

Easy Access to Grid infrastructures

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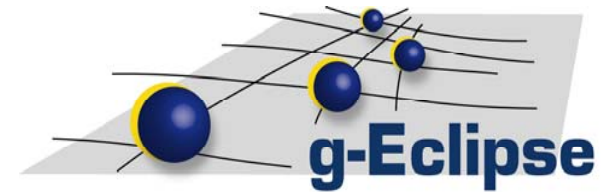
Dr. Mathias Stuempert (KIT-SCC, Karlsruhe)

EGEE User Forum 2008

Clermont-Ferrand, France

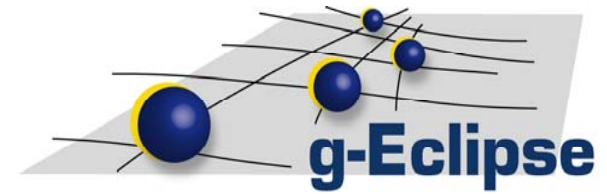
13th of February 2008

Status



- g-Eclipse **is available** and can be used to access Grid infrastructures **independent** of the middleware
 - g-Eclipse 0.5 in September supports gLite
 - g-Eclipse 1.0 is under development to support the GRIA middleware (www.gria.org)
 - Current Milestone (g-Eclipse 1.0M2)
- g-Eclipse is open for contributions
 - **more middleware implementation**
 - based on the “Eclipse way”
 - integration of existing tools

Potential of g-Eclipse



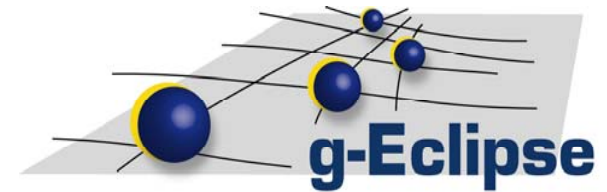
- The success of the WWW was based on the availability of a
 - **Browser** which enables access to
 - **server infrastructure** which use a common
 - **protocol**
- The current Grid is based on
 - **Too many portals/CLI** to access
 - **Middleware dependent**
Grid infrastructure by using
 - **many protocols, standards and proprietary software stacks**

Potential of g-Eclipse (II)

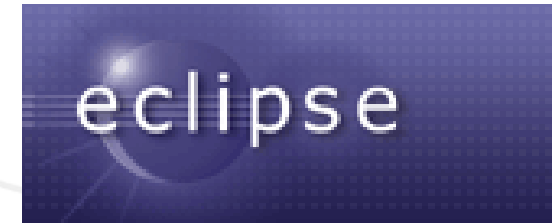


- The future Grid should be
 - An extensible, middleware agnostic framework to access
 - Grid infrastructures independent of the used
 - protocols, standards and software stacks
- g-Eclipse has the potential for the client side “browser” of Grid infrastructures
 - Middleware independent
 - OS independent
 - reliable
 - extensible

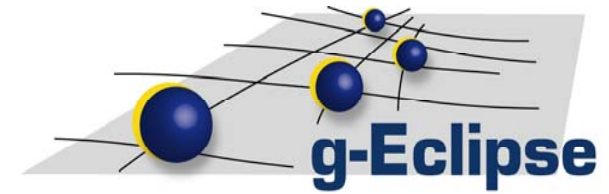
g-Eclipse – basis



- Built on top of the extensible Eclipse eco system
 - Open Source changes the process of software development
 - Eclipse has 70% market share in tooling market
 - Important: Eclipse offers a Open Source development process for industry to deliver in **time** and **quality**
 - **Planned, Transparency, Quality, Agile methods**
 - Enabler for commercial products:
 - i.e. Lotus Notes, ...



g-Eclipse – projects



- www.geclipse.eu
- Project funded by the European Commission (INFSO-32347)
- 7 partners
- www.eclipse.org/geclipse
- Technology project at Eclipse Foundation
- Release 1.0.0 with stable API scheduled for autumn of 2008



