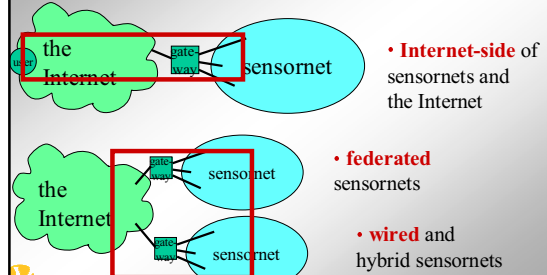


Data-Centric Networking as An Information "Layer"

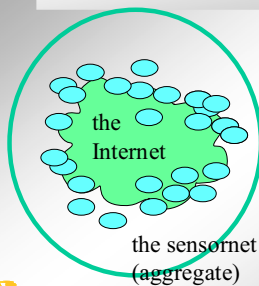
John Heidemann, USC/ISI
 (SISS Project co-PIs: Mark Hansen, Junghoo Cho, UCLA)
 28 November 2007

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Richer Interaction Between Sensornets and The Internet

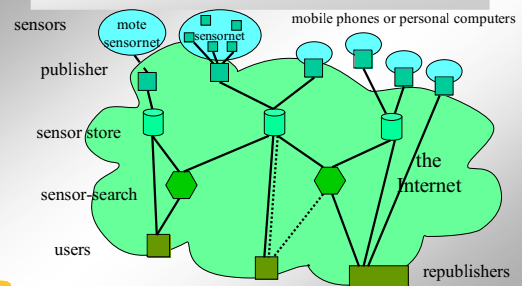


Sensornet Sharing



- supporting a few sensornets
 - in the limit: supporting millions of sensornets (citizen-operated sensornets or *slogging*)
- "sensornets" as motes, PC-connected sensors, and cell phones

SISS Components



Implications of Millions of Sensors

- a data-centric Sensor-Internet
 - care about the information, not the nodes
 - metadata is sensor type and location, not IP address
- willingly abstract lower layers
 - just as Internet abstracts link layer, we abstract network layer (IP, mote network, DTN, etc.)
 - search and discovery matters
- important concepts:
 - nouns: publishers and re-publishers writing to sensor stores
 - adjectives: authorship, attestation, attribution
 - adverbs: privately, easily

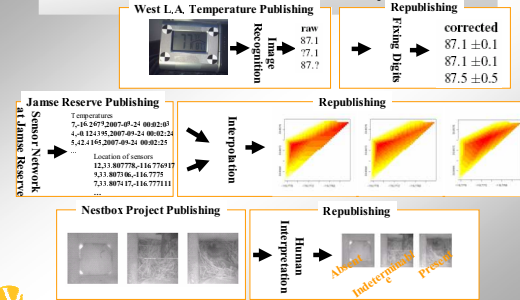
Research Directions

- a data-centric Sensor-Internet
 - implication: track *data provenance*, knowing where your data came from and how it was processed (addresses authorship, attestation, attribution)
 - implication: *data-level abstractions*
- willingly abstract lower layers
 - implication: need *synchronization support*, coordinating loosely coupled publishers and republishers
 - implication: tools for *search and discovery* over sensor data
- important concepts
 - libraries for re-publishing
 - building a sensor-store ecosystem
 - understanding acceptable privacy and access control

Inspiration

- Network concepts with recent impact
 - blogging
 - photo-sharing sites
 - social networking sites
- all are about *sharing data*
 - not what host the data lives on
 - not what lookup scheme they use
 - not how to tweak routing for one more 9 of reliability
- **our goal: to create a blog-like feedback loop**
 - data fostering more data, self-selection and editing

Republishing Examples



More Information

- our posters (talk about republishing, search)
- architecture paper:
 - “Sensor-Internet Share and Search—Enabling Collaboration of Citizen Scientists”, by Reddy et al., ACM Workshop on Data Sharing and interoperability on the World-wide Sensor Web, April 2007
- <http://www.isi.edu/ilense/siss>
 - project information
- <http://sensorbase.org/>
 - one possible sensorstore