

An Overview of the GridWay Metascheduler

José Luis Vázquez-Poletti (UCM)

**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.

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

Benefits

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

Workload Management

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

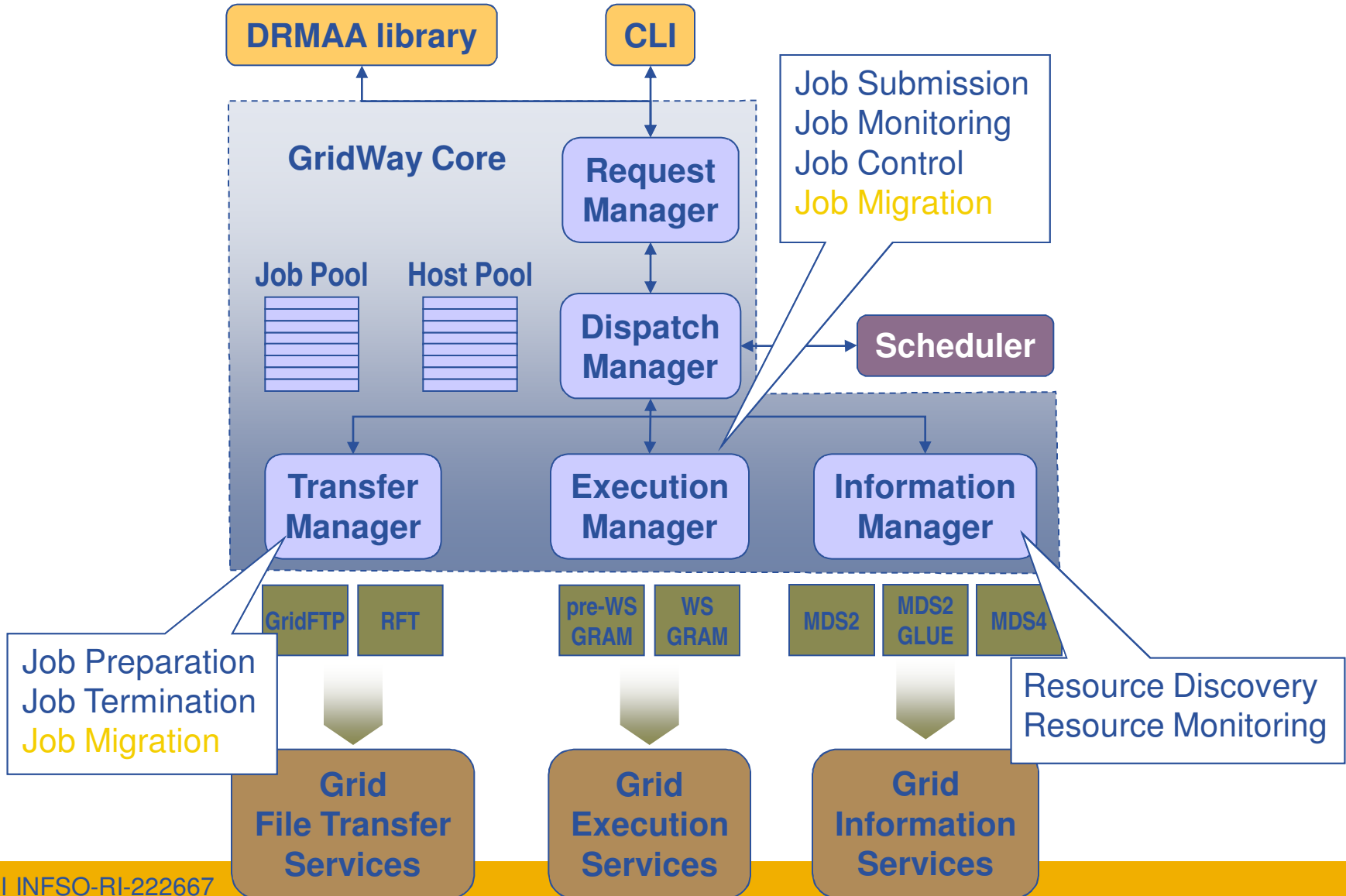
User Interface

- 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)

- 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.

