

# EUROPEAN GRID INFRASTRUCTURE

EGI SOLUTIONS



- COMMUNITY DRIVEN -  
**INNOVATION & SUPPORT**



[WWW.EGI.EU](http://WWW.EGI.EU)



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## Introduction

The Community-Driven Innovation & Support solution is aimed at helping the individual researchers and the research teams that have problems in accessing and using computational services for their research activity. A considerable number of European researchers may experience the complexity of a computational infrastructure as a barrier for benefiting from this powerful tool in their research. This may result in a depletion of their normally scarce resources, or worse in a rejection of the facilities on offer. With this solution they are helped to bridge the knowledge gap in accessing the services so they can focus on their core research activity, resulting in a more efficient use of their research budgets.

The solution is built on a combination of services already provided by the EGI.eu organisation, such as Project and Programme Management, Technical Consultancy and Support, but also using the resources located in the federation that comprises the European Grid Infrastructure.

The solution provides multiple entrance points for help requests, which enhances the possibility of a higher number of potential users being attended to. The requests are channelled to a single point of processing, the Distributed Competence Centre (DCC) with proven expertise in helping users and a network of experts, and experienced users located across the whole EGI Community. The DCC receives, processes and provides a solution to the problem that is based on previously existing methods or a brand new, innovative solution. This practice not only ensures a very high effectiveness in solving problems, but also the generation of innovation by the community with benefits for the whole community.

This solution is one of the ways in which EGI attends to the needs of the different actors that are a part of its community through the EGI.eu services portfolio.

# 1. Target Groups and Specific Challenges

## 1.1. Target Groups

The Community-driven Innovation and Support solution is aimed at individual researchers, or national and international research collaborations that want to run their data- and computing-intensive experiments but find obstacles or difficulties in accessing and running computing facilities. Researchers are specialist in their own scientific domain, but should not need to be computing experts to use available computing resources.

These problems have been identified as being particularly acute among a considerable number of European researchers, the so-called long-tail, that are not organised in large Research Collaborations or in fields of science that are traditionally connected with computational processes.

Typically, the research collaborations have a relatively small size and would be on average in the bracket of 10 to 15 members, but they can be substantially larger. These communities might be already using EGI computing facilities and services or they might be completely new users.

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## 1.2. Specific Challenges

The specific challenges that the target group experiment can be described as follows:

- **Technical Requirements:** Researchers are unaware of both the technical and administrative requirements for accessing the EGI computing facilities (certificates, permissions, contracts, etc.). This might even be the first time they try to access a computing infrastructure. Even if those requirements are not particularly difficult to solve, they may constitute a major stumbling block for many researchers.
- **Data Management:** They lack specific knowledge in data management and curation, which results for example in problems for feeding their datasets into the system and running them in a way that supports their research.
- **Resource Management:** They need to be extremely effective in their use of their resources regardless whether they are material (budget, infrastructure capacity, etc.), or immaterial (highly skilled workforce, time, etc.). They need to focus on their own speciality and work and not on understanding the requirements of using computational capacity tools. This issue can be described as need for high effectiveness and efficiency.
- **Changes in Methodology:** At a previous step in the scientific work, researchers may need support to organise their research methodology into one that is data- and computational intensive. This shift in science-making to a new paradigm can be considered a major challenge.

The consequences of these problems are that they refrain from using the EGI facilities and expertise, or experience a loss of efficiency when using them. With proper support the research-users could benefit from limiting the effort needed to access the grid, and doing it seamlessly.

## 2. EGI Solution

### 2.1 .Objectives

EGI offers the Community-driven Innovation and Support solution for potential and existing users to:

- Facilitate access to EGI technical resources by informing them of the administrative and technical requirements,
- Enable data- and computation-intensive research, by providing consulting support to structure research datasets, enabling an user-friendly interface or application,
- Increase the efficiency and effectiveness of the research process,
- Innovate the research approach and methodology, by providing expertise about the digital research procedures from computation experts and like-minded researchers already aware of the new high performance computation research paradigm.
- The ultimate purpose is to create an environment where scientists, regardless of their discipline, can make the most of the European Grid Infrastructure for their research without having to become experts in the infrastructure itself.

