PRACTICAL INTRODUCTION TO SPATIAL DATA INTEGRATOR POWERED BY TALEND

Francois Prunayre

ABSTRACT

Spatial Data Integrator (SDI) is an ETL tool with geospatial capabilities. Based on Talend Open Studio (TOS), Talend's generic Extract/Transform/Load (ETL) solution, it includes specific geospatial components.

Likewise regular TOS components, there are basically three sorts of Geo components: input, output and transform components. Input and output components read and write common GIS formats (Mif/Mid, Shapefile, PostGIS, GeoRSS, ...). Transform components read features from their input flows, possibly transform those features, and write features to their output flows. The term "transform" is to be taken loosely here as it represents any sort of operation (eg. buffer, centroid, area, simplify, convexhull operations).

SDI is based on JTS and GeoTools Java library and also have capabilities to interact with geonames.org webservices and GeoNetwork opensource metadata catalogue.

This workshop teaches the basics of using SDI for beginners. Attendees will learn how to:

• install SDI;

• create new process using the job designer;

• use metadata to build easily new jobs;

• use most useful components (how to map, sort and filter data?);

• discover geospatial components;

The workshop starts with a history of Talend Open Studio and Spatial Data Integrator, and then moves quickly to hands-on exercises in setting up and using SDI. Attendees receive a full workbook, sample data, and software CDROM, so they can review the material later at their own pace.

Website : http://spatialdataintegrator.org

Presentation : http://www.foss4g2007.org/presentations/view.php?abstract_id=227

LABS

WORKING WITH GEOSERVER

Justin Deoliveira and Chris Holmes

ABSTRACT

This workshop provides a hands-on introduction to GeoServer. Attendees will be given a comprehensive introduction to the GeoServer platform, going from installation to advanced features.

The first half of the workshop will target beginners. Tasks covered will include installation, data and style setup, base map creation, and map previewing.

The second half will focus on some of the more advanced GeoServer features. This includes working with templates for customizing data presentation, viewing and manipulating data with KML and Google Earth, tile caching with GeoWebCache, and WFS editing with OpenLayers.

Time permitting some topics that may be covered include versioning functionality with WFS, and optimizing image creation with WMS.

LABS

PRACTICAL INTRODUCTION TO THE MAPFISH WEB-MAPPING FRAMEWORK

Eric Lemoine

ABSTRACT

MapFish is an open-source development toolkit for building web-mapping applications. MapFish is composed of two parts: MapFish Client, based on OpenLayers and Ext, and MapFish Server, based on the Pylons web development framework. This lab is about getting started with the usage of MapFish Client components.

LABS

INTRODUCTION TO THE 52°NORTH
WEB PROCESSING SERVICE

Bastian Schaeffer

ABSTRACT

The Open Source Software Initiative 52°North provides services and applications that enable standardized and distributed geoprocessing on the web. An open standard based - e.g. an Open Geospatial Consortium (OGC) based - SDI mostly supports the retrieval and visualization of data through web services. Data processing is usually performed by humans with more or less proprietary and monolithic Geo Information Systems (GIS). With growing network capacity and processing power, it became feasible to integrate stand-alone geoprocessing applications and their expert functionality into a web service environment and therefore enable web services to execute geoprocessing tasks. The OGC Web Processing Service (WPS), which became an official standard in mid 2007, is a major attempt to address this issue in a standardized way. The WPS interface specification defines a standardized way to publish and perform geospatial processes over the web and therefore fosters interoperability. Such a process can range from a simple geometric calculation (e.g. a simple intersect operation) to a complex simulation process (e.g. a global climate change model). However, the intrinsic complexity of geodata often requires the use of several processing steps to address a given problem. Thus, to automate whole business processes and form value-added chains, orchestrated geoprocessing workflows have to be built.

Workshop Contents

After a solid introduction to the basic concepts of standardized geoprocessing, the participants will set up a scenario installation of the different 52°North geoprocessing components. With the help of these free components, a common geoprocessing problem will be solved.

