EGI-InSPIRE

SCIENCE GATEWAY PRIMER
VIRTUAL TEAM PROJECT FINAL REPORT

https://wiki.egi.eu/wiki/VT_Science_Gateway_Primer

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Abstract

This report is the final report of the 'Science Gateway Primer' Virtual Team (SGP-VT) project. The project ran between May 2012 and December 2012 by the EGI-InSPIRE project with the main aim to create a comprehensive document, a 'Science Gateway Primer', that would support portal developers within the European Grid Infrastructure (EGI) collaboration. The Primer collects information about technologies, policies, and solutions concerning EGI web based science gateways, i.e. about community-specific set of tools, applications, and data collections that are integrated together via a web portal, providing access to resources and services from EGI. During the preparation of the Primer the VT project also reviewed the content and services that the EGI Applications Database provides for science gateway users and developers. This report describes the work that was carried out by the representatives of 15 nations who were involved in the project, reports about achievements of the activities, and provides a set of recommendations for EGI that have to be dealt with outside of the Virtual Team project.



I. COPYRIGHT NOTICE

II. DOCUMENT LOG

Version	Date	Comment	Author/Partner
0.1	21/12/2012	First draft	Robert Lovas/MTA SZTAKI, Nuno Ferreira/EGI.eu
0.2	02/01/2013	Second draft (final candidate)	Robert Lovas/MTA SZTAKI
0.3	16/01/2013	Third draft based on comments from Gergely Sipos, Richard Mclennan, and Nuno L. Ferreira	Robert Lovas/MTA SZTAKI
0.4	18/01/2013		Nuno Ferreira/EGI.eu
0.5	23/01/2013	Review of text and update of various sections	Gergely Sipos/EGI.eu
0.6	25/02/2013	Final version …	Robert Lovas/MTA SZTAKI
0.7	06/03/2013	… with minor corrections.	Nuno Ferreira/EGI.eu

III. ACKNOWLEDGMENT

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- EGI-InSPIRE: A project in the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 283481.
- SCI-BUS: A project in the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 261585.
- COMMIT e-Biobanking: A project funded in the knowledge infrastructure ('Besluit Subsidies Investeringen Kennisinfrastructuur' (BSIK) scheme by the Netherlands Bioinformatic Centre (NBIC).

IV. APPLICATION AREA

This document is a public report produced by the VT of the 'Science Gateway Primer' EGI Virtual Team project, run under the EGI-InSPIRE NA2 virtual team framework. Further

information about the framework and about its projects is available at https://wiki.egi.eu/wiki/Virtual_team.

V. TERMINOLOGY

A complete project glossary is provided at the following page: http://www.egi.eu/about/glossary/.

TABLE OF CONTENTS

1 INTRODUCTION

As the digital research landscape broadens, so more research communities are seeking to establish community or science domain specific environments for data sharing and analysis scenarios enabled by the European Grid Infrastructure (EGI). These environments, the so called Virtual Research Environments (VREs) use a mix of EGI, third party academic and commercial resources to support multi-national communities on a sustainable and long term basis. Science gateways are key enablers of VREs: they integrate and provide a coherent view of the various software tools and services that researchers need for custom analysis workflows. Authentication frameworks, visualization tools, monitors, databases, workflow systems, job execution pilots are few examples from the rich set of services that science gateways glue together and make easily consumable through a Web portal or a desktop application.

Over the last decade the members of the European Grid Infrastructure collaboration accumulated rich knowledge on developing, deploying, operating and monitoring science gateways. EGI members provide nearly 30 science gateways for various scientific groups in Europe and beyond. Many of these gateways are built from 'off the shelf' frameworks or components that exist as reusable products to those who wish to build new gateways for their own specific needs. EGI.eu has a dedicated section on the EGI web site on this topic[1].

