EGI-InSPIRE

OPERATIONAL LEVEL AGREEMENT

BETWEEN NGI AND SITES

Document identifier:	EGI-InSPIRE-NGI-Site-OLA-v0.7.docx
Date:	**22/07/2010**
Activity:	**SA1**
Lead Partner:	**EGI.eu**
Document Status:	**DRAFT**
Dissemination Level:	**PUBLIC**
Document Link:	https://documents.egi.eu/document/31

Abstract

This document formalizes the services which a site provides to its National Grid Initiative, and vice-versa.

Delivery Slip

	Name	Partner/Activity	Date
From			
Reviewed by	**Moderator:** **Reviewers:**		
Approved by	**AMB & PMB**		

Document Log

Issue	Date	Comment	Author/Partner
1.0	22/7/2010	Adapted new EGI template	Dimitris Zilaskos
2.0			
3.0			
4.0			

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 the 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 the ESFRI projects. 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 − structured international user communities − that are grouped into specific research domains. VRCs are formally represented within EGI at both a technical and strategic level.

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1. INTRODUCTION

1.1. PURPOSE

EGI makes a collection of hardware, software and support resources available to the European academic community and others. This Operational Level Agreement (OLA) is intended to specify the constraints imposed on National Grid Initiatives (NGIs) and sites (resource centres) in order to ensure an available and reliable grid infrastructure.

1.2. APPLICATION AREA

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

1.3. REFERENCES

Table 1: Table of references

R 1	**List of NGIs** http://web.eu-egi.eu/partners/ngi/
R 2	**- Operational Procedures** https://documents.egi.eu/public/ShowDocument?docid=15
R 3	**GOCDB** https://goc.gridops.org/
R 4	**Grid Site Operations Policy** https://edms.cern.ch/document/819783/1
R 5	**Security and Availability Policy for LCG** https://edms.cern.ch/document/428008
R 6	**Global Grid User Support (GGUS)** https://gus.fzk.de/pages/home.php
R 7	**European Middleware Initiative** http://www.eu-emi.eu/
R 8	**– Project Metric Store** https://twiki.cern.ch/twiki/bin/view/EGEE/MultiLevelMonitoringOverview#Project_Metric_Store

R 9	**GridView Availability and Reliability Calculations** https://twiki.cern.ch/twiki/pub/LCG/GridView/Gridview_Service_Availability_Computation.pdf
R 10	"**EGEE III Service Level Agreement between ROCs and Sites"** https://edms.cern.ch/document/860386

1.4. 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

1.5. TERMINOLOGY

A complete project glossary is provided in the EGI-InSPIRE glossary:
http://www.egi.eu/results/glossary/.

2. REFERENCE TO EGEE

This OLA document is based on the "EGEE III Service Level Agreement between ROCs and Sites" [R 10].

Throughout this document, terminology has been adjusted to meet EGI standards. More specifically, references to EGEE policies and bodies have been replaced with their EGI equivalents. ROCs have been replaced with NGIs, and references to regional bodies and services have been adjusted to their national incarnations.

References to EGEE central operational tools such as SAM, accounting tools, and availability calculations in this OLA have been updated to EGI/NGI employed tools wherever they are available, such as NGI Nagios and Project Metric store.

3. PARTIES TO THE AGREEMENT

The parties to this agreement, which is not legally binding, are:

National Grid Initiative:	
Site (Resource Centre):	

3.1. NATIONAL GRID INITIATIVES

EGI is consisted of National Grid Initiatives, which are the national bodies representing all communities and institutions related to a national grid infrastructure. NGIs provide a framework of support, to both users and sites, in order to allow them to use the data and computational resources of the grid. The list of NGIs is maintained at [R 1]. All NGI must sign this Operational Level Agreement with their sites.

3.2. SITES (RESOURCE CENTRES)

All EGI sites that run grid middleware and are members of one of the afore-mentioned NGIs must sign this Operational Level Agreement with their NGI. Grid middleware is defined as being supported versions of EGI endorsed middleware [**Error! Reference source not found.**].The Site (Resource Centre) provides the actual computational resources, such as Computing Elements (CE), Storage Elements (SE), and middleware services.

4. DURATION OF THE AGREEMENT

This OLA is valid for as long as the site is part of the EGI production infrastructure, i.e. the site is registered in GOCDB as being certified for production.

