EGI-InSPIRE

NGI INTERNATIONAL TASK REVIEW

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Abstract

The National Grid Infrastructures (NGIs) undertake a number of specific tasks within EGI that interface with the central coordination provided by EGI.eu. This report provides a self-assessment of the current services from an NGI perspective. The individual contributions provided by the NGIs are analysed and summarised in this report. Each service follows a standardised structure to include a service description, service assessment, and an aggregated score.

I. COPYRIGHT NOTICE

II. DELIVERY SLIP

	Name	Partner/Activity	Date
From	Steven Newhouse	EGI.eu/NA1	28/3/2013
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III. DOCUMENT LOG

Issue	Date	Comment	Author/Partner
ToC	07/02/2013	Table of Contents	Sy Holsinger/EGI.eu
1	08/02/2013	Task descriptions added	Sy Holsinger/EGI.eu
2	26/02/2013	NGI assessments and scores added	Sy Holsinger/EGI.eu
3	27/03/2013	Managerial assessment provided	Sy Holsinger/EGI.eu, et al.
4	28/03/2013	Executive Summary and Conclusions added; Final edits ready for external review	Sy Holsinger/EGI.eu
5	18/04/2013	Updated version from AMB review	Sy Holsinger/EGI.eu, et al.

IV. 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: https://wiki.egi.eu/wiki/Procedures

VI. TERMINOLOGY

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

VII. 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 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.

VIII. EXECUTIVE SUMMARY

The National Grid Infrastructures (NGIs) undertake a number of specific tasks within EGI that interface with the central coordination provided by EGI.eu. This report provides a self-assessment of the current services from an NGI perspective and an analysis and summary of the individual contributions provided by the NGIs. Each service follows a standardised structure to include a service description, service assessment, aggregated score, suggestions for improvement, and considerations regarding the continuation or service impact at the end of EGI-InSPIRE.

Community engagement has been developed through the NGI International Liaisons (NILs) structure, which has now been established and integrated with the national activities in most of the EGI countries. NILs are key communication hubs for community outreach and various planning activities. Both EGI.eu and the NGIs see the NIL structure as a good way of organising communication for non-technical activities within the community. This includes the Virtual Team (VT) framework that is proving to be an effective vehicle for taking the needs of specific parts of the community forwards and turning ideas and requirements into real solutions. Nevertheless, there have been times when EGI.eu has had to step out and play a proactive role in driving the VTs and their projects forward towards a conclusion.

The NGI activities around operations and user support, while differently organised and in scale, have all reached a very good level of maturity in PY3. These are internally managed involving local user communities and Resource Centre administrators through periodic meetings, workshops, national training programmes, and documentation and are facilitated by a number of local support tools. NGI participation to operations meetings and the OMB is very good, and the NGIs have been effectively contributing to the EGI operations roadmap and its implementation at a national level.

The NGI's integration with EGI's Core Infrastructure Platform for monitoring, accounting and the implementation of a distributed helpdesk system are functioning well. In PY3, the service monitoring framework was expanded to include operational tools, and the service level management procedures were extended to include the NGI and EGI.eu core operations services. These support systems are necessary to extend the existing quality control procedures to NGI technical and operations services. This action is part of the roadmap for PY4 and will allow for a further improvement of the service level delivered by NGIs. The quality levels delivered by services under the technical responsibility of NGIs are already very good on average, while further improvement is still needed for the technical services that are provided at the Resource Centre level especially in new emerging NGIs. In PY3, these were affected by a major upgrade campaign from the gLite middleware distribution to EMI, which required the re-installation of software across a large fraction of the infrastructure.

The sustainability of the current level of service guaranteed by operations is an area of concern for many NGIs. During PY3, two operations centres closed due to lack of financial sustainability: Ireland and Iniciativa de Grid de America Latina – Caribe (IGALC), whose operations were sustained by the EC project GISELA. A significant fraction of NGIs still need to secure national funding to compensate for the end of EGI-InSPIRE after April 2014. A lack of funding will likely cause degradation in performance with services provided on a best effort service basis or will be re-scoped and/or reduced.

Overall, many of the services were assessed with high quality including areas for improvement. This report will be taken into consideration by activity managers for PY4 planning.

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1 INTRODUCTION

This report provides an assessment of the NGI International Tasks that take place within the EGI-InSPIRE project and the services provided by the NGIs.

The NGIs were asked to use the following scoring scheme to assign numerical scores to their own services on the basis of the overall level of satisfaction judged by the service provider:

- 0 = not applicable
- 1 = An unacceptable level of service was delivered
- 2= A level of service that was below expectations was delivered
- 3= An acceptable service level has been delivered
- 4= A level of service that exceeded expectations was delivered, but there is scope for even further improvement.
- 5= An excellent service has been delivered that should be considered as best practice

A managerial assessment of these scores was also provided. A summary of the individual NGI scores and non-respondent NGIs are also provided.

The report concludes with a brief conclusions section.