However, identifying the right set of technologies, collecting and applying best practices and solutions to have a customized EGI science gateway, can be still a difficult task for some. Responding to this need EGI-InSPIRE started a new Virtual Team project, titled ’Science Gateway Primer’, in May 2012. The project was led by Robert Lovas (NGI_HU NGI International Liaison, MTA SZTAKI) and had three main goals:

1. Gather and provide up to date and complete information about EGI science gateways and science gateway enabling technologies in the EGI Applications Database.
2. Provide recommendations to EGI-InSPIRE on how to improve the EGI Applications Database (AppDB) and the EGI website to better support science gateway developers and users.
3. Write a comprehensive document, an 'EGI gateway primer’, which collects information about technologies, policies, solutions and best practices that exist within the EGI community for gateway developers.

Concerning the first goal the project listed and gathered detailed information about science gateways and science gateway enabling technologies and compared them in the Primer document, which can form the basis for the update of EGI Applications Database (together with the recommendations addressed in the second goal).

The project collected and submitted a set of recommendations concerning the further development of AppDB to better support EGI Science Gateway developers and users. in the recommendations have been discussed within the EGI.eu User Community Support Team and the AppDB developer team (IASA, Greece), and a timeline for the implementation of the requested features have been produced.

[1] http://go.egi.eu/sciencegateways

Most of the VT projects' effort was spent on the writing of the EGI Science Gateway Primer document. The project managed to compile a comprehensive document, and get it reviewed by the EGI community. Most of the review feedbacks ask for changes that cannot be done inside the VT and require a final editing phase to be done by the EGI.eu User Community Support Team (UCST). The VT therefore handed over the primer document together with the received review feedbacks to UCST[2]. After the primer is updated according to the reviews, it can be promoted within and beyond EGI.

This report provides details of the achievements of the VT project.

[2] A public version is available at https://documents.egi.eu/document/1463, whereas an internal version to EGI.eu UCST is available at https://documents.egi.eu/document/1561 with all comments provided both by VT and non-VT members recorded for later processing.

2 AIMS

The main aims of the project were to provide the following outputs:

1. Provide up to date and complete information in the EGI Application Database about EGI science gateways and science gateway enabling technologies
2. Provide recommendations on how to improve the data structure of the EGI Application Database and the EGI website to better support science gateway developers
3. Produce a comprehensive document, an 'EGI gateway primer', which collects information about technologies, policies, solutions and best practices that exist within the EGI community for gateway developers.

In order to reach the above mentioned goals, the following tasks have been defined during the start-up phase:

1. Check, and if needed sanitise the information that is presented about science gateways and science gateway enabling technologies on the EGI website and in the EGI Applications Database
2. Make recommendations for data structure updates in the EGI Applications Database in order to better support science gateway users and developers
3. Define the structure (Table of content) of the EGI gateway primer
4. Collect and integrate contributions in the EGI gateway primer
5. Promote the EGI gateway primer mostly for review to existing and to new EGI communities and gather feedback about the document but it provided also visibility and raised the awareness concerning the on-going work.

3 ACTIVITY/METHOD

After EGI.eu announcement of a call for participation in a virtual team (VT) subordinated to the theme Science Gateways, the VT was able to gain significant attention in the EGI and some related communities as well; 36 members[3] from 15 countries had assembled rapidly by the end of 2nd month (see Q9 progress report of the EGI-InSPIRE project). Therefore, the VT rapidly reached the 'critical mass', it actually became the largest VT in the EGI-Inspire project.

At the beginning the communication infrastructure and tools were configured and/or set up including on-line conference tool (see Section 3.1), email list, Wiki site, etc. for the VT members. The details are available on the VT's dedicated wiki site[4].

As the second step the VT leader was nominated, selected and replaced (Agnes Szeberenyi to Robert Lovas), the tasks with their schedules have been defined, and the volunteer tasks leaders have been assigned to each of the tasks mentioned in section 2. Some related efforts in other projects were also checked like XSEDE[5], and the first version of the Table of Contents (ToC) have been created, discussed, and updated based on the comments and contributions from the active VT members.

The intermediate status and ideas were shared with the wider community at the EGI Technical Forum 2012[6], see details in Section 3.2.

The recommendations concerning the AppDB have been gathered, discussed and dispatched to the responsible team in EGI.eu using the wiki pages and the RT system in order to provide maximum visibility and transparency.

