EGI-InSPIRE

SUSTAINABILITY ASSESSMENT OF OPERATIONAL SERVICES

EU DELIVERABLE: D4.7

Document identifier:	EGI-D4.7-v1.3.docx
Date:	**29/01/2013**
Activity:	**SA1**
Lead Partner:	**EGI.eu**
Document Status:	**DRAFT**
Dissemination Level:	**PUBLIC**
Document Link:	https://documents.egi.eu/document/1471

Abstract

This document provides the description of the current EGI operations services and activities, assesses the status and provides future perspectives of the operations of the EGI Global Tasks, and reports on the status and progress towards the sustainability status of NGI operations. Various mitigation actions are proposed at the NGI level, and additional actions are recommended to complement the current EGI Action Plan for 2013 approved by the EGI Council.

I. COPYRIGHT NOTICE

II. DELIVERY SLIP

	Name	Partner/Activity	Date
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III. DOCUMENT LOG

Issue	Date	Comment	Author/Partner
1	15-12-2012	V1.0 for review	T. Ferrari/EGI.eu
2	10-01-2013	V1.1 addressing internal review comments	T. Ferrari/EGI.eu, S. Newhouse/EGI.eu
3	23-01-2013	V1.2 addressing external review comments	T. Ferrari/EGI.eu

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/.

The following list provides a set of terms that are used in this document.

- EGI Platform model: refers to business models that may emerge by utilising any of the IT platforms that are described in the EGI Platform architecture.

- EGI Core Infrastructure Platform: comprises of IT Infrastructure and IT Services that are required by all Research Communities that are part of the EGI ecosystem in order to deliver community-specific services and infrastructure.

- EGI Collaboration Platform: provides IT Infrastructure and Services that facilitate collaboration between Research Communities without being a core infrastructure service for Research Communities.

- EGI Community Platforms (there may be more than one): consist of services that are specific to the respective community's needs and contribute to the Virtual Research Environment used by that research community

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

EGI operations rely on services and activities in three domains: the EGI Core Infrastructure Platform, Community Platforms, Support and Operations Coordination. Services and activities are provided centrally by EGI.eu through a number of operations EGI Global Tasks and nationally through complementary NGI International Tasks.

The sustainability of EGI operations depends on the sustainability of both components. Both types of task currently rely on EC co-funding. According to the EGI strategy plan defined in 2012 the main funding that EGI can rely on to support operations after the end of EGI-InSPIRE, is the one coming directly from the EGI stakeholders. It is therefore essential that EGI's core operational and associated activities are identified, organisations willing to deliver these services after the end of EGI-InSPIRE are selected, and any transitions from the current service providers planned.

The status and perspective of the current set of global operations activities and services are assessed in this deliverable in preparation to the Evolving EGI workshop which will take place in January 2013[1]. The current running costs of the operations tools need to be established and opportunities for the reduction in cost identified. A revision of the current funding level depends on the actual performance currently provided. The operations EGI Global Task monitoring infrastructure was rolled into production in November 2012 and information needs to be collected in the coming months for a complete status assessment of the tools, which is needed to understand the future operational costs of these. Support activities and funding levels were already recently reviewed at the beginning of PY2 and no further changes are proposed during the course of EGI-InSPIRE. Third level software support is currently provided by EGI through SLAs and MoUs, but the actual costs are currently sustained directly by the Technology Providers. The level of engagement of providers of the EGI Core Infrastructure platform technology needs to be appraised. A paid service model may need to be established with some of the providers of the components considered to be critical, with a consequent extra cost for EGI.

The overall current level of funding for human coordination activities will likely reduce through the merging of activities like Service Level Management and Grid Oversight, and thanks to the objectives already accomplished through documentation and integrations activities.

Additional potential activities and services that may need to be structured as EGI Global Tasks are identified:

- Operations services supporting the EGI Federated Cloud activities like MarketPlace, top-BDII, dedicated SAM instance (whose functionality may be transferred to the standard production infrastructure in the future).
- Dedicated SAM installations for central monitoring of the infrastructure.
- 3rd level software support for products of the EGI Core Infrastructure platforms where this can only be provided by Technology Providers according to a pay per service model.
- Incident response activities.

The handling of Network Support to DANTE and its partners will be assessed at the beginning of 2013.

A survey was conducted in September 2012 to assess the status and progress of sustainability of NGI operations tasks. Information was collected in the following areas:

- the services (if any) that would be affected by the of EC funding provided through EGI-InSPIRE;

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[1] https://indico.egi.eu/indico/conferenceDisplay.py?ovw=True&confId=1252

- the status of securing additional funding to compensate for the end of EGI-InSPIRE, the progress accomplished in the previous twelve months in improving the funding position, and the funding sources NGIs are planning to rely on;
- The criticality of EGI.eu operations services provided centrally through its technical partners, and the need of new emerging services;
- The mechanisms to improve EGI.eu and NGI operations services.

26 production NGIs provided feedback. Among the responding NGIs 85% have no compensating funding secured to date, and only 44.4% stated that funding is currently under negotiation. Only 7.4% of the respondents already have secured funding after April 2014.

47.2% of the operations services across all NGI are foreseen to rely on national funding sources. Several NGIs however will investigate the possibility of applying to EC funding through Horizon 2020, this to collectively support 31.8% of the NGI operations services and activities in EGI. 11.4% of the services will possibly benefit from EC structural funds, in particular for the future capacity building of the national infrastructure. Fee for usage is a funding model being explored by a small minority of NGIs for a few selected services (3.1%). Switzerland is the only country where service fees are established as one of the major funding sources (fees are complemented by national funding).

Support services (Armenia), provisioning of core grid services for VOs (Germany) and resource capacity (Moldova) are the three types of operations service for which a pay per use model is being investigated.

NGIs participating to the survey were requested to provide information on the progress of the funding position in the period October 2011 – September 2012. 70.3% of the respondents reported no improvement in the funding position during the previous 12 months. For 18.6% of them the overall position worsened because of changes and/or cuts in the funding program of the national ministries, this being due to the worsening economic scenario.

Various mitigation actions can be adopted where needed to reduce the costs of operations: the federated provisioning of NGI services and activities across NGIs through bilateral agreements, the EGI coordinated provisioning of community platform services, and EC targeted support actions.

An action plan was approved by the EGI Council to proceed with the reassessment, prioritization and evolution of the EGI Global Tasks. Two actions are requested to be added to this plan: the reappraisal of NGI operations sustainability in March 2013 to understand the impact on EGI Global Tasks, and the assessment of the future costs (if any) of 3rd level support of critical components.

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1 INTRODUCTION

A survey [SUR] was conducted in September 2012 within the EGI Operations Management Board to collect feedback from NGI/EIRO operations managers about the criticality of the operations services centrally provided by EGI, and to assess the progress in ensuring sustainability of operations services provided at the NGI/EIRO level to complement these global activities after April 2014.

Information was collected in the following areas:

- The services (if any) that would be affected by the of EC funding provided through EGI-InSPIRE.
- The status of securing additional funding to compensate for the end of EGI-InSPIRE, the progress accomplished in the previous twelve months in improving the funding position, and the funding sources NGIs are planning to rely on.
- The criticality of EGI.eu operations services provided centrally through its technical partners, and the need of new emerging services.
- Mechanisms to improve EGI.eu and NGI operations services.

26 production NGIs/EIROs provided feedback through the survey: Armenia, Bosnia and Herzegovina, CERN, Croatia, Czech Republic, Estonia, France, Georgia, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, FYR of Macedonia, Moldova, Montenegro, Netherlands, Poland, Portugal, Serbia, Slovakia, Spain, Switzerland, and Turkey (see ANNEX I). Additional feedback was received from the following integrated Resource Providers: Canada and Ukraine. Individual NGI feedback is available [OUT]. In the remainder of the document we will concentrate on the feedback received from EGI Resource Providers.

