

Introduction to geoprocessing services using SEXTANTE.



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SEXTANTE Geospatial Services

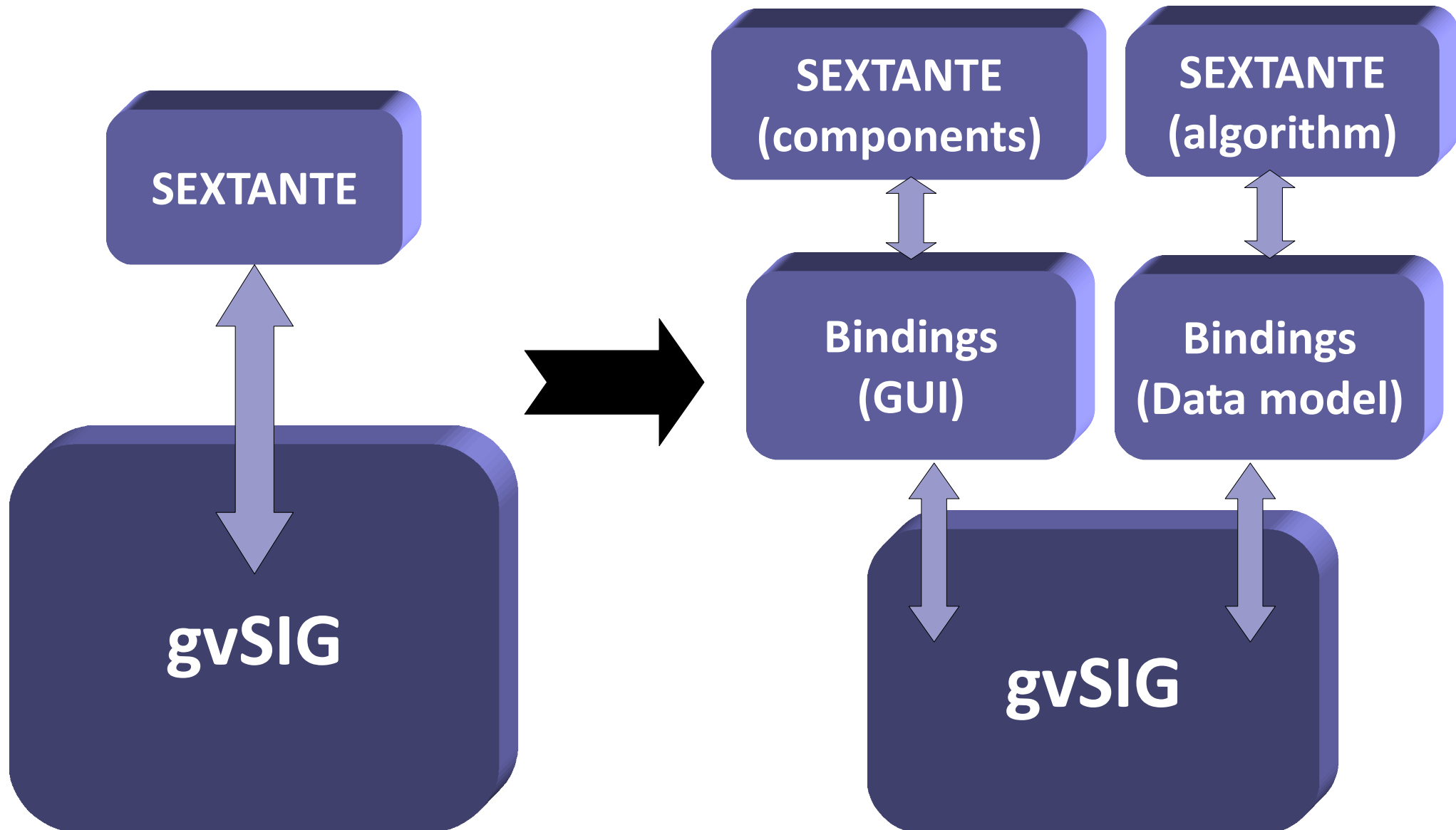
Overview

- Quick introduction to SEXTANTE
- Client/Server fundamentals
- Standards for web-based geoservices
- SEXTANTE in the geoweb

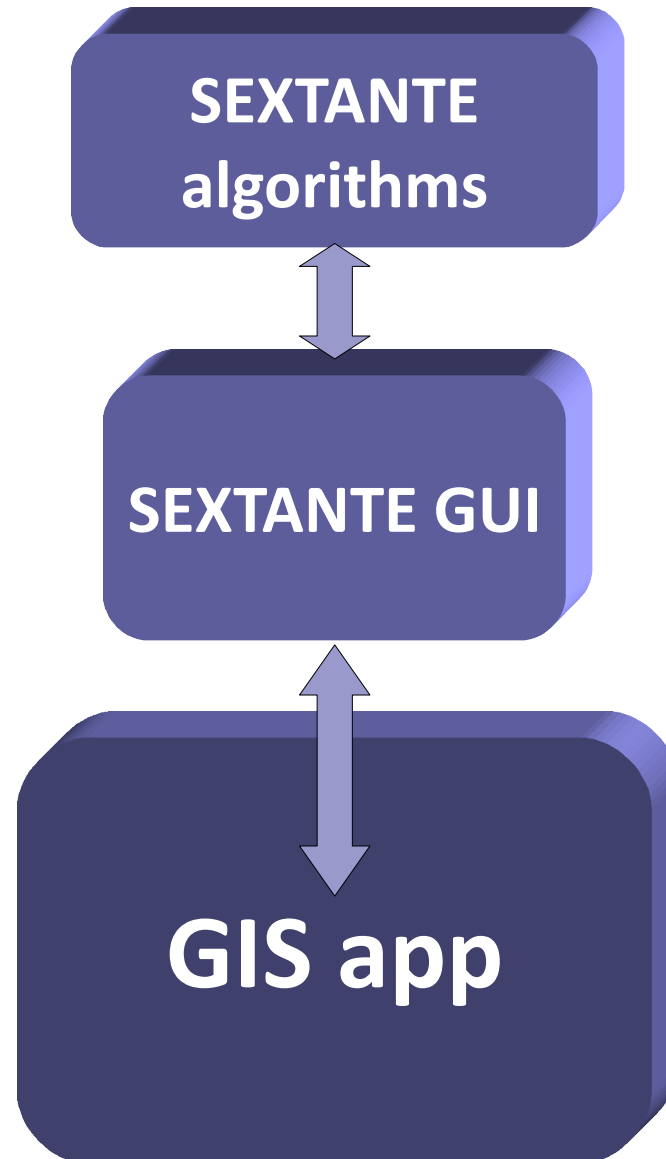
What is SEXTANTE?