Forschungszentrum Karlsruhe
in der Helmholtz-Gemeinschaft

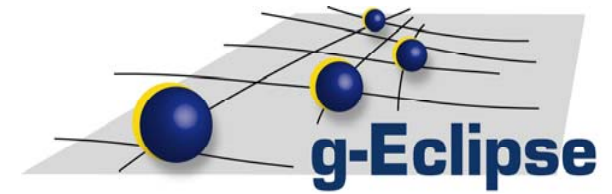


The University of Reading



- Until autumn of 2008

Grid project



Resource Broker

Replica Manager

Computing

Storage

Infrastructure

Grid project

Programming
languages

Applications

Domain
services

Batch apps

Infrastructure
Providers

Policies

Interactive apps

Virtual
Organisations

Service
Providers

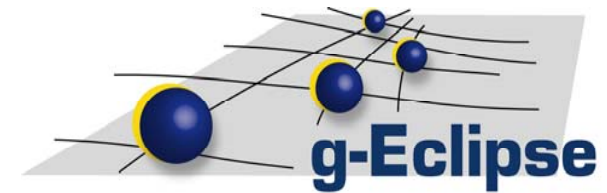
Workflows

Members

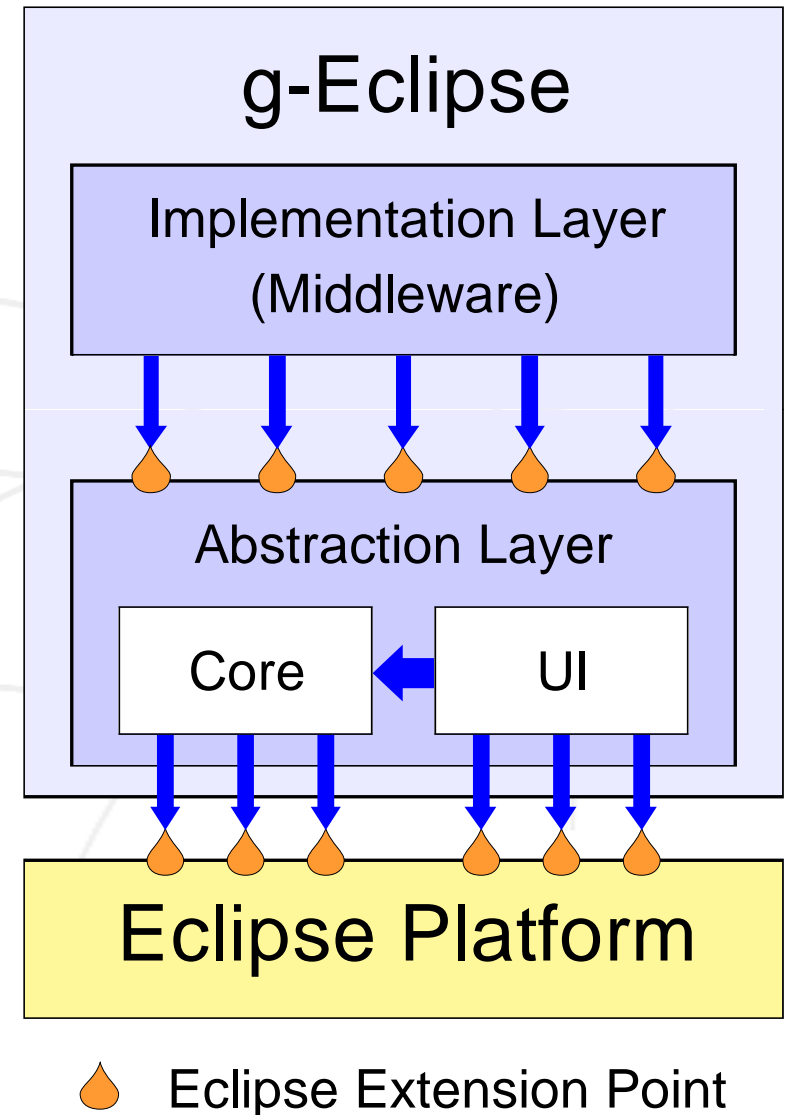