2 COMMUNITY ENGAGEMENT

2.1 NGI International Liaison

Description: The role of the NGI International Liaisons (NILs) [R1] is new to the non-operational activities in EGI, but replicates a similar model that has proven to be successful in the EGI operations community. It recognises the complexity and diversity of individual NGIs yet the need for each NGI to be encapsulated through a management structure for the purpose of providing consistent and integrated European wide activity. It is not necessarily the role of the NILs to undertake any of the following tasks, but instead to make sure the appropriate individuals or teams within the NGI respond to any particular non-operational issue or activity that is requested. These issues or activity may include matters of policy, strategy, dissemination, training, outreach, events, etc. but will have a focus around new communities and sustainability. One of the key functions of the NIL is to identify technical expertise within an individual NGI that can be brought to tackle issues of importance to the EGI community as a whole.

Assessment: The NIL structure has now been established and has been integrated with the national activities in most of the EGI countries. NILs are key communication hubs for community outreach and various planning activities. Both EGI.eu and the NGIs see the NIL structure as a good way of organising communication for non-technical activities within the community.

EGI.eu improved the support for NILs during the recent 6 months. A monthly email dispatch (short, action-oriented newsletter) has been launched, and a dedicated person at EGI.eu provides coordination and monitoring services for the NILs. The dispatch is gaining momentum and is read by a growing number of NILs on a monthly basis. EGI.eu and the NGIs will need to make more effort in the next six month on improving the flow of communication from the NILs towards EGI.eu. This is very important in order to see the achievements that emerge at national outreach activities, and to make these achievements visible at the European level. Improved communication can be realised by hooking into the regular meetings that NILs have with their national peers. A regular WebEx teleconference routine is being established for to foster such communication and more proactive management with the NILs such that they have the opportunity to exchange experiences and to raise issues concerning Outreach and planning activities. EGI.eu will also increase the use of the PPT tool to monitor and get the outputs of the NILs' activities. NILs report their activities in TNA2.1N task within the PPT system on a monthly basis. At present this is has yet to gain consistency in the manner of reporting – this will be developed as part of the routine NIL teleconferences.

Several NGIs raised the need to sustain the NIL network beyond the EGI-InSPIRE project, and at the same time raised the issue of the lack of funding that is available for this. The EGI community should therefore identify funding sources to continue with the NIL network.

NGI Aggregate Score: 3.7 (Avg.) 4 (Median)

Suggestions for improvement:

- Portugal: People that have the expertise to assume the NIL role are already deeply involved in other fundamental tasks of the NGI or of the EGI-InSPIRE project. With such an accumulation of duties it is hard to keep staff motivated or to achieve goals in a timely manner.
- UK: Continue engagement with new communities, consider outreach event subject to funding availability.
- France: Improve the relationship among the NILs and build a team. They could learn from each other.[1]
- Macedonia: Attend more national conferences in order enlarge the community.
- Switzerland: Focus on fewer key communities and adapt the infrastructure to meet their requirements.
- Finland: Active contribution to new communities outreach.
- Italy: NILs should meet more often that just at the Forums. Maybe a good timing is every quarter after having filled the quarterly report, so that main NGI activities can be reported to the others and crosschecked with the information entered in the CRM and AppDB.

Continuation or service impact at the end of EGI-InSPIRE:

- Montenegro: After EGI-InSPIRE, will be provided on a national or regional scale.
- Portugal: Beyond EGI-InSPIRE the NIL model is not sustainable and does not fit well the structure and effort of all NGIs especially the smaller ones. Another model is needed.
- UK: Anything after EGI-InSPIRE will be driven by national priorities and funding opportunities.
- Denmark: The work will continue beyond EGI-InSPIRE, but at reduced effort.
- Romania: Best effort beyond EGI-InSPIRE.
- Bosnia and Herzegovina: After EGI-InSPIRE will be done on a smaller scale – regional.
- Serbia: Best effort beyond EGI-InSPIRE.
- France: Will try to keep this team alive beyond EGI-InSPIRE.
- Macedonia: Beyond EGI-InSPIRE, it will be harder to find funds for continuation of the activities.
- Switzerland: Will probably remain at national level (and more importantly, organised at national level).
- Italy: This activity is important to be continued after InSPIRE.

2.2 Distributed Competency Centre

Description: Distributed competency centres have been established across the NGIs by providing a web-based registry of human skills and technical assets that reside within the NGIs that can be accessed by the EGI community. The recorded skills and assets focus around the NA2 tasks of communication and marketing, strategic planning and policy support, community outreach and

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[1] Reply: This issue was identified at the NIL meeting at the EGI Community Forum. Mechanisms will be put in place (web conferences, social media, mailing lists, etc.) to improve the networking between NILs and EGI Champions.

