**EGI-InSPIRE**

User Support Metrics

**EU MILESTONE: MS307**

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| Abstract  The European Grid Infrastructure community operates a complex network of support services in order to serve its multi-national user communities. Understanding the roles of the various support elements within the global context is already a big challenge. Defining viable metrics to monitor their operation, impact and costs of support activities is an even bigger problem. However, measuring the performance of these elements as well as of the global “EGI user support function” is necessary in order to optimise resource usage and maximise consumers’ satisfaction. The document aims to collect the metrics that are required to monitor EGI user support processes to understand the performance and impact of the support teams as part of the project’s quality assurance process. While it is clear that many of these metrics are very difficult to measure, the project needs to have an understanding of what is needed in order to drive support activities towards a sustainable structure. |

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1. 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.

1. 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:  
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This document is the second version of four milestone documents to be produced by the EGI-InSPIRE project about User Support Metrics: MS304, MS307, MS310, MS313. The next two documents will be produced in project month 27 and 39.

1. Terminology

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

1. 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 high-throughput 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 European Strategy Forum on Research Infrastructures (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.

1. EXECUTIVE SUMMARY

The European Grid Infrastructure community operates a complex network of support services in order to serve its multi-national user communities. Understanding the roles of the various support elements within the global context is already a big challenge. Defining viable metrics to monitor their operation, impact and costs of support activities is an even bigger problem. However, measuring the performance of these elements as well as of the global “EGI user support function” is necessary in order to optimise resource usage and maximise consumers’ satisfaction. The document aims to collect the metrics that are required to monitor EGI user support processes to understand the performance and impact of the support teams as part of the project’s quality assurance process. While it is clear that many of these metrics are very difficult to measure, the project needs to have an understanding of what is needed in order to drive support activities towards a sustainable structure.

The project already collects a large number of metrics on a quarterly basis to monitor progress and impact of the various activities. Twenty-two out of these metrics are relevant for user support and provide information about various aspects of support activities and impact achieved within the communities. Moreover, the reporting tools inside the EGI Helpdesk [R5], the Metrics Portal [R6] and the Applications Database [R7] provides additional sets of matrices to monitor support cases and support usage. The Google Analytics service, which is configured to all the user-facing services in EGI-InSPIRE captures important statistics about web visits.

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# Introduction

The stated goal of EGI is to provide significant added value for existing and new user communities. The growing user demands have provided, and will continue to provide, the necessary push for development and extension of the grid infrastructure. Therefore, the active support for these communities is a primary concern for the EGI.eu / NGI ecosystem as the users are the raison d’être of the grid [R1].

The four year long EGI-InSPIRE project drives the transition of the European Grid Infrastructure to a sustainable service which is independent from project cycles. An important part of this work is establishing sustainable user support processes without introducing radical changes that would make the existing users turn to other solutions. The transition of EGI to a sustainable structure already started. The relevant elements of this transition in the current context are:

* the original Regional Operations Centres (ROCs) are being gradually replaced by an increasing number of self-sustainable NGI’s Operations Centres, and
* the previously project based and centralised user support services are gradually taken over by self-sustainable NGI user support teams and the user communities themselves.

EGI is expected to attract research communities of different sizes, backgrounds and scopes. For this reason the user support activities within EGI must act as a bridge that allow heterogeneous, multi-national communities to reach infrastructure services and then become confident and sustainable users of these services. The bridge assures that the people who made contact with EGI perhaps through its dissemination activity, reading the EGI newsletters, being present at EGI related events, visiting the EGI Web page, etc. are continuously supported up to the point when they are confident users of the infrastructure and are members of one of the self-sustainable EGI user communities.

The main providers of user support processes are the NGIs. NGI user support teams provide consultancy through the EGI Helpdesk and face to face support that can include various other things, such as training, application access, application porting, portal development, documentation, VO setup, testing. (The complete list of services with descriptions is available in D3.1 [R8]) Because the skills, the focus and the interest of NGIs can be different from each other, EGI users can receive different support in the different EGI member countries. Meanwhile the EGI Helpdesk can integrate and uniformise support across countries, some of the services require face to face interaction with experts or trainers and cannot be given through the Helpdesk.

Besides receiving support from NGIs, the members of the largest scientific EGI user communities receive specialised, discipline-specific support from their scientific VOs or VRCs. While most of these specialised support activities are delivered through the EGI Helpdesk, some are provided through domain specific helpdesks or face to face interactions outside of EGI.

As an integrated part of user support processes, EGI must capture feedback, experiences, success stories failures and metrics. The captured information must be stored, analysed and then fed back to the EGI-InSPIRE project and into the larger EGI collaboration, where the various activities can use this knowledge to improve services, operations and impact.