The workshop attendees might hand in one of their example data sets or processes to the workshop organizer in advance. The workshop organizer will choose one of the processes and datasets and apply them during the workshop.

Setting up the scenario implies:

- download the 52°North WPS

- install and configure the 52°North WPS

- add a predefined process

- execute the new WPS process in uDig

After successful execution of the processes in uDig, it will be explained how to export the process results to GoogleEarth.

LABS

MAPWINDOW GIS LAB - INTRODUCTION TO CUSTOM GIS APPLICATION DEVELOPMENT FOR WINDOWS

Brian Marchionni and Ted Dunsford

ABSTRACT

The open source MapWindow GIS project (http://www.MapWindow.org) is both a desktop GIS application and set of programmable mapping components. The desktop GIS application is an easy to use data visualization and editing tool while the mapping components fill a critical niche need for open source GIS development tools specifically intended for the Windows operating system and developers using the Microsoft .NET Framework.

With more than 6,000 downloads per month and several thousand registered users since becoming open source in January 2005, MapWindow GIS is rapidly becoming adapted throughout the world for uses in academia, government, and business where there is a need for simple, open source GIS development tools.

This hands-on workshop will focus on the development of custom GIS applications using the MapWinGIS ActiveX component in Visual Studio 2005. (C# and VB.NET languages) It will cover installing the mapping components, adding them to an application and integrating their functionality. Members of the core MapWindow GIS Open Source Team will present the lab and participation is welcome from any and all current and future MapWindow GIS users.

LABS

PRACTICAL INTRODUCTION INTO 52°NORTH'S SENSOR OBSERVATION SERVICE

Christoph Stasch

ABSTRACT

The OGC Sensor Web Enablement initiative aims at providing an architecture for the integration of sensor data into spatial data infrastructures consisting of OGC conform implementations like WMS, WCS or WFS. It comprises the definition of services for accessing sensor data (Sensor Observation Service - SOS), alerting (Sensor Alert Service - SAS) and controlling/tasking sensors (Sensor Planning Service - SPS).

52°North is an open source initiative founded in Muenster, Germany, which provides prototypes as well as stable reference implementations of OGC standards. The 52°North SWE framework consists of robust and quality assured implementations of the SWE service specifications.

The 52°North Sensor Observation Service (SOS) is one of the central components of the 52°North SWE framework as it provides web based access to sensor observations as well as to detailed metadata of the sensors. It is able to handle data of stationary and mobile sensor data and of different types (like video streams or simple scalar measurements). By implementing the transactional profile of the OGC SOS specification, the 52°North SOS also offers the possibility to register new sensors to it or insert new sensor observations into it. The implementation is based on Java, XmlBeans and PostGIS.

The lab will present the current 52°North SOS implementation, starting with a short introduction into the OGC SWE framework and the OGC SOS implementation specification. Afterwards features, the architecture, source code excerpts and the deployment process of the 52°North SOS implementation will be presented. The participants will be involved in the lab through testing the SOS functionalities using a simple thin client which allows sending raw XML requests to the SOS. The lab will end with an overview of current research and implementation work of the 52°North SWE community.

LABS

GENERATING END-TO-END WEB MAPPING APPLICATIONS WITH GEGIS

Jan de Moerloose

ABSTRACT

At the end of this workshop you have a working web mapping GIS application on your desktop, so you can experiment with the server side configuration and test the browser generated content to edit the provided datasets.

geGIS (http://www.gegis.org) is an instant web mapping application generator. Web mapping applications are running on top of open-source Majas technology while the generator is a Udig custom application.

In this workshop we will show how a non-skilled end-user can easily generate a custom web mapping application in a couple of minutes through a plug-and-play configuration process. The generated applications are a mixture of a Java back-end and our own thin-client solution based on the Dojo toolkit.

In the first part of the workshop we will show how to produce a standard geGIS application by assembling layers and configuring maps from a variety of data sources (shapes, geo-database, WFS, WMS). Configuration, styling and filtering of both vector (rendered by SVG/VML) and raster layers will be handled. Concepts like tools and actions, the dynamic toolbar and the configurable layer tree will be explained in detail. Some standard modules like feature table representation and advanced attribute searching capabilities will be demonstrated.

