Spatial World Models for Mobile Context-Aware Applications

Use Cases

- Display Map
  - Specify format, desired object types and clipping area
  - Map is dynamically generated from federated data
- Access Information
  - Virtual Information Towers (VITs) tie information (Web-pages) to locations
- Mobile Objects
  - Show positions of members of a visiting group
  - Prerequisite for spatial events and geo messaging

Architecture

- Application NexusCloud
- GeoServer
- Map Service
- Federation
- Location Server
- Notification Service
- Geonode
- GeoRegister
- WWW

Data Management Challenges

- Transparency for the Application
- Extensibility: Schema Extensions
- Find relevant Providers
- Adapt Objects to Client Schema
- Create Integrated View on heterogeneous Data
- Caching, Update Propagation

Future Work

- Integrate additional Dimensions
  - Time: Temporal Events, Temporal Queries, Prognoses
  - Value-added Services
    - Service specifies its interface and result format
    - E.g. map service (+ picture), navigation service (+ path-description)

Query Semantics

- Type Hierarchy
  - Building
  - Room
  - Area

Data Distribution

- Multi-Type
- Multi-Attribute
- Full Vector Data
- Simplified Vector Data
- Building
- Room
- Area

Use Cases

- Spatial Events
  - I want to buy shoes
    - OnEnterArea-Event
    - I want to talk to my colleague
    - OnMeeting-Event
- Get current Position
  - Using GPS
  - Using IR-Beacons
- Geo-Messages
  - Send a message to persons within a specified area
    - Emergencies
    - Announcements in stations

Extensibility: Applications

- New Providers
- Schema Integration
- Resultset-processing-operators
- Sensors
- Symbolic Coordinates
- Value-added Services

NexusScout
An Advanced Location-Based Application on a Distributed, Open Mediation Platform