

**EGI-Engage**

Operational tools development roadmap agreed

M3.1

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Abstract

This document summarises the development plans of the EGI operational tools until the end of the EGI-Engage project. The whole set of EGI tools composes the *e-Infrastructure Commons*, an ecosystem of services that constitutes the foundation layer of any distributed e-Infrastructures, which is one of the three pillars of the *Open Science Commons* vision. The technical development of the e-Infrastructure Commons services is user-driven to satisfy the needs of scientific communities, EGI-Engage competence centers, research infrastructures, NGIs, resource providers, technology providers and European Policy boards. Furthermore, interoperability with other e-Infrastructures and research infrastructures will be ensured. The development roadmap will be periodically revised to satisfy new emerging requirements.

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**TERMINOLOGY**

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

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# Introduction

This document summarises the development plans of the EGI operational tools until the end of the EGI-Engage project. The whole set of EGI tools composes the *e-Infrastructure Commons*, an ecosystem of services that constitute the foundation layer of any distributed e-Infrastructures. The e-Infrastructure Commons is one of the three pillars of the *Open Science Commons* vision, where researchers from all disciplines have easy and open access to the innovative digital services, data, knowledge and expertise they need for collaborative and excellent research.

The e-Infrastructure common evolution is coordinated by the Work Package 3, which is organised in five tasks covering the following themes:

* WP3.1: Authentication and Authorisation Infrastructure;
* WP3.2: Service Registry and Marketplace;
* WP3.3: Accounting (repository & portal);
* WP3.4: Operations Tools (Operations portal, GOCDB, Monitoring, Messaging Infrastructure and Security Monitoring);
* WP3.5: Resource Allocation – e-GRANT.

The technical development of the e-Infrastructure Commons services is user-driven to satisfy the needs of scientific communities, EGI-Engage competence centers, research infrastructures, NGIs, resource providers, technology providers and European Policy boards. Furthermore, interoperability with other e-Infrastructures and research infrastructures will be ensured. The roadmap, which will be presented later and is the main part of this document, has been defined through the process to gather requirements described in Section 2. Furthermore, a well-defined procedure will allow us to periodically revise this roadmap accordingly to the new user needs that will be collected and identified during the project lifetime.

Sections from 3 to 7 outline the development plans for each tool that is part of the e-Infrastructure commons. Each section includes the planned activities for each of the above listed WP3 tasks. The roadmap is also available in the WP3 wiki page.

A summary of the document is available in Section 8.

# Operations tools roadmap definition

The roadmap presented in this document has been defined taking into account the requirements collected from different actors as scientific communities, EGI-Engage competence centers, research infrastructures, NGIs, resource providers, technology providers and European Policy boards as e-IRG. The planned activities will allow us to extend the current capabilities of the existing EGI core infrastructure services to adapt them to the needs of new user communities and research infrastructures and to ensure interoperability, accordingly to the EGI-Engage Objective 3 (O3) - *Offer and expand an e-Infrastructure Commons solution*.

The requirement gathering process has been accomplished in collaboration with the other EGI Engage WPs, which are in charge of the communication with users and key stakeholders. WP2/NA2 is exploring new service definitions by enabling the possibility to provide ICT services that can be paid for the use, along with the more traditional procurement of resources to be managed and offered for free to the owners. A subset of the outcome of this activity is the definition of a set of new features, which should be offered by the EGI tools to evolve the e-Infrastructure commons to support the pay-for-use mode. Furthermore, closely linked to this activity, NA2 is developing the Marketplace concept that will be implemented in WP3/JRA1. WP4/JRA2 is taking care of the technical infrastructure of EGI by expanding the capabilities of the current platforms, and by integrating new ones. The roadmap of the EGI tools includes activities to extend their capabilities to support the new technology introduced by WP4/JRA2 in the EGI infrastructure. WP5/SA1 is another source of requirements for the tool roadmap, in particular the EGI Operations team, NGIs and Resource Providers needs are collected by this activity. Finally, the requirements from the eight EGI-Engage competence centers and, in general, from the EGI users are gathered in WP6/SA2 that coordinates the provisioning of services for scientific communities. Then, the communication channel with WP6/SA2 is of outstanding importance and the WP3 and WP6 activity managers are working closely to identify the most relevant e-Infrastructure commons requirements for users.



Figure 1. e-Infrastructure commons requirement gathering process in EGI-Engage.

Figure 1 shows the e-Infrastructure commons requirement gathering process in EGI-Engage with highlighted the interactions between the WP3 and the other WPs.

Before the roadmap definition, all the requirements have been prioritised during the WP3 meetings and in tool specific Operations Tools Advisory Groups (OTAGs) when exists. Now, an OTAG was already settled for three WP3 tools: Operations Portal, Accounting Portal and e-Grant. New OTAGs will be created for other tools if the number of requirements to be prioritised will require ad-hoc meeting.

However, the requirement gathering process cannot be considered completed and closed after few project months. It will be continuously carried out during the whole project lifetime and beyond. Then, the roadmap described later contains actions, specific for activities, to collect input from the various stakeholders and, furthermore, a procedure to periodically update the roadmap has been defined and is described in the next section.

## Procedure to update the roadmap

The e-Infrastructure commons roadmap will be updated during the project lifetime according to the requirements gathered through the identified communication channels with the other project work packages. This will allow us to prompt answer to emerging needs and new trends in the scientific world.



Figure 2. Procedure to update the roadmap for a tool.