The second part of the workshop will focus on the editing capabilities of geGIS and the ability to use complex domain models and relationships between features. Relationships include both one-to-one, one-to-many, many-to-many as well as inheritance and allow to build and manage rich feature models.

Finally, the workshop will shed some more light on the modular nature of geGIS. geGIS will be presented as a framework for which developers can write custom modules that can be seamlessly plugged into the Dojo container model and benefit from the rich API at both front and back end. One of the more interesting real-world use cases is a combination geGIS with the .NET framework.

User level : Beginner

LABS

CREATING MAPGUIDE MAPS WITH STYLE

Robert Bray (presented by Tom Fukushima)

ABSTRACT

MapGuide Open Source 2.0 introduces a new symbolization engine that allows users to define custom libraries of dynamic, expression driven symbols for everything from highway shields to utility network symbology. This 90 minute lab provides an overview of the new XML symbol formats and shows participants how to define symbols in XML format and use them to stylize feature data in MapGuide. In the lab participants will create a small symbol library and use the symbols for styling points, lines, and labels in MapGuide. Upon completion of the lab participants will have a concrete understanding of how to take advantage of the new cartographic capabilities of MapGuide and all the techniques they need to get starting building their own symbol libraries.

LABS

PRACTICAL INTRODUCTION TO ORBISGIS

Erwan Bocher, Thomas Leduc and Fernando González Cortés

ABSTRACT

OrbisGIS is a Geographic Information System (GIS) dedicated to the scientific modeling and simulation. OrbisGIS is developed at IRSTV (Research Institute on Urban Sciences and Technics, CNRS/FR-2488) in the context of the Urban Data Federative Research Project. This project has to do with Urban GIS : tools and methods for the spatial analysis of the urban environment.

OrbisGIS is a part of a more global Spatial Data Infrastructure. It is a mandatory component to anyone who needs to process spatial data (create, update, process and model) or visualize them. Based on robust and wellknown open source libraries such as JTS (Java Topologie Suite) and ImageJ, it provides the ability to visualize and process in 2D vector and/or raster data. Those both data types may be stored in a flat file or remote DataBase Management System.

The OrbisGIS workshop will introduce to some basics concepts and uses of the platform. User will learn how:

- to use with OrbisGIS user interface : create a workspace, customize the UI and load flat files,

- to deal with style and create simple and complex thematic maps,

- to use the SQL query language to manipulate vector and raster data.

LABS

RASTER PROCESSING AND PREPARATION WITH GDAL

Frank Warmerdam and Mateusz Loskot

ABSTRACT

A practical tutorial on processing and preparing raster data for visualization or futher analysis. Exercises will include:

- Exploring your image data

- Format translation

- Optimizing data for MapServer/MapGuide/etc

- Rescaling

- Mosaicing

- Reprojection

- Using virtual files.

Most exercises will be performed using GDAL command line utility programs, with a final exercise demonstrating Python scripting for specialized processing. It is intended that the workshop would be useful for anyone needing to prepare raster data for use in packages such as MapServer, MapGuide, QGIS, GRASS, OSSIM or proprietary GIS and imaging applications.

LABS

CONFIGURATION OF DEEGREE WEB SERVICES WITH AN OPENJUMP BASED CONFIGURATIONTOOL

Judit Mays and Jens Fitzke

ABSTRACT

The new deegree Configuration Tool supplies a graphical user interface which is embedded as a plug-in into OpenJUMP to configure the main Web Services of the deegree service family. It allows for map based publishing of geospatial data in a Web Map Service (WMS), as well as providing data access to services like Web Feature Service (WFS) or Web Coverage Service (WCS). Geospatial data can be loaded, edited and styled to be published on a deegree WMS, WFS, or WCS in an instance.

The Configuration Tool can be used in a variety of ways. The options can be roughly grouped into three types. There are options to manage local services, options to manage remote services, and admin functions for a remote service. This 3 hour workshop will treat all of these three aspects.

