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EGI-InSPIRE

EGI HELPDESK AND THE NGI SUPPORT UNITS

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Abstract

This document aims at giving an overview of the infrastructure that is in place in EGI to support its users. The support infrastructure consists of a central part dealing with global issues and regional and topical subsystems inside various activities and in the NGIs. The central helpdesk also acts as a relay between the different areas of support.







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II. DELIVERY SLIP

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$\ensuremath{\text{IV}}\xspace$ Application area

This document is a formal deliverable for the European Commission, applicable to all members of the EGI-InSPIRE project, beneficiaries and Joint Research Unit members, as well as its collaborating projects.

V. DOCUMENT AMENDMENT PROCEDURE

Amendments, comments and suggestions should be sent to the authors. The procedures documented in the EGI-InSPIRE "Document Management Procedure" will be followed: <u>https://wiki.egi.eu/wiki/Procedures</u>

VI. TERMINOLOGY

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







PROJECT SUMMARY

To support science and innovation, a lasting operational model for e-Science is needed – both for coordinating the infrastructure and for delivering integrated services that cross national borders.

The EGI-InSPIRE project will support the transition from a project-based system to a sustainable pan-European e-Infrastructure, by supporting 'grids' of high-performance computing (HPC) and highthroughput computing (HTC) resources. EGI-InSPIRE will also be ideally placed to integrate new Distributed Computing Infrastructures (DCIs) such as clouds, supercomputing networks and desktop grids, to benefit user communities within the European Research Area.

EGI-InSPIRE will collect user requirements and provide support for the current and potential new user communities, for example within the ESFRI projects. Additional support will also be given to the current heavy users of the infrastructure, such as high energy physics, computational chemistry and life sciences, as they move their critical services and tools from a centralised support model to one driven by their own individual communities.

The objectives of the project are:

- 1. The continued operation and expansion of today's production infrastructure by transitioning to a governance model and operational infrastructure that can be increasingly sustained outside of specific project funding.
- 2. The continued support of researchers within Europe and their international collaborators that are using the current production infrastructure.
- 3. The support for current heavy users of the infrastructure in earth science, astronomy and astrophysics, fusion, computational chemistry and materials science technology, life sciences and high energy physics as they move to sustainable support models for their own communities.
- 4. Interfaces that expand access to new user communities including new potential heavy users of the infrastructure from the ESFRI projects.
- 5. Mechanisms to integrate existing infrastructure providers in Europe and around the world into the production infrastructure, so as to provide transparent access to all authorised users.
- 6. Establish processes and procedures to allow the integration of new DCI technologies (e.g. clouds, volunteer desktop grids) and heterogeneous resources (e.g. HTC and HPC) into a seamless production infrastructure as they mature and demonstrate value to the EGI community.

The EGI community is a federation of independent national and community resource providers, whose resources support specific research communities and international collaborators both within Europe and worldwide. EGI.eu, coordinator of EGI-InSPIRE, brings together partner institutions established within the community to provide a set of essential human and technical services that enable secure integrated access to distributed resources on behalf of the community.







The production infrastructure supports Virtual Research Communities (VRCs) – structured international user communities – that are grouped into specific research domains. VRCs are formally represented within EGI at both a technical and strategic level.

VII. EXECUTIVE SUMMARY

This milestone "EGI helpdesk and the NGI support units" serves the purpose of regularly (roughly annually) giving a snapshot of the current status of the support infrastructure that has been defined and implemented in EGI. This is the second edition of this milestone. The support infrastructure of EGI is built upon the infrastructure of the EGEE project. As there are major differences between EGEE and EGI it is clear that a lot of workflows and tools needed to be adapted to the new model adopted by EGI. The most significant difference is that the EGI infrastructure is made up of parts being governed by different projects, whereas EGEE was one project including everything from operations to middleware development and application support. In the EGI model each NGI is a separate entity with its own procedures and idiosyncrasies. The middleware, which is now provided by external middleware consortia, is consolidated by EGI into the Unified Middleware Distribution (UMD). EGI needs to provide the glue between all these different bodies.

Of course these changes also affected the user support activity and necessitated various adaptations here as well. The resource centres that used to belong to a ROC now are part of an NGI and needed to be transferred to the NGI infrastructure. Workflows needed to be put in place to govern the ticket handling process between the central project-wide activities and the NGIs.

The area of middleware support has become more complex with the addition of other middleware stacks. The support infrastructures for these components needed to be integrated with the EGI tools and processes.

The EGI Helpdesk is the infrastructure used to aid the process of supporting users and operations staff in their daily work in the EGI infrastructure. It is a distributed conglomeration of various ticket systems and other tools relying on the GGUS helpdesk system as a central integration platform which all other tools (regional or topical) need to interface in order to allow structured communication between the various partners in the user support activity. The Ticket Process Management (TPM), EGIs first line support (the team that receives incoming tickets, performs a triage and assigns the tickets further to expert support units) works exclusively in the GGUS system, all other project-wide support groups at least show up as responsible units even if they do their work in a different tool that interfaces GGUS. Some project-wide groups, like the TPM and the COD (Central Operator-on-Duty) have been well established, whereas in other areas like the community support, where the changes from EGEE to EGI were much more significant, the full picture needed more time to develop. The sections describing these areas of support therefore are much more complete in this second edition of the milestone as compared with the first edition when things were still a bit vague.

Roughly a half of all NGIs answered the request for inputs to this milestone and their answers vary in detail and complexity. This is to be expected as NGIs that have been formed in countries that played an active role in EGEE of course have better developed infrastructures already in place on which they can build their NGI. Generally a large variation in the implementation of the NGI support workflow and tools is to be expected and does not pose a problem as long as the interfaces to EGI are properly functioning.







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1 INTRODUCTION

This document aims at giving a general overview of the infrastructure that is in place in EGI to support its users. The support infrastructure consists of a central part dealing with global issues and regional and topical subsystems inside various activities and in the NGIs. The central helpdesk also acts as a relay between the different areas of support. The report is divided into two main parts, one dealing with technical infrastructure (chapter 2) used to describe distributed user support and the other dealing with the user support workflows and processes (chapter 3). Both these parts then have subsections dealing with the project-wide (2.1, 3.1) and the NGI activities (2.2, 3.2).







2 TECHNICAL INFRASTRUCTURE

In the following paragraphs we describe the technical infrastructure that is in place to support users and operations staff in the daily work on the European Grid Infrastructure. Section 2.1 focuses on the central helpdesk and its functionality. The next three paragraphs deal with central tools that have been put in place for community/application user support (2.1.2), technology user support (2.1.3) and network user support (2.1.4). The chapter on the technical infrastructure closes with a section on the support tools in use in the NGIs (2.2).



