EGI-Engage

First intermediate report

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Abstract

This report describes the EGI-Engage activities from 1st March 2015 to 31st August 2015.

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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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1 Executive Summary

At the time of reporting, the EGI service catalogue provides advanced computing, storage and data management, and community-specific services and tools. These are part of: (1) the high throughput data analysis platform, (2) the federated cloud platform providing IaaS Compute and Storage, and (3) various community platforms. In total EGI federates 620,000 CPU cores, 480 PB of storage (online and nearline for persistent storage of data), 20 cloud providers and serves about 40,000 estimated users. On average, 1.5 Million jobs/day are executed in the federated infrastructure. Various Research Infrastructures, including BBMRI, CLARIN, CTA, ELIXIR, LifeWatch, LOFAR, and KM3NeT are either in early adoption phase or full production (CTA and LOFAR). Two new major international research collaboration were engaged: the Human Brain Project Scientific Pillar 5 (neuroinformatics) and the International Cancer Genome Consortium, to which a grant of cloud compute and storage resources was allocated. The integration of two new platforms started: GPGPU computing and the Open Data Platform for delivery of distributed HPC services through GPGPUs and the publishing of open data resulting from processing and analysis activities in EGI.

Communication and Dissemination focused on the organisation of the EGI flagship events, delivering the first – the EGI Conference in Lisbon (May 2015) and started preparations for the EGI Community Forum in Bari (Nov 2015). It has supported dissemination and outreach with its communication channels such as the EGI Inspired newsletter, case studies and external articles, and launched a revised EGI Champions programme. As part of the future plan activities, the concept of a joint e-Infrastructures Community Forum was defined in collaboration with GÉANT with the aim of federating effort and activities across e-Infrastructures on technical user support, training and user-driven innovation.

The Strategy, Business Development and Exploitation of the project focused early efforts in exploring cross-border procurement opportunities, understanding how to move the pay-for-use prototype into production, creating the conceptual model of the EGI marketplace[1] and improving the management of EGI services through better defined processes and procedures according to the FitSM IT service management standard. This included the development (currently in progress) of the EGI service portfolio[2], the definition of the procedures and templates for introducing innovation in the live service catalogue, and the negotiation and establishment of Service Level Agreements[3] between international research communities and service providers of EGI. Procedures and processes are being adopted to establish SLAs for current and prospective user communities. The adoption of service management procedures[4] is a major advancement in the process of engagement and support involving international research communities and the distributed service providers of EGI through the mediation and brokering activity of EGI.eu.

[1] https://documents.egi.eu/document/2535
[2] https://wiki.egi.eu/wiki/EGI_Service_Portfolio_Management
[3] https://wiki.egi.eu/wiki/EGI_Service_Availability_and_Continuity_Management
[4] https://wiki.egi.eu/wiki/EGI_IT_Service_Management

For SME/Industry Engagement and Big Data Value Chain, the project established the business engagement programme[5] for outreach to industry and started to initiate discussions with organisations to formalise potential collaborations including the Big Data Value Association. In addition, an initial market analysis was conducted in selected sections (marine, agriculture).

The first workshop dedicated to the Open Science Commons[6] for policy makers, funding agencies and research infrastructure providers was organized during the EGI Conference 2015. Following this, the Open Science Commons vision (extensively discussed at the recent EGI Conference in Lisbon), was adopted in May by the European Council in the conclusions on "open, data-intensive and networked research". The Council acknowledged the potential of open science and welcomed "growing support for open access to publicly funded research publications and underlying data". The Council also underlined "the importance of developing EU-wide data communities of researchers, research funding organisations, research performing organisations, companies, SMEs, public sector and other relevant stakeholders" and recognized the importance of initiatives "aiming at sharing and governing advanced digital services, scientific instruments, data, knowledge and expertise that enable researchers to collaborate more effectively, such as the Open Science Commons"[7].

JAR2.1 “Federated Open Data” has worked on the organisation of the EGI Conference session which gathered open data use cases and requirements from different data providers and research disciplines. The task collected communities’ requirements through special template for requirements collection to capture plans and need for data management. Using the feedback obtained from the communities in the form of requirement questionnaires, a milestone report M4.1 "Open Data Platform: requirements and implementation plans" was prepared[8]. Furthermore an initial architecture for the open data platform has been designed.

In the context of JRA2 requirements and priorities for the development of the EGI Cloud Federation were defined. The source code of the existing integration tools regarding the OCCI support has been maintained. The task has also developed the Keystone-VOMS integration module for X.509 authentication in OpenStack; in addition, a new version of the accounting collection tools for OpenStack was released. Initial contact with some Product Teams for the release of the EGI-Engage developed modules in UMD – the EGI Unified Middleware Distribution, has been established and the integration is now an ongoing process.

JAR2.3 “e-Infrastructures Integration” spent the first period on D4Science integration work by porting of two selected use cases to the EGI Federated Cloud. In order to track the different integration activities with the EGI Federated Cloud, the task set up process to better coordinate the work and collect for each of the collaboration the contact points and its status. In addition, integration scenarios of EGI and EUDAT services were defined, focusing on AAI and data access from the EGI Cloud Federation. Finally, the integration plan of the CANFAR research cloud in

[5] https://documents.egi.eu/document/2548
[6] http://go.egi.eu/osc
[7] http://www.egi.eu/blog/2015/06/10/the_open_science_commons_are_adopted_by_the_european_council.html
[8] https://documents.egi.eu/document/2547

Canada and EGI was defined aiming at allowing sharing of data products, tools and data across CANFAR and EGI.

JAR2.4 "Accelerated Computing" during last 6 months was working on enabling GPGPU and co-processor support for the EGI HTC and Cloud platform. An HTC testbed has been set up and a new version of BLAH was prototyped for including GPU directives to be passed to the underlying Logical Research Management Sysstems. For Cloud available technologies have been reviewed and GPGPU virtualisation in KVM/QEMU has been analysed and performance tests have been carried out. In addition a cloud site with GPGPU support has been set up.

SA2.1 "Training" has worked on the creation of an experts' network to collaborate across EGI in provisioning and designing training activity. Besides provisioning trainings, the task focused on designing and preparing framework to support trainers and training provisioning.

SA2.2 "Technical User Support" focused efforts in setting up process for gathering and tracking user requirements. This preliminary work on structuring user support will result in next periods in more efficient and effective work performed by the activity. In addition, support to various medium size and large research collaborations and Research Infrastructures not originally planned in the project, was provided. The beneficiaries of this support activity include the Human Brain Project (scientific pillar 5/neuroinformatics), the International Cancer Genome Consortium, and LOFAR. The European projects, RIs and research collaborations currently being engaged are 42, most of these are at initial engagement stage, while 6 are in final SLA negotiation phase. At the time of writing, seven Research Infrastructures are either using EGI services for their production activities or are in early adoption phase: BBMRI, CLARIN, CTA, ELIXIR, LifeWatch, LOFAR and KM3NeT.

All Competence Centres (CCs): DARIAH, EISCAT-3D, EPOS, LifeWatch, MoBRAIN and natural "disaster mitigation"[9] started their work successfully. Activities aimed at requirements gathering and technical support in defining the Research Infrastructure AAI, compute and data platforms. These activities are the foundation of further development work.

The DARIAH Competence Centre is working on refining the e-infrastructure requirements from digital humanities researchers and groups for the integrated science gateway that will be setup for the support of storage, data discovery and data analysis/simulation. Similarly, EISCAT_3D is collecting requirements for the development of a data portal allowing management, sharing and processing of the big scientific data produced by the EISCAT-3D incoherent scatter radars infrastructure. The ELIXIR CC started early work on the testing and integration of the EGI core platform (the services for the federation): the EGI service registry (GOCDB), the Virtual Machine Image marketplace (AppDB), service availability and reliability monitoring service (ARGO), the usage accounting system (APEL) and user certificate generation and management service. LifeWatch is integrating the first Resource Centre that will host LifeWatch services. The centre, located in Sevilla is expected to provide about 1,000 cores and 1 PB, and will be part of the EGI Cloud Federation. Data flows from ecological observatories to a federated cloud infrastructure for different applications, and the porting of workflows and virtual laboratories are in progress.

[9] BBMRI and ELIXIR started at PM07 and PM06 respectively.

EPOS defined two use cases, one focusing on the AAI needs for data retrieval, transfer and linkage across different data and computing infrastructures, and a second focusing on the integration of computational resources and EPOS services. Through the CC the EPOS Satellite Community (EPOS WG14) will contribute to the specification and implementation of the computational use case.

A virtualised e-infrastructure[10] has been setup in the form of a new Virtual Organization hosted on the EGI Federated Cloud. The VO is complemented by a training access control mechanism to generate short-term proxy certificates for trainees and trainers wishing to use the system. In addition,

Activities on AAI aimed at establishing contacts with other project and infrastructures (AARC, GN4, EUDAT2020 and PRACE) in order to work together towards an interoperable AAI. Security operations are being coordinated across different infrastructures, and the first cross-infrastructure meeting will take place in Barcelona, 20-22 October[11].

The requirements for the next generation accounting portal have been gathered. In addition, the accounting infrastructure supporting the EGI Cloud Federation was further enhanced. The support tool for resource allocation – serving both free-at-point-of-use and pay-for-use access, has been improved.

EGI operations coordination – funded through activity SA1 – ensured the reliable steady running of the distributed infrastructure. A new bid for the running of the EGI core services and activities in the period May 2016 – December 2017 was launched in July[12]. The EGI core services and activities – necessary for the running of the European federation – are funded through the annual fees of the EGI participants.

Security operations focused on the definition of requirements for the EGI Cloud Federation, in particular those concerning endorsed Virtual Machine images. New draft versions of the "EGI-CSIRT Critical Vulnerability Handling" and ""EGI Software Vulnerability Group – Strategy and Vulnerability Issue Handling" procedures[13] have been produced and work started on four new or revised policies. The task also worked towards planning and developing a security challenge of the EGI Federated Cloud services.

"Integration, Deployment of Grid and Cloud Platforms" spent effort on prototyping the long tail of science platform integrated with the Catania Science Gateway Framework. Work towards defining how to integrate the ESA authentication system with the Federated cloud has been performed by EGI and ESA. The activities for the D4Science integration focused on the selection of the use cases and services that will run in the EGI Federated cloud. The integration plan needed to seamlessly connect the Canadian research cloud infrastructure for astronomical data (CANFAR) and EGI were defined[14]. EGI-EUDAT technical interoperability activities progressed. A joint testbed involving the EGI Cloud Federation and the B2STAGE was implemented, and stage-in and stage-out operations

[10] https://wiki.egi.eu/wiki/Training_infrastructure
[11] https://www.terena.org/activities/ism/wise-ws/
[12] https://wiki.egi.eu/wiki/EGI_Core_Activities_Bidding#PHASE_II_May_2016-December_2017
[13] https://wiki.egi.eu/wiki/Operations_Procedures#Security
[14] https://documents.egi.eu/document/2549

were successfully tested with globus-url-copy. The next testing activities will involve the management of PIDs, automatic VM configuration through contextualisation, virtual appliance management through the EGI Cloud marketplace[15].

The GPGPU platform development is progressing. GPGPU integration in the Torque/MAUI scheduler is complete and is now in testing phase. Additional test GPGPU clusters are being identified to complete the integration work for the LSF scheduler. Publication of GPGPU information in the GLUE 2.0 standard[16] is being designed. Availability of GPGPU information is paramount to enable the distribution and brokering of computation to the distributed GPGPU clusters that EGI will provide. Access to GPGPU capabilities via virtualization is in design phase, the status of activities is documented on wiki[17].

Collaborations with other H2020 actions have been established, including: World-wide E-infrastructure for structural biology (West-Life)[18], A comprehensive and standardised e-infrastructure for analysing medical metabolic phenotype data (PhenoMeNal)[19], Authentication and Authorisation for Research and Collaboration (AARC)[20], INtegrating Distributed data Infrastructures for Global ExplOitation (INDIGO DataCloud), and EUDAT 2020[21].

Project management successfully established the three bodies that constitute the project governance: the Activity Management Board, the Project Management Board and the Collaboration Board. The quality management activities including risk management, the management of the record of open source software produced and the monitoring of the data management plans have been successfully delivered. All milestones and deliverables due by PM06 are with the EC.

[15] https://appdb.egi.eu/
[16] http://glue20.web.cern.ch/glue20/
[17] https://wiki.egi.eu/wiki/GPGPU-FedCloud
[18] http://cordis.europa.eu/project/rcn/198312_en.html
[19] http://cordis.europa.eu/project/rcn/194953_en.html
[20] http://cordis.europa.eu/project/rcn/196642_en.html
[21] http://cordis.europa.eu/project/rcn/194928_en.html

2 Strategy, Policy and Communications

2.1 Summary

The main purpose of this work package is to steer the consolidation and growth of the EGI community by developing a strategy towards the Open Science Commons vision and ensure the engagement of all stakeholders. This will be achieved by developing services, solutions and related business models, and by communicating project results and disseminating EGI's value and impact. The activity will also focus on the engagement with SMEs to increase the exploitation opportunities of EGI services and research results.

NA2.1 "Communication and Dissemination" has worked on the organisation of the EGI flagship events, delivering the first – the EGI Conference in Lisbon (May 2015) and started preparations for the EGI Community Forum in Bari (Nov 2015). It has supported dissemination and outreach through its communication channels such as the EGI Inspired newsletter, case studies and external articles, and launched a revised EGI Champions programme.

NA2.2 "Strategy, Business Development and Exploitation" focused early efforts in exploring cross-border procurement opportunities, understanding how to move the pay-for-use prototype into production, creating the conceptual model of the EGI Marketplace and improving the management of EGI services through better defined processes and procedures according to the FitSM IT service management standard.

NA2.3 "SME/Industry Engagement and Big Data Value Chain" spent the first period setting up the business engagement programme for outreach to industry and started to initiate discussions with organisations to formalise potential collaborations including the Big Data Value Association. In addition, an initial market analysis was conducted in selected sections (marine, fisheries, and agriculture)

Project partners across the activities were heavily involved in the first EGI conference not only in the development of the programme agenda, but actively participating, leading and presenting in several sessions organised on relevant topics.

2.2 Main Achievements

2.2.1 Communication and Dissemination

During the first six months of EGI-Engage the NA2.1 task has the following achievements:

2.2.1.1 Events

EGI Conference in Lisbon, 18-22 May 2015

The event was successfully organised in partnership with IBERGRID and the local support of the LIP – lead partner of the Portuguese NGI. Information about the logistics and organisation procedures is available online as a report[22], on the event website[23] and its Indico pages[24].

EGI Community Forum 2015 in Bari, 10-13 November 2015

Preparations for the EGI flagship event of 2015 are well underway. As of the writing of this report:

- an event website has been established[25]
- the Indico pages are created[26]
- the Call for Participation is closed, with ca. 140 abstracts submitted
- the abstracts are with the programme committee for review
- a registration system is in place
- co-locations are under negotiation with four projects (INDIGO-DataCloud, EDISON, WestLife, Open Grid Forum)

2.2.1.2 Active communication channels

Newsfeed and newsletter

The EGI newsfeed has been updated with on average 3 news items per month (total of 18, as of end PM05), of which about one third have been developed in conjunction with the NGIs and the EGI Champions.

Issues 19 and 20 of *Inspired*, the EGI newsletter, have been published. More than half of the content of these two issues has been sourced in the community (i.e., not written by EGI.eu staff).

The significant proportion of external material in the newsfeed and newsletter suggests that our first steps towards more inclusive communications channels, at the disposal of the community, have been successful.

Blog

As of the end of July, eleven blog posts were published, mainly to report policy developments. The blog is developing organically as a communication channel aimed at policy makers, which is something to be encouraged over the next reporting period.

External publications / Media mentions

As part of the dissemination effort, the task endeavoured to have EGI featured in external publications by working with both the EGI.eu team and the editors of the publications. This resulted in having articles successfully published in the following outlets: the EC CORDIS magazine, the EC HORIZON magazine, Primeur Weekly magazine, CONNECT magazine and iSGTW (several); also in the following newsletters: DRIHM project newsletter, e-IRG newsletter.

[22] https://documents.egi.eu/secure/ShowDocument?docid=2529&version=1
[23] http://conf2015.egi.eu
[24] http://go.egi.eu/c15
[25] http://cf2015.egi.eu
[26] http://go.egi.eu/cf2015

EGI was also mentioned in articles published by external outlet without direct involvement of the NA2.1 task, of which the highlight is a mention of the EGI Federated Cloud in a Nature News feature article.

Details and links to be found in the dissemination activities table (Appendix I).

Champions programme

The logistic and procedural aspects of the Champions programme have been revised to render the whole scheme more agile and inclusive. As opposed to the previous set up, now any scientist that uses EGI's services for research can apply directly for travel support under the scheme. The revised programme has been implemented as an Open Call, hosted by an Indico container[27] that allows potential interested champions to submit an application anytime.

Under this new system, and in the period covered in this report, three requests for support have been received and EGI responded favourably to two.

Case studies

The task published one case study during this period, however in question is a blueprint for how to maximise case studies a communication tool for impact marketing. The case study, entitled New Biomarkers for multiple sclerosis ¬, described how a Swedish PhD student used a VRE developed in France for his work. This VRE – the Virtual Imaging Platform – was the subject of a newsletter article written by the developer . Together, these sister articles convey both the technical achievement and the scientific impact of the work. A third article, combining the two views, was published in iSGTW.

Outreach support

In cooperation with the EGI.eu Outreach team, as part of the support to that activity, the task edited and published 4 webinars introducing the EGI-Engage and technological developments in the areas of authentication and authorization infrastructure (AAI), EGI cloud service and EGI data management services. Together the webinars have attracted over 150 views (as of the date of writing).

The task also took the opportunity to publicise two upcoming EGI Federated Cloud tutorials and one set of online tutorials dedicated to the Chipster tool.

Publications

The task cooperated with the EGI.eu Operations team to develop the design and the concept for a series of brochures dedicated to the Operational Tools. At the time of writing, this activity is under development.

Additionally, the task:

Worked with the Strategy and Policy team to copyedit and publish a brochure-like version of the 'EGI Strategy 2015-2020' document

[27] https://indico.egi.eu/indico/conferenceDisplay.py?confId=2529

Published the 'Compendium of e-Infrastructure requirements for the digital ERA', a work led by the EGI Council on going since the end of the EGI-InSPIRE.

Prepared a flyer for distribution at the BDVA Summit in Madrid, which EGI sponsored.

2.2.2 Strategy, Business Development and Exploitation

During the first six months of EGI-Engage the NA2.2 task has the following achievements:

Development/Exploitation

As part of the work regarding development and exploitation the task followed-up with the DHRIM consortium to define a long-term service agreement for EGI services delivery and organised a set of calls concerning the involvement of EGI in ESA Stimulus Projects (paid for services).

Service Management

The task prepared an ITSM seminar held at INFN-Pisa (June) and worked towards evolution of internal ITSM process based on FitSM[28] standard produced by FedSM project. A number of improvements have been introduced to EGI Service Management System[29] which goal is to define structured processes for the improvement of EGI service delivery to its customers. A new policy board, the EGI Service and Solutions Board, was kicked off with several calls to revise the EGI service and solutions portfolios and to define detailed processes and procedures for portfolios management and evolution.

