

Design Geo-publication service in the Cloud

Abstract – Cloud computing can bring Geographical Information Systems (GIS) considerable benefits in terms of scalability, performance and cost-effectiveness. Nowadays, a lot of organizations in the geo-spatial field need to process geographical data to do some complex operations. So they need to use a program for few minutes only and we have to bring the necessary tools to be able of executing these applications in the cloud. In AKKA Research center, we developed the CLOUDS project PaaS which aims to use Cloud capabilities to build efficient GIS applications and that was the subject of my final internship. The project was following the innovation process defined by AKKA Research (State of the art, Test, Proof of concept, Design, Implementation...).

The purpose of this poster is to show the design of a geo-publication service in the cloud to allow the using of GIS applications and services. Those applications are running in a private cloud based on Openstack- the leading open source framework for building clouds. The architecture of the service is built using open source tools only (Postgres/PostGIS databases, Mapserver, Geoserver....). This service is on demand and will allow deploying a scalable architecture..

This poster will contain an overview of all the web services developed in the CLOUDS platform. The core services aims to offer sustainable and highly-scalable databases, file systems, web servers and GIS servers compliant with the Open Geospatial Consortium (OGC) standards... Within this platform, users can publish, manage and share their geographical data in databases or file systems. Next, I will show the results of some performance tests that I have been performed for geo-publication service.

- In order to evaluate the performance of single nodes depending in demanded service and data sources.
- Then to compare the results with nodes in cluster in order to demonstrate the benefits of using Cloud computing.

Finally, I will present various Cloud implementation architectures of the project with the design and development of several services and more specifically geo-publication services. I will also show how they are connected to each other in order to provide high-availability. To pilot and manage the clusters in the CLOUDS project, we are using REST APIs that allow supervision and monitoring services and/or administrators to add/remove instances dynamically depending on charge peaks and to adapt the capacity of computation power (number of instances) and data storage to the needs.



Figure: CLOUDS architecture

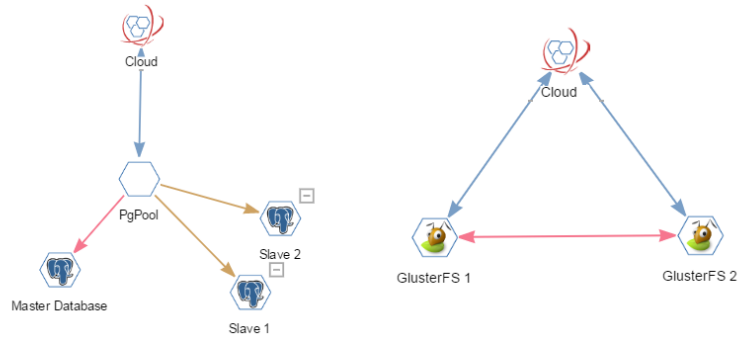


Figure: ElasticDB & ElasticFS Architectures

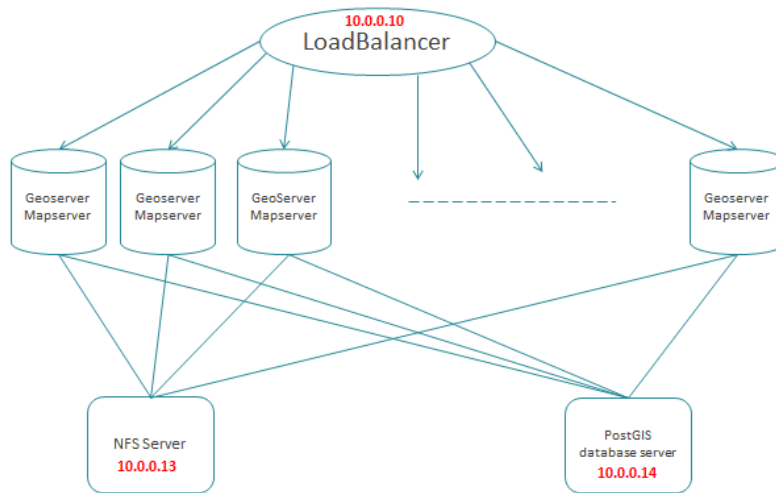


Figure: Geo-publication design