Roles

Web services

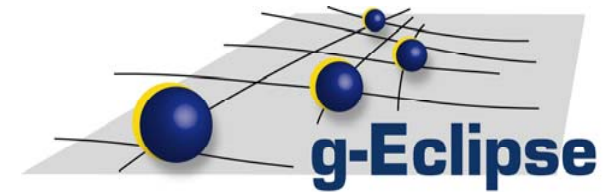
Architecture - Overview



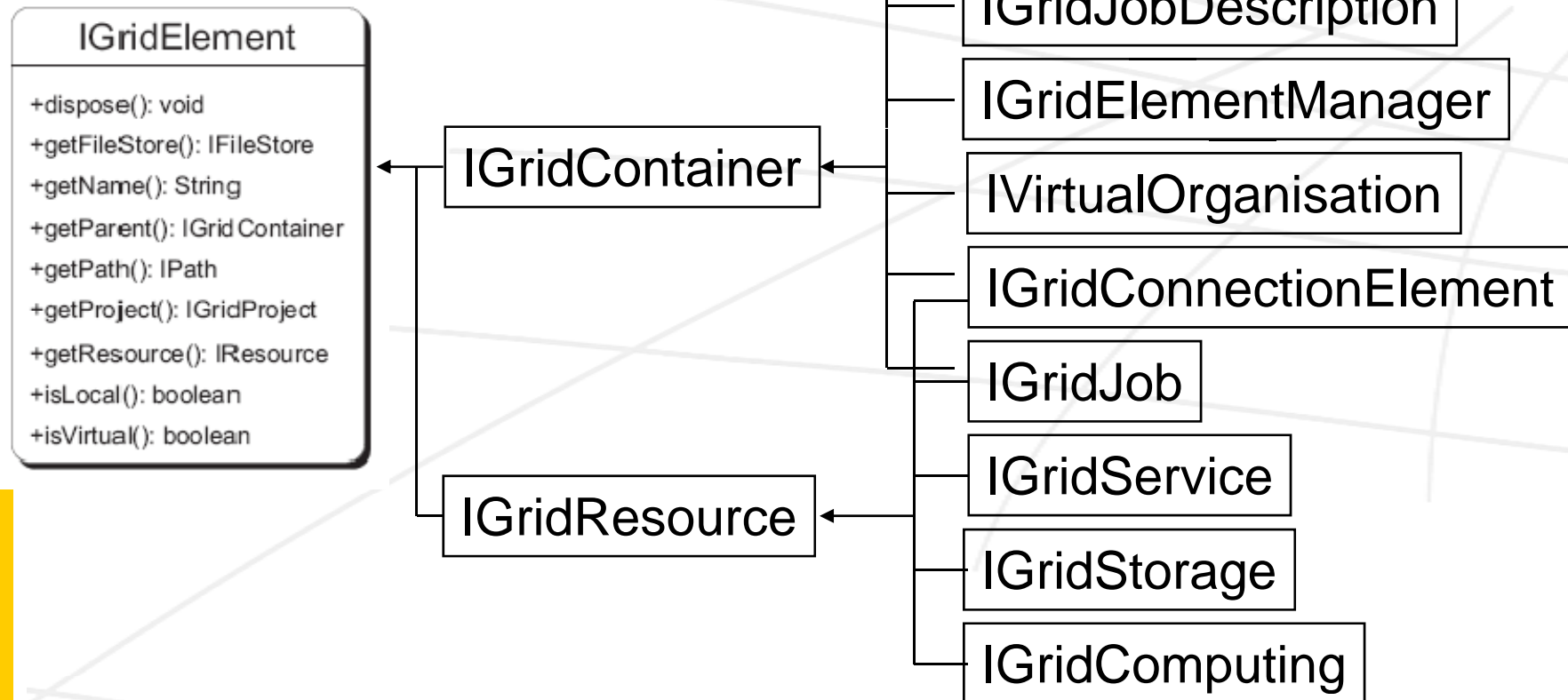
- Abstraction Layer
 - Core functionalities, e.g.
 - Authentication/Authorization
 - VO management
 - Data management
 - Job submission
 - Common user interface, e.g.
 - Views
 - Wizards
 - Dialogs
 - Preference pages
- Implementation Layer
 - Extended core functionalities
 - Middleware specific functionalities



Grid Model



How to integrate the Grid into the Eclipse workbench?

