Web mapping

contents

- Introduction
- Types of web maps
- Examples
- Map servers
- Standard for web portrayal services

Introduction

“web mapping” refers at a minimum, to the following actions:

- A client makes requests to one or more services registries(based on the OpenGIS Catalouge Services Specification) to discover URLs of Web Map Servers containing desired information.
- Service registries return URLs and also information about methods by which the discovered information at each URL can be accessed.

- The client locates one or more servers containing the desired information, and invokes them simultaneously.
- As directed by the client, each Map Server accesses the information requested from it, and renders it suitable for displaying as one or more layers in map composed of many layers.

Web maps: types

- Static web map
- Dynamically created web maps

- Distributed web maps
- Animated web maps
- Real-time web maps
- Personalized web maps
- Interactive web maps
- Analytic web maps
- Collaborative web maps

Static web map

- Are essentially the digital equivalents of paper maps.
- User may be able to zoom in or out on the map, the content of the map is static.
- Scale of the map cannot be changed.
- Areas off the edges of the map cannot be viewed
- Components of the map cannot be toggled on or off.
- Is often a digital scan of paper map or an export from a GIS package.

Dynamically created web maps

- Are generated on the fly when user loads the associated web page.
- The of choice of whether to publish a static map or a dynamic map should depend on how frequently the map data change.
- Consider the following three maps:
  A. Population figures compiled by a census
  B. Hometowns of students enrolled in a course
  C. Locations of buses in a public transportation system

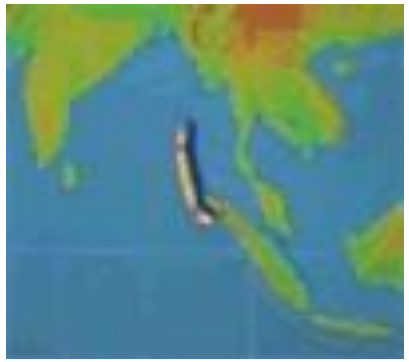
- Scenario A calls for a static map, since the population data and the geographic subdivisions in which they were collected represent a snapshot in time. After the census is complete, the data should never change.

Distributed web maps

- Is actually a sub-class of the dynamically created class.
- The distinguishing feature of this category is that at least some of the data come from other servers.

- This might involve the use of formal data sharing protocols such as the Open Geospatial Consortium’s Web Map Service(WMS), Web Feature Service(WFS) or Web Coverage Service(WCS) standards.
- It could also involve the extraction from other websites of data that wasn’t expressly packaged for mapping purposes.

Animated web maps



- Animated web maps are most often associated with the display of snapshots of the same map variable taken at different times.
- Weather maps are also commonly animated to illustrate changing weather patterns.
- Another use of map animation is for showing different map variables for the same place.

- For example, one could animate a series of maps of any state depicting their population, income, education level, ethnicity, etc. Finally, animation can also be used to modify the user's view of the same map data through the use of zooming and panning; i.e., to create a "fly-through" of a place.

Real time web maps

- In addition to fitting into the animated map category, weather maps are also perhaps the most commonly viewed type in the real-time map category.

- The collection of data required for a real time map is usually automated through the use of sensors, such as those installed along urban road networks to detect vehicular traffic.
- Other examples in this category include locational maps of the various entities that we outfit the GPS transceivers such as vehicles, wildlife.

Personalized web maps

- Sites that allowed the user to have some input into the look of the map.

- Such input could include its color scheme, classification method, title, legend, scale bar or any other map element that one might have control over when constructing a map in a GIS package.

Interactive web maps

- Includes the ability to change the map's extent through zooming and panning. Other forms of interactivity include the ability to: ○ Toggle map layers on or off ○ Obtain detailed information about map features ○ Browse to web sites associated with map features ○ Produce a personalized map, ○ And

explore data patterns and relationships using visualization tools that are dynamically linked to the map.

