 2KB RAM, 8KB EEPROM
  - Contiki OS

• Laptop 1: running Janus

• Laptop 2: running the presentation GUI