Section 2 provides an overview of the current operations activities and services, their providers and the corresponding current funding level. Dependencies between EGI Global Tasks and the corresponding NGI International Tasks are also identified.

Section 3 describes an assessment of the current status and future perspectives of the operations within EGI Global Tasks is described. New activities and services that may be needed to support the EGI strategy are identified, and the discontinuation or restructuring of others are discussed.

Section 4 presents the output of the NGI operations sustainability survey and presents a list of possible risk mitigation actions. Section 5 summarized the EGI Council Action Plan 2013 for the revision and evolution of the EGI Global Tasks: two additional actions are requested to be added to the current plan.

2 OPERATIONS SERVICES AND ACTIVITIES

This section presents the list of current EGI operations services and activities, mapping them to the related Information Technology Infrastructure Library (ITIL)[2] stages, processes and functions [ITC, ITD, ITO, ITS, ITT] as applicable, and documents the dependency between the part of the service or activity centrally provided by EGI.eu and the part provided by the NGIs where applicable.

The EGI operations services and activities are distributed across four units:

- EGI Core Infrastructure Platform services and activities;
- Community platform services and activities;
- Support;
- Operations coordination.

These are presented in the following sections.

2.1 *EGI Core Infrastructure Platform*

The EGI Core Infrastructure Platform includes the operations services needed to ensure the daily running of the infrastructure, for accounting, configuration management, monitoring and service level reporting.

Table 1. EGI Core Infrastructure Platform services

Service and Activity Unit		Providers (Y=Yes, N=No, O= Optional)		Customers	Supported ITIL Stages, Processes, Functions	Depends on NGI International Tasks and activities (Yes/No)?
Service	**Description**	**EGI.eu**	**RP**			
Message brokers	EGI provides a network of brokers, as a messaging common infrastructure for operational tools	Y **Provider: CERN, SRCE, GRNET** **Current effort: 3+3+6 PM/y**		RPs RCs	=	No
Service Availability Monitoring (SAM) and availability computatio n engine	The Monitoring Infrastructure is a distributed service based on Nagios and messaging. The central service includes • the MyEGI portal for the visualisation of information and	Y **Provider: CERN + SRCE** **Current**	Y	RPs RCs	**Service Design** (Availability Management, IT Service continuity management)	Yes

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[2] ITIL ® is a Registered Community Trade Mark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.

	availability reports, • databases for the persistent storage of information about test results, • Availability computation (ACE), • monitoring profiles (POEM), • Aggregated topology information (ATP). The central services need to interact with the local monitoring infrastructures operated by the RPs, • Central monitoring of EGI.eu technical services • VO management of the OPS VO • Development of operations probes • Profile management	**effort: 12 + 6 PM/y**				
Operations Portal	Central portal for the operations community offers a bundle of different capabilities: • Broadcasting • VO management dashboard • Operations dashboard • Security dashboard • NGI availability dashboard	Y **Provider: CNRS** **Current effort: 3 PM/y**	Y (O)	RPs RCs	**Service Design** (IT Service continuity management)	No
Accounting	The EGI Accounting Infrastructure is distributed. At a central level it includes the repositories for the persistent storage of usage records, and a portal for the visualisation of accounting information. The central databases are populated through individual usage records published by the Resource Centres, or through the publication of summarised usage records.	Y **Provider: STFC and FCTSG** **Current effort: 3 +3 PM/y**	Y (O)	VRCs RPs RCs	**Service Strategy** (Demand management) **Service Design** (Capacity management)	No
Helpdesk (GGUS)	EGI provides support to users and operators through a distributed helpdesk with central coordination (GGUS). The central helpdesk provides a single interface for support. The central system is interfaced to a variety of other ticketing systems at the NGI level in order to allow a bi-directional exchange of tickets.	Y **Provider: KIT** **Current effort: 12 PM/y**	Y	VRCs RPs RCs	**Service Operation** (Incident Management, Problem Management) **Service Operation Functions:** Service Desk **Service Transition** (Change Management, Service validation and testing)	No

| Security Monitoring | The objective of a Security Infrastructure is to protect itself from intrusions such as exploitable software vulnerabilities, misuse by authorised users, resource "theft", etc., while allowing the information, resources and services to remain accessible and productive for its intended users. Through the coordination groups a specifically designed set of tools and services help reduce these vulnerabilities. These comprise monitoring individual resource centres (based on Nagios and Pakiti); a central security dashboard to allow Resource Centres, NGIs and EGI Computer Security Incident Response Teams (CSIRT) to access security alerts in a controlled manner; and a specific ticketing system to support coordination efforts. RTIR | Y

Provider: CESNET as part of IT services and GRNET (unfunded) | - | RPs RCs | **Service Design** (Information Security Management) | No |
| **Grid Configuration Database (GOCDB)** | EGI relies on a central database (GOCDB) to record static information about different entities such as the Operations Centres, the Resource Centres, and the service instances. It also provides contact, role and status information. GOCDB is a source of information for many other operational tools. | Y

Provider: STFC

Current effort: 6 PM/y | Y (O) | VRCs RPs RCs | **Service Design** (Service catalogue),
Service Operation (Event Management, Problem Management, Incident Management, Request Fulfilment),
Service Transition (Change, Service Asset Management – People and Infrastructure) | No |

2.2 Community Platform

The Community Platform services provided by operations are needed to facilitate the deployment of community support of emerging user communities and NGIs, to ensure the running of VOs for troubleshooting and testing, staged rollout of community platforms and technical roadmapping.

Table 2. Community platform services and activities

Service and Activity Unit					Supported ITIL Stages, Processes, Functions	Depends on NGI international services and activities?
		Providers (Y=Yes, N=No, O==Optional)		Customers		
Service	**Description**	**EGI.eu**	**RP/RC**			

Core Grid Services and Catch-all Grid Services	Core Grid services are needed for the authentication of end-users, to allow access to individual RC Grid services, and in some cases to support the running of Infrastructure Services. Examples of such services are • VOMS, VO management of infrastructure VOs (DTEAM, OPS); • Support services for Central SAM monitoring • Provisioning of middleware services for RC certification (e.g. top-BDII and WMS); • Catch-all CA; • Catch-all core Grid services to support small user communities or emerging NGIs (central catalogues, workflow schedulers, authentication services, information discovery).	Y **Provider: GRNET** **Current effort: 6 PM/y**	Y	VRCs RPs	**Service Operation** (Function: IT Operations Management)	No
Staged Rollout	Deployed software updates need to be gradually adopted in production after internal verification. This process is implemented in EGI through staged rollout, i.e. through the incremental deployment of a new component by a selected list of candidate Resource Centres.	Y **Global task Provider: LIP** **Current effort: 12 PM/y**	Y (RCs)	RPs RCs	**Service Transition** (Release Deployment and Management)	Yes
Technical roadmapping	Production of a Statement of Requirements	Y **Provider: EGI.eu** **Current effort: part of operations coordination**	Y	RPs RCs	**Service Design**	Yes
Requests for Changes	The Service Desk processes Request For Changes that are handled to the appropriate technology provider	Y **Provider: EGI.eu** **Current**		RCs RPs EGI.eu	**Service Transition** (Change Management)	Yes

		effort: part of operations coordination				

2.3 Support

Support services are provided for the management of incidents and problems encountered by the user and operations community. Support provided centrally is complemented by 1st level and 2nd level support provided at a national level by NGIs.