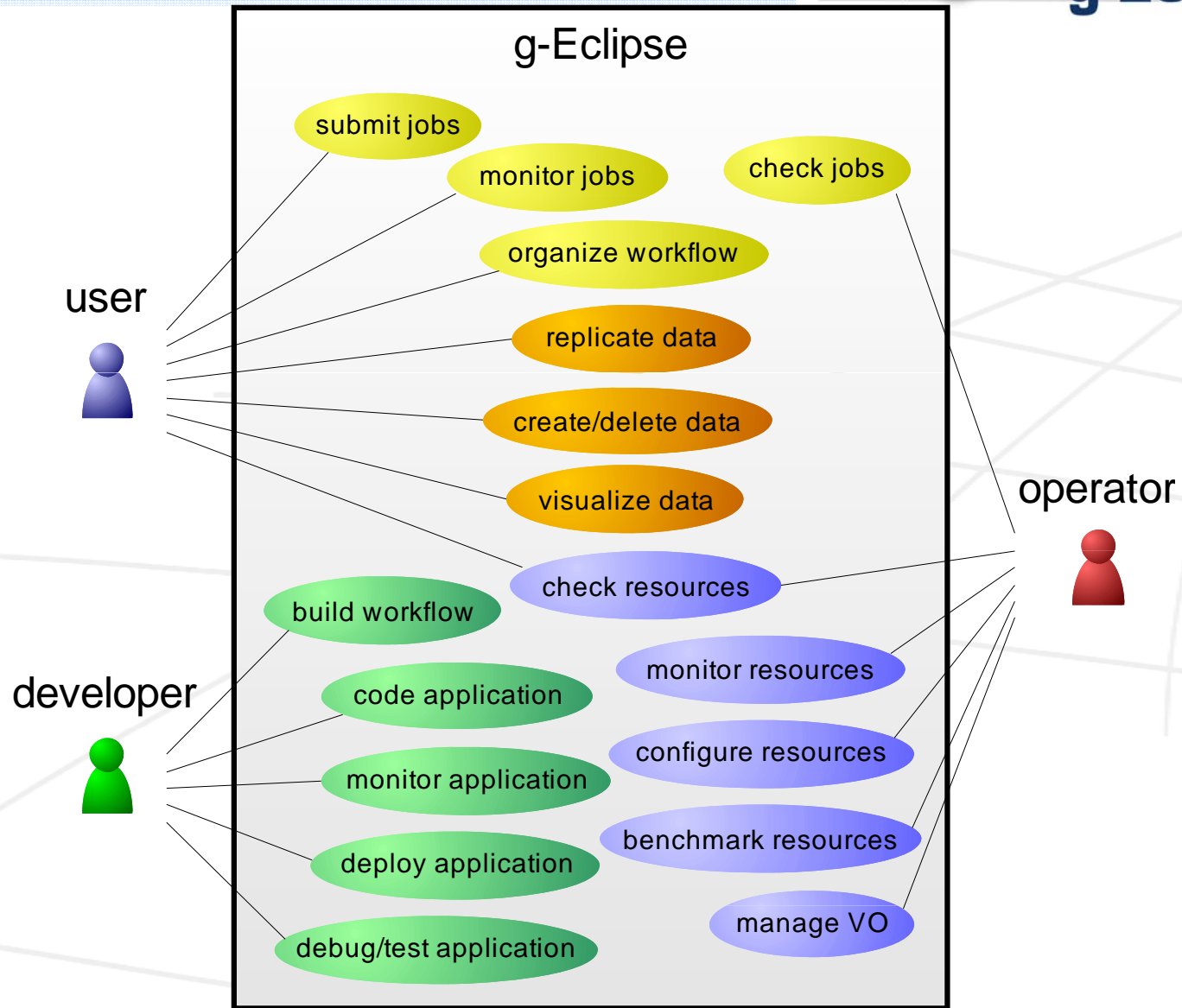


Grid application life cycle

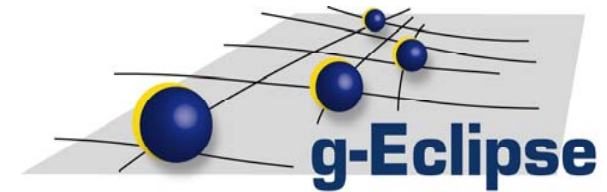


- In most cases, e-Users (e-Scientists, e-Engineers, e-Stock Traders) have their application(s)
 - Legacy code written in different languages (FORTRAN, C, C++, ...)
- e-Users want to collaborate
 - A Virtual Organization is build around a Virtual Computing Center on existing (and new) infrastructure
- e-Users create Grid projects
- e-Users want to interact with the Grid
 - without knowing all details!!
(development, deployment, testing, management, ...)
- → Tooling is necessary!!
 - Wizards, Editors, ...
 - Hide the complexity!!

Use cases

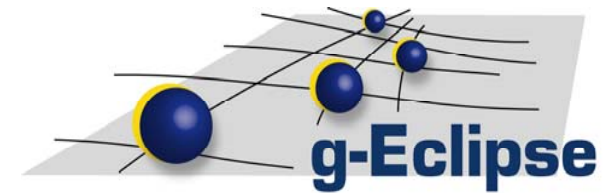


Roles and Contexts



- Grid user plays different **roles**
 - Grid applications user
 - Grid resource provider and operator
 - Grid application developer
 -
- Grid user acts in different **contexts**
 - Virtual Organizations
 - Projects
 - ...
- g-Eclipse supports “Contextualization”
 - Depending on the user role/context a different set of tools is used by/presented to the user
- g-Eclipse supports “Customization”
 - Build the user-preferred workbench
 - Persistent over sessions

User perspective

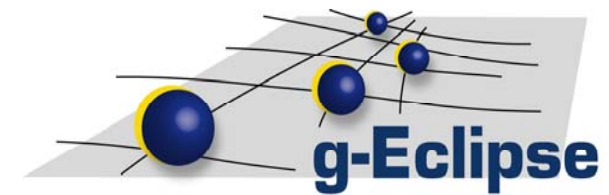


The screenshot displays the g-Eclipse IDE interface with several views and callouts:

- Grid project view:** A callout pointing to the "Grid Projects" view on the left, which shows a tree structure of projects and resources.
- Data Connection:** A callout pointing to the "Connections" view on the left, which lists various data connections.
- Job Status View:** A callout pointing to the "Jobs" view on the right, which displays a list of jobs and their status.
- Job Descriptions:** A callout pointing to the "Job Descriptions" view on the left, which shows details for selected jobs.
- Jobs:** A callout pointing to the "Jobs" view on the right, which displays a list of jobs and their status.
- VO resources:** A callout pointing to the "VO resources" view on the left, which lists various virtual organization resources.
- JSDL Editor:** A callout pointing to the "JSDL Editor" view in the center, which is used for editing JSDL documents.
- VO computing resources:** A callout pointing to the "VO computing resources" view on the left, which lists various virtual organization computing resources.
- VO services:** A callout pointing to the "VO services" view on the left, which lists various virtual organization services.
- VO storage resources:** A callout pointing to the "VO storage resources" view on the left, which lists various virtual organization storage resources.
- Glue Info view:** A callout pointing to the "Glue Information Viewer" view at the bottom left, which displays information about the current project.
- GGUS Web view:** A callout pointing to the "GGUS Web View" at the bottom center, which displays the GGUS website.
- Auth Token View:** A callout pointing to the "Authentication Tokens" view at the bottom right, which displays a list of authentication tokens.

The interface also includes a standard menu bar (File, Edit, Navigate, Search, Project), a toolbar, and a status bar at the bottom showing the current project and time.