technical outreach to new communities. Each NGI records the effort they contribute locally to activities undertaken as part of the EGI community in conjunction with the other NA2 tasks. Such activities include helping new communities with the integration of their applications into the infrastructure through exemplar 'proof of concepts' that could involve a workshop to establish community priorities (through TNA2.4), technical effort (porting new applications to the infrastructure, integrating the applications into portals, workflow engines or other services using effort contributed by the NGIs coordinated by TNA2.5), communication and marketing (using skills in TNA2.2) telling the target communities about this exemplar and possibly updating policies (from TNA2.3) to establish new modes of operation within the production infrastructure. This work is performed via a framework of distributed Virtual Teams (VTs) [R2] that undertake to progress small projects within a timeframe of 6 months or less. VT project progress monitoring has been set in place and is gaining momentum as it develops beyond a concept of supervision into one of providing assistance with using the EGI.eu services (WebEx, Indico, etc.) and project management advice (including templates for project initiation and reporting). Much remains yet to be done as these VTs have worked without proper allocation of resources and thus mechanisms to reward productivity have yet to be established. In particular, there is no means yet for measuring total effort delivered by any VT, meaning that this effort, which may be trivial or substantial, is invisible to the consuming and providing organisations.

Assessment: The VT framework is proving to be an effective vehicle for taking the needs of specific parts of the community forwards and turning ideas and requirements into real solutions. Nevertheless, there have been times when EGI.eu has had to step out and play a fairly proactive role the driving VTs and their projects forwards towards a conclusion. Not too surprisingly, experience confirms that success of a VT very much depends on the project leader. There are a number of VTs that report significant membership but close scrutiny reveals that active participation of the members is trivial, sometimes if at all. Participation needs to improve greatly and members need to commit time to proactive work rather than simply be ready to see the results of the project. A particular example is the case of the Environmental and Biodiversity VT, which has a large but inactive membership. This is an area that is under development and new procedures and support are put in place on a weekly basis as issues emerge. Template documents have been developed for Project Initiation and Final Project Reporting and these are already helping in the start up and concluding phases of VTs. Reviews of the reporting processes have also been performed and new procedures are being proposed.

The first VTs that really do outreach have not finished yet (B&E, CTA, CMMST, ELIXIR). Real value of the VTs can be seen only after these are over.

Proactive involvement with the VTs from start to finish and a growing catalogue of successful vs. unsuccessful projects, methods and support tools is starting to provide a good basis for 'best practices', which can be re-used for future VT projects.

NGI Aggregate Score: 3.9 (Avg.) 4 (Median)

Suggestions for improvement:

- UK: Improve knowledge/visibility of the UK NGI offerings. Undertake some exemplar projects (this is in the GridPP KE and Impact plan).
- Netherlands: VTs should be driven by goals and results rather than activity and progress.
- Portugal: Increase the visibility of the work performed by the VTs and its members. Provide a mechanism to guarantee the follow-up of the VT work after the VT end.
- France: VTs results and outcomes could probably be better and wider advertised (e.g. in the "dispatch" message to the NILs). The VT wiki page is more focused on the VTs progress than in the VTs results and outcomes. Dissemination of the outcomes could be improved with the help of the NILs and of the EGI.eu team.
- Switzerland: Have more focused activities with clear objectives aimed to extend the infrastructure to better serve the key communities targeted by NA2.1.
- Czech Republic: Motivate VT team members to be active (to evaluate quality of membership not quantity/the number of participation in the VT teams).
- Italy: Effort to this activity should be increased. Maybe we should start a phase of more technical, now most of them where focused on community building and requirements definition.

Continuation or service impact at the end of EGI-InSPIRE:

- UK: Management not dependent on EGI-InSPIRE.
- Romania: Best effort beyond EGI-InSPIRE.
- France: At least keep web pages with all participants' names and outcomes beyond EGI-InSPIRE.
- Switzerland: Will continue those activities that have a national impact beyond EGI-InSPIRE.
- Italy: This activity is important to be continued after EGI-InSPIRE.

3 OPERATIONS

3.1 NGI Activity Management

Description: NGIs are responsible for coordinating internal operational activities and user support activities in collaboration with the local Resource Centre managers and the local user communities. NGI operations participate to the OMB [R3] for coordination at the EGI level providing feedback, for contributing to the definition of the technical operations roadmap, for participating to surveys and reporting operational issues.

Assessment: NGI operations managers have effectively contributed to the definition and implementation at a national level of the EGI operations roadmap [R4]. Most of the operations managers from both NGIs and integrated infrastructures regularly participate to both the fortnightly operations meeting [R4] and the monthly OMB meetings (phone meetings and face to face meetings hosted by the EGI conferences) [R5] with attendance of 20 to 30 participants on average. Commitment in implementing the operations roadmap has been very successful in all NGIs and the OMB is considered by them a useful coordination function.

The NGI internal operations activities are organised differently depending on the scale of the national infrastructure to deliver effective management. Medium and large NGIs run internal operations management through regular meetings (weekly and monthly) in some cases also involving user communities, sub-project meetings, and national workshops and are supported by NGI collaborative tools (e.g. IBERGRID, NGI_IT, NGI_NL, NGI_UK).

In IBERGRID, the quality of NGI operations management is periodically assessed and scored very good results: this internal quality verification process is recommended to all NGIs.