- Originally a set of gvSIG extensions providing advanced geographical analysis capabilities, featuring a SAGA-like architecture
- Currently an independent library with 2 main parts
 - A set of foundation classes and a comprehensive set (+230) of geoalgorithms developed upon those classes.
 - A set of graphical components to run and use those algorithms in different contexts.

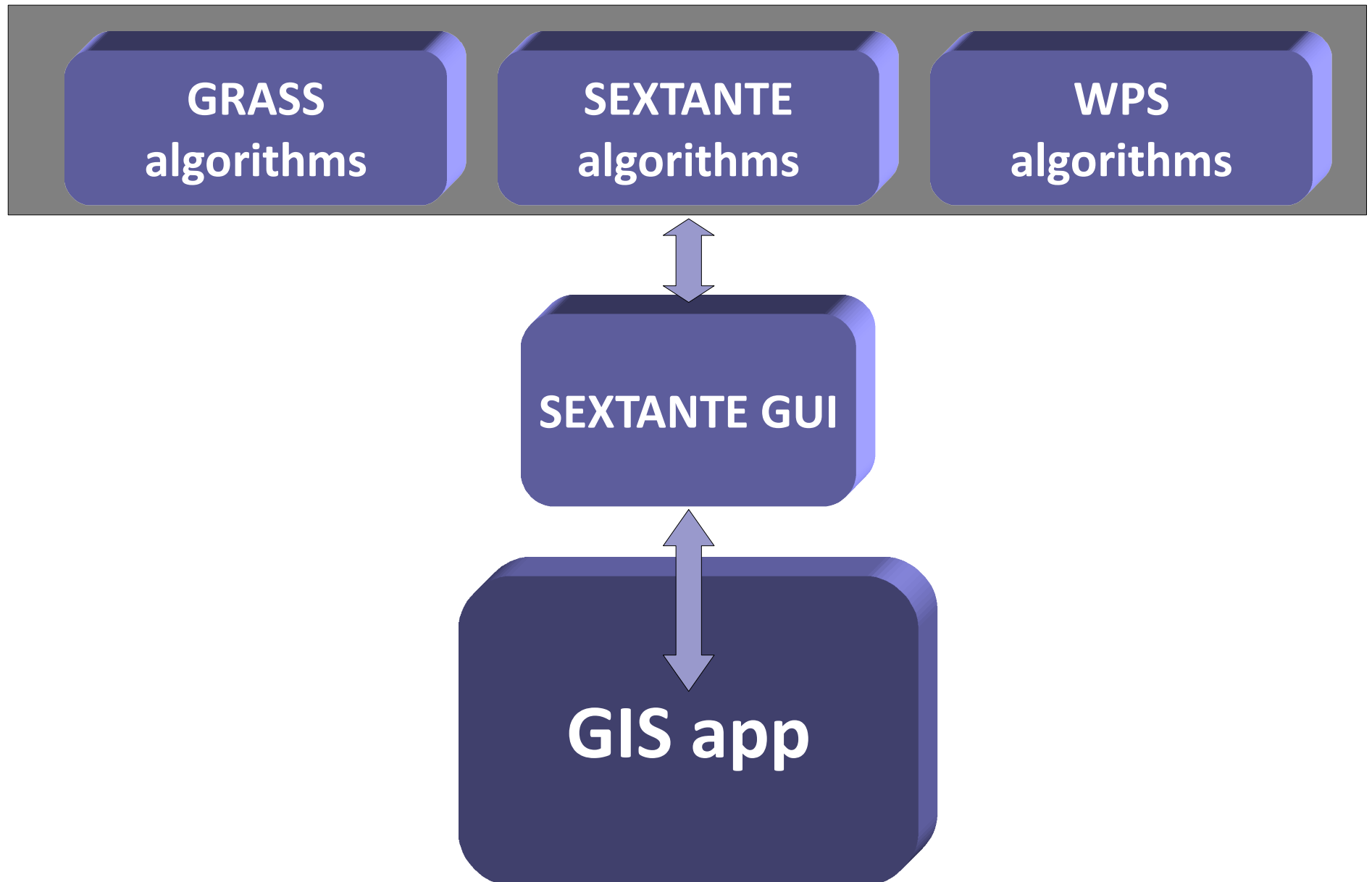
Evolution



Evolution (SEXTANTE as a frontend)

