Geospatial Web Services
Three main components of Web Architecture

Recap

- HTML: Language of Representation
  - Jquery
  - ASP
  - XML
  - etc...

- HTTP: Communication Protocol
  - FTP
  - SMTP
  - IRC
  - etc...

- URL: Resource Identifier
  - IP Address
  - Mac Address
  - etc...
Web GIS Server

The Web GIS server is the most important component in a Web GIS. Its functionality, ability to be customized, scalability, and performance are critical to the success of the Web GIS application. The capability and the quality of a Web GIS application is largely dependent by the Web GIS server it uses.

Leading Web GIS Servers

• **esri ArcGIS Server** — esri Proprietary Software

• **Geoserver** — Originally Developed by volunteers and some paid programmers by the Open Planning Project. Now part of the OpenGeo Suite which is now part of Boundless

• **Mapserver** — Developed by University of Minnesota
Web Services

In contrast with Web pages, which are usually isolated and closed to external software systems, **Web services** are considered open, in that they are programming interfaces that can be accessed by other applications over the Web.
Web Services

A **Web service** is a program that runs on a Web server and exposes programming interfaces to other programs on the Web.

Example of a Web Service:

http://www.w3schools.com/webservices/ws_example.asp
Web Services

Advantages of Web Services:

– Open to other software systems over the Web

– Independent of programming language and OS

– Web services and their clients are not tightly bound to one another

– One-for-all release and update
Geospatial Web Services

Geospatial Web services can be categorized by the functions they provide:

- Map Services
- Data Services
- Analytical Services
- Metadata Catalog Services
Geospatial Web Services

Map Services: Map services allow clients to request maps of a specific geographic extent, and the maps are returned in an image format.

Beyond viewing, map services may also support: attribute query, spatial identify and dynamic reprojection functions.
Geospatial Web Services
Map Services

There are two types of Map Services:

- Cached/Tiled Map Service
- Dynamic Map Service
Cached/Tiled Map service

A map service that fulfills requests with pre-created tiles from a cache is called a cached/tiled map service.

A cached map service:

- Highly resource intensive on the server side
- can significantly improve performance time in delivering maps
- Is typically used to serve maps where the content is relatively static.
- Eg. Imagery, basemaps, contour maps etc.
Geospatial Web Services
Map Services

Dynamic Map service

A Dynamic map service requires the server to render the map each time a request comes in.

A Dynamic map service:

- Not very resource intensive on the server side
- can be significantly slow depending on the size of the data and server capabilities
- Is typically used to serve maps whose data is constantly changing
- Eg. weather, population, gps data etc...
Data services allow you to query, edit and synchronize data over the Web. Some data services are also map services, which let you see the map display as well have access to the raw data.

There are 4 types of Data Services:

- Feature Editing Services
- Search Services
- Image Services
- Geodata synchronization Services
Geospatial Web Services

Data Services

Example:

- Feature Editing Service: http://sampleserver3.arcgisonline.com/ArcGIS/rest/services
- Search Service: http://www.geonames.org/
- Image Service: http://imagery.arcgisonline.com/arcgis/rest/services/LandsatGLS