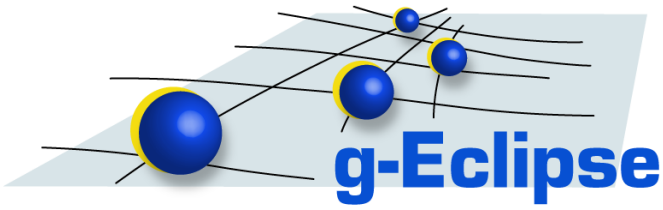

Newsletter

for the g-Eclipse Project

Scientists from six European institutes are preparing an Integrated Development Environment for the Grid.

As of 1 July 2006, the grid landscape has changed with another potentially very interesting project, g-Eclipse, partially funded by the European Commission. The central idea of g-Eclipse is to simplify access to the grid and its power and to provide an integrated environment which addresses the needs of all possible grid activities.

Grid initiatives provide sets of geographically distributed resources shared by different organizations to solve large-scale computation problems. This emerging computing model enables users to perform high throughput computing by taking advantage of many networked computers. In principle, this resembles a virtual computer, able to distribute process execution across a large parallel computing architecture. However, while Grids allow solving very large computational problems, they require substantially more effort and experience from users.

In recent years, many Grid projects initiated on the national and the European level focused mainly on the basic low-level building blocks of the infrastructure. As of today, there is still the lack of a uniform toolbox, which will be an entry point to the Grid and which will allow for unfettered grid access for different user activities. Currently most Grid tools are stand-alone applications that address one specific problem or application-domain on the Grid. Consequently, Grid application development is hindered by the lack of common, generic, Grid-based environments and tools that can easily integrate existing stand-alone tools that have the potential of being adopted by a broad range of application-developer, -operator and end-user communities.

The main goal of the g-Eclipse project is to create an integrated development environment (IDE) for all grid activities. The idea is that the same toolbox can be used for utilizing grids in applications, for operating and managing grid infrastructure, and for developing grid applications.

Eclipse g-Eclipse will be based on Eclipse, probably the most successful IDE available nowadays. The development of Eclipse was started by IBM in the late 1990s and then handed over to the nonprofit Eclipse Foundation (www.eclipse.org), to be managed as an open-source platform. Its design follows the standards set by the Object Management Group (www.omg.org) that supports the interoperability between enterprise applications. The Eclipse platform is freely licensed and open source. It provides a small IDE with a modular architecture that supports multiple operating environments and multiple programming languages. Although it started as an open source IDE for JAVA, nowadays it supports many other programming languages like C/C++, FORTRAN, PERL, PHP, and tools for the generation of web services. The power of Eclipse lies in the common platform that it provides into which different multi-vendor tools can be integrated. Eclipse was designed for extensions from the very beginning and all Eclipse components and plug-ins are built for re-use. Anyone can write plug-ins for Eclipse and can have them work directly with any other plug-in for the platform. Eclipse's success is attributable to this capability and to the Eclipse open-source license, which allows developers to have easy and free-of-charge access to the source code. This will allow them to modify it and innovate quickly to meet user needs. Eclipse is also experiencing strong adoption in the research area as an ideal platform for research, as it allows the user to concentrate on the research subject, instead of creating the basic infrastructure. The rich set of open source extensions (>500 at the time of writing) available from the Eclipse community can provide an additional benefit to research projects. With all these features, Eclipse is a perfect base on which to build an integrated Grid environment.

The g-Eclipse framework will be the workbench of the future, bringing new applications, users and Grid resource providers together in the European Research Area. It will provide an integrated Grid

environment for Grid users, operators and developers, bringing together expertise from the academic Grid community and from the Eclipse community.

The g-Eclipse integrated Grid environment will allow for user-friendly access to Grid resources by hiding the increasing complexity of the Grid. The architecture of the g-Eclipse framework will be geared towards reuse and extensibility in order to allow for easy adaptation by new Grid applications. The g-Eclipse project will address three major groups in the Grid domain: Grid users will benefit from the user-friendly access to Grid resources; Grid operators and resource providers will be able to reduce the time-to-service by the Grid management and Grid site configuration tools; and Grid application developers will reduce the time-to-market for new Grid applications by accelerating the development and deployment cycle.

The primary impact of g-Eclipse can be seen in the academic e-Science community. The development cycle of new e-Science applications will be reduced and e-Science users will get a standardized user interface with the same look-and-feel on different computer platforms. This success will encourage commercial Eclipse plug-in providers and distributors to take g-Eclipse into their portfolio. The main result will be vastly simplified access to Grid resources which will help to provide a pervasive use of Grid infrastructures for European citizens in the future. By simplifying grid usage, g-Eclipse has the potential to gain the same importance on the Grid as web browsers had on the World Wide Web.

The project is comprised of six partners from five European countries – five experienced academic partners and one highly skilled industrial partner from the Eclipse community. The Coordinator of the project is Forschungzentrum Karlsruhe and partners are Poznan Supercomputing and Networking Center, Johannes Kepler Universität Linz, University of Cyprus, University of Reading and Innoopract Informationssysteme GmbH.