During PY3, two operations centres terminated operations: NGI Ireland and IGALC – one of the two federated operations centres active in Latin America supported by the GISELA EC project [R6]. In both cases the end of operations was caused by financial sustainability problems. To mitigate this, international user communities supported by NGI Ireland were migrated to other partner NGIs, while part of the IGALC production resources centres were migrated to the other federated operations centre active in Latin America (ROC Latin America). Unfortunately during this transition part of the IGALC production Resource Centres that had not accomplished a sufficient level of maturity, were decommissioned.

NGI Aggregate Score: 4.0 (Avg.) 4 (Median)

Suggestions for improvement:

- France: More effort is needed locally to support inter-NGI collaborations.
- Portugal: The coordination with the WLCG operations activities should be improved.[2]

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[2]Reply: Better coordination structures were agreed in PY3: EGI operations regularly attend the fortnightly WLCG coordination activities and the status of UMD release/deployment regularly reported. A working group to gather WLCG feedback on software releases will be established and co-chaired by EGI. EGI already ensures regular attendance and actively contributes to WLCG Mgmt. Board and Grid Deployment Board. The EGI UCB mandate was improved in PQ11, and is now used by EGI user support activities to collect feedback from all user communities, including WLCG, about policy issues, technical plans and other operational areas.

Continuation or service impact at the end of EGI-InSPIRE:

- Bosnia and Herzegovina: In case of lack of EC funding after EGI-InSPIRE NGI operations management will be run on a smaller scale to just cater for operational and user support needs of national communities.
- Czech Republic: Continuation of this activity will be ensured after the end of EGI-InSPIRE.
- Germany: No funding is currently available to ensure the continuation of NGI operations coordination after EGI-InSPIRE.
- Italy: NGI operations coordination is considered a critical service to be continued at high priority after EGI-InSPIRE.
- Macedonia: No problems with the continuation of operations coordination are envisaged after the end of EGI-InSPIRE.
- Serbia: The costs of the NGI operations coordination services after EGI-InSPIRE will be likely supported by various national research projects.
- Netherlands: Continuation of NGI operations management will be ensured after EGI-InSPIRE.

3.2 A Secure Infrastructure

Description: The aim of this task is to address the various operational security-related risks and incidents, to contain incidents in order to maintain the availability of EGI services, to ensure a secure resource access to users and the enforcement of security policies at a national level. This task covers all aspects of security operations including security incident coordination at a national level, the execution of national Security Service Challenges to assess and foster the adoption security procedures by service administrators, the support to security vulnerability handling, training and the coordination with central EGI security operations.

Assessment: The overall score of NGI security operations is good. The level of maturity of national security operations is overall very good but can vary depending on the local availability of qualified experts. Because a good level of expertise is not always available, just a subset of NGIs currently contributes effort and support to EGI incident response activities. The level of NGI security operations varies from a basic level where just security contacts are made available with limited security qualifications, to a highly organised activities organised around a team of security experts that also contribute to EGI-wide security activities and liaises nationally with NREN CERT teams. Security operations can be affected by turnover of highly specialised personnel, such as in the case of NGI France. In NGIs with a high level of expertise (in particular the large NGIs who can rely on a larger pool of resources), national security operations are coordinated through bi-weekly meetings, regular security reviews are conduced, supported by security training events.

Multiple training events have been organised by EGI security operations in co-location with EGI conferences, the Asia Pacific International Symposium on Grid and Clouds 2013, and various grid schools organised nationally. These events were very well attended.

The availability of EGI security monitoring tools is considered to be highly beneficial to the infrastructure run nationally.

NGI Aggregate Score: 3.8 (Avg.) 4 (Median)

Suggestions for improvement:

- Bosnia and Herzegovina: NGI security operations would benefit from an EGI-wide knowledge base.
- Croatia: Nagios-based security monitoring should be strengthened by adding more security monitoring probes.
- UK: The NGI will concentrate effort on more training and awareness building beyond the core security team. Nationally effort will remain in place until at least 2015.

Continuation or service impact at the end of EGI-InSPIRE:

The availability of EGI security monitoring services and EGI security support activities (training, incident response coordination, advisories, software vulnerability assessment etc.) are considered necessary by various NGIs to ensure the good working of national security operations.

- Bosnia and Herzegovina: In case of no EC support after EGI-InSPIRE, NGI security operations will be continued locally without guaranteed coordination with European-wide activities of EGI.
- Denmark: NGI security operations will be discontinued in case of no funding after EGI-InSPIRE.
- IBERGRID: The continuation of support of EGI security monitoring tools is considered critical.
- Romania: NGI security operations will be provided on a best-effort basis in case of no continuation of EC funding after EGI-InSPIRE.
- Netherlands: Continuity of NGI security operations is guaranteed after EGI-InSPIRE.
- UK: NGI security operations will rely on national funding, which is currently secured until at least 2015.

3.3 *Software verification*

Description: This task ensures that new software releases (for operational tools, and global and site services) are deployed safely and reliably without any degradation of service to the production grid infrastructure, and while maintaining interoperability with other grids infrastructures. This is achieved through a managed staged rollout of middleware and operational tools. In collaboration with NGIs and end-user communities new software releases are deployed to build operational and user experience.

