Agenda

- 52° North
- Web Processing Service
- Projects
- Outlook
52° NORTH
Network

- Principal Partners
  - Institute for Geoinformatics (Germany)
  - ESRI Inc. (USA)
  - con terra GmbH (Germany)
  - International Institute for Geo-Information Science and Earth Observation, ITC (Netherlands)

- Associate Partners
  - Austrian Institute for Technologie, AIT (Austria)
  - Bundesanstalt für Wasserbau (Germany)
  - Kister AG (Germany)
Company

- **Mission**
  - promote conception, development and application of open source geo-software for research and practical use

- **52° North Initiative for Geospatial Open Source Software GmbH**
  - non-profit (!)
  - source management (source repositories)
  - license management (GNU GPL / dual licensing)
  - communication platform (website, mailinglists)
  - public relations (newsletter, events)
Activities

- Research
  - concept development and validation
  - scientific publications

- Development
  - reference implementations (proof-of-concept)
  - customer-specific solutions

- Standards
  - contributions to standardization process

- Open Source Software (GNU GPL)
Communities

- Sensor Web Community
- Security & Geo-RM Community
- Geoprocessing Community
- ILWIS Community
WEB PROCESSING SERVICE
Introduction

- OGC Standard since late 2007 (Version 1.0.0)
- Standardized service interface to publish and perform geospatial processes over the web
Example

Geometry

Distance

20

WPS

Buffer

Process 1

Process n

52north
exploring horizons
52° North WPS

- General Features and Compliance
  - full java-based open source implementation
  - build up on robust libraries (jts, geotools, xmlbeans)
  - supports all features and operations of WPS 1.0.0
  - pluggable framework for algorithms and XML data handling
  - supports raw data parsers
  - supports full logging of service activities
    - supports exception handling according to the specification
    - storing of execution results on the server
52° North WPS

- Service Invocation
  - supports synchronous & asynchronous service invocation
  - HTTP-GET for Execute operation
  - supports SOAP & exposes a WSDL document

- Supported Datatypes
  - GeoTIFF support
  - ArcGrid support
  - GML2 support for ComplexData
52° North WPS

- Extensions
  - integrate 220+ Sextante processes
  - distributed and parallel computing
    - UNICORE middleware
    - GridGain framework
  - web-based GUI to maintain the service
  - ArcGIS Server connector *new*
  - GrassGIS connector *new*
Architecture
package org.n52.wps.server;

import java.util.List;

public interface IAlgorithm {
    Map<String, IData> run(Map<String, List<IData>> inputData);
    /* ... */
}

Jump
uDig
OpenLayers
PROJECTS
OWS-6 (Debris Flow Monitoring)
A typical layout of a fixed monitoring station.

**OWS-6 (Debris Flow Monitoring)**
OWS-6 (Debris Flow Monitoring)
OWS-6 (Plume Dispersion)

- Airport Desaster Scenario
OWS-7

- WPS FSA (Feature and Statistical Analysis)
  - Use Case
    - Haiti Emergency Management
  - Implementation
    - geostatistic, topology and vector analysis algorithms
    - topology und vector analysis based on Sextante
    - geostatistic analysis based on ArcGIS Server
  - Engineering Report (ER)
    - WPS Profiling ER (lat/lon & Institute for Geoinformatics)
    - WPS Feature and Statistical Analysis ER (Institute for Geoinformatics)
ETC-LUSI

- Utilization of 52° North WPS
  - processing of professional EEA landuse models for landuse data in geoportal for professional and lay users
GITEWS

- German Indonesian Tsunami Early Warning System
  - project studies and implementation of
    - Sensor Data Center which provides data for the control center
    - interoperable decision support components (WPS)
SLA4D-GRID

- Service Level Agreements for D-Grid
  - funded by German Federal Ministry of Education and Research (BMBF)
  - from 06/2009 until 05/2012
  - D-Grid is the Germany's national grid computing infrastructure
  - designing and realising a SLA-layer for the D-Grid
    - service and resource usage under given guarantees, quality-of-service requirements and pre-defined business conditions
SLA4D-GRID

Negotiation

CPU: 2 x 2 GHz
Memory: 2 Gbyte
Storage: 10 Gbyte
From: 2009-09-30 11:00 AM
To: 2009-10-02 11:00 AM
Costs: 19,20 €

SLA

SLA Layer

Resource Management

Grid Middleware

WPS

+ DATA

SLA
OUTLOOK
Cloud Computing

- We already …
  - deployed the WPS in Google Cloud (Google App Engine)
  - deployed the WPS in Amazon Cloud (Amzon Web Services)
  - run performance tests

- We now focus on …
  - Hybrid Cloud (Private Cloud + Public Cloud)
Hybrid Cloud (Motivation)

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Hybrid Cloud (Use Case)
Experimental

- **WPS-T**
  - transactional profile of WPS
  - based on OGC Discussion Paper (Bastian Schäffer)

- **WPS and R**
  - wrapping the R framework

- **WPS and FME**
  - wrapping the Feature Manipulation Engine (FME)

- **WPS and GPU**
  - utilizing the GPU for processing

- (...)
More Information

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Thank you for your time!

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