Despite the progress in the defined tasks, the project requested and received extension until the end of 2012. The first public version (v0.5) of the Primer document was released for external review on the 22th November 2012, after several rounds of internal review inside the VT.

3.1 Regular WEBEX meetings

The VT members held meetings regularly in order to exchange ideas, check the progress, discuss the plans, etc. More information available on the wiki site under 'Meetings' section together with the meeting minutes[7].

The VT leader (or its representative) chaired 14 Webex meetings with usually 5-7 representatives of active members over the 8 month period.

[3] See Appendix section.
[4] https://wiki.egi.eu/wiki/VT_Science_Gateway_Primer
[5] https://www.xsede.org/gateways-overview
[6] https://indico.egi.eu/indico/sessionDisplay.py?sessionId=48&tab=time_table&confId=1019#20120920
[7] https://wiki.egi.eu/wiki/VT_Science_Gateway_Primer/meetings

3.2 EGI Technical Forum 2012

The Science Gateway event held at the EGI Technical Forum 2012 gave an opportunity to meet face to face the virtual members that constitute the Science Gateway Primer Virtual Team. The event was organized by EGI.eu in collaboration with SGP-VT members. The participants (more than 40) were partly delegated from the VT members' institutes, and partly from other institutes and communities. The double-session provided not only updates to the community about the activities, e.g. way how to facilitate the adoption of EGI gateways and gateway technologies within the European Research Area, as well as active discussions with valuable feedbacks involving XSEDE representative from USA and experts from other fields.

The contributions and questions of this double-session focused on various technical aspects of science gateway enabling technologies and of gateway development. Here bellow a brief summary of the presentations.

Robert Lovas (NGI_HU NIL, MTA SZTAKI), the SGP-VT leader, did the honors by setting up the stage to the audience. The scope of the virtual team was profiled such that both presenters and attendees would be in sync with the goal of this event. Current status and future outcomes were highlighted.

Nuno Ferreira (EGI.eu UCST) provided an overview about current support services EGI.eu has in place to support the work being done by SGP-VT. A dedicated web page, Applications Database, a requirements tracker, a training marketplace, a common glossary, policies, and social media, were the pack of services mentioned.

Zoltan Farkas (MTA SZTAKI) put together a set of relevant info about the generic science gateway framework based on the WS-PGRADE/gUSE technology. Robustness, sustainability, functionality, adaptability and open source collaboration, are some of the key features that characterize this technology.

Dusan Vudragovic (NGI_RS NIL deputy, IPB) provided a generic picture how gateways could be integrated into the monitoring tools EGI is using at the e-infrastructure operations level. Science Gateways operation and performance should be monitored in order to ensure quality of service for end-users.

Roberto Barbera (INFN-Catania) elucidated how Identity Federation authentication could/should be part of gateways. Social science gateways and how we should move towards enabling mobile access to the e-infrastructure were emphasized, yet keeping the required access security to the resources. The adoption of standards has an investment towards sustainability and interoperability/re-usability were also abridged.

Ricardo Graciani (University of Barcelona, DIRAC) kicked off the second session of the Science Gateways event. Portals can hide relevant data about user activity, not reported to EGI central accounting system. Some ideas how gateways could be better accounted were brainstormed. A possible accounting common schema adopted by all gateway developers is on the table.

Mark Santcroos (Academic Medical Center Amsterdam) presentation focused on how data management inside gateways is a non-trivial subject. Several use cases were the base of the talk, showing how different are the data requirements amongst the communities. Exploring available technologies for data handling while feeding the community requirements into the loop, will foster the development of a generic layer (if possible) as well as of application specific portlets.

Alessandro Constantini (INFN/IGI, Bologna) addressed the topic about how commercial software can be handled. ANSYS was ported to the grid and made available through a gateway. License restrictions were implemented using VOMS user roles, a simple but effective solution. Plans to offer this software as a service is in the agenda, after a solid platform is in place.