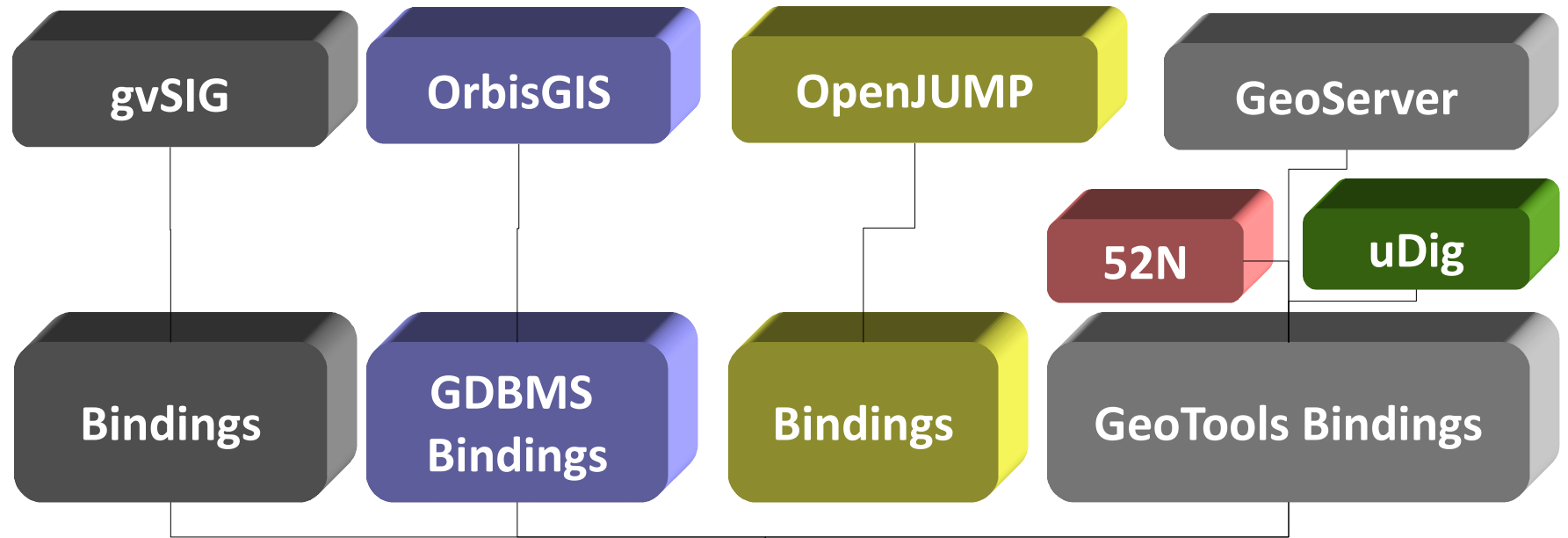


Evolution (SEXTANTE as a frontend)

