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# WS-PGRADE: the second generation P-GRADE portal

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After the great success of the first generation P-GRADE portal we have created the second generation P-GRADE portal, called WS-PGRADE portal. WS-PGRADE is the user interface service of gUSE (grid User Support Environment) which is a high-level grid middleware to provide a set of services for high-level work-flow execution. These services include: workflow engine, workflow storage, data storage, information service, brokering service and various grid submitter services for LCG-2, gLite, GT2, GT4 and BOINC grids.

## Impact

Since WS-PGRADE can support both advanced application developers who understand grid technology as well as end-users who do not necessarily know grid systems, WS-PGRADE can attract large number of new users for EGEE. The built-in application repository concept enables the collaboration of user communities to jointly develop new applications. Application developers can place grid-enabled applications into the repository and end-users can download and use those applications by simply defining the necessary parameters. The applications can be single jobs, parameter sweep (PS) jobs, workflows including PS nodes, generators and collectors. These special node types can be used anywhere in the workflow providing a very flexible way of constructing highly sophisticated and very large workflows. WS-PGRADE workflows can be executed in various resources: local clusters, web services, LCG-2, gLite, GT2, GT4 and BOINC grids, and hence users can exploit many resources from different grids.

## URL for further information

http://www.guse.hu/

## Conclusions and Future Work

WS-PGRADE is used in the EU CancerGrid project to develop and run three applications: Descriptor Calculation, Model Building and Property Prediction. The application developer interface of WS-PGRADE was used to develop the three applications and the end-user view is used by the chemists to run the applications in a private BOINC desktop grid and in EGEE. This version of WS-PGRADE is used in production by the cancerGrid users. A beta version of WS-PGRADE is available publicly for EGEE users.

## Keywords

grid portal, workflow, parameter sweep, P-GRADE, WS-PGRADE, gUSE

## Detailed analysis

The parameter sweep (PS) workflow (WF) concept of P-GRADE has been further developed and extended by the new generation of SOA-based WS-PGRADE portal that is one of the services of gUSE. The talk explains in detail the new PS features of WS-PGRADE. While P-GRADE enables only one level DAG-based WFs WS-PGRADE supports the construction of nested WFs and even recursive WF invocations. The DAG concept is also extended with some control mechanism and web service invocation capabilities. WS-PGRADE WFs

can be executed in various resources: local clusters, web services, LCG-2, gLite, GT2, GT4 and BOINC grids supported by a built-in meta-grid broker selecting always the best resources even in case of PS nodes of the WF. WS-PGRADE supports the concept of abstract workflows, WF templates and WF instances. All these can be stored in a built-in repository that supports the collaboration of application developers and end-users. An example is the usage in the EU FP6 CancerGrid project.

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