D6.5 Periodical assessment of Federated access services

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Deliverable Abstract

The deliverable provides metrics and assessment about the 10 EGI-ACE installations available under the Virtual Access (VA) mechanism in WP6.

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DELIVERY SLIP

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TERMINOLOGY

https://confluence.egi.eu/display/EGIG

Terminology/Acronym	Definition
VA	Virtual Access
EOSC	European Open Science Cloud

Contents

Executive summary

This report provides an assessment at M30, end of the EGI-ACE project, of the 10 WP6 Federated Access services installations provided by the EGI-ACE project under the Virtual Access (VA) mechanism. This assessment is based on the metrics collected by these installations during the project period with 6 times data collection: M01-M05, M06-M10, M11-M15, M15-M20, M20-M25, M25-M30.

During the project, the EOSC Compute Platform was extended with new installations previously not available in the EGI portfolio: EGI Rucio, openRDM, EC3 and the Orchestrator which all have gone through the process of integration within the EGI-ACE Key Exploitable Result 1 (Services enabling federated computing in EOSC). The installations have gone through operations and maintenance tasks and installation of release upgrades following requirements from user communities.

WP6 installations have been used by 132 Virtual Organizations during the project duration, resulting in a 660% increase compared to the number of Virtual Organisations integrated in the reference period (15 months prior to the project start). The uptake of services evolved in the following ways:

- EGI Check-in has been used by 165 service providers and 17,747 users, respectively a 106% and 887% increase in the project period. It clearly outperformed what was planned as targets during the project proposal preparation. The usage of the service increased a lot due to the integration of new service providers and access via EGI Check-in to other EGI-ACE services, so it clearly <u>outperformed</u>.
- EGI FTS did not see an increase in user communities during the project, so the target in terms of numbers of new communities supported <u>was not met</u>. As reported in section 2.2, the lack of communities with requirements over distributed data management and hence data transfer impacted on the service usage.
- EGI CVFMS has been used by 7 new communities, with the number of hosted files and storage occupied increased by 74% and 39% respectively. It almost <u>met</u> the target set during the project preparation.
- EGI Rucio onboarded 1 new community using the service since the project starting date. The main reason for the lower usage of the service has to be found in the need for distributed data management which was not one of the main requirements of the communities accessing the EOSC Compute Platform, so the service clearly <u>underperformed</u>.
- EGI Onedata has been integrated into 11 new community use cases, with new providers installed in Turkey, Hungary, Italy, France, Poland and Czech Republic. It went <u>slightly over the expectations</u> due to the interest of communities in EGI-ACE but also coming from external projects.
- Master Portal has been integrated by 2 new portals, but the overall usage of the service has been <u>quite low</u>. As explained in the section 2.6, one of the reasons could be seen in the missing access via Identity Providers not compliant with SIRTFI, so access was not possible for some users.
- Orchestrator has been integrated by the community representing an EGI Data Space SeaDataNet WebODV Data Analysis, and communities from the C-Scale project,

reaching 250 deployments per year in the second part of the project. The service reached the target in the second part of the project, but the access was low in the first period, hence it slightly underperformed when taking into account the whole project duration. As will be described similarly for EC3, the availability of 2 services exposing similar functionalities could be the main reason for the low usage.

- PERUN is now used by 644 new users, reaching the target set during the project preparation.
- EC3 has been used both by WP5 Data Spaces (ENES) installations and 3 use case applications, with an average of 304 deployments orchestrated per year. The service slightly underperformed compared to what was planned, mainly due to the presence of another service delivering similar functionalities (Orchestrator).
- openRDM has been deployed in the EGI cloud and support to 9 research institutes has been given for their on-premise installations, almost reaching the target set at project proposal preparation.

All installations have been onboarded in the EOSC Portal by M12.

To promote the uptake of new and existing WP6 installations, beside the Webinar programme[1] organised by the project, dedicated sessions have been organised at the EGI Conference 2021[2] where each installation representative has presented their services and the work during the first part of the project. Similarly in EGI Conference 2022 and 2023 sessions and training have been organised, as reported in Section 3, and they all played an important role in extending the user base in Europe as demonstrated by the metrics reported during the periods of observations.

Section 4 finally describes the level of satisfaction by checking the orders received via the EOSC Portal and the EGI customers satisfaction reviews, which showed an average level of 4.64 out of 5[3] during the project duration. The satisfaction recorded in the first 15 months of the project was 4.53, hence it has slightly improved.

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[1] https://www.egi.eu/webinars/
[2] https://indico.egi.eu/event/5464/
[3] On a scale of 1 to 5 with 5 being the highest

1 Introduction

Virtual Access (VA) is financial instruments to reimburse the access provisioning costs to access providers. This instrument is provided by the European Commission to increase the sharing of research infrastructures and services that otherwise would not be available to international user groups.