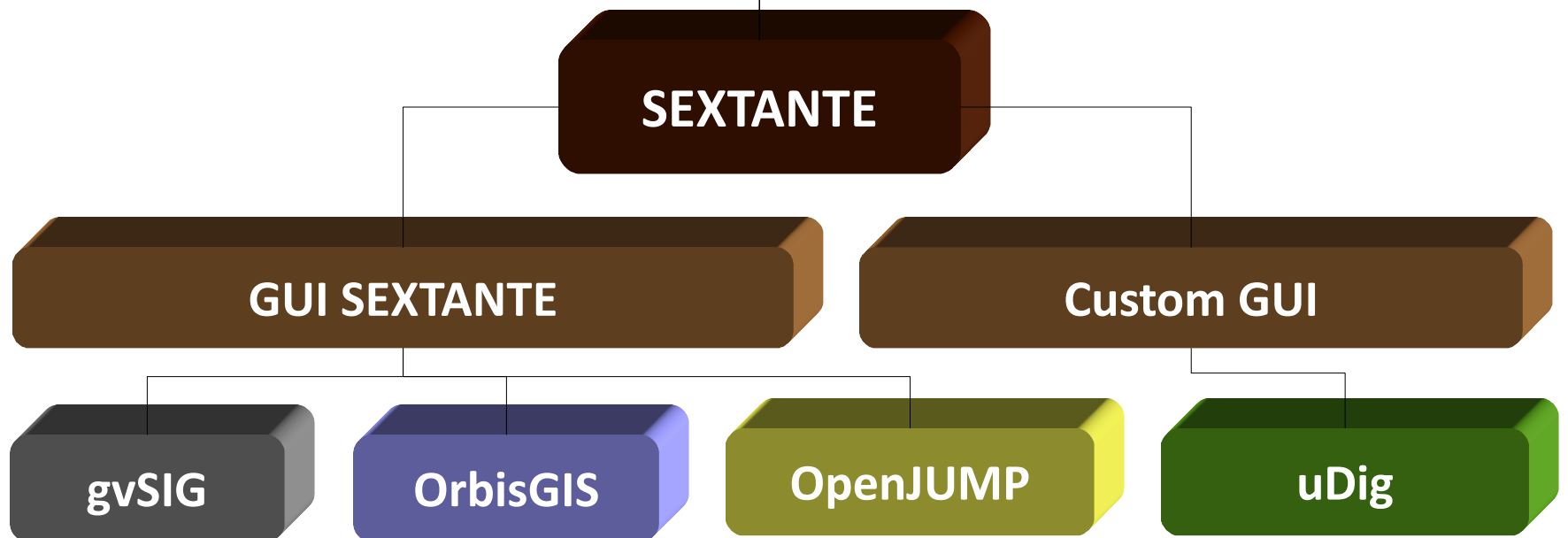


Arquitecture

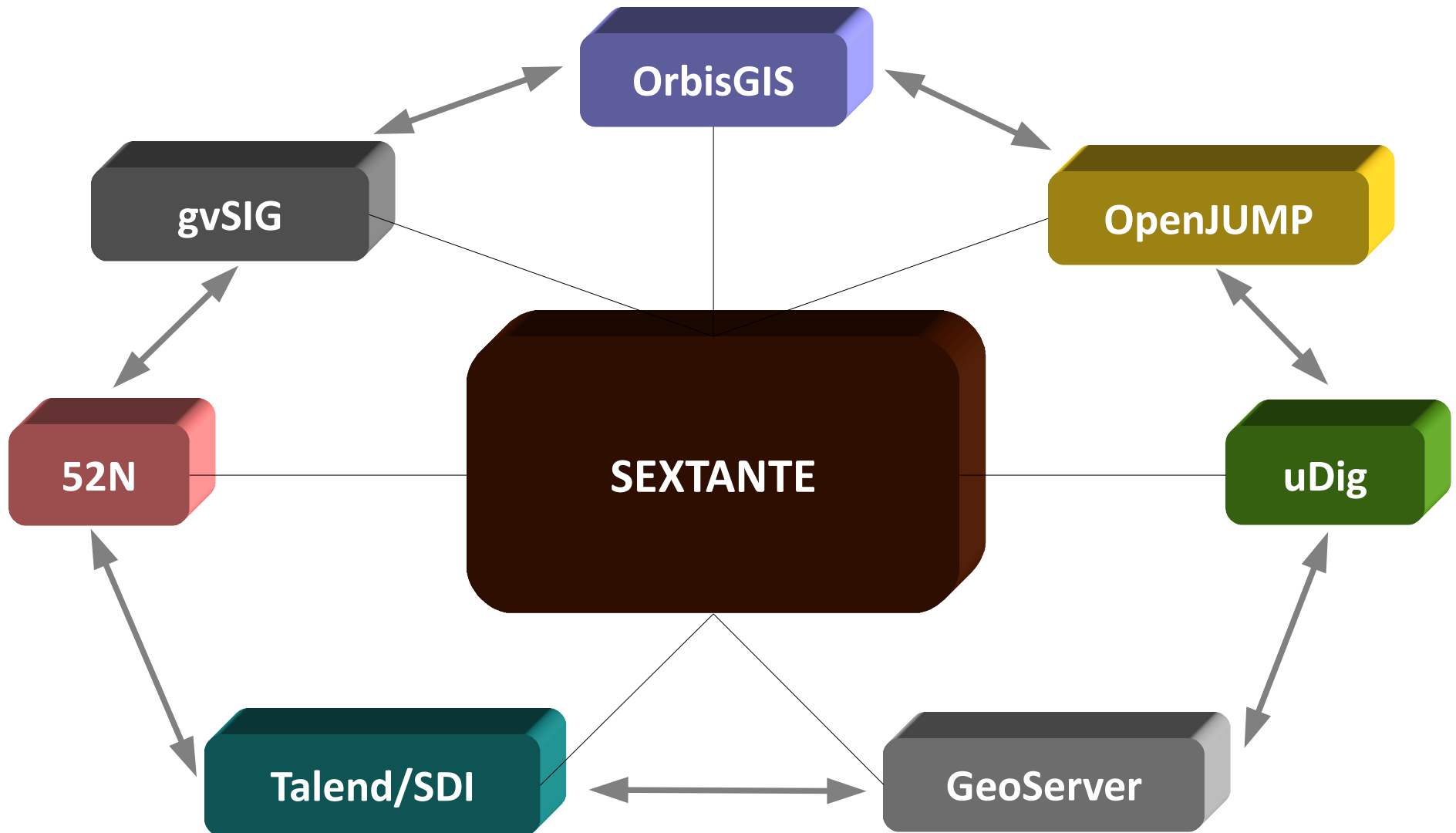
DATA



GUI

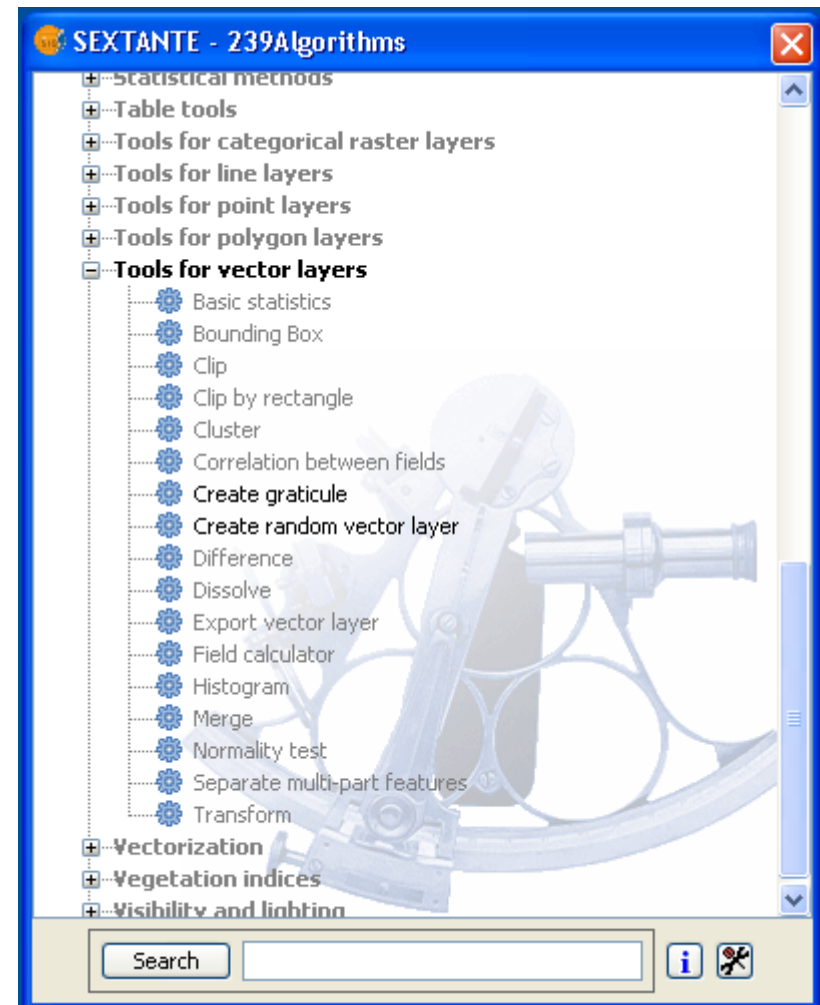


SEXTANTE Ecosystem



Using SEXTANTE (I)