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

History of the Project

- 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

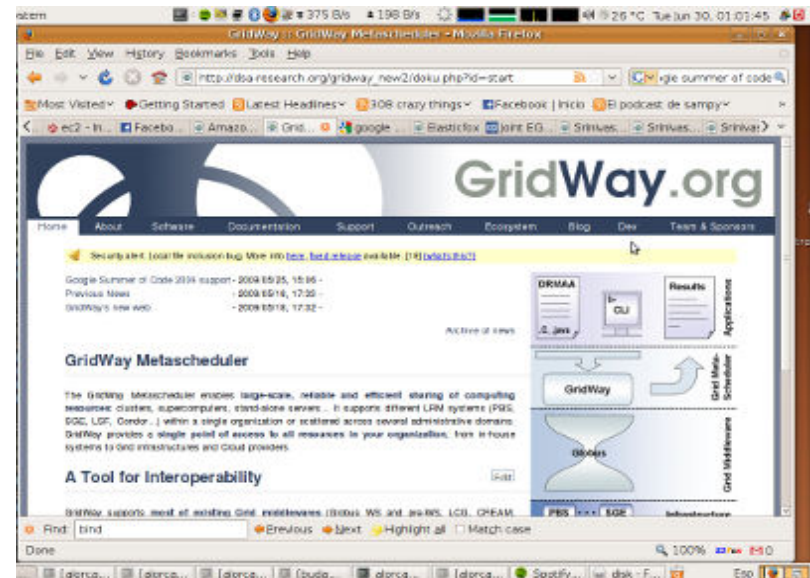
- **Community** – Open Source Project. Globus Development Philosophy
- **Development Infrastructure** (thanks to Globus Project!)
 - Mailing Lists
 - Bugzilla
 - CVS
- **You are very welcome to contribute:**
 - Reporting Bugs (gridway-user@globus.org)
 - Making feature requests for the next GridWay release (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
 - 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!**



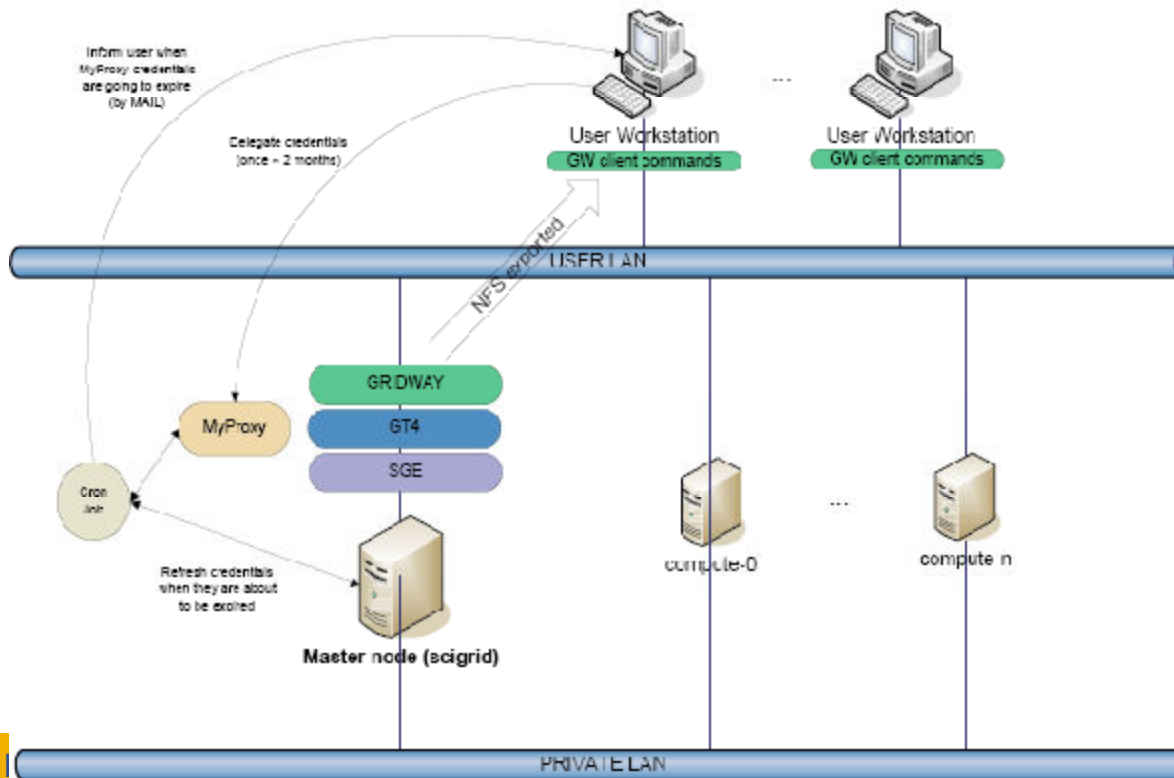
1. What is GridWay?
2. A Global Vision
3. The GridWay Project
4. **Working Examples**