Pay-for-Use

The Pay-for-Use pilot group has already been active for more than one year prior to the start of EGI-Engage; therefore all activities are a continuation of progress made throughout 2014. The focus of the work within the task is on how to move the proof of concept into production. This activity is led by EGI.eu with partners coming from providers already in a position to sell services: IICT-BAS, CSIC, GRNET, INFN, TUBITAK. These activities link to other areas such as with CYFRONET for e-GRANT development and JRA1 as whole, as well as the EGI Marketplace, Procurement and SME engagement.

Moreover, the Pay-for-Use pilot group has much larger participation than EGI-Engage partners, which expands to more than 20 institutes across 15 countries[30].

As activity leader, EGI.eu organises regular phone meetings, chairs discussions, tracks actions and steers the direction of activities. It established all partner contacts, set-up all mailing lists, project management tools (e.g. wiki), and definition of activity metrics. In addition, during the first 6 months of EGI-Engage, the main achievements can be summarised as:

- Contributions to D2.1 Dissemination, Communication and Engagement Strategy
- Coordination with the EGI Marketplace activities

[28] http://fitsm.eu/

[29] https://wiki.egi.eu/wiki/EGI_SMS

[30] https://wiki.egi.eu/wiki/EGI_Pay-for-Use_PoC

- Collation of procurement related information from providers
- EGI Conference – 18-23 May – Lisbon: Two pay-for-use related presentations (Procurement and Service Level Management sessions)
- Interface between Helix Nebula and EGI providers
- Introduction to Pay-for-Use meeting at INFN-Pisa

CYFRONET created an e-GRANT development plan for pay-for-use activities[31] for developing the pilot execution of the pay-for-use process in e-GRANT (Nov 2015) and for the first prototype of pay-for-use platform in production (Mar 2016). Results have been the pay-for-use 'pools' implemented and HTC resources and Cloud resources available in the system with resource survey available for the Customers. The negotiation process (Customer – EGI Broker – EGI Provider) of the resources and the price of the resources are also in place with the negotiation process resulting in signing an SLA between the Customer and EGI.eu. The defined plan includes extending support for pay-for-use process (Dec 2016) with at least one billing function implemented in the system, Integration with EGI Accounting Portal, and support of requirements from new P4U Customers. The final release of e-GRANT will be the common system for EGI Resource Allocation process and P4U process, where the customer can ask for both free and non-free resources in one request. e-GRANT team is also preparing a platform ready for pilot execution of pay-for-use process, which means implementing a full negotiation scheme between customer, EGI broker and EGI provider.

IFCA-CSIC has continued supporting pay-for-use in the same framework as previously such as active participation in the majority of phone conferences, contributing from a resource provider perspective to ensure processes and policies are shaped according to real use cases, etc. In addition, a quite detailed analysis has been made to present an offer through EGI.eu to the support required by BILS_ELIXIR_SWEDEN[32], considering the different type of resources and usage. At the same time, a new study has started to analyse backfilling options for HPC cloud resources, where a compromise between cost and percentage of use of resources is needed.

IICT-BAS held an important event related to the creation of Mathematical Modelling and Advanced Computing centre, with participation from policymakers and industry leaders. During this event the strategic steps were discussed to undertake in order to open-up the substantial computing resources and scientific and technical expertise of the IICT-BAS and its collaborators to SMEs from the ICT cluster, not only from Bulgaria, but also from the region of South Eastern Europe. The governmental documents and policies were discussed with the aim to achieve synergy between them and the European Horizon 2020 programme. It is envisaged that national funding will be used for the acquisitions of hardware resources, while the services will adhere to the established standards and models in Europe.

[31] M3.1 Operational tools development roadmap - https://documents.egi.eu/document/2485

[32] https://www.bils.se/

GRNET continued its active participation in the regular phone conferences of this activity and implemented all the allocated action items and is in the final stages of completing a paid service to an organisation outside of Greece that will be reported on in the next report.

2.2.3 SME/Industry Engagement and Big Data Value Chain

The key objectives of this task are to facilitate the connection of EGI with SMEs at a European and National level; understand the requirements from SMEs in all sectors but with special focus on the agriculture and food and the fishery and marine sciences sectors, which will provide use cases for the creation of enhanced services unifying computing and data approaches; create a model (similar to a master franchise) for SME engagement that will be put in practice but can also later be adopted and adapted for a wider number of NGIs/Resource Centres; and attract SMEs to explore and detect opportunities and threats around the Open Data and co-develop business models for their exploitation.

The task achievements can be summarized as:

2.2.3.1 SME Engagement

This activity is designed to be the implementation phase of a dedicated business engagement virtual team that ran over the course of 2014. During the first 6 months the main achievements as an activity as a whole have been:

- Definition of the EGI Business Engagement Programme
- Organisation of and participation to the Business Track at the EGI Conference in Lisbon
- Gathering of a database of contacts with various level of engagement comprising: 33 industry organisations in 10 countries, 4 international covering a range of sectors with diverse engagement types such as a consumer of EGI services, service/technology provider, broker, developer, and reseller, amongst others.
- Identification of business related events for attendance.

As activity leader, EGI.eu organises regular phone meetings, chairs discussions, tracks actions and steers the direction of activities. It established contact with all partner, set-up all mailing lists, project management tools (e.g. wiki), and definition the activity metrics. In addition, during the first 6 months of EGI-Engage, the main achievements can be summarised as:

- EGI Conference – 18-23 May 2015
    - Business track leader organizing overall content and speaker liaison (5 sessions over 2 days including chairing summary and wrap-up session to extract key action points).
    - Prepared and presented a dedicated talk opening the business track on the "EGI Business Engagement Programme)
    - Wrote a summary article on the EGI Blog[33]

33 https://www.egi.eu/blog/2015/05/29/business_track_summary_outcomes_and_next_steps_egi_conf_2015_lisbon.html#preview

- Direct engagement with industry: Arctur, Big Data Europe, Engineering, FIWARE, ITEMO, Mathworks, Strategic Blue, UberCloud, Dropbox, Zenotech
- Main author of D2.2 – Master Model for SME Engagement
- Abstract submitted for EGI Community Forum in Bari

During reporting period CNRS contacted the SMEs identified during EGI-Inspire as willing to collaborate with the EGI community. At the same time France Grilles (the French NGI) collaborates with another SME named SixSq (Switzerland): one of SixSq managers was member of a CNRS unit. Both StratusLab and SlipStream software developed by SixSq are deployed on one site of France Grilles cloud infrastructure. Slipstream is used in the framework of its current first cloud challenge.

After some discussions with SMEs and collection of requirements CSC made a contract on using HPC IaaS cloud service with Fimmic Oy[34] a start-up company based on the research done at the University of Helsinki. The Software as a Service (WebMicroscopy) of Fimmic is for virtual microscopy for pathological images. Due to the fact that the microscopy images can be terabyte scale and demand matrix operations, and in the future will use classification algorithms, there is need for efficient cloud service including computing, storage and network. Under Fimmic contract, CSC offered a trial period for cloud service evaluation. This demonstrated to be valuable for trust building. WebMicroscopy software runs on Windows Server and therefore CSC had to acquire the commercial data center license for a server. CSC's cloud is used also for agricultural science, called CSCJuga, where a SME is doing the administration of the operating system and operates their bioscience software on the virtual machine for the scientists. In this case the researchers pay for the work and licensing for the SME but do not have to pay CSC for the resources since the research project can be applied by the university researchers free of charge. The CSC press release on the CSCJuga cloud service for agricultural science was published on Feb 2015[35].

IFCA-CSIC has continued and extended the collaboration with SMEs related to exploitation of Big Data that started in EGI-InSPIRE. As a first example, ECOHYDROS SL is using the implementation on a Federated Cloud machine of the DELFT3D Water quality module in regular mode to understand the model and make an optimisation. The input/output data volumes make optimisation unfeasible at SME installations. A recent new contact is Genetracer SL, installed at the technological park in Santander, interested in the execution of genomic pipelines (like Galaxy or TRUFA). Genetracer has accounts and will explore the possibility of implementing a new pipeline for personal medicine analysis in the forthcoming months (they are looking for funding for this initiative). Again this is a Big Data topic, and new scalable specific analysis tools like STAR are also being considered.

IICT-BAS established a collaboration with two Bulgarian SMEs with high interest in using distributed computing for processing of Big Data. In the domain of traffic data acquisition and analytics IICT-BAS studied the requirements and some use cases with the aim to serve as technology and computing resource provider for SMEs that are able to acquire high amounts of

[34] http://www.fimmic.com/

[35] https://www.csc.fi/-/bc-platforms-ja-csc-kehittivat-supertehokkaan-palvelun-genomitiedon-hallintaan

potentially useful traffic data, but lack the expertise and resources to process it and obtain added value from it. The EGI Federated cloud seems to offer appropriate type of services for use in deep learning tasks and the framework for future collaboration in this area has been established. In relation to the establishment of the new computing centre of IICT-BAS, based on servers with Xeon Phi coprocessors, with theoretical peak performance of 410 Teraflops, has been established a collaboration with a Bulgarian SME with interest and expertise in the domain of real-time in-memory databases like SAP HANA.

SwiNG has been involved in exploring the concept of partnering with commercial providers of solutions of interest to researchers and a proof of concept of this kind of partnership has been done with Dropbox, which developed a special offering for organizations involved with EGI. This offering has already been implemented by one participate in the project. To help provide input from the perspective of industry into the project, the Friedrich Miescher Institute for Biomedical Research has been involved because of its close ties with Novartis. The project is also examining if the Service Registry and Marketplace activity within EGI-Engage can serve as a medium to help SMEs discover academic research resources that may be of use for them, as well as helping academia discover commercial offerings that could facilitate their research. The lessons learned from the pay-for-use activity will serve as input into this activity where services are used within or a across organizations for a fee. In addition participants of the pay-for-use project will be asked if they would be willing to register their services in the Service Registry and Marketplace solution being developed.

GRNET continued its active participation in the regular phone conferences of this activity and implemented all the allocated action items that are tracked via an internal Google Doc as formal meetings of each meeting and has started to gather a list of current and potential companies as potential collaborations for EGI.

2.2.3.2 Market analysis and user requirements in selected sectors

The objectives of this activity are:

- investigate market potential, size, structure, stakeholder composition and segmentation, value chains, competing offerings of the agri-food, and/or geospatial data analytics sector in Europe, and possibly extended to other geographical areas such as North and South America
- collect and validate a wide set of requirements from the identified SMEs that will be used to profile new and enhanced EGI services
- propose recommendations for new and enhanced services for (big) and/or open data services targeting the industry and academia.

This activity will focus on developing personas (descriptions of typical users) and scenarios described in detail, and then validate these assumptions in a series of interviews with potential users. The scope of the interviewees is intended to cover different organisational roles, customer segments, and activities. This activity also examines what problems EGI can address (market/product fit), the specific challenges, and, if possible co-develop demonstrators or prototypes between developers and potential communities.

The main achievements for this period were around the organisation of a number of phone conferences to kickstart this task. The main focus at the start of the project was to shape the programme of the business track sessions at the EGI Conference, which included the organisation and chairing of a dedicated session. Two presentations were prepared and delivered: "Introduction to EGI Market Analysis" and "agINFRA - the European hub for agri-food research and how EGI can support it".

2.2.3.3 Data policies, legal aspects and market analysis (fishery and marine sciences)

This activity consists of two main areas: identification of data sharing policies and legal aspects as well as a market analysis for fishery and marine sciences. The following sections provide further details around these activities. FAO's inputs to the project will focus on legal interoperability. Engineering will focus on the production of the market analysis, whereas CNR's role is in technical analysis.

Regarding achievements around Data Sharing Policies and Legal Aspects (fishery and marine sciences datasets), FAO facilitated community interactions through events, mailing, bilateral meetings. This comprised a Strategic Data Workshop held in May 2015. FAO inventoried additional requirements for secure data storage and exchange of Fisheries data, including machine-to-machine interactions and a gave a presentation on the iMarine secure data exchange opportunities at 2 community events 1.) a global network of marine scientists working on marine protected areas, and 2.) internally to the semantic web interest group. An analysis of legal barriers in sharing fishery & marine sciences datasets was conducted and discussion of Roll-out paper with the legal offices in FAO and CNR concluded in July with the preparation of a dedicated document.

A framework of legally relevant instructions to data providers and consumers was established including a selection of a sample use case to be further analysed. Candidates are: Regional Fisheries Databases and SmartForms secure and scalable data collection based on mobile devices supported by a managed infrastructure. The SmartForms technology option and data policy was presented to 2 FAO projects, and 1 external project. FAO also prepared and submitted an abstract called "Data policies and legal aspects with a focus on fishery and marine sciences" to the EGI Community Forum 2015 to be held in November.

Engineering collaborated as part of the EGI Programme Committee and contributed to shaping the Programme of the business track sessions at the EGI Conference held in May 2015. They prepared and delivered a dedicated presentation "Marine/Maritime Market Analysis - Initial Findings for the iMarine Case", as part of the "Engaging SMEs" session organized with other contributors from GRNET and AgroKnow at the EGI Conference held in May 2015. The dedicated presentation described the iMarine initiative, being its diverse services and the communities they serve, along with initial market size figures of the marine industry and its growth opportunities. An abstract, "Market analysis of agri-food sector and, the fishery and marine sciences data analysis sector", was prepared and submitted to the EGI Community Forum 2015 to be held in November. The session is jointly organized with GRNET, with contribution from AgroKnow and CNR. Finally, a market analysis of the fishery and marine sciences data analysis sector research activities was done. Specifically, investigation of the data analysis sector in Europe and worldwide, planning of

activities/interviews to gather information in regards to the potential of the sector, stakeholders and respective interests, and insights into value chain and revenue streams.

2.3 Issues and Treatment

No project issues raised in the period PM01-PM06.

2.4 Plans for next period

In next period the **NA2.1 task** will continue to keep the EGI communication channels open and active as a means to support the dissemination and outreach activities, as well as a way to promote dialogue and community building. The task will promote the Champions programme and aims, over the next period, to increase the level of support granted to EGI Champions. It will also support the logistical organisation of the EGI Community Forum in Bari and the programme development. The first steps towards an EGI workshop in Amsterdam (4-8 April 2016) will be taken.

Within **NA2.2 task** in the next period, it is planned to manage overall activities and hold regular phone meetings. In November 2014, during a dedicated session at the EGI Conference in Bari, it is foreseen to organise a demo presenting pay-for-use functionality implemented in the e-GRANT tool, which is used to request and allocate resources in the EGI e-Infrastructure. In addition, the task plans to promote pay-for-use capabilities through the business engagement activities e.g. events, marketing materials[36].

CERN is establishing the mechanisms for performing cross-border procurements by ERICs with their member states, including Pre-commercial procurement (PCP)/Public-private partnerships (PPI) and EU structural funds. Each programme/structure will be further studied to understand the opportunities and implications. The pursuit of these actions and the opinions of the RIs, gathered through direct contact and workshop feedback, on the results achieved will form the basis for the 'cross border joint procurement' task (NA2.2.5) in the EGI-Engage project and will provide material for the deliverable D2.11. The progress of this task will be reviewed by the participating partners and RIs at the EGI events starting with the EGI community forum in November 2015.

CYFRONET plans to prepare a platform ready for a pilot execution of pay-for-use (P4U) process comprising finishing the implementation of a full negotiation scheme between customer, EGI broker and EGI provider and implementing P4U SLA Document in the platform. Other activities will be:

- adapting metrics of EGI resources available in the system so they match the Customers' requirements
- supporting the Pilot execution of pay-for-use process in e-GRANT
- implementing features suggested by the P4U Customer after the pilot P4U process execution
- preparing for deploying P4U platform to production.

[36] EGI-Engage D2.2 - Master Model for SME engagement: https://documents.egi.eu/document/2548

NA2.3 task in upcoming period will focus on formalising both existing use cases that have been identified from the NGIs, identify commonalities for replication across the infrastructure as well as define specific requirements that can be fed into EGI development activities. These activities will also be complemented by the market analysis underway in marine, fisheries and agriculture sectors where both policy and technical requirements are currently being articulated. Another area will be on establishing/finalising collaboration agreements from (initial/mature) discussions with industry organisation (i.e. UberCloud) and will attend relevant events.

More specifically, CNRS partner will study the best actions to be taken to engage concretely with the 3 SMEs already contacted. France Grilles will organise Success Days (i.e. grid, HPC and cloud days) in November in Paris[37]. If possible it will seize the opportunity to contact other SMEs. A service unit of CNRS (ISCPIF) contacted a few weeks ago the France Grilles team expressing the interest to participate to the EGI business team. This unit provides technical and market studies to industrials and its participation could be useful in the next months.

IICT-BAS partner is planning to prepare and sign MoUs with the main interested SMEs, where to detail the concrete technical steps and areas of collaboration in relation to the business engagement programme, which will serve as an interface to the substantial new resources that will be available in IICT-BAS for science and innovation. An important event in this period will be the official opening of the new computer centre, where governmental officials, policymakers and representatives of industry will be present. This event will be used to demonstrate the interconnection with EGI services and the benefits for SMEs from their use. This will be a good occasion to achieve also some press and media coverage of our EGI activities.

CSC is launching a new secure oriented cloud for organizational customers, called ePouta[38]. Thus ePouta is suitable for commercial use. In parallel, CSC is in constant contact with and trying to reach new potential SME customers.

IFCA-CSIC plans to continue active support of the overall pay-for-use group to support the move from prototype to production and answer with service offers to presented use cases such as done with the BILS request. For SME Engagement, information and opportunities with several ongoing relationships and partnerships with industry will continue to be fed through EGI activities. The opportunity previous described with Genetracer SL will be pushed forward during the next period.

FAO will work in the "Analysis of legal barriers in sharing fishery & marine sciences datasets" will continue with the roll-out of the paper with other partners and possible preparation of session at EGI CF in November 2015 to present interim results. An important upcoming activity is the deliverable preparation, "Report on data sharing policies and legal framework in fishery and marine sciences data sector", with expected delivery at PM12.

Engineering plans possible preparation of a session at EGI CF in November 2015 to present interim results, and also deliverable preparation, "Market Report on the fishery and marine sciences data sector", with expected delivery at PM12.

[37] http://succes2015.sciencesconf.org/

[38] https://research.csc.fi/epouta

CNR is playing a support role in the production of deliverable D2.7, “Market Report on the fishery and marine sciences data sector”, led by Engineering and due Feb 2016

SWING is planning to do some proof of concepts based on the input from the different participants. In addition various platforms will be examined to see if they are suitable to serve as the platform that can be used to provide the Service Registry and Marketplace solution. The initial business model of the platform will also be defined, which will explore the idea of establishing a consortium to support the long-term sustainability of the platform. So far five organizations have expressed interest in using the platform, and work will be done to try and attract additional partners. Regarding SME engagement, efforts will be put on formalizing current and new industry contacts through the marketplace activities.

GRNET is involved in several activities such as pay-for-use, SME engagement and leads the market analysis. In addition to participation on regular phone meetings, plans are to participate in a dedicated session at EGI Conference in Bari, to participate in Pay-Per-Use Pilot by offering resources through e-GRANT, to evaluate methods to overcome legal/financial barriers, formalise relationships with business contacts and/or provide opportunities to be explored by the EGI community. For the market analysis and user requirements in selected sectors, GRNET will attend relevant events, create the platform for the market analysis, start collecting input/feedback, present initial findings in EGI Community conference in Bari and build the foundation for a dedicated report due next year.