A procedure to update the WP3 roadmap was defined and agreed with the products teams and is described below. The WP3 roadmap is revised each three months:

* each product team collects the requirements for its tool during the three months between two revisions. All the requirements should be stored in the EGI ticket system;
* the requirements are prioritised during the WP3 periodic meetings and in specific Operations Tools Advisory Groups when exists;
* at the end of the three months, each product team defines a roadmap revision and propose it in the next WP3 meeting to be approved;
* the approved roadmap revision will be published in the WP3 wiki pages.

# Authentication and authorization infrastructure

TJRA1.1 – Authentication and Authorization infrastructure will explore how to integrate suggested AA methods with current middleware and community services, guaranteeing a sufficient Level of Assurance, and the use of credentials issued by other infrastructures and services. TJRA1.1 will:

* enable users to access the EGI Federated Services (web and non web);
* enable Scientific Communities and the Long Tail of Science to organize themselves and collaborate on top of the EGI infrastructure;
* allow seamless access to and from other e-Infrastructures through interoperable services
* work together with AARC, eduGAIN and Identity Federations in order to maximize the number of IdPs “connected” to the EGI platform.

## Roadmap summary

An initial analysis of the current scenario in Europe to identify relevant actors working on AAI system has been the first activity started on this task (1.1.). Its outcome will be the creation of communication channels with the AAI working group of the other European e-infrastructures and of the most relevant European projects dealing with AAI as AARC. In the meantime, discussions with the EGI-Engage CCs will be done to understand their needs, gather requirements and identify the most important use cases and guidelines for enabling federated access in an initial set of tools (GOCDB, Monitoring and Accounting) will be defined (1.2).

After this preliminary activities the design of technical architecture and pilot implementation will start, split in for different phases. In the first phase (1.3), in collaboration with the AAI pilot and the user portal activity for the LTOS, a pilot to connect of the first set of EGI tools to the EGI IdP proxy will be deployed. In the second phase (1.4), the pilot will be extended to other EGI Tools and selected CCs and requirements gathered from SA2.1 and SA2.2 (Training & User support) will be taken into account. After a technology reassessment, the pilot services and best practices to enable federated AAI solutions in the EGI infrastructure will be officially released (1.5) and will be deployed in production (1.6). The task will complete its work with a report of all the activity (1.7) and a refinement of the architecture (1.8).

Table - Authentication and authorization infrastructure roadmap

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **1.1** | Identification of and liaison with stakeholders:   * WP3 F2F and EGI Conference * Liaise with AARC * Connections with GN4, EUDAT2020 and PRACE * Identification of Tools | 05/15 | 06/15 | Started |  |
| **1.2** | Requirements capturing:   * Use FIM4R as the starting point * Align with AARC DJRA1.1 * Identify the most important use cases (EGI-Engage CCs) * Technical guidelines for enabling federated access in an initial set of tools (GOCDB, Monitoring and Accounting) | 05/15 | 08/15 | Started | 1.1 |
| **1.3** | Technical architecture and pilot implementation - Phase 1:   * Identify which AA services are needed * Collaboration with the AAI pilot and the user portal activity for the LTOS * Pilot: Connection of the first set of EGI tools to the EGI IdP proxy | 09/15 | 12/15 | Planned | 1.2 |
| **1.4** | Technical architecture and pilot implementation - Phase 2:   * Expansion to EGI  Tools and selected CCs * Interaction with SA2.1 and SA2.2 (Training & User support) | 01/16 | 04/16 | Planned | 1.3 |
| **1.5** | Technical architecture and pilot implementation - Phase 3:   * Technology reassessment * Pilot services and best practices to enable federated AAI solutions released | 05/16 | 07/16 | Planned | 1.4 |
| **1.6** | Technical architecture and pilot implementation - Phase 4:   * Pilot services and best practices to enable federated AAI solutions released * Architecture and solution for the production EGI AAI services. | 07/16 | 02/17 | Planned | 1.5 |
| **1.7** | Identity Management for Distributed User Communities report | 02/17 | 02/17 | Planned | 1.6 |
| **1.8** | Refinements to the architecture and pilot wrap-up | 03/17 | 08/17 | Planned | 1.6, 1.7 |

# Service registry and marketplace

Sharing and discovering research resources (instruments, computing, software, data, etc.) and services (consulting, sample preparation, etc.) is essential for helping researchers to be competitive. It is envisioned this can be done by developing a “marketplace” concept where free and paid resources can be listed and discovered. The goal of this activity is to put together a marketplace concept and demonstrate the ideas via a proof-of-concept (POC). This will be done with the involvement of the relevant stakeholders and demonstrated via real cases, which will be used to develop the POC.

## Roadmap summary

The service registry and marketplace is a new activity in EGI, therefore there is not established tool in place. The roadmap for 2015 focusses on tasks that will help understand the core requirements for this activity. The requirements are to be gathered from the EGI Engage proposal input, from EGI.eu staff, from informal discussions, and those expressing interest in using such a tool (either as a consumer or provider). Tasks include meetings with those participating in EGI Engage project and a workshop at the EGI meeting in Lisbon (task 2.1), an analysis of e-marketplaces is done in collaboration with a University of Applied Sciences Northwest Switzerland (2.2), and what is learned will also be reflected in an update of the business engagement strategy of EGI (2.3). To help understand the requirements and to populate the POC, the services of EGI.eu will be collected (2.4) which will also feel into the design requirements for the service registry and marketplace (2.5). The service registry and marketplace will then be populated based on gathered use cases and services from EGI (2.6). This will then be integrated into the EGI.eu web site (2.7) and the first release of the first prototype of the marketplace and service registry (2.8). Based on the feedback from this there will be a second release of the service registry and marketplace (2.9). All information and experiences gathered will culminate into a final report (2.10).