The most straightforward functions of the Configuration Tool are to edit already existing deegree web services, but it is also possible to create new web services.

In a first step, participants will load layers from a WMS, edit a few features, change some styling information and write these changes back to the WMS. They will also learn how to load data from ShapeFiles or from a database and publish it in a WFS. Another possible use for the Configuration Tool is to create new web services. They come with predefined configuration files, and the participants will learn how to edit the service metadata of all the service types. Adding new feature types and layers is just as easy as for existing services. Even though there are some differences in the work flow, both local and remote access are possible and will be demonstrated.

When using the Configuration Tool together with the Configuration Service, more features become available. Defined web service instances can be started and stopped and a user management is included to enable multi-user service administration environments. The tool can be supervised technically by an administrator and used by GIS experts.

Participants will learn how the tool can be incorporated to set up a new SDI, where a group of people can cooperate in adding, editing and revising feature types, layers and coverages of deegree web services, all in a remote infrastructure.

The complete deegree Configuration Tool provides the participants of the workshop with a desktop based tool to publish GIS resources via standardised interfaces within no time.

LABS

EXTENDING THE FUNCTIONALITY OF QGIS WITH PYTHON PLUGINS

Marco Hugentobler, Horst Düster and Tim Sutton

ABSTRACT

The topic of this workshop is the extension of QGIS with Python scripting language. The QGIS program, although written in C++, provides Python bindings (PyQGIS), including the possibility to write plugins in Python. The main part of this workshop is the programing of a basic example plugin that provides a good starting point into the PyQGIS world.

LABS

PRACTICAL INTRODUCTION TO FUSION

Michael Robert Adair and Julian-Samuel Lacroix

ABSTRACT

Fusion is a web-mapping application development framework. It allows non-spatial web developers to build rich mapping applications quickly and easily. Using widgets, developers are able to add, remove, or modify functionality using standard-compliant HTML and CSS. Fusion does not require any proprietary browser plug-ins and works in all the major browsers on Windows, Mac, and Linux.

Fusion initially provides support for MapGuide Open Source and MapServer web mapping architectures, but it incorporates the OpenLayers client API so Fusion can be extended to use any server technology supported by OpenLayers.

This workshop will cover a range of topics starting with the basics - dowload, install and configure Fusion - to more advanced usage - customizing your application and creating custom widgets.

The target audience for this workshop are those tasked with implementing applications and have a basic understanding of HTML, CSS, XML and JavaScript.

LABS

A PRACTICAL INTRODUCTION TO BIRDEYE:
A GEOVISUALIZATION TOOLKIT

Jason Bellone

ABSTRACT

BirdEye is a free and open source geovisualization toolkit developed by the United Nations, Centre for Advanced Visual Analytics . BirdEye was designed to meet the needs of the UN in analyzing and presenting geospatial data. Based on the experience of developing and using the tool, BirdEye will be released as a free and open source software for community use, specifically to offer an advanced geovisualization capability to developing nations.

The purpose of the workshop is to offer guided hands-on tutorials on the development of a complete web-based geovisualization interface using BirdEye.

LABS

INTEGRATION OF ACCESS CONTROLLED OGC WEB SERVICES IN IDENTITY FEDERATION SYSTEMS BASED ON 52°NORTH SECURITY SOLUTIONS AND OPENSSO

Marko Reiprecht

ABSTRACT

The Open Source Software Initiative 52°North (http://www.52north.org) provides services and applications that enable OGC web service providers to protect their services from unrestricted access. One of the building blocks of this security system is the currently evolving Gatekeeper Service, which is a SOAP based alternative to 52°North's Web Security Service (WSS). The SOAP-binding enables the service to make use of the OASIS standard WS-Security to enforce security policies. This capability is the core functionality used to integrate OGC web services in mainstream identity federation systems.

The Open Web SSO project (OpenSSO, https://opensso.dev.java.net) provides core identity services to simplify the implementation of a transparent single sign-on (SSO) mechanism in a network infrastructure. The OpenSSO project is based on the code base of the Sun JavaTM System Access Manager, a core identity infrastructure product offered by Sun Microsystems. With the core services of OpenSSO you can build an identity federation system, which enables different domains to share identities in a secure and privacy protecting way. This means, users who were authenticated within a particular domain might be able to seamlessly access 3rd party services without re-authentication.

