

SAFE Project Proposal

Answer to call FP7-INFRASTRUCTURES-2010-2 (Call N° 7)

Topic: INFRA-2010-1.2.3 “Virtual Research Communities”

1 Project name

Title: “SSCs for Astronomy & Astrophysics, Earth Sciences and Fusion”

Short name: “SAFE”

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3 Project Abstract

SAFE (SSCs for Astronomy & Astrophysics, Fusion and Earth Sciences) is a project jointly prepared by three scientific communities, proposing to coordinate the implementation of the “Specialised Support Centre” concept as introduced in the EGI Design Study in their respective community. All three communities actively participated in the EGEE projects and were also represented as Strategic Discipline Clusters: A&A (Astronomy & Astrophysics), ES (Earth Sciences) and F (Fusion). The motivations for proposing a common project are:

1. Their complementary activities covering a wide geo-cultural dimension including Western and Eastern Europe (e.g. Russia): research activities of several partner Institutions and groups overlap the three disciplines.
2. The common approach concerning the utilization of Grid infrastructure, characterized by:
 - a. the need of accessing non conventional resources located outside the Grid like large external data repositories, real-time sensors and scientific instruments;
 - b. equally challenging applications in consequence of the complexity and scale of the investigated phenomena;
 - c. common interest in HPC due to fine-grained parallelism of those.
3. All partners have a medium or long term experience in Grid making SAFE a homogeneous project from this point of view.
4. The demand to create appropriate interfaces linking the SSCs with other e-Infrastructures of their scientific domains, for example the Virtual Observatory for A&A and numerous portals for data for Earth Sciences. This integration will enhance and open the e-Infrastructure of EGI to the existing users of the complementary infrastructures and further enrich the user experience of researchers and scientists.

4 Project Goals

To achieve its goals, SAFE aims at establishing close collaborations with all actors of the Grid-based DCI; EGI.eu, NGIs, all horizontal and vertical SSCs, M/W Consortia and others. Such goals consist of:

- Setting up and putting into operation the SSCs for A&A, ES and Fusion.
- Assisting SSCs (identification of new opportunities for funding channels) in the task of preparing their sustainability plans to ensure their stable financial support beyond the end of the SAFE project.

The goals mentioned above will be achieved through several actions:

1. Scientific, technical and administrative management and coordination of the whole project to ensure that activities of each SSC proceed according to the established work plan.
2. Constant collaboration with EGI.eu and with NGIs for a wider and capillary diffusion of the Grid-based DCI in Europe; this requires a close coordination for what concerns:
 - a. Access and utilizations of Grid resources;
 - b. Middleware components, tools and services;
 - c. Negotiation of common policies, protocols and standards;
 - d. Negotiation of technical, political and financial support;
 - e. Representation of SSCs of SAFE in technical and governance bodies of EGI.eu and of NGIs.
3. Handling of key aspects like: the quality management to ensure that deliverables of the project are of good quality and able to maximize their impact at scientific, industrial, commercial and social level; the knowledge management dealing with aspects like the intellectual property protection and exploitation, the protection of knowledge and access rights.

4. Coordination of all activities related to training and dissemination for an internal (within the SAFE project) expansion and consolidation of the know-how and expertise about the Grid and of its exploitation for scientific, industrial, commercial and technical purposes and an adequate dissemination of achieved results externally to the project.

Each SSC aims in turn at:

- Giving support to discipline communities represented in the first instance by ESFRI, IT and scientific projects in their effort of effectively access and use the Grid-based DCI operated by EGI.eu and by NGIs. At the same time SSCs will not neglect small projects and research groups willing to test the Grid for their research goals. This is essential to achieve a wide utilization of the Grid infrastructure.
- Ensuring their own long term financial support by preparing a sustainability plan with the assistance of the project management and involving EGI.eu, supporting NGIs, SSC stakeholders (public and private) and any other funding opportunities at European, national and regional/local level.

Support to end-users (both skilled users and Grid beginners) encompasses: a) Application Porting; b) Training and dissemination (in collaboration with the project management and related EGI projects); c) Missing M/W components, tools and services; d) Scientific Gateways development (if necessary), deployment, maintenance and exploitation.

5 Project partners

SAFE SSCs currently try to accommodate two contrasting needs: 1) keep the number of core partners limited to avoid the dispersion of initial funds and create executive technical teams able to effectively and quickly put into operation tools and services according to the project work plan; 2) be as much inclusive as possible to quickly increase the number of partners; inclusion mechanisms will be planned and implemented to allow new partners to join the SSCs (see section 8).

To this end, different partner profiles are planned for SAFE and each profile implies a different level of involvement. Partner profiles are: Core partners (Level 0), Contributors (Level 1), End-Users (Level 2).

Core partners (Level 0) directly undertake all necessary activities with the SAFE WPs to set up the SSCs and play a direct role in the SSC governance and in the WPs leadership. They are funded through the initial pot of money allocated by the EC in case of success of the SAFE proposals.

Contributors (Level 1) participate to the WP activities but at a lower level of involvement and without coordination role in the various WPs. Contributors are expected to bring their expertise in the following areas: a) porting of applications in Grid; b) definition and deployment of tools and services; c) design and implementation of scientific gateways; d) integration with HPC; e) integration with other virtual communities; f) integration with other technologies of relevance for SAFE communities. They also contribute to the project as resource providers. It is planned to allocate financial resources to Level 1 partners at a later stage through funding channels identified in the sustainability plan of each SSC.

End Users (Level 2) do not directly contribute to the SAFE WPs. They mainly make use of resources of the SSC and provide use-cases, best practices, documents and other material that could be helpful to improve the effectiveness of the dissemination plan.