Table - Service registry and marketplace

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **2.1** | Stakeholder involvement   * Involvement with Engage participants * EGI Lisbon conference session | 04/2015 | 08/2017 | Started |  |
| **2.2** | Marketplace strategy   * Collaboration with FHNW on paper | 04/2015 | 07/2015 | Started |  |
| **2.3** | Update EGI business development strategy   * Discussions with EGI strategy team * Discussions with potential business partners | 04/2015 | 07/2015 | Started |  |
| **2.4** | Identify/collect EGI services   * Task assigned within the JRA1.2 team | 05/2015 | 07/2015 | Planned |  |
| **2.5** | Design of the EGI Service Registry and Marketplace   * Outcome of discussion with stakeholders and JRA 1.2 participants | 05/2015 | 02/2016 | Planned | 2.1, 2.2, 2.3, 2.4 |
| **2.6** | Populate service catalog   * Tasks assigned to JRA 1.2 participants to gather information | 08/2015 | 04/2016 | Planned | 2.1, 2.2, 2.3, 2.4 |
| **2.7** | Integrate service catalog to EGI web site   * Tasks assigned to JRA 1.2 participants to gather information | 10/2015 | 04/2016 | Planned | 2.6 |
| **2.8** | First release of the EGI Service Registry and Prototype   * Leveraging existing tools for prototype | 03/2016 | 08/2016 | Planned | 2.6 |
| **2.9** | Second release of the EGI Service Registry and Prototype   * Refine based on feedback from first release | 08/2016 | 04/2017 | Planned | 2.8 |
| **2.10** | Final report on EGI Service Registry and Marketplace   * To be done collectively by participants in JRA 1.2 | 06/2017 | 08/2017 | Planned | 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9 |

# Accounting

The target of this task is the evolution of the EGI accounting system. Its main components are the accounting repository and the Accounting Portal. The development guidelines will be:

* Evolve the accounting system to be able manage big data: the accounting team will investigate techniques to manage huge amount of data as, for example, Hadoop or Cassandra;
* Include new types of data accounting to record who accesses data, how often, how much is transferred and where to;
* Extend the current accounting measurement:
  + Cloud accounting: the current system will be extended adding features to normalise the CPU usage on different kind of cloud resources and to account the usage of the cloud storages supported in the EGI Federated Cloud;
  + Storage accounting: the number of the supported storage systems will be extended;
  + GPU accounting: extended the number of batch systems supported;
* Improve the portal designing new and easier way to access and visualise data for the end users;
* Develop unified views in the portal for different kind of resources (e.g. CPU usage for grid and cloud resources);
* Create new views to show the new types of data available in the accounting repository (e.g. data accounting);
* Expose a complete API allowing third parties to gather accounting data from the system.

## Accounting repository

APEL is an accounting tool that collects accounting data from sites participating in the EGI and WLCG infrastructures as well as from sites belonging to other Grid organisations that are collaborating with EGI, including OSG, NorduGrid and INFN.

The accounting information is gathered from different sensors into a central accounting repository where it is processed to generate statistical summaries that are available through the EGI/WLCG Accounting Portal.

Statistics are available for view in different detail by Users, VO Managers, Site Administrators and anonymous users according to well defined access rights.

### Roadmap summary

The main target of this task is the evolution of the EGI accounting system. The development themes identified are:

* re-design the accounting repository to be ready to manage increasing volumes of data with less latency;
* create more generic parsers to enable faster integration of other accounting data sources;
* including new types of accounting measurement (e.g. data accounting) and extend the current ones (e.g. cloud (3.1.1, 3.1.3) and storage (3.1.2, 3.1.6, 3.1.10));

The re-design of the accounting repository to manage large volumes of data will start with an analysis of the tools available (3.1.11). A pilot system will then be created to match the features of the current production system but allowing for greater throughput and lower latency.

The creation of more generic parsers will run in three development cycles (3.1.4, 3.1.7, 3.1.13) where a new parser will be developed in each. An ‘SQL’ parser will allow extraction of data directly from another database and an ‘XML’ parser will allow input from a standard XML format. Another parser will be developed with details to be decided by use cases.

Data set usage accounting will be developed over three development cycles. An initial prototype will be developed to work as a proof of concept (3.1.5). After this, a set of minimum requirements will be sought to create an initial prototype (3.1.9). This will allow us to report on the design of the data accounting system (3.1.4) and implement this by the end of the project (3.1.15).