Figure 1: Central Helpdesk as relay between different areas of support

It is of utmost importance that the various parts of the user support infrastructure are properly integrated with each other. This is the aim of having a central helpdesk system, which acts as an integration platform between the different tools in use and provides the technical foundation for the overall support workflow (Figure 1).

2.1 Central Support Infrastructure

2.1.1 EGI helpdesk

The central tool for user support is the EGI helpdesk provided by GGUS [R 1]. It is hosted within the German NGI-DE and operated by a team at KIT (Karlsruhe Institute of Technology). The main components of the helpdesk are (Figure 2):

- A web front end that allows ticket creation and modification. It includes a search engine to effectively find tickets, by timeframe, category and lots of other options. The query results can be saved for further processing in various formats. The web front-end has different views for users and support staff, each tailored to the specific needs of these groups.
- An interface that can be used to connect other ticket systems to the central helpdesk. There are two variations of the interface, one based on web services and one based on messaging.
- A workflow engine, in which the workflows for the ticket handling process are implemented. These workflows can vary significantly depending on the specific ticket categories or areas of support.
- A user database in which support staff are registered and the different access rights are documented.







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• A ticket database containing the actual status and the complete history of all tickets created or having passed through the GGUS helpdesk.

The full functionality of the GGUS system is described in detail in the GGUS User Guide and the GGUS Helpdesk System Tutorial, both of which can be found in the documentation collection on the GGUS portal [R 2].



Figure 2: Schematic view of the architecture of the GGUS helpdesk system

All support units (a group responsible for a specific type of problem or area of support) with a project-wide responsibility are listed in the GGUS system and workflows have been defined and implemented steering what happens when a ticket is assigned to a specific support unit. These workflows vary depending on the scope of the support units and on the technical solution in place for the support unit. There are two main options (Figure 3):

- A support unit uses GGUS to implement their specific workflow. In this case the GGUS development team builds the workflows needed for this support unit and includes them in the GGUS system. This option is used for the project-wide first line support, the TPM (Ticket Processing Management) and for other mainly operations-focussed central support units.
- A support unit relies on an additional external tool that is used to track user requests and issues. In this case an interface has to be defined between the two systems. This option is in use for middleware related support units and for some user communities. Another example of this use case is the COD, the Central Operator-on-Duty, a team responsible for monitoring the infrastructure and raising alarms in case of malfunction. For the COD work a different tool, the Operations Dashboard, is used. This dashboard via an interface to GGUS can create tickets that are automatically assigned to grid sites.









Figure 3: Schematic view of the technical user support infrastructure in place in EGI, provided through GGUS and various other support tools interfacing GGUS

Regardless of which option was chosen in a specific case, for the user the whole system consisting of central helpdesk and its regional and topical satellite systems should behave like one integrated tool. The transfer of tickets between various tools has been implemented to be transparent to the user.

During the first year of the project most of the NGIs have been created. This process includes setting up an NGI support unit in GGUS and migrating support units formerly belonging to a ROC to the respective NGI.

There are three options for NGIs to set up their support infrastructure:

- Direct use of GGUS (one support unit in GGUS for the whole NGI, no regional ticket system)
- Regionalised GGUS (xGUS, customisable slimmed down version of the GGUS portal allowing the hosting of regional support units in GGUS)
- Regional ticket system (with an interface to GGUS to allow for ticket exchange)

Currently there are 31 NGIs support units in GGUS:

- 22 NGIs are using GGUS directly:
 - o NGI_AL
 - NGI_ARMGRID
 - NGI_AT
 - NGI_BA
 - NGI_BG
 - NGI BY
 - NGI_CYGRID
 - o NGI_FI
 - NGI_GE







- NGI_HR
- NGI_HU
- o NGI_IE
- o NGI_IL
- NGI_MARGI
- NGI_MD
- NGI_ME
- NGI_NDGF
- NGI_NL
- NGI_RO
- NGI_SI
- NGI_SK
- NGI_TR
- 6 NGIs with regional ticket system interfaced to GGUS
 - NGI_CZ
 - NGI_FRANCE
 - NGI_GRNET
 - NGI_IBERGRID
 - NGI_IT
 - o NGI_PL
- 3 NGIs are using the regional view of GGUS
 - NGI_AEGIS
 - NGI_CH
 - NGI_DE

There are 7 ROCs still listed in GGUS (mostly for non-european partners):

- ROC_ASIA/PACIFIC
- ROC_CANADA
- ROC_CERN
- ROC_IGALC
- ROC_LA
- ROC_UK/IRELAND (only used for sites in the UK)

2.1.2 Community and application support

The Application and community support activities have continued to develop through this first year of the project with the transition of ROCs to NGIs being now almost complete and with specialist communities coalescing at an increasing pace into formalised VRCs. Helpdesk support provided through GGUS is well established throughout the user community and is undeniably recognised as the de facto route for trouble ticketing of issues that can't be resolved locally within a community or NGI. For dealing with long term 'problems' and system requirements, the EGI Requirements Tracking system (RT) [R 3] has become the established vehicle.

Application support is also provided through the Applications Database (AppDB) [R 4] which now hosts nearly 400 specialist applications and tools that are made readily available to communities







through a fully customisable AppDB 'Gadget'; this tool can be tailored by NGIs and research groups to meet specific needs and then integrated into local websites. Further support is provided to users through the Training Marketplace [R 5] which was transferred from Edinburgh University in March 2011 to being hosted by the STFC (the Science and Technology Facilities Council in Oxfordshire). The website is undergoing considerable change with the objective of providing expanded functionalities and improved usability to the communities – the most visible change will be the display of information via the map view that is increasingly being used by others when presenting information that has regional relevance and content.

2.1.3 Technology support

One of the areas that changed the most in the transition from EGEE to EGI is middleware development, deployment and support. Whereas EGEE only supported one middleware stack (gLite) EGI is now bringing the main deployed middleware stacks closer together in a single distribution called UMD. Another difference is that in EGEE middleware development part of the project, whereas EGI now receives its middleware components from external technology providers.

We now have a detailed picture of how the middleware user support is organised between EGI and external technology providers, such as EMI (Figure 4). The second level support for middleware issues is performed by the EGI body DMSU, the Deployed Middleware Support Unit, under the umbrella of the DMSU there are second level experts for all the middleware components in use. All middleware related tickets are routed through this support unit in GGUS. To enable this, a separate helpdesk instance, the Technology Helpdesk [R 6] has been created.



Figure 4: Tools and workflow for middleware user support

The third level support is then done by the technology providers, optionally using their own issue tracking systems. For EMI, support units have been created in the Technology Helpdesk on the level of the product teams or on the level of specific components. Additionally an overall EMI support unit has also been created, that serves as a catch-all support unit and can be used for more general requests. This generic EMI support unit and the DMSU are always in the loop when a ticket is assigned to a product team, thus enabling an overview over the tickets on the EGI and the EMI side.

