## Solicitation for Pre-Proposals for the Open Science Grid

*The Open Science Grid Council is soliciting pre-proposals of up to three pages in length to contribute to the Consortium's needed program of work. It is expected that the proposers will subsequently submit full proposals to one or more funding sponsors. Pre-proposals submitted to the osg-ieb@opensciencegrid.org mail list by July 20th 2005 will be discussed at the Council meeting on July 22nd. The Council will work with the proposers to supply written endorsement and support to accompany the proposals, thus organizing ourselves to present a coherent picture and program of work for any future funding solicitations, guided by the text below:*

The Open Science Grid (OSG) is based on the achievement that we today have a powerful collection of resources, solid suite of middleware, and engaged communities of scientists, all of which are collaborating in an effort to build, maintain and operate a US wide grid infrastructure. We have made a good start and must continue to build on this base. In the future we will look to include more resources, more powerful middleware, and new communities. The Open Science Grid depends on what exists today, together with future sustained and dependable efforts.

The OSG Consortium brings together resource providers, communities of scientists, and middleware providers. The objective of this diverse group is to build and operate the OSG Infrastructure that will enable the communities to do science on the resources via the middleware. Each member of the group is an entity with a scientific mission that is supported by locally managed lines of funding. The responsibility of the core effort of OSG is to provide the "glue" that turns the resources and middleware offered by the providers into a dependable computing environment that meets the needs and expectations of the communities. In the same way that the OSG Infrastructure does not own the resources, it will not "own" the middleware. OSG takes the technology offered by the middleware providers and turns it into a deployable (OSG) software stack, which may require extensions to the middleware. Resources for hosting common services (e.g centralized information services) or software packages (e.g. software caches) will be required and will most likely be owned by the OSG Consortium.

The OSG Consortium's goal is to provide a flexible grid infrastructure which supports the longer term growth in the scale of the resources and the number of scientific users, and increased functionality of the middleware. Since the Consortium started from an initial base of the Trillium (GriPhyN, iVDGL and PPDG) projects and related facility and research groups, the initial user community is naturally focussed around those participating in these projects. The longer term goals of the Consortium are to provide benefit to and engage a much broader community of researchers. To meet this goal, interoperability of the OSG infrastructure with other grids, common interfaces and services within OSG, and partnerships with the broader organizations in which OSG members participate, are important parts of the Consortium's initial and ongoing program.

### *OSG Pre-Proposal Solicitation*

The OSG Council is soliciting pre-proposals to contribute to the programmatic needs of the Consortium, where the intent is to submit a full proposal to funding sources. Teamwork and coordination have been hallmarks of the OSG success to date. Proposals will optimally include multiple organizations and extend existing collaborative work. Proposals preferably give benefit to multiple communities. For the immediate term the priority is for contributions to one or more of the core activities necessary to sustain and augment the current efforts. Proposals may be

intended for submission to any or all of NSF, DOE, NIH, NASA, other bodies that fund open scientific research for programs of work which have a defined duration, as well as to institutions with ongoing long term funding.

The Council encourges efforts to adiabatically extend participating groups and research communities through collaborative proposals that benefit and make leveraged contributions across the communities and the organizations involved. Examples of research communities that could beneficially participate include many areas in the physical sciences, computer science, biological science and medicine, engineering and manufacturing, geoscience, and the social sciences.

The OSG Executive team works with groups submitting pre-proposals to facilitate coverage of the essential needs (Core Activities) of the OSG in proposals submitted to the funding agencies. The OSG Executive team will work with all groups submitting pre-proposals to understand the benefits to the Consortium's roadmap. The OSG Council will appoint a committee to vet and endorse pre-proposals. This will provide respected informational input, to accompany the proposals when submitted to the funding agencies, about how proposals are aligned with and contribute to the goals of OSG. The OSG pre-proposal process assures proposers, as well as the funding agencies, of the relevance to the Consortium of the program of work, with a commitment that contributions will be formally recognized.

### *Open Science Grid Needs*

All of the work areas below contribute toward the goals and vision of OSG and are assumed to leave a legacy of value to OSG and its members. There is a minimal set of Core Activities that are essential to sustain and use the existing, infrastructure. Without continued efforts for these core activities the current infrastructure cannot be kept alive.

The importance and production nature of the OSG infrastructure requires staffing and attention to the core activities at a serious programmatic level. We do not underestimate the level of effort necessary to provide a sustained, robust and usable service that is scaled to and performs for the needs of the research communities, that gets rave reviews from the users, and allows the operations and support staff to "have a life".

**The Core Activities**

Core Activities are those essential to ensure continuation, scaling, and evolution of the existing OSG infrastructure. We must garner sustained funding and effort for these critical areas:

- Provisioning:
  - Turn the OSG software stack into deployed and maintainable software.
  - Provision the server OSG software stack for resource provider sites.
  - Provision the client side of the OSG software stack.
  - Deploy the common services of the OSG.
- Operation:
  - Ensure the security of the OSG infrastructure.
  - Establish agreements that govern accounting, usage charges and access priorities.
  - Monitor activities on the OSG infrastructure.
  - Change and extend the configuration of the OSG software stack.
  - Generate reports on activities and usage of OSG infrastructure.
  - Maintain the administrative infrastructure needed to operate the OSG Consortium.
  - Interoperate with other grid infrastructures, including information and accounting systems.