Table 3. Support services and activities

	Service Unit					
Service	**Description**	**Providers (O) = Optional**		**Customers**	**Supported ITIL Stages, Processes and Functions**	**Depends on NGI international services and activities?**
		EGI.eu	**RP**			

Ticket oversight and followup	• Administrative and reporting functions of the helpdesk infrastructure, e.g.
	  o Collecting ticket statistics,
	  o Internal and external reporting of statistics for SLAs monitoring and other reporting duties.
	• Follow-up, for example:
	  o Notifying supporters when the reaction to high-priority tickets is not fast enough,
	  o Requesting information from ticket submitters when they do not react,
	  o Ensuring assigners/resolvers will react sufficiently fast when the submitter provides additional information
		Y
		
		Global task Provider: KIT
		
		Current effort: 6 PM/y
				RPs RCs VRCs EGI.eu	**Service Operation** (Incident management, Problem management)	No

1st level support	GGUS ticket triage	Y **Global task Provider: CESNET, INFN** **Current effort: 6 PM/y**		RPs RCs VRCs EGI.eu	**Service Operation** (Incident management, Problem management)	No
2nd level support	Incident and problem records that are submitted centrally through the EGI Service	Y	Y	RPs	**Service Operation**	Yes

	Desk are handled internally and are escalated to 2nd level support in case they require specialized support (Provider: EGI.eu) Incident and problem records can be also submitted locally through the local Service Desk operated by the Resource Centre and/or the Resource infrastructure Provider. Local tickets will be escalated to the Resource infrastructure Provider or the EGI.eu 2nd level support units if specialized support about deployed software is required (Provider: RC/RP) Through the EGI helpdesk support issues are routed through to NGI support teams. Some of these requests may be related to specific support units but others issues relating to users' use of the e-infrastructure will require human intervention either from an operational or user support aspect. Coordination of software support Network support	**Global task provider: CESNET, INFN, JUELICH, LIU, STFC** **Current effort: 37.25 PM/y** **Global task provider: CESNET** **Current effort: 1 PM/y** **Global task Provider: GARR** **Current effort: 3 PM/y**		RCs VRCs EGI.eu RPs RCs VRCs EGI.eu	(Incident management, Problem management) **Service Operation** (Incident management, Problem management)	 No
3nd level support	Software-related tickets are further analysed for potential forwarding to 3rd line support units only when there are clear indications of a defect (in software, documentation, etc.).	N **Provider: Technology Providers**		RPs RCs VRCs EGI.eu	**Service Operation** (Incident management, Problem management)	No
Software support coordination	Review of software support activities and reporting to operations meetings	Y **Global task provider: CESNET** **Current effort: 1 PM/y**		RPs RCs VRCs EGI.eu	**Service Operation** (Incident management, Problem management)	No

2.4 Operations coordination

Operations coordination comprises a number of human services that are offered to ensure the integration of the operations services and activities provided nationally by NGIs. Central coordination relies on the availability of the corresponding NGI international tasks.

Table 4. Operations coordination services and activities

Service Unit					Supported ITIL Stages, Processes and Functions	Depends on NGI international services and activities?
Service	**Description**	**Providers (Y=Yes, N=No, O= Optional)**		**Customers**		
		EGI.eu	**RP**			
Grid oversight (COD, ROD, RC)	Grid operations oversight activities include the detection and coordination of the diagnosis of problems affecting EGI until their resolution. The daily operation of the infrastructure at RC, RP and EGI.eu level	Y **Global task provider: CYFRONET, SARA** **Current effort: 12 PM/y**	Y	RPs RCs EGI.eu	**Service Operation** (Event Management) Function: IT Operations Management **Service Transition** (knowledge management – ROD Newsletter)	Yes
OMB Coordination and technical roadmapping	Monitoring of status of capacity utilization, planning of expansion (EGI.eu, RPs, RCs) Policy management, strategy planning (EGI.eu, RPs, RCs) Liaison with internal, integrated and peer Resource Providers Communications relevant to operations	Y **Global task provider: EGI.eu** **Current effort: 12 PM/y**	Y	RPs RCs EGI.eu	**Service Design** (Capacity Management and Planning) **Service Transition** (Transition Planning and Support) **Continual Service Improvement**	Coordinated Capacity Management and Planning across multiple providers
Service Level Management	Supervision of tools for performance measurement and report generation, verification and distribution of monthly Availability reports (Resource Centre and Resource infrastructure Provider reports), modification of reports in case of problems with the tool infrastructure (EGI.eu) Definition of roles, responsibilities and	Y **Global task provider: GRNET** **Current effort: 6**	Y	RPs EGI.eu	**Service Design** (Service Level Management)	Yes

		PM/y				
Coordination of security operations	Overall coordination of operational security, including incident response, security drills, monitoring and dissemination/training Coordination of software vulnerability assessment (1.7 PM/y)	Y **Global task provider: STFC, FOM** **Current effort: 9+1.7 PM/y**	Y	RCs RPs EGI.e u	**Service Design** (Security Management) **Service Transition** (Knowledge Management)	Yes
Coordination of documentation	Maintenance and development of operational documentation, procedures, best practices, etc. EGI.eu provides Technical Coordination of this community activity partners with specialize expertise.	Y **Global task provider: EGI.eu** **Current effort: 6 PM/y**	Y	RPs RCs	**Service Transition** (knowledge management)	Yes
Coordination of interoperations	Analysis of interoperability problems when new technologies are being integrated to make sure that new resources and services can be accounted for usage, monitored, registered etc. EGi.eu provides the coordination of these activities	Y **Provider: EGI.eu** **Current effort: 6 PM/y**	Y (O)	RPs	**Service Design** (Design Coordination)	No

3 GLOBAL OPERATIONS SERVICES AND ACTIVITIES

NGIs were requested in September 2012 to provide an assessment of the currently provided operational EGI Global services and activities by defining their perceived level of criticality. The result of this assessment is indicated in Table 5, where the percentage indicates the number of NGIs responding to the survey who indicated the global service or activity as necessary for the running of the infrastructure. EGI Global Tasks are listed in decreasing order of priority.

Table 5. Assessment of EGI Global services and activities. These are highlighted in green if more than 50% of the NGI operations managers rated them as "necessary"; in yellow if more than 20% and less than 50% of the respondents rated the service as "necessary"; in red if less than 20% of the respondents considered the service or activity as "necessary".

EGI Global services and activities	Percentage of NGIs rating the task as necessary (%)
Central Helpdesk (GGUS)	90
EGI Operations Coordination and OMB	81
Configuration Management (GOCDB)	81
Software Verification and Coordination of Staged Rollout	71
Service Availability Monitoring	71
Operations Portal	62
Coordination of Security Operations	62
Central Security monitoring and incident response tools	57
Central Accounting	57
UMD Software Repository	52
1st level support: Ticket Process Management	52
Message Broker Network for support of Accounting and Monitoring	48
2nd level support: specialized software support	48
EGI Core Services for emerging VOs and operations	43
Availability/Reliability Control and Report	43
Oversight of NGI support (COD)	33
Coordination of Documentation	33
Coordination of Interoperation with other e-infrastructures	29
Metrics Portal	24
Network support	5

The NGI assessment presented above is complemented in this section by the appraisal of the current status and of the envisaged future evolution for each of the tasks.

3.1 Assessment and perspectives

This section provides an overview of the current operations EGI Global Tasks and of their future perspectives, and proposes a reorganization of some of them.

This section also identifies some additional potential activities and services that could be structured in the future as EGI Global Tasks:

- Operations services supporting Federated Cloud activities: MarketPlace, top-BDII, dedicated SAM instance (whose functionality may be transferred to the standard production infrastructure in the future).
- Dedicated SAM installations for central monitoring of the infrastructure.
- Third level software support for products of the EGI Core Infrastructure Platform where this can only be provided by technology providers according to a pay per service model.
- Incident response.
- Network support is proposed to be transferred to DANTE and its partners.

A detailed assessment of each EGI Global Task follows.

3.1.1 EGI Core Infrastructure Platform

EGI Core Infrastructure Platform services include the technical tools that support the daily operations. The maintenance and development of these services is currently supported by EGI-InSPIRE JRA1. Maintenance is an EGI Global Task, while innovation within EGI-InSPIRE is classed as a General Task. The EGI strategy aims at supporting innovation in EGI's Operation Tools through EC projects in collaboration with its partners from within the operational tools product teams and adopters from other e-Infrastructures and Research Infrastructures, thereby continuing the innovation and integration of operational tools for distributed service infrastructures. Maintenance of the existing tools needs to be continued, however costs and perspectives are not assessed in this deliverable. This assessment in this section is focused on the service provisioning aspects of the tools.

Message brokers

The message broker network, which was rated to be necessary by only 48% of the responders, is actually a fundamental part of the operations infrastructure ensuring message exchange for monitoring, the operations dashboard and accounting. As such it is a critical infrastructure component whose continuity and high availability configuration must be ensured. It includes a network of production brokers, currently operated at AUTH, CERN and SRCE, and a test instance of the infrastructure.

Message brokers are necessary for monitoring, accounting and infrastructure oversight and this service needs to be an EGI Global Task. A high availability and distributed network of brokers is needed to ensure redundancy.

The message broker network is now a stable production system. Given the improved stability and reduced number of upgrades that are now needed, the funding can be reduced.

Service availability monitoring

Monitoring of the public interface of services is necessary to support daily operations, providing notifications in case of failure, and collecting data for service level management. Monitoring includes additional support services such as the membership administration of the OPS VO, running a VOMS service for OPS, the management of monitoring profiles and the development of monitoring probes. Monitoring probes can be specific to a software service (technology probes) or be generic to support (operations probes such as the automated generation of alarms in case of Resource Centre performance does not meet a minimum service level target).

Technology probes are currently provided by technology providers while operations probes are sourced in-house (6 PM/year are currently allocated to this activity). According to the output of the EMI and IGE survey conducted by the TCB in November 2012, most (but not all) of the Product

Teams will continue supporting probes after April 2014, so the current level of probe development funding does not need to increase [TPS].

Given the current rate of updates being released, the current level of funding of SAM could be kept. The effort for maintenance and development of new probes can be adjusted to 3 PM/year.

Operations Portal

The Operations Portal provides tools supporting the daily running of operations of the entire infrastructure: grid oversight, security operations, VO management, broadcast, availability reporting. Being a central portal serving all Resource Providers, the system has to be run in a high availability mode.

Given the criticality of the tool and the centralized nature, and the new number of different modules provided, the Operations Portal should be run in a high availability mode. Operation of the system includes support of the central instance running of a test instance and requirements collection. The current effort (3 PM/year) needs to be increased to allow for the reliable running in a high availability configuration of the MySQL and Web servers.

Accounting portal and repository

Accounting information needs to be reliably collected and displayed by the accounting portal, which is a user- as well as operations-facing service.

The accounting repository has been undergoing a number of changes in terms of formatting of user DN information, structure of the usage record, protocols for consuming accounting data, and types of resources being handled. The accounting repository will be used for accounting of storage and virtual machines of the EGI Federated Cloud infrastructure, and accounting of data usage is progress. We propose an increase of the effort allocated. A merge of the operation of the accounting repository and of the portal under the responsibility of a single provider is recommended for a more efficient usage of the effort.

The EGI Helpdesk

The EGI Helpdesk is a user- and operations-facing tool necessary that needs to be highly available to ensure continued support.

GGUS has been consolidated in the past year and was rated by NGI operations managers a priority task. From November 2012 the availability and reliability of the system is being recorded, this will allow the gathering of more information about the service levels currently provided. The amount of effort for operating GGUS will be revised according to the needs of further consolidation that will emerge.

Security Tools

Security Nagios, Pakiti, and the RTIR ticketing system are currently operated by various partners (AUTH and CESNET). The Security Dashboard is also a tool supporting security operations but it is a module provided by the Operations Portal and is not part of this assessment.

The provisioning of security monitoring services was not originally identified as an EGI Global Task and it needs to be included. Funding of all tools is recommended as they are needed for the daily running of security operations and support incident response activities. The central operations of a service for the central banning of users' needs to be included in the support services for security operations.

Grid Configuration Database (GOCDB)

The tool provides topology information to SAM/ATP and supports service management activities (maintenance, scheduling of downtimes etc.).

The tool needs to consolidate its high availability configuration - a remote database and read-only interface are already provided. Funding needs to support both primary and secondary instances. The availability data collected centrally from November 2012 will provide information about the current stability of the system.

3.1.2 Support to the EGI Core Infrastructure Platform

Ticket oversight and followup, 1st and 2nd level operations and software support, coordination of software support

These activities were reviewed during in May 2012. This resulted in a redefinition of the needed tasks and of the related effort distribution [RTD]. There is no need to further review the current activity structure and the allocated funding.

Network support

EGI provides network support for the resolution of end-to-end network performance issues. This includes support to tools for troubleshooting and monitoring of network connectivity and IPv6 readiness testing activities.

The number of incident records handled by this support unit is very limited. EGI is planning to strengthen its collaboration with DANTE and its partners for the provisioning of network support as a services leveraging on existing expertise and support structures offered by GEANT and National Research and Education Networks. A MoU was recently established with DANTE [MOU] to investigate the implementation of a network support as a service provided by DANTE through its partners to support EGI users in the following areas: network performance, network monitoring and troubleshooting through perfSONAR Multi-Domain Monitoring (perfSONAR MDM) and provisioning of EGI technical services on IPv6. The feasibility of this provisioning model will be investigated in early 2013. In case of success of this implementation study, the EGI Global Task can be discontinued once alternative support channels are established.

Third level support

Specialized software support is currently provided by EGI.eu through collaborations with external Technology Providers and is regulated by SLAs and MoUs, which define the support channels and the guaranteed support levels. With the end of the EMI and IGE projects in April 2013, a new set of agreements needs to be established, which will need to be customized according to the level of engagement that Technology Providers are willing to establish with EGI. Three levels of commitment are expected: *integrated*, *contributed* and *community* [PEI]. Third level support is expected for integrated products and it is expected for contributed ones.

The EGI Core Infrastructure Platform comprises of operational services that support the operational management of a federated infrastructure, and a number of technical software services that aid in integrating any other platform with the operational management infrastructure. The level of commitment that technology providers will guarantee for 3rd level support of products that are part of the EGI Core Infrastructure Platform through MoUs and SLAs will be assessed in the coming months. A pay per service model may need to be established with some of the providers.

3.1.3 Operations Coordination

Operations coordination and technical roadmapping

Activities related to EGI.eu operations coordination, technical roadmapping, liaison with EGI resource providers and communications are expected to continue in the future. Central operations coordination are complemented by a number of technical coordination activities that are detailed in the following paragraphs of these section. Assuming these can be continued with an adequate level of funding, no additional effort is foreseen to be needed for this activity.

Grid oversight

Oversight activities were originally intended to supervise the activity performed locally by the Regional Operator on Duty (ROD) teams of the EGI Operations Centres, and to assist existing ROD teams in user and operations support, including the Operations Centre certification and decommissioning. This activity has been gradually evolving to embrace service level management activities for the monitoring of the monthly performance delivered by services of the Resource Centres and NGIs/EIROs according to the service level targets defined in the established EGI Operational Level Agreements.

The grid oversight function is foreseen to evolve from an oversight of all Operations Centre to a targeted technical support action to a number of activities, which include:

- The technical support to new Resource Centres and Operations Centre.
- The assessment of status of the operations tools supporting daily operations and the leading of working groups to address the issue identified.
- Service level management of all services to EGI customers and EGI partners regulated by user SLAs and OLAs. This includes activities related to the establishment of centrally managed resource offering through user SLAs.

The level of funding of grid oversight needs to be reassessed during PY3 and it depends on the evolution of activities around service level management, and the amount of automation of the related activities that can be achieved through the extension of the current operational tools.

Service Level Reporting

Service level reporting has been greatly enhanced during PY2 through extensions that provide greater automated handling of routine tasks through the Operations Dashboard. This level of automation is expected to be extended to NGI and EGI.eu services in the future.

Additional support duties are the management of availability profiles, the management of monthly report re-computations and the maintenance of reporting-related procedures. It is proposed that service level management activities are transferred to the central grid oversight team (COD).

Coordination of security operations

- **Coordination of the software vulnerability group and vulnerability assessment:** The Software Vulnerability Group (SVG) aims at eliminating existing vulnerabilities from the deployed infrastructure, primarily from the grid middleware, and prevent the introduction of new ones. This is aimed at preventing security incidents. The largest activity of the SVG is the handling of reported software vulnerabilities. This depends on investigation and risk assessment by a collaborative team drawn from technology providers and other security groups. Other activities include co-ordination of Vulnerability Assessment, which is the investigation of software to find whether any vulnerabilities are present. Although this is largely carried out by groups outside EGI the prioritization of which software packages should be assessed is defined by the EGI SVG.

  Considering the recent number of vulnerabilities detected and the co-ordination effort needed with other entities (Technology providers, UMD distribution managers, staged rollout co-

ordinator, central operations co-ordination) it is recommended that the current level of funding is increased.

- **Coordination of Security threat risk assessment**: EGI.eu coordinates activities around security threat risk assessment for the assets that EGI security seeks to protect. The assessment work is a collaborative effort contributed by experts from various NGIs and security groups.
- **Coordination of incident response and security drills:** EGI.eu currently provides coordination of incident response activities. Coordination relies on the availability of experts (currently contributing on a voluntary basis to on-duty activities) that assist grid administrators with the handling of the incident that are basis. Currently only a minority of the NGIs retain the expertise needed to participate to this activity and because of personnel turnover securing contribution to this activity proved to be difficult. It is recommended that the whole incident response evolves from an unfunded activity into an EGI Global Task activity supported by EGI.eu.
- **Coordination of security operations**: this activity ensures cooperation between all security groups and security policy boards. It is recommended that this activity is continued with the current level of funding.

Coordination of documentation

The organization of documentation activities, including the development of new procedures and documentation items with the technical support of NGI/EIRO experts, and the periodic update of the existing documentation base, need to continue. However, the documentation structure and the majority of the existing documentation pages are being consolidated. Once this task is completed the level of funding to this coordination activity can be reduced.

Coordination of interoperations

These tasks support the integration of various software stacks into the production infrastructure. Needed procedures and processes have been established to allow an easier integration: GOCDB has evolved into a tool where custom service types can be registered, the SAM extensions require the provisioning of third-party probes and protocols and format for usage record publishing have been evolved to encompass different software stacks and resource types. This activity needs to continue to ensure the integration of new community platforms. The current level of funding can be reduced assuming the current rate of new platforms to be integrated remains stable.

3.1.4 Support given to Community Platforms

Catch-all services

Catch-all services[3] are needed to facilitate the integration of small communities and resource providers.

Core Infrastructure Platform

Various technical supporting services are needed by daily operations activities and infrastructures.

- Certification of Resource Centres to be included into the production infrastructure requires services for the ad-hoc running of tests. In order to reduce the overall overhead of this for the infrastructure, these are provided to all interested NGIs. The services include a top-level BDII, WMS and LB.

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[3] https://wiki.egi.eu/wiki/Catch_All_Grid_Core_Services

- A Catch All CA needs to be available to any user community within the EGI. Right now most of the countries participating in the EGI have or are in the process of creating their own Certification Authorities. Yet, there are still a number of countries that are late to this process and their user communities depend on the existence of a catch all CA to issue certificates to them.
- Monitoring and troubleshooting. OPS and DTEAM are the two Virtual Organizations allowing monitoring and troubleshooting of the infrastructure. These require technical support services and human resources for daily VO membership management.

Functional community services

Functional community services for small and/or emerging user communities in order to reduce the overhead for the user. This currently includes community services like VOMS, MyProxy, LFC, WMS and LB and top-level BDII.

Additional services may be required in the future, for example to support new service provisioning models such as the Federated Cloud (e.g. the MarketPlace) and centrally managed resource allocation. This EGI Global Task may need to be extended to encompass these new services. For this reason it is recommended that current level of funding is maintained.

Coordination of Staged Rollout

As part of EGI's change management process, staged rollout is needed to ensure that new software versions can be safely deployed without disrupting the production infrastructure. This is needed to complete Product Team certification activities by exposing services to different deployment scenarios. EGI-InSPIRE supports the coordination of this task at a European and NGI level, however this activity mostly relies on unfunded effort contributed by expert Resource Centres administrators (64 Resource Centres to date) to undertake the actual work.

Staged Rollout established itself as one of the most important operations EGI Global Tasks for software change management and quality control. The current level was – increased in PY2 to 12 PM/year – proved to scale with the number of products and supported platforms which increased significantly during PY2. The coordination role requires liaison with the Technology Providers, the Early Adopters and the managers of the UMD distribution. It is recommended that the current level of effort is maintained.

Technical roadmapping and requests for changes

Requirements and requests for changes relevant to the operational aspects of the platforms being operated are regularly collected from the Resource Centre administrators and NGI operations managers.

With the discontinuation of the EMI and IGE projects' coordination activities, requirements will be discussed directly with the platforms integrators. The coordination of this activity is done at a European level by EGI.eu and national by NGIs.

3.2 Progress towards sustainability

The current strategy around the EGI Global Tasks is to define a critical core of activities where the routine operation of these activities (including the maintenance of any software) is supported by the fees collected directly from the NGIs, EIROs and other organisations that are affiliated to EGI.eu. This baseline operational activity could be sustained outside of EC project funding and its continuing operation ensured as long as the communities that consumed these services were willing to continue to

support them. The priority for funding would be the Operations Coordination around the EGI Core Infrastructure platform and its support, and the support and coordination given to Community Platforms.

Changes to this baseline activity through new innovative development activities would need to be undertaken through specific projects funded by national, European or community funds. Any changes in the baseline activity through the results of these projects would have to be financially viable within the available funding envelope.

A community workshop[4] planned for January 2013 will review the initial set of EGI Global Tasks that can be sustained by this model.

Understanding of the real costs and strategy for continually innovating, operating and running the e-infrastructure in a distributed way is essential. In preparation to the workshop, Global Tasks total costs incurred in PY2 for the provisioning of the tasks will be gathered to understand the cost incurred to deliver functions that ensure (1) the daily running of the infrastructure, (2) the improvement and expansion of the infrastructure and (3) the infrastructure innovation.

3.3 Risk assessment and mitigations

The current participation fees total around €1.6 M while the total cost of all the EGI Global Tasks are estimated at €4.3 M supported by matching funds from the European Commission and from the partners hosting the particular EGI Global Task. Clearly, for sustainability a move away from a dependency on European Commission funding for the routine operation is a priority. However, given the disparity in the current costs and the available community funds, even if the hosting partner provides matching funds, the EGI Global Tasks that can be supported will need to be prioritised.

The risk to the EGI community is that not all the EGI Global Tasks can be supported sustainably at the current levels of activity. Not only is there a need to classify and order the priority of the EGI Global Tasks, but to examine the costs around their delivery to understand if there approaches (including out sourcing) that could provide the current level of operational performance for lower direct cost. In this assessment, cost of hardware or software licenses required by the global services to operate need to be considered.

For instance, many of the EGI Global Tasks are critical and essential for having a secure, reliable, federated production infrastructure and can only be delivered centrally. Delivery of these tasks can be achieved by:

a) Using fees collected from the community to fund the most effective service provider selected by peer review.
b) Delivering 'in-kind' services by those in the community who have the resources available locally to provide the service.

Option (a) is the preferred and the current model used within EGI. Option (b) has been considered and has previously been rejected as the quality of services delivered in this mode cannot be assured. If the quality of the critical and essential EGI Global Tasks is to be assured then option (a) would be the preferred model of service delivery. If funds are not available to support the EGI Global Tasks that are not critical and essential using option (a) then option (b) could be considered. A final option is not to provide the EGI Global Task at all if none of the two options is viable.

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[4] https://indico.egi.eu/indico/conferenceTimeTable.py?confId=1252#20130128

4 NGI OPERATIONS SERVICES AND ACTIVITIES

The National Grid Infrastructures (NGIs) provide a number of specific services (the NGI International Tasks) within EGI in areas such as operations, user support, dissemination and policy that interface with the central coordination provided by EGI.eu. The minimum set of NGI International Tasks that deliver services and activities for an integrated EGI operational environment, includes:

- NGI operations management
- NGI monitoring infrastructure
- NGI accounting infrastructure
- NGI helpdesk (optional)
- Core grid services for VOs
- Software Staged Rollout
- Support to Users and Resource Centre Administrators
- National Grid Oversight
- Service level management
- Security operations

NGI International Tasks are necessary to ensure an effective coordination action across 43 national Resource Providers (the number increases to 59 if we include the integrated Resource Providers) for the support of international user communities due to the distributed nature of EGI.

The cost of NGI International Tasks **complements** the cost of running and operating Resource Centres, which are already entirely autonomously sustained by the organizations contributing resources to EGI. Resource Centre costs do not benefit of EGI-InSPIRE funding.

NGI International Tasks are necessary due to the distributed infrastructure, and which needs to exist to test, deploy, rollout and evolve (innovate) distributed (computing and data) services.

Continuity of NGI International Tasks is of highest importance, because NGIs can neither maintain nor support new requests from user communities if the funding stream for this cohesive layer, on the top of the Resource Centre operations costs, is not available. This layer is important to keep the whole infrastructure cooperating at the European level and as such deserves European (co-)funding.

33% of the cost of NGI International Tasks is currently supported by EGI-InSPIRE through European Commission funding. NGIs were requested to estimate the impact of the end EC co-funding after April 2014 according to the status of fund securing and its recent progress.

4.1 Assessment and perspectives

The EGI strategy towards Horizon2020 [STR], describes the funding of NGI operational services moving from an EC co-funded model to a community-funded funding structure where costs are mainly funded through NGI funding streams.

The majority of NGIs responding to the survey have no future national funding secured to date (85%): for 44.4% this is currently under negotiation. The Irish NGI was decommissioned at the end of 2012 because of no possibility to secure funding to support any of its NGI International Tasks (Table 6).

Only 7.4% of the respondents (Czech Republic and Poland) already have secured funding after April 2014. CERN is currently not relying on EGI-InSPIRE funding for the delivery of its 'NGI' International Tasks and their future sustainability is already secured.

NGIs and EIROs were classified in Table 7 in three groups depending on the impact on the continuity of NGI International Tasks with the end of EC funding: no impact (category 1), medium (category 2) and critical (category 3). Because of the lack of secured compensating funding, to date the continuity of the NGI International Tasks cannot be guaranteed in 59.2% of the NGIs. As indicated in Table 7, in the case of no secured funding, either International Tasks will be discontinued (category 3) or partially

re-scoped, downsized or only provided in a best-effort fashion to compensate for reduced funding (category 2).

Table 6. Availability of secured funding to compensate for the end of EGI-InSPIRE in April 2014.

	National funding	NGIs/EIROs	Number
1	Secured	Czech Republic, Poland (until 2017)	7.4%
2	Not secured	Bosnia and Herzegovina, Croatia, France, Germany, Greece, Hungary, Lithuania, Montenegro, Netherlands, Portugal, Spain	40.8%
3	Under negotiation	Armenia, Estonia, Georgia, Israel, Italy, Latvia, FYR of Macedonia, Moldova, Serbia, Slovakia, Switzerland, Turkey	44.4%
4	Other	CERN (CERN does not get funding from EGI-InSPIRE for NGI International Tasks) Ireland will stop operations in December 2012 (Ukraine: no funding secured)	7.4%

Table 7. Assessment of impact on NGI international tasks of the end of EGI-InSPIRE

	Impact on operations services	NGIs/EIROs	Number
1	NGI operation services not affected	CERN (focus on service provisioning to WLCG), Estonia, Georgia, Hungary, Moldova, Netherlands, Poland, Slovakia	26.0%
2	NGI International Tasks partially affected (will be downsized, run on a best effort basis or discontinued in some cases)	Bosnia and Herzegovina, Croatia, Czech Republic, France, Germany, Italy, Latvia, Lithuania, Montenegro, Serbia, Spain, Switzerland, Turkey	48.1%
3	All NGI operations critically affected (in some cases because of lack of secured funding to date). Services will be run on a best-effort basis or discontinued if no funding will be secured	Greece, Portugal, Ireland (withdrawing at the end of December 2012)	11.1%
4	No response	Armenia, FYR of Macedonia, Israel	14.8%

The 16 NGIs that reported problems with the continuity of the current NGI operations tasks, were asked to prioritise the NGI International Tasks that would be supported by national funds if their

funding position will not improve. According to the survey, effort would be focused on the running of those services that are necessary to ensure the best-effort running of the infrastructure, namely: grid technical services to ensure the continuity of user activities, the operation of the monitoring infrastructure, user and operations support, security operations and oversight activities. Other processes and activities needed to ensure quality of service (service level management, coordination at European level, reporting of usage and software staged rollout for change management) would be provided on a best effort basis only. The list of services to be discontinued depend on which NGI International Tasks could be run centrally rather than locally such as the helpdesk in order to reduce costs.
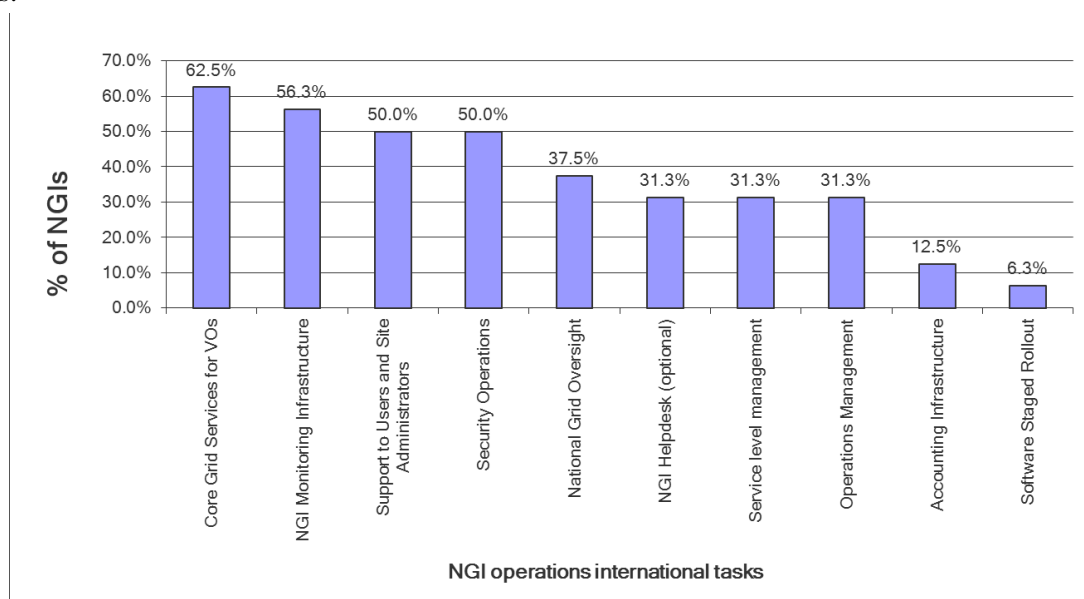