This means that the Technology Helpdesk is not only used inside EGI, but also by EMI. Only at the level of the product teams does a ticket leave the Technology Helpdesk to be transferred to the bug







tracking tool used by this product team. Some of these tracking systems are interfaced with the Technology Helpdesk, for others the transfer is currently done manually.

For IGE and SAGA, the initial workflow is simpler as there is just one third level support unit in the Technology Helpdesk. To these support units all Globus or SAGA related middleware bugs are reported. This workflow might change in the future, once an increasing number of tickets require a more sophisticated set-up.

With other middleware providers, similar workflows have to be defined once their software is in use in EGI.

2.1.4 Network support

Network Support makes use of the tools listed on [R 7]. Some of them are still being finalized, in order to make them ready for production quality deployment. They will be presented at the forthcoming EGI Technical Forum in Lyon, 20-23 September 2011. The tools are the following ones:

- HINTS is a tool for providing Network Troubleshooting on demand. It is based on the PerfSONAR protocols for the Web services implementation. It requires the deployment of local probes at the sites: a Central HINTS server is able to generate troubleshooting session from any two sites among the ones recorded in the system. It foresees multiple user profiles: a central manager, able to trigger network troubleshooting tests between any two sites belonging to the infrastructure, and other users, with less operational rights. The Network Support coordination has decided to adopt this tool, which has been developed by CNRS UREC and France Grille, and made available to the whole EGI community. The tool is currently in beta testing state.
- Netjobs is a Network Monitoring tool based on the usage of Grid Jobs. A central monitoring server launches Grid jobs which, once accepted by the sites, to perform periodic monitoring measurements on the network, and report the data back to the server. It does not require any local deployment by the Grid sites. It is currently being beta tested on the WAN. Developed by the CNRS UREC Team and GARR, it is currently endorsed by GARR.
- The Spanish NGI RedIRIS is developing a live distribution of PerfSONAR on a CD to provide an e2e Monitoring tool to the EGI Community. It will include a graphical user interface and a DB to keep historical data. It is currently being finalized and it will be demonstrated at the EGI Technical Forum in Lyon in September 2011.
- The DownCollector is a centralized tool which checks the reachability of major Grid services for Grid sites, registered in the GOC-DB. The system check if the published Grid services are reachable on the known, expected ports, pinging them periodically from a central location, therefore implementing a Star architecture. It is operational and reachable from the Network Support Tools portal.

2.2 NGI and EIRO support infrastructures

2.2.1 Albania

There is only one gLite cluster integrated in the European Grid Infrastructure. This cluster (AL-01-FIT) is situated at the Faculty of Information Technology of the Polytechnic University of Tirana (UPT).

The site was set up in the framework of SEE-GRID initiative. As such, it was integrated in the SEE-GRID regional infrastructure using its centralized services. The connectivity is via private ISPs through an optical fibre, with limited capacity that may go up to few Mbps.







Other clusters exist in the country, at least in the Departments of Physics in the Polytechnic University of Tirana and University of Tirana, but those are used for internal purposes.

The site AL-01-FIT is open for the research community and used for a few gridification experiments. Because the size of actual grid user community is very small, located in the same capital city and the intensity of grid calculations is not high, the user support system is based in direct contacts between interested end-users and site management team.

2.2.2 Armenia

The Armenian NGI (ARM NGI) uses GGUS for handling EGI tickets, as well as the most of the support actions are performed via NGI support mailing list. The support unit (group of administrators) responsible for all kind of issues related to operations of grid sites. The Armenian Grid infrastructure (gLite middleware) consists of seven Grid sites located in the leading research (National Academy of Sciences, Yerevan Physics Institute) and educational organizations (Yerevan State University, State Engineering University) of Armenia.

Apart from computing (about 500 cores) and storage resources, core Grid services which enable seamless access to all resources are provided to national users. The first Armenian national VO ARMGRID.GRID.AM has been established and registered in the Grid operations centre database in May 2009. The nodes of the Grid sites are interconnected by Myrinet and Infiniband High bandwidth or Gigabit networks. Many international and national projects have contributed to deploy the infrastructure.

2.2.3 CERN

CERN is an EIRO (European Intergovernmental Research Organization) which only includes a grid production site, called CERN-PROD. The associated support unit in GGUS is called ROC_CERN.

As a result of starting the implementation of ITIL practices in the area of incident management, the local ticketing system changed since February 2011, from a Remedy based one to Service Now (SNOW). The interface to GGUS is based on web services, fully implemented in both directions.

Most operational tickets arriving to CERN do it through the direct assignment route ("Notify site" feature), and few pass through the TPM.

Once at the CERN ticketing system (SNOW), they land into a general category, and are manually sorted and distributed based on keywords plus experience of the team doing that. There are 12 different categories (one per grid service run in production), and each of them has 3 support levels, with the service managers giving the 3rd level support (expert level).

2.2.4 Croatia

Croatian NGI (CRO NGI) uses GGUS for handling EGI tickets. As a part of the NGI creation the new support unit NGI_HR has been created. The aim of NGI_HR support unit is to deal with all kind of issues related to operations of grid sites.

2.2.5 France

There is one specific NGI Support Unit dealing with incoming EGI tickets within the regional helpdesk which is looked after by the French ROD team rotating shifts weekly and the NGI operation team. Outgoing tickets can be assigned to all EGI SUs.

The French NGI operates a "local" helpdesk based on Xoops/XHelp (eXtensible Object Oriented Portal System), fully interfaced in both directions with GGUS since September 2008.







Currently it is used by the site IN2P3-CC as local helpdesk system, and its usage is restricted to the IN2P3 site to assign relevant tickets to local experts. In addition, the system is shared with other non-Grid application domains. Other sites in the French region are encouraged to use GGUS.

For all these reasons, at the time of writing it cannot be considered a full regional ticketing system. The reference platform for the implementation of the French NGI helpdesk is a background topic and use-cases are gathered to feed internal discussions.

In addition to the local ticketing system herein described, several sites deploy their own (local) ticketing systems, which are completely independent from GGUS and the regional one.

2.2.6 Georgia

In Georgia there is only one Grid site GE-01-GRENA integrated in the EGI infrastructure. This site is located at the Georgian Research and Educational Networking Association – GRENA. NGI_GE uses GGUS for handling EGI tickets and currently there is no need to introduce a local ticket system, because of the small number of users. The aim of NGI_GE support unit is to deal with all kind of issues related to operations of Grid site and users.