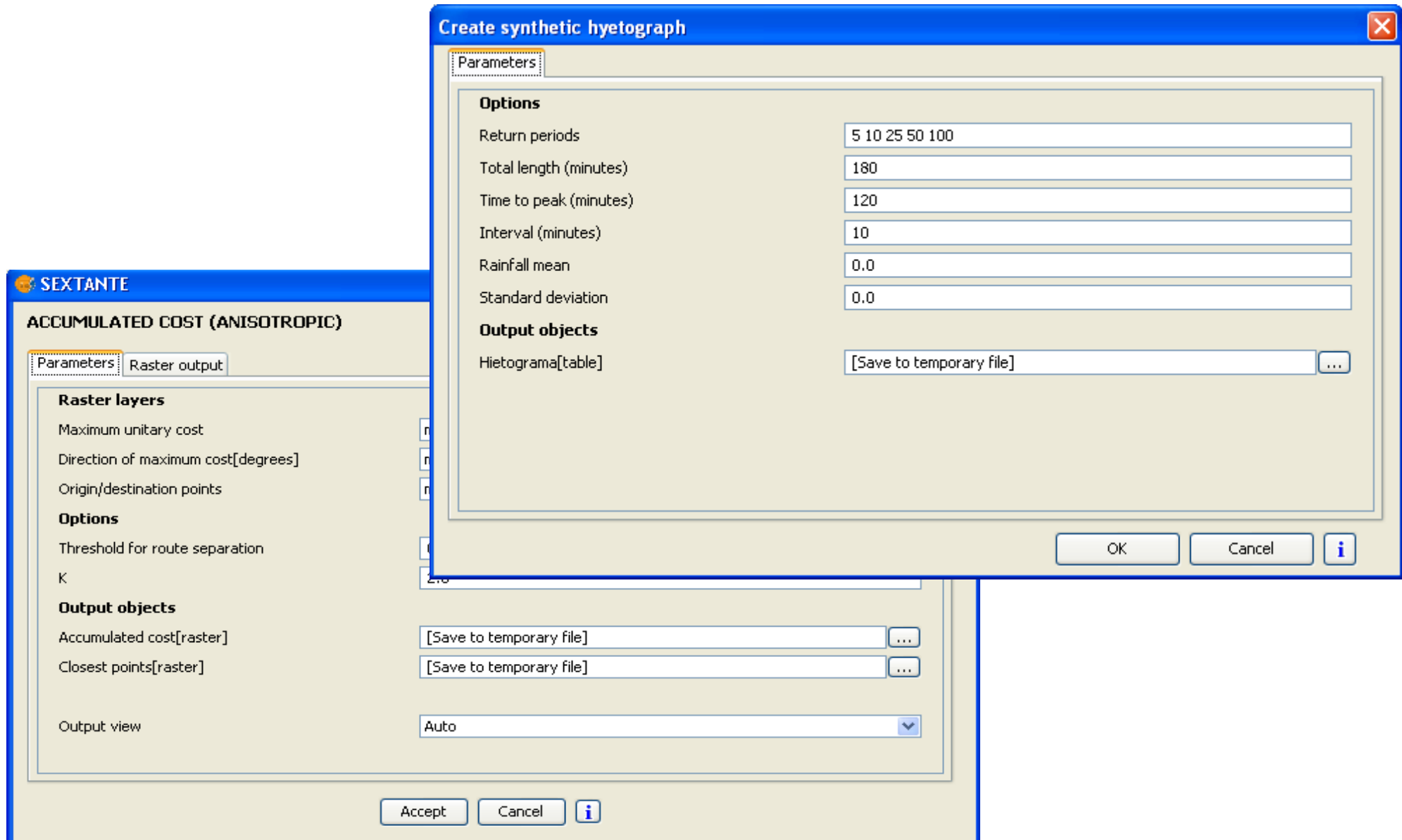
- The toolbox is the main component.
- It can execute both local and remote processes (WPS)



Using SEXTANTE (II)

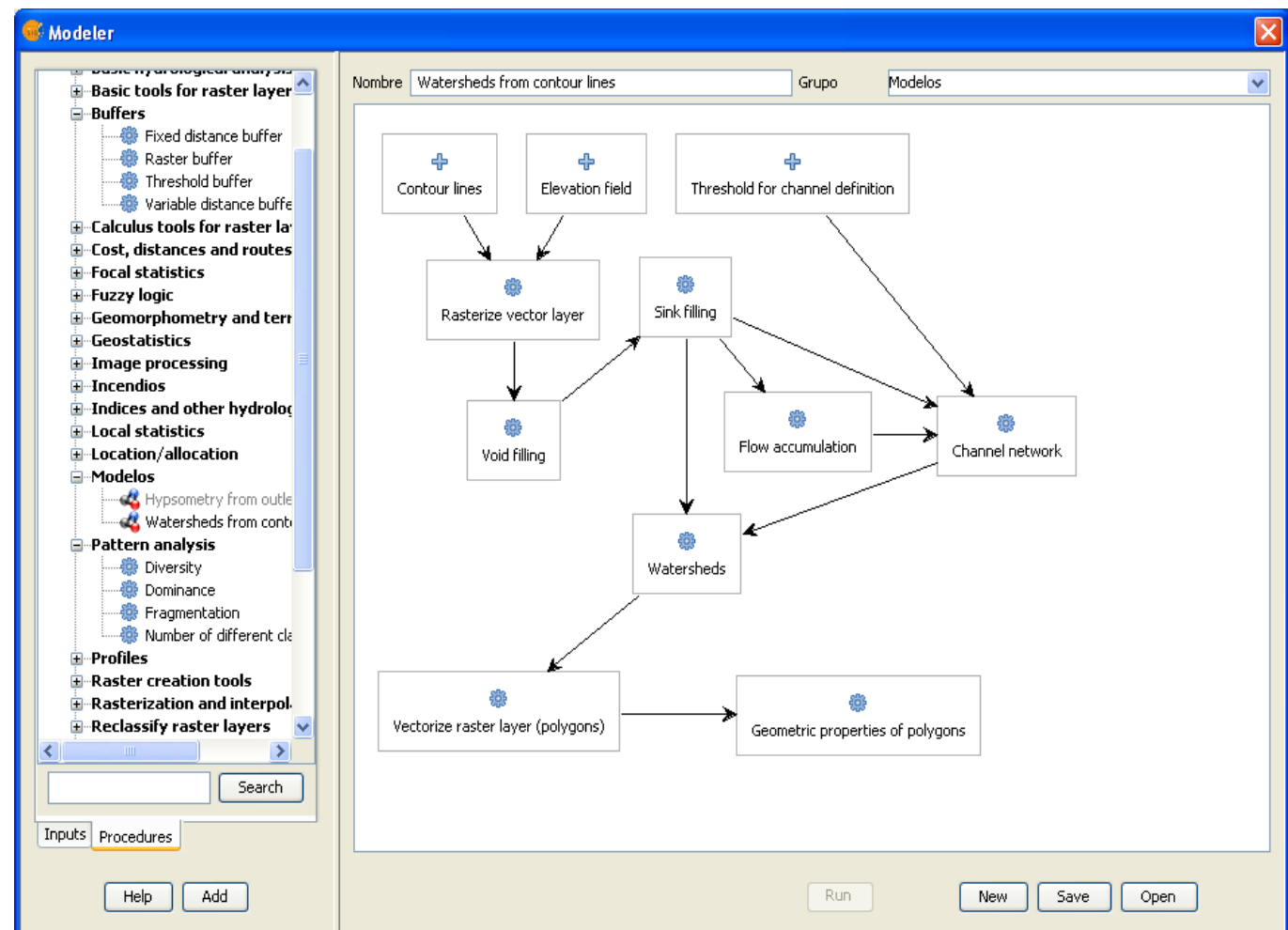
- Dialogs for executing algorithm are created on-the-fly from algorithm requirements, so the GUI and the processes are completely independent
- This guarantees that all dialogs follow the same criteria and have a similar appearance, making it easier for users to understand them

Using SEXTANTE(III)



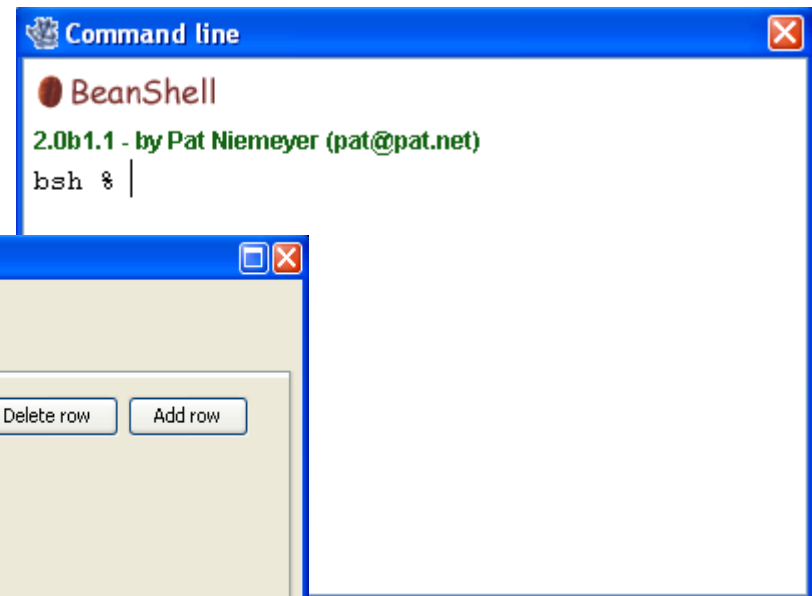
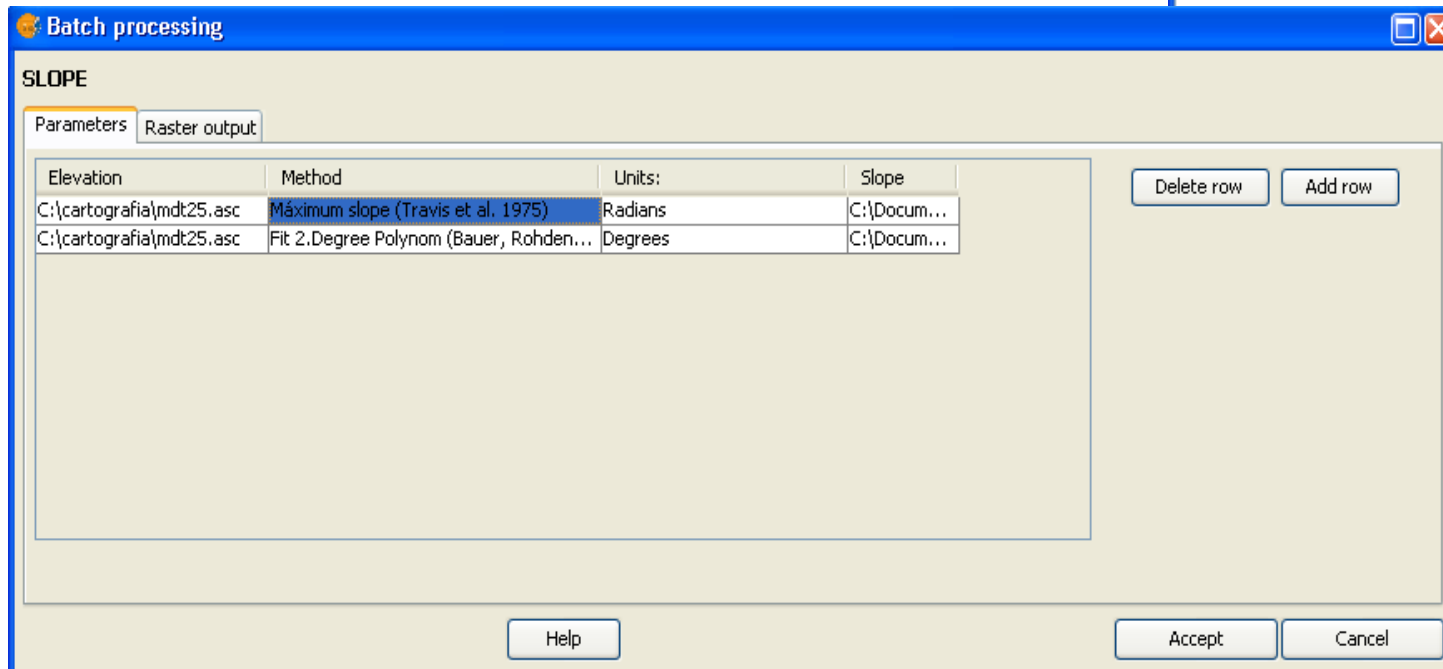
Using SEXTANTE(IV)

- Algorithms can be combined using the graphical modeler.