3 E-Infrastructure Commons

3.1 Summary

This workpackage coordinates the development of the e-Infrastructure Commons - an ecosystem of services that constitute the foundation layer of any distributed e-Infrastructures. The technical development of the e-Infrastructure Commons services is planned to be user-driven to ensure full interoperability with other e-Infrastructures and RIs. The existing set of services is going to be expanded to include a Service Registry and Marketplace. The main targets of this task are:

- Provide viable methods for authentication and authorisation in the EGI ecosystem.
- Simplify the access to the infrastructure services through technological innovation and new services in the area of Service Registry and Marketplace and resource allocation.
- Evolve the EGI accounting system to manage the data deluge expected over the next years, including new types of accounting metric (e.g. data accounting) and redesigning of the presentation layer to improve the user experience.
- Adapt the operations tools to new technologies and to satisfy new requirements emerging from service providers and user communities.
- Define interfaces to create a network of analogue tools that provides users with integrated view of all the infrastructures involved.

During this first period, the e-Infrastructure Commons work package focussed its effort on the definition and the implementation of the main processes that will drive its activities until the end of the project:

- **Requirement gathering**: communication channels were established with the other EGI Engage WPs that are in charge of the communication with users and key stakeholders (see Figure 1).
- **Requirement prioritisation**: Operation Tool Advisory Groups (OTAGs) were settled inviting representative of users for each tool[39].

[39] https://wiki.egi.eu/wiki/Operations_Tools_Advisory_Groups

- **Roadmap definition and procedure to update it**: a roadmap was defined for each tool taking into account all the requirements collected. The roadmap will be updated each three months according to the requirements gathered through the identified communication channels involving both internal and external stakeholder groups. The procedure to update tool roadmap is described in Figure 2.

Two face-to-face meetings, one in Amsterdam[40] and the other in conjunction with the EGI Conference in Lisbon[41], were organised to define the above described process, agree on common rules and define the first roadmap.

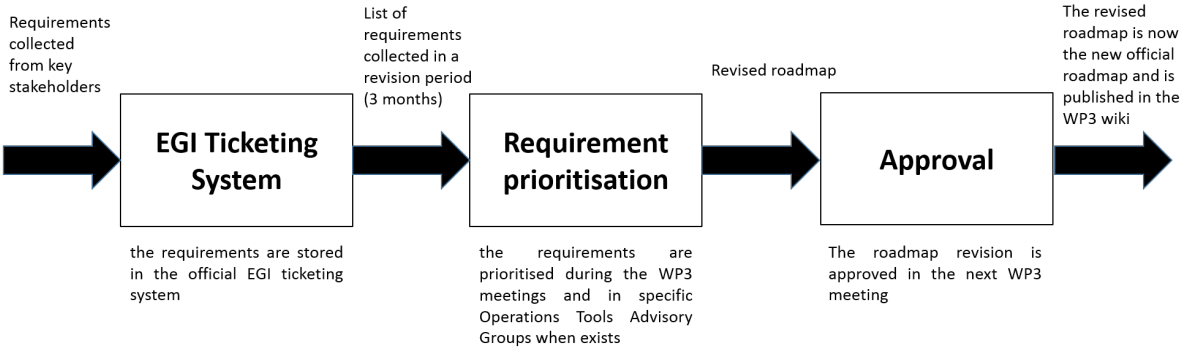

Figure 2. Procedure to update the roadmap for a tool.

The WP3 manager organises monthly meeting to check the progress of the developments and

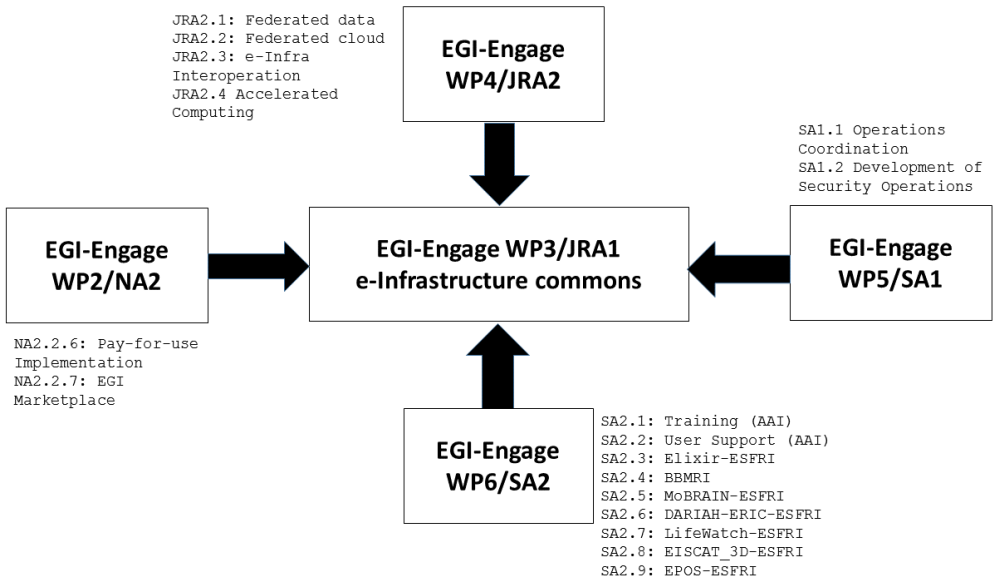

Figure 1. e-Infrastructure commons requirement gathering process in EGI-Engage.

[40] https://indico.egi.eu/indico/conferenceDisplay.py?confId=2472

[41] https://indico.egi.eu/indico/sessionDisplay.py?sessionId=98&confId=2452#20150518

discuss about issues and tool dependencies.

The WP3 roadmap is published in the activity wiki page[42] and it is also described in the M3.1 *Operational tools development roadmap agreed*.

JRA1.1 "Authentication and Authorisation Infrastructure" has been working on establishing contacts with other project and infrastructures (AARC, GN4, EUDAT2020 and PRACE) in order to work together towards an interoperable AAI.

JRA1.2 "Service Registry and Marketplace" focused on requirements gathering and analysis to prepare a concept for the marketplace and identify interfaces with other EGI tools.

JRA1.3 "Accounting" spent the first period on development around Data, Cloud and Storage accounting and collecting requirements for new Accounting Portal.

JRA1.4 "Operations tools" focused on number of developments to improve existing EGI tools according to EGI needs.

JRA1.5 "Resource Allocation – e-GRANT" continued implementation of improvements needed for EGI Resource Allocation and EGI Pay-for-Use processes.

3.2 Main Achievements

3.2.1 Authentication and Authorisation Infrastructure

The Authentication and Authorisation Infrastructure task (JRA1.1) officially started on May 2015. In this period, the team drafted the initial roadmap and organized a full day workshop at the EGI Conference in Lisbon[43], in which the team had the opportunity to present this roadmap to the EGI community and engage in a discussion with participants in order to understand their short-term and medium-term requirements. In parallel, the team has established contacts with AARC, GN4, EUDAT2020 and PRACE in order to work together towards an interoperable AAI. Finally, the task identified, in collaboration with JRA1.4, the initial set of operations tools that will enable federated logins within this year.

3.2.2 Service Registry and Marketplace

In the first period the focus of Service Registry and Marketplace task (JRA1.2) has been in requirement gathering in order to define the outline for the Proof of Concept (PoC) that will be developed in a later stage.
To better understand needs and expectations of Marketplace future users the activity organized a session at the EGI conference in Lisbon May 18-23 where experts in the area presented their work[44]. In addition input from key stakeholders has been gathered via a survey sent to competence centers and NGIs and several competence centers, research communities and NGIs

[42] https://wiki.egi.eu/wiki/EGI-Engage:WP3
[43] https://indico.egi.eu/indico/sessionDisplay.py?sessionId=89&confId=2452#20150522
[44] https://indico.egi.eu/indico/sessionDisplay.py?sessionId=78&confId=2452#20150520

have been interviewed. To gather in depth requirements for research resource sharing and management, which is considered an import element of the platform, task members visited several organizations in France, Switzerland, and Belgium. Finally EGI face-to-face meeting has been organised in Amsterdam in July to agree on the Marketplace concept.

3.2.3 Accounting

In this first period, the accounting task (JRA1.3), after the roadmap definition, started several activities that are described below:

- **Cloud accounting** - Database schema and code has been changed to support version 0.4 of the Cloud Accounting Usage Record and test will start shortly.
- **Storage –** Code has been changed to allow unloading of data into StAR records and currently it is tested by sending of data to the portal.
- **ARC Parser -** Corpus of test files have been collected and first proof of concept has been defined. The development just started.
- **Data Accounting -** First outline plan is almost completed to gather comments from stakeholders.
- **Accounting Portal** - The process to gather requirements, prioritise and implement has been defined. Requirement gathering has been started within dedicated advisory group. Technical design of the new Accounting Portal and its implementation plan is in preparation and the outcome of this activity will be reported in the D3.1.

3.2.4 Operations Tools

All tools being part of the Operations Tools task (JRA1.4) defined their roadmap and started their activities as described below.

3.2.4.1 Operations Portal

In this period, the Operations Portal team mainly worked on the roadmap definition and on the analysis on how to capture cloud resources information and to publish the information on the EGI Federated Cloud sites in its resource browser.

In the meantime, new requirements were gathered from the EGI operations team related to metrics computation and the relative developments were accomplished.

Two Operations Portal versions were released in this period 3.1.2[45] and 3.2[46].

3.2.4.2 GOCDB

Work has focussed on the development of v5.4, which was released into production on 6th July. The main new features of this version include:

- RoleActionLogging - Records all role request related actions (deny, approve, revoke)[47].

[45] http://operations-portal.egi.eu/home/tasksList/release_id/10
[46] http://operations-portal.egi.eu/home/tasksList/release_id/12
[47] https://rt.egi.eu/rt/Ticket/Display.html?id=7307

- Improved Role approve/deny page rendering and logic and many changes necessary for future business logic improvements.
- Define downtimes in site's local timezone with automatic conversion to UTC[48].
- Many small changes.

The full release note is available in GOC DB repository[49].
Furthermore, AAI work was prioritised toward the end of period, in particular to satisfy requirements gathered from the ELIXIR competence center. Work has involved prototyping and testing different SAML Service Provider implementations for federated login on the GOCDB test instance (ShibSP + SimpleSamlPHP), and preparing for GOCDB integration into the UK Access Management Federation[50].

3.2.4.3 Monitoring

ARGO Compute Engine & Web API

According to the roadmap, the objectives for this period were:

- Automatic recomputation triggers.
- Multi-tenant support.
- Stability and performance improvements.

During this period the work was focused on the automation of the recomputation triggers, the multi-tenant support and on stability and performance improvements. Regarding the recomputation triggers, the team implemented a periodic polling of recomputation requests and new authorized recomputation automatically submitted to the compute engine. Multi-tenant support has been implemented both in the compute engine and in the web API. As a result of the multi-tenant work, the data architecture of the compute engine and the web API have been refactored in order to introduce customer agnostic data structures. Finally, there has been significant work on the stability and performance improvement of both the compute engine and the web API.

ARGO EGI Web UI

According to the roadmap, the objectives for this period were:

- ACL mechanism (support groups/roles).
- UI Enhancements.

During this first phase, the developments on the Web UI have been focused on the ACL mechanism (support groups/roles) and UI Enhancements. Different authentication mechanisms have been put in place, namely authentication by certificate, authentication by login/password, while the work for the support for federated logins using SAML is ongoing. Support of group and

[48] https://rt.egi.eu/rt/Ticket/Display.html?id=7722, https://rt.egi.eu/rt/Ticket/Display.html?id=8038
[49] https://github.com/GOCDB/gocdb/blob/dev/changeLog.txt
[50] https://rt.egi.eu/rt/Ticket/Display.html?id=7493

roles is ensured with the roles associated to the certificate of users registered in GOCDB. Different improvements have been done on the interfaces to follow the requirements of EGI operations.

ARGO Monitoring Engine

According to the roadmap, the objectives for this period were:

- Probe framework.
- Support documentation (Guides).
- Stability and performance improvements.

During the period, the task proposed deployment of centralized ARGO monitoring engine that will replace distributed SAM Nagios instances. Most of the effort was spent on testing and tuning of the ARGO monitoring engine and probes in order to support the monitoring of all services in EGI infrastructure. Testing is still in progress. This work was not part of the initial roadmap and as a result the task had to push the deadlines for the activities on the probe framework and support documentation to the next periods.

The probe framework was initially proposed in order to optimize deployment of new probes on distributed SAM Nagios instances. With the shift to central ARGO monitoring engine, this functionality is not needed any more in this way. Initial discussion took place and it was decided to maintain focus on providing a framework for probe development and a mechanism for automating the process of registering and deploying new probes, developed by the product teams, to the central monitoring service.

ARGO EGI Connectors

According to the roadmap, the objectives for this period were:

- Improved support for VOs.
- Stability and performance improvements.

During this period the task significantly improved the support for VO in the EGI connectors. As results of the architectural changes that were triggered by the addition of the multi-tenant support to the ARGO Compute Engine, the EGI connectors were refactored in order to adopt the new multi-tenant and customer agnostic architecture.

ARGO POEM Service

According to the roadmap, the objectives for this period were:

- ACL mechanism (support groups/roles).
- Stability and performance improvements.

During this period we introduced the notion of groups of profiles. POEM administrators can now be owners of one or more groups of profile and manage them independently from the rest of the profiles available in the service. Furthermore, several improvements have been implemented regarding the complexity and efficiency of the SQL queries.

3.2.4.4 Messaging

As foreseen in the roadmap, in this period the task performed preparatory work, namely investigation about the requirements for an HTTP API for Messaging.

3.2.4.5 Security Monitoring

The activity has been focused on the roadmap definition and on identifying solutions and procedures to:

- Detect quickly weaknesses that could lead to security issues.
- Improve the incident response.
- Find monitoring solutions for the IAAS cloud infrastructure.

3.2.5 Resource Allocation – e-GRANT

At the beginning of EGI-Engage project e-GRANT development team focused on planning and starting the development in three main areas:

- Creating a consistent environment for introducing Service Level Agreement (SLA) document to the Resource Allocation Process, this included defining and specifying interfaces with EGI tool ecosystem so e-GRANT can become a central and integral part of EGI SLA life cycle. As a result, a first prototype of a system producing SLA Documents has been developed (now in the testing phase) and a number of interfaces towards other EGI tools to develop were identified as described below:
  - EGI Marketplace - a way to integrate is under discussion
  - EGI LToS Portal and UNITY - first integration has been already implemented
  - EGI monitoring framework
  - EGI Accounting system
  - EGI Accounting Portal
- Continual implementation of improvements needed for already deployed EGI Resource Allocation process. Requirements for this task are being gathered from Resource Allocation Support Team. As a result an improved version of a matching resources function (Find Pools) has been developed and is now being tested
- The team worked on further development for EGI Pay-for-Use (P4U) process. A plan of e-GRANT development for P4U has been established with the Pay-for-Use working group. First milestone is to process first P4U request created by a real customer (EPOS) in a test environment. Results from this will be taken into account to plan further development. In the end of the project it is planned to have one common system for both the EGI Resource Allocation and Pay-for-Use processes.

3.3 Issues and Treatment

Following issues have been identified within JRA1 work package:

Task: JRA1.3/JRA1.4

Issue: Activities on accounting portal and operations portal slowly started due to delays during the hiring process.
Treatment: In both cases, the process is now completed and developments are progressing as expected.

Task: JRA1.4 (Monitoring)
Issue: It has been identified that most of the effort has been spent on testing and tuning of the ARGO monitoring engine and probes in order to support the monitoring of all services in EGI infrastructure.
Treatment: The task proposed deployment of centralized ARGO monitoring engine that will replace distributed SAM Nagios instances. It would allow more effective utilization of the effort dedicated to monitoring development and maintenance, and make possible to faster introduce changes in monitoring framework in the infrastructure. This work was not part of the initial roadmap and as a result the task had to push the deadlines for the activities on the probe framework and support documentation to the next periods.

3.4 Plans for next period

3.4.1 Authentication and Authorisation Infrastructure

In the next period the task plans to use the outcome from FIM4R (Federated Identity Management for Research Communities) as the starting point of the activities and align the roadmap according to the work done in AARC JRA1.1[51]. In addition it is planned to identify the most important use cases from Competence Centers and requirements from EGI tools and prepare a technical guidelines for enabling federated access in the identified initial set of tools. Based on users' requirements the task will identify which AA services are needed in the EGI infrastructure. In upcoming period it is foreseen to collaborate with the EGI AAI Virtual team[52] and the user portal activity for the Long Tail of Science (LToS) and start a pilot to connect the first set of EGI tools to the future EGI IdP proxy.

3.4.2 Marketplace

In the coming months the ecosystem of the Marketplace will be defined as well as the interface of the platform. Work will start on implementing the Proof of Concept based on the input gathered from the first stage. The PoC will also take into account the input from the business model that is being developed for the tool. So far, five organizations have expressed interest in participating in the PoC (Friedrich Miescher Institut, Institut Curie, ETHZ, University of Basel, and Vlaams Instituut voor Biotechnologie). The user experience to be delivered by the marketplace also in relation to other existing online platforms of EGI will be defined, the dependencies between tools will be defined.

[51] https://aarc-project.eu/
[52] https://wiki.egi.eu/wiki/VT_AAI

3.4.3 Accounting

During next reporting period the task will continue the development of ARC parser and Data Accounting proof of concept following feedback on the proposed plan from stakeholders. It if foreseen to start development of Storage Accounting Cycle 1 and for Cloud Accounting cycle on handling long running VMs. Accounting Portal team will start the first implementation of the new accounting portal according to the technical design defined in the deliverable D3.1 *Technical design of the new Accounting Portal and implementation plan*. It will include modernize the Portal with the adoption of technologies easier to maintain, simplify access to some basic functionality. The goal would be also to avoid the use of complex forms for common statistics and get accounting information with some common queries and improve graphs visualization. Finally support for Cloud Usage Record V0.4 and accounting of long running VMs will be added.

3.4.4 Operations Tools

3.4.4.1 Operations Portal

Following the study done previously, the team will work on the capture the cloud resources information for the resource browser. The team plans to upgrade accordingly the Lavoisier configuration:

- replace the queries currently adapted to Glue 1.3 with Glue 2.
- extract the part related to cloud resources as published by the BDII.

The new collected information will be exposed in:

- resource browser
- VAPOR portal
- different dashboards

3.4.4.2 GOCDB

Work planned for the next period follows the roadmap until the end of the year:

- RoleAbstractions (v5.5)
- Object Diff Auditing (v5.6)
- Cater for Marketplace requirements

In addition, it is expected that the federated login work will be completed.

3.4.4.3 Monitoring

In the next 6 months the task will work on following improvements:

- For ARGO Compute Engine & Web API it is planned to create the specification and implementation for API/APIv2 for data ingestion and to separate the Availability/Reliability and Metric stores. Work towards general stability and performance improvements will be performed.
- For the ARGO EGI Web UI will add initial support for federated logins using SAML and with IdP Discovery.

- For ARGO Monitoring Engine the team will design and implement a probe development framework and a workflow and the necessary technical services in order to allow product teams to publish and manage their probes. It is planned to improve probe development guidelines documentation and implementation of Federated cloud probes.
- For ARGO EGI Connectors & Consumer, use of Compute Engine ingestion API will be implemented and stability and performance of the component will be improved.
- ARGO POEM Service will be extended to initially support federated logins using SAML and with IdP Discovery. The team will provide support for probe management and work towards stability and performance improvements.

3.4.4.4 Messaging

In upcoming period the team will prepare APIv1 alpha specification and test its implementation. And finally prepare APIv1 final draft specification (ready for external review).