2.2.7 Germany

The German NGI-DE consolidates the grid resources offered to users in Germany bringing together the institutions from the former ROC-DECH and from D-Grid, a grid project funded by the German Research and Education Ministry. In the area of support infrastructure this meant combining the two independent helpdesk systems that have been in place for ROC-DECH and G-Drid and in the process keeping the useful functionalities from both systems. The NGI-DE helpdesk was also the prototype of xGUS, the regionalised GGUS. NGI-DE will continue the strong collaboration with Switzerland, now in the form of SWING, the Swiss Grid Initiative. NGI-DE and SWING will work together in the field of user support.

2.2.8 Greece

At NGI_GRNET there are various support units for the users and the operations. These support units and their missions are the following:

- HellasGrid User Support Team: provides consultancy services, meaning that it guides novice users that want to join the HellasGrid/EGI infrastructure and provides personnel who can answer and deal with day-to-day issues that users find and experience while using the EGI infrastructure.
- HellasGrid Application Support Team: is a second level communication channel for users and is used for advanced support in porting scientific applications to the infrastructure.
- HellasGrid Regional Operator on Duty (ROD) Team: has the role of ticket process management at our local helpdesk system for the EGI tickets.
- HellasGrid Nodes Operational Support Teams: are responsible for dealing with EGI tickets related to the operation and support of HellasGrid nodes.

Also NGI_GRNET has installed a local helpdesk system (based on Best Practical Request Tracker platform) which is fully integrated with GGUS. This helpdesk system is used for gathering user's requests and tracking issues related to the operation of HellasGrid infrastructure.







2.2.9 Hungary

The aim of the NGI_HU support unit is to deal with all kinds of issues related to operations of grid sites in Hungary. The operational tickets raised with the use of tools like the Operations Dashboard as well as users' tickets related to site operations in Hungary should be addressed to NGI_HU support unit.

Ticket handling for NGI_HU is done with help of the ngi-support@listserv.niif.hu mailing list and with direct usage of GGUS.

There are two ways on how the ticket can reach NGI_HU support unit:

• A ticket can be created in GGUS and then it will be assigned to NGI_HU and will thus be propagated to ngi-ggus@listserv.niif.hu mailing list. Progress updates will be communicated to the GGUS ticket by the helpdesk staff.

• A request can be sent to the ngi-support@listserv.niif.hu mailing list and then a ticket can be created in GGUS by the helpdesk staff if needed.

2.2.10 Ireland

The support infrastructure for Grid-Ireland (NGI_IE) reflects the size of the NGI. ROD tasks are shared with the UK. There is a single NGI support unit, which deals with EGI tickets directly in GGUS and national tickets in a local RT ticket system.

2.2.11 Italy

No major changes happened with respect to the previous report.

XOOPS/XHELP is still the system used for the regional helpdesk, with some minor configuration changes and bug fixes in order to fulfil the Italian communities' requirements.

Nevertheless, some work has started with the goal to evaluate other more widely used tools, which can be used in the future as a replacement of XOOPS/XHELP. In fact, in view of a long term sustainability of the system, it might be important to share the knowledge and the effort of the maintenance with a larger community of people.

The number of support units has slightly changed; some new sites have been added and some others removed because tagged as "closed" on the GOCDB. Now the Italian ticketing system has about 90 support units, counting production sites and general departments.

2.2.12 Moldova

NGI_MD is on its way to become independent, having had 4 sites deployed and running gLite 3.1 MW during the SEE-GRID projects' family. Currently 1 site, MD-02-IMI, is being deployed, running gLite 3.2 MW in the virtual environment, and is prepared to be certified.

NGI_MD is connected to the GEANT backbone via RoEduNet using 1Gbps link and there is a backup link via local commercial ISP Starnet.

The list of NGI support units dealing with EGI tickets consists of network, user and grid support units. NGI_MD intends to use directly GGUS for handling EGI tickets.

2.2.13 NDGF

NDGF NGI is a distributed NGI and operates purely as an Operations Centre. The primary reason for this NGI is to support NDGF-T1 and the Nordic sites providing resources to WLCG. For historical







reasons, the Baltic countries are also monitored by NDGF NGI, as is Austria, which to date is still setting up its NGI.

Countries (NGIs) participating in NDGF NGI are

- Austria, 2 certified sites;
- Denmark, 2 certified sites;
- Estonia, 2 certified sites;
- Finland, 1 certified site;
- Latvia, 2 certified sites;
- Lithuania, 5 certified sites;
- Norway, 1 certified sites;
- Sweden, 1 certified sites;

The Nordic countries run the Operations Centre on a rotation basis, and Latvia will join in some of the operations soon. As it is inconvenient to try to run an internal helpdesk, GGUS is used by the sites in this NGI. Communications to sites is primarily through the Operations Dashboard but we also encourage participation in the NDGF Jabber Chat room, to speed up the process of solving problems. The Operations Centre is both an NGI Operations Centre and a T1 Operations Centre.

2.2.14 Netherlands

The Dutch NGI NCF and the Belgian NGI BELNET have decided that in the EGI era for the time being the Dutch NGI will fulfil the ROD tasks as well as the first-line support tasks on behalf of the Belgian NGI for the sites in Belgium.

Although BELNET does not take part in EGI InSPIRE, BELNET contributes resources to the EGI infrastructure and therefore we give a description how things are setup in Belgium for the sake of completeness.

BELNET has a support email address where people can turn to.

In the Netherlands the BiGGRID organisation takes care of the operational responsibilities taken on by the NGI NCF. BiGGRID has a helpdesk email address, but users as well as site managers frequently contact the support email addresses of the Dutch NGIs operational partners SARA and NIKHEF. A person on duty monitors the incoming support emails and forwards the request to the appropriate person. Both at NIKHEF and SARA the support email addresses are linked to a trouble ticket system. These trouble ticket systems are not interfaced with GGUS.

Currently BIGGRID is considering using xGUS. However, there is no plan to integrate the current BiGGRID trouble ticket system with GGUS. BiGGRID support people monitor GGUS directly for incoming tickets. This has worked satisfactorily for the last number of years.

BiGGRID support has not been grouped in different formal support units. The BiGGRID support team consists of a number of people knowledgeable about the services, middleware, and infrastructure et cetera. Incoming tickets are simply forwarded to the right person.

2.2.15 Poland

NGI_PL is represented in GGUS system by the NGI_PL SU. All issues assigned to the NGI_PL SU are transferred to national helpdesk [R 8], which is fully integrated with GGUS. The NGI_PL helpdesk is based on the Request Tracker system and keeps the tickets status flow in accordance with GGUS. It has implemented synchronization of private and public comments, attachments, information about submitter, modifier etc. The NGI_PL helpdesk also gives the possibility to export tickets that cannot







be processed locally to GGUS, reject the tickets incorrectly assigned to NGI_PL and synchronize after the onset of synchronization errors.

