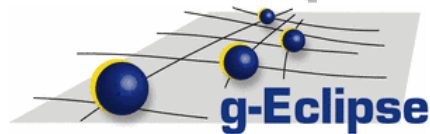# g-Eclipse - Access the power of the Grid

INTRODUCTION

The g-Eclipse framework provides tools to customise Grid users' applications, to manage remote resources and to support the development cycle of new Grid applications. The framework consists of general Grid workbench tools that can be extended for many different Grid and Cloud middlewares (such as gLite, UNICORE, Globus Toolkit, QosCosGrid, Amazon Cloud). As the PL-Grid consists of heterogeneous resources the g-Eclipse is the perfect tool for PL-Grid users and application developers and they do not need to care about the specific grid middleware supports. The same application can work with different grids or infrastructures without any changes. Core Grid plug-ins for the Eclipse platform standardise the access of Grid infrastructures from within Eclipse, while the intuitive interface hides the complexity of using Grid services from the end user or application developer, which results in a low entry barrier especially for users and developers new to the Grid.
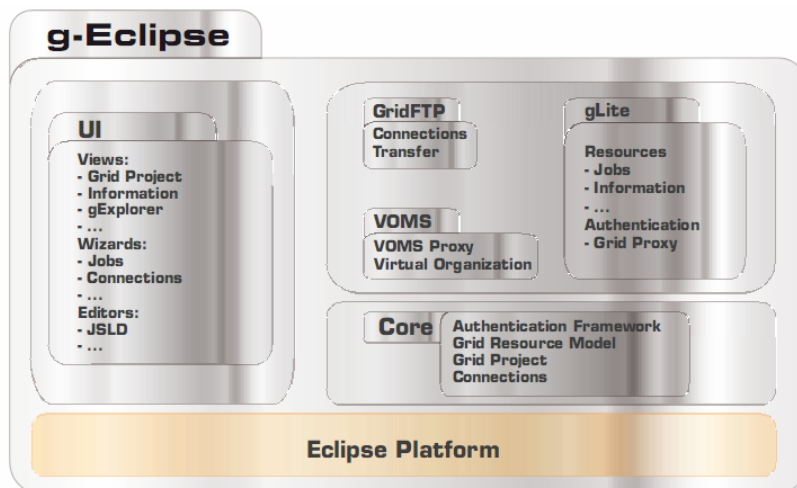
BENEFITS FROM USING G-ECLIPSE

❑ Grid application users will benefit from the desktop-like access to Grid resources.

❑ Grid operators and resource providers will be able to reduce the time-to-service by using the Grid management and Grid site configuration tools.

❑ Grid application developers will reduce the time-to-market for new Grid applications by accelerating the development and deployment cycle.

g-Eclipse ELEMENTS (functionalities)

Grid Virtual Organisation management allows the dynamic creation and management of Virtual Organisations and their resources.

Grid job management supports Grid users and developers in creating and managing Grid jobs independently of the middleware.

Grid file management provides access and management of local and foreign resources whitch are seamlessly integrated into the Eclipse Workbench.

Grid application deployment supports Grid application developers and Grid application users with deployment of their applications on the Grid.

Grid visualisation tools offer functionalities that allow the visualisation of scientific and numerical calculations.

Grid workflow builder support the creation and management of middleware independent workflows.

Grid command console is a command line interface used to access the Grid.

API and User Interface modules for all above functionalities are provided.

g-Eclipse was funded by European Commission Sixth Framework Programme. In PL-Grid project the framework is customized for specific PL-Grid requirements and implementation focuses on following continuous evolution of grid middleware.
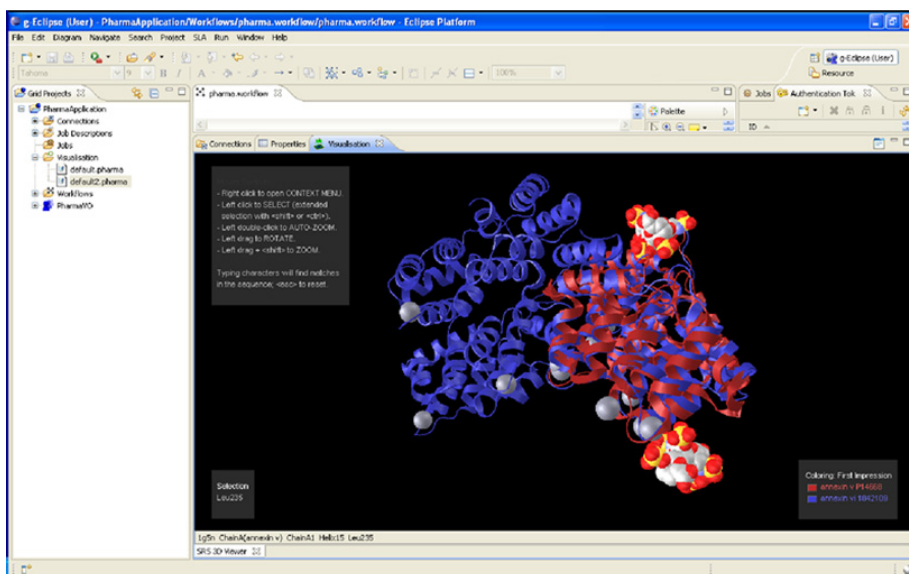
Application integration with g-Eclipse