3.4.4.5 Security Monitoring

The activity will be focused on the cloud area with an adapted monitoring with assessment (certification) of images. It is planned to monitor running VMs which would be part of the certification process and also best practices will be recommended to Cloud providers that will cover detection of known vulnerabilities that often lead to compromise. In terms of network monitoring, recommendations for cloud providers and image owners will be produced and gathering and utilization of network monitoring will be examined.

3.4.5 Resource Allocation - e-GRANT

During the next reporting period the task plans to prepare the first prototype of the pay-for-use platform and process the first P4U request created by a real customer (EPOS) in the test environment. In addition it will implement improvements to pay-for-use platform according to suggestions and requirements delivered by P4U clients (for example EPOS, BILS). Finally, will deploy to production the first release of the pay-for-use platform. Plans for next period will include integration work with a number of tools like EGI monitoring framework, EGI marketplace, EGI Accounting System and Accounting Portal. Further work on implementing support for tracing site configuration for allocated SLA is foreseen as well.

4 Platforms for the Data Commons

4.1 Summary

The main purpose of this work package is to advance the current technical infrastructure of EGI by expanding the capabilities of the current platforms, and by integrating new ones. The result of the activity will be an integrated solution of data and compute services that will contribute to the Open Commons solution. It will do so by further evolving the EGI Federated Cloud infrastructure platform to provide the integrating services and users with greater flexibility and elasticity in the overall use of the platform, as well as ensuring continuity in the support for Cloud Middleware Frameworks. It will also introduce an Open Data Access platform that will provide capabilities to publish, use and reuse openly accessible data (including, but not limited to, scientific data sets released into the public domain, publicly funded research papers and project deliverables, and software artefacts and demonstrators coming out of public research projects). Ensuring support for a broad number of use cases and data commons needs, activities in this work package will also include integration activities of a number of partner e-Infrastructures both located in Europe and worldwide. This will include integrating existing cloud infrastructures with the EGI Federated Cloud platform (e.g. the Canadian CANFAR infrastructure) and accelerated computing facilities (e.g. GPGPUs – general-purpose computation on graphics processing unit).

JRA2.1 “Federated Open Data” has worked on the organisation of the EGI Conference session which gathered open data use cases and requirements from different data providers and research disciplines. The task has started collecting communities’ requirements through special template[53] for requirements collection to capture plans and need for data management. Using the feedback obtained from the communities in the form of requirement questionnaires, a milestone report M4.1 "Open Data Platform: requirements and implementation plans" is being prepared. Furthermore an initial architecture of the open data platform has been designed.

JRA2.2 “Federated Cloud” focused efforts in setting up a process for tracking and prioritization of the needed developments. Moreover, this task also performed the maintenance of the existing integration tools regarding the OCCI support. The task has also developed the Keystone-VOMS integration module and new version of the accounting collection tools for OpenStack. Initial contact with some of Product Teams for UMD integration has been established and the integration is now an ongoing process.

JRA2.3 “e-Infrastructures Integration” spent the first period on D4Science integration work[54] by porting of two selected use cases to the EGI Federated Cloud: the gCube WN and the DataMiner service [55].

[53] https://wiki.egi.eu/wiki/Requirement_Collection

[54] https://wiki.egi.eu/wiki/EGI-Engage:WP4.3-D4Science

[55] The gCube worker node (the name of the gCube service is Executor) is the service where the D4Science computations are executed. The gCube DataMiner is a service hosting a number of models. It adopts a plugin-

Purpose of this activity is to integrate D4Science resources at Engineering (commercial) and CNR (public) into the EGI Federated Clouds infrastructure by implementing OCCI client capabilities. In order to track the different integration activities with the EGI Federated Cloud, the task set up a process to better coordinate the work and collect for each of the collaboration the contact points and its status.

JRA2.4 "Accelerated Computing" during last 6 months was working on enabling GPGPU and co-processor support for the EGI HTC and Cloud platform. An HTC testbed has been set up and a new version of BLAH was prototyped for including GPU directives to be passed to the underlying LRMS. For Cloud available technologies have been reviewed and GPGPU virtualisation in KVM/QEMU has been analysed and performance tests have been carried out. In addition a cloud provider in Slovakia with GPGPU support has been set up.

4.2 Main Achievements

4.2.1 Federated Open Data

The goal of Open Data Platform is to provide a solution to integrate various data repositories managed by different user communities within EGI. The Open Data Platform will focus on providing a federated, open access, unified platform for users and application developers in order to foster research results reuse in Europe.

In the reporting period, within the JRA 2.1 task, several results have been accomplished so far. First of all, an Open Data track was organized during EGI Conference in Lisbon 18-22 May, 2015. The track was led by Lukasz Dutka from CYFRONET. The track presenters reported on the state of the art and the requirements for the Open Data platform that will enrich the current EGI federated cloud capabilities. The Open Data platform will allow the integration of various data repositories available in EGI and of those externally provided. The session presented a number of open data use cases and requirements from different data providers and research disciplines, including astrophysics, fishery and marine sciences, agriculture, biodiversity and life science. The presentations and discussions on the topics of this track allowed for identification of potential user communities that require new technology solutions for publishing their data sets to open public.

Based on the selection of communities with potential open data requirements, a special template[56] for requirements collection has been prepared, focusing on current data management issues and technologies within communities as well as their expectations and challenges with respect to opening their data sets to the public. The template has been distributed to the communities for input and several teleconferences were held with the communities' representatives in order to verify their needs in detail.

based architecture where each model is implemented via a service plugin. New models can easily be added by simply deploying a new plugin in the service.

[56] https://wiki.egi.eu/wiki/Communties_Requirements

Furthermore, an initial architecture for the open data platform has been designed. The platform will be based on the Onedata data management system[57]. The designed Open Data platform will allow for transparent federation of data between data centers and enable easy publication of data according to specific communities' policies (e.g. astrophysical data is often private for 1 year to Principal Investigator and then should be made public).

Using the feedback obtained from the communities in the form of requirement questionnaires, a milestone report M4.1 "Open Data Platform: requirements and implementation plans" is being prepared. The report contains information on the requirement collection methodology, an overview of the considered research communities and a summary of their use cases and requirements. Its goal is to ensure that the Open Data platform will cover all functionality required by the communities with respect to open data policies.

4.2.2 Federated Cloud

The main objective for this task is the evolution of the existing IaaS Cloud with new capabilities, focusing on satisfying the incoming requirements from the Competence Centers (CCs). In order to track and prioritize the needed developments, the "Requirements" queue in the EGI RT[58] is being used. Whenever possible, these improvements will be pushed into the OCCI standard, so as to have a way to expose the new developed capabilities. Moreover, this task also performs the maintenance of the existing integration tools, required for a resource center in order to be part of the EGI Federated Cloud infrastructure, such as the OCCI interfaces, authentication and authorization modules, VM image management, accounting, and information system.

The main achievements during this period have been the following:

- Collection of an initial set of requirements, from the description of work, from CC, NGIs, VOs and RCs. Those requirements have been added to the RT queue[59] and they have been studied and prioritised.
- Regarding the OCCI extensions design:
  - Several CC have required that OCCI should support VM resize. Initially this was planned to be developed as an extension, but after a preliminary study, it was identified that the modifications could be added directly into the standard. Therefore the proposed change was sent as to the OCCI 1.2 public comment phase[60].
  - The design of the VM snapshot extension for OCCI has been postponed, since further discussions need to be done with the OGF.
- Regarding the OCCI support for the various CMFs:
  - A review of the OCCI support status has been performed, taking into account the upcoming version of the standard OCCI 1.2.

[57] https://documents.egi.eu/document/2547
[58] http://rt.egi.eu/
[59] https://rt.egi.eu/rt/Dashboards/4121/Federated%20Clouds
[60] https://redmine.ogf.org/boards/29/topics/446

- A new version for rOCCI server 1.1.7 has been released[61].
- A new OpenStack OCCI (ooi) module is under development and has been integrated into the OpenStack CI's infrastructure[62]. This module is now being tested by several Resource Centers.
- Since Synnefo's native interface is compatible with OpenStack, the integration of "ooi" is being studied. This was not possible in the past, since the existing OCCI implementation (occi-os) used the private OpenStack APIs. Therefore Synnefo had to develop its own OCCI interface. "ooi" is using the public APIs so it has been decided to study its integration with Synnefo so that there is no need for a duplicate development.

- Regarding the integration support for the various CMFs:
  - The Keystone-VOMS integration module has been updated to support the latest OpenStack production versions (Juno, Kilo).
  - A new version of the accounting collection tools for OpenStack has been released[63].
  - Initial contact with some Product Teams for UMD integration has been established and the integration is now an ongoing process.

4.2.3 e-Infrastructures Integration

This task objective is to further expand the EGI capacities and capabilities with the integration of other e-Infrastructures. The proposal included three target e-Infrastructures and technical solutions for integration: EUDAT, the Canadian Advanced Network for Astronomical Research (CANFAR), and gCube and the D4Science infrastructure (D4Science). Since the task is not limited to mentioned infrastructures, contacts with external partners have been established for the integration of other solutions and e-Infrastructures into EGI.

The activities regarding the harmonisation of EGI and EUDAT for Virtual Research Environment have started with a F2F meeting with EUDAT representatives to discuss respective AAI details and roadmaps, and interoperability use cases.

The integration of CANFAR community platform is currently being discussed and planned by the project members involved in the collaboration. Several meetings were held during this period to start the definition of the possible architecture and components to be integrated.

D4Science integration work has also started with porting of two selected use cases to the EGI Federated Cloud. These use cases would allow exploiting EGI resources from the gCube and D4Science platforms. An initial pilot is planned to be finished by the end of July.

The integration of new technical solutions and e-Infrastructures requires a well-defined framework that defines the interaction points and services provided by the EGI federation and how these can be used to federate with new community platforms. A document developing these concepts is being produced in order to facilitate the collaboration with new partners.

[61] https://appdb.egi.eu/store/software/rocci.server/releases/1.1.x/v1.1.7-1/
[62] https://review.openstack.org/#/c/187526/
[63] https://github.com/IFCA/caso/releases/tag/0.3.1

In order to track the different integration activities with the EGI Federated Cloud, a new queue in the EGI Request Tracking (RT) system was created. The queue, named "fedcloud-integration", collects for each of the collaboration the contact points and its status following the same phases as the ones defined in the workflow of the Federated Cloud support use cases[64] that capture the process from the pre-assessment to complete integration in the production infrastructure. The selection of collaborations is mainly driven by the requirements of user communities involved in WP6. The following use cases and progress have been captured in this period:

- IHEP (Chinese Academy of Science): IHEP has several cloud deployments and is interested in the Federation of these within IHEP itself and with EGI. Initial contact has been established and IHEP will evaluate how the EGI model can fit their infrastructure
- NeCTAR: NeCTAR is an Australian-wide cloud federation based on OpenStack. Collaboration with EGI has started in order to integrate the resources following the requirements from key user communities: HumanBrainProject, ELIXIR and SKA/LOFAR.
- CERN: CERN counts on a large OpenStack deployment and is interested in a loose federation profile with EGI using sustainable developments. Activities to integrate OpenStack native API as part of Federated Cloud have started to evaluate possible ways of integration with CERN infrastructure.
- KISTI: KISTI is a Resource Center in Korea providing Cloud resources using OpenStack. Integration activity with EGI is progressing and planned to be completed during the next months.
- FogBow: The EU Brazil Cloud Connect project has developed a middleware named FogBow for the creation of cloud Federations. Currently are under evaluation the features that could be integrated into EGI.
- Harness: Harness is an EU FP7 project providing support for non-conventional architectures on cloud. The evaluation of OCCI as an interface for making the resources of the project available for EGI is planned on the coming months.
- Compute Canada: triggered by the CANFAR collaboration, Compute Canada has been identified as a possible e-Infrastructure to federate with EGI.
- IUCC: IUCC (Israel) is deploying a private cloud and plans to integrate their resources into EGI by the end of 2015.
- GARR: The Italian NREN has expressed its interest on Cloud federation. The EGI cloud federation model was presented during a meeting and now is under internal discussion within GARR.

4.2.4 Accelerated Computing

Driven by the user communities represented in the EGI-Engage Competence Centres (MoBrain and LifeWatch), and other ones making use of the EGI infrastructure (Virgo, LHCb, and Molecular

[64] https://wiki.egi.eu/wiki/Federated_Cloud_Communities

Dynamics), this task aims at enabling GPGPU support both on HTC and Cloud platforms. For the HTC platform, the plan is to provide full GPGPU support for CREAM-CE with the most popular batch systems, also by exploiting the new attributes defined in the GLUE2.1 schema. For the cloud platform, the task will investigate the current Passthrough and vGPU technologies to prepare specialised VM images for enabling GPGPU support in the EGI Federated Cloud.

EGI Conference in Lisbon was the opportunity to restart the activity about enabling GPGPU and co-processor support for the EGI platform. A dedicated session to Accelerated computing has taken place the Tuesday 19th of May with summary of the GPGPU task force and virtual team achievements obtained in the EGI-Inspire and the work plan of the EGI-Engage task JRA2.4 was presented.

For HTC platform the following has been achieved:

- a testbed of 3 servers with 2 GPUs each one managed by torque-4.2 batch system has been set up at CIRMMP data centre;
- a new version of BLAH was prototyped for including GPU directives to be passed to the underlying LRMS. More in detail, the new attributes "GPUNumber" and "GPUMode" have been added to the command BLAH_JOB_SUBMIT. This required modifications to blah_common_submit_functions.sh and server.c. The first implementation of the two new attributes has been successfully tested at CIRMMP cluster with the PBS/Torque LRMS. This required modifications to pbs_submit.sh.

Within Cloud platform, the following has been achieved:

- After a review of the available technologies, GPGPU virtualisation in KVM/QEMU has been analysed and performance tests of passthrough technology have been carried out in a IBM dx360 M4 server with two NVIDIA Tesla K20 accelerators. The STMV test example of NAMD molecular dynamics simulation (CUDA version) has been used as testing application. The results shown that the application run 2-3% slower in a virtual machine compared to direct run on the tested server. To avoid potential performance problems, hyperthreading should be switched off.
- a cloud site with GPGPU support has been set up with one master node and two compute nodes, using OpenStack Kilo as CMF and KVM as hypervisor, all on top of Ubuntu 14.04.2 LTS operating system.

4.3 Issues and Treatment

No issues have been identified during reporting period.

4.4 Plans for next period

4.4.1 Federated Open Data

During the next reporting period, the first implementation of the Open Data platform will be made available to selected communities for preliminary testing and evaluation. Further integration with

the user communities is planned as well as extending the Open Data platform functionality in order to meet their functional and non-functional requirements as well as possible.

4.4.2 Federated Cloud

In upcoming period the task plans are:

- To deliver an initial release of the new OCCI interface for OpenStack.
- To deliver a preview implementation of OCCI 1.2 for the various CMFs.
- Prepare a draft of the OCCI extensions for creating snapshots of running VMs.
- Finish the design of the AppDB basic brokering extensions.
- Work on the integration of the developed products into UMD.
- Creation of a draft of the design document addressing the VM relocation within sites.

4.4.3 e-Infrastructures Integration

During next reporting period the CANFAR integration activities will focus on initiating integration with Federated Cloud. It is planned to perform an evaluation of the different EGI core and cloud services and how these can be integrated with CANFAR. The implementation of a Group Management Service that is in charge of authorization will be started. Integration of the gCube/D4Science will continue by further development and test the use cases already identified during the current period. It is planned to enrich the computing models defined in the use cases and to integrate the accounting provided by Federated Cloud with the one collected by D4Science. EUDAT collaboration will continue to be developed by further analysing AAI interoperability between the two infrastructures. During the next period the task will continue to develop the international collaborations to expand the EGI capabilities and will review the framework to federate the Federates Cloud resources with new community platforms.

4.4.4 Accelerated Computing

In the next 6 months the task will work on the installation of the SLURM[65] LRMS on CIRMMP cluster and on adding new JDL attributes in CREAM for HTC platform. The OpenStack Scheduler will be tested on the cloud platform and finally integrated with EGI Federated cloud.

[65] https://computing.llnl.gov/linux/slurm/

5 Operations

5.1 Summary

SA1 work package coordinates the operational activities of the EGI production infrastructure, ensuring a secure and reliable provisioning of grid, cloud and storage resources, harmonised between resource providers and peer e-Infrastructures. It aims to evolve the security activities in EGI to support the new technologies and resource provisioning paradigms, maintaining a secure and trustworthy infrastructure while supporting new use cases and new ways to access the resources. Within the work package cloud and HTC resources will be integrated to support new use cases for the existing and new EGI users. These platforms will include services for the long tail of science that will reduce both the barriers for new users to access EGI resources and the learning curve to efficiently use them.

SA1.1 “Operations Coordination” focused on provisioning of reliable production infrastructure by improving and modifying several of the procedures and manuals supporting operations activities. The task also work towards sustainable delivery of EGI Core activities, essential for the infrastructure, through oversight of the performance and preparing new bidding for the period of 20 Months starting from May 2016. Significant improvement has been also done in terms of UMD Software Provisioning by optimizing the verification and releasing the middleware distribution process.

SA1.2 “Development of Security Operations” has been working on security requirements, in particular security requirements on endorsed Virtual Machine images. New versions of the “EGI-CSIRT Critical Vulnerability Handling” and “"EGI Software Vulnerability Group – Strategy and Vulnerability Issue Handling" procedures have been produced and work started on four new or revised policies. The task also worked towards planning and developing a security challenge of the EGI Federated Cloud services.

SA1.3 “Integration, Deployment of Grid and Cloud Platforms” spent effort on prototyping the long tail of science platform integrated with the Catania Science Gateway Framework[66]. Work towards defining how to integrate the ESA authentication system with the Federated cloud has been performed by EGI and ESA. The activities for the D4Science integration focused on the selection of the use cases and services that will run in the EGI Federated cloud.

[66] http://www.catania-science-gateways.it/

5.2 Main Achievements

5.2.1 Operations Coordination

EGI Operations continued to coordinate the federated operations of EGI. The Operations Management Board[67] meetings have been regularly held on a monthly basis, the OMB is the operations policy body of EGI where the policies and procedures are discussed and approved, as well as the activities related to the production infrastructure are discussed, including but not limited to EGI-Engage project activities. On a monthly base EGI Operations also follow up with the OLA (Resource infrastructure Provider and Resource Center) reporting.

5.2.1.1 Documentation

During the reporting period a new procedure for the integration of new middleware services in production is being finalized. Procedure 19[68] aims to ensure that new cloud or high throughput middleware services integrated in production are compliant with the EGI requirements. In particular the procedure enforces the requirements for the middleware to:

- Be integrated in the EGI monitoring
- Be integrated with the EGI Accounting
- Be integrated in GOCDB as a service type
- Fulfil the EGI security requirements

The procedure is being applied to two middleware stacks, which now are under certification.

The documentation for the operations of the cloud services in EGI, including the deployment of the extensions needed to enable the technical integration in the federation, has been collected and organized in the EGI wiki in order to be accessible from a single entry point, under Operations Manuals[69]. Moreover, the site administrators of new cloud-based resource centres willing to join the EGI federation can now easily find all the information about the configuration requirements of the infrastructure in a single manual (MAN10[70]).

During the reporting period SA1.1 also developed the templates for the underpinning agreement with the Technology Providers[71]. Technology providers are often external providers of the software that is used in the EGI production infrastructure. The underpinning agreements will support the service provisioning of EGI by defining the minimum level of support that can be expected from our external providers. At the moment of writing the underpinning agreements have not yet been officially agreed with our providers and this is a goal for the upcoming months.