Wibke Sudholt (CloudBroker GmbH) enthusiastically touched crucial topics EGI.eu is pursuing. Cloud computing is not only a technology; it is also a business model. Science Gateways sustainability was emphasized, and a bold idea was launched. There's a strong buzz around the three fundamental models cloud computing providers offer: SaaS, PaaS and IaaS. What about GaaS, Gateways as a Service?

4 RESULTS & ANALYSIS

The progress per defined SGP-VT task is shown below.

1. Check, and if needed sanitize the information that is presented about science gateways and science gateway enabling technologies on the EGI website from the EGI Applications Database.
   - **Status:** external dependency on task 2
   - **Comments:**
     - This task depends on the recommendations done by the VT members towards AppDB (see Task 2 below).
     - All gateway contacts will be informed if there is the need of, once the AppDB recommendations are implemented in AppDB.

2. Make recommendations for data structure updates in the EGI Applications Database in order to better support science gateway users and developers
   - **Status:** Done
   - **Comments:**
     - Six recommendations were recorded and fed as requirements to AppDB developers[8]
     - AppDB development team and EGI.eu UCST reviewed the recommendations and their possible implementation on the 14th Jan. 2013.

3. Define the structure (Table of contents) of the EGI gateway primer
   - **Status:** Done
   - **Comments:**
     - The Primer ToC had several rounds of editions. The structure was frozen on the 25th Oct. 2012[9]
     - Current Primer ToC might be different due to re-shuffling of topics or to lack of contribution to some of the initially proposed topics

4. Collect and integrate contributions in the EGI gateway primer
   - **Status:** compiled (it was the main reason for requesting extension)

[8] https://wiki.egi.eu/wiki/VT_Science_Gateway_Primer/appdb
[9] https://docs.google.com/document/d/16P6wNUqo9T2FgI1tIgPxqmWFNjEPyKXEGA_bkQeI1L0

- **Comments:**
    - Primer is stored in EGI.eu DocDB[10]
    - Final document – version 0.9.2
    - Comments both from VT/non VT members are not publicly shared[11]
    - Final Primer to be handed over to EGI.eu UCST

5. Promote the EGI gateway primer to existing and to new EGI communities

- **Status:** Done
- **Comments:**
    - The 1st draft public version (v0.5) was released for external review on the 22th Nov. 2012
    - Dissemination channels for v0.5:

EGI.eu

- ✓ AppDB relevant profiles (Science Gateway software entry contacts)
- ✓ Blog titled 'Science Gateway Primer'[12]
- ✓ UCST Twitter account[13]
- ✓ Science Gateway discussion forum[14]
- ✓ Mailing lists, namely UCB and Portal Community

SCI-BUS project dissemination channels

- External review comments have been discussed and incorporated into the Primer if relevant and accepted by the chapter leaders
- Final public version to be released and disseminated in 2013 by EGI.eu UCST

[10] https://documents.egi.eu/document/1463
[11] https://documents.egi.eu/document/1561
[12] http://www.egi.eu/blog/2012/11/30/science_gateway_primer.html
[13] https://twitter.com/EGIUsers/status/274299084360265728
[14] https://forum.egi.eu/viewtopic.php?f=21&t=18&sid=d03c1020fb2983b44bff6e4161730844

5 CONCLUSION

The Virtual Team project focused on different aspects of what is needed to efficiently develop science gateways on the EGI production grid infrastructure. Most of the related topics have been described in the latest version of the Primer document and the AppDB related recommendations have been submitted and discussed with EGI.eu UCST, but there are still open actions that need to be followed up after the lifetime of Virtual Team. These actions have been described in the report and are summarized below.

Action 1

AppDB and EGI.eu reviewed the recommendations and their implementations in January 2013 (related to Task 2). Half of the recommendations were accepted, the other recommendations are in one of these states: implemented, in progress, or in standby[15].

Once the AppDB recommendations are implemented (related to task 1), all AppDB gateway contacts will be informed if there is the need for them to update their AppDB gateway software entry profiles. This action will be performed by EGI.eu UCST.

