Implementation of INSPIRE in Lithuania:

experience with the transition to FOSS4G

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Presentation outlines

- ➔ Roadmap of INSPIRE implementation in Lithuania
- ➔ Implementation using commercial software
- ➔ Transition to open source
- ➔ Takeaways from this experience

roadmap of

INSPIRE implementation in Lithuania

LEGISLATION

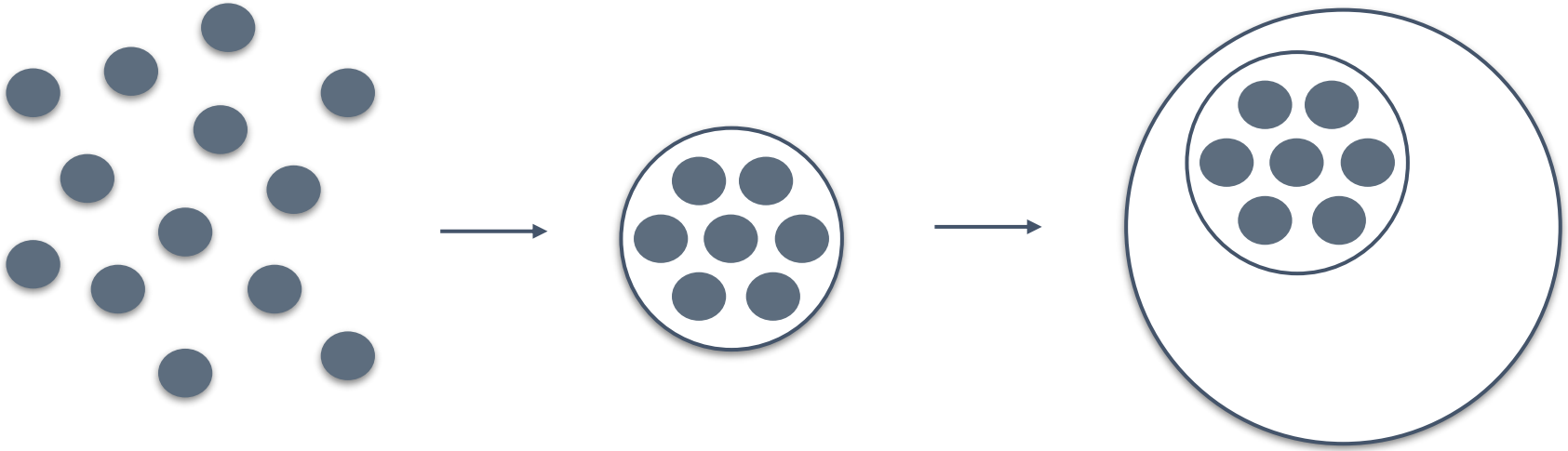
Mandatory and must be transposed into national laws

DATA

Implementation rules for the interoperability of spatial data sets and services

TECHNOLOGIES

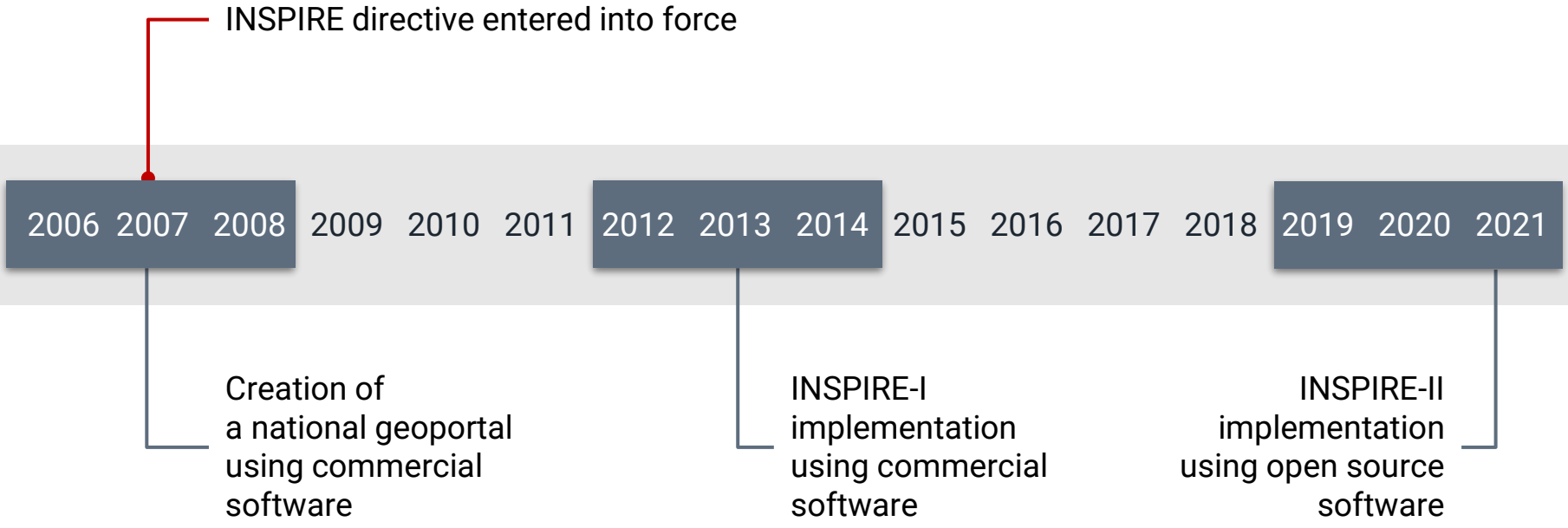
Guidelines, good practices, webinars, pilots



