Overview: Internet scale sensing

- Irisnet - Internet-scale Resource-Intensive Sensor Network Service
  - http://www.intel-iris.net/research.html

Architecture

- Planet wide local data collection and storage
- Real time adaptation of collection and processing
  - Reconfigure capture and storage based on the data
- Data as a single queriable entity (even though it may be spread across the planet)
- Queries posed anywhere on the internet
- Data integrity, privacy, robustness …

Architecture

- Service agents and organizing agents

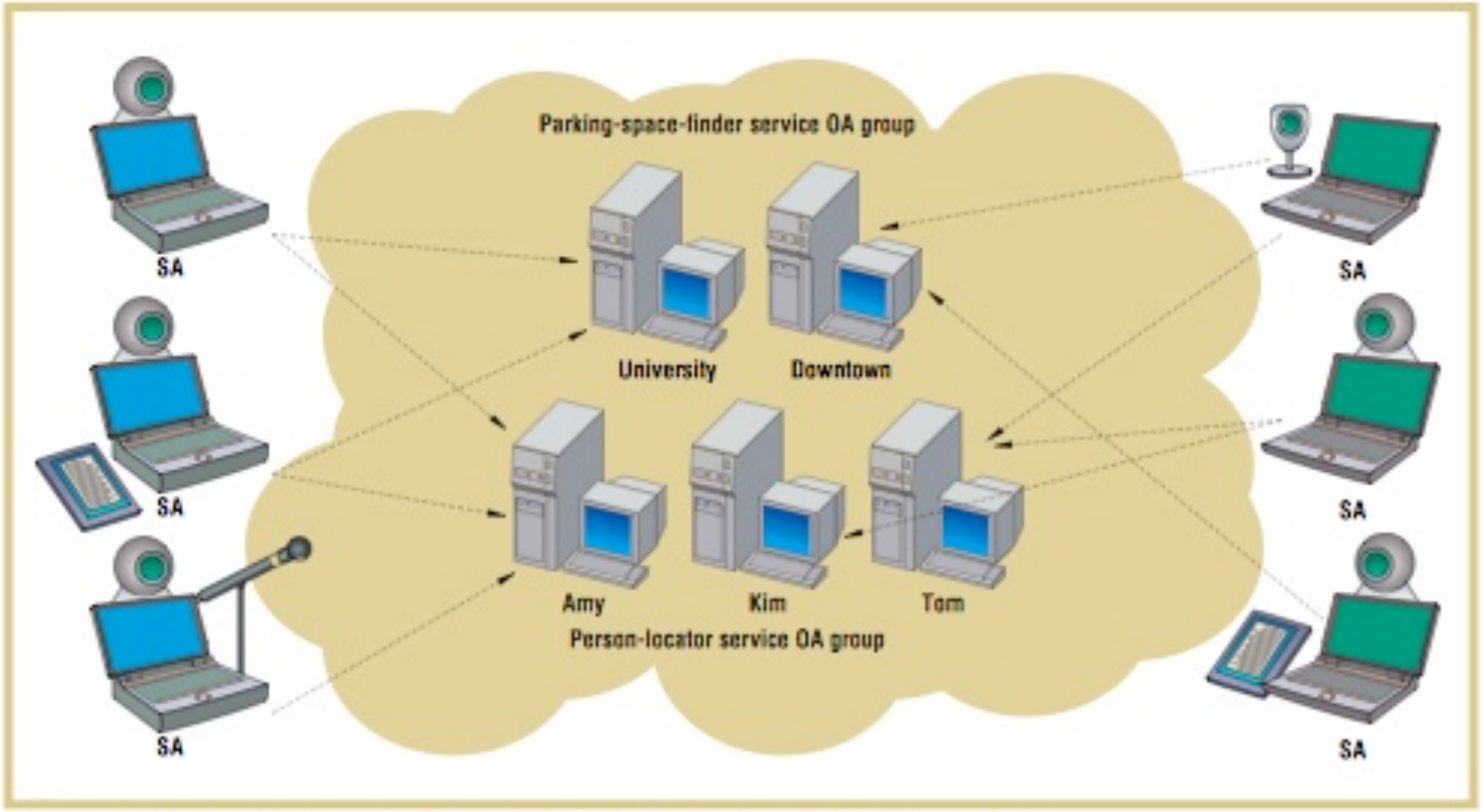

Figure 1. The IrisNet architecture, with sensing agent (SA) and organizing agent (OA) nodes.

Architecture

- SA perform the local processing and populate XML records
  - Programmable - senselets
  - Run in isolation to protect Senselets and SA host
  - Privacy filter - video camera might take picture of everyone. Privacy filter can remove objects not pertinent to the query
  - Shared computation among senselets - intermediate steps are shared
- OA form a hierarchy to implement a distributed XML database
  - Each OA owns a certain number of Sas
- Queries are routed as XPATH queries
  - Consistency and caching

Applications

- Query status of nodes in planetlab
  - Distributed, planet wide infrastructure
  - Each node runs a agent which collects local information/logs. Irisnet is used to query the system
- Parking finder
  - Cameras in lot, results available with mapping service

- Coastal monitoring with Oregon State Univ.