*Table 3 - Accounting repository*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **3.1.1** | Cloud Accounting: Usage Record V0.4 (Benchmarks etc) | 03/15 | 04/15 | Planned |  |
| **3.1.2** | Storage Accounting: Contact sites and test of the current solution | 03/15 | 06/15 | Planned |  |
| **3.1.3** | Cloud Accounting: Long running VMs | 03/15 | 09/15 | Planned |  |
| **3.1.4** | Parser 1 | 04/15 | 11/15 | Planned |  |
| **3.1.5** | Data Accounting: proof of concept | 06/15 | 01/16 | Planned |  |
| **3.1.6** | Storage Accounting: Usage Record V2.0 | 07/15 | 02/16 | Planned | 3.1.2 |
| **3.1.7** | Parser 2 | 12/15 | 07/16 | Planned |  |
| **3.1.8** | D3.3: Accounting Repository Release | 02/16 | 02/16 | Planned | 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6 |
| **3.1.9** | Data Accounting: minimal requirements implemented | 02/16 | 09/16 | Planned | 3.1.5 |
| **3.1.10** | Storage Accounting: support new storage systems | 03/16 | 10/16 | Planned | 3.1.6 |
| **3.1.11** | D3.6: Analysis on techniques to manage big data on the EGI accounting system | 05/16 | 05/16 | Planned |  |
| **3.1.12** | Investigating Big Data tools to improve accounting repository | 07/16 | 02/17 | Planned | 3.1.11 |
| **3.1.13** | Parser 3 | 08/16 | 03/17 | Planned |  |
| **3.1.14** | D3.8: First data accounting prototype | 10/16 | 10/16 | Planned | 3.1.9 |
| **3.1.15** | Data Accounting: production requirements | 10/16 | 05/17 | Planned | 3.1.14 |
| **3.1.16** | GPGPU Accounting | 10/16 | 05/17 | Planned |  |
| **3.1.17** | Support AAI evolution | 01/17 | 08/17 | Planned |  |
| **3.1.18** | D3.12: Second release of the Accounting Repository | 02/17 | 02/17 | Planned | 3.8, 3.9, 3.10, 3.12, 3.14 |
| **3.1.19** | D3.13: Report on Data Accounting | 02/17 | 02/17 | Planned | 3.1.15 |
| **3.1.20** | D3.15: Second data accounting prototype | 06/17 | 06/17 | Planned | 3.15 |
| **3.1.21** | D3.17: Final release of the Accounting Repository | 08/17 | 08/17 | Planned | 3.1.13, 3.1.15, 3.1.16, 3.1.17, 3.1.18 |

## Accounting portal

The EGI Accounting Portal is the global graphical front-end to EGI accounting data. Accounting statistics are available through this portal for the analysis of the different grid users, VO administrators and site administrators. This data is analysed to generate statistical summaries that are made available through a web interface.

### Roadmap summary

The roadmap for 2015 focuses on tasks that will modernize and make the portal more user friendly. The requirements will be gathered from the Accounting Portal OTAG which includes members from the user communities and research infrastructures, as well as EGI participants (3.2.1). The technical design of the new Accounting Portal and implementation plan will be drawn according to the requirements collected (3.2.2). Tasks include the adoption of new technologies easier to maintain (3.2.3), simplify the access to some basic functionality and avoid the use of complex forms for common statistics and get accounting information for some common queries (3.2.4). The federated AAI integration was also prioritised to be available in the first year release (3.2.6). Also includes the support of cloud usage record v0.4 and accounting of long running VMs (3.2.5). The first release of the new Accounting Portal will contain all these features and will be deployed in production by April 2016 (3.2.7).

The tasks for the second year include the definition of a complete API to get the accounting data directly from the accounting portal (3.2.8), the representation of geographical accounting data in maps (3.2.9), and the addition of analytics to extract intelligence operation from the accounting data (3.2.10). A second release of the Accounting Portal is planned for the end of project year 2 (3.2.11).

For the third year the tasks focus more on the addition of new types of accounting data, including data accounting (3.2.12), support for GPGPU (3.2.13) and to be compliant with the Big Data tools available in the accounting repository (3.2.14). The activity will end with a third release of the Accounting Portal (3.2.15).

Table - Accounting portal

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **3.2.1** | Requirements collection | 03/15 | 08/15 | Planned |  |
| **3.2.2** | D3.1: Technical design of the new Accounting Portal and implementation plan | 03/15 | 08/15 | Planned | 3.2.1 |
| **3.2.3** | Modernize the accounting Portal with the adoption of technologies easier to maintain | 06/15 | 01/16 | Planned | 3.2.1 |
| **3.2.4** | Simplify access to some basic functionality. Avoid the use of complex forms for common statistics and get accounting information for some common queries | 07/15 | 04/16 | Planned |  |
| **3.2.5** | Support Cloud Usage Record V0.4 and accounting of long running VMs | 07/15 | 04/16 | Planned | 3.1.1, 3.1.3 |
| **3.2.6** | EGI Federated AAI Integration | 04/16 | 04/16 | Planned | Depends on outcome of AAI TF and EGI policy |
| **3.2.7** | D3.5: First release of the new Accounting Portal deployed in production | 04/16 | 04/16 | Planned | 3.2.2, 3.2.3, 3.2.4, 3.2.5 |
| **3.2.8** | Define a complete API to get accounting data directly from the accounting portal | 05/16 | 12/16 | Planned |  |
| **3.2.9** | Integrate data in maps for a graphical distribution of the information | 07/16 | 01/16 | Planned |  |
| **3.2.10** | Integrate analytics to extract intelligence operation from the data | 08/16 | 05/17 | Planned |  |
| **3.2.11** | D3.10: Second release of the new Accounting Portal deployed in production | 02/17 | 02/17 | Planned | 3.2.7, 3.2.8, 3.2.9, 3.2.10 |
| **3.2.12** | Support Data Accounting | 01/17 | 08/17 | Planned | 3.1.5, 3.1.8, 3.1.9, 3.1.15, 3.1.18 |
| **3.2.13** | Support GPGPU Accounting | 01/17 | 08/17 | Planned | 3.1.16, 3.1.18 |
| **3.2.14** | Support Big Data tools | 01/17 | 08/17 | Planned | 3.1.12, 3.1.18 |
| **3.2.15** | D3.19: Final release of the new Accounting Portal deployed in production | 08/17 | 08/17 | Planned | 3.2.11, 3.2.12, 3.2.13, 3.2.14 |

# Operations tools

The task JRA1.4 deals with the continuous improvement of the EGI operations tools to adapt them to the technology evolution and to satisfy new requirements emerging from service providers and user communities. This task includes the evolution of the following tools: Operations Portal, GOCDB, ARGO, EGI messaging infrastructure and security monitoring .

