European Grid Initiative

RESOURCE CENTRE OPERATIONAL LEVEL AGREEMENT V. 1.0

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Abstract

This document defines the minimum set of operational services and the respective quality parameters that a Resource Centre is required to provide in EGI.

I. COPYRIGHT NOTICE

II. DELIVERY SLIP

	Name	Document Version	Date
Approved by	**Operations Management Board**	V 1.0	3 June 2011

III. DOCUMENT LOG

Please see the Resource Centre OLA v1.0 Release Notes at [REL].

IV. ORGANIZATION

To support science and innovation, a lasting operational model for e-Infrastructure is needed – both for coordinating the infrastructure and for delivering integrated services that cross national borders. The objective of EGI.eu (a foundation established under Dutch law) is to create and maintain a pan-European Grid Infrastructure in collaboration with National Grid Initiatives (NGIs) in order to guarantee the long-term availability of a generic e-infrastructure for all European research communities and their international collaborators.

In its role of coordinating grid activities between European NGIs, EGI.eu will:

- Operate a secure integrated production grid infrastructure that seamlessly federates resources from providers around Europe
- Coordinate the support of the research communities using the European infrastructure coordinated by EGI.eu
- Work with software providers within Europe and worldwide to provide high-quality innovative software solutions that deliver the capability required by our user communities
- Ensure the development of EGI.eu through the coordination and participation in collaborative research projects that bring innovation to European Distributed Computing Infrastructures (DCIs)

The EGI.eu is supporting 'Grids' of high-performance computing (HPC) and high-throughput computing (HTC) resources. EGI.eu 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 will collect user requirements and provide support for the current and emerging user communities. 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 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, 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

This Operational Level Agreement (OLA) is to obtain agreement between a Resource Centre and the respective Resource Infrastructure Provider on the commitments needed to ensure an available and reliable grid infrastructure.

The EGEE document "EGEE III Service Level Agreement between ROCs and Sites" [SLA] is obsoleted by the present OLA.

1.1 Document Amendment Procedure

The Resource Centre OLA is a document discussed and approved in the framework of the EGI Operations Management Board (OMB) [TOR]. Amendments, comments and suggestions must be addressed to the OMB (noc-managers at mailman.egi.eu). Changes introduced are documented in the Release Notes available at [REL].

The Resource Infrastructure Operations Manager will promptly inform his/her Resource Centre administrators about changes introduced to the policies, metrics and targets defined in this document, and will ensure that the impact of the changes is understood.

1.2 Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

More information about the entities defined in the sections below is available in [ARCH].

1.2.1 Resource Centre (Site)

The Resource Centre – also known as Site – is the smallest resource administration domain in EGI. It can be either localised or geographically distributed. It provides a minimum set of local or remote UMD-compliant capabilities [UMD].

See section 5.2 for more information on the Resource Centre responsibilities.

1.2.2 Resource Centre Operations Manager

The Resource Centre Operations Manager leads the Resource Centre operations, and is the official technical contact person in the connected organisation. He/she is locally supported by a team of Resource Centre administrators.

1.2.3 Resource Infrastructure

A Resource Infrastructure is a federation of Resource Centres.

1.2.4 Resource Infrastructure Provider

The Resource Infrastructure Provider is the legal organisation responsible for any matter that concerns the respective Resource Infrastructure. It provides, manages and operates (directly or indirectly) all the operational services required to an agreed level of quality as required by the Resource Centres and their user community. It holds the responsibility of integrating these operational services into EGI in order to enable uniform resource access and sharing for the benefit of their users. The Resource Infrastructure Provider liaises locally with the Resource Centre Operations Managers, and represents the Resource Centres at an international level. Examples of a Resource Infrastructure Provider are the

European Intergovernmental Research Institutes (EIRO) and the National Grid Initiatives (NGIs) – see section 1.2.7.

1.2.5 Resource Infrastructure Operations Manager

The Resource Infrastructure Operations Manager represents his/her Resource Centres within the OMB and at an EGI level. He/She is appointed by the Resource Infrastructure Provider.

1.2.6 Operations Centre

The Operations Centre offers operations services on behalf of the Resource Infrastructure Provider.

The operations services are delivered locally in collaboration with the relevant Resource Centres and globally with EGI.eu.

1.2.7 National Grid Initiative

The National Grid Initiative (NGI) an entity that fulfils the following criteria [STA]:

a) have a mandate to represent its national Grid community in all matters falling within the scope of EGI.eu;
b) be the only organisation having the mandate described in (a) for its country and thus provide a single contact point at the national level.
c) be able to commit to EGI.eu financially i.e. to pay the agreed EGI.eu financial contribution.
d) be able to nominate a representative duly authorised to deliberate, negotiate and decide on all matters falling within the mandate of the EGI Council.
e) have a sustainable structure or be represented by a legal structure which has a sustainable structure in order to commit to EGI.eu in the long term.

