OGC Sensor Observation Service

and its Application in Practice

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Open Source GEO Software

Topics:
- Sensor Web Enablement
- GeoProcessing
- Linked (GEO)Data
- ...

OGC standardization
- SOS 2.0
- WPS 2.0

Commercial & Academic Shareholders ...
Sensor Observation Service (SOS)

- Web service optimized for **time series** data

- Based on well-defined data models:
  - Observations & Measurements (O&M)
  - SensorML

- SOS interface has well-defined *temporal, spatial, and thematic* filters for **near realtime** environmental data

- **OGC** standard (version 2.0)

**INSPIRE**
Data Specification on Environmental Monitoring

soon to be brought into INSPIRE...
Feature of Interest

Observed Property := “temperature”

Procedure

Phenomenon Time

Result

6.3.2013 9:15

11°C

Observation

Observations & Measurements
Sensor Observation Service

Service Metadata  GetCapabilities

SensorML  RegisterSensor

O&M  DescribeSensor

GML Features  InsertObservation

GetObservation  GetFeatureOfInterest
Case 1:

European Air Quality Sensor Network
European Environment Agency (EEA)

- *Collection, coordination* and *dissemination* of environmental data and information
- ~ 1,500 air quality stations (measuring O3, CO, …)
- > 1,000,000 observations for 30 days

Problem: Proprietary AirQuality Reporting

Annual Air quality Reporting
- Proprietary formats (CSV, XLS)
- FTP / HTTP

Data Consumers

Member State Env. Agencies

Application-specific Interfaces

ArcGIS Server based Infrastructure

EEA
Approach

Member State Env. Agencies → SOS Interface ← ArcGIS Server based Infrastructure → EEA

Data Consumers

EEA

ArcGIS Server

SOS Interface
52°North SOS Implementation

- SOS Extension for ArcGIS Server
  - Supports SOS standard version: 2.0
  - Flexible DB support, since based on ArcGIS Server + ArcSDE
Case 2:

Hydro / Met Sensor Network in Germany
• **Service Centre IT** of the **Federal Ministry**
  of Transport, Building and Urban Development

• Administered sensor networks:
  
  – Water gauges / Weather stations: ~1,600 sites
  – Groundwater monitoring stations: >10,000 sites
  – Waterway structure monitoring (e.g. locks): >1,000 sites

• Data provision via:
  
  Sensor Observation Service
DLZ-IT – SOS

Choose data source

Dataprovider

PEGELONLINE

- Abfluss
- Chlorid
- Elektrische Leitfähigkeit
- Lufttemperatur
- ph_Wert
- Sauerstoffgehalt
- Wasserstand
- Wassertemperatur
- Windgeschwindigkeit

Search for time series

52°North – Dr. Arne Bröring, ECMWF, 6th March 2013
SOS Client
**SOS Client**

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**52°North SOS Implementation**

- **52n Standalone SOS**
  - Supported SOS standard versions: 1.0 + 2.0
  - Flexible DB support, since based on Hibernate
    (e.g. PostGIS, Oracle Spatial)
Conclusions & Outlook

• Sensor Observation Service
  – Efficient & interoperable exchange of near real-time data

  – 2 implementations @ 52°North:
    • ArcGIS Server based
    • Standalone

http://52north.org/arcgisServerSOS
http://52north.org/sos

• INSPIRE compliance:
  – O&M is already part of INSPIRE Data Specification for Environmental Data
  – SOS is in discussion
Questions?

Thank you!

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