24 data providers, > 100 data sets, different formats of data sets and services, local portals

Central national portal geoportal.lt

INSPIRE geoportal


INSPIRE directive entered into force
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Creation of a national geoportal using commercial software
INSPIRE-I implementation using commercial software
INSPIRE-II implementation using open source software

INSPIRE-I

Implementation using commercial software

SCOPE

Prepare and publish data sets from Annex I and Annex II (only orthophoto imagery). 10 themes total.

IMPLEMENTATION

Implemented by the company that won the tender

TECHNOLOGIES

Stack of commercial software

Store and transform

MS SQL Server
8 core server

FME
4 core +
desktop

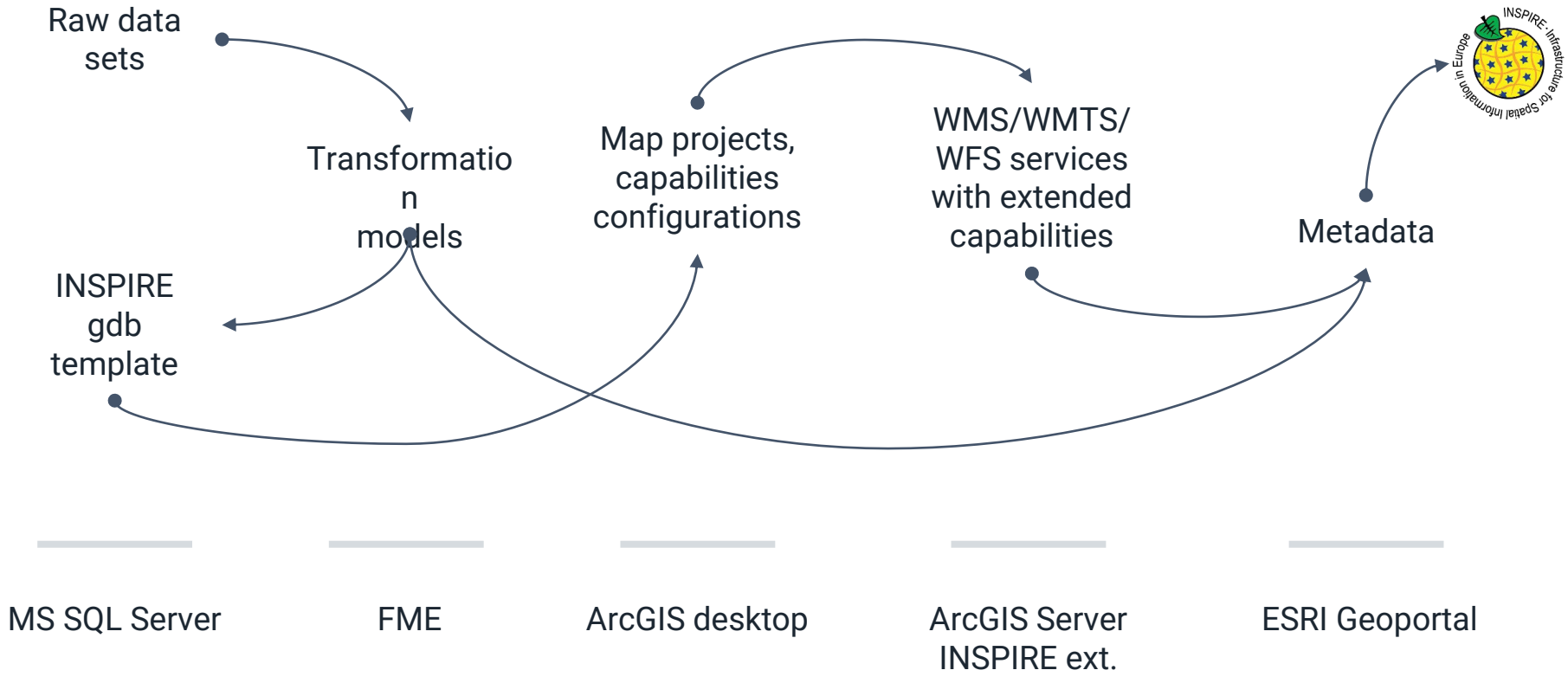
ArcGIS Desktop
ArcInfo, ArcView
for each workplace