Analytic web maps

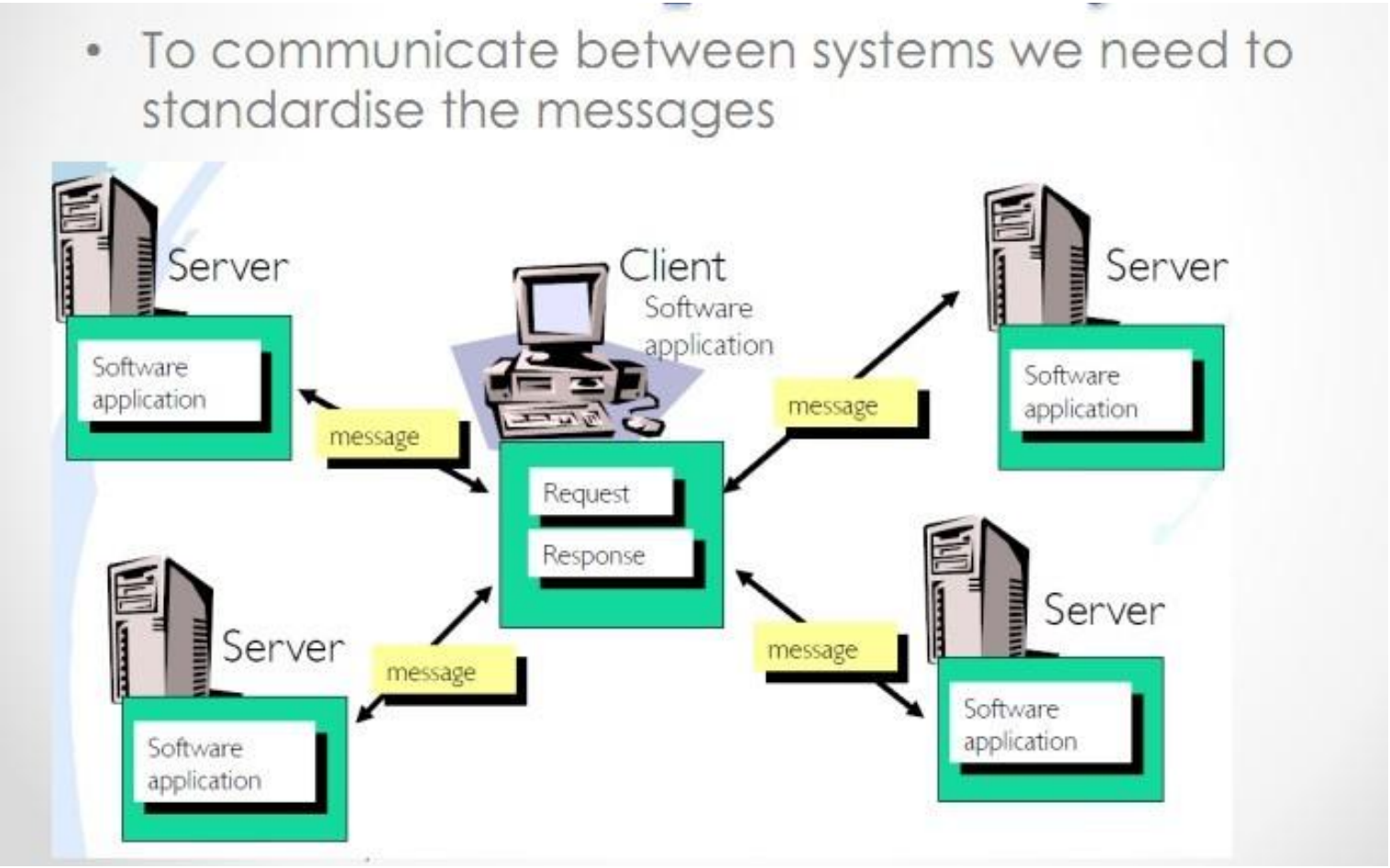
- Applications that enabled the public to perform analyses that had previously only been available to GIS professionals.
- The most common analytic function performed by web map applications is route finding.

- Overlay analysis, which is an integral part of any GIS package, is another function that is often found in web maps in this category.

