
Executive Summary

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Scientific Discovery through Advanced Computation Solicitation LAB01-06
National Collaboratories and High Performance Networks

CoG Kits: Enabling middleware for designing science applications, Web portals, and problem solving environments

Web Page: <http://www.cogkits.org>

For the period July 1, 2001 – July 31, 2004

The computing demand of many state-of-the-art scientific applications, such as climate modeling, astrophysics, high energy physics, structural biology, chemistry, and tele-immersive engineering, will require the coordinated use of numerous distributed and heterogeneous components, including advanced networks, computers, storage devices, display devices, and scientific instruments. Such a national collaborative Grid infrastructure is currently being developed and supported by DOE, NSF, and NASA. Developing advanced scientific applications for these emerging national-scale Computational Grid infrastructures is still a difficult task. Although elementary Grid services are available that assist the application developers in authentication, remote access to computers, resource management, and infrastructure discovery, these services often are not compatible with the commodity technologies and frameworks used by application scientists today, or they are too complex to be used by computational scientists who are not experts in Grid programming. A higher level of abstraction is demanded that provides advanced

Grid services within frameworks that are, and will be, used as part of the scientific problem-solving process.

We propose to develop and implement Commodity Grid (CoG) Kits that will allow the application programmer or middleware developer to readily make use of Grid services from a higher-level framework. We will focus this effort on the development of two CoG Kits; one for Java and the other for Python. These kits will allow for easier and more rapid application development. These kits will allow for easier and more rapid application development. They also will encourage collaborative code reuse and avoid the duplication of effort among problem solving environments, science portals, Grid middleware, and collaboratory pilots.

Within this proposal we will be following the complete software engineering cycle of requirement analysis, design, implementation, evaluation, deployment, outreach, and support. Our activities leverage prototype implementations and research. We collaborate with ongoing projects and Grid Forum activities to meet many requirements posed by the community.

Timeline

Year 1

- Identify the Requirements of the community

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- Provide access to basic Grid services in Python and Java
 - Release the developed software to the community

Year 2

- Provide success stories for the use of the CoG Kit with application and Grid service developers
- Provide advanced Grid services
- Interact with application development teams

Year 3

- Provide extensive tutorials and documentation for an open source development
- Provide a community release of the software
- Verify the development of independent maintained CoG Kits

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