

Grid-Based Business Partnerships using Service Level Agreements

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Abstract

Traditional academic Grids are based on collaborative resource sharing usually organised by service providers, who agree to share their resources to create a single 'resource pool' that can meet the needs of a common user community. However, this involves service providers and users signing up to a 'virtual organisation' with a common objective (that of the relevant user community), and agreeing unified policies for managing and granting user access to the shared resources. This arrangement is very expensive to establish and operate, does not meet the business needs of commercial service providers or consumers, and leaves no room for participants to compete openly on price or quality of service.

The SIMDAT project [1] is developing generic Grid technology targeted at business users from several representative industry sectors. As part of SIMDAT, we have developed an SLA (Service Level Agreement) Management service for GRIA [2] that allows service providers and customers to trade resources (applications, data, processing, storage) under the terms of bilateral SLAs. Service providers are able to operate independently of each other, and compete as necessary to provide services to paying customers. Customers are able to control which services they consume, how much they are used, and by whom.

The SLA Management service allows service providers to advertise SLA templates that are proposed by customers during SLA negotiation. The SLA describes quality of service (QoS) and other commitments by a service provider in exchange for financial commitments by a customer against an agreed schedule of prices and payments.

Service providers deploy application services appropriate to their business operation. These services generate usage reports using their own QoS criteria which may be qualitative (e.g. error conditions) or quantitative (e.g. processing time, data transferred). The SLA Management service uses these reports to monitor customer usage and the level of commitments from existing agreements compared with available capacity. It can then automatically decide whether to enter into a new SLA (with a given QoS) when requested by a customer; whether a requested service is covered by an existing SLA, and whether the service can be provided within the capacity of the provider; which SLA(s) should be breached when capacity is about to be exceeded, and how to reduce loads in the corresponding application service(s); when a consumer is exceeding the limits of an SLA, and how to prevent this by reducing service

consumption in the corresponding application service(s); and what level and quality of service is actually delivered, and how much to bill for this.

To enter into a new SLA, a customer must be authorised to bill services provided under the new SLA to a GRIA charging account, and the account must have sufficient credit left to cover the scale of services that would be supplied under the SLA. This means the human manager of GRIA services can control how much service will be provided to which customers, but he only has to make one business decision: what credit limit to allow on the customer's trade account, if any. After that, everything is automated, which makes GRIA services very responsive to new user needs, yet inexpensive to operate for providers. This is critical in a business Grid where human resources can easily become the largest cost when running services - in GRIA these costs are minimised, so services can be profitable for providers while still being affordable for customers.

Within SIMDAT, GRIA has been successfully deployed to support business partnerships in the aerospace, automotive, and pharmaceutical sectors. The SLA Management service is part of GRIA's Service Provider Management package, which is available for download, free and open source, from www.gria.org.

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[1] www.simdat.org

[2] www.gria.org