Development of a prototype cloud application for a geodatabase

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ABSTRACT

Cloud is the next evolution step of IT with revolutionary implications for business and society, creating new possibilities and enabling more efficient, flexible and collaborative computing models. Cloud computing delivers computation, software, data access, and storage services that do not require end-user knowledge of the physical location and configuration of the system. Similar to this concept is the electric grid where users utilize power without understanding the system components. Major goal in development of a geodatabase is to use web browser while all services, data and applications are on the cloud. This prototype cloud application for the geodatabase is composed of web services and additional software components:

1) Relational database GeoMak created in PostgreSQL and PostGIS that stores all geospatial and other types of data of the geodatabase.
2) Web service Geoserver – developed for presentation and management of vector maps and geospatial data from HMak (1). Important role of Geoserver is to serve as a middle layer application that abstracts distributed data sources and creates a platform for access of geospatial data to created services of the geodatabase.
3) Web service for processing spatial data based on OpenLayers, JavaScript mapping library that support OGC standards for geospatial web services. Service is linked to Geoserver (2) and using protocols (WMS, WFS), enters, modifies and saves geospatial data.
4) Integration of all previous components and services (1-3) into the cloud-based implementation of the geodatabase.

Design of the geodatabase is based on two paradigms that are closely related, cloud and service oriented architecture. Spatial information system is web based that enables data processing and access to services independent from the physical location. The defined services (list 2, 3) are accessible via the two web-based interfaces. Cloud application is built using several programming languages (JavaScript, AJAX, PhP, Java), additional applications (Geoserver, PostgreSQL, PosgGIS), libraries (OpenLayers), geospatial standards (OGC), protocols (WMS, WFS) and others. Components and software packages used in the development of the spatial information system are open source. Design and system components allow easy upgrade of the system and its interoperability, heterogeneous, distribution and scalability.

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