University of Belgrade, Serbia Innovation Center Store of Electrical Engineering (ETF) ProSense, European FP7 Project PROSENSE

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,

rosense Gateway Client					
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/localhost:8080/					
The Prosense Common Gateway					
T Satellite Hybrid	Discovery Search Results Registration				
C → Retrort Contractor Contra	Register network				
	Network Name: test network 1				
	Network URL: networktest01				
	Network Description: lest mreza 1				
TOTAL TOTAL STATE	SN 01(Test Sensor 1)				
	Register Sensor Clear				
	Sensor Internal Id:				
	Sensor Description:				
	Sensor Type: BasicHumiditySensor				
Бранкова	Properties:				
Brankov most Brankov most	Measure of humidity:				
imagery ezemy, vigitationolog, General, man varia exercite currents i comologice da barries e	Location of sensor: Place On Map				

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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



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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

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> 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





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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 PROSENSE SME Workshop Ljubljana, May 20, 2010
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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:

using data mining algorithms





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- Currently serves 4000 habitants
- Optical network is used for

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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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