PL-Grid users can benefit from a g-Eclipse user-friendly graphical interface designed for accessing grid infrastructure and integrate their applications with g-Eclipse to hide the grid heterogeneity and make usage of PL-Grid resources simple.

The easiest way is to provide XML-based application descriptions to specify application parameters in a friendly way. XML description is converted to a graphical dialog form, containing fields for entering application parameters.

Pharmaceutical Data Visualisation using g-Eclipse

With the help of the g-Eclipse framework, application developer or integration can prepare applications, both simple or workflow, and share them with the application users group.

More advanced way of application integration can be achieved by providing more advanced plug-ins like input file editor or result visualisation. g-Eclipse provides visualisation functionality that can be used by application plug-ins. For some application also submission support plug-in is necessary to prepare a proper job description and input scripts. Plug-ins can also register additional job description format and supporting editors (textual or graphical ones) which can submit and handle specific application input file format. By embedding application into g-Eclipse, developer does not need to provide client interface or grid resources management. All elements, menus and actions to submit job, manage it, update its status or transfer relevant files are provided by g-Eclipse framework.
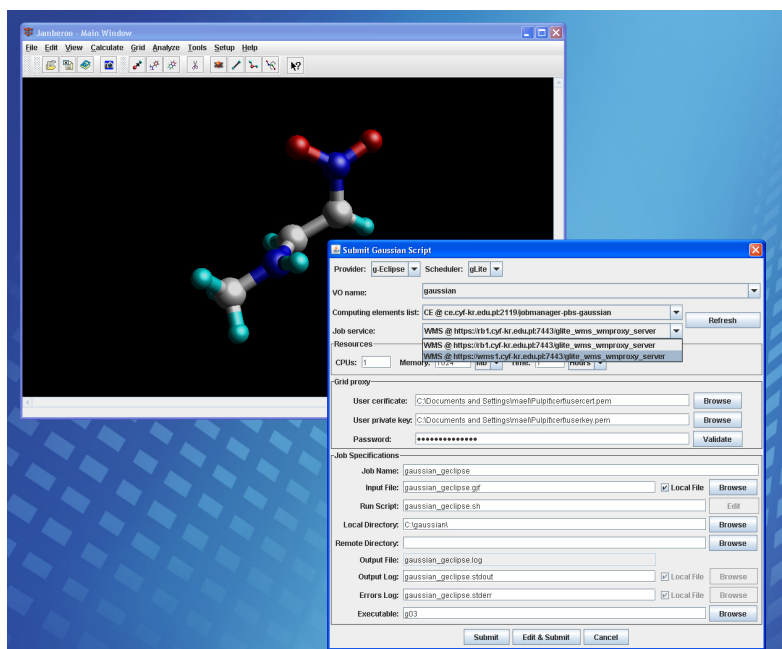
JMolEditor with Grid submission capabilities

The advanced method of integration is to prepare a custom application. By extensive use of the Eclipse extension mechanism in combination with object-oriented design patterns, the framework can be easily extended by application-specific implementations. The application is not plugged into g Eclipse, but rather built on top of it. It follows the approach of the Rich Client Platform (RCP) of Eclipse. Dedicated applications can be built by using parts of g-Eclipse as a common library to handle resources and grid access. With such an approach existing applications can be gridified. As the g-Eclipse core model is grid middleware independent the same application can access resources from different grid middleware.

Many of PL-Grid users expressed interest in using GAUSSIAN application. To meet their need g-Eclipse is being integrated with GAUSSIAN and JMoleEditor which will allow simple working with g98 input files in Grid context. User can submit just GAUSSIAN input files to the grid ant they do not need to care about all grid technical details. GAUSSIAN was chosen as a exemplary application integration but support for other applications can be provided as well.

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