SHIWA Services for Workflow Creation and Sharing in Hydrometeorolog

Gabor Terstyanszky (1), Tamas Kiss (2), Peter Kacsuk (3), and Gergely Sipos (4)

(1) University of Westminster, Faculty of Science and Technology, Dept of Computing and Data Science, London, United Kingdom (terstyg@gmail.com, 442079115000), (2) University of Westminster, Faculty of Science and Technology, Dept of Computing and Data Science, London, United Kingdom , (3) MTA SZTAKI, Budapest, Hungary, (4) EGI.eu, Amsterdam, Netherlands

Researchers want to run scientific experiments on Distributed Computing Infrastructures (DCI) to access large pools of resources and services. To run these experiments requires specific expertise that they may not have. Workflows can hide resources and services as a virtualisation layer providing a user interface that researchers can use. There are many scientific workflow systems but they are not interoperable. To learn a workflow system and create workflows may require significant efforts. Considering these efforts it is not reasonable to expect that researchers will learn new workflow systems if they want to run workflows developed in other workflow systems. To overcome it requires creating workflow interoperability solutions to allow workflow sharing. The FP7 "Sharing Interoperable Workflow for Large-Scale Scientific Simulation on Available DCIs" (SHIWA) project developed the Coarse-Grained Interoperability concept (CGI). It enables recycling and sharing workflows of different workflow systems and executing them on different DCIs.

SHIWA developed the SHIWA Simulation Platform (SSP) to implement the CGI concept integrating three major components: the SHIWA Science Gateway, the workflow engines supported by the CGI concept and DCI resources where workflows are executed. The science gateway contains a portal, a submission service, a workflow repository and a proxy server to support the whole workflow life-cycle. The SHIWA Portal allows workflow creation, configuration, execution and monitoring through a Graphical User Interface using the WS-PGRADE workflow system as the host workflow system. The SHIWA Repository stores the formal description of workflows and workflow engines plus executables and data needed to execute them. It offers a wide-range of browse and search operations. To support non-native workflow execution the SHIWA Submission Service imports the workflow and workflow engine from the SHIWA Repository. This service either invokes locally or remotely pre-deployed workflow engines or submits workflow engines with the workflow to local or remote resources to execute workflows. The SHIWA Proxy Server manages certificates needed to execute the workflows on different DCIs. Currently SSP supports sharing of ASKALON, Galaxy, GWES, Kepler, LONI Pipeline, MOTEUR, Pegasus, P-GRADE, ProActive, Triana, Taverna and WS-PGRADE workflows. Further workflow systems can be added to the simulation platform as required by research communities.

The FP7 "Building a European Research Community through Interoperable Workflows and Data" (ER-flow) project disseminates the achievements of the SHIWA project to build workflow user communities across Europe. ER-flow provides application supports to research communities within (Astrophysics, Computational Chemistry, Heliophysics and Life Sciences) and beyond (Hydrometeorology and Seismology) to develop, share and run workflows through the simulation platform. The simulation platform supports four usage scenarios: creating and publishing workflows in the repository, searching and selecting workflows in the repository, executing non-native workflows and creating and running meta-workflows.

The presentation will outline the CGI concept, the SHIWA Simulation Platform, the ER-flow usage scenarios and how the Hydrometeorology research community runs simulations on SSP.