

WP3 – Final Activity Report

Nicholas Loulloudes
WP3 Representative

On behalf of the g-Eclipse Consortium

Outline



- Work Package 3 Final Status
- Achievements
- Work Package 3 Goals and Benefits
- WP3.1 Grid Infrastructure Monitoring
- WP3.2 Grid Infrastructure Configuration
- WP3.3 Grid Benchmarking and Tests
- WP3.3 Grid Management and Virtual Organizations

Work Package 3 Status



- The g-Eclipse Operator perspective **is there**. Consists of:
 - GLUE Information View
 - Batch View
 - Queue Configuration Framework
 - Benchmarking Framework
 - SLA Framework
 - Service Availability Monitoring and Testing Framework
- Based on reviewers recommendations **effort was reduced** for the last reporting period.
- During **last reporting period** effort was put on:
 - AWS integration to GLUE Information View.
 - Testing and Benchmarking Framework (GridBench port to g-Eclipse).
 - SLA and Negotiation framework.
 - Code hardening and preparation of final user and developer documentation.

Achievements - Users



- **Current users** of the g-Eclipse Operator Perspective:
 - EGEE Grid site administrators at UCY
 - EGEE Grid site administrators at University of Nicosia
 - EGEE Grid site administrators at RUR
- Steven Childs (*Deputy Grid Manager of Grid-Ireland*) comment:
 - “It's the **best free tool** around for managing PBS systems by a **long way!**”
- BAE about g-Eclipse Operator Perspective:
 - “The operator perspective would be **interesting**, because they do not have existing tools that can help them manage heterogeneous Grid installations”.

WP 3 Goals and Benefits



- **Goals**

- Provide a simple and intuitive abstraction for the following Grid interactions:
 - Browse Grid Resources and Services (WP3.1)
 - Configure Local Grid Site (WP3.2)
 - Benchmark and Test Grid Resources (WP3.3)
 - Manage membership to the Grid (WP3.4)

- **Benefits**

- **Simplify** the daily activities of the Grid site operator (transition from CLI to GUI).
- **Reduce** Grid site mis-configuration.
- **Graphical View** of the Grid Site state.
- **Bundle** daily used Grid operator tools in a single GUI application.
- **Improve** productivity.

Work Package 3 Tasks



- **WP3.1**

- Infrastructure Monitoring Plug-in.
- Grid Information Cache.
- Service Availability Monitoring.

- **WP3.2**

- Local Queue Management.
- Site / VO Resource Management.
- Local Job Management.

- **WP3.3**

- Service Availability Testing.
- Service Performance Testing.

- **WP3.4**

- Editor to enable the management of Service Level Agreements (SLA).
- Support the management of Virtual Organisation.

WP3 Planned / Reported Effort



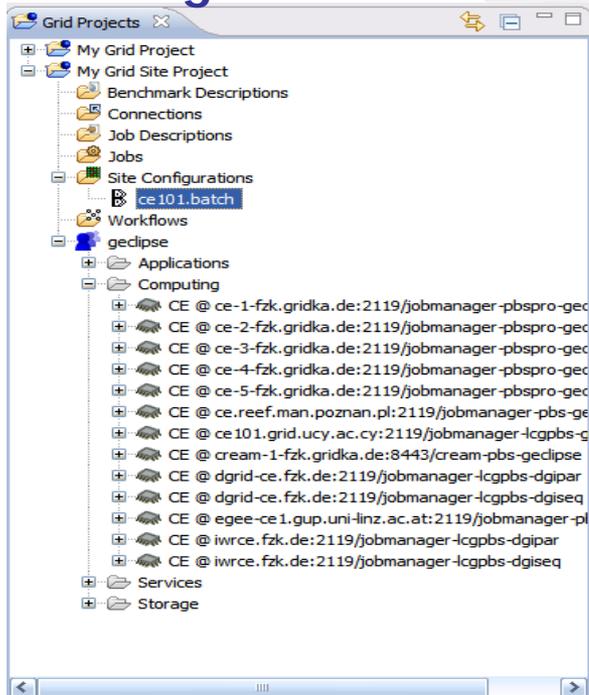
	WP3.1	WP3.2	WP3.3	WP3.4
UCY	6.4	19.8	6.3	0
PSNC	0	0	16.3	0
FZK	0	0	0.5	2.4
NEC - IT	0	0	0	4.1
Total Reported (Planned)	6.4 (6.0)	19.8 (19)	23.1 (22)	6.5 (12)

