



Standardizing the Description and Execution of Geoprocessing Workflows

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Workflows that transform geospatial datasets to maps or other derived geospatial information usually involve several processing steps. These steps may be implemented in various tools and may run on different machines or in cloud environments. Though there has been a reasonable amount of previous work, a common approach for defining such distributed workflows, for sharing these workflows with others, and for (semi-)automating the execution of such workflows in workflow engines is still missing. Besides the general question of how to compose and execute the workflow, also access restrictions need to be considered and may require approaches such as identity mediation or delegation when executing these workflows.

This presentation will present an approach developed in the Testbed 13 of the Open Geospatial Consortium (OGC), where a workflow for road data conflation consisting of several steps including coordinate transformations, quality assurance and data fusion has been implemented. The different processing steps are exposed as standardized Web Services (OGC WPS) and the Business Process Model and Notation is used for defining, describing and exchanging the workflow. In order to provide an automated execution of the workflow, the Camunda BPMN execution engine has been used and in turn has been encapsulated in a transactional WPS. Since the workflow is run in different secured environments, approaches for identity mediation, dominating privileges and for tunneling proxies have been developed and implemented.

The talk will start with a general overview on previous work and workflow description languages. Afterwards, the approach utilizing BPMN and the Camunda execution engine will be demonstrated. We afterwards present lessons learned and shortcomings regarding the usage of BPMN in common execution engines for running geoprocessing workflows that require either extensions of BPMN and/or customization of execution engines. Finally we sketch future work needed to facilitate an exchange and execution of distributed geoprocessing workflows without the need to customize tools.