

# An Overview of the GridWay Metascheduler

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**Introduction to gLite & RESPECT Tools at  
EGEE'09 Conference (Barcelona)**

**18-19 September 2009**

- 1. What is GridWay?**
2. A Global Vision
3. The GridWay Project
4. Working Examples

GridWay is a Globus Toolkit component for meta-scheduling, creating a scheduler virtualization layer on top of Globus services (GRAM, MDS & GridFTP)

- For **project and infrastructure directors**
  - GridWay is an open-source community project, adhering to Globus philosophy and guidelines for collaborative development.
- For **system integrators**
  - GridWay is highly modular, allowing adaptation to different grid infrastructures, and supports several OGF standards.
- For **system managers**
  - GridWay gives a scheduling framework similar to that found on local LRM systems, supporting resource accounting and the definition of state-of-the-art scheduling policies.
- For **application developers**
  - GridWay implements the OGF standard DRMAA API (C and JAVA bindings), assuring compatibility of applications with LRM systems that implement the standard, such as SGE, Condor, Torque,...
- For **end users**
  - GridWay provides a LRM-like CLI for submitting, monitoring, synchronizing and controlling jobs, that could be described using the OGF standard JSDL.

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## Benefits

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### **Integration of non-interoperable computational platforms (Organization)**

- Establishment of a uniform and flexible infrastructure
- Achievement of greater utilization of resources and higher application throughput

### **Support for the existing platforms and LRM Systems (Sys. Admin.)**

- Allocation of grid resources according to management specified policies
- Analysis of trends in resource usage
- Monitoring of user behavior

### **Familiar CLI and standard APIs (End Users & Developers)**

- High Throughput Computing Applications
- Workflows

## Features

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### Workload Management

- Advanced (Grid-specific) scheduling policies
- Fault detection & recovery
- Accounting
- Array jobs and DAG workflows