Collaborative web maps

Openstreet Map: Crowd Sourcing

Interoperability

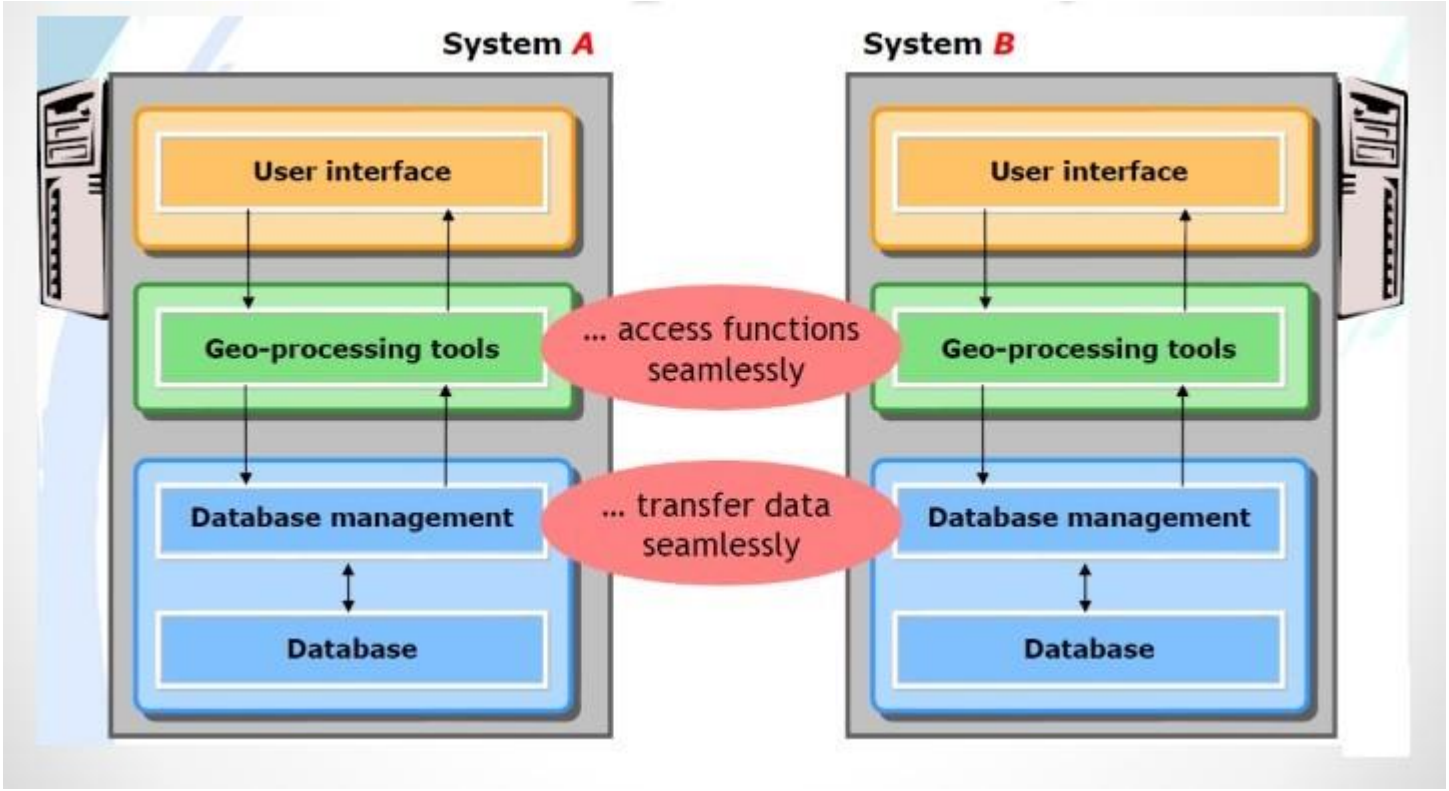


Interoperability

“the capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units.”

-ISO 1993

Interoperability



How to achieve interoperability?

Make data seamlessly transferable & accessible.

- Encode data in a standardized, platform & application independent manner

XML

Access distributed functionality seamlessly

- Specify and set up an infrastructure of interoperable(software) services,

which encapsulate functionality and make it accessible via well specified interfaces

Web services

Open Geospatial Consortium(OGC)

- Focus on interoperability of software at the interface level to promote plug and play components for geographic information interchange