In the context of improving the processes and the workflows of the federated operations, the Site suspension procedure[72] has been created and approved. Sites are suspended by EGI Operations

[67] https://wiki.egi.eu/wiki/OMB
[68] https://wiki.egi.eu/wiki/PROC19
[69] https://wiki.egi.eu/wiki/Operations_Manuals
[70] https://wiki.egi.eu/wiki/MAN10
[71] https://documents.egi.eu/public/ShowDocument?docid=2282
[72] https://wiki.egi.eu/wiki/PROC21

when failing to reach the OLA targets for three consecutive months. Suspension means that sites are removed from the infrastructure and need to be re-certified following the dedicated procedure[73]. Suspension has a high impact on both service providers and users using the site's services; therefore the suspension procedure was needed to be created to ensure that the all parties (Operations Center, Resource Center and managers of supported VOs) are notified about suspension. The new procedure has been approved by OMB, and EGI Operations have started to apply it from June 2015.

5.2.1.2 EGI Core activities

During the last 6 months EGI Operations has been coordinating the EGI core activities[74] including Operational Level Agreements' reporting, creation and negotiation of new OLAs' set and preparation bidding process for next period. The current core activities agreements will end in April 2016, therefore new bids needed to be prepared for 20 months starting from May 2016. The set of core activities have been re-designed, merging few activities to rationalize the funding scheme and adding new services based on the needs of the EGI Infrastructure and communities.

5.2.1.3 UMD Software provisioning

The UMD Software provisioning team has been working during the last 6 months on releasing the middleware distribution according to the criteria of the Software Provisioning Process developed in the EGI context. The coordination with the software developers has been ensured by organizing and chairing the bi-weekly UMD Release Team meetings (URT), whose minutes are available on the EGI agenda[75]. In collaboration with the product teams, Java7 and EPEL7 compatibility of the different products have been assessed so far, creating a summary that will be used to release the next upcoming version 4 of the UMD.

A new guide has been written in order to better guide Technology Providers through the UMD workflow[76]; this guide also gives a view of the provisioning procedure as a process compatible with FitSM standard[77]. Moreover, several optimizations to the release workflow allow to reduce, and most importantly to monitor, the delays if products take more than two months to be released and more reliable, to avoid that products delayed for any reasons are forgotten delaying their releases for weeks or months, unless there are technical reasons that prevent their release.

A new major release of UMD has been planned for September 2015. The release will be based on the adoption of CentOS7 and Ubuntu as OS platforms, so adopting also EPEL7 as a reference repository. Assessments have been performed regarding the EPEL7 readiness, and we have the exact list of products that candidate to the September release. The UMD4 release will host also the products developed in the EGI Federated Cloud context: in particular the new Keystone-VOMS

[73] https://wiki.egi.eu/wiki/PROC09
[74] https://wiki.egi.eu/wiki/Core_EGI_Activities
[75] URT Agendas: https://wiki.egi.eu/wiki/URT_meetings_agendas
[76] https://wiki.egi.eu/wiki/EGI_Software_Component_Delivery
[77] http://fitsm.eu/

is acting as pilot for the Federated Cloud developers to learn the UMD Software provisioning process. A dry run for the UMD4 was performed (end of July) successfully.

The Staged-Rollout step, aiming at introducing production quality assessment before the integration of a product in the UMD, determined problems with non-working packages (StoRM, CAs), increasing the quality of the final product.

The UMD releases[78] in the first half of 2015 have been:

- UMD-3.11.0 (Feb 16th), followed by one minor release in March adding few important packages.
- UMD-3.12.0 (May 5th)
- UMD 3.13.0 (July 1st), followed by two minor releases fixing few issues.
- UMD4 is planned for end of September.

In those releases, several products were released and upgraded for several capabilities: compute (CREAM), accounting (APEL), attribute authority (VOMS server, UNICORE XUUDB), authentication (Globus GSI, UNICORE-Gateway), authorization (ARGUS-PAP), client tools (GFAL2 utils, VOMS clients), credential management (MyProxy, ProxyRenewal), data access (DAVIX), File Access, File Transfer, Storage Management (StoRM, dpm-xroot, XRootD, CVMFS, dCache, DPM/LFC, FTS3, Frontier SQUID, Globus GRIDFTP), Information Discovery (Globus InfoProviderService, UNICORE Registry), Job Execution, Job Scheduling (CREAM, Globus GRAM5, QCG-Computing, UNICORE TSI, UNICORE/X), Job scheduling (WMS), together with other software modules and libraries (BLAH, CGSI-gSOAP, CREAM TORQUE module, CREAM GE module, DMLITE, GFAL2, GFAL2-python, SRM-ifce, classads-libs, edg-mkgridmap, fetch-crl, ARC Nagios probes).

5.2.2 Development of Security Operations

The aim of this task is to evolve the security activities in EGI to support new technologies and resource provisioning paradigms, while maintaining a secure trustworthy infrastructure and supporting new use cases and ways to access the resources. The activities have been split into 5 sub-tasks: security requirements and risk assessments; evolution of operational security procedures; development of new trust frameworks and security policies; development of new security challenge frameworks; and development of software vulnerability handling processes. During this first period work has started on all of these sub-tasks. Ideas and plans were presented at the May 2015 EGI Conference in Lisbon and feedback was taken into account. Discussions took place on the changes required to incident handling, vulnerability handling, new and revised security policies and security monitoring. The EGI Conference also included a workshop on Cloud Federation and the incident response issues related to Virtual Machines (VMs) and VM users. Plans for a security challenge concerning VMs and traceability were also discussed.

5.2.2.1 Security requirements and risk assessments.

Work has begun on security requirements in particular security requirements on endorsed Virtual Machine images. The current situation has been established, and documentation of the detailed

[78] UMD Releases: http://repository.egi.eu/category/umd_releases/distribution/umd-3/

requirements on the various parties concerning endorsed images and on the AppDB functionality extensions is in progress. This is being developed in parallel to updating and expanding the "Security Policy for the Endorsement and Operation of Virtual Machine Images" (see below). There was a lack of clarity concerning the EGI Federated cloud usage and operation of VMs. This has been largely resolved by documenting the current situation and asking for comments and corrections. This has helped us understand the current situation far better and helps with the planned security threat risk assessment.

5.2.2.2 Evolution of security procedures.

A new version of the EGI-CSIRT Critical Vulnerability Handling procedure has been produced and this will soon be ready for formal adoption. A security incident was handled in May 2015 involving a compromised VM running at an EGI Federated Cloud provider which was used in a DDOS attack. Analysis of this incident found that the VM image, even before instantiation, contained a weak admin password that was easily compromised. This has been an extremely useful example to better understand the requirements for both VM endorsement and incident handling in the federated Cloud. Work continues on updating the incident handling procedure including the addition of appropriate reporting and debriefing after an incident is closed.

5.2.2.3 Development of new trust frameworks and security policies.

A two-day face-to -face meeting of the EGI Security Policy Group was held early in March 2015. At this meeting agreement was reached as to which security policies were the most important for first attention. Work started on four new or revised policies during the meeting and has continued since. An updated version of the "Acceptable Use Policy" has been produced and circulated widely for comments. This version was generalised to include all EGI service offerings (Grids, Clouds, Long Tail of Science, etc.), added a policy requirement to acknowledge support in publications and addressed liability issues. Work has been done on a new Data Protection Policy and this has also highlighted that yet more changes are required to the AUP before we seek formal adoption. A revised "Security Policy for the Endorsement and Operation of Virtual Machine Images" has been produced using input from a better understanding of the usage of VMs in the EGI Federated Cloud. More work on this is required before adoption. A new draft policy and guidelines document entitled "The Long Tail of Science (LToS) Service Scoped Security Policy" was produced. The LToS aims to enable a low-barrier service to be offered to a wide range of research users in Europe and their collaborators world-wide, by any Resource Centre organisation that elects to do so. The policy and guidelines aim to ensure that in offering such LToS Services, the Resource Centre shall not negatively affect the security or change the security risk of any other Resource Centre or any other part of the e-Infrastructure.

There has been considerable activity in new trust models related to Levels of Assurance (LoA) in the EUGridPMA and IGTF federated identity bodies. The LoA generalisation process extracted elements from the IGTF authentication profiles that are of general value to the community well beyond PKI. A draft document was produced by EUGridPMA with EGI-Engage leadership and input

and has now been discussed at a TAGPMA meeting[79]. Other trust issues related to federated identity include input to the work on the SIRTFI[80] activity of REFEDs[81], which is building a trust framework for security incident response in the identity federations in collaboration with the H2020 AARC project.

5.2.2.4 Development of new security challenge frameworks.

Work has started to plan and develop a security challenge of the EGI Federated Cloud services.

5.2.2.5 Development of software vulnerability handling processes.

A draft of the updated "EGI Software Vulnerability Group – Strategy and Vulnerability Issue Handling Procedure" has been circulated and presented to the EGI OMB. This includes changes needed to the strategy and procedure due to the now wider variety of software in use in the EGI infrastructure and the challenges presented by the EGI Federated Cloud and usage of Virtual Machines. New members have joined SVG who have knowledge of cloud enabling technology. Six vulnerabilities concerning Cloud enabling technology have been handled during the period and these have provided useful experience for input to the new strategy and procedures.

5.2.3 Integration, Deployment of Grid and Cloud Platforms

The activities of this task include the deployment of the long tail of science platform, integration of the D4Science and iMarine services with the EGI federated cloud and the ESA exploitation platform.

5.2.3.1 The Long Tail of Science platform

The Long Tail of Science platform is a set of services that enable access to a dedicated pool of resources to individual users of small collaborations. The goal of the platform is to reduce as much as possible the overhead and the barriers for the users accessing EGI for the first time.
During the reporting period the technical architecture of the platform, initially defined during EGI-InSPIRE has been further detailed, with the definition of the use cases and the integration with the EGI SSO and federated identities technologies of the components of the platform, a user management portal and several science gateways. The portal will act as a front-page for users to submit requests and for NGIs and user support to approve the requests[82]. It has been deployed in a prototype version, interfaced with the Unity[83] system for the integration with the federated identity providers and the attribute management for the information that need to be associated to the users for regulate the access to the platform.

[79] The American Grid Policy Management Authority: http://tagpma.es.net/wiki/bin/view/Main/TagPma21st http://indico.rnp.br/conferenceDisplay.py?confId=217
[80] Security Incident Response Trust Framework for Federated Identity: https://wiki.refeds.org/display/GROUPS/SIRTFI
[81] Research and Education Federations: https://www.terena.org/activities/refeds/
[82] http://access.egi.eu
[83] http://www.unity-idm.eu/site/about

The second type of services is the science gateways that expose the services to the users. For the moment the platform has one science gateway integrated, the Catania Science Gateway (SG) Framework. The integration of a service, or a gateway, with the platform means:

- ability to consume the authorization information provided by access.egi.eu
- support the per use sub proxy, to bridge federated identities with X509 authentication[84]
- support the long-tail.egi.eu Virtual Organization

These integration requirements are already supported by the Catania SG Framework.
A virtual organization, long-tail.egi.eu has been created and it is ready to be supported by the service providers.

5.2.3.2 ESA exploitation platform

During the report period EGI and ESA have collaborated to define how to integrate the ESA authentication system with the Federated cloud. A VOMS server and two VOs have been set up, integrated with the ESA certification authority[85].

5.2.3.3 Integration of the D4Science and iMarine services

The activities for the D4Science integration focused on the selection of the use cases and services that will run in the EGI Federated cloud.

5.3 Issues and Treatment

Following issues have been identified within SA1 work package:

Task: SA1.1
Issue: Few NGIs are experiencing issues in maintaining the activities supporting their national operations.
Treatment: EGI Operations has started a series of interviews with the operations representatives of the NGIs with visible issues. The goal of the meeting is to identify the issues of the operations centre, and in case of lack of effort to identify the critical activities where the effort should be focused and, for the medium-long term, how to make more sustainable the operations centre activities.

5.4 Plans for next period

5.4.1 Operations Coordination

During the next reporting period UMD will release the fourth major release, supporting EPEL7 and Ubuntu 14. Subsequently EGI will plan to decommission of Scientific Linux 5 applications from the UMD repositories. The decommissioning of an operating system support from UMD requires a

[84] https://wiki.egi.eu/wiki/Fedcloud-tf:WorkGroups:Federated_AAI:per-user_sub-proxy
[85] The Virtual Organizations registered for the ESA collaboration: http://operations-portal.egi.eu/vo/view/voname/hydrology.terradue.com

planned procedure that needs to run for several months. It is planned to end towards the end of PY1.

EGI Operations will assess the bids for the EGI core activities submitted for Spring 2016, and coordinate – where needed – the handover from the current providers to the new ones.

5.4.2 Development of Security Operations

Work will continue during the next period on all sub-tasks of SA1.2 (the development of security operations). The security requirements and security risk analysis for the EGI Federated Cloud service will be produced and we will seek agreement and approval from the EGI Federated Cloud team, the OMB and the security team. This will highlight the most serious security problems and allow management to focus on resolving them. New or revised security policy documents will be produced, consulted on and passed all the way through to formal adoption. This will include at least a revised AUP, a revised VM Endorsement and the new LToS service policy. The new trust fabric identity management will be evaluated on new usage scenarios and access control mechanisms. New procedures for Federated Cloud will be developed, approved and adopted for Incident Response and Vulnerability Handling. A security service challenge of the EGI Federated Cloud Service will be carried out.

5.4.3 Integration, Deployment of Grid and Cloud Platforms

During EGI Forum in November, the Long Tail of Science platform will enter in full production and will be open for users.

Both D4Science and ESA platforms will start using in pre-production EGI federated cloud resources by the end of PY1.

6 Knowledge Commons

6.1 Summary

WP6 (SA2) coordinates the provisioning of services for scientific communities and supports the co-design, co-development and dissemination of new community-specific e-Infrastructure services. These services will support novice and semi-experienced user communities as well as members of the long-tail of sciences to become active and self-sufficient users of e-Infrastructure solutions. In addition, some of the services will support mature e-Infrastructure communities in taking their production experiments on distributed computing and data infrastructures to the next level. The work package includes dedicated tasks for eight Competence Centres (CCs) to support high-impact Research Infrastructures/communities by joint development of customised services for these based on core EGI capabilities, by user engagement and training. Two of the CCs (BBMRI and EISCAT_3D) are supported by both EGI and EUDAT within the Horizon2020 programme. The work package also contributes to fostering open science, and nurturing smaller or less structured research groups by providing training and direct technical support to them. Specific objectives of WP6 are:

- Identify and support communities and users from EGI and its partners;
- Facilitate the integration of scientific applications with EGI's e-Infrastructure services;
- Co-design and co-develop services for sustainable, structured scientific communities;
- Promote and support the uptake of new services within scientific communities;
- Provide a training framework, foundational training services and domain specific training events for scientific communities, EGI members and partners.

SA2.1 "Training" has worked on the creation experts' network that would collaborate in provisioning and designing training activity. Apart of provisioning trainings the task focused work on designing and preparing framework to support trainers and training provisioning.

SA2.2 "Technical User Support" focused efforts in setting up a process for gathering and tracking user requirements. This preliminary work on structuring user support will result in next periods in more efficient and effective work performed by the activity.

All Competence Centres in first 6 months delivered significant work forwards their objectives. Most of the work has been done around requirements gathering which will be the base for further development.

6.2 Main Achievements

6.2.1 Training

This task of EGI-Engage provides foundational training services and coordination to training activities across the whole EGI collaboration. The main goal is to operate a framework that enables members of EGI community as well as external partners to effectively create, deliver, share, reuse and benefit from training services in the context of e-infrastructures and e-science. The prime objective is to provide 'glue' and also facilitation for training activities conducted by Competence Centres, National Grid Initiatives and partner projects (including e-infrastructure and Research Infrastructures), maximising the effectiveness and impact of training across countries and communities. During the reporting period the task established the network of experts from CERN, CESNET, STFC, LIP, NIKHEF and EGI who serve as a core team in this task and together defined the plan of work for the first 12 months of the project and began implementation. The plan defines activities in 8 areas, with implementation progressed during the period as following:

1. **E-infrastructure for training:** A virtualised e-infrastructure has been setup in the form of a new Virtual Organization[86] hosted on the EGI Federated Cloud. The VO is complemented by a training access control mechanism to generate short-term proxy certificates for trainees and trainers wishing to use the system.
2. **Training resources**: Datasets, computing applications, workflows, science gateways, Virtual Machine Images, etc. that can be used by trainers and trainees on the training e-infrastructure during organised events and self-paced courses to carry out specific training or demonstrational tasks. Two applications (a MoinMoin Wiki and a Fractal application) have been prepared in the form of VM images, and were used during two Federated Cloud tutorials[87] on the training VO.
3. **Training modules**: Self-contained sets of training resources and training materials that are documented and shared with trainees and/or with self-paced learners for specific training events or courses. An event or course can include multiple modules possibly with dependences among them. A new training package has been prepared on the Federated Cloud and was tested during two events in late July. Based on the experiences a generic version of this package will be prepared and made available in the training marketplace during August.
4. **Training marketplace:** An online portal through which training resources, training modules and other building blocks can be shared, advertised, discovered, reused or even discussed. The marketplace facilitates interactions among trainers, trainees and training service providers. The project continues to use the marketplace that was developed in the EGI-InSPIRE and started discussions with the H2020 EDISON project about forming and later adopting their marketplace in EGI.
5. **Webinar and/or e-learning system**: The project continues using the Webex and Adobe Connect systems to deliver Webinars. Three webinars[88] have been organised during the first six months.

[86] Training.egi.eu Virtual Organisation: http://operations-portal.egi.eu/vo/view/voname/training.egi.eu

[87] https://harnesscloud.github.io/2015-07-15-feltham/ and http://hpcs2015.cisedu.info/home/cts-2015-tutorials

[88] The three webinars were: EGI Authentication Authorization Infrastructure; Cloud services; Data management services (grid and cloud). Agenda and webinar recordings are available at https://indico.egi.eu/indico/categoryDisplay.py?categId=114

The topics of these were consulted with the Competence Centres to help them learn about the most relevant EGI services and platforms for their work. The webinars were recorded, recordings are available online.

6. **Access control system:** Training resources are currently stored in different systems, such as DocDB, AppDB, and training marketplace. There is no single access control system for these and the project does not foresee any development in this area.
7. **Supporting high-impact training events:** Two Federated Cloud tutorials have been organised by the project in July. These events tested the new training infrastructure, the new training package, and promoted the EGI cloud activities. The event helped the project form and nurture new collaborations with scientific communities, specifically with the PhenoMeNal H2020 project and with a Next Generation Sequencing research team from the University of Oxford.
8. **Evaluation process:** A reusable form has been prepared for EGI-related training events to capture feedback from training attendees. The form was used during the two federated cloud events and will be made available in the EGI DocDB, in a generic form, for future events.

6.2.2 Technical User Support

This task (SA2.2) operates a distributed user support team across multiple NGIs to provide technical support to the integration of domain-specific applications with EGI platforms. The support includes, for example, integration of scientific code with EGI cloud and HTC platforms, workflow development, development of community gateways or resource allocation. The effort is focused primarily on new communities coming from scientific disciplines that do not have dedicated EGI Competence Centres and lack sufficient support within the NGIs.

In the first part of the reporting period the task set up working practices and linked this to the EGI Engagement strategy to better integrate with related activities within the NGIs, and with the services that have been established in EGI-InSPIRE. This activity involved two tasks:

1. To support the tracking of multi-national support cases through a new, dedicated ticket queue[89] has been setup and configured in the RT system by this task. The use of the queue is documented in a manual[90]. The new RT queue is called 'technical-support-cases' and serves as a placeholder for tickets representing support cases that require assistance and follow-up by multiple EGI members and particularly those that are supported by SA2.2. At the time of writing status of 37 support cases are captured in the queue.
2. To gather requirements from EGI user communities in a systematic way, a standard template has been designed. The template provides a structured framework with guiding questions. It captures the state-of-the-art experiences from various EGI involved projects, such as INDIGO, EGI-InSPIRE, EGI-Engage, and ENVRI. It is based on the Open Distributed Processing (ODP) framework, an ISO standard, and uses a case-study driven approach. A wiki page[91] has been set up to make the template and the captured community requirements

[89] http://go.egi.eu/technicalsupportcases

[90] Tracking and implementing technical support cases in EGI – Supporters' manual: https://documents.egi.eu/document/2478

[91] https://wiki.egi.eu/wiki/Communties_Requirements

available for the broader EGI community. The page currently current stores requirements from the Human Brain Project and CANFAR. LoFAR requirements will be added soon.

Support for new communities was provided during the period to the following groups:

- **Chipster:** An online tutorial is available on dedicated Youtube channel[92] and the project is looking for communities willing to start a pilot. In addition an abstract has been submitted for a tutorial at the next EGI Community Forum.
- **BILS:** Test phase has been completed. The community expressed willingness to move to production and SLA is under negotiation.
- **LOFAR and SKA:** A couple of meetings with ASTRON took place. The use case aim to connect the LOFAR LTA resources in Groningen and Amsterdam using a cloud infrastructure.
- **CLARIN:** First test on CESNET site has been successfully completed for hosting the 'Virtual Language Observatory' service.
- **EMSO**: Community agreed to sign a MoU between EGI-Engage and EMSODev (EMSO implementation phase, starts in September) and define an EMSO Competence Center (unfunded). EMSO would like to deploy a Hadoop instance in the EGI Federated Cloud.
- **DRIHM:** Integration of various hydrological models in the community science gateways has been completed. These models run currently on Windows VM created on the fly on the EGI Federated Cloud. Negotiation for an SLA is ongoing.
- **CNR**: Satellite Data use case has been included in EPOS CC.
- **Auger:** Porting application to the Federated Cloud has been completed.
- **PhenoMeNal project:** Initial contact has been established at EGI Conference. Cloud usage is foreseen through AppDB (to exchange community images) and EGI or ELIXIR cloud sites (to host and instantiate images).
- **CLIPCE:** CLIPCE develops a science gateway dedicated to the climate impact community using data from Earth System Grid Federation (ESGF) repository. An initial assessment meeting was conducted and the developers expressed interest in the Federated Cloud and are currently evaluating possible ways of using the infrastructure within their developments.
- **1000 Genomes:** 1000 Genomes Project aims to sequence the DNA of thousands of individuals and characterize human genetic variation worldwide. This use case will be supported by the EGI's DIRAC instance to test and run their workloads on AWS.
- **VLEMED Scientific Gateways:** This community performs biomedical data analysis using EGI's DIRAC instance. The initial pilot with selected use cases of the gateway have shown that DIRAC is a suitable tool and has helped to identify problems for integrating DIRAC with gateways. Next steps will be to further develop the gateway optimising the way DIRAC is accessed and to collect requirements for a basic workflow engine in DIRAC.

6.2.3 ELIXIR

The ELIXIR CC will start as an official project task (SA2.3) in project month 7; however the members started preliminary work with the EGI community. This was focusing on two activities:

[92] http://www.egi.eu/news-and-media/newsfeed/news_2015_022.html

1. Working with various EGI product teams to customise EGI services for evaluation and inclusion within the ELIXIR Compute Platform. These services are expected to provide key contributions to the platform, such as: service registry (GOCDB), Virtual Machine Image marketplace (AppDB), service availability and reliability monitoring service (ARGO), usage accounting system (APEL), cloud computing interfaces (OCCI, rOCCI) and user certificate generation and management service (per-user sub-proxy). So far initial tests have been carried out and recommended developments and customisations are ongoing. Use cases for more profound tests and applications will be selected during autumn 2015, and will be performed as the ELIXIR Compute Platform matures.
2. Collecting information about emerging life science use cases from the EGI and ELIXIR communities that could drive system integration, application development and evaluation activities. Discussions with the 'Integrating life science reference datasets into EGI' Virtual Team project[93].

6.2.4 BBMRI

The BBMRI Competence Center (BBMRI CC) will focus on utilization of federated cloud technology developed by EGI in order to implement a secure omics data processing platform, with focus on processing human data with all the legal and ethical considerations. Another aspect of the BBMRI CC will be the collaboration with EUDAT on long-term data preservation and curation strategies. The platform will be usable by the biobanks in order to process the data stored therein in such a way that the data does not leave the biobank, thus evading from the most of the specific privacy and security concerns that relate to sharing human data outside their originating institutions or even abroad. The goal of the BBMRI CC is to integrate existing tools that have been developed within the BBMRI-ERIC[94] community with the EGI and EUDAT technologies and validate their usability by pilot deployments in a few selected biobanks.
The start of the BBMRI CC task has been delayed by 6 months (to month 7, 1st of September 2015) in order to align with the start of the BBMRI-ERIC Common Service IT, which will be the major tool of BBMRI-ERIC to provide IT services for its community. Within the first 6 months of its active period the BBMRI CC will finalize description of the primary use case, provide specifications for the EGI and EUDAT technology groups, and do preliminary integration tests of the technologies coming from the BiobankCloud project[95] with the EGI platform.

6.2.5 MoBrain

The MoBrain CC aims to lower barriers for scientists to access modern e-Science solutions to simulate life science processes from micro to macro-scales. The CC will build on grid- and cloud-based infrastructures and on the existing expertise available within WeNMR/INSTRUCT and NeuGrid4You. During the reporting period MoBrain defined its requirements concerning the discovery of GPGPU resources within the EGI infrastructure, and communicated this to the team working on the implementation of related features in the production system (task JRA2.4).

[93] https://wiki.egi.eu/wiki/Integrating_Reference_Datasets
[94] http://bbmri-eric.eu/
[95] http://www.biobankcloud.com/

Discussions have started between the WestLife VRE project (to start later in 2015 in H2020), the NeuGRID4you community and the WeNMR community about the concept and architecture of an integrated Virtual Research Environment that would enable multi-scale simulations 'from molecules to brain'. Investigations to host the MoBrain portal service on the EGI Federated Cloud have very recently begun.

6.2.6 DARIAH

The EGI DARIAH Competence Centre held its kick off meeting on the 22nd of April 2015 in Ljubljana, in conjunction with the DARIAH General VCC meeting. On the kick-off meeting the details of the workplan were agreed and made visible on the CC wiki page. It was also decided that the regular web-based meeting will be organized every month in order to ensure the on-time conduction of the CC's activities. During the first 6 months 4 web meeting were organized.
One of the first research actions that the CC was working on was preparing a survey to capture e-Infrastructure requirements and needs from digital arts and humanities groups related to DARIAH. The plan was to conclude the survey by June 2015, but the preparation was extended due to the specificities of the target user community. The survey will be completed by the end of July and the collection of the inputs will start at the beginning of August 2015 and then will continue during early autumn with phone and skype interviews.
The original activity plan of the EGI DARIAH CC includes 3 mini-projects but, on the kick-off meeting a better integration and connection between the mini-projects was proposed. The progress on that activity is still ongoing, and the first (beta) version of integration is expected in the next 6-month period. The first use case (dataset of Bavarian dialects from Austrian Academy of Science) was transferred to digital repository on EGI infrastructure (part of the “Storing and Accessing DARIAH contents on EGI” mini-project. The activity is ongoing and is expected to be finished by November 2015. The CC started establishing a new VO in EGI that will be dedicated to the DARIAH user community and in general to all scientists coming from Arts and Humanities.
To ensure the long-term sustainability of the CC's future outcomes and to better integrate into the DARIAH community, the CC is now in the process of proposing a new Working Group within DARIAH (tentative name: “Grid and Cloud infrastructure for Digital Humanities). The working group will provide a sustainable platform to disseminate benefits of (EGI) infrastructure and provide user support and training to DARIAH community beyond the end of the EGI-Engage. The work on the DARIAH working group proposal was started on May and the plan is to finish it by the end of July and then officially submit to the DARIAH board of directors for official approval at the beginning of August.
During the first 6 months the overall objectives, goal and mini-projects of the DARIAH CC were presented at two international conferences via posters and short presentations: MIPRO conference (Opatija, Croatia, May 2015) and ESWC (Portorož, Slovenia, June 2015).

Regarding the workplan, the project activities are performed on time except the release and the collection of inputs form the survey that occurs due to some specificities required by DARIAH community. This small deviation from the workplan does not influence the other activities within the CC.

6.2.7 LifeWatch

The EGI LifeWatch CC (LW CC) activities along the first 6 months of project are progressing as expected, according to the schedule proposed. The status of the four different tasks is as follows:

1. **Support:** The main action being carried on is the integration of new resources in the Federated Cloud and the setup of support tools, to facilitate the adoption and exploitation of the EGI infrastructure by the LifeWatch user community. The installation of around 1000 cores and around 1 PB of storage in a new site in Seville is progressing well, and the site is registered in EGI[96] and almost operational.
2. **Data flow from ecological observatories**: Data flow is significant for the Case Study to support an ongoing experience by LifeWatch Belgium on marine biodiversity research, involving the large data transfer from a ship. The whole transfer chain is working depositing the data in cloud resources at IFCA, and a solution based on MongoDB to handle millions of small image files corresponding to the plankton observed has been implemented. The status of this Case Study was presented in Lisbon along EGI Conference in May, and reviewed in an ad-hoc meeting at Ostende at VLIZ premises on 1st of July. The case for data from Lakes and Water Reservoirs (Sanabria Lake and CdP Water Reservoir, ES) and supporting large software suites for Modelling Ecosystems like Delft3D (on water quality and eutrophication) are progressing well. Data is being transferred these days from CdP and Cogotas Water Reservoirs, and the new project to collect data and model the complete water mass in Sanabria Lake is being signed with authorities. Regarding the development of an integrated framework/toolbox at international level, including a catalogue of applications and final user interfaces based in R and Python, significant progress has been made. First draft of the deliverable has been produced including significant points on performance found in the comparison of different platforms (Power versus Intel clusters, parallel options, etc.), and the possibility of integrating SPARK is now under consideration. Other Case Studies are being considered with the different actors involved and will be analysed in the next months, in particular at the meeting in Santander on 2-4th September.
3. **Workflows and virtual laboratories:** Significant progress was already shown at EGI conference in Lisbon by UPV team on the implementation of an elastic cloud-based solution for Galaxy (with INRA). A first prototype PaaS solution based on OpenShift has been also analyzed in order to implement TRUFA[97] in the Cloud. TRUFA has now more than 100 registered users from many countries around the world, and requires an urgent migration to the Cloud framework. The idea of the Network of Life was presented by CIBIO[98] at Lisbon meeting, and will be further developed in the meeting in Santander in September by Miquel Porto.

[96] https://goc.egi.eu/portal/index.php?Page_Type=Site&id=1405

[97] TRUFA: A User-Friendly Web Server for de novo RNA-seq Analysis Using Cluster Computing: http://www.ncbi.nlm.nih.gov/pubmed/26056424

[98] The Network of Life in the LifeWatch CC meeting: https://indico.egi.eu/indico/sessionDisplay.py?sessionId=105&confId=2452#20150521

4. **Citizen science:** After the very successful sessions at EGI Conference in Lisbon, including the presentations from Greece, Portugal and Spain, the technical work on setting up a tool using GPUs for assisted image recognition is progressing well under the leadership of BIFI. A potential tool has been identified based on deep neural computing, and is being tested. Upcoming meeting in Santander in September will provide a framework for discussion. The dissemination activities are being coordinated with the Royal Botanic Garden in Spain and GBIF.es, and the application for mobile phones from naturalist is being adapted.

Regarding coordination, management and meetings, the EGI LifeWatch Competence Center is already providing a forum for technical and scientific discussion to the LW community along 2015, in particular oriented to VREs (Virtual Research Environments) and VLabs. This idea was discussed in the LW VLabs meeting in Amsterdam in March, and confirmed in the two sessions for the LW CC in EGI conference in Lisbon are targeted along this line: in the first one the LW Marine VRE was presented, and in the second one the ongoing path for the development of new VRE/VLabs was analysed. A new meeting took place in Lovaine on 3rd July, with participation of EGI LW CC representatives.

6.2.8 EISCAT_3D

The design of the next generation incoherent scatter radar system, EISCAT_3D, introduces significant challenges in handling large-scale experimental data which will be massively generated at great speeds and volumes. The CC will build an e-Infrastructure to meet the requirements of the EISCAT_3D data system, will support the EISCAT science community in their acquisition, curation, access to and processing of the data, and will train data scientists who can explore new approaches to solve problems via new data-centric way of conceptualising, organising and carrying out research activities. The start of the CC took longer than anticipated, because the role of some of the CC members had to be redefined, considering the availability of scares expertise that's necessary for the successful completion of the CC mission. After the network of involved experts has been setup the CC focused on two activities:

1. Evaluate the prototype EISCAT portal that has been setup jointly by the EGI-InSPIRE and EUDAT initiatives under the ENVRI project umbrella during 2013-2014. The conclusion of this activity was that despite the portal provides most of the features that the first version of the EISCAT portal requires, because of the discontinued support of ESA (European Space Agency) for the applied portal framework technology, the current setup would not be a sustainable solution. Consequently the CC decided to select more sustainable technologies for the portal (open source, community maintained ones), and re-implement it in those. The baseline solution that was chosen is LifeRay, possibly with iRODS or dCache for storage and transfer engine.
2. Write a requirement and design document to gather the requirements for the EISCAT-3D portal and to capture the design specification of its functional components and applied data model. The document will drive the portal implementation work of the CC contributing to the effort in EISCAT_3D to establish an integrated e-infrastructure to handle, share and use big scientific data from incoherent scatter radars. The document will be finalised within the next six months.

6.2.9 EPOS

The EPOS Competence Centre work starts at PM01. Their aims are:

- Identify and validate authentication and authorisation services from EGI for EPOS,
- Evaluate academic cloud resources and usage models through the EGI setup,
- Provide knowledge transfer between e-Infrastructure and EPOS communities.

To date the most important task is to identify and validate AA(A)I services which might possibly be useful to be integrated within EPOS infrastructure. To test possible solutions a simple use case scenario has been designed. It covers simplest interaction between EPOS central hub (ICS-C) and two thematic core services (TCSs). As result of its implementation we expect basic data transfer to be achieved with help of the full AAI implementation.

The CC designed also a second use case scenario in which, in addition to the basic data transfer, further data analysis will be performed. The goal of this work is to test ICS-C - ICS–D interactions.

The use cases have been discussed and analysed during EGI Community Forum in Lisbon as well as during several internal meetings. More details concerning use-case scenarios can be found on EPOS CC wiki pages[99]. EPOS CC work has been presented to the EPOS IT groups during the meeting in Nottingham (8-9.07).

6.2.10 Disaster Mitigation

Disaster Mitigation Competence Centre (DMCC) is aiming to improve the strategy of disaster mitigation by advancing the understanding of earth physical phenomena and enhancement of estimation quality on target hazards. Scenario-based approach is conducted by analyzing the natural hazards at a given site or by means of early warning systems, or by forecasting the occurrence of the eventually generated disaster after the next strong leading events. An open and sustainable collaboration framework is built up by developing scientific gateway to integrate tools, services, and data based on the needs of user communities. Started from the 6 DMCC initial members, the collaboration welcomes participation of any Asia Pacific countries, and will leverage the achievements of related projects in Europe and the rest of the world.

In the first 6 project months, DMCC has been focused on the simulation and analysis of web portal construction for earthquake and tsunami as well as extreme weather hazards as planned. Five case studies were identified to guide the development of the scientific gateway by working together with user communities from all partners.

1. Impact assessment of tsunami hazards from Manila Trench: leading by Academia Sinica (Taiwan), Philippine is the primary partner and provides the tidal gauge data etc.;
2. Identification of potential sources of historical tsunami in South China Sea: leading by Academia Sinica (Taiwan);
3. Storm surges cases in Philippine and Taiwan: leading by Academia Sinica (Taiwan);
4. Thailand floods in 2011: leading by NECTEC (Thailand), and Taiwan is the primary partner;
5. Malaysia floods in 2014-15: leading by Malaysia, and Taiwan is the primary partner;

Through the case studies, a reliable modelling and simulation capability for future events analysis will be established. Both the web portal of tsunami simulation (iCOMCOT) and weather simulation

[99] https://wiki.egi.eu/wiki/EGI-Engage:Competence_centre_EPOS

(gWRF) are available now, which is ahead of the planned schedule. Training and demonstration are arranged at the next DMCC face-to-face meeting on August 12, at Kuala Lumpur, Malaysia, co-locating with the Asia Pacific Advanced Network (APAN) meeting.
The web portals will be integrated with the current regional distributed e-infrastructure. To make simplified and flexible infrastructure, application platform and resource access, DMCC will take advantage of the evolutionary core technologies from EGI and other EC funded projects, such as the authentication and authorization infrastructure, operation, data management, federated cloud, etc. A taskforce is formed to review the advancement of EGI services and plan for the implementation.
Fortnightly DMCC meeting is held after the kick off meeting on March 16, 2015. In addition, two face-to-face meeting were convened in March (the kick off meeting in Taipei during ISGC 2015) and in May during the EGI Conference 2015. The next one is to be held in August, in Malaysia.

6.3 Issues and Treatment

Following issues have been identified within SA2 work package:

Issue: The NILs of several NGIs became inactive since EGI-InSPIRE ended and do not attend the Engagement meetings and do not respond to the requests sent to the NIL email list.
Treatment: The current status of the NILs of these NGIs are being investigated through the EGI Council. Support actions for strengthening NGI human networks are needed.

6.4 Plans for next period

6.4.1 Training

During the next six months SA2.1 will work on expanding the EGI training module portfolio based on the content that has been developed for the introductory-level 'Federated Cloud with OCCI/rOCCI' courses in July. New courses are envisaged about the following cloud-related topics:

1. High-level tools (PaaS and SaaS) that are compatible with EGI cloud resources for researchers and educators.
2. A module with EUDAT based on the joint use case that has been identified and documented during the EGI-EUDAT meeting at the EGI Conference in Lisbon (collaborative use of EUDAT data and EGI cloud services).
3. Develop a training module about Virtual Machine preparation and certification in the EGI Federated Cloud.
4. Develop a training module about incident reporting and handling in the EGI Federated Cloud.
5. Deploying clouds and federated clouds for scientific and educational purposes (in collaboration with Federated Cloud Task Force and Operations).

It is planned to work with EGI resource providers to identify suitable sites, services and business model for the long term operation of the cloud-based training e-infrastructure to serve EGI-related courses and self-paced training needs.

