Science Gateways Initiative (SGI)

Delivering integrated, community-focused access to Europe's research infrastructure

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The aim of the SGI is to maximize the impact of the EGI by designing and delivering multiple science gateways in partnership with user communities in many different domains in order to bring together appropriate tools and platforms using open standards as a means to achieve interoperability between DCIs and other resources.

To which programme and call the proposal will be submitted:

As part of the Topic INFRA-2010-1.2.1: Distributed computing infrastructure (DCI) there are five related sub-topics. This proposal addresses elements of the last three of these, namely:

- The creation of **SW-component repositories** for subsequent maintenance by EGI (1.2.1.3)
- Easier access to DCIs through **science gateways** and support for workflows combining capacity and capability computing as well as access to data and networks (1.2.1.4)
- The **extension to existing DCIs** to incorporate remote operation of scientific instruments such as those in the **ESFRI roadmap projects** (1.2.1.5)

Project abstract and goals

The Science Gateway Initiative (SGI) will design and build "Science Gateways" specifically tailored to the particular needs of a wide spectrum of science communities. We define a Science Gateway quite simply as an entry point to a domain-specific collection of valuable resources for a particular community. In practice this will encompass rich internet applications, DCI resources, workflows and visualisation tools all of which will be tightly and securely integrated with scientists' own specialist tools. The purpose of a Science Gateway is to enable European scientists to conduct more and better research through an increased take up of DCI resources by reducing the barriers to usage whilst also raising the imagination of potential users.

The SGI will welcome approaches from all areas of research across ERA, however, to maximize efficiency, the Initiative will focus on two particular channels of communication. Firstly, the various Scientific SSCs will act as points of contact for the flow of information to and from users; secondly, the various ESFRI projects will be valuable partners in channelling user requirements. In addition, communities such as those from the Humanities that have up until now been under represented as users of DCIs will be given extra support and encouragement. A Science Director will be appointed to oversee the SGI project from the researcher's perspective ensuring that the scientific goals, quality controls and project vision are all being appropriately addressed and met.

Requirements for Science Gateways will be monitored by the EGI as they are acquired from the other SSCs and the ESFRI projects in order to optimize the overall EGI project ecosystem. Within the

SGI these requirements will be used to continually evolve a model of what an EGI Science Gateway could and should be. The platforms, tools and plug-ins that could be used to implement gateways will be assembled into a virtual toolbox and stored in a project repository. Open Standards will be used where appropriate to achieve interoperability, scalability of development, utilization of data and compute resources, ease of maintenance and uptake of the technical outputs by others. This repository and the collected knowledge will be disseminated to the broader European community and transferred to EGI.eu at the end of this project.

The vast range of specialist knowledge and experience contained within the consortium will be exploited to develop community-focused portals and application suits as required. The resulting gateways will provide access to profound research-enhancing capability in an open architecture that is both flexible and extensible.

Project Goals:

The Science Gateways Initiative (SGI) will focus on the following goals:

1. The SGI will ***reach out*** to the widest possible breadth and depth of communities through working with established large-scale groupings such as the ESFRI projects and the EGI Scientific Specialised Support Centres (SSCs).
2. The SGI will ***seek out*** research communities such as the digital humanities that are new to the DCI environment and adapt the existing technology to meet their requirements.
3. The SGI will ***deliver*** a series of implementations of an evolving Science Gateway model tailored to each community's needs and requirements.
4. The SGI will ***share*** solutions, resources and reengineered components with the wider community by establishing a repository that supports an open development model (i.e. community contributions) that will at the end of the project be taken up by EGI.

Relationship to the UK NGI

As a 'horizontal' Specialised Support Centre the SGI will deliver gateways to the EGI and the Scientific SSCs for hosting in a variety of locations of their choosing. SGI will host development systems internally. However, as this is a UK-led project we pleased to say that Neil Geddes, UK National Grid Service (NGS) Director and David Wallom, UK NGS Technical Director have both indicated that they will be pleased to support this initiative. Stephen Brewer is part of OMII-UK, a three-way partnership between the Universities of Southampton, Edinburgh and Manchester. OMII-UK acts in partnership with the UK NGS to deliver and support applications and middleware components for e-Research.

Project duration (if funded):

SGI will last for 3 years starting from May 2010 until April 2013.