This document aims to collect the metrics that are required to optimise the user support processes of EGI and to monitor the performance of the support teams as part of the project’s quality assurance process. Because some of these support activities are delivered outside of the EGI Helpdesk, capturing the required metrics to measure their performance is impossible. However, the project needs to have a clear understanding on what metrics are required in order to steer support processes towards a more measurable and sustainable structure. The metrics that are collected by the project in the second project year (May 2011 – April 2012) are introduced in the “D1.5 - Quality Plan and Project Metrics” document [R4]. The metrics collected by and discussed within this document is a superset of these. The goal is to collect and discuss all the metrics and strategies that the EGI collaboration needs to collect and understand support services, their utilisation and cost.

# METRICS

The EGEE and the ETICS projects defined and implemented various practices to measure the performance of support activities [R1][R2][R3]. The metrics that they used can be classified into the following groups:

* SLA (Service Level Agreement) related metrics to describe the common helpdesk performance
* End user satisfaction related metrics collected with surveys
* Efficiency metrics to discover the relationship between helpdesk operating costs and performance
* Metrics related to user follow-up activities (cross-subtasks metrics)
* Direct feedback from training events, collected from trainees and trainers

EGI-InSPIRE is a more complex project than EGEE or ETICS was. Moreover, it is embedded into a different environment, where many of the support activities are delivered to users outside of tools that EGI-InSPIRE delivers and monitors. EGI delivers and monitors support tools such as the Helpdesk, Training Marketplace, Application Database, VO Specific SAM, etc. Several NGIs and VRCs use local support tools and mechanisms that are not monitored by EGI-InSPIRE and sometimes are not integrated into the EGI support structure.

In order to build up a comprehensive understanding of the performance and resource usage of EGI user support processes, and to optimise performance and cost of these processes the collaboration needs to requires the following four types of metrics:

1. User satisfaction metrics – What support experience do users have?
2. Support performance metrics – How well are the support services operate?
3. Impact metrics – How much impact does EGI support processes have on user communities?
4. Correlation between other metrics – What happens if we change support services?

These four types of metrics are described in the next three subsections.

## User satisfaction metrics

Metrics from this category can help us answer the question “How satisfied are the users with the current support mechanisms?”. Because support is delivered to users via different channels, measuring satisfaction also requires different mechanisms:

1. Monitoring satisfaction through the EGI helpdesk. This approach can provide data about support cases that was managed through the EGI Helpdesk. A form – integrated into the helpdesk user interface – could be used to capture the data. Information about individual support cases, about cases of a specific support unit or of the whole EGI Helpdesk would be possible with this method.
2. Capturing users’ satisfaction with surveys. Surveys could work for any support case whether it is managed inside or outside of the EGI Helpdesk. If the same survey is used across all the national or discipline-specific support teams, then the data can be integrated and compared at EGI level.
3. Ratings given by those who used any of the support services is only one side of the coin. There may be persons who did not use EGI support because, for example they do not need support or were not satisfied with some EGI mechanism in the past. Because identifying and contacting these persons is very difficult, this type of feedback is the hardest to capture.

The ratings given for support cases (type 1 and 2) should be weighted and merged with the metrics given by those who do not use EGI support (type 3) in order to get the full picture of user satisfaction.

## Support performance metrics

The second set of metrics aim at answering the question “How do the support services perform?”. Performance can be defined in various ways. The relevant definitions for EGI User Support activities are:

1. Solution time: low long does it take to close a support case? Meanwhile this metric can be easily captured for support cases that are managed by the EGI Helpdesk, defining a start and end date of support cases outside of helpdesks can be complicated and ambiguous.
2. Success rate: how many percent of the *closed* support cases were actually successful? (Provided acceptable solution for the client). Capturing this metric requires carefully designed follow up processes because the question whether a solution is suitable for a client or not can be sometimes answered weeks or month after the support case is closed.
3. Cost: how much does it cost to solve a case? Depending on the type of the case various cost factors must be included: salaries of support experts, operational cost of software services (for example the Helpdesk); spending on new software, hardware and human resources to solve the case.

## Impact metrics

The first set of metrics can describe how users receive the support they get from EGI. The second category provides information on how support services perform. This third category of metrics can inform the community about the impact that is achieved *within the user communities* by the support they received from EGI. What technological or scientific achievements were accomplished within the user communities because EGI(-InSPIRE) was there? Measuring the impact of grid project is a very difficult task because the services delivered by EGI are integrated into complex scientific processed within the user communities. Identifying “the EGI part” of these processes is usually impossible. Moreover, many of these processes are long lasting, so the real impact of EGI can be observed and recognised only after years, sometimes after decades. The complexities of measuring impacts of e-Infrastructure projects is studied by the ERINA+ EC project. EGI-InSPIRE supports ERINA+ in developing methods that can measure impact of a the European Grid Infrastructure and can be implemented at the scale of 50 partners.