Assessment: Software verification is rated by user communities as one of the most important operations services of EGI, which complements existing software certification activities carried out by the Technology Providers, ensuring that software is also testing in a production environment. The importance of this service will likely grow in PY4 with the end of coordinated software quality

assurance services currently provided by EMI and IGE. The continuation of software verification coordination provided by EGI is considered to be very important.

The participation of expert resource centres to software verification activities has been continuously growing during PY3 and ensured the staged rollout of an increasing set of products (gLite, EMI 1 and 2, IGE). Most of the effort contributed by NGIs through expert site managers is currently unfunded in EGI-InSPIRE, and leverages on the availability of local experts that participate to testing activities, which is higher in large NGIs. The participation to early adoption varies greatly with the maturity of an NGI and the availability of local expertise. The availability of clear support tools like RT and procedures guiding early adoption activities is well rated by NGIs.

NGI Aggregate Score: 3.6 (Avg.) 4 (Median)

Suggestions for improvement:

- France: More participation will be sought for nationally.
- IBERGRID, Italy and Serbia: Software verification would benefit from larger participation especially when major releases are being prepared.
- Switzerland: A simplification of the repository structure and the adherence to Linux distribution procedures is recommended where possible.
- Italy and UK: Ensure that early adoption activities are targeted to virtual research environments of both large and small user communities, and that rollout is completed quickly. With the absence of Technology Provider coordination after April 2013, an EGI body is needed to coordinate UMD release activities.[3]

Continuation or service impact at the end of EGI-InSPIRE:

- Czech Republic: Participation to software verification after EGI-InSPIRE is guaranteed.
- Croatia: Participation to software verification will continue after EGI-InSPIRE.
- Georgia: In order to ensure the continuation of this activity at a Resource Centre level, more financial support is needed nationally and from the EC, as software verification is a service that EGI provides through NGIs for the benefit of all European e-Infrastructures and interested users of the software.
- Germany: Participation to software verification will depend on the availability of local funding, which is currently not secured.

3.4 EGI Core Infrastructure Platform

Description: The purpose of this task is the provisioning of a set of services for Grid operations consisting of a set of services and tools needed by the NGI/EIRO Operations Centres for the daily running of the national infrastructures. This includes monitoring, service level management and reporting, the operations portal functional modules, the message broker network, the operations portal, and the service registry (GOCDB).

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[3] Reply: EGI will establish a UMD release team for coordination of EGI software verification and technology providers. A ToR is being finalised. UMD releases will be provided at a lower frequency (quarterly). Experience with the production infrastructure demonstrates that Resource Centres need fewer but more stable software releases.

Assessment: The EGI Core Infrastructure Platform was operated reliably in PY3, and is considered to be a critical service to be continued after EGI-InSPIRE. Two components of this platform – monitoring and accounting – are completely distributed and rely on the availability of nationally deployed software components/services, which require the periodic update at a national level whenever new Service Availability Monitoring (SAM) software versions and new accounting publishers supporting new resources or interfaces, are released. NGIs proactively deploy new software and participated to the campaign for the publishing of user DN information in usage accounting records, which is a pre-requisite for the implementation of inter-NGI usage reports.

The deployment of national accounting database will be possible starting from PY4 thanks to the availability of a regional package of the APEL database (currently only run centrally by EGI). Several NGIs are already collaborating with the APEL team for testing.

While monitoring and accounting are now fully established as distributed infrastructures, in PY3 GOCDB and the Operations Portal have been evolving into fully centralised tools, due the availability of new GOCDB features like service scoping allowing the coexistence of multiple e-Infrastructure registries in a single service instance, of NGI and site-specific view in the Operations Portal. Both GOCDB and the Operations Portal central instances demonstrated to scale well with the growing number of Operations Centres supported thanks to software re-engineering work completed in JRA1.

NGI Aggregate Score: 3.7 (Avg.) 4 (Median)

Suggestions for improvement:

- IBERGRID: More expertise is needed for the operation of highly available critical services within the region. Fault tolerance and high availability mechanisms need extensions and enhancements.
- Italy and Switzerland: NGI core services would benefit from a federated cloud deployment model (for both international and small national collaboration). The automation of the provisioning of core Grid service using an IaaS infrastructure is recommended. Better distribution of core services in order to optimise the management effort. It is important to assess the number of core services needed in the whole infrastructure in order to optimise the management effort and minimise the costs.[4]
- UK: The deployment of network monitoring and troubleshooting is considered necessary especially to support large international research infrastructures like WLCG.[5]

Continuation or service impact at the end of EGI-InSPIRE:

- Croatia and The Netherlands: The deployment of the NGI components of the EGI Core Infrastructure Platform will be ensured after EGI-InSPIRE.

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[4] Reply: This action will be included in the PY4 activity plan.