The common goals of the development activities related to these tools are to:

* implement a modular architecture to manage AAI;
* make tools able to serve any research infrastructure;
* evolve and improve their support for cloud resources;
* define interfaces towards analogue tools belonging to other e-Infrastructures or research infrastructures;
* expose internal data through a REST API interface.

## Operations portal

The EGI Operations Portal is developed and hosted into the IN2P3 Computing Center since November 2004. This service is used by different actors of the EGI area: regional operators, regional managers, resource center administrators, virtual community managers or any end users linked to this infrastructure.

The main features provided by the Operations Portal are:

* registration / update / consultation of the virtual community information;
* communication tools to contact and inform the different actors of the project;
* the access of multiple information sources on synoptic views (dashboards);
* the tracking and follow-up of operational/security problems detected on the resource centers;
* metrics and indicators related to the user distribution or the VO disciplines.

### Roadmap summary

The development activity during the EGI-Engage project will cover the following main points:

* Integrate the VO Administration and operations PORtal (VAPOR) into the Operations Portal (4.1.1): VAPOR has been developed to address VO operation tasks and will allow the Operations Portal to become a unique, one-stop tool for resource monitoring, issues management and user community management, either from the resource centre perspective or from the VO perspective.
* Monitor infrastructure resources: the Operations Portal and VAPOR provide complementary tools and views dedicated to either resource centres or VOs. These tools will be evolved to be easily extended and support any type of resources (e.g. cloud) (4.1.3, 4.1.5, 4.1.12). The resource distribution browser and the dashboard will be updated to better serve the cloud resources (4.1.4, 4.1.6), giving more details (e.g. OS, number of cores, capacity) and allowing the monitoring. Furthermore, the main GSTAT features will be added to this module (4.1.7) and APIs will be provided for the resource distribution browser and more generally for the VO information (4.1.8, 4.1.9, 4.1.10). VAPOR monitoring features will be integrated as part of the existing VO Operations dashboard (4.1.11, 4.1.12).

Table - Operations portal

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **4.1.1** | LavUpgrade  Upgrade Vapor configuration for lavoisier | 05/2015 | 02/2016 | Planned |  |
| **4.1.2** | LavGlue  Replace Glue1.3 queries by Glue 2 | 05/2015 | 02/2016 | Planned | 4.1.1 |
| **4.1.3** | LavCloud  Capture Cloud Resources in Lavoisier | 06/2015 | 02/2016 | Planned |  |
| **4.1.4** | RBExtension  Extend the resource browser to cloud resources | 06/2015 | 02/2016 | Planned | 4.1.3 |
| **4.1.5** | VaporExtension  Extend Vapor views to cloud resources | 06/2015 | 02/2016 | Planned | 4.1.3 |
| **4.1.6** | DashboardExtension  Extend dashboard views to cloud resources | 10/2015 | 02/2016 | Planned | 4.1.3 |
| **4.1.7** | ReplaceGstat  Replace Gstat Main Features | 11/2015 | 02/2017 | Planned |  |
| **4.1.8** | ExtendAPI1  Extend dashboard API | 04/2016 | 02/2017 | Planned |  |
| **4.1.9** | ExtendAPI2  Extend Vapor API | 04/2016 | 02/2017 | Planned |  |
| **4.1.10** | ExtendAPI3  Extend Gstat API | 04/2016 | 02/2017 | Planned | 4.1.7 |
| **4.1.11** | MonitorVM1  monitor running/creation requests VM | 06/2016 | 02/2017 | Planned |  |
| **4.1.12** | MonitorVM2  monitor success/error/time-out rates for cloud sites | 06/2016 | 02/2017 | Planned | 4.1.11 |
| **4.1.13** | ExtendVoDataManagement  Support cloud storage solutions / File catalog | 01/2017 | 08/2017 | Planned |  |

## GOCDB

GOCDB is a central registry to record information about the topology of an e-Infrastructure. This includes entities such as Operations Centres, Resource Centres, service endpoints and their downtimes, contact information and roles of users responsible for operations at different levels. The service enforces a number of business rules and defines different grouping mechanisms and object-tagging for the purposes of fine-grained resource filtering.

### Roadmap summary

The roadmap for 2015 focuses on tasks that will extend the capability of GOCDB as a Configuration Management Database (CMDB). The requirements were gathered from both EGI and EUDAT and refined/prioritised during informal discussions. Tasks include extending the role logging for the purposes of increased auditing (task 4.2.1), extending the change logging to record who did what and when (including recording object diffs to record edits pre and post change - 4.2.3), and further abstraction of the business rules/roles so that actions and roles can be defined and customised per-project for better multi-tenant support. The CMDB related tasks (4.2.1, 4.2.2, 4.2.3) should mostly be addressed during 2015. The federated AAI integration (4.2.6) was recently prioritised and effort has been diverted accordingly.