Operator perspective



g-Eclipse (Operator) - huschel/batchService.batch - Eclipse Platform

File Edit Navigate Search Project Run Window Help

100%

Grid Projects

- huschel
 - Connections
 - Job Descriptions
 - Jobs
 - batchService.batch
 - geclipse
 - Computing
 - Services
 - Storage

Glue Information Vi

- Computing Elements
- Sites
- Storage Elements

batchService.batch

biomed enabled running

dteam enabled running

geclipse enabled running

ops enabled running

voce enabled running

egee-ce1.gup.uni-linz.ac.at

Type:pbs
Num. of Queues:5
Num. of WNs:4
Num. of Jobs:5

egee-wn1 free

egee-wn2 free

egee-wn3 free

egee-wn4 job-exclusive

Properties

Property	Value
Kernel:	2.6.9-67.EL.cernsmp
Name:	egee-wn2.gup.uni-linz.ac.at
Num. of CPU:	2
RAM:	514432kb
Running jobs	0
State:	free

Terminal

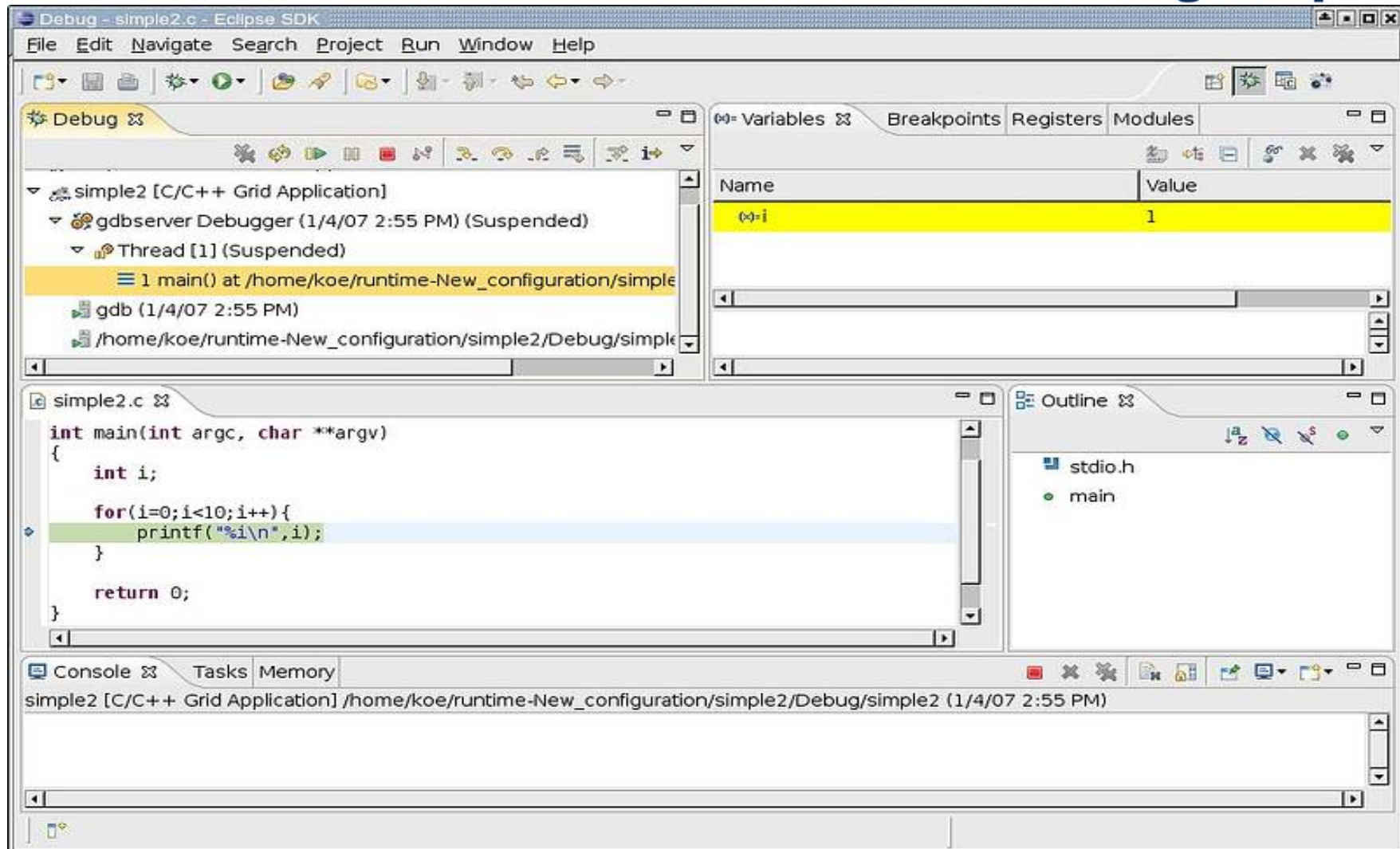
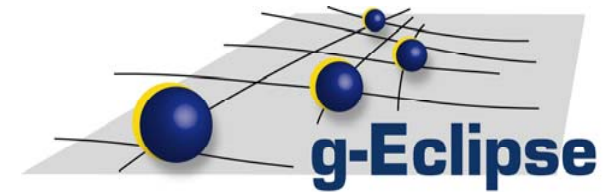
```
SSH: hakor@cvs.fzk.de
hakor@savannah:~$ _
on Mar 26 21:49:04 UTC 2007 1686

The programs included with the Debian
system are free software;
the exact distribution terms for each
are described in the
individual files in /usr/share/doc/*/c

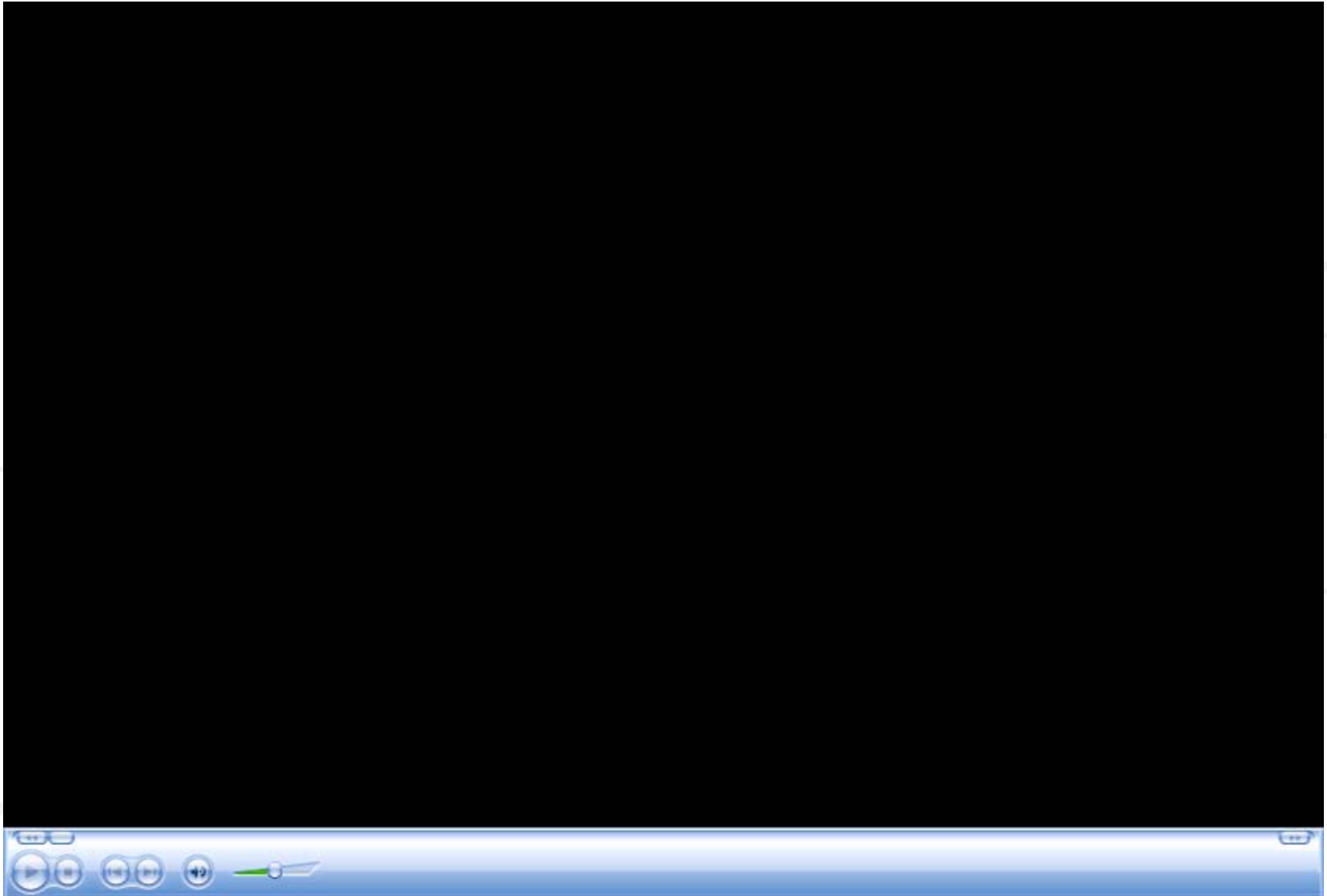
Debian GNU/Linux comes with ABSOLUTELY
NTY, to the extent
permitted by applicable law.
Last login: Thu Jan 24 11:41:54 2008 f
tz.it.neclab.eu
hakor@savannah:~$
```