Action 2

The VT gave the opportunity to all the stakeholders to contribute to the Primer document, but due to the partial inactivity in the VT, the latest version of the Primer reflects (obviously) only the authors' view -- mostly from the SCI-BUS related communities, the only large-scale FP7 project, which is fully science gateway oriented in the EGI ecosystem. EGI.eu UCST is to be responsible for re-editing the primer (e.g. make it more compact and aligned with EGI platform architecture) after handing it over from the VT, and will produce a new version to deal with the remaining comments of the internal and external reviewers (internal: VT member; external: non-VT member).

Then, the final public version to be released and disseminated in 2013 (related to task 5).

As a summary; EGI.eu UCST accepted the Primer document as a valuable contribution from the authors of the VT, and after the end of VT' timeframe EGI.eu will be responsible for broadening the Primer's scope wider involving more stakeholders from the EGI communities.

[15] https://wiki.egi.eu/wiki/VT_Science_Gateway_Primer/appdb#Status

6 APPENDIX

The VT members have different roles under the scope of this project:

- **Active** members are the ones which committed effort to the Primer
- **Observer** members want to be kept updated about the achievements of the VT

All members can participate in the online conferences. For managerial purposes these roles are highlighted bellow.

APPENDIX A – Active members of the "Science Gateway Primer" VT

Member	Affiliation	Country	Comment
Robert Lovas	MTA SZTAKI, NGI_HU	Hungary	VT leader, NIL
Nuno Ferreira	EGI.eu – UCST	Netherlands	EGI.eu buddy
Peter Kacsuk	MTA SZTAKI, SCI-BUS project coordinator	Hungary	
Tibor Gottdank	MTA SZTAKI	Hungary	
Roberto Barbera	INFN, University of Catania	Italy	
Shayan Shahand	AMC, LSGC VRC, COMMIT Project	Netherlands	
Silvia D. Olabarriaga	AMC, LSGC VRC, SCI-BUS Project, COMMIT Project	Netherlands	
Antun Balaz	IPB, NGI_RS	Serbia	NIL
Dusan Vudragovic	IPB, NGI_RS	Serbia	NIL deputy
Elisa Cauhé Martín	University of Zaragoza, BIFI, SCI-BUS	Spain	
Ricardo G. Diaz	University of Barcelona, DIRAC	Spain	
Wibke Sudholt	CloudBroker GmbH	Switzerland	
Hsin-Yen Chen	ASGC	Taiwan	
Petar Jovanovic	IPB, NGI_RS	Serbia	

APPENDIX B – Observers of "Science Gateway Primer" VT

Member	Affiliation	Country	Comment
Hrachya Astsatryan	IIAP NAS RA, NGI_AM	Armenia	NIL
Tristan Glatard	CNRS, LSGC VRC	France	
Kalliopi Giannakopoulou	CTI	Greece	
Gkamas Vasileios	CTI	Greece	
Kitti Varga	MTA SZTAKI	Hungary	
David O'Callaghan	NGI_IE	Ireland	NIL
Diego Scardaci	INFN	Italy	
Giuseppe La Rocca	INFN	Italy	
Riccardo Bruno	Consorzio COMETA	Italy	
Riccardo Rotondo	INFN, University of Catania	Italy	
Valeria Ardizzone	INFN	Italy	
Gergely Sipos	EGI.eu - UCST	Netherlands	
Karolis Eigelis	EGI.eu - UCST	Netherlands	
Mariusz Sterzel	ACC Cyfronet, NGI_PL	Poland	NIL
Muhammad F. Sjaugi	SCI-BUS subcontractor	Malaysia	
Rubén Vallés Pérez	University of Zaragoza, BIFI, SCI-BUS dissemination WP leader	Spain	
Sergio Maffioletti	UZH, NGI_CH	Switzerland	NIL
Eric Yen	ASGC	Taiwan	
Vicky Huang	ASGC	Taiwan	
Stephen Winter	University of Westminster, SCI-BUS	United Kingdom	
Tamas Kiss	University of Westminster, SCI-BUS User Support WP leader	United Kingdom	
Yuri Gordienko	SCI-BUS subcontractor	Ukraine	