    - Provide an alert notification system for critical OSG services.
    - Provide problem diagnosis and validation tools.
- Support:
    - Turn the middleware provided by the middleware providers into a packaged, dependable and manageable software stack.
    - Port existing and new communities applications to the OSG infrastructure.
    - Help communities to trouble shoot their applications on the OSG infrastructure.
    - Help sites join the OSG.
    - Help sites to trouble shoot the locally deployed OSG software.
    - Trouble shoot the administrative infrastructure.
    - Provide tools to test the scalability and performance of the infrastructure.
- Outreach:
    - Document the infrastructure and services.
    - Publicize the benefits from OSG.
    - Integrate new communities into OSG.
    - Educate and disseminate how to use OSG.

**Beyond the Core**

To meet the goals of OSG activities are needed to provide: targeted operational support for new resources, middleware and communities; extend and improve the capabilities of the infrastructure and services; and to enhance the education and inclusion of new communities.

***Outreach and Education***

Activities that use and rely on the OSG infrastructure and resources to provide a venue and platform for communication of and education in grid technologies and use:

- Train new users and developers, disseminate the knowledge and experience.
- Develop short lived or permanent demonstration environments (exhibits, web portals etc.) to display the infrastructure and its use.
- Sponsor short term positions for training and education of students, teachers and new user communities.
- Participate in University, Laboratory or Facility based education programs, workshops and demonstrations.

***Operations and Support***

Activities that contribute to, extend and improve the core operations and support within OSG:

- Adapt applications of a specific community to enable it to use and benefit from the OSG.
- Support operations for a specific group or service.
- Provide services that benefit operations – e.g trouble shooting, auditing, measurement and analysis of performance metrics.

***Extensions***

Extend the resources, infrastructure, software stack, and administrative services. These activities include the interoperation and transparent use of federated grid infrastructures.

- Adapt specific technologies to contribute to the common middleware and integrate into the OSG software stack.
- Migrate and adapt new and existing facilities to be accessible to and provide resources for OSG.
- Receive the results of R&D efforts and incorporate them into the grid infrastructure and middleware.
- Increase transparency and interoperation of OSG with other grids such as TeraGrid, EGEE, LCG, Campus Grids, etc.

***Improvements***
This includes sponsorship of developments to benefit and improve any aspect of the Open Science Grid. While the current infrastructure provides a usable base, it is clear that the medium and longer term needs of the user communities are not yet met in terms of performance, capabilities, and robustness.

- Performance and Robustness: Improve performance by developing a new technology, interface or algorithm; improve robustness by provisioning more automated, complete and consistent error and fault handling infrastructure; improve efficiency through more sophisticated analysis and presentation of the grid-wide monitoring and information. etc.

- Architecture and Engineering: The OSG blueprint outlines the principles and requirements that guide and drive the design and implementation of the current infrastructure. These need to be refined and extended to engineering principles and architecture for evolution of OSG, as well as for interfacing with standards bodies.

- New Capabilities: OSG is an excellent source of operational experience and feedback in the use of grid technologies. We support and encourage needed improvements. Developments are needed in areas such as (and these are only examples):
  - *Data Services and Management*: transparent, universal, managed data storage and access; data security, assurance and lifetime management infrastructures;
  - *Administrative and Management Infrastructures*: Resource discovery, policy, usage, and accessibility infrastructure; administrative management, accounting, and statistics summary and report toolkits;
  - *User Access and Management*: User interface and grid portals; user application and debugging tools; User application verification and validation tools; Virtual Organization administrative tools in support of dynamic and flexible group structures.
  - *Monitoring and Information Infrastructure:* resource policy definition and enforcement tools and infrastructure; log file analysis and interpretation tools; usage, accounting, and statistics analysis and reporting.
  - *Security*: resource security definition and enforcement tools and infrastructure; resource inventory, auditing, event notification and response infrastructure; robust and complete access revocation infrastructure; provide security audits and reviews of the middleware.
  - *Auditing and Accounting:* services and infrastructure for accuracy and checking of accounting systems.
  - *Exchange of Value*: an infrastructure to support an exchange of value between resource providers and consumers.

## Writing Pre-Proposals for the Open Science Grid

This page gives guidelines for writing pre-proposals to contribute to the Open Science Grid Consortium's needed program of work. Pre-proposals may be up to three pages in length (11-point font or larger). It is expected that the proposers will subsequently submit full proposals to one or more funding sponsors. Questions about the pre-proposals can be submitted to osg-ieb@opensciencegrid.org. The Council will work with the proposers to supply written endorsement and support to accompany the proposals, thus organizing ourselves to present a coherent picture and program of work for any future funding solicitations.

**Sections of the Pre-Proposal:**

***Summary of the Proposal:*** The pre-proposal should contain a summary of the proposed activity not more than one page in length. It should be a self-contained description of the activity that would result if the proposal were to be funded.
The following is text from the NSF Program solicitation guidelines: The summary should be written in the third person and include a statement of objectives and methods to be employed. It must clearly address in separate statements (within the summary): (1) areas where the proposed activity will contribute to the needs of the OSG Consortium; and (2) broader impacts resulting from the proposed activity. It should be informative to other persons working in the same or related fields and, insofar as possible, understandable to a scientifically or technically literate lay reader.

***Description of the Program of Work:*** A clear statement of the work to be undertaken. It should outline the general plan of work in not more than 1 page, including the broad design of activities to be undertaken.

***Broader Collaborations:*** A brief summary of any substantial collaboration included in the activity for which funds will not be requested.

***Synergistic Activities*:** A paragraph that demonstrates the broader impact of the activity.

***Participants*** : A list of persons on the pre-proposal to date in alphabetical order, including their current organizational affiliations.

***Agencies:*** Funding agencies to which the Proposal (post-preproposals) would be submitted:

***Budget:*** A target budget in FTEs and/or $ for each year of support, together with the number of years for which support would be requested.

***References:*** A list of up to 5 pertinent references showing previous work in the area proposed.