While transferred to the NGI_PL helpdesk, the ticket can be assigned to one of support units including national TPM responsible for ticket processing, ROD responsible for operational tickets, sites support unit (experts and site administrators) and user support.

NGI_PL is ready to share the experiences of RT integration with GGUS with other NGIs.

2.2.16 Portugal/Spain

After one year integrated in EGI infrastructure, the operation model for the IBERGRID community (Portuguese and the Spanish NGIs) is more mature. NGI_IBERGRID has 3 first line support units, one from Portugal and two from Spain, which also performs the ROD work through round-robin shifts on a weekly basis. During the shift, the teams are responsible for ensuring that sites follow all requests in a timely manner, independently if the requests are sent through the regional mailing lists, though the local or EGI helpdesks, or raised during the weekly operation meetings. The advantage of having the same staff performing the ROD work is that, whenever a failure is detected and it is necessary to notify a site about a precise problem, suggestions for solutions can also be provided in the GGUS tickets. All issues and questions raised during the week are jointly discussed on a weekly meeting.

The NGI_IBERGRID continues to operate its local helpdesk (SWE helpdesk) which is integrated with GGUS. SWE helpdesk is mainly used for the automatic assignment of GGUS tickets which reach NGI_IBERGRID without any assigned responsible. The plans to deploy and integrate a new RT helpdesk have been delayed due to manpower issues, but the current integration functionalities are maintained by the SWE helpdesk. Nevertheless, users and site administrators seem to prefer to use GGUS directly.

2.2.17 Serbia

The Serbian NGI_AEGIS support infrastructure consists of a regionalized instance of GGUS (NGI_AEGIS Helpdesk) [R 9], a NGI support mailing list, and GGUS NGI_AEGIS support unit.

The NGI support mailing list is still a main means for support actions within the AEGIS but with NGI_AEGIS Helpdesk in production, more and more user support operations are performed via national xGUS portal. This is achieved by strong advertisement of this portal to Serbian user community by the NGI_AEGIS user support team through the Grid training events and by directly addressing the users. The Helpdesk has been customized to serve specific needs of NGI_AEGIS users with specific support units added. Beside its original function, AEGIS support team plans to use this Portal to show important AEGIS Infrastructure information to the user community like current and planned downtimes of AEGIS sites etc.

For resolving urgent issues, the lcg-rollout mailing list is still frequently used by NGI_AEGIS.

2.2.18 Slovakia

Operations support in the SlovakGrid NGI is provided by the Institute of informatics of the Slovak Academy of Sciences (UI SAV). It includes:

- 1st line support unit ("on-duty" based), monitoring status of sites and supporting sites in solving operational problems. It is responsible also for training and middleware deployment support.
- ROD, provided by one person with a deputy as a backup







• Security support: support for sites regarding operational security is provided by the NGI security officer.

Slovakia currently relies on GGUS as helpdesk system. The GGUS support unit "NGI_SK" currently involves 1st line supporters and ROD.

2.2.19 Switzerland

Tickets within the NGI are handled through the regionalized xGUS helpdesk instance [R 10] which is connected to the helpdesk support address helpdesk@swing-grid.ch.

- NGI_CH operates a general first level support unit, and a support unit for questions related to ARC middleware.
- ROD with NGI_DE, SMSCG

2.2.20 Turkey

All NGI_TR sites are centrally managed by NGI_TR Operation Centre which is also responsible for managing national support activities. NGI_TR Operation Centre is dealing with all kinds of issues related to the operations on grid infrastructure as well as users individual problems.

There is a mailing list (grid-teknik@ulakbim.gov.tr) where all the members of support team have been subscribed. When a ticket is raised, the user support team has been informed by this e-mail list and the ticket is started to be handled. Who will take the required actions within the group is an internal process and monitored by a NGI support manager.

We also have a RT-based helpdesk system which is mostly utilized by national users. Furthermore, we are using GGUS tool for handling EGI tickets. We have a plan to integrate NGI_TR helpdesk system with the GGUS tool.

In a summary, there are three ways to report a problem to NGI-TR support unit:

- A ticket can be created and assigned over the GGUS tool
- By simply sending an e-mail to RT ticketing system, a ticket is automatically created and managed by using web interface as well as replying the e-mail.
- The users can easily contact us by sending an e-mail that all the support team can read or calling with phone.







3 SUPPORT PROCEDURES

Similar to chapter 2 this section on the support processes focuses first on the project-wide support procedures and support units (support units responsible for a specific task or topic and covering the whole project) for user (3.1.1), operations (3.1.2), community/application (3.1.3), technology (3.1.4), and network support (4.1.5). This is then followed by section 3.2 that describes the support processes in the various NGIs.

3.1 Project-wide support units and processes

3.1.1 TPM

In EGI two TPM teams (one in Italy and one in Germany) share the TPM effort alternately in biweekly shifts.

The TPM schedule is organised by the German team and can be found on the GGUS portal [R 11].

First-level support service hours are usually eight hours a day, Monday to Friday - excluding public holidays in the country of the TPM on shift.

The duty of the TPM is to (re-)assign tickets to the correct SU.

The TPM, before ticket assignment to a SU, must interact with the submitter to clarify the problem towards a solution, when possible.

Every ticket must be assigned by the TPM to the right SU within one working hour. This rule doesn't apply to tickets with submission time after 16hrs UTC, before 8hrs UTC and during week-ends i.e. between Friday 16hrs and the following Monday 8hrs.

Tickets submitted as of 16hrs UTC should be assigned before 9hrs UTC the next working day.

GGUS allows Direct Site Notification for all tickets. These are cases transparent to the TPMs, directly assigned to the relevant NGI/ROC and emailed to the Site contact list. As a result, TPMs have fewer tickets to handle.

- Some quality work items are added instead, namely to:
- Identify 'forgotten' tickets and act on them. The weekly escalation reports help to do this.
- Identify tickets revealing middleware bugs and assigning them to the DMSU.
- Act on submitter's 2nd and 3rd call for GGUS ticket escalation.
- Create FAQs from tickets with the 'Add to wiki' flag on or with a useful solution.
- TPM performance is monitored and can be reported to relevant EGI meetings.

3.1.2 Grid Operations Oversight

Primarily the grid operations oversight activity lies with the NGIs where for each NGIs or set of collaborating NGIs there is a ROD team who monitors the availability and reliability of sites. Here ROD stands for "Regional Operator-on-Duty". These ROD teams respond to alarms raised in a dashboard. An alarm is raised in cases where a certain test has run at a site and failed. The procedure is that if the alarms are open, which means that the problem is not solved for more than 24 hours, a GGUS ticket is raised against the site. ROD teams will also monitor the progress that is made in solving the ticket.

