



Applying integrated sensor networks in public distribution systems

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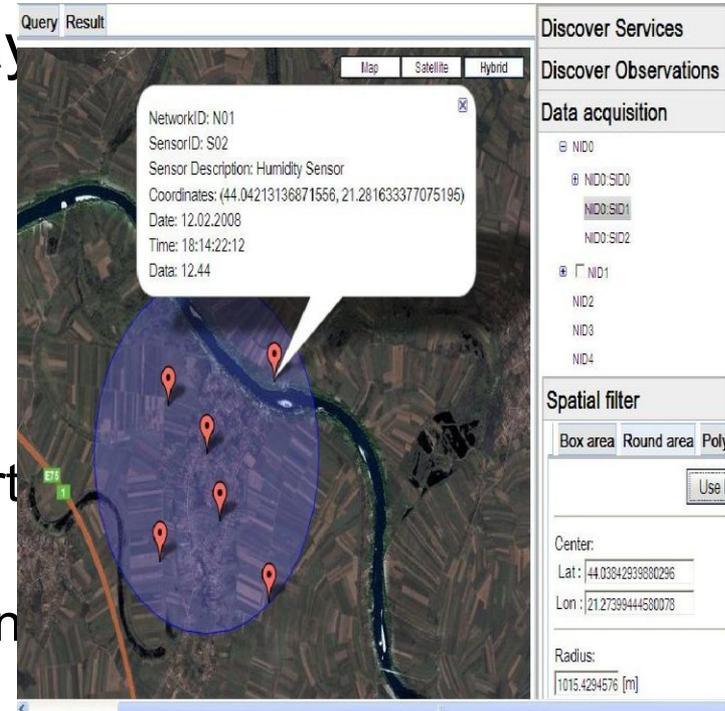


Introduction

- Experiences from the EU FP7 Project ProSense:

- ProSense Common Gateway

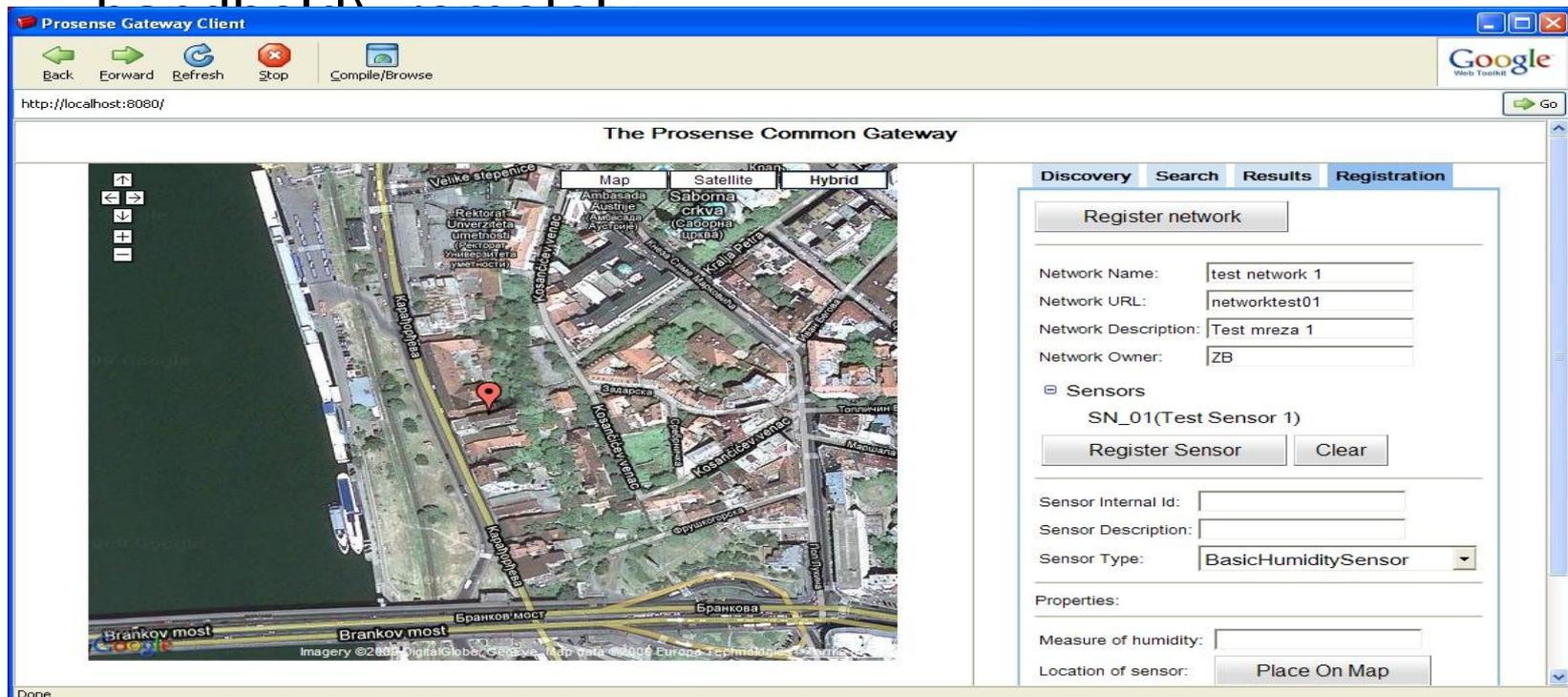
- Integration of various WSN
- Collecting of sensor data
- Searching sensor data using temporal, spatial, and semantic queries
- Providing subscribing and alert services on sensor data
- Visualization of sensor location using