The remaining tasks are currently less well defined and new tasks will undoubtedly emerge. Evolution of the marketplace (4.2.4) and support for changing e-infrastructure requirements (4.2.0) are currently evolving with external dependencies. MVC and GUI refactoring is currently regarded as lower priority (4.2.7).

Three main GOCDB releases are foreseen during the project lifetime, the first at M12 (4.2.5), second at M24 (4.2.8) and the last at the end of the project (4.2.9).

Table – GOCDB

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **4.2.0** | Support changing infrastructure requirements:   * Extend Data Model where necessary | 03/15 | 08/17 | Planned |  |
| **4.2.1** | RoleActionLogging (v5.4)  Also:   * Finer grained content rendering (PermitAll and Protected pages) * Downtime declaration in local timezone | 04/15 | 05/15 | Planned |  |
| **4.2.2** | RoleAbstractions (v5.5)   * Multi-tenant (apply different rules/roles on a per-project basis) | 06/15 | 08/15 | Planned |  |
| **4.2.3** | Object Diff Auditing (v5.6) | 09/15 | 12/15 | Planned |  |
| **4.2.4** | Support Marketplace developments | 05/15 | 19/15 | Planned |  |
| **4.2.5** | D3.4: First release of the Operational tools - GOCDB | 02/16 | 02/16 | Planned | 4.2.1, 4.2.2 |
| **4.2.6** | EGI\_Fed\_AAI\_Integration, LoA integration. | 01/16 | 06/16 | Planned | Depends on outcome of AAI TF and EGI policy. |
| **4.2.7** | MVC + GUI refactoring:   * Replace proprietary MVC with Symfony2 | 04/16 | 08/16 | Planned |  |
| **4.2.8** | D3.11: Second release of the Operational tools - GOCDB | 02/17 | 02/17 | Planned | 4.2.3, 4.2.4, 4.2.6 |
| **4.2.9** | D3.18: Final release of the Operational tools - GOCDB | 08/17 | 08/17 | Planned | 4.2.7 |

## Monitoring

The ARGO platform is the continuation and evolution of the SAM monitoring framework. ARGO has been re-architected in order to provide a flexible and powerful solution, which can meet the requirements and challenges of the emerging e-Science platforms across Europe.

Monitoring in a complex federated cloud infrastructure presents a number of interesting challenges. Firstly, to provide a monitoring solution that integrates and enriches the existing cloud ecosystem. Secondly, to deploy a monitoring framework with constraints posed by a multi-cloud large scale environment and the timing and synchronization requirements of any delivery service. Finally, to provide a modular monitoring framework, scalable, extensible and adoptable by different users utilizing the EGI infrastructure facilities. All these challenges imply that an appropriate orchestration engine will be deployed that will compose monitoring services tailored to specific user/administrator profiles and which will improve EGI’s infrastructure utilization.

### Roadmap summary

*Roadmap description*

ARGO development activities are grouped in five main sets:

* ARGO Compute Engine & Web API: to compute (engine) and retrieve (Web API) metrics for Services, Sites, NGIs and VOs (4.3.1, 4.3.6, 4.3.11, 4.3.17);
* ARGO Monitoring Engine: to run the monitoring tests (NAGIOS) (4.3.2, 4.3.7, 4.3.12, 4.3.18);
* ARGO EGI Web UI: the ARGO user interface (4.3.3, 4.3.8, 4.3.13, 4.3.19);
* ARGO EGI Connectors & Consumer: to retrieve raw data from the monitored services (4.3.4, 4.3.9, 4.3.14, 4.3.20);
* ARGO POEM: module where the metrics are defined (4.3.5, 4.3.10, 4.3.15, 4.3.21).

The roadmap is organised in three months period for these activity sets, repeated until the end of project year 1. A detailed roadmap for project years 2 and 3 is not defined yet.

Three ARGO releases are foreseen in the project at M12 (4.3.16), M24 (4.3.22) and M30 (4.3.23).

