Open Source WEBGIS

Open Source WEBGIS and its scope in developing Countries like Nepal

Geographic Information System (GIS) has come to be an indispensable tool for analyzing and managing spatial data. Basically GIS is used to provide user with spatial information. In the case of the traditional GIS these type of information was within an organization or group of organization. Thus the information provided by GIS was restricted within a boundary. Hence this disadvantage of traditional GIS lead to a solution of integrating GIS to Internet, which was called WEBGIS.

The implementation of the GIS to the internet can make the GIS information available to the whole world. Any one staying at one end of the globe can get the GIS information of the other end with a single click of the mouse. One of the major advantages of WEBGIS is that it would allow sharing of information and technical expertise among a wide range of users.

Most GIS vendors and some commercial spatial data providers have realized that the Internet will be the next-generation GIS platform, providing a powerful medium for geographic information distribution, as well as a new market to exploit.

Hence many Commercial vendors have developed their own version of WEBGIS application for example ESRI's ARCIms e.t.c. Though this software provided better information, they were expensive and required vast knowledge to implement them. And to use this type of application for developing countries like ours is of no use. Hence there was a necessity of an open source WebGIS application that should be both powerful for visualizing GIS information, can compete with other GIS based applications and at the same time easily accessible to all.

The implementation of Open Source WEBGIS application in developing countries like ours will help the country to utilize the money exclusively towards developing skills and local capacity, instead of paying license fees that tie customers to a single vendor. Expenditures can stay at home, instead of constantly being sent to software providers overseas. Access to source code and to the communities surrounding Open Source projects can greatly help to develop the talents of domestic programmers.

GeoSpatial Systems Pvt. Ltd. is a Pioneer in the GIS industry of Nepal which has been contributing to the industry at domestic and international level for more than half a decade. It has been researching for an Open Source WEBGIS application which allowed the dynamic creation of maps based on user interaction and requests. One of such Open Source System is Mapserver which allowed all the above operations and also supported scripting modules such as PHP/ Mapscript, Python/ Mapscript e.t.c.

Mapserver an Open Source WEBGIS application

Mapserver is a GIS tool oriented towards publication and use of online web maps. It is an Open Source development environment for building spatially enabled internet applications. MapServer will run where most commercial systems won't or can't, on Linux/Apache platforms. MapServer is known to compile on most versions of UNIX/Linux, Microsoft Windows and even MacOS. The basic MapServer CGI application provides a significant number of features.

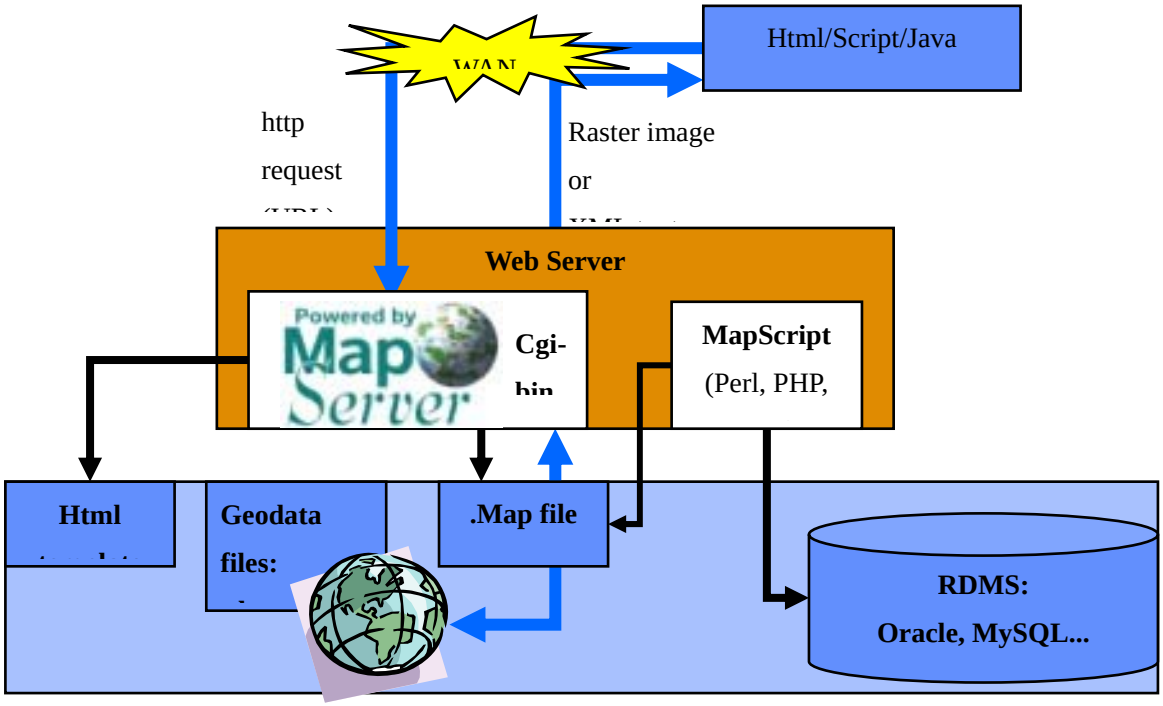

Fig Mapserver Architecture

The above figure shows the general architecture of MapServer .It consists of the Webserver, database server and other scripting languages that is used to request the data to the server.

MapServer's core configuration is through a text-based runtime configuration file.Referred to as a map file, it is the core of most MapServer-based applications. The CGI program or custom MapScript application reads this configuration information, accesses data, draws the map and returns a graphic ready for online viewing.. The map file has a simple hierarchical object structure, with object inheriting settings from their children.

A MapServer map file is the like the glue that holds a MapServer application. Together it defines almost every aspect of a map, its layers, and preferences for display. Based on the constraints provided in the file, MapServer will dynamically generate map, a smaller keymap to show position of the main view in the overall map, scalebar if requested, as well as a legend. Certain metadata elements are also defined within the map, as well as feature colors, defaults, and projection preferences.

It determines not only the look and feel of the map, but also how MapServer behaves when invoked by the web server.

Mapscript

MapScript is the scripting interface to MapServer. In MapScript's case, the server executes a certain script, which contains standard language functionality, plus access to almost all of the MapServer C API. MapScript module, allows us to do many GIS operations on spatial data, including readwrite access to shapefiles, reprojection of data, and many others.

The CGI version of MapServer is not required to run MapScript applications, just as we don't need a particular MapScript module to run the CGI. MapScript can be configured using only map files, but, unlike the CGI, also includes the possibility of dynamically create maps or modify existing ones and to mix this information with other sources of non GIS data, such as user input, non spatial and spatial databases, text files, etc. and that we can use every single module the language provides.

Mapserver support different scripting interfaces such as PHP/Mapscript, Perl /Mapscript, Python/ Mapscript. Basically, we feed geographical data and relevant user input to MapScript and as a result get one or more file(s),typically standard image files such as a PNG or JPEG., So that we can apply anything we have seen in any server side scripted web application, HTML, Java applets, CSS,HTML templates, sessions e.t.c.

MapScript has its own methods classes and functions that are used to communicate between mapserver and webserver. It uses these functions to access the functionality of mapserver and get the data to the user as requested by them.

Conclusion

The Internet and World Wide Web is gaining popularity as the revolutionary medium of communication for the new millennium. Thus the integration of Internet and GIS for information dissemination has provided a new Opportunity for GIS Industries to exploit. The use of Open Source WEBGIS application in the developing countries like ours will benefit immensely by having our own software industry, both by keeping government and NGO funds in their own economy, and by giving the country more input into the solutions developed for citizens.