Publish

ArcGIS Server
16 core server

ArcGIS for INSPIRE
Extension for 8
cores

ESRI Geoportal
Open source
metadata portal


Raw data sets
Transformation models
INSPIRE gdb template
Map projects, capabilities configurations
WMS/WMTS/ WFS services with extended capabilities
Metadata
MS SQL Server
FME
ArcGIS desktop
ArcGIS Server INSPIRE ext.
ESRI Geoportal

Problems we faced after the project

- Overcomplicated and poorly documented transformation models
- 16 cores for 10 themes but services still worked unreasonably slow
- Data structure implementation based on software
- Poor implementation and performance of WFS
- WMTS even for small datasets because of WMS performance issues

- No space for customization in technical architecture
- Dependence on new releases that made us dependent on new investments
- The system was created to finish the project, not for long run maintenance by ourselves

At the end…

- We actually didn’t understand how some of the parts worked at all
- Dependency between INSPIRE data specification, gdb template and transformation models just drove us crazy
- Knowledge gap was bigger problem than vendor lock
- No real specialists in the team = no active participation in INSPIRE progress

INSPIRE-II

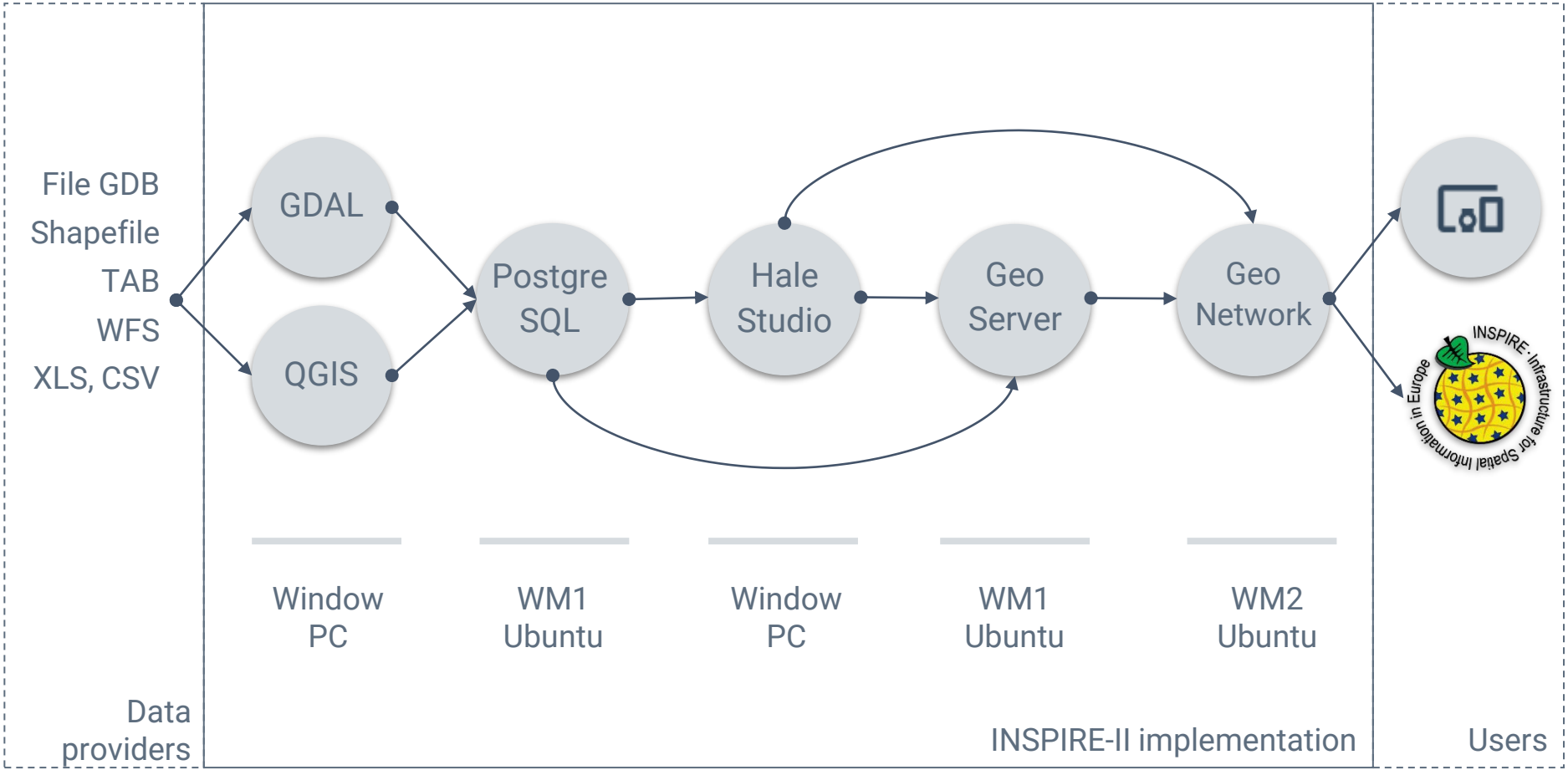
Implementation using open source software