Enabling OGC web services or geo-applications to join identity federations is a major step towards mainstreaming Geo-IT approaches. e.g. it allows you to connect workflows from the geo domain (like finding a cinema close to you) with workflows of other domains (like reserving movie tickets). The workshop will show how OGC web services can (a) be protected by the 52°North Gatekeeper Service and (b) integrated into an identity federation, by applying the OASIS SAML 2 standard.

After a brief introduction into the basic concepts of Identity Federation, SAML 2 and the 52°North security system solution, the participants will set up a scenario installation which provides identity shared access to a Web Map Service (WMS). Setting up the scenario implies - Installation of an Identity Federation System (pre-configured on a life cd or on the lab computers)

The sample identity federation system will consist of three entities, one identity provider and two service providers. Each entity will have its own identity management and therefore they can act independently on the market. One of the service providers (SP-A) acts as geo content provider and will host an OGC-WMS which is protected by the Gatekeeper Service. The other service provider (SP-B) acts as a geo application provider and hosts a web mapping application, which is able to display maps dynamically from other service providers. The business case which shall be shown is that a user which is customer on SP-A and SP-B can federated his two identities with the help of the identity provider, thus he is able to load the content of the OGC-WMS of SP-A in the mapping application of SP-B without offering any security credentials to SP-B, what can be called privacy protecting single sign on.

- Deployment and configuration of the Gatekeeper Service of SP-A on Apache Tomcat.

- Deployment and configuration of the mapping application of SP-B on Apache Tomcat.

After successful deployment and installation of all services the system will be tested by applying them in a pre-defined scenario. During the tests it will be shown how single-sign-on at the web application level and the web service level can be realized. It will be demonstrated that users who are authenticated in one domain can seamlessly access services which are hosted and controlled within another identity domain.

LABS

USING AND EXTENDING ILWIS OPEN SOURCE GIS SOFTWARE TOGETHER WITH GEONETCAST SERVICES FOR WEB-BASED SATELLITE IMAGE ANALYSIS

Rob Lemmens and Martin Lucien Schouwenburg

ABSTRACT

The objective of this lab is to provide participants (both GIS users and programmers) a hands-on insight into the power of combining functionality of a user-friendly and highly functional GIS software with remote geo-webservices. Our GIS software is the ILWIS software which has been developed over 15 years by ITC as closed source software and has a large user community in developing countries, but recently has been migrated to open source software. Our remote geo-webservices are OGC based Web Map Services and data streams from GEONETcast, a near real time, global network of satellite-based data dissemination systems.

The Integrated Land and Water Information System (ILWIS, http://52north.org/ilwis) is a PC-based GIS & Remote Sensing software. ILWIS comprises a complete package of image processing, spatial analysis and digital mapping. It is easy to learn and use; it has full on-line help, extensive tutorials for direct use in courses and 25 case studies of various disciplines. ILWIS has established a wide user community over the years of its development.

Recent project efforts have migrated ILWIS into a modular, plug-in-based software, and provide web-service support for OGC-based web mapping and processing.

The core objective of the ILWIS Open source project is to gradually provide a maintainable framework for researchers and software developers to implement up-to-date training components, scientific toolboxes and (web-) service implementations used in student projects, research and consulting projects. The development of this framework is done since 2007 in the context of 52°North (http://52north.org/).

GEONETCast, as part of the emerging Global Earth Observation System of Systems (GEOSS), is designed to put essential environmental data at the fingertips of users around the globe. This user-friendly and low-cost information dissemination provides global information as a basis for decision-making in a number of critical areas, including public health, energy, agriculture, weather, water, climate, natural disasters and ecosystems.