Grid Information Cache

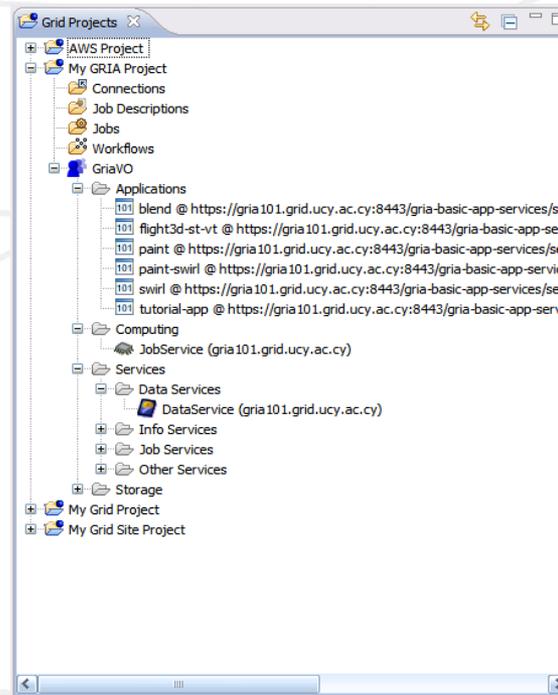


- Proved that Information Cache is **independent** from the underlying architecture by providing support for the Amazon Web Services (AWS).
- AWS integration to the Information Cache was given **highest priority**.

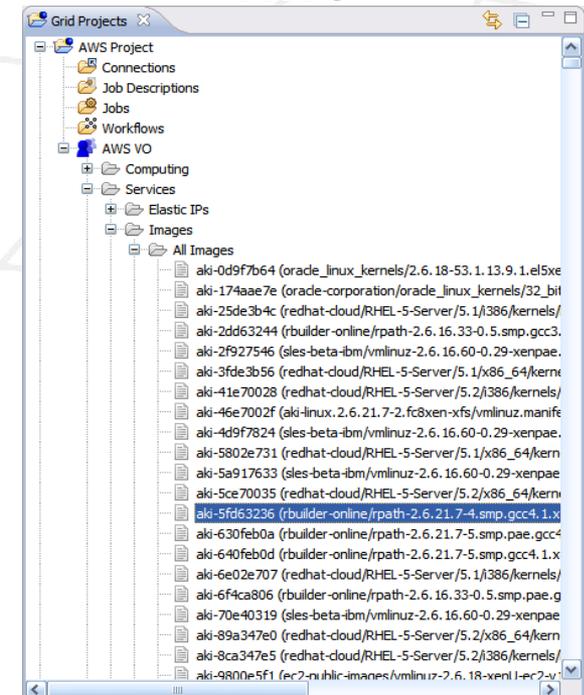
g-Lite VO



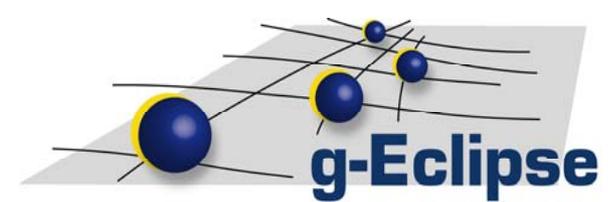
GRIA VO



AWS



Grid Benchmarking

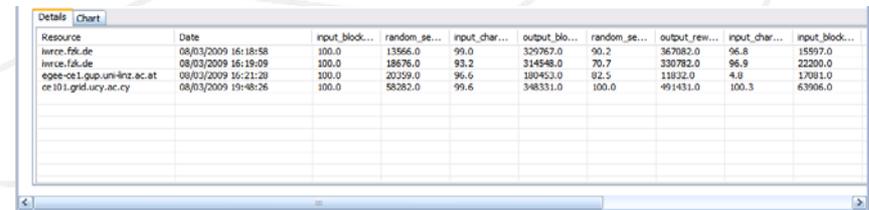


- Due to lack of resources this tool was given the **lowest priority**.
- For the last reporting period effort was put into developing **storage**, **reporting** and **graphing** functionality of benchmark data.
 - Use of existing libraries for storing results and graphing.
- In parallel with above code hardening and completion of user and developer documentation.