Table – Monitoring

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **4.3.1** | ARGO Compute Engine & Web API:   * automatic recomputation triggers * multi-tenant support * stability and performance improvements | 04/15 | 06/15 | Started |  |
| **4.3.2** | ARGO Monitoring Engine:   * probe framework * support documentation (Guides) * stability and performance improvements | 04/15 | 06/15 | Started |  |
| **4.3.3** | ARGO EGI Web UI   * ACL mechanism (support groups/roles) * UI Enhancements | 04/15 | 06/15 | Started |  |
| **4.3.4** | ARGO EGI Connectors & Consumer:   * improved support for VOs * stability and performance improvements | 04/15 | 06/15 | Started |  |
| **4.3.5** | ARGO POEM:   * ACL mechanism (support groups/roles) * stability and performance improvements | 04/15 | 06/15 | Started |  |
| **4.3.6** | ARGO Compute Engine & Web API:   * API for data ingestion specification * separation of A/R and Metric stores * APIv2 Specification * stability and performance improvements | 07/15 | 09/15 | Planned | 4.3.1 |
| **4.3.7** | ARGO Monitoring Engine:   * FedCloud probes * stability and performance improvements | 07/15 | 09/15 | Planned | 4.3.2 |
| **4.3.8** | ARGO EGI Web UI:   * UI Enhancements * initial support for federated logins using SAML | 07/15 | 09/15 | Planned | 4.3.3 |
| **4.3.9** | ARGO EGI Connectors & Consumer:   * use of CE ingestion API * stability and performance improvements | 07/15 | 09/15 | Planned | 4.3.4 |
| **4.3.10** | ARGO POEM   * initial support for federated logins using SAML * support for probe management * stability and performance improvements | 07/15 | 09/15 | Planned | 4.3.5 |
| **4.3.11** | ARGO Compute Engine & Web API:   * API for data ingestion specification * APIv2 * stability and performance improvements | 09/15 | 12/15 | Planned | 4.3.6 |
| **4.3.12** | ARGO Monitoring Engine:   * fedcloud probes update * stability and performance improvements | 09/15 | 12/15 | Planned | 4.3.7 |
| **4.3.13** | ARGO EGI Web UI:   * UI Enhancements * support for federated logins with IdP Discovery | 09/15 | 12/15 | Planned | 4.3.8 |
| **4.3.14** | ARGO EGI Connectors & Consumer:   * stability and performance improvements | 09/15 | 12/15 | Planned | 4.3.9 |
| **4.3.15** | ARGO POEM:   * support for federated logins with IdP Discovery * stability and performance improvements | 09/15 | 12/15 | Planned | 4.3.10 |
| **4.3.16** | First release of the Operational tools (D3.4) | 03/15 | 02/16 | Planned | 4.3.1 – 4.3.15 |
| **4.3.17** | ARGO Compute Engine & Web API:   * stability and performance improvements | 01/16 | 03/16 | Planned | 4.3.11 |
| **4.3.18** | ARGO Monitoring Engine:   * FedCloud probes update * stability and performance improvements | 01/16 | 03/16 | Planned | 4.3.12 |
| **4.3.19** | ARGO EGI Web UI:   * join as a SP to eduGAIN | 01/16 | 03/16 | Planned | 4.3.13 |
| **4.3.20** | ARGO EGI Connectors & Consumer   * stability and performance improvements | 01/16 | 03/16 | Planned | 4.3.14 |
| **4.3.21** | ARGO POEM   * join as a SP to eduGAIN * stability and performance improvements | 01/16 | 03/16 | Planned | 4.3.15 |
| **4.3.22** | Second release of the Operational tools - ARGO (D3.11) | 03/16 | 02/17 | Planned | 4.3.17 – 4.3.21 |
| **4.3.23** | D3.18: Final release of the Operational tools – ARGO (D3.18) | 03/17 | 08/18 | Planned | 4.3.22 |

## Messaging

The production EGI Operations Message Broker Network is used in order to facilitate the message exchange between the operational tools of EGI. This broker network consists of two geographically separated brokers which are operated by two geographically separated institutes, AUTH and SRCE, to increase the reliability of the system.

### Roadmap summary

The development activity on the EGI messaging infrastructure foresees the provision of a Restful HTTP API as a layer on top of the existing Message Broker Network. The change will be backwards compatible as we will continue the operation of the STOMP interfaces for direct usage of the Message Broker Network. Still, we believe after consulting with the major users of the Messaging Service, that everybody will be eager to move to the new Restful Service layer and simplify the maintenance of their client implementations.

First project year will be devoted to define the Restful API specification (4.4.1, 4.4.2, 4.4.3, 4.4.4). A beta implementation will be completed by M22 (4.4.5). The first production level release will be ready by the end of project year 2 (4.4.6) and a further version will be released at M30 (4.4.7).

Table – Messaging

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **4.4.1** | Preparatory phase | 04/05 | 06/05 | Planned |  |
| **4.4.2** | APIv1 alpha specification | 07/05 | 09/05 | Planned | 4.4.1 |
| **4.4.3** | APIv1 test implementation  APIv1 final draft specification (ready for external party review) | 09/05 | 12/05 | Planned | 4.4.2 |
| **4.4.4** | APIv1 final specification | 01/06 | 03/06 | Planned | 4.4.3 |
| **4.4.5** | APIv1 beta implementation | 03/16 | 12/16 | Planned | 4.4.4 |
| **4.4.6** | Second release of the Operational tools - ARGO (D3.11) | 01/17 | 02/17 | Planned | 4.4.5 |
| **4.4.7** | D3.18: Final release of the Operational tools – ARGO (D3.18) | 03/17 | 08/18 | Planned | 4.4.6 |

## Security Monitoring

Security incidents may cause significant problems for users, service providers and infrastructure operators. Security monitoring tools try to identify weaknesses that lead to a security incident. Current technologies, namely federated clouds, bring new security challenges that must be addressed by new approaches. In this task we will identify the new areas and provide solutions for proper monitoring of them.

### Roadmap summary

The first project year will mainly focus on run a Gap analysis (4.5.1). After that a Cloud VM image assessment will be done identifying methodology to identify security flaws on the images (4.5.2). Finally, a cloud resources monitoring system will be deployed in the production infrastructure (4.5.3).

