OGSA Resource Selection Services Working Group

Global Grid Forum, Compute Area

Administrative Information

Name and Acronym:
  OGSA Resource Selection Services Working Group (OGSA-RSS-WG)

Chairs:
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Charter

Focus/Purpose
  The OGSA-RSS WG will provide protocols and interface definitions for the Selection Services portion of the Execution Management Services (EMS) part of the Open Grid Services Architecture (see section 3.4.6, page 22 of GFD.30: "The Open Grid Services Architecture, Version 1.0"). The Resource Selection Services (RSS) consist of the Candidate Set Generator (CSG) and the Execution Planning System (EPS). The CSG can be used to generate a set of computational resources that are able to run a job in general, while the EPS uses this list to decide where to run the job. Other resources such as data are out of scope of these services.

Scope
  The group will define interfaces and protocols for the Resource Selection Services, namely the Execution Planning Service and the Candidate Set Generator. The needed interfaces between these services and other OGSA components will be described, along with a protocol definition on how other components may use the RSS. Other components include, but may not be limited to, the Job Manager Service, the Service Container and the Information Service.
  The working group will provide feedback on the OGSA to the OGSA-WG, especially other WGs in the OGSA-EMS architecture. For example, it might be necessary to describe additional constraints on other parts of the architecture (e.g. constraints on storage) to support execution planning or reservation. As such requirements are identified, the working group will collaborate with the OGSA-WG and its fellow working groups to ensure that the OGSA is capable of handling the scenarios.
  The Grid Scheduling Architecture RG investigates general scheduling architectures and models. The WG will use the conceptual models and documents of this RG.

Goals

The WG aims at the definition of the protocols for the components described above. Although the definition of EPS and CSG are a substantial fraction of the overall architecture, we think these services are closely coupled and therefore it seems not to be reasonable to define the services in isolation. In order not to lose focus, we decided to split the work in two deliverables:

1. D1: Specification of CSG interface and protocol
2. D2: Specification of EPS interface and protocol

The specification documents will include the semantics necessary for other EMS to use the RSS. In order to synchronize our work with the OGSA-WG, we will have a review meeting (possibly on the phone) before document publications. In addition, we will create a service description document which will provide an outline of the functionality of the services. It will be used as a basis to build the deliverables upon.

We see a strong need for today's scheduling systems to support advance reservation, but the definition of a complete and extensive reservation service is out of the scope of this WG. We will collaborate with the GSA-RG to define the scheduler requirements on reservation services.

Our milestones are:

- GGF14: BoF and start work on Service description
- GGF15: Kickoff, Service description milestone, start work on D1 & D2
- GGF16: First draft of D1 & D2
- GGF17: Revised draft of D1 & D2
- GGF18: D1 & D2 in public comment

Management Issues

Evidence of commitments to carry out WG tasks

Mathias Dalheimer is the editor of D1, the CSG protocol specification. Donal Fellows, Soonwook Hwang and Ramin Yahyapour volunteer to be co-editors.
Donal Fellows is the editor of D2, the EPS protocol specification. Mathias Dalheimer, Soonwook Hwang and Ramin Yahyapour volunteer to be co-editors.
Ramin Yahyapour and Philipp Wieder will act as liaisons to the Grid Scheduling Architecture RG. Andrew Grimshaw will act as liaison to the OGSA-WG.
Please also refer to question five below.

Pre-existing Document(s) (if any)

- Donal Fellows has contributed a paper "An Architecture for Distributed Grid Brokering" as background material (available at http://www.cs.man.ac.uk/~fellowsd/europar05.pdf)
- The GSA-RG provides the following documents:
  - The "Grid Scheduling Use Cases" draft document which will enter public comment period shortly after GGF14
  - The "Grid Scheduling Architecture –Requirements" draft document
- The OGSA-WG has some draft documents about RSS which we will use. In addition, they will identify a meta-model for resources which can be used by the CSG.

Evaluation Criteria (from GFD-C.3)

Is the scope of the proposed group sufficiently focused?