1.2.8 Virtual Organization

A Virtual Organisation (VO) is a grouping of users and (optionally) resources, often not bound to a single institution, which, by reason of their common membership and in sharing a common goal, are given authority to use a set of resources.

1.2.9 Certified Resource Centre

A Certified Resource Centre is a Resource Centre that conforms to the requirements specified in the "Resource Centre Registration and Certification Procedure" [PROC09].

1.2.10 Unified Middleware Distribution

The Unified Middleware Distribution (UMD) is the integrated set of software components that EGI makes available from technology providers within the EGI Community [D2.7]. These components are distributed to provide an integrated offering for deployment on EGI.

1.2.11 Capability

A Capability is a functional or non-functional activity needed by either the user or the operations communities. The Capability is defined and delivered by one or more I*nterface*s supported by one or more technology providers [D5.1]. Examples of functional Capability are   user management, authentication and authorization, and job submission. Examples of non-functional capabilities are messaging, accounting, and monitoring.

1.2.12 UMD-compliant Middleware

UMD-compliant Middleware is the software that provides one of more UMD capabilities, and complies with the UMD supported interfaces specified in the UMD Roadmap [UMD]. It is mandatory that UMD-compliant software supports Monitoring and Accounting.

2 PARTIES TO THE AGREEMENT

The parties to this agreement are the Resource Infrastructure Provider (represented by the Resource Infrastructure Operations Manager) and the Resource Centre (represented by the Resource Centre Operations Manager).

3 DURATION OF THE AGREEMENT

This OLA is valid for as long as the Resource Centre is part of EGI, i.e. the Resource Centre is registered in the central configuration repository GOCDB[1] as being certified for production [GOC]. It is not binding when the Resource Centre status is "suspended" or "uncertified". If parties agree to end the agreement, then the Resource Centre is no longer part of EGI.

4 SCOPE OF THE AGREEMENT

The Resource Centre OLA covers the commitments made by a Resource Centre with respect to its Resource Infrastructure Provider and EGI, and correspondingly, the commitments that a Resource Infrastructure Provider makes to their member Resource Centres.

This OLA is applicable to all certified Resource Centres associated to a Resource Infrastructure Provider that meets one of the following conditions:

- the Resource Infrastructure Provider is a Participant or Associated Participant in *The European Grid Initiative Foundation* [STA];
- the Resource Infrastructure Provider collaborates with EGI.eu in a framework defined by a Resource Infrastructure Provider MoU [MoU].

Global and Local infrastructure services [ARCH] are out of scope of this OLA. Similarly, this OLA does not cover the relationship that specific Vos might have with Resource Centres; those SHOULD be detailed in VO-specific agreements.

5 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.

5.1 *Resource Infrastructure Provider*

The main responsibilities of the Resource Infrastructure Provider are:

- to provide helpdesk facilities either by using one GGUS[2] support unit, or by providing a national helpdesk which is interfaced with GGUS;
- to register Resource Centre administrators in the available helpdesk facilities;
- to provide first and second-level support by helping in the resolution of advanced and specialised operational problems that cannot be solved by Resource Centre administrators. If necessary, the Resource Infrastructure Provider will propagate and follow-up problems with higher-level operational or development teams;
- to monitor progress of tickets and to ensure that Resource Centres work on tickets opened against them;
- to respond to tickets from Resource Centres in a timely manner (see Section 10).

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[1] https://goc.egi.eu/

[2] https:// www.ggus.eu

Resource Infrastructure Providers coordinate and support the deployment of UMD-compliant middleware on Resource Centres, and are also responsible for registering new Resource Centres. Their administrative tasks include:

- to maintain accurate GOCDB entries for the Operations Manager and their deputies.
- to adhere to the operational procedures, manuals and policies agreed between EGI.eu, the EGI Resource Infrastructure Providers and the Resource Centres. The policies and procedures of EGI are periodically reviewed, and are published at [POL]; manuals are available at [MAN].
- to raise any issues deemed necessary by their Resource Centres to the attention of the OMB, Technology Providers, deployment, monitoring, and/or certification teams and to ensure that these issues are properly dealt with.

The Resource Infrastructure Provider MUST provide, using GOCDB, the details (name, phone number, e-mail address) of a set of contact points for security, operational and administrative matters. The Resource Infrastructure Provider is responsible for ensuring the accuracy of the contact details in GOCDB (own and of their Resource Centres).