Using SEXTANTE(V)

- SEXTANTE also features other productivity tools:
 - BeanShell-based command-line interface
 - Batch processing interface



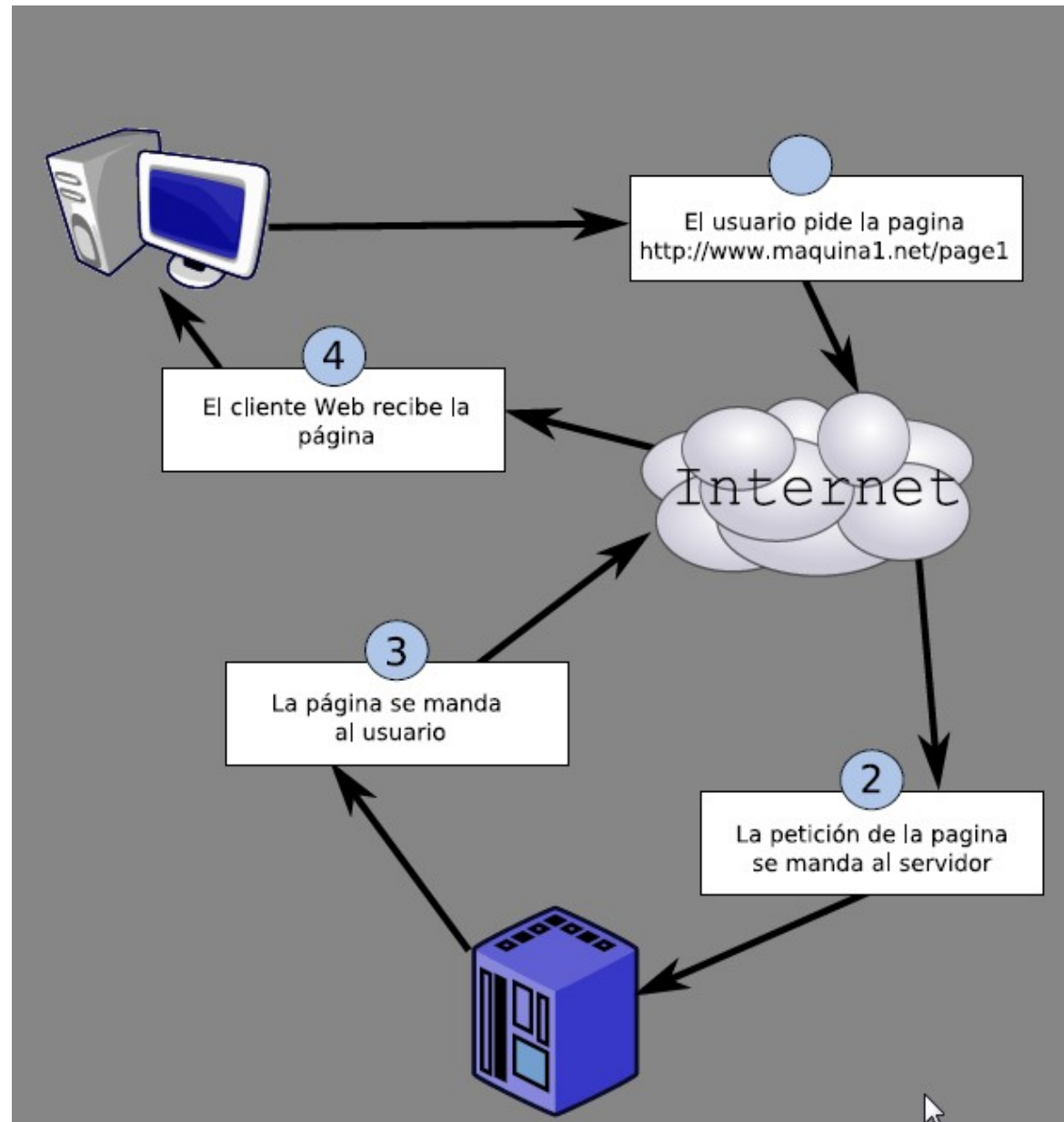
Using SEXTANTE(VI)

- Components are linked between them, expanding their possibilities.
 - Models are just like any other SEXTANTE algorithm and can be used as part of a bigger model, executed as batch processes or from the command-line interface.
 - WPS processes can also be executed incorporated as part of a model, executed from the command line interface or as batch processes.
 - When executing an algorithm or model from the toolbox, the corresponding command is created and stored in the history, so it can be invoked later.

