Alchemi: .NET-based Enterprise Grid Computing

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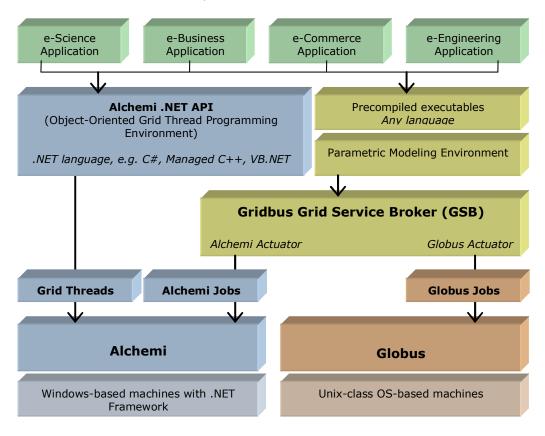**Students:** Rajiv Ranjan, Chee Shin Yeo
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Alchemi is a .NET-based Enterprise Grid framework that allows seamless aggregation of the computing power of networked desktop computers into a virtual supercomputer for executing resource intensive applications. Thus, it enables organizations to use the power of employees' idle desktops and avoid buying expensive hardware to execute distributed applications. The Alchemi grid computing framework was conceived with the aim of making grid construction and development of grid software as easy as possible without sacrificing flexibility, scalability, reliability and extensibility. The key features supported by Alchemi are:

- Internet-based clustering of desktop computers without a shared file system;
- federation of clusters to create hierarchical, cooperative grids;
- dedicated or non-dedicated (voluntary) execution by clusters and individual nodes;
- object-oriented grid thread programming model (fine-grained abstraction); and
- web services interface supporting a grid job model (coarse-grained abstraction) for cross-platform interoperability e.g. for creating a global and cross-platform grid environment via a custom resource broker component.

Alchemi has been used in various types of applications including document processing (Tier Technologies, USA), detection of mammalian genes (FMI Bio Research Institute, Switzerland), investment risk analysis (Stochastix Germany) and catchment modelling (CSIRO and eWater CRC, Australia). Alchemi is hosted on Sourceforge.net as well and there are around 100 external developers that are currently registered with the project mailing list.