Table - Security Monitoring

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status (Planned***  ***/Done)*** | ***Dependencies***  ***From other***  ***tasks*** | ***Issues*** |
| **4.5.1** | Gap analysis | 04/15 | 11/15 | Planned |  |  |
| **4.5.2** | VM Image assessment | 12/15 | 09/16 | Planned |  |  |
| **4.5.3** | Cloud resources monitoring | 10/16 | 06/17 | Planned |  |  |

# Resource Allocation – e-Grant

e-GRANT is a platform that enables EGI customers to apply and get allocation of compute and storage resources. In this task, e-GRANT functionalities will be extended to cover the complete SLA life-cycle - enabling activities such as tracing of resource centre configuration, monitoring of resources delivery, availability analysis for agreed services, capacity reports analysis and billing. Another area of e-GRANT development includes facilitating activities taking place before customer request resources. The platform will enable customers to investigate the services and resources available to them by publishing this information on the EGI Service Registry and Marketplace, including special offers or promotion actions, such as seed-resources for new communities, demonstrators or hackathons. Furthermore, e-GRANT will be extended to play an important role in the new model of service delivery like pay-for-use, which would require extension towards negotiating the price. e-Grant will support the integration of EGI with other e-Infrastructures enabling customers to jointly request resources owning to different infrastructures.

## Roadmap summary

The main area of the development for e-GRANT is connected with creating a consistent environment for introducing SLA Documents to the Resource Allocation Process. Year 2015 will be devoted to defining and specifying interfaces with EGI tool ecosystem so e-GRANT can become a central and integral part of EGI SLA life-cycle (5.1) and to fitting SLA life-cycle to an already existing process (5.3). Main interfaces and extensions have been already defined and added to e-GRANT roadmap (5.5 – 5.11). Development for two of the tasks (5.7, 5.10) has already started.

Along with extending e-GRANT with new SLA-related functionalities comes continual implementation of improvements needed for already deployed EGI Resource Allocation process (5.2). Requirements for this task will be gathered from e-GRANT client, namely Resource Allocation Support Team, in e-GRANT Request Tracker which is also a part of 5.1.

e-GRANT roadmap specifies also further development for Pay-for-Use process (5.12-5.14). After gathering requirements from Pay-for-Use Team, four main milestones have been specified:

* processing first pay-for-use Request created by a real customer (EPOS) (5.12);
* deploying to production the first prototype of pay-for-use platform (5.13);
* implementing new functionalities such as a billing function, SLA reporting etc. (5.14);
* incorporating Pay-for-Use process to EGI Resource Allocation process, so both free and non-free resources will be available from one central EGI Tool (5.16)

Undoubtedly, along with the project development will come new requirements connected with new EGI services and/or services from other e-Infrastructures, which are included in the roadmap in task 5.15.

Table - Resource Allocation – e-Grant

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task Number** | ***Task Name*** | ***Start Date (MM/YY)*** | ***Release Date (MM/YY)*** | ***Status*** | ***Dependencies***  ***From other***  ***tasks*** |
| **5.1** | Defining extensions and interface with other tools and processes. | 04/15 | 12/15 | In progress |  |
| **5.2** | Continual implementation of improvement needed for resources allocation process | 04/15 | 08/17 | Planned | 5.1 |
| **5.3** | Alignment with EGI SLA framework for existing process | 04/15 | 06/15 | In progress | 5.1 |
| **5.4** | Implementing support for tracing site configuration for allocated SLA | 07/15 | 06/16 | Planned | 5.1, 5.2 |
| **5.5** | Integration with market-place | 10/16 | 03/17 | Planned | 5.1 |
| **5.6** | Integration with EGI monitoring framework | 01/16 | 12/16 | Planned | 5.1 |
| **5.7** | Integration with LTOS portal | 04/15 | 12/15 | In progress | 5.1 |
| **5.8** | Integration with EGI Accounting system | 02/16 | 12/16 | Planned | 5.1, 5.2 |
| **5.9** | Integration with EGI Accounting Portal | 02/16 | 12/16 | Planned | 5.1, 5.2 |
| **5.10** | Integration with EGI authorization platform - UNITY | 04/15 | 09/15 | In progress | 5.1, 5.2 |
| **5.11** | Further integration with GOCDB | 06/16 | 06/16 | Planned | 5.1, 5.2 |
| **5.12** | Pilot execution of pay-for-use process in e-GRANT | 08/15 | 11/15 | Planned |  |
| **5.13** | First prototype of pay-for-use process in production | 01/16 | 03/16 | Planned | 5.1 |
| **5.14** | Extending support for pay-for-use process | 03/16 | 12/16 | Planned | 5.1 |
| **5.15** | Extensions needed for including new types of EGI services | 10/16 | 07/17 | Planned | 5.1 |
| **5.16** | Final release of e-GRANT | 08/17 | 08/17 | Planned | 5.2-5.11, 5.14, 5.15 |

# Summary

The development roadmap of the EGI tools is presented in this document and details are provided for each product. The overall objective of this roadmap is the evolution of the EGI tools towards the e-Infrastructure Commons, an ecosystem of services that constitute the foundation layer of any distributed e-Infrastructures, which is one of the three pillars of the *Open Science Commons* vision.

The roadmap definition has been steered by requirements gathered from different actors as scientific communities, EGI-Engage competence centers, research infrastructures, NGIs, resource providers, technology providers and European Policy boards. The requirements have been collected in collaboration with the other EGI-Engage work packages and prioritised during the WP3 periodic meetings or in tool specific Operations Tools Advisory Groups (OTAGs).

The requirement gathering process will be continuously carried out during the whole project lifetime and beyond and the roadmap will be revised accordingly. A well-defined procedure has been adopted to periodically (each three months) update the roadmap of each tool.

# References

|  |  |
| --- | --- |
| ***No*** | ***Description/Link*** |
| R1 | Description  <http://example.com> |
| R2 |  |
|  |  |
|  |  |
|  |  |
|  |  |