The expectations for the project

- Create a system that we can understand, administer and develop by ourselves
- Create infrastructure that is cost-effective in the long run
- Automate the workflow as much as possible
- Create strong know-how base
- Create a real team of specialists who understand INSPIRE

The biggest doubts before transition to open source GIS

- If we face a problem, we will have to solve it on our own
- Too few specialists in this field, so how we will maintain the system after the project
- Is OS GIS mature and user-friendly enough
- Unfamiliarity with the software. Didn't know what to expect
- Getting the system ready for production will be painful
- INSPIRE is hard, open source GIS is hard – are we well prepared for this


File GDB
Shapefile
TAB
WFS
XLS, CSV
GDAL
QGIS
Postgre SQL
Hale Studio
Geo Server
Geo Network
Window PC
WM1 Ubuntu
Window PC
WM1 Ubuntu
WM2 Ubuntu
Data providers
INSPIRE-II implementation
Users

WM1 - DBMS

4 GB RAM, 2 vcpu
Ubuntu Server
PostgreSQL
Extensions - PostGIS, pg-cron

WM2 - GIS server

32 GB RAM, 4 vcpu
Ubuntu Server
GeoServer
Extensions - INSPIRE, app-schema

WM3 - Metadata server

6 GB RAM, 2vcpu
Ubuntu Server
GeoNetwork

WM5 - File server

2 GB RAM, 1vcpu, 200 GB space
Ubuntu Server
GDAL

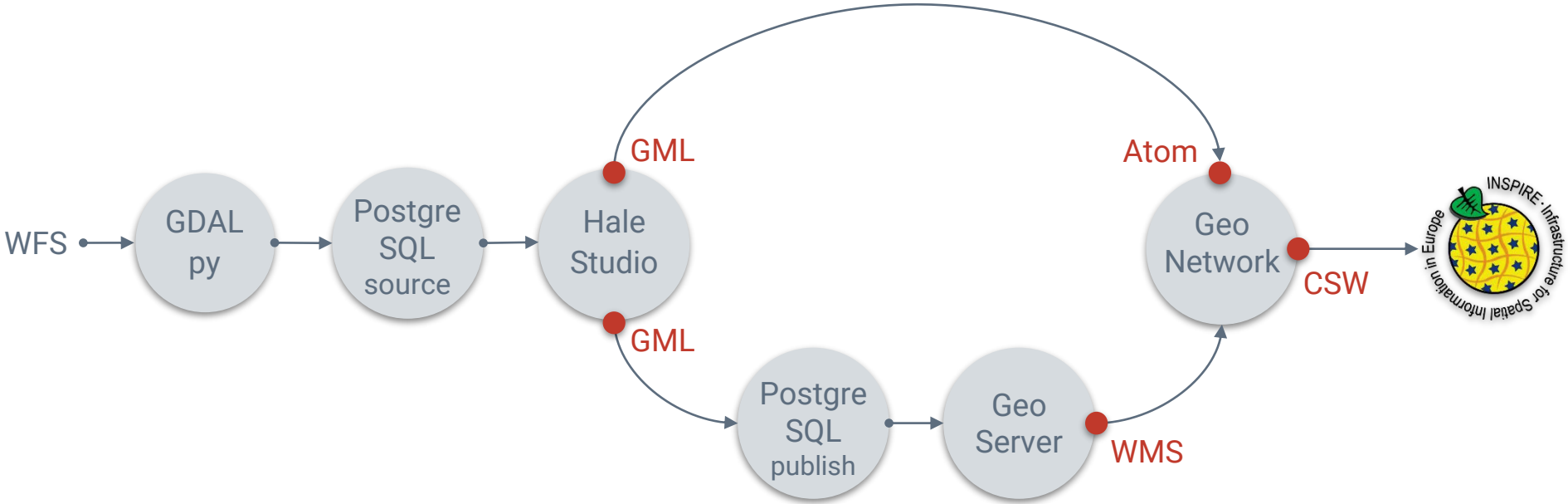
WM5 - HTTP/Proxy server

2 GB RAM, 1vcpu
Ubuntu Server
Apache HTTP Server

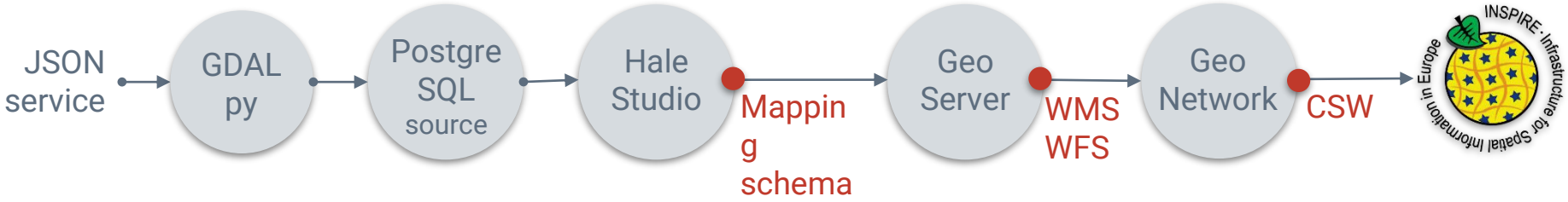
Desktop workplace

Standard workstation
Windows
Hale Studio, QGIS

USE CASE: GE (geology)



USE CASE: MF (Meteorological features)



RESULTS!


Atmospheric conditions 3
Area management/restriction/regulatio... 28
Buildings 4
Elevation 3
Geographical grid systems 3
Human health and safety 41
Meteorological geographical features 3
Oceanographic geographical features 3
Production and industrial facilities 7
Species distribution 4
