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# Cloud Support for Scientific Workflow Execution: Prototyping Solutions for Remote Sensing Applications

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**Abstract :** Workflow concepts are essential for the development of remote sensing applications. They can help users to manage and process satellite data and execute scientific experiments on distributed resources. The objective of this paper is to introduce an approach for the specification and the execution of complex scientific workflows in Cloud-like environments. The approach strives to support scientists during the modeling, the deployment and the monitoring of their workflows. This work takes advantage from Petri nets and more pointedly the so-called reference nets formalism, which provides a robust modeling/implementation technique. RENEWGRASS is a tool that we implemented and integrated into the Petri nets editor and simulator RENEW. It provides an easy way to support not experienced scientists during the specification of their workflows. It allows both modeling and enactment of image processing workflows from the remote sensing domain. Our case study is related to the implementation of vegetation indecies. We have implemented the Normalized Differences Vegetation Index (NDVI) workflow. Additionally, we explore the integration possibilities of the Cloud technology as a supplementary layer for the deployment of the current implementation. For this purpose, we discuss migration patterns of data and applications and propose an architecture.

**Keywords :** cloud computing, scientific workflows, petri nets, RENEWGRASS
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