In VA, the services – also called "installations" – must be made available 'free of charge at the point of use' for European or International researchers. VA access is open and free access to services through communication networks to resources needed for research, without selecting the researchers to whom access is provided.

Virtual Access to services of the EGI-ACE catalogue applies to the following four categories:

1. Infrastructure Services WP3 - the Cloud Compute (IaaS) and High Throughput Compute services of the EGI portfolio supported by a set of 16 datacentres from the EGI Federation. The enabling components that support the Cloud Compute service: AppDB, for resource discovery and software catalogue; Dynamic DNS, for user-managed DNS provision of domain names for VMs and services running on the e-Infrastructure; and Infrastructure Manager (IM) for the basic orchestration of IaaS resources.
2. Platform Services WP4 - mature software tools offering generic capabilities to facilitate the usage of the underlying infrastructure for EOSC users and Data Spaces.
3. Federated data spaces WP5 - services provided by major European research collaborations, research infrastructures and research institutes, and are composed of mature software tools, datasets and services that offer science discipline specific processing and data analysis capabilities for EOSC users.
4. Federated Access Services WP6 – services providing secure access to other services and enabling large-data analysis workloads in the distributed infrastructure. Included services are delivered by major European research institutions using mature open-source software with already established user communities from multiple scientific disciplines.

This document provides Virtual Access metrics and assessment for WP6.

1.1 Installations

Within EGI-ACE project 10 installations are part of Virtual Access work package 6.

The following installations have been subject to change since the beginning of the project:

- 3 services have been onboarded from WP6 in the EOSC Portal since the start of EGI-ACE (EGI Rucio, EGI CVMFS, and openRDM)
- 1 already existing EOSC service has been extended with new providers and features (EGI Data Transfer extended with FTS installation at UKRI).
- Integration activities have been completed or are ongoing between the WP6 installations and the EGI core services. Table 1 summarises the activities including also the details on the installation integration that happened before the start of the project.

Table 1: WP6 installations integration matrix with EGI core services

Installation	EGI Check-in	EGI Helpdesk	EGI Monitoring	EGI GOCDB	EGI Accounting
EGI Check-in	n/a	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
EGI FTS	DONE	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
EGI CVMFS	DONE	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
EGI Rucio	DONE	DONE	DONE	DONE	NOT COMPLETED
EGI Onedata	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	NOT COMPLETED
MasterPortal (EGI Check-in)	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
Orchestrator	DONE	DONE	DONE	DONE	NOT COMPLETED
PERUN	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
EC3	pre EGI-ACE	DONE	DONE	DONE	NOT COMPLETED
openRDM	DONE	DONE	DONE	DONE	n/a

- The Planned integration activities with all the EGI Core services have been completed, with some Check-in integration activities done in the second part of the project.

● Planned integration activities of EGI Rucio, EGI Onedata, Orchestrator and EC3 with the EGI Accounting service were not finalised given the missing support from the EGI Accounting to this new type of accounting information.

1.2 Communities

The Table 5 in Appendix A, summarises the usage of the WP6 installation by the EGI communities (both existing and new communities). The table omits the values for the EGI Check-in installation as it's basically used by most of the communities and the Master Portal installation as it serves individual researchers not linked to specific communities.

1.3 Metrics definition

For each installation several metrics has been defined between the provider and WP6 leader, taking into account following categories:

● **Number of users** – depending on the nature of installation, number could be defined based on accounts (if registration was required) or number of unique IPs (if registration is not needed to benefit from the service) or number of communities (VO) using the service.
● **Usage** – the goal of this metric is to report how much the service is used. This metric depended on functionality provided by the service.
● **Number and names of the countries reached** – the goal of this metric was to report how broadly the service is used and how the geographical coverage is changing with time.
● **Marketplace orders** – the goal of this metric is to provide information about how often the service is being ordered via EOSC Portal.