Statistical units 3
Addresses 3
Administrative units 3
Cadastral parcels 3
Energy resources 4
Geographical names 5
Hydrography 21
Mineral resources 6
Orthoimagery 3
Protected sites 8
Soil 3
Transport networks 9
Agricultural and aquaculture facilities 5
Bio-geographical regions 3
Environmental monitoring facilities 14
Geology 17
Habitats and biotopes 3
Land cover 23
Natural risk zones 16
Population distribution — demography 4
Coordinate reference systems 3
Sea regions 3
Utility and governmental services 5
Dataset 127
Service 77
service-view 41
service-download 35
service-discovery 1

Takeaways

Experience and what we would do differently

What opportunities have opened up for us

- Flexibility to modify and adapt solution
- Freedom to choose parts of technological chain
- Flexibility for scaling the system
- Test out the newest versions
- Know-how and understanding how system works
- Self motivation and the joy of discovery

Lessons learned from mistakes

- Dedicate budget for specialized trainings (esp. for Hale Studio, PostgreSQL)
- Dedicate budget for technical support during project
- Try to publish and validate your service as soon as possible
- Do not try to cover all the errors from validator reports immediately
- Data preparation for a single data theme can take from a few weeks to a month or more
- In our case it was easier to redo the things from commercial software than migrate it to open source

A few technical tips

- More transformation and data preparation for PostgreSQL and PostGIS
- Use dynamic app-schema mapping in geoserver when it’s actually needed
- Start with GML and Atom for data download
- Flat data structure for WMS is actually very good
- It is not necessary to display all the data in small scales :)
- Increase resources only when needed

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