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Cloud computing geospatial application for water resources based on free and open source software and open standards – a prototype

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Presently, most of the existing software is desktop-based, designed to work on a single computer, which represents a major limitation in many ways, starting from limited computer processing, storage power, accessibility, availability, etc. The only feasible solution lies in the web and cloud.
This abstract presents research and development of a cloud computing geospatial application for water resources based on free and open source software and open standards using hybrid deployment model of public – private cloud, running on two separate virtual machines (VMs). The first one (VM1) is running on Amazon web services (AWS) and the second one (VM2) is running on a Xen cloud platform. The presented cloud application is developed using free and open source software, open standards and prototype code. The cloud application presents a framework how to develop specialized cloud geospatial application that needs only a web browser to be used. This cloud application is the ultimate collaboration geospatial platform because multiple users across the globe with internet connection and browser can jointly model geospatial objects, enter attribute data and information, execute algorithms, and visualize results. The presented cloud application is: available all the time, accessible from everywhere, it is scalable, works in a distributed computer environment, it creates a real-time multiuser collaboration platform, the programing languages code and components are interoperable, and it is flexible in including additional components.
The cloud geospatial application is implemented as a specialized water resources application with three web services for 1) data infrastructure (DI), 2) support for water resources modelling (WRM), 3) user management. The web services are running on two VMs that are communicating over the internet providing services to users. The application was tested on the Zletovica river basin case study with concurrent multiple users.
The application is a state-of-the-art cloud geospatial collaboration platform. The presented solution is a prototype and can be used as a foundation for developing of any specialized cloud geospatial applications. Further research will be focused on distributing the cloud application on additional VMs, testing the scalability and availability of services.