Access the power of Grid with Eclipse

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Outline

- Grid
  - e-Science
  - EGEE
  - Middleware

- g-Eclipse
  - The idea
  - Functionality
  - Architecture
  - Roadmap and status

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Grids for e-Science

- The meaning of Grids depends …. 
  - but we talk about Grids for e-Science

- “To solve together a scientific problem, the distributed resources of scientists can be dynamically and coordinately connected by using fast networks to build a “virtual computing center/organization”
  - (Ian Foster, Carl Kesselman)

- We see many Grid infrastructures for e-Science emerging!
  - On national and international levels
  - EGEE, D-Grid, TerraGrid, int.eu.grid, …
the EGEE infrastructure (1)

- **EGEE = Enabling Grid for E-sciencE**

- **Objectives**
  - Large-scale, production-quality grid infrastructure for e-Science
  - Maintain and further improve gLite Grid middleware
  - Build the infrastructure for the LHC accelerator at CERN
  - Attracting new resources and users from industry as well as science
Grid middleware (I)

- Layered approach

- g-Eclipse address the top layer of User friendly access
Grid middlewares (II)

- **gLite**
  - Developed by EGEE, Component based (CE, SE, RB, LFC, …)
  - High level services exist

- **Globus toolkit**
  - Implements WSRF, “Quasi standard” in Grid
  - Only a toolset without high level services

- **UNICORE**
  - Widely distributed in HPC centers
  - Monolithic structure

- **Others (GRIA, ARC, GEMSS, …)**
g-Eclipse – the idea

- Grid infrastructure are complex systems
- Users want easy access to the system
- User acts within different roles
  - Grid applications users
  - Grid resources providers and operators
  - Grid application developers
- Provide a general UI framework/eco system for the different Grid actors based on a reliable platform
  → use Eclipse and contribute!
- Eclipse project proposal already submitted!
  → http://www.eclipse.org/proposals/g-eclipse/
g-Eclipse – the project

- Funded by European Union
  - 24 months
  - approx. 2 M€ funding
- Specific targeted research project
- 6 Partners
  - Academic partners with experience in Grid technology
  - Industrial partner with Eclipse knowledge
- Coordinator: Forschungszentrum Karlsruhe
  - Harald Kornmayer
g-Eclipse – the challenges

- Simplification of access to different Grid resources
  - Development of a general framework

- Abstraction of the complexity of Grid middleware
  - Defining standard actions for Grid actors

- Integration of different Grid tools in one platform/eco system

  - Design of a general architecture
    - For different tools
    - For different middlewares
    - Third party contributions
g-Eclipse & the EGEE infrastructure (II)

- g-Eclipse will support the gLite middleware by providing exemplary support
- g-Lite is still under development
- EGEE offers the biggest Grid infrastructure
  - The biggest User community
- In year two, a second middleware will be supported by g-Eclipse partners
Grid applications

- Bio-Med
  - new drugs against malaria

- Financial sector
  - Risk management

- Engineering
  - Automotive
    - Integration of the product design process chain (CAE/CAD/CAT) including external engineering companies, developers and suppliers
  - Aerospace
    - collaborative configuration design of complex products

- Others…
g-Eclipse - user roles – the big picture

- 3 different roles
  - user
  - operator
  - developer

- in general...
  - job management
  - resource management
    - files
    - applications
    - ...

→ integration in Eclipse is complex
g-Eclipse – Architecture

- VOMS UI
- VOMS Authent. Impl.
- gLite Middleware UI
- gLite Middleware Resource Management Implementation

- Authentication UI
- Grid Authentication Core
- Resource Management UI
- Job Management

- Resource Management Core
- Res. Management

- Eclipse Platform
g-Eclipse – User Interface Contributions

Authentication Token View

Site View

Job View

Web View

Resource View

Terminal View

Project Wizard

Job Wizard

Authentication Token Wizard

Resource Editor

Job Editor

Site Configuration Editor

Grid Workflow Editor

User Perspective

Operator Perspective

Developer Perspective

Authentication Preference Page

VO Preference Page

Project Preference Page
Status

- Project proposal available at eclipse.org/proposals/g-eclipse
- Core architecture document will be soon available
- First implementations are available as internal showcase
**g-Eclipse – roadmap/milestones**

- **2007-01**
  - Version 0.1
  - authentication, job, file, resource management
  - exemplary support for gLite

- **2007-06**
  - Version 0.5
  - core features improvements
  - support for gLite
  - first review

- **2007-12**
  - Version 0.8
  - core features improvements
  - support for second middleware

- **2008-06**
  - Version 1.0
  - final release with core features
  - support for second middleware
  - second review
Where to meet!

- See you at our poster booth!
- Send us comments to our newsgroup
  - news://news.eclipse.org/eclipse.technology.g-eclipse
- More information at
  - http://www.geclipse.eu
  - http://www.eclipse.org/proposals/g-eclipse