CrossGrid integrated workflow management system

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Abstract. This paper describes a workflow management system that was implemented according to the requirements of a Flood forecasting application [1] developed in the CrossGrid project [2]. The flood forecasting application contains several simulation models (meteorological, hydrological, hydraulic) implemented as the grid jobs. A need for a cascade execution of these models has been a motivation for creating workflow management system capable of executing of a cascade of simulations in the CrossGrid testbed. First implementation of the workflow system has been tied to the portal user interface, but currently has been decoupled as a standalone grid service, which can be used by the two user interfaces developed in the project.

1. Introduction

During the development of the Flood forecasting application[1] in the CrossGrid[2] project we have faced the problem of running a cascade of simulations comprising the application in the project testbed in an automatic way, so that the user will not have to submit each job separately and make the coupling of the input and output files by hand.

The application focuses on the prediction of floods, which are considered as serious problem, causing a lot of damages with many people threatened or even killed. Among the methods that can help to mitigate consequences of floods is a prediction of such an event. Our prediction system consists of several simulation models – meteorological, hydrological and hydraulic, which form the base of a simulation cascade. The cascade is actually a workflow. The meteorological model computes the precipitation in the target area, which is then processed by hydrological model for run-off computation and finally the hydraulic model computes the flow of the water in the river bed and surrounding area. More detailed description can be found in [1]. We are cooperating with experts from Slovak Hydro-Meteorological Institute, which provide us with data for the models and the relevant know-how.