5.2 Resource Centre

Resource Centres provide second-level support to users, have one or several Resource Centre administrators, and have a designated security officer. Resource Centres are expected:

- to maintain accurate information on the services they provide in GOCDB;
- to adhere to the Grid Site Operations Policy [SOP], to other policy documents referenced therein, and to relevant procedures and manuals;
- to adhere to the requirements stated in the Grid Security Policy [GSP];
- to adhere to the criteria and metric targets that are defined in this OLA;
- to run UMD-compliant Middleware supported by the respective Resource Infrastructure Provider. Sites are encouraged to stay abreast of updates in order to benefit from the latest improvements and features;
- to respond to GGUS tickets in a timely manner (see Section 10).

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

6 HARDWARE AND CONNECTIVITY CRITERIA

The Resource Centre MUST ensure sufficient computational and storage resources and network connectivity to support the proper operation of its services, as indicated by passing all relevant Nagios OPERATIONS tests[3].

7 DESCRIPTION OF SERVICES COVERED

The services that are offered by a Resource Centre MUST be specified in the GOCDB, MUST be monitored by the Resource Infrastructure Provider Nagios local monitoring system (SAM), and the usage accounted centrally (where applicable) through a UMD-compliant middleware implementing the Accounting Capability [UMD].

The Resource Centre MUST provide access to a minimum set of UMD-compliant Capabilities as follows [UMD]:

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

- at least **one** local or remote service to publish information on the Functional Capabilities provided by the Resource Centre into the site Information Discovery System (e.g. site BDII);
- at least **one** Functional Capability (e.g. File Transfer, Storage Management, Data Access, Metadata Catalogue, Compute, additional Information Discovery capability). If the Compute Capability is provided, then also Storage Management (either local or off-site) is needed.

8 HOURS

8.1 Service Hours

The Resource Centre MUST offer the services specified in Section 7 with an intended availability of 24/7.

8.2 Operating Hours

The support services specified in section 10 MUST be available during the regular Operating Hours of the host organisation of the support provider (Resource Centre for support services specified in section 10.2, and Resource Infrastructure Provider for services specified in section 10.2).

Response times to trouble-tickets are expressed in Operating Hours.

9 AVAILABILITY

Resource Centres and Resource Infrastructure Providers MUST commit to achieve the availability and reliability [QOS] of the services specified in this OLA.

Availability and reliability statistics depend on uptime and on unscheduled/scheduled downtime. Availability of a Resource Centre is calculated as uptime per month, based on monthly/weekly/daily statistics.

Reasonable steps must be taken to ensure that scheduled downtimes are kept, so that availability is at 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 can help to reduce the number of such outages, so Resource Centres are expected to take a proactive role in this domain.

Out of the list of Resource Centre services monitored by the Resource Infrastructure Provider Nagios monitoring system, only a subset of Capabilities is taken into account for availability and reliability (Compute, Storage Management, and Information Discovery[4]).

For a Resource Centre to be available, Information Discovery, Storage Management (if provided) and Compute Capabilities (if provided) MUST be available (the algorithm takes the logical AND of all service types). If a Resource Centre has several instances of a Capability, the service is deemed to be available if any of the instances are available (logical OR). Availability figures are affected by scheduled downtimes, which SHOULD be kept to a minimum [QOS].

1. **The Resource Centre MUST be available (UP) at least 70% of the time per month (daily availability is measured over 24 hours).**
2. **Resource Centre reliability MUST be at least 75% per month**.

Scheduled downtimes MUST be declared in advance in the GOCDB according to the Service Intervention Management Manual [MAN02]. Note that Scheduled Downtimes negatively affect availability without impacting reliability.

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[4] https://wiki.egi.eu/wiki/Availability_and_reliability_tests

10 SUPPORT

The EGI Helpdesk is a distributed system with central coordination (GGUS). Through the EGI Helpdesk problem reports can be submitted, tracked and escalated, and statistics can be generated. Statistics from GGUS are used to determine the responsiveness of Resource Centres, and the efficiency of the Resource Infrastructure Provider in problem tracking.

10.1 Resource Infrastructure Provider

The Resource Infrastructure Provider MUST ensure a response to a ticket raised by a Resource Centres is issued within **four hours** of the ticket having been assigned to it.

10.2 Resource Centre

- The Resource Centre will provide at least **one** system administrator who is reachable during the Operating Hours of the centre.
- The Resource Centre MUST respond to tickets within **eight hours** of the ticket having been assigned to it, and resolve incidents[5] within **five working days**.

Missing any of these metric targets on an incident constitutes a violation (see section 12).

10.3 VO Support

- The Resource Centre MUST support the OPS VO for Nagios monitoring and security monitoring.
- The Resource Centre MUST support the DTEAM VO for testing and troubleshooting.