Following training modules are planned to be developed:

1. the use of the EGI long tail platform by 'Long Tail of Science' platform development team about. Target of the module will be the NGI user support teams, who can train and support long tail users based on this knowledge;
2. security solutions and security interoperability solutions in the EGI and PRACE e-infrastructures;
3. Open Data Processing solution from EGI (in collaboration with task JRA2.1);
4. GPGPU-computing in EGI (in collaboration with task JRA2.4 and NGI-BG);
5. iRODS training (in collaboration with NGI-FR).

Training events will be organized with EGI's support at interested NGIs, using newly developed modules, resources and e-infrastructures as appropriate. Prime targets for the next 6 months are the EGI Community Forum, and events co-located with ENVRI+, PhenoMeNal and other projects' own meetings. Continuously monitor the websites of partner RIs and projects, identify high-impact events to which EGI should contribute to. Arrange contributions from the local NGIs where possible.

From September, in collaboration with the EDISON H2020 project, task plans to define and start the development of a new generation of the EGI Training Marketplace. The new generation should improve the sharing and integration of contributions from external projects for Data Scientists (the key beneficiaries of EDISON).

Finally follow-up partnerships that have been identified[100] at the EGI Conference 2015 event with JetStream, D4Science, SoBigData, Bio-Linux, EOS Cloud. Monitor the broader context in which EGI training operates, recognise and establish partnerships with initiatives that can help EGI establish sustainable, value-added services for training.

6.4.2 Technical user support

The activity has three goals for the next period:

1. Promote the recently established support tracking RT queue and requirement collection template to the NGI support teams so these will become actively used through the whole EGI collaboration, helping the project obtain a consistent picture of ongoing engagement and community support activities. This will be achieved through the Engagement meetings and through direct emails sent to the relevant groups.
2. Continue providing technical consultancy and support for those communities that are in the support pipeline (see in section 6.2.2), with a growing involvement of NGI support personals.
3. Pursue technical engagement with new communities, particularly those H2020 projects that will start in/after September. Most relevant of these for EGI are the VRE projects and ESFRI-

[100] These are detailed in the EGI Training plan: http://go.egi.eu/trainingplan

related initiatives and clusters. This will be done in collaboration with the EGI management and UCST groups.

6.4.3 ELIXIR

The CC will start its official activity in month 6, i.e. August. The focus will be on finalizing the testing of those EGI services that have been customised for ELIXIR for inclusion in the ELIXIR Compute platform, and on selecting those few life science use cases that will drive the e-infrastructure development and integration activities. The first milestone of the CC will relate to this and should be delivered in project month 12 (Life science requirements analysis and driver use case(s) with implementation roadmap are agreed).

ELIXIR's new H2020 project, EXCELERATE will start in the autumn and strong collaboration between the CC and ELIXIR is expected through this new initiative.

6.4.4 BBMRI

The BBMRI CC will start its active period on the 1st of September. Within the first 6 months of its active period the CC will finalize description of the primary use case, provide specifications for the EGI and EUDAT technology groups, and do preliminary integration tests of the technologies coming from the BiobankCloud project with the EGI platform.

6.4.5 MoBrain

In the next six months the MoBrain CC continues working towards the two deliverables that are due at month 12 and 13 respectively:

1. Fully integrated MoBrain web portal
2. Implementation and evaluation of AMBER and/or GROMACS (on GPGPUs in EGI)

The web portal integration requires interfacing of the WeNMR and neuGRID for you (N4U) web portal with each other, as well as with the EGI Federated Cloud. The AMBER and GROMACS applications have been already integrated with GPGPUs, and as soon as JRA2.4 delivers GPGPU discovery services in EGI, this task will proceed to the integration and evaluation of the GPGPU-enabled applications on EGI resources.

6.4.6 DARIAH

By the end of September 2015 the CC will collect e-Infrastructure requirements from the DARIAH community through the online survey and by interviewing key persons (such as coordinators of relevant Working Groups). The collected inputs will be analysed and presented at the EGI Community Forum in Bari in November. Furthermore, it is expected that proposed DARIAH working group will be approved and that CC can start with the more dedicated dissemination activities and presentations towards DARIAH community on the possibilities of the advanced infrastructures (e.g. Federated Cloud). Also, the beta version of the mini-project are planned to be launched at the first half of November and presented on the EGI Community Forum. To enable an access to the EGI infrastructure for DARIAH users, a new Virtual organization for Arts and Humanities is expected to be fully operational (with dedicated computational and storage

resources as well as associated applications and service, e.g. WS-PGRADE portal and gLibrary repository) in the first half of November. In November CC will produce a detailed user support and training plan (internal deliverable) and in January and February CC are obliged to produce two EGI-Engage deliverables describing the final versions of two technical mini-projects.

6.4.7 LifeWatch

The next meeting in Santander (2-4th September) will be the key to consolidate the work being done. Most partners have confirmed their presence, including also the direct participation from EGI.eu. Another presentation to the whole community will take place in Rome in September, in the European Ecology Meeting[101], showing the framework running on the EGI Federated Cloud in a LW booth (in collaboration with LW-Italy). Another demo will be given at the EGI conference in Bari in November 2015, in close collaboration with the INDIGO-DataCloud team. A session at Bari conference has been requested to discuss the progress of different activities.

Also before the end of 2015 at least two workshops/demos will show in Spain the potential of the EGI-LW IaaS and PaaS solutions, using the specific LW resources being integrated in the EGI Federated Cloud. One of the workshops will be oriented to applications for a LIFE project, another one to management applications for the environmental authorities. Another workshop will address their use by SME.

6.4.8 EISCAT_3D

During the first part of the next period the CC will finalise the portal specification document and then will present this to the EISCAT community for feedback and approval. There are three EISCAT meetings planned in September: the EISCAT symposium in South Africa, the kick-off for the EISCAT preparation for production project and the annual EISCAT meeting. In autumn CC will set up a/the portal development environment and intends to have a portal prototype by end of year. After organised tests with debugging the final first stage portal should be ready be the end of February 2016 (M12).

6.4.9 EPOS

The goal for the next 6 months is to identify and start to verify technical solutions which would help to implement both use-case scenarios. Several possibilities are under consideration right now, including EGI Long Tail of Science model. The AAI implementations of the CTA ESFRI[102] will be analysed as well. Once identified and tested, the technical information will be passed to the EPOS IT groups for verification and validation before it will be implemented by ICS-C, ICS-D and TCSs.

6.4.10 Disaster Mitigation

In next 6 months it is planned to finish identifying case studies by close work with user communities. Completing the tsunami and weather simulation portals are the top priority for this period. Participating partners need to collect observation data for those cases including the tidal

[101] http://www.europeanecology.org/meetings/

[102] The Cherenkov Telescope Array: https://portal.cta-observatory.org/Pages/Home.aspx

gauge, rainfall (hourly and daily), radar data, satellite data, etc. The simulation and analysis workflow will be adjusted according to the feedback from the users. Advance visualization will be integrated and supported by the LRZ.

7 Consortium Management

7.1 Summary

Consortium management includes project finance and administration, technical coordination and WP management and quality management. All these activities are delivered through WP1.

7.2 Main Achievements

WP1 was responsible of bootstrapping the project governance structures:

- The **Activity Management Board (AMB)**, lead by the Technical Coordinator and participated by the WP managers and quality manager. The Activity Management Board is responsible of executing the activity plan, of executing the quality plan under the coordination of the Quality Manager and of discussing inter-WP activities as well as defining the technical roadmap. The AMB meets bi-weekly[103]. The AMB produced a detailed project year activity plan, which can be consulted on wiki. The plan helps activity managers to monitor progress on a monthly basis. Activity reports and the yearly plan are available from the EGI wiki[104].
- The **Project Management Board (PMB)**, elected on Thursday 21st May – 8 members out of 12) – is the executive board of the project, with representatives from the EGI participants and the research communities receiving funding in the project. It is currently chaired by the EGI Council chairman. The PMB supervises the work of the AMB, the quality plan and risk management activities, and meets monthly[105].
- The **Collaboration Board** controls the PMB and all beneficiaries are represented there. The first face-to-face meeting took place in May 2015. The meeting was primarily devoted to the discussion of the Collaboration Agreement and the appointment of the PMB members.

The agendas of project management meetings are available on Indico[106] (access to CB meeting agendas is restricted to the beneficiaries).

Quality management

Quality management defines project metrics, KPIs, deliverable and milestone review processes and is in charge of discussing project copyright and acknowledgement policies. Quality management is also responsible of risk management, of the enforcement of the execution of data management plan (to be reviewed at the end of each reporting period), and of collecting and maintaining the register of software outputs to support the project dissemination activities ensuring the open source policy of the project is observed.

[103] https://indico.egi.eu/indico/categoryDisplay.py?categId=156
[104] https://wiki.egi.eu/wiki/EGI-Engage:AMB
[105] https://wiki.egi.eu/wiki/EGI-Engage:PMB
[106] https://indico.egi.eu/indico/categoryDisplay.py?categId=150

All this is described in the quality plan[107], which is reviewed every project year. These quality management activities have been delivered according to the plan.

The quality management activities are coordinated by the Quality Manager and developed with the contribution of all WP managers and task leaders.

Quality management activities included the setting up of mailing lists[108], the creation of templates and of the project web pages[109] and of organizing the project wiki space, which is the main online collaboration platform of the project and can be consulted publicly[110]. Quality management activities are documented on wiki[111]. Project metrics will gathered through a dedicated metrics portal that is currently under maintenance, the system will be also used to collect all EGI-wide metrics and KPIs relevant to monitor the progress of the EGI strategy implementation.

DoA Amendment

EGI.eu signed the first project amendment on Aug 07, the EC signature followed on Aug 25. The amendment was motivated by the need of removing one unfunded partner (NATIONAL SCIENCE AND TECHNOLOGY DEVELOPMENT AGENCY – NSTDA, Thailand), as the partner was not able to participate from its entry into force (the partner did not accede to the Grant Agreement).

Consortium agreement signature

The Consortium Agreement was finalized in June; signed copies were collected electronically by June 30 and hard copies by July 15. The whole process was completed on the 28th of August.

Project finance

Effort reporting guidelines are available at https://wiki.egi.eu/wiki/EGI-Engage:Project_reporting.

The total pre-financing amounted to € 3,6M (45% of the total grant). The 1st payment was executed on July 10 for an amount of € 2,554,348, while the second release of pre-financing (€ 0.9M) is planned at PM10 upon AMB validation of activities.

All project milestone and deliverables due by PM06 were submitted to the EC.

[107] https://documents.egi.eu/document/2487
[108] https://wiki.egi.eu/wiki/EGI-Engage:PO_activities
[109] http://www.egi.eu/about/egi-engage/
[110] https://wiki.egi.eu/wiki/EGI-Engage
[111] https://wiki.egi.eu/wiki/EGI-Engage:Quality_Assurance

7.2.1 Milestones and Deliverables

Table 1 – Preferred colour scheme

Id	Activity No	Deliverable / Milestone title	Type (***)	Lead partner	Original Delivery date(*)[112]	Revised delivery date(*)	Status (**)
M2.1	WP2	Website and templates	DEC	EGI.eu	01	03	*PMB approved*
M1.1	WP1	Execution plan	OTHER	EGI.eu	02	03	*PMB approved*
M6.1	WP6	Joint training program for the first period is agreed	R	EGI.eu	03	04	*PMB approved*
D1.1	WP1	Quality plan for Period 1	R	EGI.eu	03	04	*PMB approved*
D2.1	WP2	Communications, Dissemination and Engagement Strategy	R	EGI.eu	03	04	*PMB approved*
M3.1	WP3	Operational tools development roadmap agreed	R	EGI.eu	04	04	*PMB approved*
M 4.1	WP4	Open Data Platform: requirements and implementation plans	R	CYFRONET	06	07	*PMB approved*
D2.2	WP2	Master Model for SME engagement	R	EGI.eu	06	06	*PMB approved*
D2.3	WP2	Concept of EGI Marketplace	R	SWING	06	07	*PMB approved*
D2.4	WP2	Data Management Plan	R	EGI.eu	06	06	*PMB approved*
D3.1	WP3	Technical design of the new Accounting Portal and implementation plan	R	CSIC	06	06	*PMB approved*
D4.1	WP4	CANFAR integration roadmap	R	INFN	06	06	*PMB approved*

[112] *(*) Dates are expressed in project month (1-30).*

(**) Status = Not started – In preparation – Pending internal review – PMB approved

*(***) Type = **R** = Document, report **DEC** = Website, press & media actions, events **DEM** = Demonstrators, pilots, prototypes, plan design **OTHER** = Software, technical diagram etc.*

7.2.2 Consumption of Effort

This section reports on the effort consumed in the period PM01 to PM06. The report was extracted on October 05 and provides effort views per WP and per partner in each WP.

Table 1. Effort consumed during the first intermediate period per WP.

Work Package	PM M1-M30 Plan	PM M1-M6 Plan	PM M1-M6 Worked	Achieved M06 %
WP01: (NA1) Project Management	96.00	19,2	21,9	114%
WP02: (NA2) Strategy, Policy and Communications	199.00	39,8	28,5	72%
WP03: (JRA1) E-Infrastructure Commons	153.00	30,6	25,7	84%
WP04: (JRA2) Platforms for the Data Commons	156.00	31,2	18,7	60%
WP05: (SA1) Operations	105.50	21,1	15,7	74%
WP06: (SA2) Knowledge Commons	456.50	91,3	43,4	48%
Grand Total	**1,166.00**	**233**	**154**	**66%**

The overall effort consumption per WP indicates overspending on WP1 (project management) and low reporting on other WPs. WP1 slightly overspent in the period due to the project bootstrapping activities related to project governance, setup of the communications platforms, the quality plan and the related procedures and risk management. This effort will be balanced in the coming periods. The number of PMs achieved in the other remaining WPs is below threshold due to a combination of some factors: (1) the ongoing hiring process with some partners including CYFRONET who decided to postpone some recruitment to concentrate the available effort during the development periods and EGI.eu (WP4 and WP6), (2) to delays in the process of claiming effort in the effort reporting tool of the project, (3) GRNET who experienced a delay in signing the contracts with its 3rd parties due to the capital controls that were enforced in Greece in July 15. The contracts were signed from the 1st of September and work has resumed back to normal. Despite of these deviations in effort reporting, work was in general delivered according to the plans. Note that in WP4 two tasks (BBMRI and ELIXIR CCs) were due to start at PM07 and PM06 respectively.

Note. The following partners have no activity to report in M1-M6: B12 INRA, B21-2 KNMI, BE25 SNIC (no effort plan for the Lead beneficiary), BE30 EMBL, BE35 GNUBILA.

The following sections provide views by WP and partner.

7.2.2.1 WP01: (NA1) Project Management

Table 2. Effort consumed during the first intermediate period in WP1.

Work Package	Participant	PM M1-M6 Plan	PM M1-M6 Worked	Achieved M06 %
WP01: (NA1) Project Management	P01: EGI.eu	13.9	15,5	111%
	P09-4: CESGA	0.4	0,3	65%
	P15: MTA SZTAKI	3.2	4,5	141%
	P16: INFN	1.7	1,7	98%
	Total	19.2	21,9	114%

Note: Activities of EGI.eu and SZTAKI are linked to the project set up and thus uses of PMs reflect the activity at the start of the project; it will be balanced throughout the project.

7.2.2.2 WP02: (NA2) Strategy, Policy and Communications

Table 3. Effort consumed during the first intermediate period in WP2

Work Package	Participant	PM M1-M6 Plan	PM M1-M6 Worked	Achieved M06 %
WP02: (NA2) Strategy, Policy and Communications	P01: EGI.eu	23.9	15,1	63%
	P04: IICT-BAS	0.9	1,1	125%
	P05: SwiNG	1.9	3,8	200%
	P09: CSIC	0.6	0,0	0%
	P09-2: UNIZAR	0.5	0,0	0%
	P09-4: CESGA	0.4	0,0	0%
	P10: CSC	0.5	0,0	0%
	P11: CNRS	0.5	0,1	17%
	P13: GRNET	2.2	1,8	82%
	P14-1: RBI	0.4	0,5	113%
	P16: INFN	1.5	0,6	41%
	P16-2: INGV	0.4	1,0	250%
	P19: CNR	0.4	0,5	130%
	P20: Engineering	1.2	1,7	142%
	P21: SURFsara BV	0.5	0,0	0%
	P23: LIP	0.5	0,0	0%
	P27: TUBITAK	1.0	1,0	102%
	P29: BBMRI-ERIC	0.4	0,1	13%
	P31: CERN	1.2	1,2	100%
	P33: FAO	0.9	0,0	0%
	Total	39.8	28,5	72%

Note: BE05 SwING is unfunded.

7.2.2.3 WP03: (JRA1) E-Infrastructure Commons

Table 4. Effort consumed during the first intermediate period in WP3.

Work Package	Participant	PM M1-M6 Plan	PM M1-M6 Worked	Achieved M06 %
WP03: (JRA1) E-Infrastructure Commons	P01: EGI.eu	1.5	0,3	21%
	P05: SwiNG	1.4	2,8	200%
	P06: CESNET	1.6	2,1	128%
	P09-4: CESGA	3.0	2,4	80%
	P11: CNRS	3.2	2,9	91%
	P13: GRNET	2.6	0,6	22%
	P13-1: IASA	0.6	0,0	0%
	P13-2: AUTH	2.0	0,0	0%
	P14: SRCE	2.0	2,1	106%
	P16: INFN	1.3	1,2	95%
	P21-3: NIKHEF	0.8	0,7	88%
	P22: CYFRONET	4.0	0,3	7%
	P28: STFC	6.6	10,3	156%
	Total	30.6	25,7	84%

Note: BE05 SwING is unfunded

7.2.2.4 WP04: (JRA2) Platforms for the Data Commons

Table 5. Effort consumed during the first intermediate period in WP4.

Work Package	Participant	PM M1-M6 Plan	PM M1-M6 Worked	Achieved M06 %
WP04: (JRA2) Platforms for the Data Commons	P01: EGI.eu	0.8	0,0	0%
	P06: CESNET	4.2	4,5	108%
	P09: CSIC	2.1	1,0	48%
	P09-2: UNIZAR	0.9	0,8	89%
	P09-3: UPVLC	1.4	0,3	20%
	P09-4: CESGA	1.2	0,7	60%
	P13: GRNET	1.0	0,0	0%
	P13-1: IASA	2.4	0,0	0%
	P16: INFN	4.2	5,1	121%
	P16-1: INAF	2.6	1,4	55%
	P17: CIRMMP	0.4	0,5	125%
	P20: Engineering	1.2	1,7	139%
	P22: CYFRONET	7.2	0,1	1%
	P26: IISAS	1.0	1,8	176%
	P34: Agro-Know	0.6	0,8	133%
	Total	31.2	18,7	60%

7.2.2.5 WP05: (SA1) Operations

Table 6. Effort consumed during the first intermediate period in WP5.

Work Package	Participant	PM M1-M6 Plan	PM M1-M6 Worked	Achieved M06 %
WP05: (SA1) Operations	P01: EGI.eu	6.0	2,4	39%
	P06: CESNET	0.4	1,0	240%
	P11: CNRS	0.4	0,4	101%
	P16: INFN	6.4	5,4	85%
	P19: CNR	2.4	3,2	134%
	P21-3: NIKHEF	1.9	0,5	25%
	P22: CYFRONET	0.8	0,1	18%
	P28: STFC	2.0	1,3	67%
	P31: CERN	0.8	1,4	175%
Total		21.1	15,7	74%

7.2.2.6 WP06: (SA2) Knowledge Commons

Table 7. Effort consumed during the first intermediate period in WP6.

