Overview and Status of the GridWay Metascheduler

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1. What is GridWay?
2. A Global Vision
3. Working Examples
4. Status
What is GridWay?

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

- For **project and infrastructure directors**
  - an open-source community project.

- For **system integrators**
  - highly modular
  - allowing adaptation to different grid infrastructures
  - supports several OGF standards.

- For **system managers**
  - scheduling framework similar to Local Resource Manager Systems
  - supporting resource accounting and defining scheduling policies.

- For **application developers**
  - implements the OGF standard DRMAA API (C and JAVA bindings)
  - compatibility of applications with LRM systems that implement the standard, such as SGE, Condor, Torque,...

- For **end users**
  - Has 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

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

- DRMAA library
- CLI
- GridWay Core
- Request Manager
- Dispatch Manager
- Scheduler
- Transfer Manager
- Execution Manager
- Information Manager
- Grid File Transfer Services
- Grid Execution Services
- Grid Information Services
- Job Submission
- Job Monitoring
- Job Control
- Job Migration
- Job Preparation
- Job Termination
- Job Migration
- Resource Discovery
- Resource Monitoring
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Different scientific-domain

Massive Ray Tracing

CD-HIT workflow

AITALC code Bhabha

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

Enterprise Grids: Examples

European Space Astronomy Center

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

Diagram showing the components of the European Space Astronomy Center's grid infrastructure, including grid resources and user interactions.
Scheduling Infrastructures

UABGrid, University of Alabama at Birmingham

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

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
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Latest version 5.6.1 (Released 21/01/2010)

Bug fixing campaign

• Proxy user identification properly working
• Installation in older machines (lower autotools version)
• Annoying delay-bug (check proxy) when proxy is there
• Capture complete \texttt{HOSTNAMES} for messaging
• Include full \texttt{QUEUE_ACCESS} info for all Vos
• ...

SSH Driver available

• Faster and unique resource discovery

LDAP server discovery

• Faster and unique resource discovery

Output of cli available in XML format

• Allowing easy implementation of add-ons
• Following a well-defined XML Schema (validation)
status

Google Summer of Code 2009 projects

• 2 accepted projects with the Globus Alliance
• 3-months projects to develop and learn free open source code
  • GUI for GridWay
    • Developed by Srinivasan Natarajan (mentor J.L Vázquez-Poletti)
    • Easy to use GUI
    • Based on GTK+
    • Provide full cli features
  • GridWay + GoogleMaps mashup
    • Developed by Carlos Martín (mentor A. Lorca)
    • Information from GridWay output geolocalized
    • Based on Google Web Toolkit
    • Show real-time status
New web page design

A renovated web portal has been designed [http://gridway.org]

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**
- New **development** web platform [http://dev.gridway.org]
Thank you for your attention!