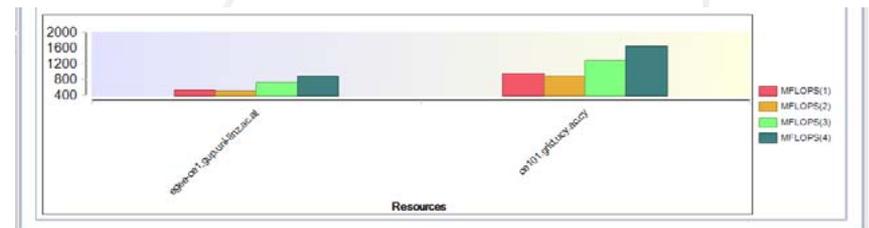
Grid Benchmarking (2)



- Benchmark output stored in a **local database** (Eclipse Derby).
- Local database **import / export** functionality.
- Benchmark View used to generate SQL queries for retrieving Benchmark output from the database.
- Query results displayed in:
 - **Tabular Form**
 - **Graph Form**



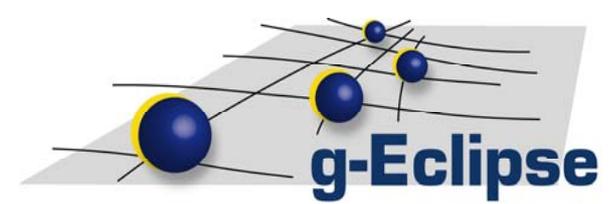
Resource	Date	input_block...	random_se...	input_char...	output_blo...	random_se...	output_rew...	input_char...	input_block...
lncrc.fbk.de	08/03/2009 16:18:58	100.0	13566.0	99.0	329767.0	90.2	367082.0	96.8	15597.0
lncrc.fbk.de	08/03/2009 16:19:09	100.0	18676.0	93.2	314548.0	70.7	330782.0	96.9	22200.0
eece-oe1.gup.uni-linz.ac.at	08/03/2009 16:21:20	100.0	20259.0	96.6	100453.0	82.5	11932.0	4.8	17081.0
ce101.grid.ucy.ac.cy	08/03/2009 19:48:26	100.0	58282.0	99.6	348331.0	100.0	491431.0	100.3	63906.0



Benchmark Framework Demo



- Benchmarked **5 randomly selected** Grid sites belonging to the EGEE infrastructure.
- Two types of Benchmarks submitted:
 - **FLOPS**: For measuring floating point operations per second.
 - **Bonnie**: For measuring the performance of Unix file system operations.
- Benchmarks and resources were defined using the Operator Job wizard.
- The **Operator Job Framework** was used for execution and monitoring of Benchmarks.
- Benchmark results were stored into an **Apache Derby** database integrated to Eclipse.

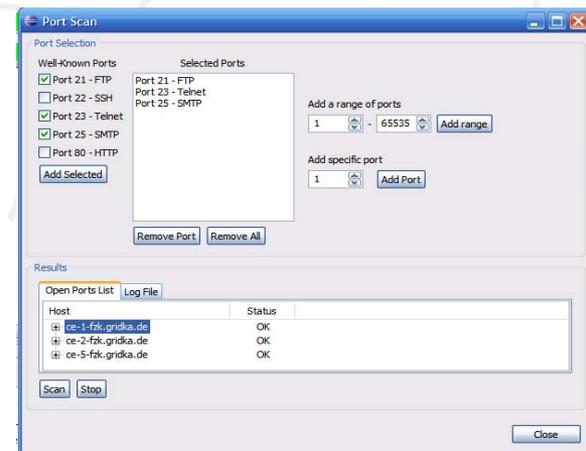
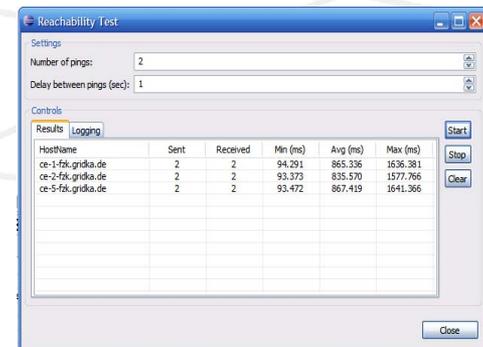
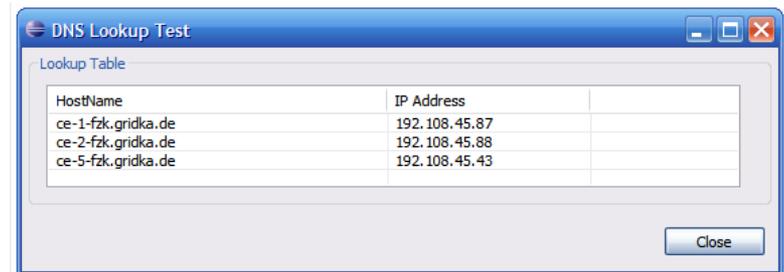