## Correlation between other metrics

Meanwhile the previously described metrics can describe the current performance of support processes (Section 2.2) and their impact on the user community (Section 2.1 and Section 2.3), they do not provide information on how the values depend from each other, what happens if one metrics is changed. Efforts that aim at optimising resource usage and users’ satisfaction in EGI can be carried out responsible only, if the correlation between performance metrics and between performance and user satisfaction metrics are known. These correlation metrics could answer complex questions, such as:

* How would the users’ satisfaction change if solution time for support case type X gets longer by Y percent?
* How would the solution cost increase for support case type X if solution time gets shorter by Y percent?
* How would operation cost change if we redirect tickets from support unit Y to support unit Z?
* What effect would the redirection of tickets from unit Y to unit Z would have on the cost of solving a ticket in Z?

Identifying the correlation among the different processes and capturing these by a set of metrics is extremely difficult not only because the correlation functions are complex, but also because:

* Many of the support types do not have enough cases, some support units in the EGI Helpdesk do not have long enough history to recognise correlations.
* Some support mechanisms are operating under fix circumstances and with fix parameters so we simply do not have information to know “what happens if X or Y” is changed in the support mechanism.
* Many support services are operated and delivered outside of the EGI Helpdesk and collecting objective statistics about these is very hard, sometimes impossible. (e.g. Would EGI have more users if NGI X delivers twice as many training events?)

# current status

Many of the above described metrics are difficult or impossible to capture in a uniform way across the EGI community, or members of the EGI-InSPIRE project. At the same time the project as well as the user facing activities (particularly the NA3 and SA3 activities) must capture metrics to understand performance and impact of user support activities. These metrics are defined for the project at an activity and project level in an annually updated series of deliverables (D1.1 for project year 1; D1.5 for year 2; D1.9 for year 3; D1.13 for year 4). These project and activity metrics are used to

* monitor progress towards project objectives. These metrics have targets.
* monitor the work of the different activities
* monitor the work of national operational infrastructures (NGIs)
* monitor the work of Virtual Research Communities

The metrics defined in these documents are measured by through manual and automatic means and are reported on a quarterly basis in EGI-InSPIRE Quarterly Reports. Many of the project and activity metrics require inputs from several different NGIs each quarter, and gathering these is a complicated and time consuming process. During project year 2, the Quality team investigates with SA1 and JRA1, mechanisms for gathering as many of these metrics through an updated metrics portal as possible, rather than gathering them manually.

Meanwhile user support services are provided by and through the NA3 work package, metrics that relate to user support processes (satisfaction, performance, impact) are reported by other work packages as well. These metrics are summarised in Table 1 below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Metric ID** | **Metric** | **Public / Internal** | **Task** | **Comments/**  **Explanation** |
| M.NA2.5 | Number of papers published by users of EGI | P | TNA2.2 | Contributed from each NGI and each VRC |
| M.NA2.11 | Number of MoUs or agreements established with collaborating Virtual Research Communities (VRCs) | P | TNA2.3 & TNA3.1 | Demonstrates the EGI capability to engage a diversified number of user communities engaged in using EGI’s service |
| M.NA3.1 | Number of GGUS tickets CREATED (grouped by submitting community – where available) | P | TNA3.2/3 | EGI Helpdesk Statistics |
| M.NA3.2 | Average and Median Solution time to resolve tickets | P | TNA3.3 | EGI Helpdesk Statistics |
| M.NA3.3 | Uptime of User Support websites:   * Training * Application Database * VO Support Services | P | TNA3.4 | Nagios |
| M.NA3.4 | Visitors to User Support websites:   * Training * Application Database * VO Support Services | P | TNA3.4 | Google Analytics |
| M.NA3.5 | Number of VO Support Services | P | TNA3.4 | Total number |
| M.NA3.6 | Number of Applications in the AppDB | P | TNA3.4/3 | Recorded by NGI |
| M.NA3.7 | Number of Training Days delivered through NGI Training events | P | TNA3.4/3 | Recorded by NGI |
| M.NA3.8 | Number of:   * New/decommissioned VOs * Low/Medium/High Activity VOs * international VOs | P | TNA3.1 | An international VO is one that has a scope beyond a single country. (See registration portal.) VO Activity measured by Accounting Portal[[1]](#footnote-1). |
| M.NA3.9 | Number of users (grouped by community and VO) |  | TNA3.1 | Statistics from the VO registration portal. |
| M.SA1.Support.1 | Overall average number of GGUS tickets in EGI per month CREATED | P | TSA1.7 | GGUS reporting tool |
| M.SA1.Support.2 | Average/Median monthly ticket solution time (hours) | P | TSA1.7 | GGUS reporting tool |
| M.SA1.Support.3 | Assigned ticket monthly Average RESPONSE TIME (hours) | I | TSA1.7 | Tool: GGUS reporting tool |
| M.SA1.Support.4 | Number of tickets SOLVED by TPM (1st line support) | I | TSA1.7 | Tool: GGUS reporting tool |
| M.SA1.Support.5 | Average-Median ticket assignment time by TPM (1st line support) per month (hours) | I | TSA1.7 | Tool: operations dashboard |
| M.SA2.11 | Number of tickets assigned to DMSU | P | TSA2.5 | Demonstrates use of DMSU |
| M.SA2.12 | Mean time to resolve DMSU tickets | P | TSA2.5 | Demonstrates effectiveness of DMSU for resolving tickets |
| M.SA3.13 | Number of MPI support tickets | P | TSA3.2.5 | Total numbers |
| M.SA3.14 | Mean time to resolve MPI support tickets | P | TSA3.2.5 | Measured in days |
| M.SA3.15 | Number of HEP VO support tickets | P | TSA3.3 | We can sum the number of tickets where the concerned VO = ATLAS, ALICE, CMS or LHCb during the quarter. |
| M.SA3.16 | Mean time to resolution of HEP VO alarm tickets | P | TSA3.3 | Time in days |