The ProSense Common Gateway - Interface

- Web Interface – GWT (Google Web Technology) is used
- Could be accessed from small devices (mobile phones,





The ProSense Common Gateway – General Principle

- Sensor measurement on sensor node
- Notifying the PCG server with observed data
- Applying some processing or calculations on received data
- Checking for alerts, or subscription of sensor data
- Sending notifications to users



The Application: Monitoring and control of the public distribution system

- Creating the tool for enabling an easy monitoring and control to operators of the public distribution systems
- Visualization of sensor locations using popular maps (GoogleMaps or custom maps), real-time monitoring of measured data, alerts, interoperability with sensor data (using open standards)
- Access to the system not only from the control room
- Examples of the public distribution systems:
 - District heating systems



The District heating systems: Available Software Systems

- Termis by 7-Technologies, Denmark
- Termis by EL-TEC, Slovenia
- Web enabled solutions (typical SCADA solutions)
 - DAQ Connect
 - WebSCADA
 - BroadWin WebAcc
 - SCADA Node





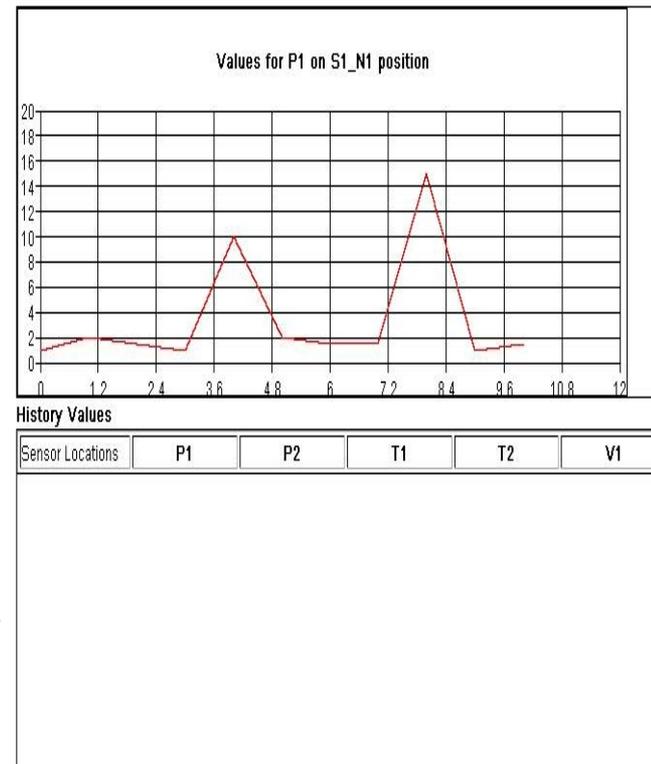
The district heating systems: Our approach

