Spatial Data Infrastructures
by using FOSS components
Technological independence and democratization
to the access of spatial data

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Definition

Spatial Data Infrastructures (SDI's) are a set of:

- Technologies (software, hardware),Policies (harmonization, standards (interoperability) and Human Resources
- The system is the NETWORK
- Communication between standards

to:

Acquire, process, **store and distribute** digital geographic information.

Objectives

- Quality and consistency of data
- To facilitate the maintenance (avoiding duplication)
- Documentation promotion
- To facilitate the search and access of data
- Data and GIS software interoperability

SDI Components

Data

Reference Data:

- Georeferenced Data to reference other data.
- Examples: Coordinate Reference Systems, Geographical grid Systems, geographical names, Transport Networks, Cadastral Parcels, etc....

Thematic Data:

- Own data of specific applications that exploit geographical information for a specific purpose.
- Include qualitative and quantitative values corresponding to attributes associated to reference data.
- Examples: vegetation, geology, traffic, pollution, climate, etc.

Metadata

- "Data that describe other data".
- Describe the content, quality, restrictions and any other feature of the main data.
- Help to the "data owner" to improve its organization and maintenance and to a user to search for data.

Regulations

- The structure and content of the metadata it must be based on a regulation accepted and widely used.
- There are some regulations and profiles within the metadata framework:
    - Dublin Core Metadata Initiative
    - ISO 19115 "*Geographic information – Metadata*"
   - Spanish Core Metadata : Núcleo Español de Metadatos "NEM"

Services

- A **SDI** is a set of services that offer a variety of useful and interesting features for the user community.
- The user is not interested in downloading the data, but to get the answers to its needs.
- The SDI services offer functionalities via Web through a browser, without the need of a specific software for that.

SDI basic services

Web Map Services (WMS)

- It offers images combining phenomena layers and images, raster and vector data.
- The client can overlay the images of several services from one or more servers.
- Transparency and legend access.
- Alphanumeric information about selected spatial objects.
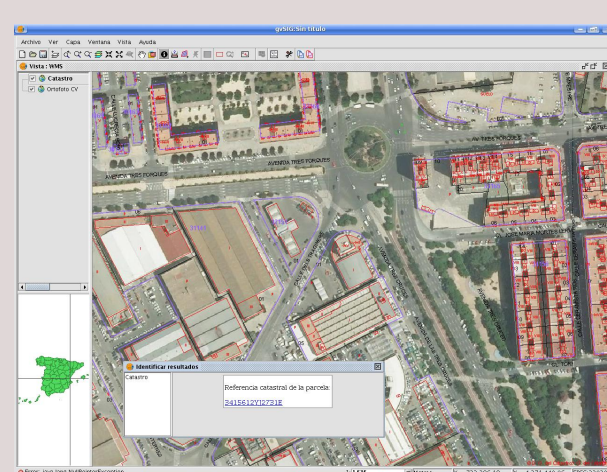
Catalogue Service (CSW)