If this progress is not sufficient then an escalation procedure kicks in which eventually may lead to site suspension.







NGIs are free to do what they want in the first 24 hours after an alarm has been raised. The NGIs have a 1st line support group in place that will assist sites to solve their problems. NGIs are free in how they implement 1st line support. In some regions a group of 1st line supporters contact the site to help them solve the problem if an alarm is raised or sites can contact the 1st line support themselves. The coordination of the grid operations oversight lies with the Netherlands and Poland since the start of EGI-InSPIRE. To describe this activity in more detail, both NGIs will perform the following tasks:

- Ticket and alarm oversight by a COD team, where COD stands for Central Operator on Duty. The COD team monitors if alarms and tickets are handled correctly by the ROD teams and takes action if this is not the case.
- Metrics are being collected and interpreted which gives an indication of the quality of the operation of grid operations oversight.
- Organising the ROD forum activities, i.e. f2f meetings, phone conferences, coordinating ROD teams, etc. in order to maintain coherency in the implementation of procedures and discussing changes in procedures et cetera.
- Representing COD/ROD/1st line requirements in operational tools development groups.
- Tests run at each site a number of times per day to verify if the sites are still functioning properly. Not all tests are critical and raise alarms if they fail. The grid operations oversight coordination activity will do recommendations on tests criticality.
- Reporting problems to middleware developers though the DMSU support unit in GGUS and handling GGUS tickets assigned to the COD support unit.
- The monitoring of the progress of the transition from the EGEE ROCs to EGI NGIs.

3.1.3 Community and applications support processes

The very nature of this environment means that the communities and applications that need to be supported are constantly evolving and thus the support strategies need to be responsive to change. The past year has shown that support procedures must on the one hand cater for a tiered organisation (in which the EGI is linked with its many associated NGIs) while on the other, the same procedures must cater for a 'Thematic' aspect that emerges from working with VOs and VRCs. Procedures have evolved very successfully to meet these 2 sets of needs in a complimentary way. In practice, we have seen that issues are generally addressed internally within the support organisations of single NGIs and only when the influence of such an issue extends beyond the 'local' environment does it become necessary to involve the EGI helpdesk (GGUS) or the EGI RT system. At that stage, the use of the EGI support process becomes a critical step in communicating and coordinating the efforts of all relevant stakeholders in resolving issues. A high level of success in this area can be judged from the fact that few if any tickets are raised in GGUS by an NGI to address issues that should have been dealt with internally by that same NGI.

Procedurally, entry points to the EGI support processes have been established directly into the EGI helpdesk (GGUS) and RT system but alternatively, these can also be reached from the EGI.eu website. This is important for new users who have yet to become fully conversant with the support system as by simply knowing the EGI website alone, users will be able to navigate successfully to the incident ticketing systems. Additionally, the process is in harmony with best practice as advocated by ITIL methodology which proposes a 'single point of entry' for all support wherever IT is delivered as a service. Further correlation with the ITIL model can be seen in the division of issues between the GGUS system which tracks short term failures and bugs (ITIL 'incidents') and the RT system which is







used to track longer term issues, new feature requests and requirements (ITIL 'problems'). In practice users of these systems do not always recognise which path they should follow for an issue and it is therefore important for the expert support staff behind each system to have the knowledge and experience to recognise when an issue needs to be re-routed; to date, the need for such rerouting has been insignificant but the process has nonetheless been put in place.





3.1.4 Technology support processes

As described in section 2.1.3 the infrastructure for technology user support is well defined between EGI and the external technology providers supplying the middleware. The same is true for the support processes. Middleware issues spotted by users of the EGI infrastructure will be assigned by the TPM to the DMSU. The DMSU will examine them and determine whether there is a problem with the service configuration, with its deployment model or with the software itself. In case of potential bugs the DMSU will assign the issue to the product team responsible for this component to get third level support. This process allows a detailed analysis and reporting of the quality of the support, which is important as this is an activity crossing project boundaries and governed by service level agreements.

3.1.5 Network support processes

The Network Support Unit of GGUS is operational, the corresponding support team is provided by GARR, the Italian NREN.

The support process is such that Network issues are posted in GGUS and assigned to the Network Support unit. The unit starts a basic debugging of the reported problem, being – if required – able to escalate the issue to the NRENs or DANTE.

The tickets are formally assigned to the Network Support unit until solved, it is responsibility of the Unit to ensure that they are properly processed by the involved actors and acted upon.







3.2 NGI and EIRO support units and processes

3.2.1 Albania

The first line of the NGI support process is the core team from the Faculty of Information Technology of UPT in charge of the set-up and maintenance of the site. Following direct requests of end-users, the team has to:

- assure necessary interfacing with requested resources
- help end-users with the execution of grid jobs
- help end-users with the gridification of applications

Due to the level of grid activities, formalization of procedures was not done in the past, and from now it is in consideration the implementation of EGI standards.

3.2.2 Armenia

The first line support is provided by the team of administrators via mailing lists.

3.2.3 CERN

CERN is an EIRO (European Intergovernmental Research Organization) which that only includes a grid production site, called CERN-PROD. For this reason, CERN does not have what is called a regional first line support.

There is a general service desk type team, not dedicated exclusively to the GGUS grid tickets but part of the local helpdesk infrastructure, which gets the GGUS tickets and distributes them between the different grid services, entering then the same flow that tickets generated locally at the site. Then, the service managers do the 2nd level support and are the responsible for solving the tickets.

The SLA applied is the WLCG one for ticket response times.

Weekly Fortnightly ticket review meetings are held, where a continuous follow up is done on those tickets that the experiments highlight as requiring action, so no ticket is left unresolved.

Additionally, there are also HEP VO specific support teams in the site, in close contact with the grid site managers (e.g. daily WLCG operations meetings), which helps to solve issues very quickly.

3.2.4 Croatia

The CRO NGI operational team is responsible for handling all NGI_HR tickets. Tickets can be created in GGUS and assigned to NGI_HR which generates notifications to the alias egi-fls@cro-ngi.hr. Alternatively users can send tickets directly to the alias. Operational team creates a GGUS ticket if needed. SLAs are not defined at this point. Once the EGI OLA is defined CRO NGI plans to follow it. Escalation follows EGI procedures.

3.2.5 France

The first line support service is dealt with by a dedicated team of 5 people taking shifts at assigning all incoming tickets acting as "French TPM".

They assign incoming tickets specifically to the NGI SU, i.e. the French NGI ROD, when tickets are opened for operational matters, like tests failures. The sites are notified and react accordingly. They follow the ROD escalation procedure when created by RODs or regular GGUS escalation procedure for other tickets that are assigned to relevant experts in the NGI-France.