[5] Reply: EGI-InSPIRE has been providing support and training in a number of network tools since the beginning of EGI-InSPIRE. Through the establishment of an agreement with DANTE, the main tool – PerfSONAR MDM – will be directly supported by DANTE. Collaboration with NRENs and EduPERT is being established to establish synergies and leverage on existing community expertise.

- Georgia: More national and EC funding is deemed necessary to ensure the continuation of the deployment of the national components necessary for the implementation of the EGI Core Infrastructure Platform.
- Denmark and Serbia: The running of the national operational tools will be supported by national funding.
- Germany: Funding for the continuation of this services after EGI-InSPIRE is still to be secured.
- Romania: The deployment of the NGI components of the EGI Core Infrastructure Platform will be ensured after EGI-InSPIRE only on a best effort basis.
- UK: Software development of the operational tools needs to be sustained after EGI-InSPIRE to ensure continued innovation.

3.5 Accounting

Description: This task provides a reliable record of the usage of the infrastructure for users, VOs, NGI and EGI management. Access to data is restricted according to agreed policies and NGI/EIRO privacy laws. Overall, this task provides: securely and reliably run accounting repositories for EGI, and if desired at the NGI-level; a portal to provide on-demand visualisation and/or data downloads. In PY3 this service has been significantly evolving from a compute-centric approach, to a service encompassing multiple types of resource: virtual machines, MPI jobs and storage. The accounting of these additional resource types will be gradually moved into production in PY4.

Assessment: NGIs have proactively maintaining the national accounting infrastructure ensuring that Resource Centres publish User DNs when local policies allow. A limited set of NGIs is currently deploying a national accounting infrastructure including a national persistent repository and a portal; this set is expected to expand in PY4 with the availability of a regional APEL database package. Part of the NGIs are expected to continue to rely on a EGI central database for their national accounting activities, especially when running a national database is considered to be an overhead compared to the size of the national infrastructure. Not all NGIs have national procedures for the auditing of accounting data that is published; periodic auditing should be established as best practice in more NGIs. The complete accounting of usage in case of Resource Centres deploying multiple middleware stacks is currently not possible and is affecting NGIs supporting multiple middleware stacks like Poland and Switzerland. The problem is known and the APEL team is working on it.

Accounting is deemed to be a fundamental service per se, and as a support system for the establishment of pay per use business models.

NGI Aggregate Score: 3.4 (Avg.) 3 (Median)

Suggestions for improvement:

- Bosnia and Herzegovina, Serbia: Anonymisation of private data in usage records should be made possible in accounting publishers to circumvent local policy issues.

- Italy: The extension of accounting to new resources like cloud, storage and network capacity is desirable.[6]
- Netherlands: The GUI and the user friendliness of the central accounting portal should be improved.
- UK: Periodic validation of accounting records is necessary to ensure accuracy.

Continuation or service impact at the end of EGI-InSPIRE:

- Croatia: The continuity of the accounting infrastructure provisioning is guaranteed after EGI-InSPIRE.
- Germany: No compensating funding secured for after EGI-InSPIRE.
- Georgia: More funding is needed nationally and at an EC level.
- Serbia and Switzerland: The national accounting infrastructure will be operated on a best effort basis after EGI-InSPIRE in case of no compensating funding is procured.

3.6 Helpdesk Infrastructure

Description: This task is linked to the central EGI Helpdesk available to all NGIs and related support projects. NGIs integrate their own national helpdesk into EGIs through an agreed interface or use the EGI Helpdesk remotely. Standard procedures for handling tickets, passing them between helpdesks, ensuring software support, monitoring and escalating them are established.

Assessment: Various NGIs are deploying a national incident management tool that is fully integrated with GGUS, by doing so EGI can provide a distributed helpdesk with a single interface. The distributed helpdesk infrastructure has been running reliably in PY3 ensuring the availability of a high quality support system, and GGUS is a critical service of EGI according to the NGIs.

The adoption of a national incident management system particularly suits NGIs with a large number of Resource Centres. On the other hand, many medium-small NGIs are currently just relying on the availability of a GGUS support unit, and assignment of tickets to sites is performed manually. With the exception of CERN, which adopted SNOW as support system whose integration required adaptation of GGUS, the NGI helpdesk infrastructure has been stable and working reliably as production service.

The UK has internal procedures to periodically review the status of local tickets. The adoption of these procedures is recommended to all NGIs to avoid ticket stagnation. Similar ticket monitoring procedures are established centrally at a GGUS level, and this process will be increasingly automated in GGUS during PY4.

The continuation of the EGI helpdesk is considered to be critical, and the provisioning of NGI-level support units in GGUS will mitigate possible reductions in NGI funding which may require the discontinuation of the NGI helpdesk instances.

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[6] Reply: Cloud and storage accounting are planned to become production services in PY4. Few NGIs supported the requirement of network accounting in EGI, so this is not currently part of the JRA1 development plans.