Below all the partners that are interested in participating or in being connected to the SAFE project proposal are listed.

6 Estimated project start date and duration if funded

Estimated Start Date: 1st May 2010.

Duration: 36 Months (the project could be extended of one additional year for a total duration of 48 Months to come abreast of EGI-Inspire Project).

7 Relevance to the EGI project in terms of contributing or use of the infrastructure

SAFE gathers three virtual Grid scientific communities that have acquired a lot of expertise with the Grid mainly thanks to EGEE projects where disciplinary clusters for them have been activated far-back. The three communities, that are now considered HUCs, have partners all over Europe, so the number of potential users that can benefit of the support provided by the three SSCs is high. Several ESFRI projects in each disciplinary domains are connected to SAFE; SSCs moreover have to plan their long term sustainability and in doing that contacts will be established with identified stakeholders that represent a class of skilled users able to bring advanced use cases that in turn stimulate technological advances of the DCI.

End-users of the project do not only contribute to enhance the use of the infrastructure numerically; being most of them expert users, they require and use advanced functionalities of it; their applications typically need specific tools, services and access to non-conventional resources whose deployment will be matter of negotiation with EGI.eu and NGIs. The project considers the effective dissemination of its delivered products as a qualifying activity of its work plan and special attention will be paid to make the whole EGI community beneficiary of the achieved results.

8 European-wide existence and Governance Model

SAFE consists of multi-disciplinary research institutes, organisations and private companies in A&A, ES and Fusion scientific domains, and in Informatics. In particular since 2000 ESA has played an important role in the work on Grid in ES and then in A&A. A support and close collaboration in several projects have taken place. Many partners are also involved in European and international projects in their field. The long list of partners interested in participating or in being connected to SAFE is the result of the penetration of Grid usage via European and international projects (EGEE, CYCLOPS, DataGrid, DEGREE, EELA, EELA2, INT.eu.Grid, BEinGrid, SEEGrid, CEOS/Grid, EDGES) and regional Grid initiatives (COMETA, CYBERSAR, SCOPE) in southern regions of Italy. Several partners are also involved in European unions such as the IAU (International Astronomical Union), EGU (European Geosciences Union) and so forth. They are also involved in organisations for standardization devoted to data format representation and exchange, software, etc. such as OGC, e-IRG and FITS.

Virtual Research Communities have been set up in recent years driven by the development of an European e-Science Infrastructure. The needs of such Virtual Communities are not all the same, then SAFE will propose different degrees of interaction, ranging from information exchange to collaboration on specific topics via consultancy. At a first stage many of the Virtual Communities have to face the deluge of data, in general geographically distributed in data centers, and to provide to their end-users tools to access, discover and download them. The International Virtual Observatory (VObs) devoted to A&A and the GENESI-DR for Earth Observation data are some examples among many others in A&A and ES. The further stage consists in distributing and processing data at a larger scale. The IT climate project, IS-ENES, will collaborate with SAFE for such aspects and a working plan has been defined. VADMC, IT project, that concerns all three scientific domains for atomic and molecular data, has expressed its interest to collaborate on the data distribution. Other large virtual communities have already expressed their interest for SAFE such as EUFORIA for Fusion; in other cases the interest and degree of interaction with SAFE is currently under discussion. Several ESFRI projects have been contacted like CTA (Cerenkov Telescope Array), SKA (Square Kilometer Array), E-ELT (European Extremely Large Telescope), EISCAT-3D, EPOS (European Plate Observing System), ICOS (Integrated Carbon Observation System). Several scientific projects as well will be connected with SAFE. SSCs in SAFE are in the process of establishing partnership agreements with some of them. MoUs will be prepared to specify terms and conditions of such partnerships. It is expected therefore a significant mutual scientific and technological transfer, extremely important for the advances of the European research. Other IT and ESFRI projects, organizations, as well as scientific and technical projects have been or will be contacted.

A mechanism has to be implemented for new virtual scientific communities in the different fields to enter or leave the SSC. A clear formalization of these mechanisms has been discussed but they are not in place yet. Such mechanisms anyway shall encompass five fundamental aspects:

1. an efficient dissemination activity to widely publicize results got within the project;
2. the definition of formal administrative steps allowing new communities to quickly join the SSC community;
3. the definition of intellectual property rights;
4. effective training services so that new users get the necessary skill with the Grid in a short time;
5. Collaboration pattern with partners leaving the SSC

Important considerations concerning the partnership of SAFE together with the full list of current partners is reported in section 5.

9 Engagement with EGI

If approved and funded, SAFE plans to agree and co-sign with EGI a MoU in which the most important points of the reciprocal collaboration will be addressed. The most important are: 1) the definition of representatives of the project within the governance and technical bodies of EGI and, similarly, an adequate number of EGI representatives in the bodies governing SAFE; 2) the definition of procedures to negotiate: a) common policies, protocols and standards; b) reciprocal exploitation of resources; c) deployment and exploitation of M/W components and Grid-related tools and services; d) sharing of services like training and dissemination events; d) a constant bidirectional flow of information for the reciprocal awareness of the technological advances with the Grid.

SAFE expects to get great advantage by the deliverables of EGI. SAFE, similarly, can bring an important contribution to the technological advances of the DCI, given that its applications are extremely demanding in terms of resources, tools and services.

EGI and SAFE can naturally proceed in a synergic way toward the common objective of a technologically advanced DCI able to offer to the end users community a rich choice of tools and services and ultimately this attract new partners that are fundamental to ensure the sustainability of the infrastructure on a long-term scale.