GridWay: A metascheduler for Globus-based Grids

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**Architecture & Global View**

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

- Globus GridWay meta-scheduler is a scheduler virtualization layer on top of Globus services (GRAM, MDS & GridFTP).
- DRMAA
  - C, java
  - $> CLI
- Applications
  - LRM-like Command Line Interface
  - OGF DRMAA C & JAVA Bindings
  - JSDL (Posix & HTC profiles)
  - Array jobs, DAG workflows and MPI jobs
- Advanced (Grid-aware) scheduling policies
- Fault detection & recovery
- Accounting
- Open-source Globus project
- Straightforward deployment (basic services)
- Component to deploy different Grids
- highly dynamic, faulty & heterogeneous
- site autonomy

**GridWay**

**Globus Services**

**Grid Middleware**

**Infrastructure**

**Applications**

**Grid Meta-Scheduler**

**Gridway**

**Applications**

**Grid Middleware**

**Infrastructure**

**Applications**

**Grid Meta-Scheduler**

**GridWay**

**Globus Services**

**Grid Middleware**

**Infrastructure**

**Applications**
In this demo...

- (V) Organization meta-schedulers
- Science gateways
- Organization-wide Grid-aware policies

- Different Middleware stacks
- Different Data/Execution archs.
- Different Information models
- Integration through adapters

(V) Organization Architecture

Middleware

Users

Applications

GridWay

pre-WS / WS

pre-WS / WS

SGE Cluster

PBS Cluster

gLite

PBS Cluster

SGE Cluster

pre-WS / WS

pre-WS / WS

Open Science Grid

egge

Enabling Grids for E-sciencE

TeraGrid
Deploying GridWay in TeraGrid I

Scenario 1: Site Metascheduler

- User Policies (Urgent jobs, Shares…)
- Resource Policies (Usage, Fixed Priority…)
- Accounting

Site Users

GridWay

System Administrator

Globus Services
GRAM, GridFTP, MDS

Local Resources

TeraGrid Site

Globus Services
GRAM, GridFTP, MDS

TeraGrid Resources

Other TeraGrid Sites

Other Partner Grids
Deploying GridWay in TeraGrid II

Scenario 2: Science Gateway Metascheduler

- DRMAA API
- JAVA binding

Other TeraGrid Sites / SGs

Other Partner Grids

Globus Services
GRAM, GridFTP, MDS

TeraGrid Resources
Scheduling Policies

Grid Scheduling = Job + Resource Policies

Resource Policies
- Rank Expressions
- Fixed Priority
- User Usage History
- Failure Rate

Job Policies
- Fixed Priority
- Urgent Jobs
- User Share
- Deadline
- Waiting Time

Matching Resources for each job (user)
Globus GridWay for Teragrid is …

• A familiar LRM-like environment for job submission, control and monitoring (gwps, gwkill…)

• A standard-based development framework for distributed applications (DRMAA, JSDL)

• An efficient and reliable job execution management system (designed to work with Globus services)

• A state-of-the-art policy-driven scheduler (share, fixed…)

• A modular component to interoperate different infrastructures (EGEE, TeraGrid, OSG, NorduGrid…)

• An Open-Source Community