NGI Aggregate Score: 4.3 (Avg.) 4 (Median)

Suggestions for improvement:

- Czech Republic: Better testing procedures should be established to verify the interoperation of GGUS with the national helpdesks when new GGUS releases are to be released.
- Serbia: Several support units are providing slow response to tickets.[7]

Continuation or service impact at the end of EGI-InSPIRE:

- Czech Republic: The operation of a national helpdesk integrated with GGUS will continue after EGI-InSPIRE.
- Switzerland: Support to small VOs by the Swiss NGI may be affected; this will depend on the availability of NGI resources for support activities.

3.7 Support Teams

Description: This task brings together the various teams of people handling support issues for users and Resource Centre administrators at NGI level, like the Regional Operator on-Duty teams. NGI support is complemented by first, second and third level support provided by EGI.eu provided through GGUS.

Assessment: NGI support activities are generally well established and effective being complemented by training programmes and documentation (both at EGI level and national level), and quality assurance processes are in place for operations support activities through the operations portal to ensure that tickets are handled in a timely manner by NGI supporters [R7]. During PY3 the NGI support activities were complemented by a restructure software support activity, which are now covering a wider technical scope. Germany and Switzerland, Portugal and Spain federated their support activities since PY1 to leverage on their community expertise. National support activities can be demanding especially for large national infrastructure and they require highly specialised expertise. More federation of NGI support activities will be sought for in PY4 in case of problems with NGIs being able to sustain this activity. National support activities are necessary to guarantee the daily running of the services offered and to ensure a direct contact with user communities beyond EGI-InSPIRE.

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[7] Reply: In PY4, a ticket response process will be established to periodically notify ticket submitters and supporters when feedback is expected. As to software support, differentiated support levels in GGUS will be established according to the amount of support effort made available by Technology Providers.

NGI Aggregate Score: 4.0 (Avg.) 4 (Median)

Suggestions for improvement:

- UK: Use GGUS to provide more network support.[8]

Continuation or service impact at the end of EGI-InSPIRE:

- Croatia and Czech Republic: NGI support will be continued after EGI-InSPIRE.
- Czech Republic: NGI support will not be affected by the end of EGI-InSPIRE.
- Denmark, Georgia and Switzerland: Report issues with the continuation of this activity after EGI-InSPIRE if no national or EC funding sources will be available.
- Bulgaria, Macedonia and Serbia: Will provide a best effort service if no compensating funding will be secured for after EGI-InSPIRE.
- Switzerland: Will leverage more on support provided internally by VOs.
- Italy: Issues with support that may be faced by non-HEP VOs in case of shortage of funding.

3.8 Providing a Reliable Grid Infrastructure

Description: This task ensures that sites and operational and middleware services are functional, reliable, and responsive. It achieves this through subtasks on: production grid services, catch-all services for emerging user communities and NGIs, service level management applied at Resource Centre, NGI and EGI.eu level, and the development of procedures, policies and technical documentation.

Assessment: Service level reporting and follow-up procedures have significantly improved during PY3 and automation was introduced to reduce the effort needed to handle cases of service underperformance. While NGI core services are effectively and professionally run guaranteeing high performance levels (97% on average or higher), the quality of service provided by Resource Centres hasn't been significantly improving during PY3. The grid service infrastructure underwent a major software upgrade campaign to replace unsupported software with recent versions; on-going software maintenance activities have been having an impact on the availability of individual service end-points and of Resource Centres as a whole.

Several NGIs contributed expertise for the development of procedures and technical documentation.

The quality of service delivered by Resource Centres benefited from additional internal monitoring and quality assurance procedures adopted by some large collaborations like WLCG.

A targeted support campaign is needed by several NGIs to consolidate local expertise and provide better support to local Resource Centres; these are two necessary conditions to improve Resource Centre quality of service. Reduced levels of funding on the EGI operations portfolio will affect the performance indicators at an NGI level.

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[8] Reply: In preparation to the end of EGI-InSPIRE, a collaboration is being established with DANTE, NRENs and eduPERT to ensure support to network connectivity and performance issues.

NGI Aggregate Score: 4.0 (Avg.) 4 (Median)

Suggestions for improvement:

- Bosnia Herzegovina: Issues with the decommissioning of gLite, with the need of fresh re-installations to migrate to EMI releases and with the increasing complexity of middleware administration and troubleshooting.
- Macedonia: Will allocate more resources for the deployment of redundant NGI services.

Continuation or service impact at the end of EGI-InSPIRE:

- Bosnia Herzegovina and Denmark: Will continue services but at a reduced level of effort.
- Croatia, Czech Republic, The Netherlands and UK: Guarantees continuation of NGI core grid services and service level management processes after EGI-InSPIRE.
- Macedonia: Additional – currently unsecured – national funding will be necessary to maintain the current level of service.
- Switzerland: After EGI-InSPIRE, the running of some core services will be delegated to user communities.

4 CONCLUSIONS AND NEXT STEPS

Overall, many of the services were assessed with high quality and the NGIs have offered areas for improvement as well as a their view on service continuation and impact beyond EGI-InSPIRE. Moving forward, activity managers will use these assessments for PY4 planning.