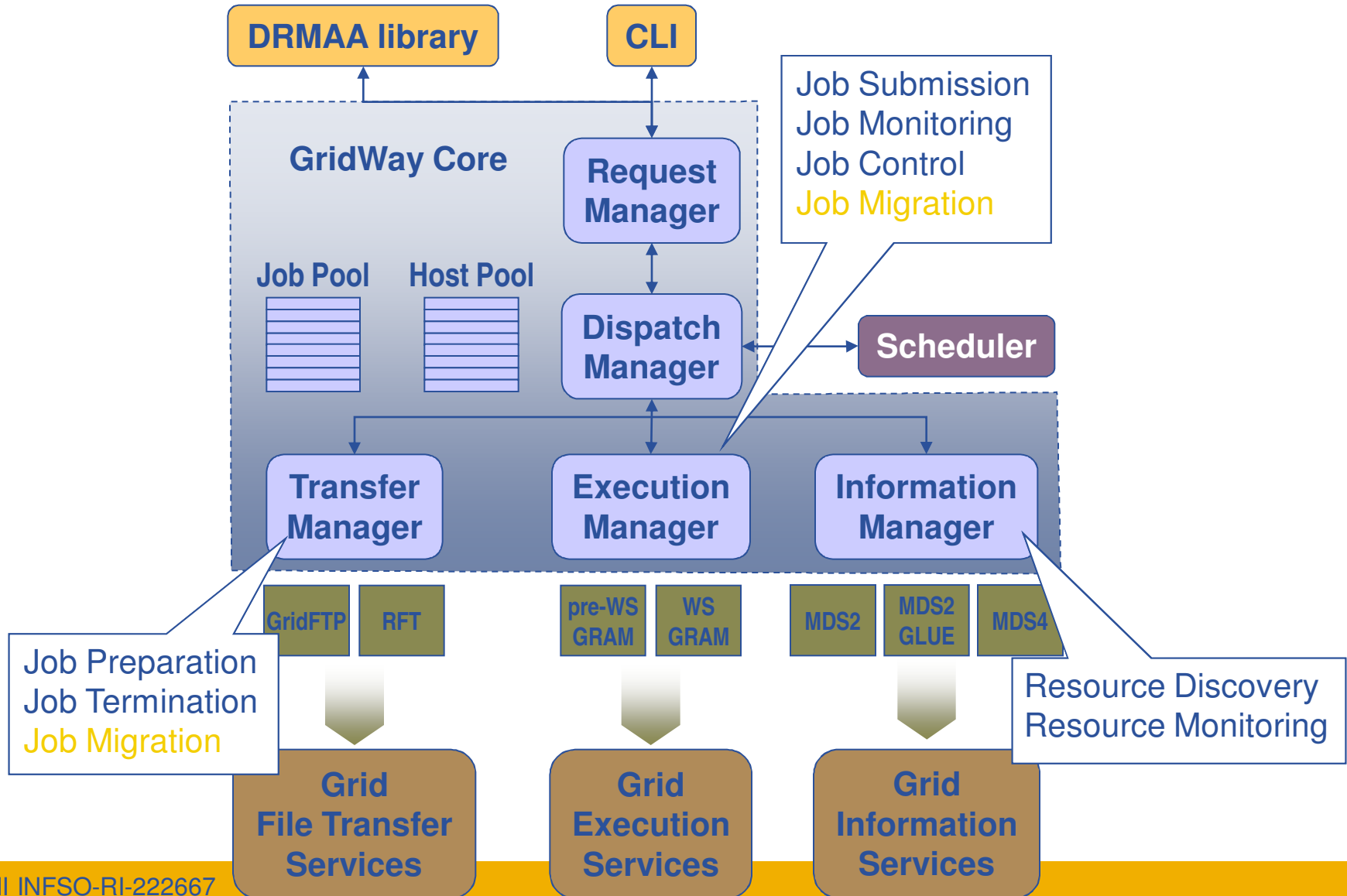
### User Interface

- OGF standards: JSDL & DRMAA (C and JAVA)
- Analysis of trends in resource usage
- Command line interface, similar to that found on local LRM Systems

### Integration

- Straightforward deployment as new services are not required
- Interoperability between different infrastructures

## GridWay Internals



## Installation Procedure (gLite 3.1)

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- Uncompress gw\_src.tar.gz
- Set \$GW\_LOCATION
- PATH = \$PATH:\$GW\_LOCATION/bin
- ./configure --prefix=/opt/gw --disable-ws --enable-prews
- make
- make install

<http://www.gridway.org/documentation/stable/egeehowto/>  
gives configuration instructions

√ Since June 2007, GridWay is included in Globus Toolkit 4.0.5+, and can be installed as part of Globus.



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## History of the Project

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- Started in **2002**, first releases were only distributed on request in binary format
- First open source release (v4.0) in **January 2005** (Apache license v2.0)
- Adhering to Globus philosophy and guidelines for **collaborative development**
- In June 2007 GridWay became part of the **Globus Toolkit**
- Since January 2005, more than **1000 downloads from 80 different countries**, 25% are private companies and 75% are universities and research centers.
- Best-effort support provided (contract support is also available)
  - **Based on a strong open source community**

## Development Process

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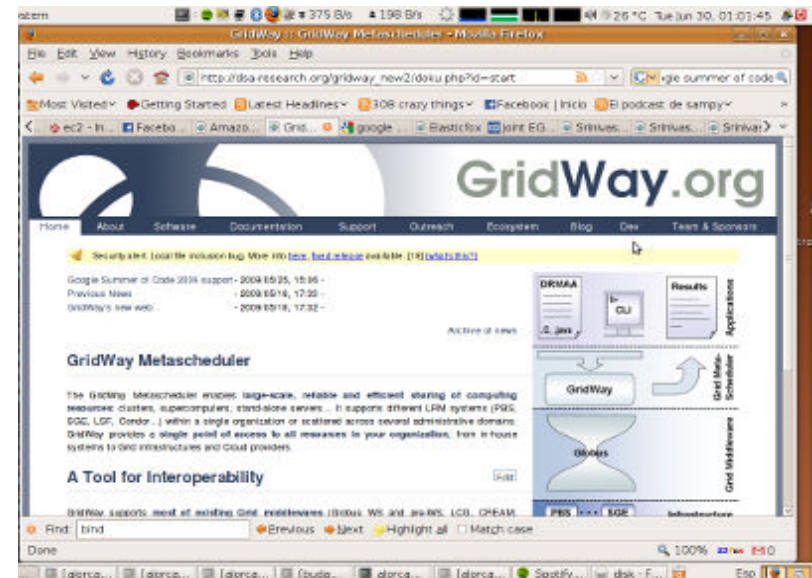
- **Community** – Open Source Project. Globus Development Philosophy
- **Development Infrastructure** (thanks to Globus Project!)
  - Mailing Lists
  - Bugzilla
  - CVS
- **You are very welcome to contribute:**
  - Reporting Bugs ([gridway-user@globus.org](mailto:gridway-user@globus.org))
  - Making feature requests for the next GridWay release ([gridway-user@globus.org](mailto:gridway-user@globus.org))
  - Contributing your own developments (bug fixes, new features, documentation)
- Detailed **Roadmap:**
  - **GridWay Campaigns** at [bugzilla.mcs.anl.gov/globus/query.cgi](http://bugzilla.mcs.anl.gov/globus/query.cgi)
  - [www-unix.mcs.anl.gov/~bacon/cgi-bin/big-roadmap.cgi#Gridway](http://www-unix.mcs.anl.gov/~bacon/cgi-bin/big-roadmap.cgi#Gridway)