The role of a 'Horizontal' Specialised Support Centre (SSC)

Support role: community engagement, partnerships and shared knowledge

The SGI aims to support as many users as possible by collaborating with established communities and working with them to develop Gateways. A small collection of initial projects have been identified and these will be used to initiate the project and also to ensure that the consortium is up and running as a user-focused going concern from day 1. The communities that will be partnered in

the first instance are: drug discovery, neurological imaging and ancient document analysis. Other communities will follow swiftly afterwards.

The components used to deliver gateways will be collected in a repository (the EGI repository may well be used) or directory as appropriate and an evolving best-practice model will be developed each time the process is repeated. As much information and material as possible will made available though following Open Source/Open Development models of working.

As mentioned previously SGI will have linked communication and information flow channels with both EGI and the other SSCs. Work is already underway to define these.

Sustainability: a learning cycle of user engagement

The SGI will continuously run a cycle of user engagement. This will ensure that lessons are always learned from each pass of the partnership design process and best-proactive is always applied in developing new instances of Science Gateways.

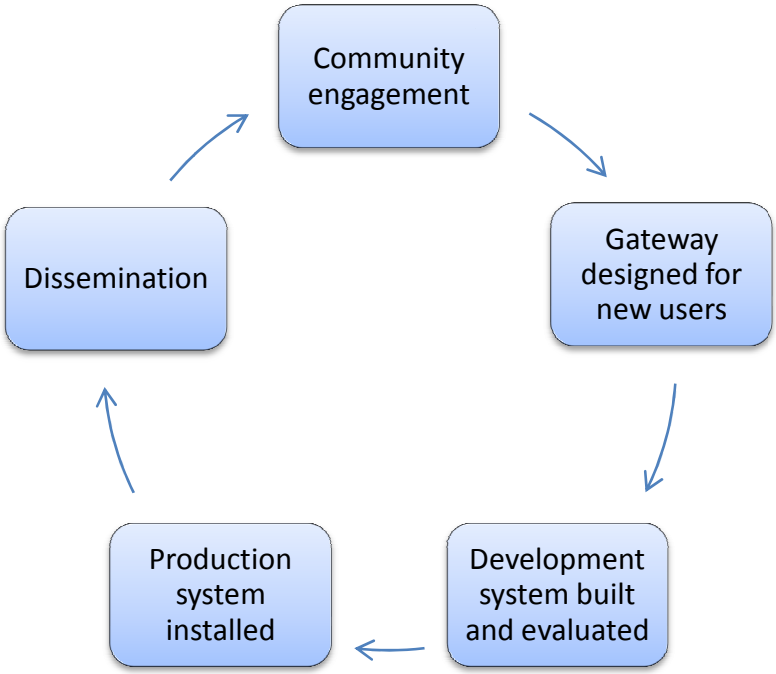

Figure 1- Science gateway user engagement lifecycle

The other key aspect that will contribute to sustainability for both the process and the delivered gateways is that the portals will be delivered in partnership with the communities. This means that each pass of the cycle will generate more knowledge and material that will reduce the amount of input that will be needed for subsequent passes. This follows the heart of the Open Source (OS) model in that by the third year of the project user communities should be able to access SGI resources and easily develop their own gateways to an advanced degree of complexity. It is anticipated that at the end of the project the rich collection of services and resources would be handed over to the EGI for continued hosting. The sustainability model for the SGI itself should further funding be available would also follow the OS model in providing further help and support or other extensions to the service.

Neutrality: research domain, portal platform and middleware independence

The SGI proposal is being coordinated by the University of Southampton, a partner of OMII-UK and former coordinator of the FP6 project OMII-Europe. OMII has a strong reputation in both the UK and across Europe as an independent organization within the context of grid computing having gained knowledge and experience working with many platforms including gLite, UNICORE, ARC, Globus, GridSAM, Genesis II, PBS and Condor. Additionally, The University of Southampton and the consortia as a whole have a strong track record of working with many different research communities in many different subject domains. In the UK the University of Southampton led the very successful ENGAGE Initiative which interacted with and supported many different subject domains. The Universities of Edinburgh and Westminster were both also involved in this JISC-funded project developing portals for the study of ancient documents and protein modelling simulation.

Under the direction of the University of Southampton we will ensure that neutrality both of technology and user communities will be a guiding principle of SGI.

Relationship between SGI and EGI after funding

After funding it is anticipated that the two project directors would expand the draft communication channels, organization plans, work programmes and event schedules to achieve a high degree of coordination with optimal efficiency. The SGI Project Director and Technical Director could easily spend regular spells at the EGI Headquarters each month in addition to other meetings and user-focused events to facilitate the successful alignment of these two projects for the benefit and ultimate success of EGI.

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