

Efficient Gridification of Environmental Protection Applications with QoS

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The environmental protection was identified as a domain of high interest for South East Europe, addressing practical problems related to security and quality of life. The gridification of these applications faces several challenges:

1. These applications are usually resource intensive, in terms of both CPU utilization and data transfers and storage.
2. The use of applications for operational purposes poses requirements for availability of resources, which are difficult to be met on a dynamically changing Grid environment.
3. The validation of applications is resource intensive and time consuming. This leads to a certain level of conservatism and requires the execution environment to be predictable and controlled by the developers of the applications. Such requirements preclude the use of some techniques that are acceptable for other areas. For example, the completion of the executable on-the-fly is not a viable option, even though in other areas it allows for the best performance.

The Job Track Service (JTS) is a grid middleware component which facilitates the provision of Quality of Service in grid infrastructures using gLite middleware. The service is based on messaging middleware and uses standard protocols like AMQP (Advanced Message Queuing Protocol) and XMPP (eXtensible Messaging and Presence Protocol) for real-time communication, while its security model is based on GSI authentication. It enables resource owners to provide the most popular types of QoS of execution to some of their users, using a standardized model.

In this work we describe a new version of the Job Track service offering application specific functionality, geared towards the specific needs of the Environmental Modelling and Protection applications. We used the modular design of the JTS in order to enable smoother interaction of the users with the Grid environment. Our experience shows improved response times and decreased failure rate from the executions of the application. In this work we present such observations from the use of the South East European Grid infrastructure. The new version of the JTS enables more collaborative and efficient use of the Grid resources and answers to the application requirements.