Each Resource Centre MUST support at least **one** non-monitoring VO, either regional or global, which MUST be registered in the operations portal[6], but Resource Centres are encouraged to support as many Vos as they reasonably can. Specific agreements between Resource Centres and individual Vos MUST be covered in a separate OLA.

11 SERVICE REPORTING AND REVIEWING

EGI.eu provides and reviews:

- availability and reliability statistics on a **monthly** basis of the Resource Centres and Resource Infrastructures. Reports include availability and reliability statistics per Resource Centre and per Operations Centre. They are available at [PERF].
- support statistics on a **yearly** basis. They are extracted from the GGUS reporting system to estimate the workload, effectiveness and responsiveness of the Resource Infrastructure Provider support services[7]. Reports are available at [MET] and include information about the following metrics:
  - number of opened tickets;
  - average/median ticket solution time (days);
  - average ticket response time (hours).

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[5] 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.

[6] https://operations-portal.egi.eu

[7] The Resource Centre support service is not monitored by EGI.eu as the GGUS reporting system produces statistics at the Support Unit granularity. Resource Infrastructure Providers that are willing to review this, need to deploy a dedicated helpdesk system integrated with GGUS.

Resource Infrastructure Providers and Resource Centres violating the minimum service parameters specified in this document CAN be requested by EGI.eu to provide justifications. In this case, the violating partner MUST provide a report. Information is exchanged through GGUS tickets.

12 LIABILITY

Resource Centres violating the minimum required availability for three consecutive calendar months are eligible for suspension.

13 SUMMARY TABLE OF METRICS AND TARGETS

	Target	**Section**
Minimum number of UMD-compliant Site Information Discovery Capability	**one**	7
Minimum number of Functional Capabilities	**one**	7
Minimum Resource Centre availability	**70%**	9
Minimum Resource Centre reliability	**75%**	9
Period of availability/reliability/outage calculations	**per month**	9
Minimum number of system administrators	**one**	10
Maximum time to acknowledge GGUS tickets (Resource Infrastructure Provider)	**four hours**	10
Maximum time to acknowledge GGUS tickets (Resource Centre)	**eight hours**	10
Maximum time to resolve GGUS incidents	**five working days**	10
Minimum number of supported user-community Vos	**one**	10
Tracking of availability conformance	**monthly**	11
Tracking of support services	**yearly**	11

14 REFERENCES

[ARCH]	EGI Operations Architecture, EGI-InSPIRE Deliverable D4.1, 2011 (https://documents.egi.eu/document/218)
[D2.7]	EGI Sustainability Plan, EGI-InSPIRE Deliverable 2.7, Mar 2011 (https://documents.egi.eu/secure/ShowDocument?docid=313)
[D5.1]	UMD Roadmap, EGI-InSPIRE Deliverable D5.1, Oct 2010 (https://documents.egi.eu/document/100)
[GOC]	GOCDB Input System User Documentation (https://wiki.egi.eu/wiki/GOCDB/Input_System_User_Documentation)
[GSP]	Grid Security Policy (https://documents.egi.eu/document/86)
[MAN]	EGI Operations Manuals (https://wiki.egi.eu/wiki/Operations_Manuals)
[MAN02]	Service Intervention Management, Manual MAN02 (https://wiki.egi.eu/wiki/MAN02)
[PERF]	Availability and reliability statistics (https://wiki.egi.eu/wiki/Availability_and_reliability_monthly_statistics)
[POL]	EGI Policies and Procedures (https://wiki.egi.eu/wiki/PDT:Policies_and_Procedures)
[PROC09]	Resource Centre Registration and Certification Procedure, EGI Operations Procedure PROC09, May 2011 (https://wiki.egi.eu/wiki/PROC09)
[QOS]	Sonvane, D.; Kalmady, R.; Chand, P. et alt.; Computation of Service Availability Metrics in Gridview (https://twiki.cern.ch/twiki/pub/LCG/GridView/Gridview_Service_Availability_Computation.pdf)
[REL]	Resource Centre OLA Release Notes (https://wiki.egi.eu/wiki/Resource_Centre_OLA:_Release_Notes)
[REP]	NGI Annual Reports (https://wiki.egi.eu/wiki/EGI-inSPIRE_SA1#NGI_Assessment)
[SLA]	The EGEE-III Service Level Agreement between ROCs and Sites, EGEE-III Project, 2008 (https://edms.cern.ch/document/860386)
[SOP]	Grid Site Operations Policy (https://documents.egi.eu/public/ShowDocument?docid=75)
[STA]	EGI.eu Statutes, May 2010 (https://documents.egi.eu/document/18)
[TOR]	Operations Management Board Terms of Reference (https://documents.egi.eu/document/117)
[UMD]	UMD Roadmap, EGI-InSPIRE Deliverable D5.2, 2011 (https://documents.egi.eu/document/272)