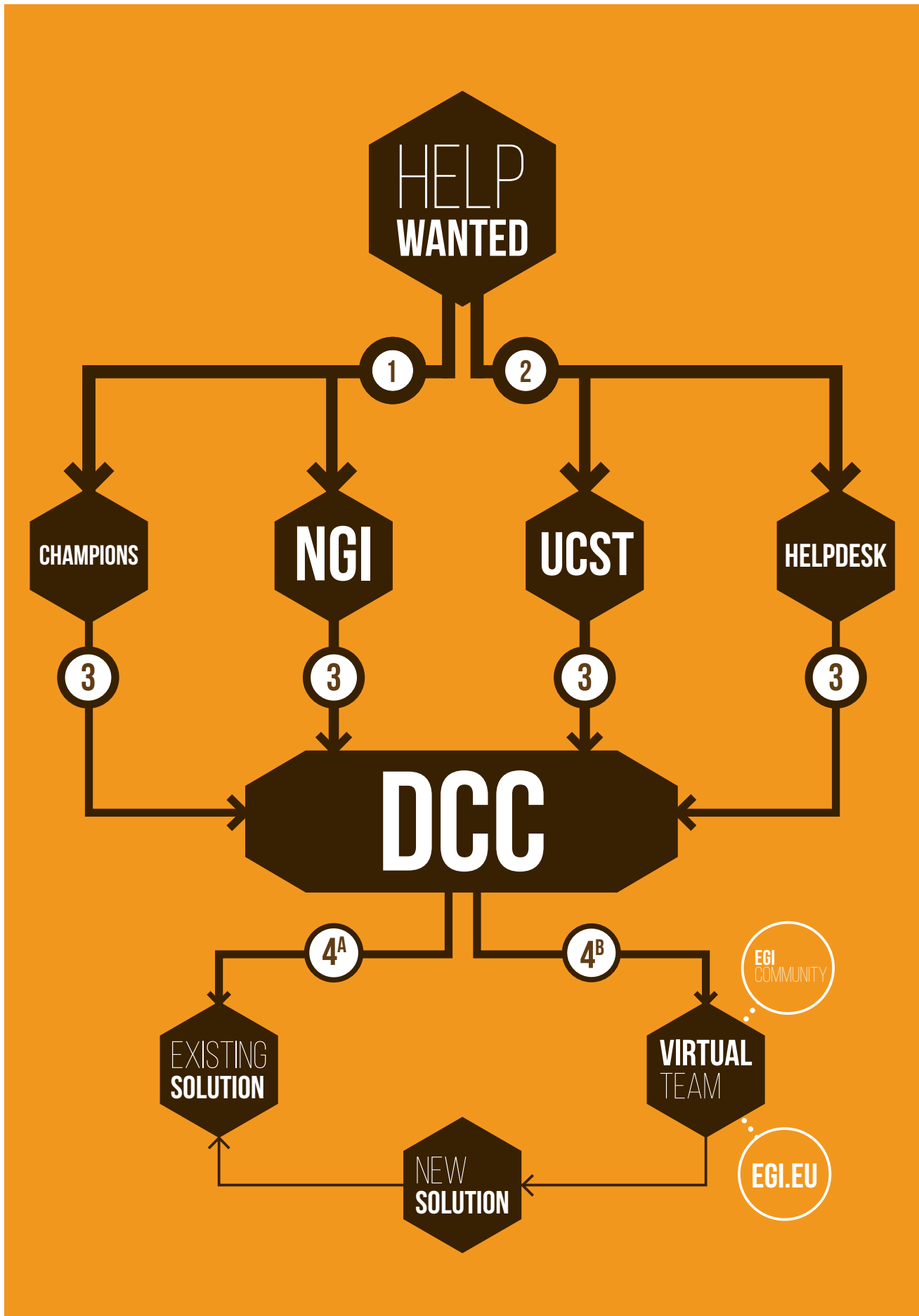


Figure 1 - Accessing the Solution, the DCC process

## 2.2 .Accessing the Solution

The basic principle behind the solution is that the researchers do not need to know who to contact to access it. The process through which the researchers use the solution is as follows (see Figure 1):

1. Contact between the EGI community and the potential user is initiated. This can be either through the user making the contact on their own, or by the user being contacted by EGI.eu Outreach service, the NGIs (NILs), or by one of the officers within the Outreach programmes (i.e. a Champion).
2. If the research-user takes the initiative of contact, they can contact a dedicated user support person/team that the country member of the EGI federation of resource providers has put at their disposal<sup>1</sup>. The research users can also contact EGI.eu directly through the [support@egi.eu](mailto:support@egi.eu) e-mail address.
3. The request is referred to the Distributed Competence Centre (DCC<sup>2</sup>), which becomes the single and main point of action and the decision maker for the next steps. The DCC will either accept or defer the request to the most appropriate channel for providing a solution. The request reception process is built in such a way that no request remains unanswered.
- 4<sup>a</sup>. If the identified problem can be solved with existing tools, it is assigned to the relevant person or team who become responsible for assisting the researchers. This can be considered as a typical case.
- 4<sup>b</sup>. If the nature of the case requires a new solution or an innovative approach, a virtual team (VT) is created around the project. Once this has been tested and implemented it becomes a part of the existing solution portfolio.



The virtual team concept allows the creation of short term task forces to solve particular problems. The average duration of these projects is in the bracket of three to six months, and the typical tasks are:

- Develop a data and compute model and make use of the EGI solutions.
- Identify the technologies needed to address the user requirements.
- Integrate application-level services with the EGI ones.

