GridWay Metascheduler 5.0

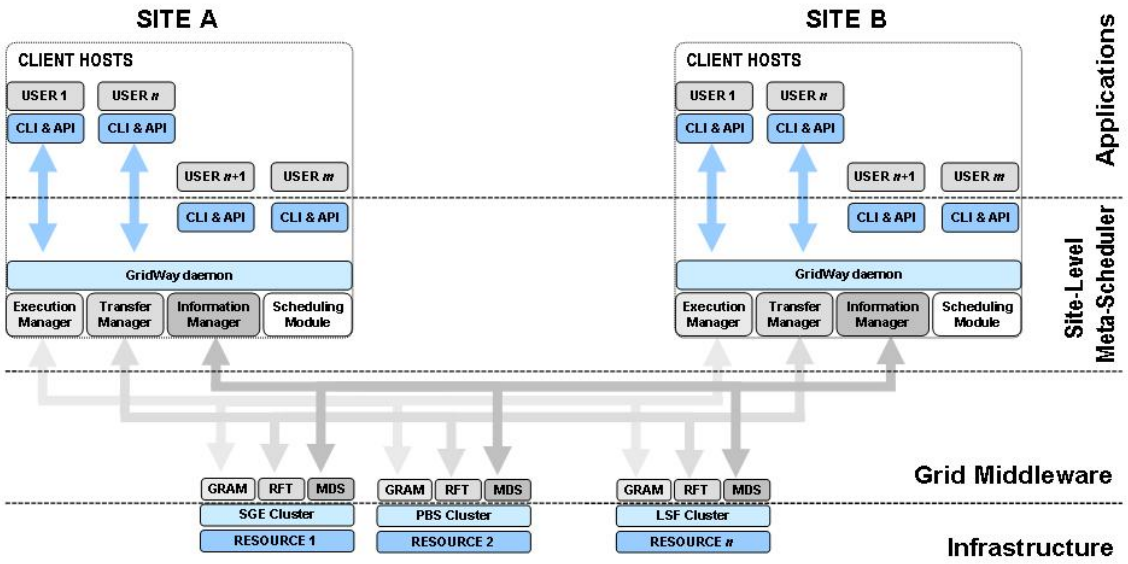
Metascheduling Technologies for the Grid

Overview

- GridWay, on top of Globus Toolkit services, enables large-scale, reliable and efficient sharing of computing resources (clusters, computing farms, servers, supercomputers...), managed by different DRM (Distributed Resource Management) systems, such as PBS, SGE, LSF, Condor..., within a single organization (such as an enterprise grid) or scattered across several administrative domains (partner or supply-chain grid)
- GridWay is an open-source component for meta-scheduling in the Grid Ecosystem, released under Apache license version 2.0, that gives end users, application developers and managers of Globus infrastructures a scheduling functionality similar to that found on local DRM systems
- The GridWay Metascheduler is a Globus project, so it adheres to Globus philosophy and guidelines for collaborative development

Highlights

- Flexible and extensible architecture
- Improved efficiency and robustness
- Advanced scheduling capabilities
- Information drivers to interface MDS2 and MDS4
- Execution drivers to interface pre-WS GRAM and WS GRAM, even both simultaneously
- Transfer drivers to interface GridFTP and RFT
- Full support for C and JAVA DRMAA GGF standard
- DRM-like commands to submit, monitor, synchronize and control jobs; monitor Globus resources and users; and extract Grid accounting information



GLOBUS GRID INFRASTRUCTURE

www.GridWay.org

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Features and Benefits

	Feature	Function	Benefits
SCHEDULING FEATURES	Advanced scheduling capabilities on a grid consisting of distinct computing platforms	Dynamic scheduling, opportunistic migration support, performance slowdown detection, self-adaptive application support and checkpointing support on heterogeneous and dynamic grids managed by Globus Toolkit services	• Decoupling between applications and the underlying local management systems (PBS, SGE...) • Non-intrusive execution • Integration of non-interoperable independent computational platforms (vertical silos) • Increased application throughput • Uniform environment and flexible infrastructure • Greater utilization of underlying resources
	Support for array jobs	Array job capability provides parameterized and repeated execution of the same task.	• Efficient execution of high throughput computing and parameter sweep applications
	Support for job dependencies	Job dependency capability allows the execution of a submitted job depending on the completion of other jobs submitted in the grid	• Efficient execution of abstract workflows involving branching and looping
	Scheduling policy module	Support for the definition of new scheduling policies that allow prioritization of jobs and users	• Allocation of grid resources according to management specified policies
	Scheduling reporting and accounting	Support for the development of scheduling reporting and accounting facilities that provide detailed statistics of usage on the grid	• Analysis of resource utilization, determining trends in usage and monitoring user behavior • Performance tuning • Troubleshooting configuration problems
	Fault detection & recovery capabilities	The meta-scheduler is able to detect and recover from the remote failure situations, such as remote job cancellation, remote system crash or outage and, network disconnection; and to recover from local failure	• Reliable and unattended execution of jobs
USER INTERFACE	Application compatibility	The meta-scheduler is not bounded to a specific class of application generated by a given programming environment and does not require application deployment on remote hosts	• Wide application range • Reusing of existing software
	DRM Command Line Interface	The scheduler command line interface allows users to submit, kill, migrate, monitor and synchronize jobs	• CLI similar to that found on Unix and DRM systems such as PBS or SGE
	Standard Applications API (DRMAA)	The scheduler provides full support for DRMAA (GGF standard) to develop distributed applications (C and JAVA bindings)	• Integration of ISV's applications to GridWay • Compatibility of applications with DRM systems that implements the standard, such as SGE, Torque...
DEPLOYMENT ISSUES	Support for multiple-users	The installation and configuration of GridWay is performed by the system manager and the users access GridWay from a front-end or from submission hosts, which do not require GridWay and Globus installation	• Globus installation is not required in each end-user system • Reduction in Firewall requirements • The administrators have full control of meta-scheduling deployment
	Flexible and extensible architecture	The scheduler provides a modular architecture to allow communication with different resource management, file management and information services	• The meta-scheduler can be extended or used as a building block for more complex architectures • Easy development of drivers to access new computing services
	Straightforward deployment	The scheduler is installed on a client system and does not require the installation or deployment of new services in the remote resources, apart from Globus services	• Easy and fast installation
	Interoperability	The meta-scheduler provides support for the development of drivers that interface to distinct middlewares	• Interoperability between different grid infrastructures (Globus, EGEE, UNICORE...)
	Supported remote services	• Information drivers to interface MDS2 (MDS schema), MDS2 (Glue schema) and MDS4 • Execution drivers to interface pre-WS GRAM and WS GRAM (even both simultaneously) • Transfer drivers to interface GridFTP and RFT	• Support the existing platforms and resource managers (fork, PBS, SGE, LSF, LoadLeveler, Condor...)