Figure 1. Distribution of NGI effort across the operations international tasks in case of lack of compensating national funding after April 2014.

4.2 Progress towards sustainability

NGIs participating in the survey were requested to provide information on the progress of the funding position in the period October 2011 – September 2012 (Table 8). 70.3% of the respondents reported no improvement in the funding position during the reference period. For 18.6% of them, namely Greece, Ireland, Italy, Montenegro and Portugal, the overall position worsened because of changes and/or cuts in the funding programmes of the national ministries, this being connected to the worsening economic scenario. The funding position improved for two NGIs: Lithuania and Switzerland.

Table 8. Progress of national funding position (October 2011 to September 2012)

	Progress of funding position	**NGIs/EIROs**	**Number**
1	Improved	Lithuania, Switzerland	7.4%

2	Remained the same	Armenia, Bosnia and Herzegovina, Croatia, Czech Republic, Estonia, France, Georgia, Germany, Hungary, Israel, Latvia, Macedonia, Moldova, Netherlands, Poland, Serbia, Slovakia, Spain, Turkey Integrated Resource Providers: Canada, Ukraine	70.3%
3	Worsened	Greece, Ireland, Italy, Montenegro, Portugal	18.6%
4	Other	CERN	3.7%

47.2% of the operations services across all NGI are foreseen to rely on national funding sources (Figure 2). Several NGIs however will investigate the possibility of applying to EC funding through Horizon 2020, this to collectively support 31.8% of the NGI operations services and activities in EGI. 11.4% of the services will possibly benefit from EC structural funds, in particular for the future capacity building of the national infrastructure. Fee for usage is a funding model being explored by a small minority of NGIs for a few selected services (3.1%). Switzerland is the only country where service fees are established as one of the major funding sources (fees are complemented by national funding).

Support services (Armenia), provisioning of core grid services for VOs (Germany) and resource capacity (Moldova) are the three types of operations service for which a pay per use model is being investigated.

Other funding sources and service provisioning models are being adopted in some NGIs.

- Canada: operations services are provided on a voluntary basis by the Resource Centres.
- Czech Republic: operations services will be supported by NGI partner membership fees (direct national project and flat fees paid by universities in Czech Republic and NGI member institutional funding in Slovakia).
- Germany: national funding will only support resource capacity building. Other sources of funding will support of all other operations services.
- Slovakia: NGI_SK services will be financed through national funding sources.

One NGI reported the lack of concrete plans about improving the sustainability perspective of the NGI operations services (Portugal).
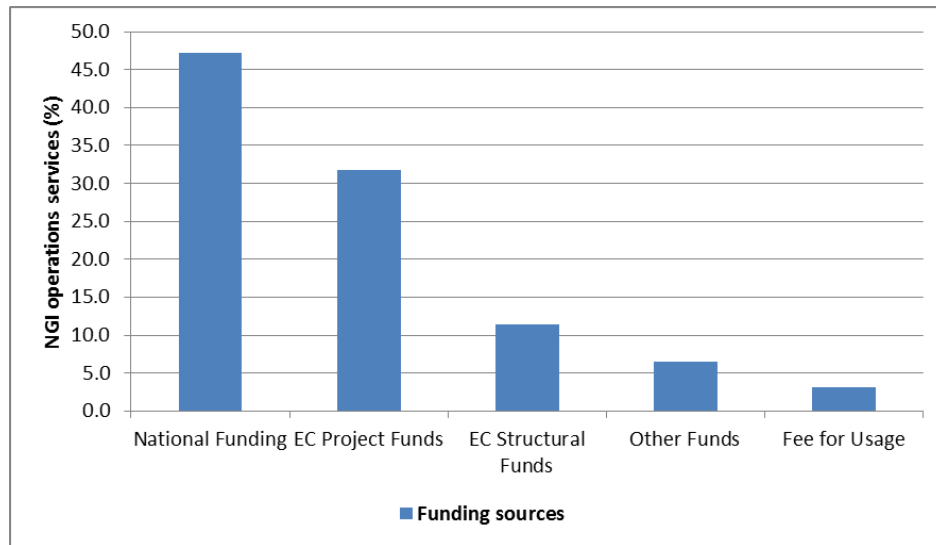
Figure 2. NGI funding sources contributing to the sustainability of NGI operations services (results are consolidated across all NGIs). The graph shows how different funding sources are planned to contribute globally to the sustainability of the NGI operations services, these including infrastructure capacity building.

4.3   Risk assessment and mitigations

The EGI Global Tasks are centrally provided (through EGI.eu) and in order to be effective they require corresponding activities and services to be run at a national level. For example, EGI-level operations coordination requires operations coordination structures running nationally; the EGI monitoring service and other core infrastructure operational services need an integrated system monitoring NGI services.

EGI.eu does not directly operate a central production infrastructure (it is distributed and operated by the NGIs) and its coordination and integration services are meant to facilitate national operations activities and services. For this reason, the partial or total discontinuation of NGI International Tasks in an NGI compromises the effectiveness of that NGI to participate in the production infrastructure.

As illustrated in the tables of section 2, a number of centrally provided global services and activities need to be complemented by nationally provided services and activities if the NGI is to benefit from the centrally provided global services. When this applies, the partial or total discontinuation of some of the NGI International Task part will compromise the effectiveness of the corresponding Global Task.

The EGI Global Tasks and their depending on the corresponding NGI activities are provided in Table 9.

Table 9. List of global services and activities depending on the continuity of the corresponding NGI international task.

Service and activity unit	Service/Activity
EGI Core Infrastructure Platform	Service Availability Monitoring and availability reporting
Community Platforms	Coordination of staged rollout

	Technical roadmapping and handling of requests for changes
Support	1st and 2nd level support of the Core Infrastructure Platform and the various Community Platforms
Operations coordination	OMB coordination
	Grid oversight
	Service level management
	Coordination of security operations
	Documentation coordination

Various mitigation actions are available if the sustainability of some national operations activities and services cannot be assured with the purpose of reducing their costs. Some of these actions have an impact on the costs of delivering EGI Global Tasks as they would require an increased level of central coordination or service offering.