## New web page design

A renovated web portal has been designed

According to the new image emerging at dsa-research.org

- **Simplify** user interaction
- Find out the content **faster**
- Paying attention to improve the existing **good documents**
- To be **launched soon (order of magnitude of weeks)**
- **New development portal**
- **Stay tuned!**



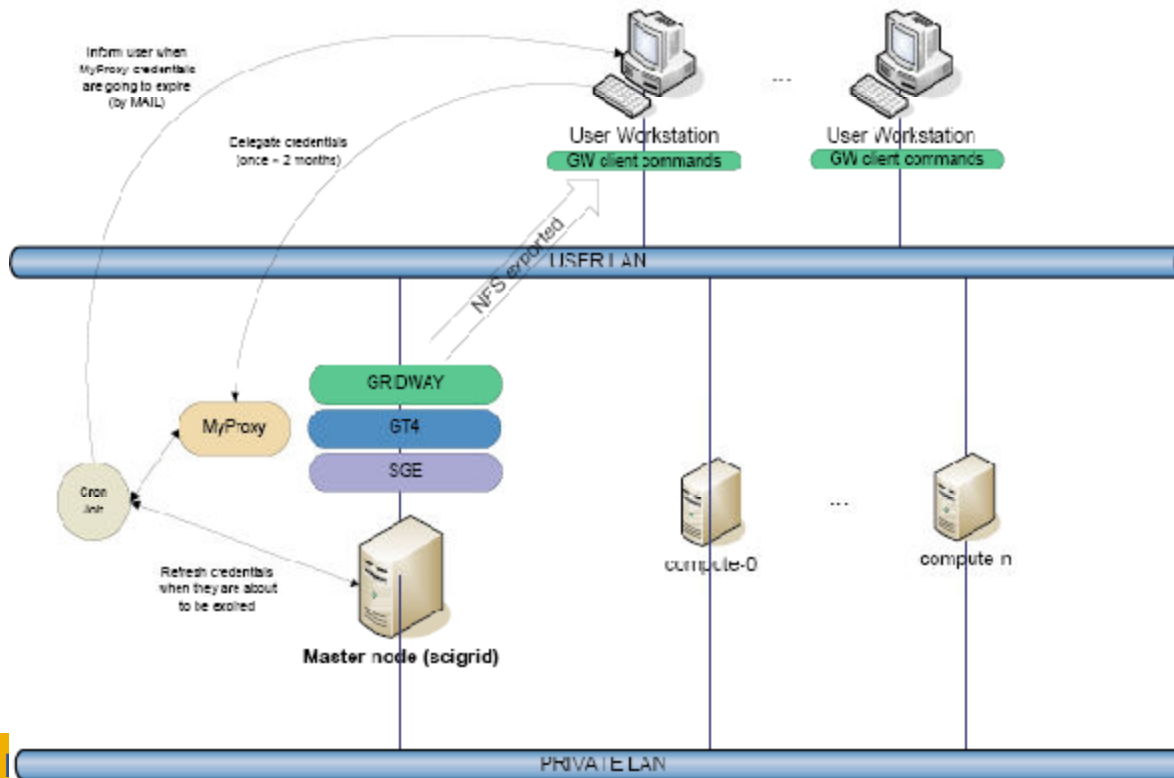
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## Enterprise Grids: Examples