5. AMENDMENT PROCEDURE

The OLA may be amended at any time if there is mutual agreement by both parties. This will usually take the form of a signed and dated OLA addendum.

6. SCOPE OF THE AGREEMENT

This Operational Level Agreement (OLA) covers the commitments made by a site with respect to its NGI and, correspondingly, the commitments that a NGI makes to its member sites. It does not cover specific core infrastructure services, such as GOCDB, GGUS, and Nagios. Neither does this OLA cover the relationship that specific VOs might have with sites; those should be detailed in VO-specific agreements.

7. RESPONSIBILITIES

This section defines the responsibilities of each party. The overall task for all concerned is to operate, support, and manage a production quality grid infrastructure across the European Research Area.

7.1. NATIONAL GRID INITIATIVE (NGI)

The main responsibilities of the NGI are:

- provide Help Desk facilities (first-level support) either by using GGUS [**Error! Reference source not found.**] support units to create a national Help Desk within GGUS, or by providing a national Help Desk which is interfaced with GGUS;
- register site administrators in the available Help Desk facilities;
- provide third-level support by helping in the resolution of advanced and specialized operational problems that cannot be solved by site administrators. If necessary, the NGI will propagate and follow-up problems with higher-level operational or development teams;
- ticket follow-up (ensure that sites work on tickets opened against them).
- respond to tickets from sites in a timely manner (see Section 12)

NGIs manage and support the deployment of UMD middleware on sites, and are also responsible for registering new sites. Their administrative tasks include:

- maintaining accurate GOCDB entries for the NGI manager and their deputies;
- to adhere to the Operational Procedures agreed between EGI, NGIs and sites. The Operational Procedures should be published in appropriate websites owned by EGI [**Error! Reference source not found.**] or the corresponding NGI.
- raising any issues deemed necessary by the sites to the attention of operational, development, deployment, monitoring, and/or certification teams, and ensuring that these issues are properly dealt with;

The NGI must provide, using GOCDB, details (name, phone number, e-mail address) of a set of contact points for security, operational and administrative matters. The NGI is responsible for ensuring the accuracy of the contact details in the GOCDB database.

7.2. SITES (RESOURCE CENTRES)

Sites provide second-level level support, have one or several site administrators, and have a designated security officer. Sites are expected to:

- adhere to the Operational Procedures described in the Operations Procedures Manual [R 2];
- maintain accurate information on the services they provide in GOCDB [**Error! Reference source not found.**];
- adhere to the Grid Site Operations Policy [**Error! Reference source not found.**], and other policy documents referenced therein;
- adhere to the requirements stated in the Security and Availability Policy document [**Error! Reference source not found.**];
- adhere to the criteria and metrics that are defined in this Operational Level Agreement (OLA);
- run supported versions of middleware [**Error! Reference source not found.**][1].
- respond to GGUS tickets in a timely manner (see Section 12)

[1] Sites are encouraged to stay abreast of grid middleware updates in order to benefit from the latest bug-fixes.

The site must provide, using GOCDB, details (name, phone number, e-mail address) of a set of contact points for security, operational and administrative emergencies. The site is responsible for ensuring the accuracy of site contact details in the GOCDB database.

8. HARDWARE AND CONNECTIVITY CRITERIA

The site must ensure sufficient computational and storage resources and network connectivity to support the proper operation of its services, as indicated by consistently passing all relevant Nagios critical tests.

9. DESCRIPTION OF SERVICES COVERED

The services that are offered by a site must be specified in the GOCDB and be monitored by the NGI Nagios Monitoring System.

Sites are encouraged to provide both Computing Elements and Storage Elements[2]. However, the minimum requirements in terms of the resources that a site must provide are as follows:

- **one** site BDII;
- at least **one** CE **or** SE
    - CE must have a number of Worker Nodes totalling at least **eight** CPUs/cores attached to it
    - SE must have a capacity of **one TB** or more;
- an EGI-compatible Accounting Service.

10. SERVICE HOURS

The site should offer the services specified in Section 9 with an intended availability of 24/7. The site support service must be available during the regular business hours of the site's host organization. A site's service hours must be specified in GOCDB. Response times to trouble-tickets are expressed in service hours.