- It searches mapping resources by geographical extent, scale,key fields, , title, etc.
- It returns the list of matching metadata.
- It can be direct or indirect access to the resources found.
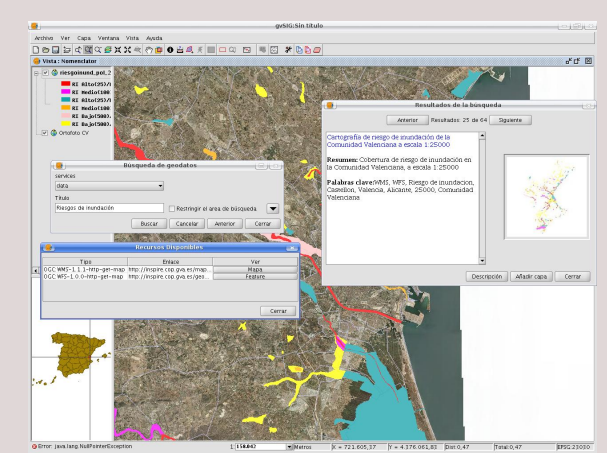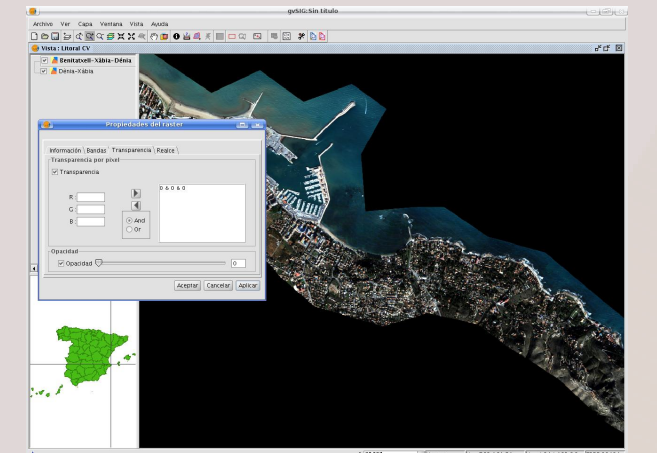
Gazetteer Service

- It searches for geographical locations by key fields, names of places and coordinates.
- It returns a list of matchings.
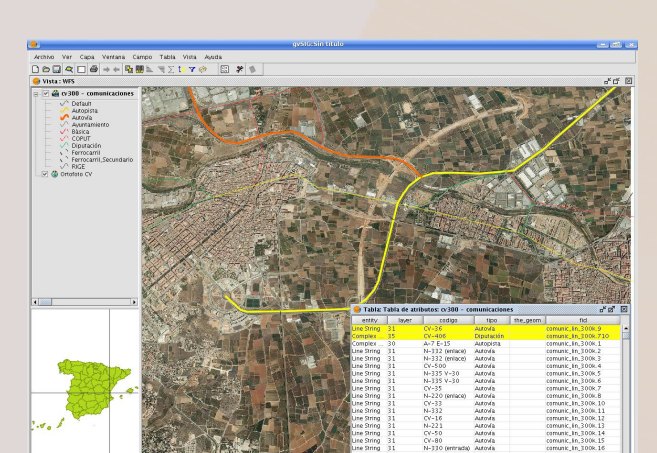- The user can visualize the found location.
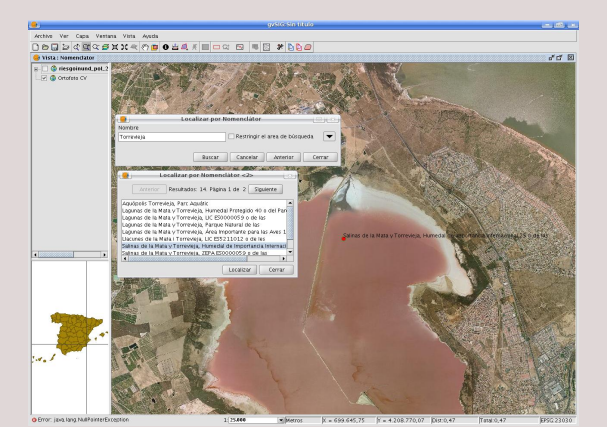
Other SDI services

Web Coverage Service (WCS)

- Full access to the pixel's attributes.
- It allows to work as if it were raster data.
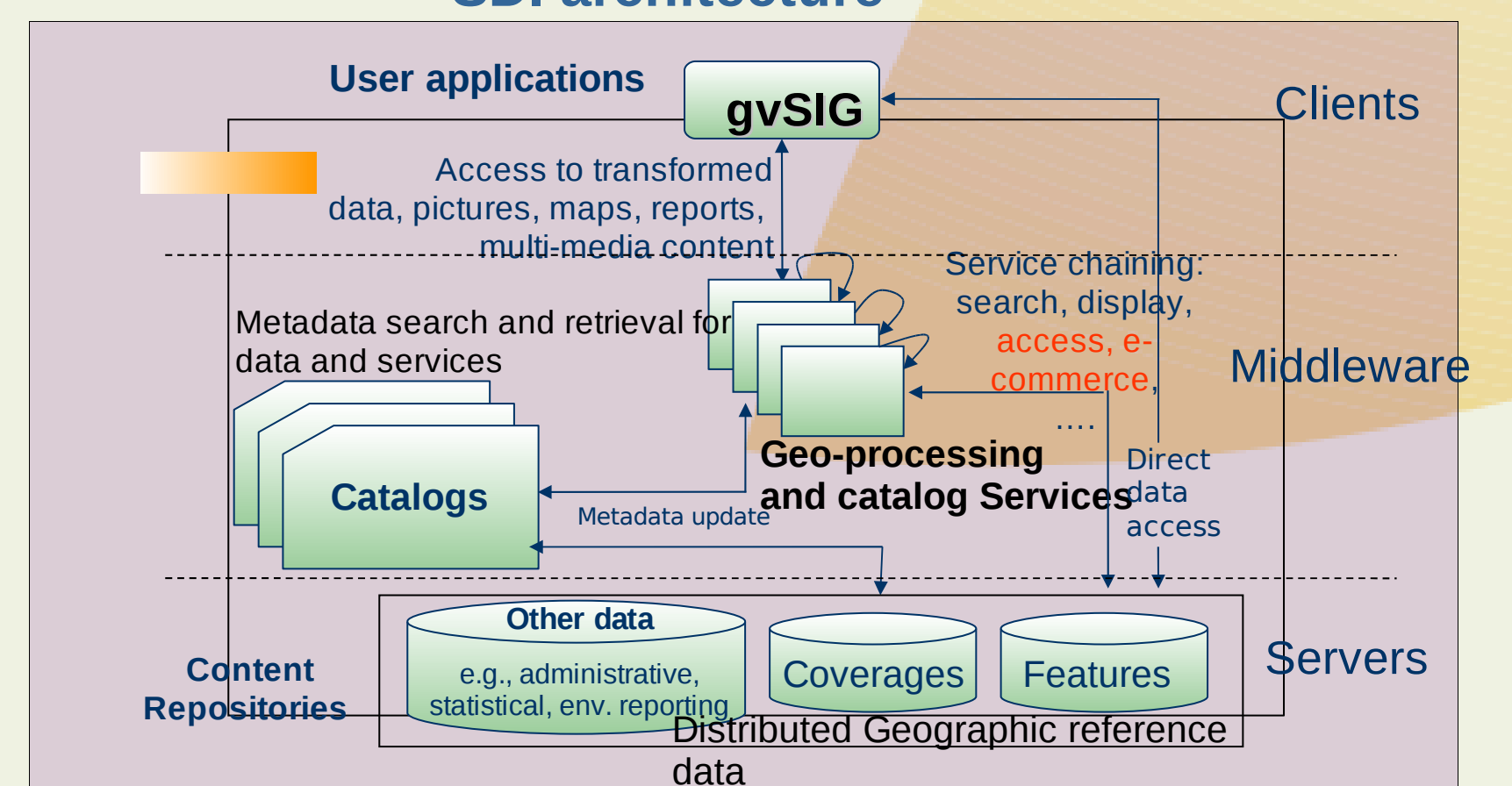- Transparency and band selection.
- Spatial Analysis.

Feature Web Services (WFS)

- Full access to the attributes of the graphic entities.
- It allows to work as if it were local vector data.
- Large volume of "continuous" information.
- Legend configuration.
- Advanced Query and Spatial Analysis.

SDI architecture

User applications

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Clients

Access to transformed data, pictures, maps, reports, multi-media content

Service chaining: search, display, access, e-commerce.

Metadata search and retrieval for data and services

Middleware

Geo-processing and catalog Services

Direct data access

Catalogs

Metadata update

Content Repositories

Other data
e.g., administrative, statistical, env. reporting

Coverages

Features

Servers

Distributed Geographic reference data

FOSS Servers

Mapserver

Geoserver

MySQL

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PostGIS

Deegree

Geonetwork