### European Space Astronomy Center



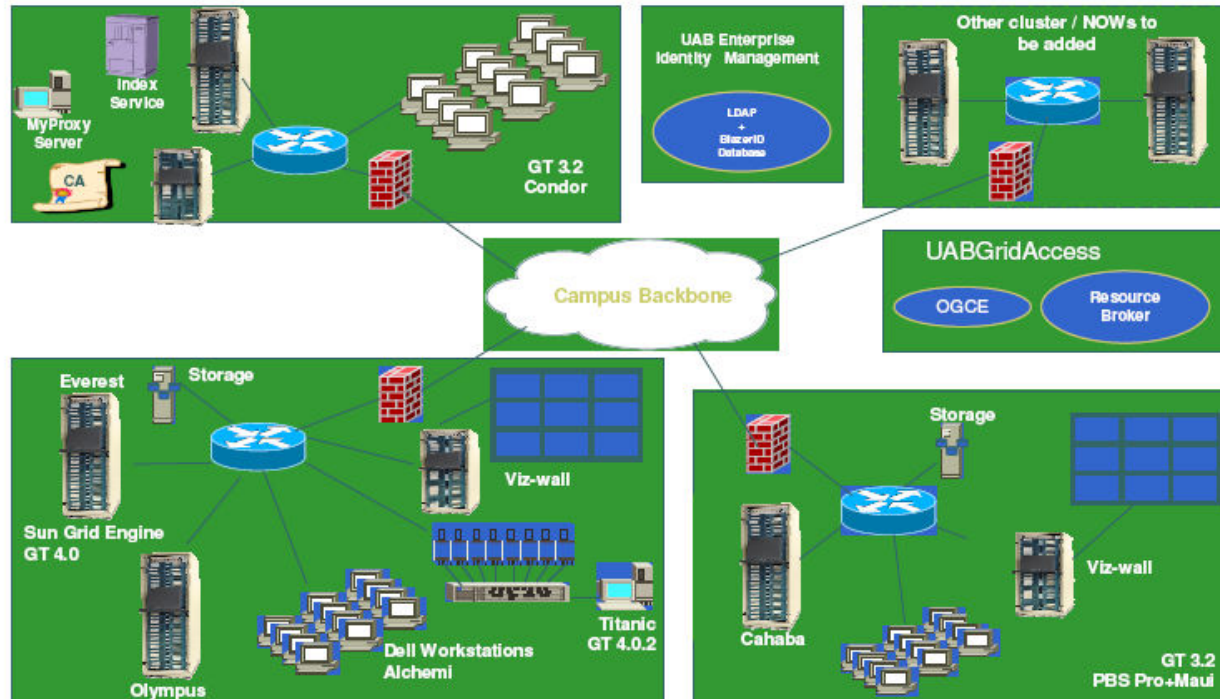
- Data Analysis from space missions (DRMAA)
- Site-level meta-scheduler
- Several clusters



## Enterprise Grids: Examples

### UABGrid, University of Alabama at Birmingham

- Bioinformatics applications
- Campus-level meta-scheduler
- 3 resources (PBS, SGE and Condor)

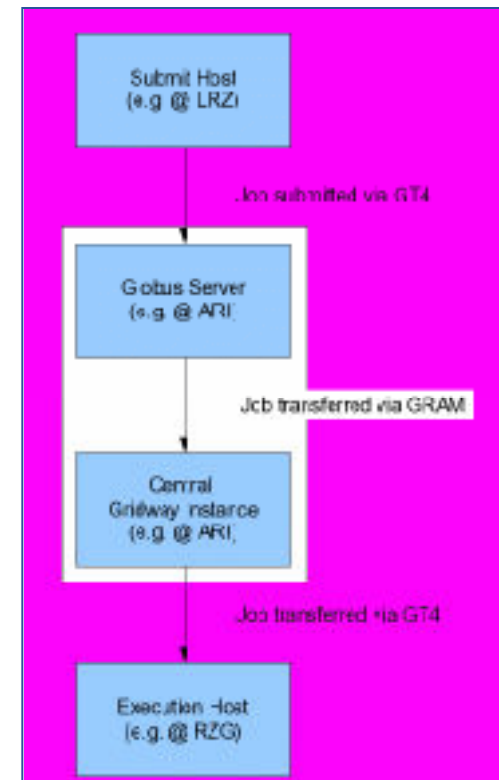
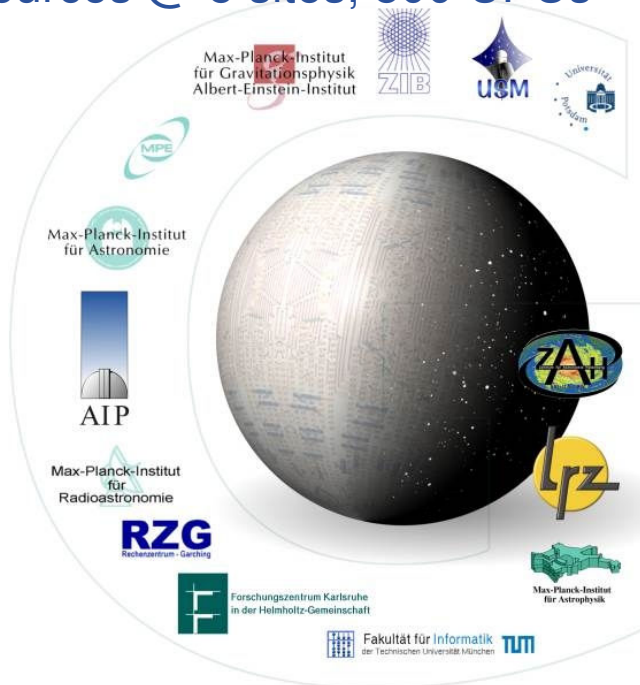


