Towards an OGC service infrastructure for meteorological workstation Meteo France current analysis

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Operational tools at Meteo-France

Toujours un temps d'avance

- At the present time, two main system: for three levels of forecast
- SYNERGIE
 - National and regional forecasting (metropolitan and overseas)
 - Worldwide usage outside of M-F
- OPPIDUM
 - Local departmental forecasting ("Prévi-Surveillance" application)
 - French usage outside of Meteo-France.
 ("Meteo+" application)
- Other operational tools
 - Same family of tools
 - Other tools for other needs





Client Interface and Services

- Visualisation interface
 - Currently each tool has its own interface
 - Currently each tool has its own display design
- Services
 - Currently each toll use its own services
 - Interfaces to the services no standardized
 - Common backbone: the databases observations, NWP and images
- Idea
 - Withdrawing multiple software maintenances for reducing the costs with:
 - Common services
 - For the data
 - For the processing
 - A unique visualization
 - Configurable
 - Using the last technologies



Target for the services

Target

- Objective: services sorted by importance
- Objective of Interoperability
- In the geographic domain: ISO TC 211 et OGC
- Objective: published inside and outside
- Objective: factorisation
- Objective: management of the SLA and IM
- Objective: clustering, service continuity, warm changes
- Objective: bounces between services (inside and outside)

Response: SOA

- Standards OGC
- Compliant INSPIRE
- Technical and organisational response
- Internal and DMZ
- Growths progressively



Target for the Client Interface

Target

- Technology
 - Taking into account the last technology
 - » No deployment
 - » Loose coupling with the operating system
 - Full Web with browser
 - Java Client downloaded easily (Java Webstart)
- Based on unified architecture
 - MF SOA
 - Plug and Play on others tools (Google, GIS)

Performances

- Central point
 - The forecaster can't wait in front of the screen
 - Better than the current requirements
- Use in different contexts
- Multi-plate-forms tools



Client Prototype

Client workstation

- Two client prototypes:
 - one Full Web (HTML and JavaScript)
 - a second in Java WebStart
- Our main tools can't be replaced by a full web response (performances)
- Our light standalone workstations possibly changed by a full web tool

Services compliant

- Business activity essentially on the server (unique possibility for the full web)
- Graphic activity on the server
- Network activity slowing down (an Arome plot shorter than an Arome Grib)



Candidate architecture

Services

- Loose coupling with the OS difficult to reach: choice of Linux 64 bits
- Re-use of bricks of the current software
- Use of ECMWF bricks
- Use of Open Source bricks:
 - PostgreSQL, PostGIS for the databases
 - GDAL, Proj4 for image processing
 - Mapserver : OGC services
- The two prototypes already use such a candidate architecture



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Services

Different levels of services

- Metadata access (catalogue)
- Data access
- Data processing
- Portrayal services
- Visualisation tool (eg SYNOPSIS, name of our future tool)
 - Interoperability for presentation and services catalogue
 - So: WMS (Web Map Service) et CSW (Web Catalog Service)

Attention !

- INSPIRE, interoperability also for data access and transformation
- So : WCS (Web Coverage Service) WFS (Web feature Service), WPS (Web processing Service)





General Architecture

• Key points :

- Data and Services catalogue (standard)
 - Dynamic discovery of data and services
- Message bus
 - Balancing charge (clustering)
 - Loose coupling between client and server
- Spatial database
 - Use of MapServer
- The clients use standard interfaces
 - Possibility to use external services (without guarantee of performances)



Validation use cases

- Domains of the pre project :
 - Geographic data
 - Open Street Map
 - Bounders, Coast lines, Blue Marble, OrthoPhoto, departments
 - Radar : Mosaic France high resolution
 - Satellite : METOP, MSG
 - Model : AROME
 - Lightning : France, UKMO
 - Objects : Nowcasting objects



Evolution scenarios

Two scenarios envisaged (for each dataset) :

1. OGC bespoke interfaces implementation

- No evolution on our databases
- Hard developments
- Questions on geographic processing performances ?

2. Use of out the shelves software (type MapServer ...)

- Need of a spatial extension of our databases :
 - Going to PostgreSQL
 - Schema evolution and extension PostGIS



Second Scenario (with MapServer)

• Very interesting (presentation and access) :

- Objects (Cb, Fronts ...), Lightning, Contextual data (charts ...)
- Satellite, radar data
- Target: the images and nowcasting databases

Interesting (access):

- Observations (publication WFS)
- Target: Observations and climatologic databases

• Useless ?

- Models fields ?



Transition step



Constraints

Clustering deployment

- Internal deployment
- Security

DMZ deployment

- Infrastructure duplication ?
- Data mirroring ?
- Access to external services
 - Geographic features ?
 - Business data ?
- Planning
 - Target 2012-2015
 - Comprehensive tool for all forecasters

