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Testing and Benchmarking Grid Infrastructures using the g-Eclipse Framework

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The dynamic and heterogeneous nature of the Grid frequently causes the degradation in the expected Quality of Service (QoS). Therefore, there is a need for developing interactive tools that enable Grid users to on-demand test and benchmark Grid services and resources. The g-Eclipe framework provides plugins that allow the execution of tests and benchmarks that evaluate the availability, reliability and performance of Grid resources.

Impact

Users that wish to utilize the Grid infrastructure for executing applications that are computational and storage demanding, need to evaluate a priori the resource offerings of different infrastructures and Virtual Organizations(VO). These evaluations should take into account the quality of the resources supporting a specific VO. Quality should incorporate aspects such as the functionality, the performance capacity, availability and reliability of these resources.
The g-Eclipse tests and benchmarking framework architecture were designed and implemented having the above in mind. The features currently provided in the two frameworks allow a Grid user to assess the quality of the resources offered by an infrastructure and consequently decide it's suitability for their applications.

URL for further information

http://www.geclipse.eu
http://www.eclipse.org/geclipse/
http://grid.ucy.ac.cy/gridbench/

Conclusions and Future Work

g-Eclipse comes with an extensive and comprehensive documentation and help system that describes the architecture of the tests and benchmarking frameworks and provides guidance for developers that wish to extend the current functionality with additional features or support for other middleware. Being an official Eclipse project, g-Eclipse follows the rules and practices of the Eclipse community for sustainable user-support, after the official project end, through mailing lists,wiki and forums.

Keywords

g-Eclipse, Bechmarking, GridBench, Tests, Eclipse, Grid

Detailed analysis

g-Eclipse is a middleware agnostic framework built on top of the reliable Eclipse community eco-system to enable a sustainable development and end-user support. The framework provides tools to test and benchmark the availability, reliability and performance of Grid resources.
An extensible test framework enables performing simple or structured tests on Grid resources through guided wizards and editors.Simple tests can check resource availability, while structured tests can perform extended

tests which may involve the submission of a job to a Grid infrastructure for performing the test or contacting an external testing service for retrieving existing results.
A benchmarking framework based on previous work made on GridBench, delivers metrics which quantify the performance of services.Through a form editor benchmark descriptions and parameters can be specified. Benchmark results are stored in a database and can be viewed in a tabular or graphical form through a benchmark specific view.

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