2 Installations

2.1 EGI - Check-in

Description	Check-in makes it easy to secure access to EGI services and resources. Through Check-in, users are able to authenticate with the credentials provided by the Identity Provider of their Home Organisation (e.g. via eduGAIN), as well as using social identity providers, or other selected external identity providers. Check-in provides an intuitive interface for communities to manage their users and their respective groups, roles and access rights. For communities operating their own group management system, Check-in has a comprehensive list of connectors that allows them to integrate their systems as externally managed Attribute Authorities.
Task	6.1
URL	https://aai.egi.eu/
Service Category	Federated Access Services
Service Catalogue	https://www.egi.eu/services/check-in/ https://marketplace.eosc-portal.eu/services/egi-check-in
Location	https://aai.egi.eu/
Duration	M01-M30
Modality of access	All the services are free at the point of use. The software repositories do not require any registration. The other services require authentication and in some cases registration, using either institutional credentials or personal certificates released by IGTF federation.
Support offered	Technical support is provided via the helpdesk central support team, and by the individual service providers. EGI Outreach activities also include webinars, training, and hands-on sessions during conferences and events.
Operational since	01/01/2018

User definition	1. Individual researchers wanting to use EGI resources and supported Community services 2. Research Communities wanting to use EGI resources 3. Service Providers willing to offer their services/resources enabling the access via Check-in 4. Research Infrastructure wanting to offer their resources to Community supported

2.1.1 Metrics

Metric name	Bas eline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of registered researchers (total)	2,000	Internal	4,769	6,227	7,748	Total: 10175, During Period: 2425	Total: 13963, During Period: 3788	Total: 17747, During Period: 3784
No of logins per month	1,500	Internal	3,870	4,900	4,484	6,050	6,715	6,954
No of countries which researchers access resources	60	Internal	102	105	102	114	119	132
Names of countries which researchers access resources		Internal	Algeria, Angola, Argentina, Armenia, Australia, Austria, Bangladesh, Belarus, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Cambodia, Cameroon, Canada, Chile, China, Colombia, Croatia, Cuba, Czechia, Denmark, Dominica, Dominican Republic, DR Congo, Ecuador,	Algeria, Argentina, Armenia, Australia, Austria, Bahrain, Belarus, Belgium, Bermuda, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czechia, Denmark, Ecuador, Egypt, El Salvador, Estonia, Eswatini, Ethiopia, Finland,	Albania, Algeria, Anguilla, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cuba,	Albania,Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Cameroon, Canada, Cayman Islands, Chile, China, Colombia, Costa Rica,	Albania, Argentina, Australia, Austria, Bahrain, Bangladesh, Belarus, Belgium, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Cabo Verde, Cambodia, Canada, Chad, Chile, China, Colombia, Costa Rica, Croatia, Cuba, Cyprus,	Albania, Algeria, Argentina, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Cabo Verde, Cambodia, Cameroon, Canada, Chile, China, Colombia,

			Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Germany, Ghana, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Ivory Coast, Japan, Jordan, Kenya, Latvia, Lebanon, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, North Macedonia, Norway, Oman, Pakistan, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, Somalia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uzbekistan,	France, Georgia, Germany, Ghana, Greece, Guatemala, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Ivory Coast, Japan, Kazakhstan, Kenya, Latvia, Lebanon, Lithuania, Luxembourg, Malawi, Malaysia, Mauritania, Mexico, Morocco, Mozambique, Nepal, Netherlands, New Caledonia, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Saudi Arabia, Singapore, Slovakia, Slovenia, Somalia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Vietnam, Zambia, Zimbabwe	Cyprus, Czechia, Denmark, DR Congo, Ecuador, Egypt, El Salvador, Estonia, Finland, France, Germany, Ghana, Gibraltar, Greece, Guatemala, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kosovo, Lebanon, Lithuania, Luxembourg, Malaysia, Mauritius, Mexico, Morocco, Nepal, Netherlands, New Caledonia, New Zealand, Nigeria, North Macedonia, Norway, Oman, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Saudi Arabia, Serbia, Singapore, Slovakia,	Croatia, Cuba, Cyprus, Czechia, Denmark, Djibouti, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Georgia, Germany, Ghana, Greece, Greenland, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Ivory Coast, Japan, Kazakhstan, Kenya, Kosovo, Latvia, Lebanon, Lesotho, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Moldova, Montenegro, Morocco, Mozambique, Myanmar, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, North Macedonia, Norway, Oman, Pakistan, Palestine, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Réunion, Saudi Arabia, Senegal, Serbia,	Czechia, Denmark, Ecuador, Egypt, El Salvador, Estonia, Faroe Islands, Finland, France, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Isle of Man, Israel, Italy, Japan, Jersey, Kazakhstan, Kenya, Kosovo, Latvia, Lebanon, Lesotho, Libya, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritius, Mexico, Moldova, Mongolia, Morocco, Namibia, Nepal, Netherlands, Netherlands:, New Zealand, Nigeria, North Macedonia, Norway, Oman, Pakistan, Palestine, Peru, Philippines, Poland, Portugal, Qatar, Réunion, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra	Costa Rica, Croatia, Cuba, Cyprus, Czechia, Denmark, Ecuador, Egypt, Estonia, Finland, France, Georgia, Germany, Ghana, Gibraltar, Greece, Guatemala, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Jordan, Kenya, Kuwait, Latvia, Lebanon, Lesotho, Lithuania, Luxembourg, Madagascar, Malaysia, Malta, Mauritius, Mexico, Moldova, Morocco, Mozambique, Nepal, Netherlands, New Zealand, Niger, Nigeria, North Macedonia, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South