Live Demo

Service Availability Monitoring



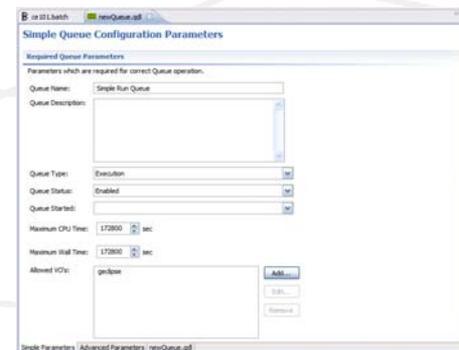
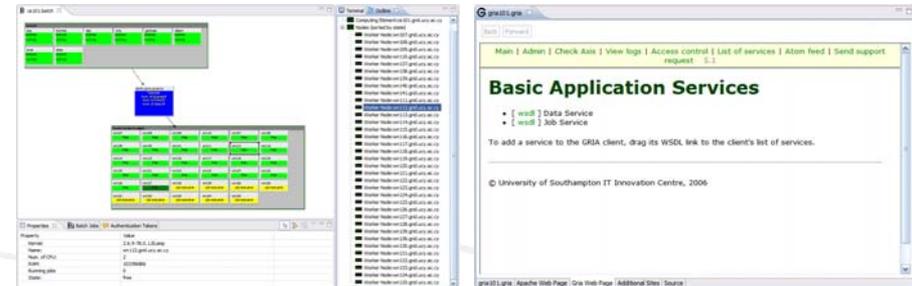
- A framework to **test physical** Grid resources and **investigate** cause of failure.
- Provision of a 3rd simple test
 - **Port Scanner**
- Code maintenance and **hardening**.
- Completion of user and developer **documentation**.



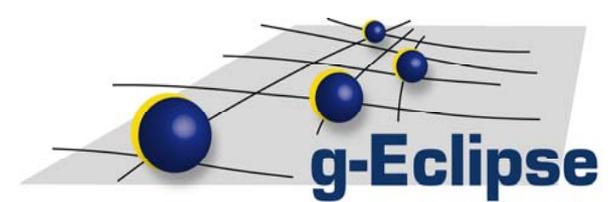
Site Management



- The Batch UI Framework
 - Support for the **Portable Batch System (PBS)**
 - Start / Stop / Drain queues.
 - Hold / Un-hold / Move Jobs
- Integration of the GRIA web service into a multi-page editor with web views.
 - **Re-use of GRIA functionality.**
- Queue Configuration
 - MPE for editing queue configuration files (QDL).
 - Wizard for applying QDL files to Batch services.
- **Scalability improvements**, code maintenance and documentation.



