



OpenDAP configuration course

Fedor Baart

July 8, 2009(revision 646)



1 Introduction

2 Overview

3 Architecture

4 Components

5 Hyrax

- Backend server

- Backend configuration

- Run

6 Frontend

7 NetCDF

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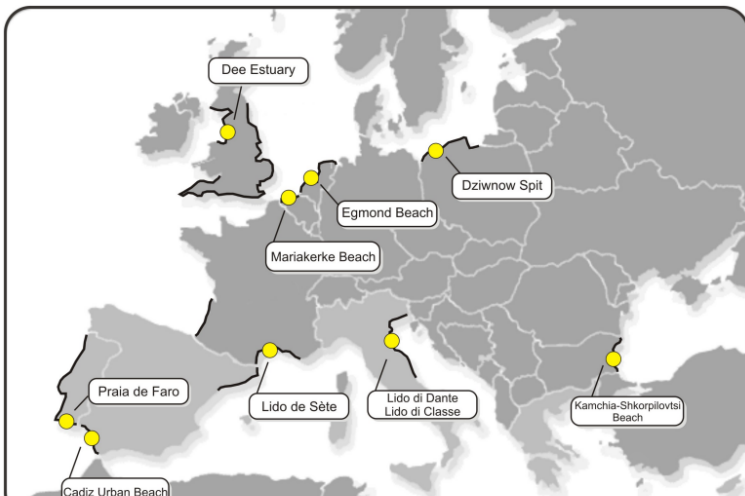
Time schedule

- 13:00 - 13:30 Project overview
- 13:30 - 14:00 System architecture
- 14:00 - 14:45 System setup exercise
- 14:45 - 15:00 Coffee break
- 15:00 - 15:30 NetCDF introduction
- 15:30 - 16:15 Configuration exercise
- 16:15 - 17:00 Tweaking

Projects using OpenDAP

- MICORE
- BwN
- Matroos

MICORE



MICORE

June 2008 - June 2011

- Historical storms (UALG, PT)
- Data standards (TUD, NL)
- Site monitoring (BRGM, FR)
- Modelling (Deltares, NL)
- Warning system (IMDC, BE)
- Dissemination (SGSS, IT)
- Project management (CFR Ufe, IT)

Building with Nature

Building with Nature is an innovative, long-term research programme aimed at developing new design concepts for the layout and sustainable exploitation of river, coastal and delta areas. Its special feature is the synergy and cooperation that will allow natural ecosystems and human intervention to reinforce each other. Ecology and technology are involved at all phases of a project: design, assessment, selection, construction and management. The primary goal is ecologically, technically and socially sustainable development.

Building with Nature Partners

- Boskalis
- Van Oord
- IHC Merwede
- Deltares
- IMARES
- SHELL
- Witteveen + Bos
- DHV
- Royal Haskoning

Matroos

MATROOS stands for Multifunctional Access Tool foR Operational Oceandata Services. MATROOS gives you easily access using your internet browser to all recent and historical model and monitoring data relevant to the storm surge forecasts. MATROOS offers also the facility of an international near-real time multi-model forecast analysis: water level forecasting data and weather forecasting data from the NOOS partners around the North Sea can be intercompared.