Work Package	Participant	PM M1-M6 Plan	PM M1-M6 Worked	Achieved M06 %
WP06: (SA2) Knowledge Commons	P01: EGI.eu	4.9	0,0	0%
	P02: OEAW	0.6	0,1	23%
	P03: VLIZ	1.2	1,0	83%
	P06: CESNET	4.6	1,6	34%
	P07: Fraunhofer	0.9	0,3	31%
	P08: GWDG	1.9	1,2	63%
	P09: CSIC	11.0	7,5	68%
	P09-1: UAB	1.2	0,6	50%
	P09-2: UNIZAR	2.2	1,5	68%
	P09-3: UPVLC	2.2	0,0	0%
	P09-4: CESGA	1.0	1,4	140%
	P10: CSC	3.2	0,6	18%
	P11: CNRS	3.0	0,6	20%
	P12: INRA	1.4	0,0	0%
	P13: GRNET	1.7	0,0	0%
	P14-1: RBI	3.7	3,5	95%
	P15: MTA SZTAKI	5.9	4,8	81%
	P16: INFN	3.7	1,6	44%
	P16-2: INGV	0.8	0,0	0%
	P17: CIRMMP	1.6	1,0	63%

	P18: IRCCS FBF	0.6	0,0	0%
	P21: SURFsara BV	2.0	0,1	4%
	P21-1: KNAW	0.5	0,0	4%
	P21-2: KNMI	0.8	0,0	0%
	P21-3: NIKHEF	0.4	0,0	0%
	P21-4: BCBR	1.6	4,0	250%
	P22: CYFRONET	0.9	0,1	16%
	P23: LIP	3.6	4,0	111%
	P24: ICETA	0.6	0,5	83%
	P25: SNIC	-	0,0	
	P25-1: KTH	1.2	1,6	133%
	P25-2: UMEA	1.4	0,8	59%
	P28: STFC	0.9	0,3	30%
	P29: BBMRI-ERIC	0.8	0,0	0%
	P29-1: BBMRI-CZ	0.6	0,0	0%
	P29-2: BBMRI-SE	0.2	0,0	0%
	P29-3: BBMRI-NL	1.0	0,0	0%
	P30: EMBL	1.0	0,0	0%
	P31: CERN	0.4	0,0	0%
	P32: EISCAT	2.8	1,5	54%
	P35: GNUBILA	0.8	0,0	0%
	P36: IU (OSG)	1.1	0,0	0%
	P37: AS	9.6	2,8	29%
	P38: ASTI	0.4	0,3	63%
	P39: ITB	0.8	0,1	18%
	P40: UPM	0.6	0.00	0%
WP06: (SA2) Knowledge Commons Total		91.3	43,4	48%

Note: BE36, 37, 38, 39 and 30 are unfunded

7.2.3 Overall Financial Status

This section provides effort views aggregated by partner.

Participant	PM M1-M30 Plan	PM M1-M6 Plan	PM M1-M6 Worked	Achieved M06 %	Direct costs	Indirect costs	Total
P01: EGI.eu	255.0	51.0	33,2	65%	262.585	65.646	328.231
P02: OEAW	3.0	1.0	0,1	14%	728	182	910
P03: VLIZ	6.0	1.0	1,0	100%	6.782	1.696	8.478
P04: IICT-BAS	4.5	1.0	1,1	112%	4.343	1.086	5.429
P05: SwiNG	16.5	3.0	6,6	220%	33.000	8.250	41.250
P06: CESNET	54.0	11.0	9,1	83%	33.024	8.256	41.280
P07: Fraunhofer	4.5	1.0	0,3	28%	3.690	923	4.613
P08: GWDG	9.5	2.0	1,2	60%	6.553	1.638	8.192
P09: CSIC	68.5	14.0	8,5	61%	39.876	9.969	49.844
P09-1: UAB	6.0	1.0	0,6	60%	3.550	887	4.437
P09-2: UNIZAR	18.0	4.0	2,3	58%	10.758	2.690	13.448
P09-3: UPVLC	18.0	4.0	0,3	7%	1.940	485	2.425
P09-4: CESGA	30.0	6.0	4,8	80%	17.198	4.299	21.497
P10: CSC	18.5	4.0	0,6	15%	6.855	1.714	8.569
P11: CNRS	35.5	7.0	4,0	57%	20.067	5.017	25.084
P12: INRA	7.0	1.0	-	0%	-	-	-
P13: GRNET	37.5	8.0	2,4	30%	11.055	2.764	13.819
P13-1: IASA	15.0	3.0	-	0%	-	-	-
P13-2: AUTH	10.0	2.0	-	0%	-	-	-
P14: SRCE	10.0	2.0	2,1	106%	12.216	3.054	15.270
P14-1: RBI	20.5	4.0	4,0	99%	10.742	2.685	13.427
P15: MTA SZTAKI	45.5	9.0	9,3	103%	47.211	11.803	59.014
P16: INFN	94.0	19.0	15,6	82%	67.718	16.930	84.648
P16-1: INAF	13.0	3.0	1,4	48%	6.955	1.739	8.694
P16-2: INGV	6.0	1.0	1,0	100%	5.000	1.250	6.250
P17: CIRMMP	10.0	2.0	1,5	75%	8.340	2.085	10.425
P18: IRCCS FBF	3.0	1.0	-	0%	-	-	-
P19: CNR	14.0	3.0	3,7	125%	21.868	5.467	27.335
P20: Engineering	12.0	2.0	3,4	169%	16.850	4.213	21.063
P21: SURFsara BV	12.5	3.0	0,1	3%	472	118	590
P21-1: KNAW	2.5	1.0	0,0	2%	130	33	163
P21-2: KNMI	4.0	1.0	-	0%	-	-	-
P21-3: NIKHEF	15.5	3.0	1,2	39%	12.463	3.116	15.578
P21-4: BCBR	8.0	2.0	4,0	200%	17.661	4.415	22.076
P22: CYFRONET	64.5	13.0	0,7	5%	4.237	1.059	5.296
P23: LIP	20.5	4.0	4,0	100%	15.885	3.971	19.857
P24: ICETA	3.0	1.0	0,5	50%	2.000,00	500,00	2.500,00

P25: SNIC	-	-	-	-	-	-	-
P25-1: KTH	6.0	1.0	1,6	160%	10.888	2.722	13.610
P25-2: UMEA	7.0	1.0	0,8	82%	8.039	2.010	10.049
P26: IISAS	5.0	1.0	1,8	176%	8.100	2.025	10.125
P27: TUBITAK	5.0	1.0	1,0	102%	4.080	1.020	5.100
P28: STFC	47.5	10.0	11,9	119%	83.270	20.817	104.087
P29: BBMRI-ERIC	6.0	1.0	0,1	5%	1.570	392	1.962
P29-1: BBMRI-CZ	3.0	1.0	-	0%	-	-	-
P29-2: BBMRI-SE	1.0	0.20	-	0%	-	-	-
P29-3: BBMRI-NL	5.0	1.0	-	0%	-	-	-
P30: EMBL	5.0	1.0	-	0%	-	-	-
P31: CERN	12.0	2.0	2,6	130%	25.900	6.475	32.375
P32: EISCAT	14.0	3.0	1,5	50%	12.479	3.120	15.598
P33: FAO	4.5	1.0	-	0%	-	-	-
P34: Agro-Know	3.0	1.0	0,8	80%	4.852	1.213	6.065
P35: GNUBILA	4.0	1.0	-	0%	-	-	-
P36: IU (OSG)	5.5	1.0	-	0%	-	-	-
P37: AS	48.0	10.0	2,8	28%	-	-	-
P38: ASTI	2.0	0.4	0,3	63%	-	-	-
P39: ITB	4.0	1.0	0,1	14%	-	-	-
P40: UPM	3.0	1.0	-	0%	-	-	-
Grand Total	**1,166.0**	**233**	**154**	**66%**	**870.930**	**217.733**	**1.088.663**

Note: The estimate of the personnel and travel costs is given for information purpose only. Some of these personnel costs have been calculated using the average PMs costs of the budget. Not all travel costs have been reported at the time of writing.

The actual costs will be provided at M12 for the preparation of the first periodic report.

7.3 Issues and Treatment

The company originally contracted to provide the tool for effort reporting in the project went bankrupt. The provisioning of tool is being handed over to a sister company responsible of developing and maintaining the project financial module being used in EGI-Engage.

Treatment. In order to ensure continuity of the tool used for effort reporting and to avoid financial loss related to the partner originally contracted, no change of tool is being considered at present. The situation is being constantly watched and reported to the PMB on a monthly basis.

7.4 Plans for next period

Partners not reporting yet, or who are strongly underreporting, will not be paid out the second part of pre-financing and will be chased in order to produce more accurate effort reports. Effort

consumption is being monitored on a quarterly basis by activity managers with the support of the Project Office.

As to governance, the PMB chairman will be elected and the management handed over by the EGI Council Chairman.

As to risk management, “Risk analysis and risk response for Period 1” is being finalized and will be documented in D1.2.

8 Project Metrics

8.1 Overall metrics

Objective	Metric ID	Impact and Metric	Value PM06	Target PM12
O4	KPI.1.JRA2.OpenData	Number of open research datasets that can be published, discovered, used and reused by EGI applications/tools	5[113]	0
O1, O2	KPI.2.SA1.Intergation	Number of RIs and e-Infrastructures integrated with EGI	7[114]	9
O1, O2	KPI.3.SA1.Software	Number of new registered software items/ VM appliances	8/30	50/50
O1, O2	KPI.4.SA1.Cloud	Number of providers offering compute and storage capacity accessible through open standard interfaces	20	25
O5	KPI.5.SA2.Users	Number of researchers served by EGI	39 000	40 000
O3	KPI.6.JRA1.AAI	Number of users adopting federated IdP	0	0 (PY1)
O5	KPI.7.SA2.Users	Number of new research communities served	9[115]	20
O2	KPI.8.SA1.Users	Number of VO SLAs established	0[116]	4
O5	KPI.9.NA2.Comm	Number of scientific publications supported by EGI	(KPI due at the end of PY1)	
O2	KPI.10.NA2.Comm	Number of relevant authorities informed of the policy paper on procurement	24[117]	5

[113] Data flow activities in progress with LifeWatch. GBIF data (Spanish node) saved in the EGI Federated Cloud; genetics: ASTD database, Ensembl , Ensembl Human Genome, 9Ensembl himo sapiens sequence indexes

[114] BBMRI (HTC use), CLARIN (Cloud IaaS), CTA (HTC), KM3NeT (HTC) LifeWatch (VOMS, LifeWatch site under integration, Cloud IaaS) LOFAR (VOMS, HTC) and EUDAT2020 (B2STAGE).

[115] 7 International VOs (chipster.csc.fi, geohazards.terradue.com, hydrology.terradue.com, juno, training.egi.eu, vo.dirac.ac.uk, vo.moedal.org) and 2 national VOs (harpo.cea.fr, ronbio.ro). 224 total VOs

[116] Four SLAs being negotiated: DRIHM (hydrology and meteorology), MoBRAIN (structural biology and brain research), BILS (bioinformatics) and the International Cancer Genome Consortium.

[117] Discussion of the Open Science Commons and the related cross-border service procurement isses at e-IRG, the EC, and Digital ERA Forum (approx. 20 Member States)

Objective	Metric ID	Impact and Metric	Value PM06	Target PM12
O5	KPI.11.SA1. Users	User satisfaction	(CRM process under definition and implementation)	
O2	KPI.12.NA2 .Industry	Number of services, demonstrators and project ideas running on EGI for SMEs and industry	14	20
O5	KPI.13.SA2. Support	Number of delivered knowledge transfer events	7	15
O3, O5	KPI.14.SA1. Size	Number of compute available to international research communities and long tail of science [Cores]	650 000	600 000[118]
O3, O5	KPI.15.SA1. Size	Amount of storage available to international research communities and long tail of science [PB]	490 (of which 215 tape)	500[119]
O2, O5	KPI.16.SA2. Support	Number of international support cases (for/with RIs, projects, industry)	38	30
O3, O5	KPI.17.SA1. Size	Number of compute resources available to the long tail of science	Platform under development	

8.2 Activity metrics

8.2.1 NA1 – Project Management

Metric ID	Metric	Task	Value PM06
M.NA1.Quality.1	Percentage of deliverables and milestones delivered on time	1.3	58% (16 days of delay on average)[120]

8.2.2 NA2 – Strategy, Policy and Communication

Metric ID	Metric	Task	Value PM06
M.NA2.Communication.1	Percentage of articles, news, blog posts about or contributed by user communities and NGIs/EIROs with	2.1	46%

[118] The current growth trend is +16,000 core per calendar month,

[119] The current growth trend based on 2014 and 2015 statistics is +15 PB/year (disk storage)

[120] Milestones and deliverables due by PM04 were submitted by e-mail, only later on through the participants portal after instructions were received.

	respect to the total of items published in EGI's channels		
M.NA2.Communication.2	Number of unique visitors to the website	2.1	45 980
M.NA2.Communication.3	Number of pageviews on the website	2.1	89 679
M.NA2.Communication.4	Number of news items published	2.1	20
M.NA2.Communication.5	Number of events with participation of EGI Champions	2.1	2
M.NA2.Communication.6	Number of case studies published	2.1	1
M.NA2.Communication.7	Attendee-days per event	2.1	1 300
M.NA2.Strategy.1	Number of EGI impact assessment reports circulated to the stakeholders	2.2	0
M.NA2.Strategy.2	Number of MoUs involving EGI.eu or EGI-Engage as a project	2.2	0
M.NA2.Strategy.3	Number of SLAs established paying customers	2.2	0
M.NA2.Industry.1	Number of engaged SMEs/Industry contacts	2.3	35
M.NA2.Industry.2	Number of establish collaborations with SMEs/Industry (with MoU)	2.3	0
M.NA2.Industry.3	Number of requirements gathered from market analysis activities	2.3	0 (in progress)

8.2.3 JRA1 – E-Infrastructure Commons

Metric ID	Metric	Task	Value PM06
M.JRA1.AAI.1	Number of communities whose Identity Provider framework integrates with EGI AAI	3.1	0
M.JRA1.Marketplace.1	Number of entries in the EGI Marketplace (i.e. services, applications etc.)	3.2	0
M.JRA1.Accounting.1	Number of kinds of data repository systems integrated with the EGI accounting software	3.3	0
M.JRA1.Accounting.2	Number of kinds of storage systems integrated with the EGI accounting software	3.3	2

M.JRA1.OpsTools.1	Number of new requirements introduced in the roadmap	3.4	27
M.JRA1.OpsTools.2	Number of probes developed to monitor cloud resources	3.4	2
M.JRA1.eGrant.1	Number of user requests handled in e-GRANT	3.5	2

8.2.4 JRA2 – Platforms for the Data Commons

Metric ID	Metric	Task	Value M06
M.JRA2.Cloud.1	Number of VM instances managed through AppDB GUI	4.2	0 (GUI under development)
M.JRA2.Cloud.2	Percentage of cloud providers providing snapshot support	4.2	0 (feature under development)
M.JRA2.Cloud.3	Percentage of cloud providers providing VM resizing support	4.2	0 (feature under development)
M.JRA2.Cloud.4	Number of OCCI implementation supporting OCCI 1.2	4.2	0[121]
M.JRA2.Cloud.5	Number of new OCCI implementations for existing or new CMFs.	4.2	1[122]
M.JRA2.Integration.1	Number of European cloud providers in the federated Astronomy community cloud	4.3	0 (integration activity starting at PM07)
M.JRA2.Integration.2	Number of virtual appliances shared	4.3	56
M.JRA2.Integration.3	Number of different datasets replicated across CADC and EGI	4.3	0 (integration activity starting at PM07)
M.JRA2.Integration.4	Number of EUDAT services integrated with the HTC and Cloud platforms of EGI	4.3	2[123]
M.JRA2.Integration.5	Number of open research datasets replicated in the federated cloud for scalable	4.3	0 (integration activity in

[121] OCCI 1.2 public comment phase ended July 2015 and it is still not released.
[122] New implementation for OpenStack.
[123] B2STAGE (EGI Cookbook: https://wiki.egi.eu/wiki/EUDAT_B2STAGE_cookbook_for_EGI_VOs) and B2SAFE.

	access by iMARINE VREs		progress)
M.JRA2.Integration.6	Number of research clouds that interoperate with EGI federated cloud: community clouds, integrated, peer	4.3	0[124]
M.JRA2.AcceleratedComputing.1	Number of batch systems for which GPGPU integration is possible to be supported through CREAM	4.4	1 (Torque/MAUI)
M.JRA2.AcceleratedComputing.2	Number of Cloud Middleware Frameworks for which GPGPU integration is supported and implemented	4.4	1
M.JRA2.AcceleratedComputing.3	Number of level 3 disciplines with user applications that can use federated accelerated computing	4.4	0 (testing with OpenStack in progress)

8.2.5 SA1 – Operations

Metric ID	Metric	Task	Value M06
M.SA1.Operations.1	Amount of federated HTC compute capacity (EGI participants and integrated) [Cores]	5.1	650 000
M.SA1.Operations.2	Amount of federated HTC storage capacity (EGI participants and integrated): (Disk/Tape) [PB]	5.1	273/221
M.SA1.Operations.3	Amount of allocated resources (storage) allocated through a EGI centrally managed pool of resources	5.1	180 TB
M.SA1.Operations.4	Amount of allocated resources (logical cores) allocated through a EGI centrally managed pool of resources	5.1	3160
M.SA1.Operations.5	Number of new products distributed with UMD	5.1	0
M.SA1.SecurityOperations.1	Number of security policies and procedures updated, reviewed and adapted to support new	5.2	6

[124] CANFAR and Nectar integration activities under implementation and/or discussion.

	services		
M.SA1.Platforms.1	Number of gCUBE VREs instantiated on the Federated Cloud for the iMARINE community	5.3	0 (integration in progress)
M.SA1.Platforms.2	Number of CPU time consumed by e-CEO challenges (hours * cores)	5.3	0 (integration in progress)

8.2.6 SA2 – Knowledge Commons

Metric ID	Metric	Task	Value M06
M.SA2.UserSupport.1	Number of training modules produced and kept up-to-date	6.2	7
M.SA2.UserSupport.2	HTC Absolute normalized time to a reference value of HEPSPEC06 (excluding OPS and dteam) per 1 level disciplines Unit in this report: - normalized CPU time seconds	6.2	Engineering and Technology: 50,157,754 Humanities: 1,881,512 Medical and Health Sciences: 55,129,437 Natural Sciences: 329,561,308 Social Sciences: 1,881,512 Support Activities: 497,533
M.SA2.UserSupport.3	HTC Relative increase normalized time to a reference value of HEPSPEC06 (excluding OPS and dteam) per 1 level disciplines	6.2	Engineering and Technology: -14% Humanities: +669% Medical and Health Sciences: -14% Natural Sciences: -7% Social Sciences: +669% Support Activities: -66%
M.SA2.UserSupport.4	Relative increase of users per 1 level disciplines	6.2	Engineering and Technology +347, +13,7% Medical and Health Sciences +419, +15,9% Natural Sciences +127, +0,71% Agricultural Sciences +276, +25,82

			Social Sciences +225, +20,9% Humanities +234, +21,1% Support Activities -2331, -49,6% Other +66, 4%
M.SA2.UserSupport.5	HTC Number of Low/Medium/High Activity VOs and total	6.2	115/103/92/310
M.SA2.UserSupport.6	Number of VM instantiated in Federated Cloud per 1 level discipline	6.2	208 254