Service Availability Testing



- A tool to **test the availability, compliance and performance** of services with user requirements.
- Development of the Operator Jobs Framework. Utilized by:
 - Service Testing
 - Benchmarking
 - Application Deployment

Service Tests

- Defined through a **wizard**.
 - Execute the tests and monitor their progress.
 - Store results.
 - **Extension points** provided to add new tests to the framework.
- Exemplary Tests provided:
 1. Certificate Lifetime test
 2. g-Lite middleware version test.
 3. Service Availability Monitoring (**SAM**)

The screenshot shows the 'Test History' window in g-Eclipse. It contains a table with columns for 'Tested resource', 'GridFTP', and 'Tomcat'. The data is as follows:

Tested resource	GridFTP	Tomcat
▼ egee-ce1.gup.uni-linz.ac.at	OK	OK
May 14, 2008 12:45:19 PM	OK	OK
▼ ce.egee.man.poznan.pl	N/A	N/A
May 14, 2008 12:45:19 PM	N/A	N/A
▼ ce101.grid.ucy.ac.cy	OK	N/A
May 14, 2008 12:45:19 PM	OK	N/A

Below the table, there is a 'Tests' tab in the interface. It shows a table with columns for 'Name', 'Project', 'Status', 'Test date', and 'Type':

Name	Project	Status	Test date	Type
certTest	MyGrid	OK	May 14, 2008 12:45	Certificate
newTest	MyGrid	OK	May 14, 2008 12:41	gLite vers

SLA Framework

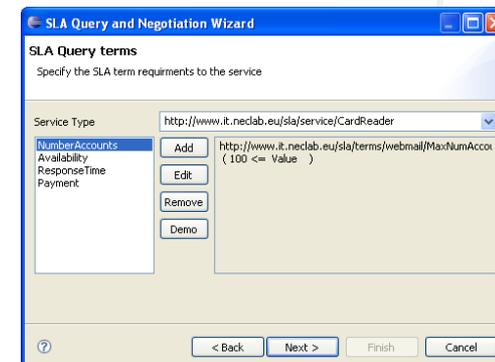
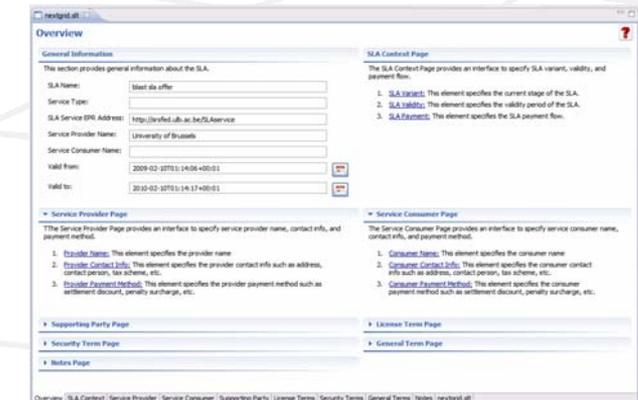
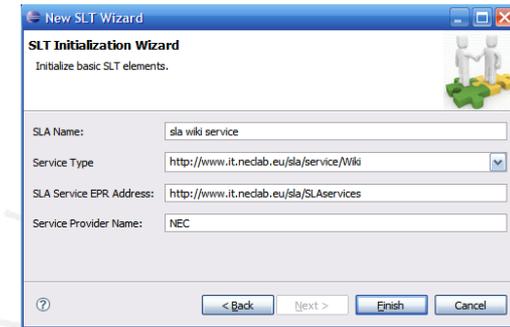


- SLA framework integration to g-Eclipse.
- Enables the **negotiation** of Service Level Agreements (SLA) between service providers and service consumers
- Development of a middleware and SLA schema **independent** SLA framework
- Two plug-ins are part of the g-Eclipse core and provide the SLA framework extensibility.
- Two additional plug-ins integrate the NextGrid SLA schema to the SLA editor.
- Completion of user and developer documentation.

SLA Framework (2)



- A wizard aimed at service providers to create Service Level Templates (SLT).
- A multi-page form editor for defining SLT's parameters.
- A wizard aimed at consumers for creating SLA queries.



WP3 Future



- Near Future (started):
 - Extension of Site Management for the SunGridEngine Batch Service
 - BSc thesis
 - Extension of the Benchmark Framework
 - MSc thesis
- Long-Term Future:
 - Extension of Site Management for LSF Batch Service (Requires access to an LSF Batch Service).
- Integration of other Batch systems will increase visibility and lifetime of the framework.
- Standardized UI processes (independent of middleware) are important !!!
 - Reduce learning curve also for Grid site operators.



**Operator Perspective
and it's components
are essential part of
the g-Eclipse Ecosystem !!!**