# conclusions

The metrics discussed in the document could help EGI stakeholders to build up an understanding on the efficiency and success of their support services, and can support EGI to move towards a cheaper yet more efficient support model. Unfortunately, many of the metrics that are required for this are very difficult to measure in the complex landscape of EGI unless there is a strong commitment from the NGIs’ side. The EGI council, and through the council the EGI-InSPIRE Project Management Board should identify priorities concerning capturing metrics. This may happen in the near future after the written feedback from the first year project review is received from the European Commission.

The project already collects a large number of metrics on a quarterly basis to monitor progress and impact of the various activities. Twenty-two out of these metrics are relevant for user support and provide information about various aspects of support activities and impact achieved within the communities. Moreover, the reporting tool inside the EGI Helpdesk [R5], the Metrics Portal [R6] and the Applications Database [R7] provides additional sets of matrices to monitor support cases and support usage. The Google Analytics service, which is configured to all the user-facing services in EGI-InSPIRE captures important statistics about web visits.

Collecting all of the metrics described here would not be viable for economic and technical reasons. Setting up tools that can collect the metrics is not a viable option either. Consequently, this document aims to initiate discussion between the stakeholders of EGI on metrics that should be collected by the project in order to have a clear picture of the efficiency of user services and on the technology that enables the project to collect these matrices. This is an on-going process and will be reported in the next versions of this milestone document in project month 27 and 39.

# References

|  |  |
| --- | --- |
| R 1 | ACTIVITY QUALITY ASSURANCE AND MEASUREMENT PLAN, MILESTONE: MSA1.3 (EGEE-III)  <https://edms.cern.ch/file/926921/3.0/EGEE-III-MSA1_3-926921-v1_2.pdf> |
| R 2 | USER SUPPORT PROCEDURES EUDELIVERABLE: DSA2.1 (ETICS-2)  <http://etics.web.cern.ch/etics/deliverables/ETICS-DSA2.1-927479-User_Support-v1.0.pdf> |
| R 3 | ACTIVITY QUALITY AND MEASUREMENT PLAN, MILESTONE MNA3.1 (EGEE-III)  <https://edms.cern.ch/file/926608/1/EGEE-III-MNA3-1-ActivityQAplan-v3-0.pdf> |
| R 4 | D1.5 - Quality Plan and Project Metrics (for project year 2)  <https://documents.egi.eu/document/436> |
| R 5 | EGI Helpdesk metrics reporting page:  <https://ggus.eu/pages/metrics/download_metrics_reports.php> |
| R 6 | EGI Metrics Portal:  <https://metrics.egi.eu> |
| R 7 | EGI Applications Database:  <http://appdb.egi.eu> |
| R 8 | D3.1 User Community Support Process:  <https://documents.egi.eu/document/106> |

1. <http://accounting.egi.eu/gridsite/accounting/CESGA/egee_view.php>. [↑](#footnote-ref-1)