- Market target: Inexpensive solution for small to medium distribution systems
- Solution based on open standards and software
 - JBoss application server, PostgreSQL or any other SQL-enabled database
- Web enabled
 - GWT is used for web interface
 - Comet technology is used for real-time user notifications
 - Thin clients are enabled by Android platform
- Scripting languages (Ruby, Groovy) are used for specialized functions



Main software functionalities

- Modeling of network topology using custom maps or Google Map
- Real-time operator & expert working mode
- Technician working mode using thin client
- Control of the system is enabled only from intranet, monitoring is enabled remotely because of security
- Management of alerts (definition and notifications)
- Interoperability with sensor data
- Advanced functions:



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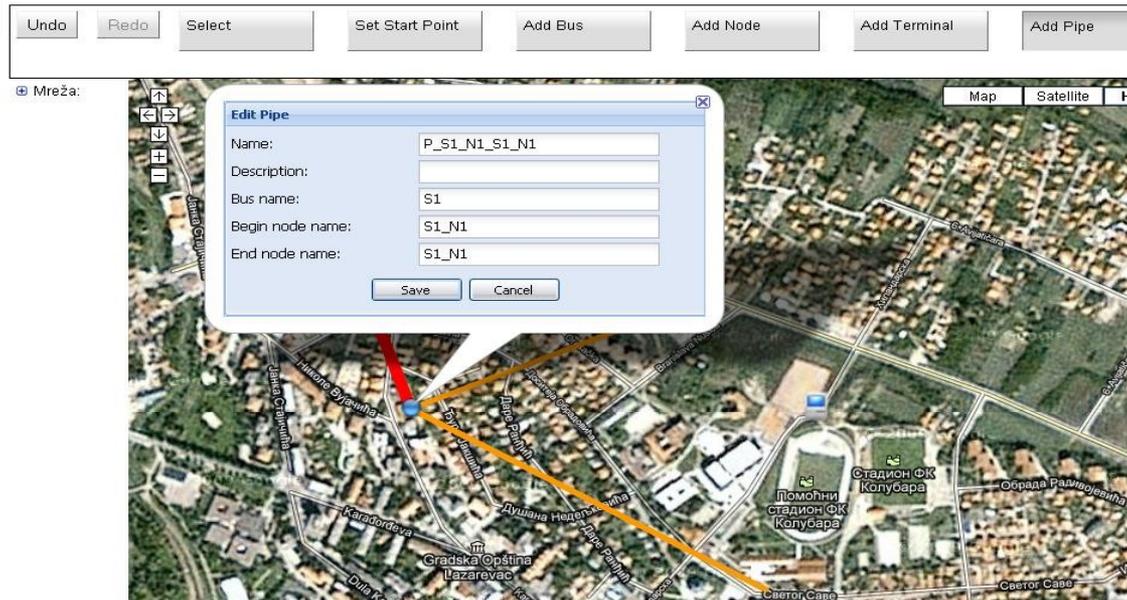
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Info:



The pilot project: The district heating system of Lazarevac town

- Currently serves 4000 inhabitants
- Optical network is used for communication





Other applications

- Monitoring and control system for building energy management, heating and cooling systems for hospitals, buildings...
- Utilizing external information for efficient energy management (intervals of cheaper electricity, weather forecast...)
- Enabling remote monitoring of the system by maintaining service company



Questions? Comments?



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