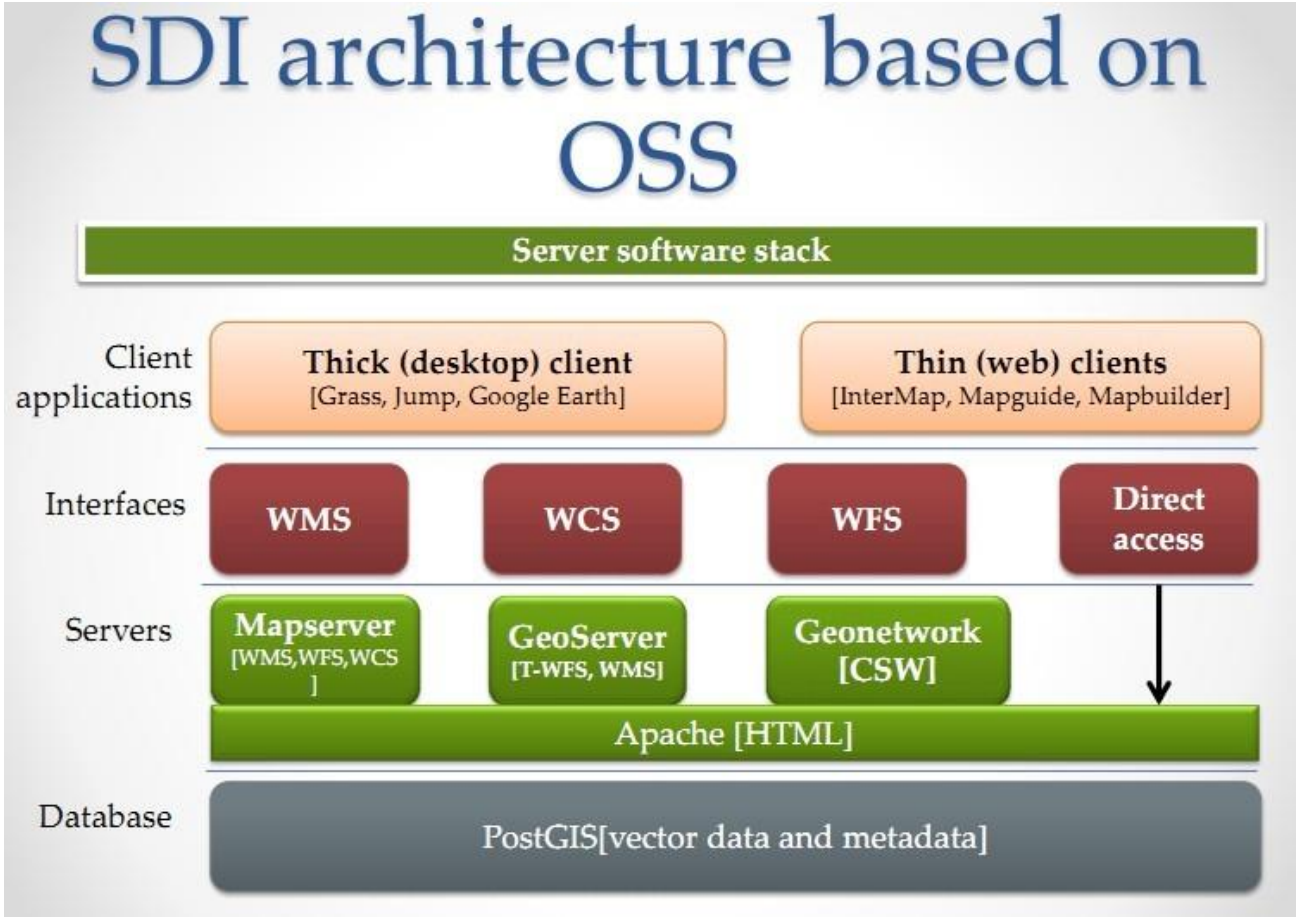
- Non profit, international consortium
- 220+ industry, government, NGO and university members

Open Geospatial Consortium(OGC)

OGC provides services with a standardized interface:

- Web Map Service(WMS): displays an image(gif, jpeg, png) of vector or raster data
- Web Feature Service(WFS): provides access to vector data(output in Geography Markup Language(GML))

- Web Coverage Service(WCS): provides access to metadata of geodata and services.
- Web Processing Service(WPS): provides access to remote GIS operations(for example Buffer, distance calculation, coordinate transformation) responses are standard-based messages.



Shiva Shrestha and I am here checking

Map Servers

A map server can do three things. It can:

- Produce a map(as a picture, as a series of graphical elements, or as a packaged set of geographic data),
- Answer basic queries about the content of the map, and

Client server technology for web mapping

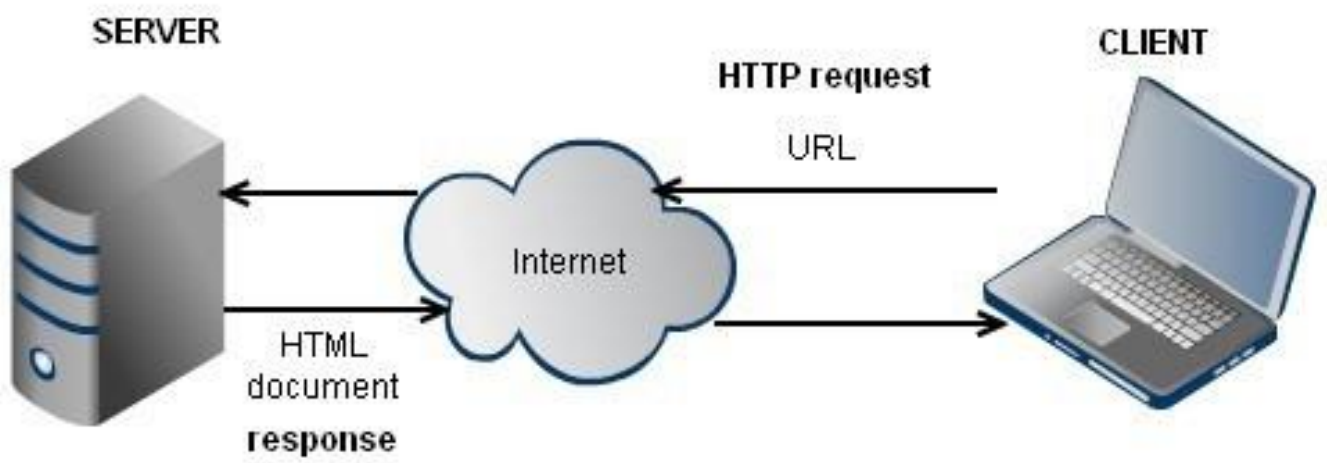
- Tell other programs what maps it can produce and which of those can be queried further.

Available mapserver softwares

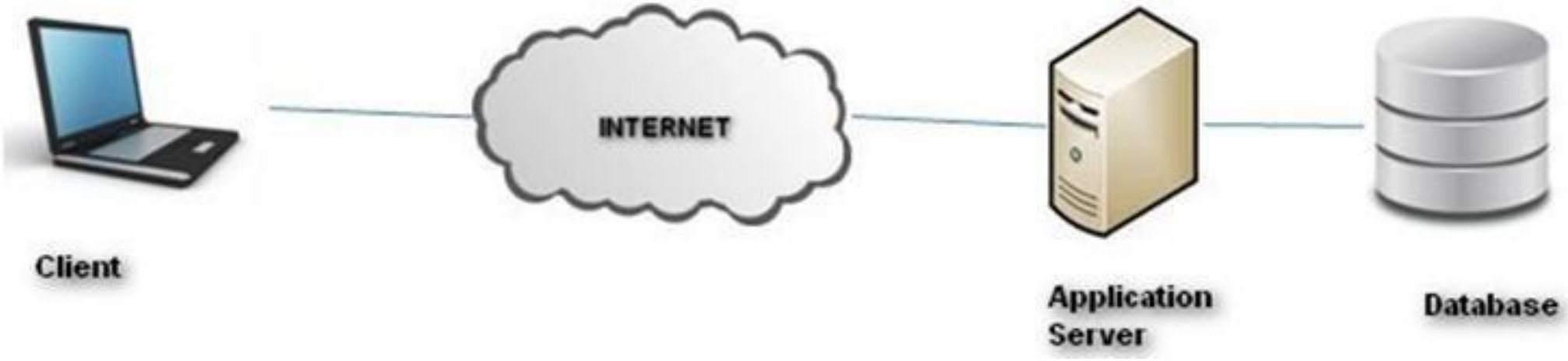
- ArcGIS server
- “mapserver” developed by university of Minnesota

- Geoserver
- World wind WMS server

Client server technology for web mapping



Client server technology for web mapping



Client server technology for web mapping