Deployment of gLite Middleware: An E-Science Grid Infrastructure

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Abstract
In recent years, a new generation of distributed systems is evolving in the internet bed. Grid computing is one of these brand-new highly heterogeneous technologies which expanded into worldwide without any limitations on location expansion. The main scope of a Grid is to execute user’s jobs by its available set of resources. A potential Grid needs to be scalable, fault tolerance and immune from network congestion. In order to deeply comprehend the key issues of Grid, in this paper we install and configure gLite (Lightweight middleware for Grid Computing) middleware. We also review the role of some basic gLite components and propose our customized grid architecture.

Aims of research
The main idea of our research is to build a scalable platform for E-Science application from universities, organizations and industries computing power. We believe that these installation details and module regulation of gLite Grid would become beneficial for academic and industrial researchers who are employed in the design and implement of scalable Grids.
In this document we present the installation and configuration of gLite 3.2 Grid middleware. The content of this paper is a handbook of adjustment of gLite Grid nodes.

Materials and Methods
As we shown in figure 1, Grid consists of four key layers of operation: fabric, core middleware, user-level middleware and applications.
1) The first layer is fabric layer which contains the Grid resources.
2) The core middleware layer offers some elementary services of the Grid such as resource management, information system, security and QoS.
3) The user-level middleware layer presents a high level of abstraction for resource brokers and Grid applications.
4) The fourth level of this architecture is application layer.
The gLite is a service oriented grid middleware which bring the required services for distributed computing management, storage resources, security, accounting and information services together.

Results
The main purpose of our work is to encourage small institutes, industrial corporations and prestigious universities to build their customized Grids upon their organization’s vacant computing power without investing a penny. The structural view of configured gLite Grid modules is depicted in figure 2. It shows main modules of our proposed architecture which are listed as follows: Berkeley Database Information Index (BDII), ApelBox accounting service, batch system server, Worker Node (WN), CREAM Computing Element (CE), Virtual Organization Membership System (VOMS) and User Interface (UI).

Conclusion
The gLite middleware is a flexible middleware which could support and manage large amount of computing devices. Our idea is to build a massive computing facility through the campus scattered computer equipment.
The next step of our work is to become CA and make the campus computing power available for students, indoor scientific researchers and other researchers from rest of the Iran’s universities.

References