Enterprise Grids: Examples



European Space Astronomy Center

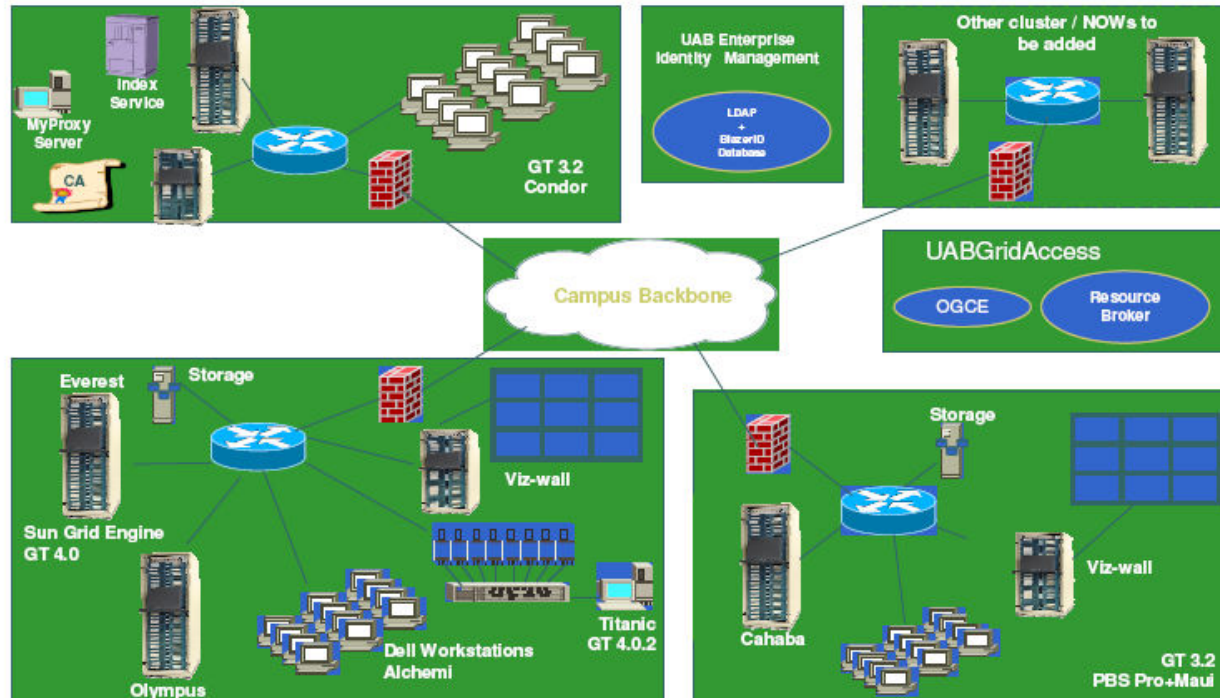
- Data Analysis from space missions (DRMAA)
- Site-level meta-scheduler
- Several clusters



Enterprise Grids: Examples

UABGrid, University of Alabama at Birmingham

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

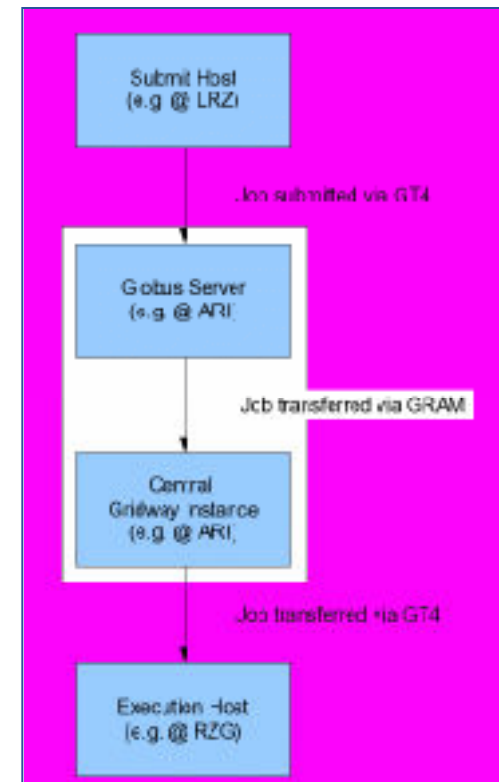
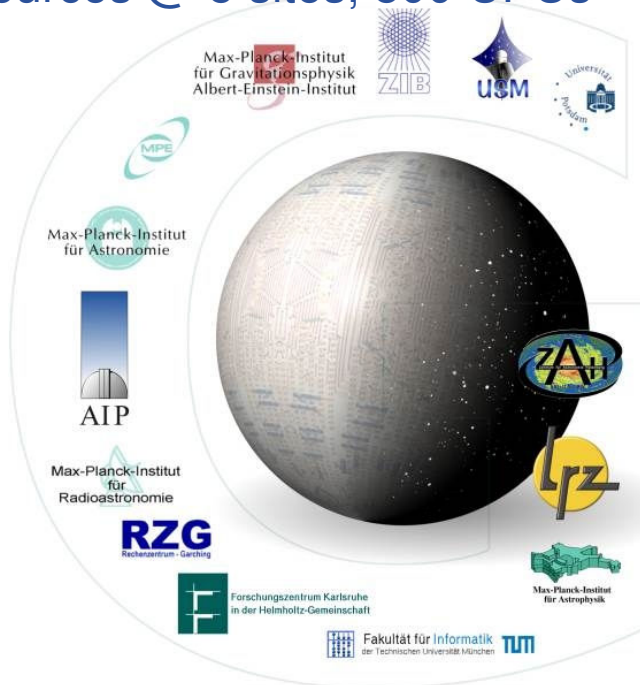


Partner Grids: Examples

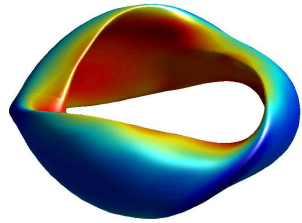
AstroGrid-D, German Astronomy Community Grid



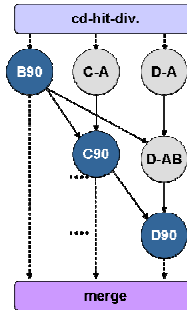
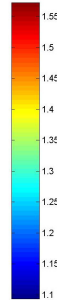
- Collaborative management of supercomputing resources & astronomy-specific resources
- Grid-level meta-scheduler (GRAM interface)
- 22 resources @ 5 sites, 800 CPUs



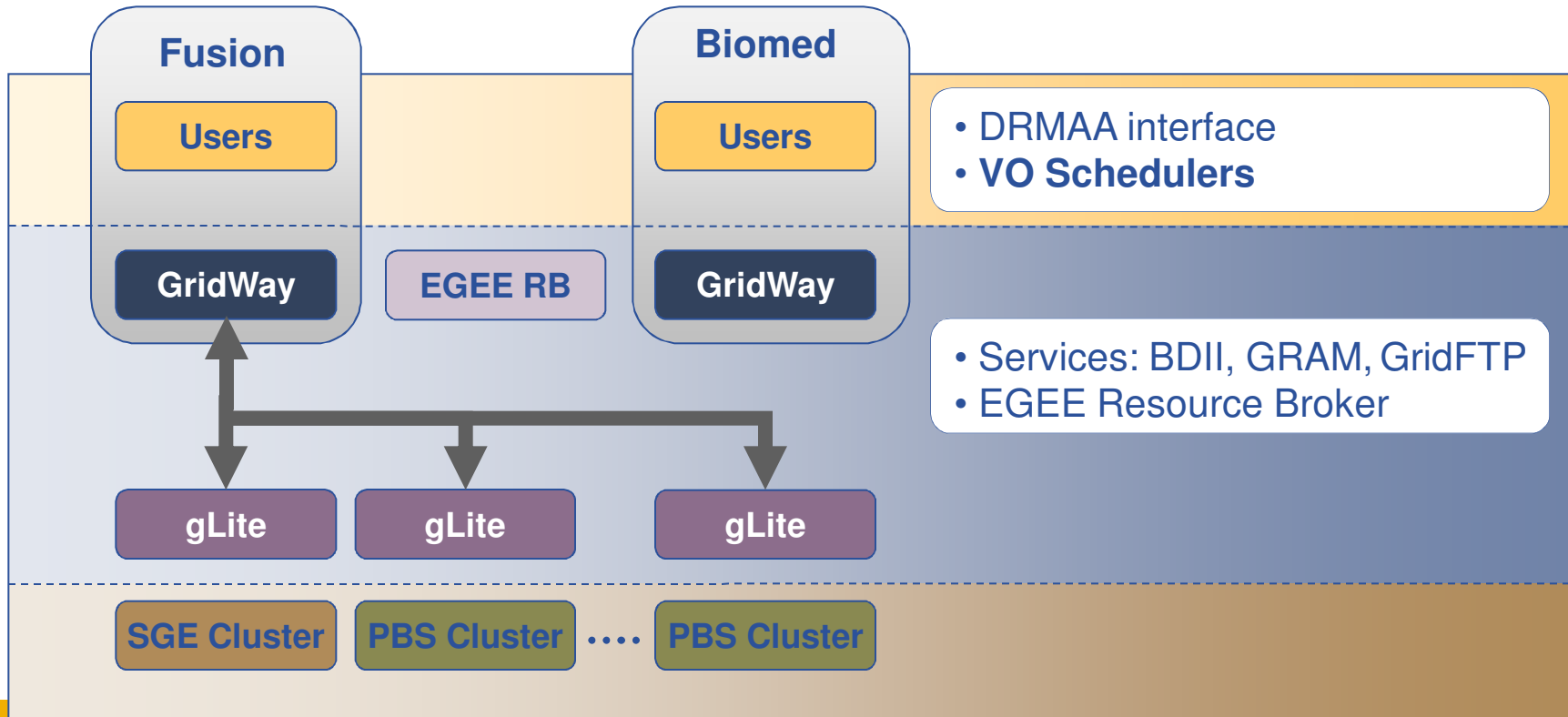
Partner Grids: Examples



Massive Ray Tracing



CD-HIT workflow



**Thank you
for your attention!**