Process

Data availability workflow

Extract

Transform

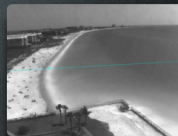
Load

Provide

Extract

Extract

- Connect to other data sources
- Measurements
- Results from other models

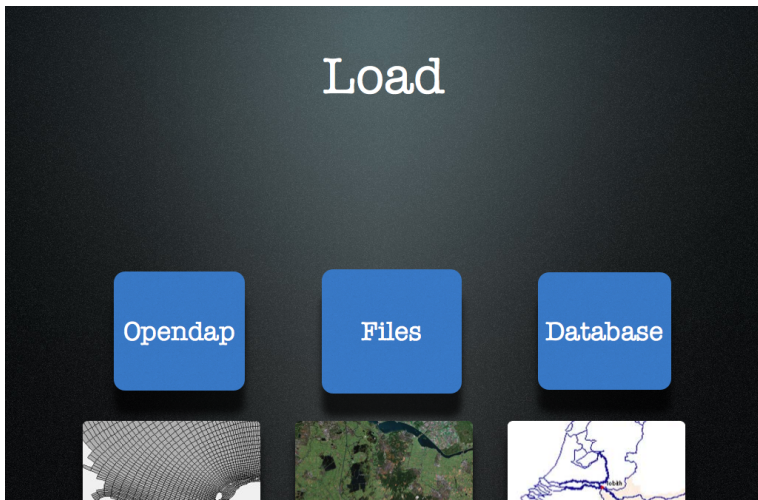


Transform

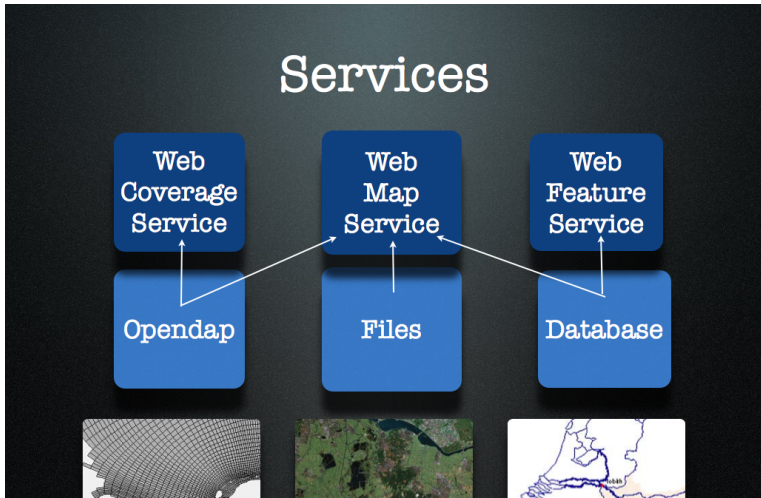
Required information

- What
- Where
- When
- How much

Load



Services



Provide

Provide

Web Coverage Service
Opendap

Web Map Service
Files

Web Feature Service
Database

Extract

Software

- *Subversion* provides version history, logging, changesets and filesystem storage for the raw data. The [subversion server](#) comes with the command line client.
- *Apache* provides [authentication and authorization](#). Provides [webdav](#) for drive mapping.

Hardware

- A *fileserver* is needed to store subversion repository. At Deltares we use [drbd](#) for high availability.
- *Backup* is needed to backup the repository.

Transform

Software

- *NetCDF* itself should be installed as a [library](#) (dll for windows). Extra tools like [nco](#) and [cdo](#) for altering and combining netCDF files and [gridspec-tools](#).
- *MatlabTM* is used for creating netCDF files from the raw data. Extra libraries required are [mexnc](#) and [OpenEarthTools](#).
- *Python* is also used for creating netCDF files. Extra libraries are [scipy](#) and [netcdf4-python](#)
- *Inspire* guidelines are used to adhere to the ISO19115/119 standards. Use the [editor](#) to fill in metadata.

Hardware

Just a computer which can do some calculations.

Load

Software

- *OpenDAP* server for giving access to generated netCDF files. We use [hyrax](#) and [thredds](#).
- *Tomcat* runs java web applications. It is quite easy to [setup](#).
- *Apache* runs as a reverse proxy in front of the tomcat, also again auth & auth.

Hardware

- *Fileserver* should host the netcdf files. This one should probably be inside the [DMZ](#). Use [t](#) to upload files.
- *Application server* should host the Tomcat application. On the same machine as the fileserver for performance.

Provide

Software

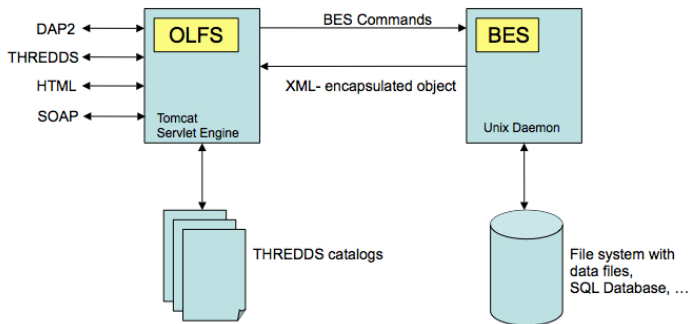
- *OpenEarthTools* contains a lot of matlab™ tools to work with the datasets.
- *Open Source GUI* tools for displaying and browsing netCDF files and opendap servers. Examples are [ncbrowse](#), [IDV](#), [netcdf-ui](#).
- *Geoserver* server for running OGC services. Also a Tomcat application.

Hardware

- *Application server* should host Tomcat application.

Hyrax

Hyrax Architecture





System setup exercise

→ `http://www.opendap.org`

→ download

→ hyrax



Downloading software

- download OLFS web archive
- download all rpm's below Linux CentOS 5.2 (i386)
- download tomcat 6



Extract rpms

Extract rpms

```
rpm2cpio filename.rpm | cpio -idmv
```



Copy & Change script

move to your home directory

```
mv usr etc var ~
```

→ Edit the besctl file to refer to ~ instead of /usr/bin



Edit the configuration so it refers to your home directory

edit configuration

```
emacs -nw ~/etc/bes.conf
```

Run the backend server

start bes

```
cd ~/usr/bin  
./besctl start
```

Create the directory ~/var/run

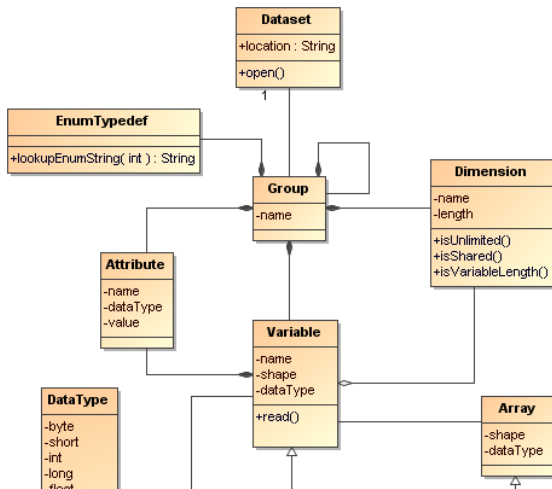
```
mkdir ~/var/run  
cd ~/usr/bin  
./besctl start
```

Extract tomcat server

Extract the java components of the server

```
tar -xzf apache-tomcat-6.tar.gz  
tar -xzf olfs-webapp.tgz
```

NetCDF Data Model



Extra exercise

- Setup thredds server (15min)
- Configure thredds server (45min)
- Security settings (30min)
- Look at url rewriting (30min)
- Caching (30min)
- Command line tools (30min)