start | eclipse | g-Eclipse (Operator) - ... | g-Eclipse - Access the... | 6:28 PM

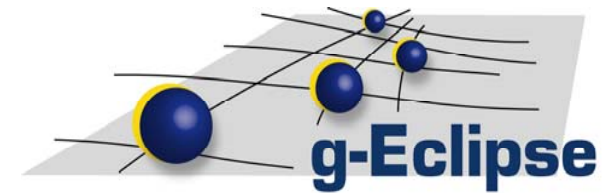
Developer perspective



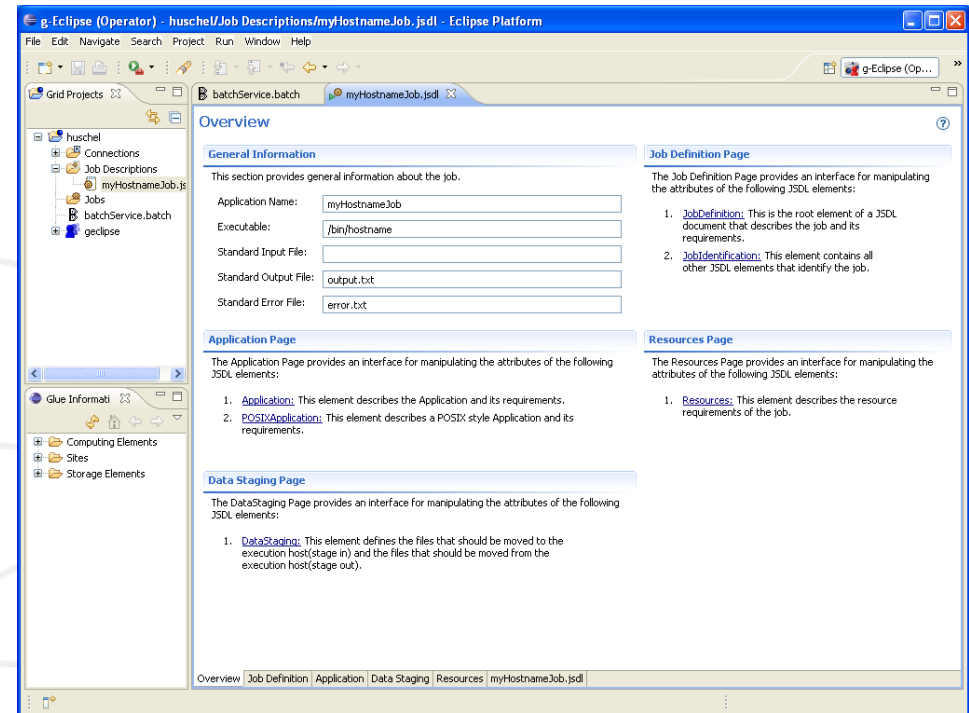
Visualisation



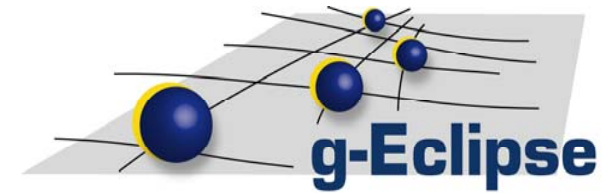
Standards



- JSDL editor
 - Multitpage editor following the OGF JSDL standard
 - Submission to different middleware possible
 - gLite:
XSLT transformation
- GLUE schema browser
 - Browse through your resources
- Eclipse is based on OSGi
 - Enables dynamic code deployment

