Chapter 11
Business Grids, Infrastructuring the Future of ICT

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ABSTRACT

Over the past years we have witnessed a shift in the market towards service orientation. Companies in the coming service market need to be extremely agile. This agility is needed at all levels from business to low level ICT in order to reflect the changes in business needs. Particularly, at application level the adoption of the SOA paradigm is already a reality. Software frameworks allowing creation, composition and orchestration of business processes enabling intra and inter collaborations are already available. Obviously, this has given a boost towards the widespread adoption of this approach. Old software vendors have service-enabled their offers, while new opportunities have been filled by new players and more will come in the future. On the other hand, at infrastructure level agility needs to be enforced. However, the infrastructure on which this market has grown so far is not able to fully leverage its potential. Business Grids are envisaged to become the infrastructure backbone for the future of ICT. This will have a relevant impact on the economy and will give support for the emergence of new services and applications. Composition and orchestration of resources is already offered by Grid, although towards more science-oriented goals. Specifically, high performance computing resources are shared among Grid participants, mainly executing stateless batch jobs. As opposite, Business Grids aim to provide support for general business applications, usually multi-tier solutions made of application servers and databases. Data consistency in business transactions is fundamental. This chapter discusses the role of Business Grids in the coming service market, analyzing relevant scenarios and providing a roadmap towards full development and adoption of this technology within the commercial arena. (See appendix for acronym guide).

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INTRODUCTION

Globalization is driving the move towards service orientation. Independent and autonomous service providers will populate the market allowing to outsource part of companies’ business processes. Large companies are converting their departments into service providers for internal and external customers. On-demand business is forested to be the future. Only players having autonomy of choice and speed of change are likely to excel in the coming scenario. This can be achieved if applications and infrastructures possess the necessary agility. Applications must be unaware of re-organization operations such as departments separations or fusions, processes insourcing or outsourcing, etc, while IT infrastructures must support all these changes.

In this chapter we want to discuss the role of Business Grids in future development of the ICT economy through the analysis of potential business scenarios, such as enterprises, hosting, outsourcing, massive online services just to mention some of them. This will set the context in which Business Grids will operate and will allow gathering the relative business requirements.

Following, we will review the current research related to Business Grids. A comprehensive analysis of main research projects that may have an impact on the future development of Business Grids will be given. Also, the technology trends that may influence future ICT business systems will be discussed. Analysis of business scenarios and technology directions will allow discussing the research challenges needed to be addressed to realize the Business Grids vision.

A market analysis discussing current use and possible evolutions of Grid in business contexts is also provided. Finally, a roadmap towards Business Grids will be given by analyzing possible future evolutions.

SETTING THE GROUND

This section discusses the current research in Grid context that influences the Business Grid area. The main research projects are reviewed for the purpose and summarized in Table 1.

Grid initially appeared in scientific domains, primary aiming to share computational resources for computationally intense applications, where smaller clusters were unable to process the whole load. In this domain, research is about improving scientific performance. Issues of importance are remote resource sharing, scalability, dynamicity and heterogeneity. Major results have been adopted or have been good starting points for business approaches.

Table 1. Relevant Grid initiatives

<table>
<thead>
<tr>
<th>Country/ies</th>
<th>Sites</th>
<th>Cores</th>
<th>Capacity in teraflops</th>
<th>Jobs/day</th>
<th>Middleware</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGEE</td>
<td>50</td>
<td>300</td>
<td>80,000</td>
<td>300,000</td>
<td>gLite</td>
</tr>
<tr>
<td>DEISA</td>
<td>11</td>
<td>11</td>
<td>135,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRID5000</td>
<td>1</td>
<td>9</td>
<td>5,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NorduGrid</td>
<td></td>
<td></td>
<td>9,000</td>
<td></td>
<td>ARC</td>
</tr>
<tr>
<td>OSG</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
<td>Globus</td>
</tr>
<tr>
<td>CERN LCG</td>
<td>33</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TeraGrid</td>
<td>11</td>
<td></td>
<td></td>
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<td>Globus</td>
</tr>
<tr>
<td>NAREGI</td>
<td>1</td>
<td>3,000</td>
<td></td>
<td>17</td>
<td>UNICORE</td>
</tr>
</tbody>
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