11. AVAILABILITY

Sites and NGIs must commit to achieve the availability and reliability of grid services specified in this OLA. Reasonable steps must be taken to ensure that scheduled downtimes are kept to the specified levels. Unplanned outages can have a considerable impact on availability figures, and will also adversely affect jobs that are running at the time. Careful monitoring of resources and the local fabric should help reduce the number of such outages, so sites are expected to take a proactive role in this domain.

Out of the list of site services monitored by the NGI Nagios Monitoring System, only the "CE, SRMv2 and Site-BDII" services are taken into account for site availability and reliability calculations. The GridView is used to calculate a site's SLA conformance, using data from GOCDB and Nagios. Details of the GridView algorithms are documented in[**Error! Reference source not found.**].

For a site to be available, all of the afore-mentioned services must be available (logical AND of all service types). If a site has several instances of a service type (e.g. Computing Elements), the service is deemed to be available if any of the instances are available (logical OR). Availability figures include scheduled downtimes, which should be kept to a minimum.

1. **Site must be available (UP)at least 70% of the time per month**
   (Daily availability is measured over 24 hrs)
2. **Site reliability must be at least 75%per month**
   (Reliability = Availability / (Availability + Unscheduled Downtime))[3]

[2] Classic SE, SRMv1 or SRMv2

Scheduled Downtime must be declared in advance in the GOCDB according to the procedure and deadlines specified in the Operational Procedures [**Error! Reference source not found.**]. Note that Scheduled Downtimes negatively affect Availability figures, but not Reliability figures.

12. SUPPORT

GGUS [**Error! Reference source not found.**] is the central support tool (Service Desk) used by EGI, and as such, provides the mechanism for entering problem reports, tracking and escalating them, and providing statistics. Statistics from GGUS will be used to determine the responsiveness of sites, and the efficiency of the NGI in problem tracking.

- the NGI must respond to tickets raised by its sites within **four hours** of the ticket having been assigned to it

In terms of support provided by sites, the following applies:

- the site will provide at least **one** system administrator who is reachable during service hours;
- the site must respond to GGUS tickets within **four hours** of the ticket having been assigned to it, and resolve incidents[4]within **five working days**.

Missing any of these metrics on an incident constitutes a violation.

12.1. VO SUPPORT

- The site must support the designated national VO for Nagios monitoring system.
- The site must support the "ops" VO (the "ops" VO is a pre-requisite for security monitoring to function correctly).

Each site must support at least **one** user-community VO, but sites are encouraged to support as many VOs as they reasonably can. Specific agreements between sites and individual VOs should be covered in a separate OLA.

13. SERVICE REPORTING AND REVIEWING

Tracking of OLA conformance shall be done on a **monthly** basis. Site availability reports will be published by Project Metric Store[R 8], and sites are responsible to provide justifications for any OLA violations. Similarly, NGIs must justify any violations on their side, if any.

14. PERFORMANCE INCENTIVES/PENALTIES

Site performance results in accordance with the targets set by this Operational Level Agreement will be published openly.

In particular, sites found with availability less than 50% for three consecutive months will be removed from the Production Infrastructure.

[3] In the extreme case of a site being in scheduled downtime over the whole period, reliability is considered to be undefined.

[4] We use the ITIL distinction between incidents and problems. An incident can be resolved (quickly) by a site, whereas a problem needs to be escalated and requires more time. The metric pertains only to incidents.

15. TABLE OF METRICS

	Value	**Section**
Minimum number of site BDIIs	**one**	8
Minimum number of CEs or SEs	**one**	8
Minimum number of WN CPUs/cores	**eight**	8
Minimum capacity of SE(s)	**one TB**	8
Minimum site availability	**70%**	10
Minimum site reliability	**75%**	10
Period of availability/reliability/outage calculations	**per month**	10
Minimum number of system administrators	**one**	11
Maximum time to acknowledge GGUS tickets	**four hours**	11
Maximum time to resolve GGUS incidents	**five working days**	11
Minimum number of supported user-community VOs	**one**	11
Tracking of SLA conformance	**monthly**	12

Nb. Ticket response times are measured in site office-hours as defined in the GOCDB

16. SIGNATORIES

Authorized representatives of the parties to this Operational Level Agreement:

For the NGI (NGI Manager or NGI Deputy Manager):

Name: | Title: | Date:

For the Site:

Name: | Title: | Date: