Some Sample Use Cases That Drive the OGSA
&
Functional Requirements of OGSA

The OGSA architecture working group defines a number of use cases from a wide variety of application scenarios including those related to e-science and e-business applications.

The main purposes of these use cases are:

1. To identify and define core OGSA platform functionalities
2. To define core platform components based on the functionality requirements
3. To define the high-level requirements on these core components and identify their interrelationship

These use cases are defined as part of the OGSA-WG charter definition specified by GGF, which says, "To produce and document the use cases that drive the definition and prioritization of OGSA platform components, as well as document the rationale for our choices."

As we can see, some of these use cases defined below from the e-business and e-science world helps identify the general OGSA platform features, components, and their interrelationships. This will pave the way for the detailed discussion on the OGSA architecture platform components.

Representational use cases from the OGSA Architecture working group.

1. Commercial Data Center (Commercial Grid)
2. National Fusion Collaboratory (Science Grid)
3. Online Media and Entertainment (Commercial Grid)

The core aspects, scenarios, and the requirements drawn from these use cases.

Commercial Data Center (CDC)

Data centers are common in most of the big enterprises in order to consolidate the huge number of servers to reduce the total cost of ownership. Data centers play a key role in the outsourcing business where major businesses outsource their IT resource management to concentrate on their core business competence and excellence. These data centers are required to manage a huge number of IT resources (servers, storages, and networks). Since these data centers are providing resource-sharing capabilities across virtual organization, grid computing forms the technology of choice for their resource management.

In order to support such a commercial grid, the grid technology platform, middleware, and applications should possess a number of core functionalities. We identify and enlist these functionalities by defining the customers of this data center and their usage scenarios.

Customers/Providers (Actors)

- **Grid Administrator.** An administrator wants to get the maximum utilization of the resources in the data center and the management of the resource sharing to be controlled through resource policies.
- **IT System Integrator.** A system integrator wants to reduce the complexity of the distributed and heterogeneous system. Also, they are responsible for the construction of the heterogeneous system and management of service changes.

- **IT Business Activity Manager.** A business manager needs a scalable and reliable platform at a lower cost and an agreed-upon quality of service.

Scenarios

Multiple in-house systems support within the enterprise. Consolidate all the in-house systems in one place and make resources available on an on-demand basis. This reduces the cost of ownership and increases resource utilization. This scenario is suitable for human resource services, customer resource management, finance, and accounting systems.

Time-constrained commercial campaign. Provides the resources on demand in order to run time-constrained campaigns and levy charges on the basis of usage. Examples of these campaigns include sales promotion campaigns , game ticket sales, and so on.

Disaster recovery. An essential part of the major IT systems today. Commercial GRID system could provide standard disaster recovery frameworks across remote CDC at low cost.

Global load balancing. Geographically separated data centers can share high workload and provide scalable systems.

Functional Requirements on OGSA

After a thorough and careful examination of the static and dynamic behavior present in this use case, the following functional requirements of the grid architecture can be identified:

1. Discovery of the available resources
2. Secure authentication, authorization, and auditing on resource usage
3. Resource brokering services to better utilize and use the resources

and to achieve the level of quality requirements

4. Scalable and manageable data-sharing mechanisms

5. Provisioning of resources based on need

6. Scheduling of resources for specific tasks

7. Advanced reservation facilities to achieve the scale of QoS requirements

8. Enable metering and accounting to quantify the resource usage into pricing units

9. Enable system capabilities for fault handling and partial failure detection/correction

10. Use static and dynamic policies

11. Manage transport and message levels and end-to-end security

12. Construct dynamic virtual organizations with common functionalities and agreements

13. Facilitate resource monitoring

14. Enable the facilities for disaster recovery in case of outages