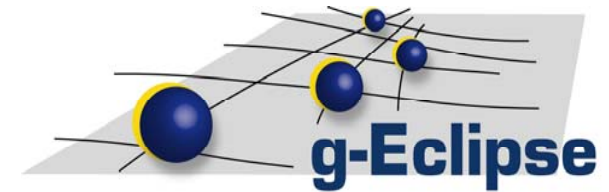


Middleware status

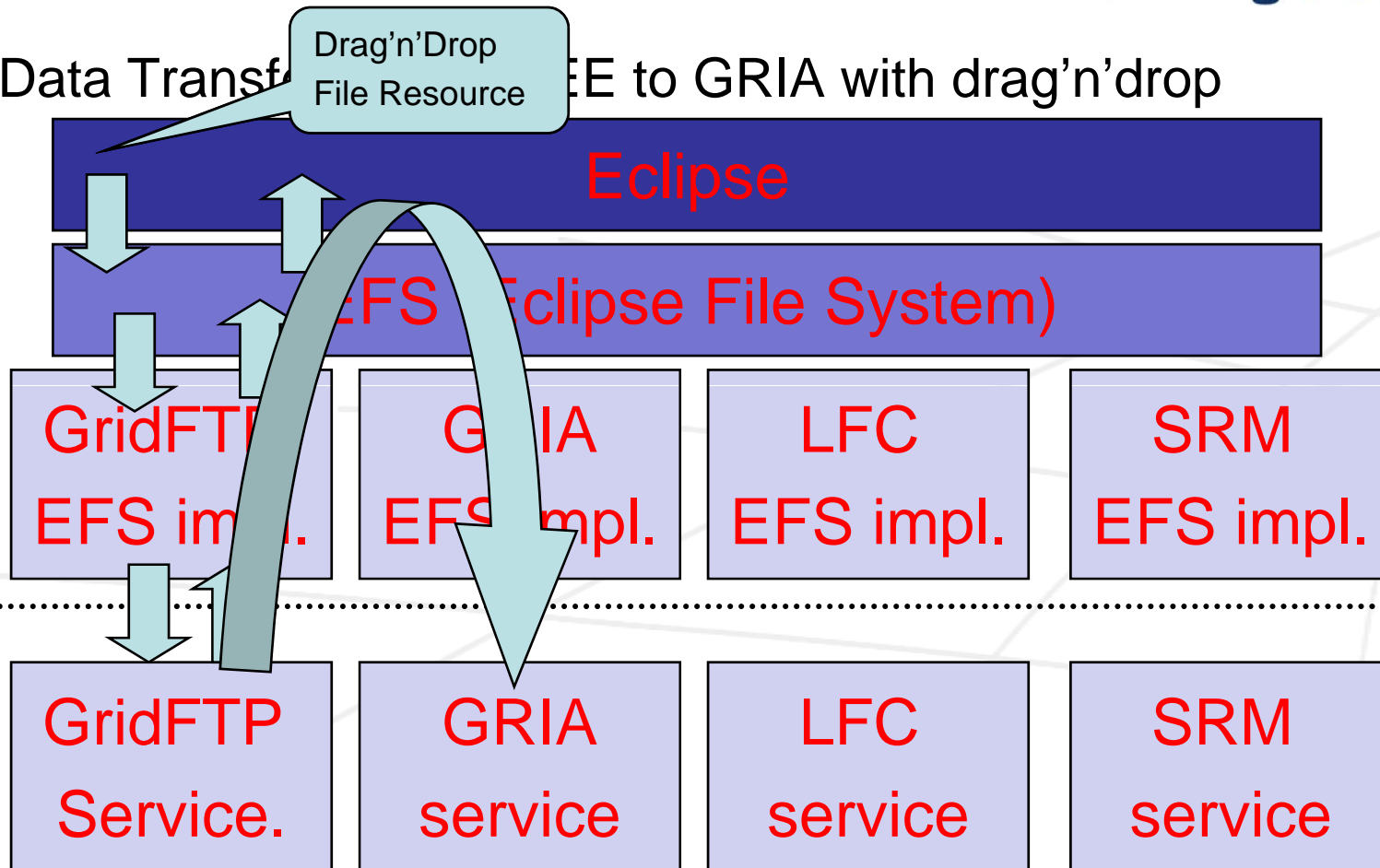


	GRIA	gLite
Authentication token	YES	YES
VO concept	NO	YES
Info System	YES	YES
Data access	YES	YES
Job definition	YES	YES
Job submission	YES	YES
Workflow definition and submission	NO	YES

Interoperability



- Data Transfer from Eclipse to GRIA with drag'n'drop

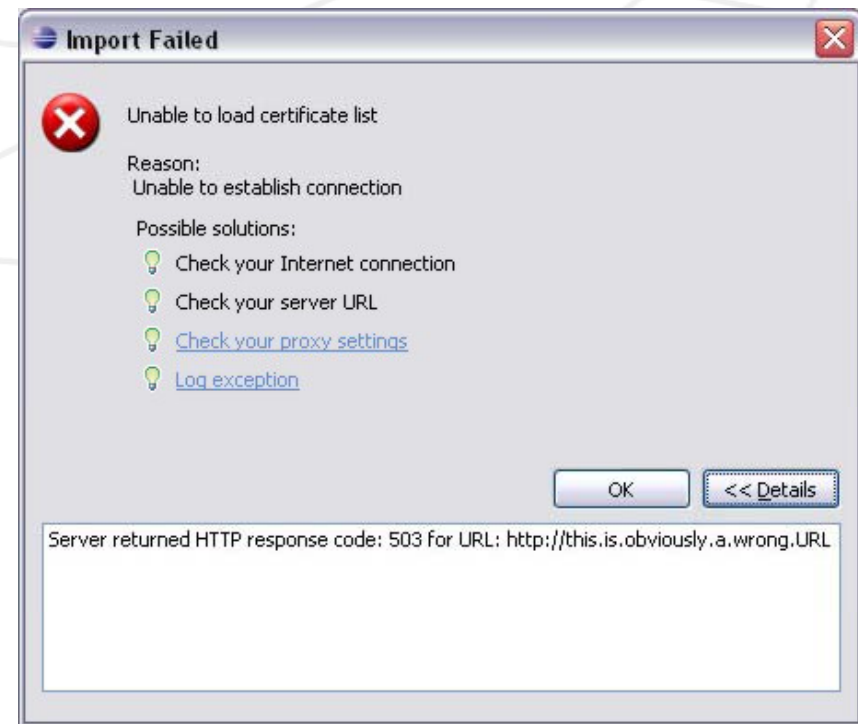


- Data Transfer to every EFS implementation is possible!

Manage Complexity



- By providing solution to common problems on Grid infrastructures
 - g-Eclipse provides an extended problem reporting mechanism based on the Eclipse core exception
 - Problems have associated solutions
 - Solutions may be
 - passive: just a descriptive text
 - active: provide an action that helps the user to solve the problem, e.g. open an associated preference page



Contribute



- Use our tool and send us feedback!
 - We do it the Eclipse way!
 - Webpage www.eclipse.org/geclipse or www.geclipse.eu
 - Newsgroup
 - <http://dev.eclipse.org/newslists/news.eclipse.technology.g-eclipse/>
 - Developer mailing list
 - <https://dev.eclipse.org/mailman/listinfo/geclipse-dev>
 - Bugzilla
 - <https://bugs.eclipse.org/bugs>
- Bring your application!!!!
 - Contact {at} geclipse.eu

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