The proposed lab will guide the participant step-by-step through a specific use case in the theme of water security in Ghana. The lab will consist of the following hands-on tutorial parts:

1. Introduction into the core functionality of the ILWIS software

2. Using GEONETcast data

3. (Web-based) satellite image processing with ILWIS

4. Integrated satellite image analysis with remote webservices

5. Extending software functionality by building your own plug-ins

LABS

MAPPING OF INFORMATION,
A MUST FOR DEVELOPMENT

Mark de Blois

ABSTRACT

In order to create a platform to facilitate the drive of localization of Google products we at Google are committed to continually improving the base maps used in our mapping products and the information which they contain, in association with our partners. In our presentation we have highlighted the latest developments in Google's mapping services. In order to find out and experience for yourselves in real life how our mapping services can serve your needs we have organised a 'hands on' workshop which lets you work with all the tools we have presented, with a strong emphasis on user contribution of data.

The workshop will deal with the following (but may be expanded):

- Creating and online sharing of data through MyMaps

- Collaborative online mapping through a spreadsheet

- Working with GIS data in Google Earth

- Embedding Google Maps into your website using API

LABS

THERE AND BACK AGAIN. USING UDIG TO PERFORM REAL-WORLD TASKS

Jesse Eichar

ABSTRACT

Are you feeling restricted by the browser window? Are Rich Internet Applications leaving you lost in a cloud? Attend this workshop and bring the power of the desktop to open source GIS experience.

This workshop is an introduction to the User-friendly Desktop Internet GIS (uDig) application.

Topics covered will include

- Constructing maps from local and web-based sources.

- Editing the vector data.

- Feature Buffering and layer intersection

- styling basics (powered by the Style Layer Descriptor standard)

- Copying data between services, for example copying features between shapefiles, Web Feature Servers and PostGIS

LABS

SUPPORTING SUSTAINABLE DEVELOPMENT: THE GRASS OPPORTUNITY

Massimiliano Cannata and Maria Antonia Brovelli

ABSTRACT

Development should be sustainable: it should meet the needs of the present without compromising the ability of future generations to meet their own needs. The GRASS GIS, thanks to its powerful modules and flexible environment, can be a valuable tool to provide useful information to decision makers for promoting successful sustainable developing policies.

Two relevant examples will be particularly addressed in this workshop: solar energy and risk analysis.

Energy is becoming one of the most crucial problems. Estimating potential solar energy power can evaluate the suitability and the expected advantages of photovoltaic installations enhancing energy planning policy.

Natural hazards risk assessment is fundamental to investigate the expected damages and fatalities. The results of this analysis are essential to make decisions on which mitigation options have to be applied in environmental management.

In the fist part of the workshop the basic commands and procedures to manage a GRASS GIS project are presented: project settings, data import, visualization, etc. This part is substantially intended to allow also new GRASS users to profitable attend the specific environmental section.

Then in the second part we will show how to estimate the quantity of potential solar energy that could be produced with solar panels using as input information the territory morphology and the characteristics of building roofs obtainable from LiDAR (Light Detection and Ranging) Digital Surface Models and Digital Terrain Models. LiDAR is a relative recent airborne technology suitable for producing high resolution models of the bare Earth and of the attached/detached objects (buildings, trees,..). LiDAR products are nowadays increasing their spreading due to the efficiency in collecting such a kind of high accuracy data. In GRASS are available commands to process raw LiDAR data to compute the previously mentioned models. Moreover commands to compute the solar irradiation are available. In the workshop an actual example will be carried out.

The second example that will be presented is the case of risk assessment due to tsunami events: hazard, vulnerability and expected damages maps will be computed for a specific case study area.

We will apply a procedure, already illustrated in the FOSS4G2006 conference, and then improved, that allows the estimation of the maximum vertical height of the tsunami waves hitting the coast (run-up) and the subsequent diffusion over the inland areas, as a function of the morphology, the vegetation, and the urbanization of the coastal area. We will use those results to estimate hazard (where, how often and with what intensity do events occur) due to different return period events, associated exposition (where the elements at risk are located and what is their value) and vulnerability (what is the extent of damage at a given event intensity). Using those information we will be able to assess and map the potential negative impacts (risk map) for a specific due to tsunami hazard for the case study area.

LABS