No other SLAs than the LCG ones on alarm and team tickets are observed.







Moreover, a status report on tickets assigned to French sites is done regularly at internal NGI monthly meetings that all sites attend.

3.2.6 Georgia

The GE-01-GRENA site operational team is responsible for handling all NGI_GE tickets. Tickets can be created in GGUS and assigned to NGI_GE. Alternatively users can contact the support staff directly via e-mail or phone. Due to the level of Grid activities formalization of procedures locally is not necessary yet, but it is foreseen for the future.

3.2.7 Germany

NGI-DE has set up several teams for the various participating resource centres that are responsible for the regional first line support for tickets originating in the region or being assigned through GGUS, as well as for the ROD. These teams work of a weekly rota and are responsible for a timely reaction to incidents and requests during normal office hours. They follow the service levels had are agreed for NGIs and for the regional first line support. One of these teams is located within SWING, the Swiss Grid Initiative. This is part of NGI-DE's collaboration with Switzerland.

There are also regional support teams for some VOs that help getting problems solved quickly, by being close to the VOs and the grid sites at the same time, e.g. GridKa employs local LCG experts cofunded by the LHC experiments.

Regional middleware support units exist for D-Grid specific software and for components with a regional flavour.

3.2.8 Greece

The Operational Support Teams of every node act also as first line supporters for operational problem observed at their site. Also the HellasGrid Regional Operator on Duty team has been created which is responsible for handling the tickets assigned to NGI_GRNET support unit at GGUS. This team is operated by the 6 Nodes Operational Support Teams located at Greece and it rotated every two weeks. The SLA used regarding the various EGI tickets coming from GGUS is the same as this defined by EGI Operations Level Agreement (OLA). In the case of tickets not coming from GGUS we use the same SLA as this defined by EGI OLA and if there is not a response to a ticket, then it is escalated to NGI_GRNET NOC manager.

3.2.9 Hungary

The Hungarian support manager makes sure that the tickets from GGUS assigned to NGI_HU are being solved and that the process of solving problems is efficient. In particular he/she makes sure the troublesome tickets are handled to their ends. He/she uses a reporting functionality to overview the state of tickets assigned to NGI_HU (GGUS and to ngi-support@listserv.niif.hu). Hungarian support staff needs to use one of the interfaces to submit a ticket, as described in 2.2.9. Then the person can use either of the interfaces she/he has an access to interact.

3.2.10 Ireland

First-line support for NGI_IE is organized around a weekly on-duty rota. The operator on duty handles all incoming requests from GGUS and RT. RT tickets may be assigned to team members with relevant expertise. Weekly meetings track all issues that have arisen since the previous meeting. Open support tickets are followed up until completion.







The ROD tasks for Ireland and the UK are handled jointly according to a weekly on-duty rota with team members from both countries.

The Grid-Ireland Operations Centre at TCD has an SLA with Grid-Ireland NGI Ltd. – the NGI legal entity – which specifies the Operations Centre's responsibilities related to support, including a requirement to respond to tickets within 4 working hours on average.

3.2.11 Italy

The Italian ROC (ROC_IT) has formally changed to the Italian NGI (NGI_IT), but no major changes have been done with respect to structure and workflow for the regional support units.

With the goal to improve the efficiency of the processes, the number of operators involved in the first and second line support has been reduced from 15 to 11.

3.2.12 Moldova

User tickets related to site operations in Moldova are addressed to the NGI_MD support team. Technical support of the NGI_MD Grid operations is provided by the operation team, which can be reached at grid-support@lists.renam.md (this is Grid support operations mailing list). For managerial support of the NGI_MD grid-managers@lists.renam.md is used.

NGI_MD signed MoUs with partner Institutions, members of the MD-GRID JRU, and SLAs with of each of the sites.

Since the tickets for NGI_MD are directed to and handled in GGUS, escalations are handled there.

Network support is being carried out by the NOC team of the RENAM Association. External requests are being redirected from GGUS and EGI's network-support@mailman.egi.eu mailing list to the appropriate staff in the NOC.

3.2.13 NDGF

As the Operations Centre is both an NGI Operations Centre and a T1 Operations Centre, problems in both these categories are handled by the Operations teams (Operator on Duty, OoD). The NDGF NGI SU is NGI_NDGF and problems for both the NGI and NDGF-T1 come to the same support mail list.

The OoD handles EGI operations and T1 Operations simultaneously during normal working hours, and is on call for T1 operations over weekends and public holidays.

As a Nordic Centre our primary support focuses on ARC middleware, but as NDGF is also involved with dCache, ARC and SGAS development, issues relating to these are also handled. Development issues are generally handled through the development streams, and not by the OoD.

3.2.14 Netherlands

The Dutch NGI NCF and the Belgian NGI BELNET have decided that in the EGI era for the time being the Dutch NGI will fulfil the ROD tasks as well as the first-line support tasks on behalf of the Belgian NGI for the sites in Belgium.

Although BELNET does not take part in EGI-InSPIRE, BELNET contributes resources to the EGI infrastructure and therefore we give a description how things are setup in Belgium for the sake of completeness.

BELNET has a support email address. There is no SLA between BELNET and its sites nor are there escalation procedures.







In the Netherlands the BiGGRID organisation takes care of the operational responsibilities taken on by the NGI NCF. There is a team at SARA consisting of about 5 people that fulfil the COD, ROD tasks and the first line support task. BiGGRID has a helpdesk email address, but users as well as sites frequently contact the support email addresses of the Dutch NGIs operational partners SARA and NIKHEF. A person on duty monitors the incoming support emails and forwards the request to the appropriate person.

Currently there is no formal SLA between the Dutch NGI and its sites. No formal escalation procedure is in place at the moment, but people can always contact BiGGRID management directly if so desired.

3.2.15 Poland

Ticket processing flow in NGI_PL was designed based on EGI procedures. NGI_PL TPM was set up to manage registered in helpdesk non-operational tickets. For operational issues responsible unit is Regional Operator on Duty team which acts according to procedures written in Operational Procedure Manual [R 12].

Escalation process in non-operational cases requires that tickets should be acknowledged within 24h by Application Expert or Site Admin and status updated every 3 working days. Oversight over user tickets is done by NGI_PL TPM. In case of exceed deadline for update a notification is send to the assigned support unit. Tickets not solved within 30 working days are escalated to NGI_PL Operations Meetings.

Escalation process for operational issues, as was mentioned before, is consistent with EGI procedures.

3.2.16 Portugal/Spain

NGI_IBERGRID is involved in the discussion of the EGI Resource Centre OLA, and has already presented the document for internal discussion, involving all sites. Once it is accepted within EGI it will also be adopted in NGI_IBERGRID.

The detailed description of the support staff model (strongly coupled with the ROD work), including all the foreseen workflows is available at [R 13].

A document clarifying what is the expected from sites in terms of their duties and responsibilities has been produced, as well as the communications chains available for sites to ask for support. Details are available at [R 14].

The main duties defined for the sites are:

- Maintain GOCDB information updated
- Declare downtimes properly in GOCDB (Major/Minor upgrades; absences)
- Participate in the weekly Ibergrid Operation Meeting
- Respond to a request to act on an incident / ticket
- Fulfil the minimum 70%/75% Availability/Reliability thresholds

A site response may be considered not adequate if the site fails to 26 fulfil some of the previous defined duties. The site response escalation steps are defined according to the following criteria:

• Each Friday morning, the first line support staff or ROD team reviews the open tickets to the region, and sends an operational status report to the ibergrid-ops mailing list. The problematic sites are invited to participate on the Monday's IBERGRID operational meeting, where they can collect or provide feedback.







- If a problematic site missed to participate on the Monday's IBERGRID operational meeting without justification, continued unresponsive along the week, and the problem remains unsolved, it reaches the first escalation step. In that case, a second request for participation in the next Monday's IBERGRID operational meeting is sent.
- If the problematic site continues unresponsive for more than 2 weeks, missed participation in 2 consecutive IBERGRID operational meetings without justification, and the problem continues unsolved, it reaches the second escalation step. Here, the site will be notified about the suspension procedure raised on it. Final decision about site's suspension will be taken on the next IBERGRID ROD meeting.

3.2.17 Serbia

The National operations team from the Institute of Physics Belgrade (IPB) is performing daily monitoring of NGI_AEGIS Grid sites using the deployed monitoring infrastructure (national NAGIOS instance coupled with MyEGI portal deployed at IPB, etc.). During the certification, all NGI_AEGIS certified sites have signed an SLA, based on the last EGEE SLA document and operations team monitors performance of all sites according to that document. The operations team is organized centrally by IPB, but, as NGI_AEGIS infrastructure keeps growing with new sites present in certification procedure, in perspective the distributed monitoring shifts will be organized, involving the personnel from other participating Serbian institutes. NGI_AEGIS operations team performs continuous monitoring of the infrastructure and handles first line support. As the first line of support, this team responds to all the issues reported via mailing list, NGI_AEGIS Helpdesk, and GGUS. Depending on the issue, the team either resolves the problem (if it is related to the local resources) or alarms responsible people with appropriate advices related to the problem.

3.2.18 Slovakia

NGI 1st line support is "on-duty" based and covered by three people. We use a pro-active mode of operation. On-duty supporter monitors status of sites using operational tools (NGI Nagios instance, Dashboard on Operational Portal, Gstat) and notifies sites when problem is detected. 1st line support performs all mandatory tasks that are listed in operational procedures manual.

There are no SLA's in place yet, we will follow EGI Operations Level Agreements when they will be finalized.

Escalations are handled according to escalation procedure defined in Operations Procedures Manual for Regional Operations.

3.2.19 Switzerland

First line support is done together with the ROD shifts, which again is done by the site administrators, jointly with NGI_DE. NGI manager is available for backup.

The Swiss NGI has the standard SLA in place.

Escalations are handled through the NGI manager.

3.2.20 Turkey

NGI_TR sites are operated centrally by the NGI_TR Operation Centre that is also responsible for managing national support activities. Whenever a problem has been reported to support unit, the problem is directly handled by the NGI_TR Operation Centre and resolved in a short time. If the







problem is related to network, hardware or operating system on the site, the NGI_TR Operation Centre is getting help from the local system administrator.

SLAs between NGI_TR and the universities where production sites have been installed were signed during EGEE project.







4 CONCLUSION

The main lesson to be learned from the exercise of writing the first edition of this milestone was that the EGI infrastructure was 'work in progress' at that point and that a lot of tools and workflows were not fully defined or implemented. One year later on and things have matured significantly, especially regarding the core project-wide tools and processes.

The list of support units in detailed in the EGI helpdesk system has been cleaned up and unused legacy support units have been decommissioned.

The technology support workflows have been defined and implemented in the EGI Technology Helpdesk, so far including the technology providers EMI, IGE and SAGA. This will continue to be extended to new providers and the workflows will be improved where need arises.

The community and application support activity has been very active in the first year of the project and has developed and put into production a set of tools covering various aspects of their field. The second year will see major efforts to integrate the helpdesk support more strongly into the community support processes through simple contact forms embedded in the EGI web pages.

A huge variety exists in complexity and readiness of the support infrastructures in the NGIs. Roughly half of the NGIs answered the request for input for this milestone. Approximately 3/4 of NGIs have gone through the NGI validation procedure and are therefore connected to EGI support infrastructure, at least by having a single support unit for the whole NGI established within GGUS. The NGI support infrastructures comprise the area of support that will take most time to mature. This is to be expected. There will continue to be differences in the sophistication of the support infrastructures between mature and new NGIs and between large and small NGIs. This constitutes no major problem as long as the support infrastructure serves the NGI properly and interfaces correctly with the central tools.

During the first year of the project it became clear that there was a strong need for having the capability to analyse the ticket data collected in the central helpdesk, to compile the data into statistics and metrics and to draw conclusions from those. The tool currently in place for this, the GGUS Report Generator, does not cover all the use cases collected so far. A consolidated list of requirements from the various user support activities is currently being compiled and will be used as the basis for an improved version of the Report Generator to be developed during the second year of the project.

Effort needs to be applied by the operations activity to finalise the NGI integration process. This means getting in touch with the NGIs yet to become part of the EGI production infrastructure and removing whatever obstacles are blocking them from joining.







5 REFERENCES

R 1	GGUS – Global Grid User Support, Provider of the EGI Helpdesk <u>http://www.ggus.eu</u>
R 2	Documentation collection on the GGUS portal https://www.ggus.eu/pages/documentation.php
R 3	EGI Request Tracker <u>http://rt.egi.eu</u>
R 4	EGI Application Database (AppDB) http://appdb.egi.eu
R 5	EGI Training Marketplace http://www.egi.eu/user-support/training_marketplace
R 6	EGI Technology Helpdesk <u>www.ggus.eu/tech</u>
R 7	List of EGI Network Support tools http://net.egi.eu
R 8	Polish NGI helpdesk http://helpdesk.plgrid.pl
R 9	Serbian NGI helpdesk https://helpdesk.aegis.rs
R 10	Swiss NGI helpdesk https://xgus.ggus.eu/ngi_ch
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