The NIL structure has now been established and has been integrated with the national activities in most of the EGI countries and is seen as a good way of organising communication for non-technical activities within the community. The VT framework is proving to be an effective vehicle for taking the needs of specific parts of the community forwards and turning ideas and requirements into real solutions, but will work on providing better structure and support in managing the teams.

The NGI activities around operations and user support have all reached a very good level of maturity in PY3. In PY4, collaboration between existing international user communities and the NGI operations and support teams will be strengthened through by giving a new structure and mandate to the User Community Board.

The NGI's contribution to the EGI Core Infrastructure Platform is functioning well with the service monitoring framework expanded to include operational tools, and the service level management procedures were extended to include the NGI services that form part of the EGI Core Infrastructure Platform. These support systems are necessary to extend the existing quality control procedures to NGI technical and operations services therefore will be part of the roadmap for PY4 and will allow for further improvements in the service level delivered by NGIs.

The sustainability of the current level of service guaranteed by operations is an area of focus for many NGIs. The federation of NGI services to support each other's provisioning, especially for the most effort intensive ones like user and operations support and the running of NGI technical services, will be sought for in PY4 as a partial mitigation action. Other areas for PY4 will come through activities regarding the federated resource allocation and provisioning and pay-for-use pilot with participating NGIs.

5 ANNEX

5.1 NGI Contributions

5.1.1 Summary of NGI Scores – Community Engagement

NGI	Marketing	NGI International Liaison	Distributed Competency Centre
Bosnia and Herzegovina	--	4	--
Croatia	--	4	--
Czech Republic	--	4	4
Denmark	--	2	--
Finland	--	3	--
France	3	4	4
Georgia	2	5	4
Germany	2	4	4
Hungary	3	4	5
Italy	4	4	4
Lithuania	4	3	4
Macedonia	--	3	--
Montenegro	--	4	--
Netherlands	--	3	4
Portugal	3	3	4
Romania	3	4	4
Serbia	--	4	4
Slovakia	--	4	4
Switzerland	--	3	3
United Kingdom	4	5	3
Avg.	**3.1**	**3.7**	**3.9**
Mode	**3**	**4**	**4**
Median	**3**	**4**	**4**

Table 1: Summary of NGI Scores – Community Engagement

5.1.2 Summary of NGI Scores - Operations

NGI	NGI Activity Mgmt.	Secure Infra.	Service Deployment	Infra for Grid Mgmt.	Acct.	Helpdesk Infra.	Support Teams	Reliable Grid Infra.
Bosnia and Herzegovina	4	5	4	4	4	5	5	3
Croatia	4	4	5	4	3	5	5	5
Czech Republic	4	5	4	3	4	4	4	4

Denmark	--	2	--	3	--	--	3	4
Finland	--	--	--	--	--	--	--	--
France	4	2	3	3	4	3	3	4
Georgia	4	4	2	3	1	4	3	3
Germany	5	5	4	4	4	5	5	4
Hungary	5	5	5	4	5	5	5	4
Italy	5	4	4	4	3	5	5	4
Lithuania	4	5	4	5	4	5	4	4
Macedonia	3	3	4	3	3	3	3	3
Montenegro	4	3	3	4	3	4	4	4
Netherlands	3	5	3	4	3	5	4	5
Portugal	4	3	4	4	3	3	4	4
Romania	4	4	4	4	4	5	4	4
Serbia	4	3	3	4	3	4	4	4
Slovakia	3	3	--	4	--	--	4	4
Switzerland	4	3	2	4	3	4	4	5
United Kingdom	4	4	3	3	4	4	3	4
Avg.	**4.0**	**3.8**	**3.6**	**3.7**	**3.4**	**4.3**	**4.0**	**4.0**
Mode	**4**	**3**	**4**	**4**	**3**	**5**	**4**	**4**
Median	**4**	**4**	**4**	**4**	**3**	**4**	**4**	**4**

Table 2: Summary of NGI Scores - Operations

5.1.3 Non-responding NGIs

1. Albania
2. Armenia
3. Belarus
4. Belgium
5. Bulgaria
6. Cyprus
7. Estonia
8. Greece
9. Ireland
10. Israel
11. Latvia
12. Moldova
13. Norway
14. Poland
15. Russia
16. Slovenia
17. Spain
18. Sweden
19. Turkey

6 REFERENCES

R 1	NGI International Liaisons: http://www.egi.eu/about/ngis/NILs.html
R 2	EGI Virtual Teams: https://wiki.egi.eu/wiki/Virtual_Team_Projects
R 3	EGI Operations Management Board: https://www.egi.eu/about/policy/groups/Operations_Management_Board_OMB.html
R 4	Technical operations meeting agendas: https://wiki.egi.eu/wiki/Grid_Operations_Meetings
R 5	Operations Management Board agendas: http://go.egi.eu/omb
R 6	EGI MoU with Iniciativa de Grid de America Latina - Caribe (IGALC): https://documents.egi.eu/document/488"
R 7	Grid oversight escalation procedure: https://wiki.egi.eu/wiki/PROC01