- **Federated operations service provisioning**. NGIs can federate some national operational services and activities by sharing them with other NGIs when the scale of the infrastructure being operated allows this. By doing so they can move from the current fully devolved model where NGI International Tasks autonomously run the complete portfolio of national operational services under their own technical and managerial responsibility, to a model where NGIs can provide and/or consume services to/from other NGIs. While retaining the current NGI-based governance structure of EGI, the federation of operations services requires NGIs to become service providers to other NGIs or consumers of services offered by other NGIs. A few NGIs already adopted this service provisioning model, such as Portugal and Spain (sharing effort for the operation of IberGrid), and several Baltic and Nordic countries (Denmark, Estonia, Finland, Latvia, Lithuania, Norway). The service federation model is particularly suitable to small and emerging NGIs. This model can be spontaneously embraced by NGIs through bilateral agreements and has no impact on the central provisioning of operations services by EGI.eu.

- **Centrally coordinated provisioning of community platform services.** Currently the offering and distribution of community platform services supporting VO grid activities is organized locally and autonomously by each NGI according to their local policies and the amount of hardware and human resources available. This activity is not coordinated at a European level, and no EGI service level agreement framework is currently in place allowing the supported international VOs to specify the services they need centrally and for these to be instantiated at local sites across Europe. The number of community platform services (e.g. compute job workload management, information discovery systems, VO membership services, data transfer services) can be reduced on a per-VO basis through sharing with other VOs by ensuring that the collective amount of services operated is correctly dimensioned and matches the actual overall VO workload. A move towards scalable and reliable centrally provisioned services that can be used by all VOs reduced the need of individual sites to deploy and operate services, and the need to package and distribute these services for many different deployment environments. A long term goal would be to reduce the number of community platform services currently provided with a consequent operational saving of effort at an NGI level. This activity would benefit from central EGI.eu coordination and additional European investment in developing these new innovative, scalable cloud services. VOs could still retain the flexibility of deploying the community platforms that they need by EGI.eu in collaboration with the EGI's Federated Cloud through a IaaS, PaaS and SaaS provisioning models.

- **Pay-for-use business models**. EGI is exploring in more depth the legal and financial impacts of the different models for pay-for-use business models of service offering. With the advent of cloud computing, business models and user expectations are shifting towards on-demand and pay-per-use service provision increasing flexibility and agility. NGIs that are resource providers will likely more easily benefit from this. However, being pay-for-use in an early experimental phase, it is not expected to be a general mitigation to sustainability for all NGIs from May 2014.

The last year has shown that some NGIs have not yet reached the critical mass to be sustained through national funding streams (e.g. direct support or service charges to consuming user communities) and that further national operations support is still required.

5 ACTION PLAN

The only funding that EGI can rely on after the end of EGI-InSPIRE is the funding coming directly from the EGI stakeholders – the NGIs, EIROs and other organisations. It is therefore essential that EGI's core operational and associated activities are identified, organisations willing to deliver these services after the end of EGI-InSPIRE are selected, and any transitions from the current service providers to these new partners is planned.

To prepare for the end of EGI-InSPIRE, an action plan was defined by the EGI Council in October 2012 for EGI over the next 12 critical months and beyond [EAP].

The list of proposed actions relevant to the operations EGI Global Tasks is detailed in Table 10.

Table 10. EGI Council actions for the revision of the EGI Global Tasks and the technical and financial transition to after EGI-InSPIRE.

Action number	Deadline	Activity
1	Workshop in January 2013	Identify and prioritise the current operational EGI Global Tasks and associated activities that can be continued and the new activities that need to be sustained on the available resources to maintain an operational infrastructure that is open to all research communities.
2	EGI Council April 2013	Provide a detailed plan relating to the baseline coordination of the operational infrastructure and other key coordination activities that can be provided given a set of different funding models and levels of participation fee coming from the EGI Council. Review the EGI2020 Strategy accordingly.
3	EGI Council April 2013	Define the process by which EGI Global Tasks are going to be delivered after the EGI-InSPIRE project will be selected.
4	July 2013	Request and assess proposals from the EGI Community to provide the post EGI-InSPIRE EGI Global Tasks using the approved selection process.
5	EGI Council September 2013	Prepare a transition plan for any EGI Global Tasks that will be migrating in April 2014 and define a timeline relating to their migration that can be reviewed regularly by EGI.eu.

This document describes the output an initial assessment of the future perspectives of the current operations tasks. This information is in preparation to Action 1.

The final definition of the future EGI Global Tasks requires the reappraisal of the NGI International Task sustainability to understand which Global Tasks will be affected by the potential discontinuity of the complementary activities run nationally.

Given the uncertain progress in making NGI International Tasks sustainable as described in Table 4, a reassessment of the sustainability of NGI operations needs to be performed before finalizing a plan for

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the baseline coordination of the operational infrastructure (Action 2) after EGI-InSPIRE. In addition, the level of engagement of the technology providers of EGI's Core Infrastructure platform also needs to be appraised. A pay-per-use model may need to be established with some of the providers of the components considered to be critical. Two additional actions are proposed with a deadline March 2013.

Deadline	Activity
March 2013	EGI Council members: reassess sustainability of NGI International Tasks, level of commitment to each task, and identify the tasks that are at risk from not being continued
March 2013	Assessment as to the level of 3rd level support provided for critical components by the Technology Providers

6 REFERENCES

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ITD	Service Design, Information Technology Infrastructure Library, Office of Government Commerce, Publisher: TSO, 2011
ITO	Service Operation, Information Technology Infrastructure Library, Office of Government Commerce, Publisher: TSO, 2011
ITS	Service Strategy, Information Technology Infrastructure Library, Office of Government Commerce, Publisher: TSO, 2011
ITT	Service Transition, Information Technology Infrastructure Library, Office of Government Commerce, Publisher: TSO, 2011
MOU	MoU between EGI.eu and DANTE, Nov 2012 (http://documents.egi.eu/document/501)
OUT	Sustainability of the EGI/NGIs operations services, EGI Survey feedback, July 2012 (https://documents.egi.eu/document/1385)
PEI	Post-EMI and IGE Software Provisioning Collaborating with Technology Providers of varying levels of commitment, Drescher, M. et alt., Dec 2012 (http://indico.egi.eu/indico/getFile.py/access?sessionId=5&resId=0&materialId=1&confId=1261)
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STR	Seeking new Horizons: EGI's Role in 2020, EGI-InSPIRE Deliverable D2.30, Apr 2012 (http://documents.egi.eu/document/1098)
SUR	Sustainability of the EGI/NGIs operations services, EGI Survey, July 2012 (http://wiki.egi.eu/w/images/9/9e/Survey_29541291.pdf)
TPS	Technology Provider Sustainability Plans, Aug 2012 (http://documents.egi.eu/document/1319)

7 ANNEX I. LIST OF NGI RESPONDENTS

NGI	Participant to the survey
Albania	Neki Frasheri
Armenia	Hrachya Astsatryan
Bosnia and Herzegovina	Mihajlo Savic
CERN	Maite Barroso
Croatia	Dobrisa Dobrenic
Czech Republic	Miroslav Ruda
Estonia	Hardi Teder
France	Hélène Cordier
Georgia	Ramaz Kvatadze
Germany	Wilhelm Bühler
Greece	Kostas Koumantaros
Hungary	Csaba Hajdu
Ireland	David O'Callaghan
Israel	Zivan Yoash
Italy	Riccardo Brunetti, Luciano Gaido, Paolo Veronesi
Latvia	Edgars Znots
Lithuania	Algimantas Juozapavicius
Netherlands	Ron Trompert
FYR of Macedonia	Boro Jakimovski
Moldova	Pavel Vaseanovici
Montenegro	Bozo Krstajic; Luka Filipovic
Poland	Tomasz Szepieniec, Marcin Radecki
Portugal	Goncalo Borges
Serbia	Antun Balaz
Slovakia	Ladislav Hluchy
Spain	Isabel Campos
Switzerland	Sergio Maffioletti
Turkey	Onur Temizsoylu