

GT4 Component Fact Sheet

WS Grid Resource Allocation and Management (WS GRAM)

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General Component Description

The Grid Resource Allocation and Management (GRAM) service provides a single interface for requesting and using remote system resources for the execution of "jobs". The most common use of GRAM is remote job submission and control. It is designed to provide a uniform, flexible interface to job scheduling systems.

GT4 contains two GRAM implementations: one based on a proprietary, pre-Web service protocol (Pre-WS GRAM) and the second built using Web service interfaces (WS GRAM). This Fact Sheet describes implementation details of the WS GRAM component.

What's New in GT4?

The WS-GRAM service has changed significantly, targeting improvements to performance and fault tolerance. The performance enhancements will improve:

- Latency – response time of job state change notifications
- Throughput – number of jobs “queued” to the MJFS per second
- Concurrency – number of jobs that can be simultaneously managed by the service

The fault tolerance enhancements will improve WS GRAM’s ability to resume management of jobs after a fault/crash of the host machine or hosting environment.

The batch schedulers supported in the Alpha release are PBS and Fork. LSF and Condor support will be included at least in the Beta release.

Other feature additions are planned for the final release. The GRAM RSL will be extended in order to target cluster node types/characteristics. Also, a new service is planned in order to provide task/job synchronization for MPICH-G2 multi-jobs.

Backward Compatibility Statement

A GT 4.0 WS GRAM breaks both protocol and API compatibility with all Pre-WS and WS GRAM versions.

The Resource Specification Language (RSL) schema has changed in the GT 3.9.2 release. The set of RSL attributes (elements) has not changed significantly, but the RSL

substitution definitions and substitution references have been removed in order to be able to use standard XML parsing/serialization tools. The functionality previously provided by RSL substitutions will be a new requirement for GRAM clients to perform. GRAM service defined substitution values will be published, but a GRAM client will need to query for these values and edit the RSL accordingly before submitting the job.

Technology Dependencies

- WS Authentication and Authorization
- Pre-WS libraries globus_common and globus_core
- XIO
- GridFTP
- Java WS Core
- RFT (In Beta release)
- C WS Core (In Beta release)
- WS MDS (In Beta release)
- Batch Scheduler Installation (optional)
 - PBS
 - Condor (in Beta release)
 - LSF (in Beta release)