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WS-PGRADE/gUSE generic DCI gateway framework for EGI user communities

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Description of the work

In this talk we introduce WS-PGRADE/gUSE, a generic DCI gateway framework and backend service stack that can be easily customized to build application-specific science gateways. The most distinguishing feature of WS-PGRADE/gUSE compared to other generic DCI gateway frameworks is that it is workflow-centric, i.e., it provides services to build workflow applications that can be executed on various DCIs. The provided execution mechanism enables the simultaneous execution of workflow nodes placed on parallel workflow branches. These nodes can be executed in parallel in different DCIs enabling the organization of very efficient parallel, multi-DCI workflow applications. WS-PGRADE/gUSE provides all the services that are needed to create, execute and monitor these workflows. Therefore the three most important features of WS-PGRADE/gUSE are as follows:

1. Workflow support
2. Enabling multi-DCI workflow execution
3. Enabling the customization of the framework towards application-specific science gateways

In the current talk we focus on these most important features of WS-PGRADE/gUSE, i.e., we show how it allows creating complex workflow scenarios, and enables running them on a diverse set of DCIs. We show two different customization methodologies of WS-PGRADE/gUSE that will be used within the EU FP7 SCI-BUS project to create customized science gateways.

As an example to create customized science gateways a new Autodock gateway based on WS-PGRADE/gUSE has been opened for biologist to access the EDGeS@home volunteer desktop grid resources. This is a good example for the communities to create specific gateways by customizing WS-PGRADE/gUSE.

Link for further information

http://www.guse.hu/
https://sourceforge.net/projects/guse/

Wider impact of this work

WS-PGRADE/gUSE is an open source software based on apache license and can be downloaded from source-forge. Since its publication on sourceforge in February 2011 more than 2000 downloads have been done from 42 countries.

The WS-PGRADE/gUSE framework has already been used by several user communities to customize for their need because its very flexible workflow system and its capability of submitting and managing these workflows on a large variety of different DCIs.

It is the core gateway framework of the SCI-BUS EU FP7 project that will customize from gUSE 17 different application-specific gateways for various user communities including seismology, astrophysics, helio-physics, chemistry, biology, medical science, etc.

WS-PGRADE/gUSE is also the basis of the SHIWA Simulation Platform that enables combining many different kind of workflows (Taverna, Askalon, Moteur, GWES, Galaxy, WS-PGRADE, Kepler, Triana, etc.) into a single meta-workflow and execute them on various DCIs.

Printable Summary

The WS-PGRADE/gUSE generic DCI gateway framework has been developed to support large variety of user communities. It provides a generic purpose, workflow-oriented graphical user interface to create and run workflows on various DCIs including clusters, grids, desktop grids and clouds. The framework can be used by NGIs to support various small user communities who cannot afford to develop their own customized science gateway. The WS-PGRADE/gUSE framework also provides two API interfaces (Application Specific Module API and Remote API) to create application-specific science gateways according to the needs of different user communities. The paper describes in detail the workflow concept of WS-PGRADE, the DCI Bridge service that enables access to most of the popular European DCIs and the Application Specific Module and Remote API concepts to generate application-specific science gateways.

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