> The proposed WG deals with the components listed in the Scope section, namely Execution Planning Service and Candidate Set Generator. The WG will provide an interface and protocol definition for each of this services.
> Usually, resource selection services are composed of these functionalities, therefore making it difficult to investigate each of these separately. The services are strongly connected to each other, indicating that the interfaces between them must be co-specified and developed in parallel.

Are the topics that the group plans to address clear and relevant for the Grid research, development, industrial, implementation, and/or application user community?

> It is a common requirement for grid implementations to select resources. This groups approach is to provide service interfaces and protocols within the OGSA framework. Currently, there are no standard interfaces available that make grid schedulers interoperable with each other. On the other hand, different application communities have very different scheduler requirements. A common definition of RSS interfaces could help to enable the communities to build scheduling solutions that are optimal for their problem domains by using available resource selection services. The proposed group will collaborate with the OGSA-WG, which already outlined a framework of Resource Selection Services.
> The standardization of the interfaces would also enable the community to focus more on the development of scheduling and brokering algorithms instead of the infrastructural mechanisms for connecting these resource selection engines to the basic job management services.

Will the formation of the group foster (consensus–based) work that would not be done otherwise?

> The development of further RSS specifications has already been outlined by the OGSA-WG. Within this draft, the proposed WG will develop a detailed specification.

Do the group's activities overlap inappropriately with those of another GGF group or to a group active in another organization such as IETF or W3C? Has the relationship, if any, to the Open Grid Services Architecture (OGSA) been determined?

> The WG is based on the RSS framework outline proposed by the OGSA-WG. We intend to provide the detailed interface and protocol definition described above for the relevant subset of the proposed OGSA. If we find any changes needed in the OGSA (e.g. new services) we will cooperate with the OGSA-WG in order to resolve this. Andrew Grimshaw has committed himself to act as a consultant.
> The work overlaps with the goals of the Grid Scheduling Architecture Research Group. The GSA-RG aims at the definition of an architecture and procedures in general. These models are of a more general nature. The proposed WG will rely on these models, but will be more focused on a concrete architecture that fits into the OGSA framework. Ramin Yahyapour and Philipp Wieder will act as consultants to the GSA-RG.
> The group's activities will use the work of other GGF groups such as JSDL-WG and GRAAP-WG as well.

Are there sufficient interest and expertise in the group's topic, with at least several people willing to expend the effort that is likely to produce significant results over time?

At the time of writing, the following people have agreed to contribute:
- Donal Fellows, representing the UniGrids project, states that this working group is directly relevant to his work on UNICORE. He has experience with implementing an architecture for distributed cross-middleware resource brokering from the EUROGRID and GRIP projects.
- Mathias Dalheimer, maintainer of the Calana scheduler already agreed upon the implementation of the interfaces into their scheduler. In addition, the interfaces will be integrated and tested within the Fraunhofer Resource Grid.
- The NAREGI project has also committed to implement the interfaces and support the work of this group.
- Ramin Yahyapour and Philipp Wieder, GSA-RG
- Walfredo Cirne, head of the OurGrid project, also stated his interest.
- Nicola Tonellotto, ISTI-CNR and Uni. Pisa, Italy

Does a base of interested consumers (e.g., application developers, Grid system implementers, industry partners, end-users) appear to exist for the planned work?

Up to now, there is no agreed standard on how to interact with a resource selection system. On the other hand, every grid project needs some kind of resource selection service. A common interface for the resource selection service would provide both EMS and scheduler developers a way to change implementations. The OGSA-WG also identified the need of these interfaces.
Various parties are interested in this work and the results will be integrated in at least three grid middleware platforms, namely NAREGI, UniGrids and Fraunhofer Resource Grid.

Does the GGF have a reasonable role to play in the determination of the technology?

Currently, grid schedulers are developed in nearly every grid project and the re-usage of components is limited due to the lack of standardized interfaces. As the GGF is a forum where all the relevant stakeholders come together, it is an excellent venue for developing a common architecture for resource selection services. Furthermore, the proposed WG is strongly connected to the OGSA, and plans to provide feedback that is derived from the detailed design of an architecture for resource selection. Therefore, we believe the GGF is the right place for the work of the proposed WG.