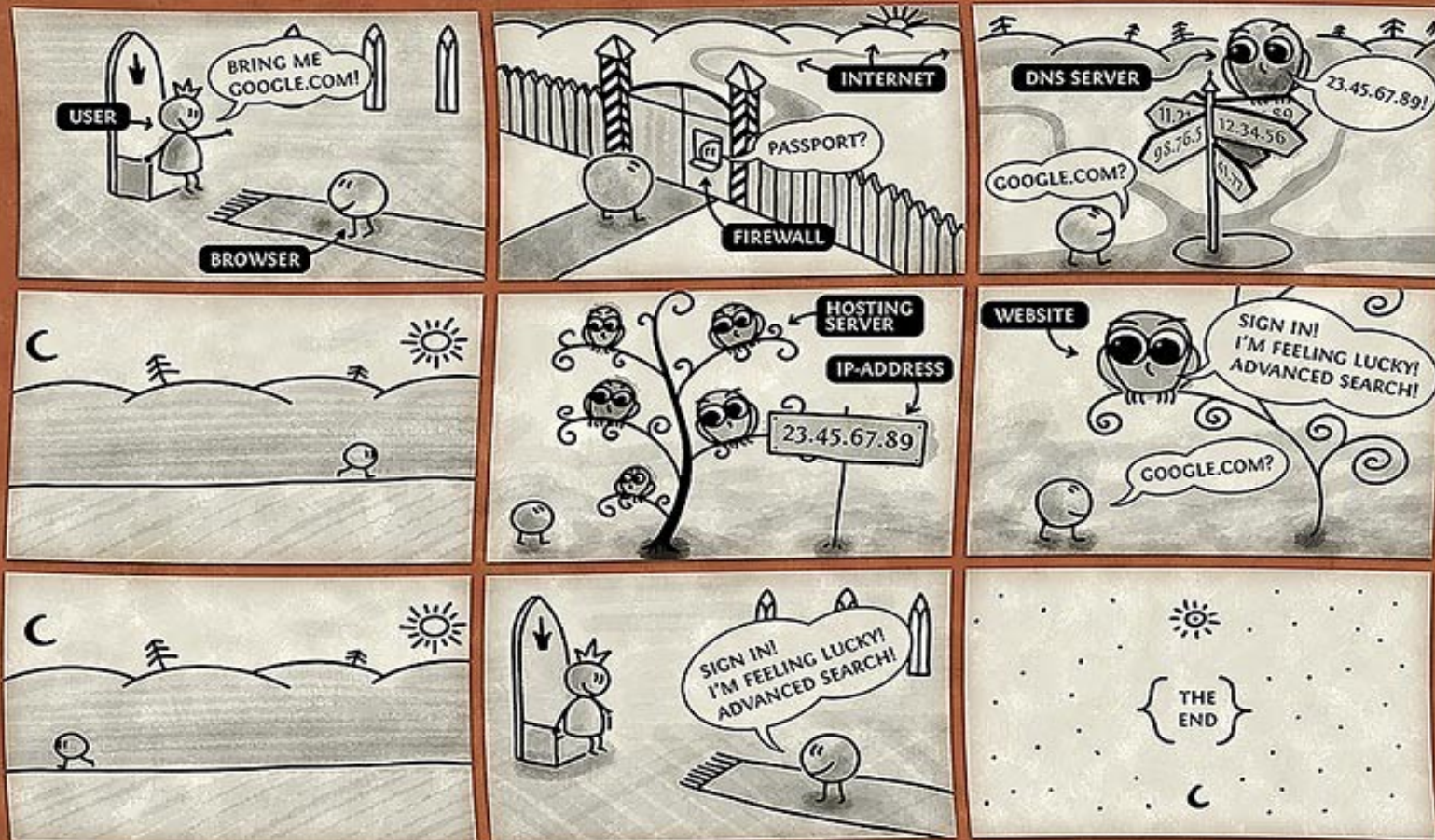
Clients and Servers

- A server provides a service
- A client consumes that service
- A Web server provides a Web-based service (the website you connect to)
- A Web client consumes a Web-based service (the software that you use to access that website)
- Clients and servers communicate with each other. Bidirectionally

How the Internet works



How the Internet works



Geoservices

- Serving a map (an already prepared image)
- Serving vector data
- Serving raster data
- Serving metadata
- Serving geoprocesses

Remote geoprocessing

- Processing remote data in a local geoprocess
- Processing local data in a remote geoprocess
- Processing remote data in a remote process
- Improving performance
 - Remote processes might run on a more powerful machine
 - Or in several ones (GRID computing)
- Sharing geoprocesses

Open Standards for Web-based Geoservices

- A common language that clients and servers understand
- Two main governing organisms: ISO and OGC
- Specifications are public, and available for all to read and implement

Open Standards for Web-based geoservices

- Advantages:
 - Interoperability
 - Improve reusability of applications
 - Fare a fair, competitive market for implementations of the standard.
- Open Source applications traditionally more inclined to implement standards

OGC standards

- WMS: Web Mapping Service
- WCS: Web Coverage Service
- WFS: Web Feature Services
- SLD: Standard Layer Descriptor
- WPS: Web Processing Service
- GML

WPS and SEXTANTE

- WPS servers have an important lack of geoalgorithms (they work...but have almost nothing to serve)
- SEXTANTE is a very interesting tool for Java WPS servers, greatly enhancing their capabilities
- Currently implemented in 52N WPS Server and being implemented in Geoserver



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Integrated Web Processing Service (WPS)

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To become a true 'GIS' server, the final piece needed by GeoServer is to perform spatial operations and analysis on the data served. The competition has done this for years, and the flexible framework of GeoServer has enabled many to code one off functionality to handle the operations they need. But the recently released Web Processing Service of the OGC now provides a standardized framework to offer advanced processing services.

There is already a prototype implementation available as an unsupported plug-in to GeoServer. And recently OpenGeo developers spent some time integrating the amazing [SEXTANTE](#) geospatial toolkit in to GeoTools and GeoServer. SEXTANTE provides over 220 spatial operations, for both vector and raster processing, giving a GeoServer WPS a big start. It will also draw on all the spatial operations available in the JTS Topology Suite.

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Other Roadmap Items

[WMS 1.3](#)

WPS and SEXTANTE(II)

- SEXTANTE client and SEXTANTE server coupling
- Testing SEXTANTE with other WPS clients
- S-Ext-ante Project (SEXTANTE on the web)
 - <http://www.unex.es/eweb/sextantegis/test.htm>
- Is the future of SEXTANTE on the web?
 - Customized web applications
 - Web GIS



SEXTANTE Geospatial Services

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