### 3. Building the Solution

The solution is enabled by combining and delivering services that already exist and are provided by EGI.eu in collaboration with the National Grid Initiatives (NGIs). The full catalogue can be found on the EGI.eu website<sup>3</sup>.

Although other services or new approaches can be created, the Community-driven Innovation and Support solution mainly integrates the following services:

- Project and Programme Management provides the necessary processes and management tools for coordinating the service provision and ensuring that requests are tracked, appropriate resources are assigned and solutions are delivered.
- Technical Consultancy and Support helps user communities to understand how they can engage and make the most of EGI resources. Consultancy offers technical advice for the best solutions: helps to get scientific applications up and running, and provides general support mechanisms.
- The Applications Database allows researchers to share, rate, use and re-use up-to-date scientific applications for running computational jobs in the EGI. It is a centralised service that stores software tools and integrated with the EGI infrastructure and information about them.
- The Training Marketplace provides a space for trainers and trainees to advertise and register for training events, online courses and training materials on scientific and distributed computing topics.

### 3. Value Proposition

The research-user experiences a seamless access to computing- and data-intensive services that result into a more efficient and highly innovative research process. The user-researchers can focus on their core work and obtain new, innovative approaches to their work.

What it is interesting with this model is the existence of a distributed centre for competence and expertise that brings the best possible solution to the needs of the research requesters, and produce brand new, highly innovative solutions for the whole community in an extremely effective way. It is expected that the multidisciplinary of the DCC will also enhance the innovation process.

<b>PROBLEM</b>	<b>PROVIDED SOLUTION</b>	<b>ADDED VALUE</b>
Difficulty in defining the technical and administrative requirements for solutions that will support their research	Multiple points of entrance that lead to a single channel for accessing experts that can adapt existing tools and applications to meet specific needs or create brand new, innovative processes	<ul style="list-style-type: none"> <li>- Enhanced access to computational infrastructure,</li> <li>- Facilitated access to existing knowledge</li> </ul>
Lack of specific knowledge in data management and curation	Centrally-provided expertise and streamlined best practices on how to set up and manage big data sets	<ul style="list-style-type: none"> <li>- More efficient use of available resources, both computational and human</li> <li>- Time and effort saving, more efficient research process</li> </ul>
Loss of efficiency resulting from the diversion of resources from the community's core work into the development of technical solutions	Existing or innovative solutions that can be adapted / re-used for the community by the community; expert assistance provided from a distributed, multidisciplinary, expert centre	<ul style="list-style-type: none"> <li>- Improved user experience</li> <li>- New, innovative ways of producing science</li> </ul>

## 4. Success Stories

This solution has been used to allow many researchers and their communities to make use of the facilities provided by EGI and its partners. Two examples are WeNMR and the Cherenkov Telescope Array.

### WeNMR

WeNMR is both an e-Infrastructure and a research collaboration in the field of biomedical investigation and structural biology. Their partnership with EGI allowed a better support for their own communities from various other e-Infrastructures and improved the capacity for running the high computing intensive applications they need in their research activities. They were also the first Virtual Research Community to sign a Memorandum of Understanding with the European Grid Infrastructure

### The Cherenkov Telescope Array

The Cherenkov Telescope Array (CTA) is one of projects of the astronomy and astrophysics community for research into the non-thermal high-energy universe. The management and analysis of the large amount of data that the CTA produces in its operation is a real challenge in terms of data storage and computing capacity. A team of experts from within the EGI community is tackling two particular areas for them: science gateway portals and federated SSO access protocols.

## 5. Conclusion

The Community-driven Innovation and Support solution is a key part of EGI's solution portfolio. It is aimed specifically at ensuring that EGI meets the needs of researchers, a crucial element in growing the European Research Area, whose base is being expanded.

With "Community-driven Innovation and Support" solution individual researchers and small research collaborations gain seamless, easy access to computational capacity, in a way which allows them to concentrate on their own business, obtaining research results in a secure and more swift way. The whole community also benefits from a systematic approach to addressing problems and the creation of a structure that produces creative and innovative solutions.

## Notes

<sup>1</sup> [http://www.egi.eu/services/support\\_contacts/index.html](http://www.egi.eu/services/support_contacts/index.html)

<sup>2</sup> The DCC is a distributed team of experts which runs under the EGI.eu coordination. It is composed of: National Grid Initiative representatives with expertise in user support, application porting, analysis of data and compute model requirements; User Communities with expertise in application porting who are interested in supporting others in becoming users of EGI; Technology Providers who join the DCC to get in touch with users, and can help in the technical analysis of the requirements and in suggesting technical solutions. The DCC can also invite other experts from across the EGI community or from outside, ensuring that the best possible solution is enabled.

<sup>3</sup> <http://www.egi.eu/services/catalogue/>