## Partner Grids: Examples

### AstroGrid-D, German Astronomy Community Grid

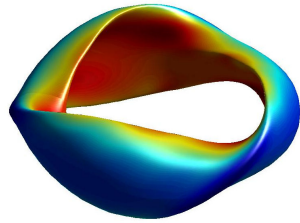


- Collaborative management of supercomputing resources & astronomy-specific resources
- Grid-level meta-scheduler (GRAM interface)
- 22 resources @ 5 sites, 800 CPUs

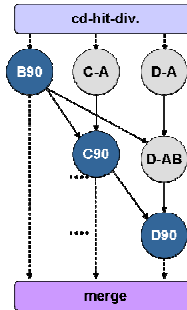
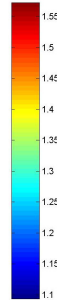




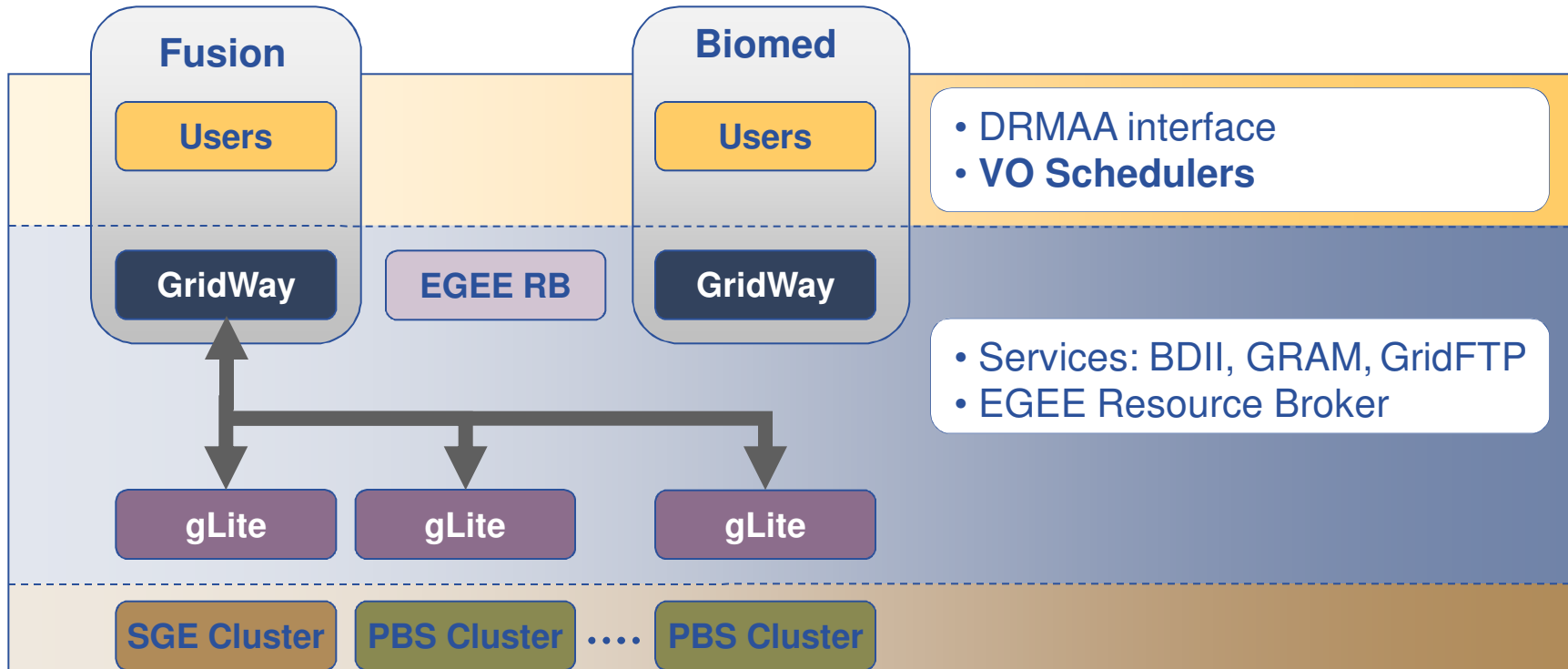
## Partner Grids: Examples



Massive Ray Tracing



CD-HIT workflow



- DRMAA interface
- VO Schedulers

- Services: BDII, GRAM, GridFTP
- EGEE Resource Broker

**Thank you  
for your attention!**