					Venezuela, Vietnam, Zambia			Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Tunisia, Turkey, U.S. Virgin Islands, Ukraine, United Kingdom, United States, Uzbekistan, Venezuela, Vietnam, Yemen, Zimbabwe	Singapore, Slovakia, Slovenia, Somalia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, Vietnam	Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Vietnam, Yemen	Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Vietnam
No of research communities accessing resources	20	Internal	51	63	84		114	119	132	
No of service providers offering resources	80	Internal	121	138	148		159	162	165	

2.1.2 Assessment

The EGI Check-in service offers the main entry point to the whole EOSC Compute Platform. Therefore the operation of the service is crucial for both end users and service providers. During the project, improvements on the service have been implemented in order to ease the interaction with service providers with a new Federation Registry interface[4]. In parallel the service has gone through a complete technological replacement from what concerns the OpenIDConnect(OIDC) Provider, which has been migrated to MitreId to Keycloak[5] to

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[4] https://aai.egi.eu/federation/egi
[5] https://www.keycloak.org/

guarantee better functionalities and evolution to a solution which is becoming a de facto standard. The integration requested also to patch some of the Keycloak components, patches that have been promptly contributed upstream. The migration of the EGI Check-in production OIDC Provider to Keycloak has been completed by September 2022. Development activities continued also in the second part of the project in order to migrate also the SAML based services to Keycloak, activity planned for July 2023.

As reported by the metrics, the number of Service providers integrated reached 165 at M30 with an increase of 105% compared to the previous period: the number includes both new EGI-ACE services (e.g. openRDM, PaaS Orchestrator) which have integrated EGI Check-in during the project, and as well external services (deployed within the EGI Federation or operated by different entities).

The number of communities integrated reached 132 at M30 with an increase of 660% compared to the 15 months previous to the project starts. The estimated target of 18 new communities using the service has already been largely reached. The number of users registered has boosted to 17,747 in M30 with an increase of 887% compared to the same time span of the previous period and consequently the number of logins per month and the countries reached.

In order to promote the service, the EGI Check-in team has also organised Webinars[6] and sessions at EGI Conference 2021, 2022 and 2023. Users[7] and service providers[8] documentations have also been improved.

2.2 EGI - FTS

Description	Service for scheduling and managing data transfers between facilities.
Task	6.2
URL	lcgfts3.gridpp.rl.ac.uk

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[6] https://indico.egi.eu/event/5494/
[7] https://docs.egi.eu/users/aai/check-in/
[8] https://docs.egi.eu/providers/check-in/

Service Category	Federated Access Services
Service Catalogue	https://www.egi.eu/services/data-transfer/ https://marketplace.eosc-portal.eu/services/egi-data-transfer
Location	Rutherford Appleton Laboratory, UK
Duration	M01-M30
Modality of access	Web and command line interfaces. Can be driven by Rucio data management service
Support offered	support/training/documentation can be provided
Operational since	2014
User definition	Primarily for any community that need to manage significant

2.2.1 Metrics

Metric name	Base line	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of Vos using the service(period)	8	internal monitoring, GOCDB	1	4	2	1	2	2
Daily files transferred	200,000	internal monitoring	211	179	732	2,177	3,081	376
Daily data volume (TB)	300	internal monitoring	0.23	0.15	0.23	3	3	0

No of countries where storage endpoints are contacted by FTS	30	internal monitoring, GOCDB	23	23	22	2	2	2

2.2.2 Assessment

The EGI FTS installation hosted at UKRI-STFC has not seen an usage of VOs as predicted at the beginning of the project. The instance is mainly used in conjunction with the EGI - Rucio installation, which uses EGI FTS to orchestrate transfer between storages. The low usage of the service is related to the communities supported during the project, which didn't have high requirements on distributed data management and hence data transfer. The service has been maintained and upgraded to the latest available releases, in particular 3.11 and 3.12 which brought support for Python 3 and OIDC support enhancements . During May 2022 the setup of a new dedicated instance for EGI was completed with the intent to separate WLCG VOs from EGI Communities. The integration of the service with EGI Check-in, an activity which is also planned for Q2 2022, has been finally completed in the last part of the project with the upgrade to version 3.12 as reported. The statistics related to the baseline takes into account the usage of the service by WLCG communities, while the number of VOs reported in the first part of the project exclude them and concentrates only on the VOs which are EGI specific.

To further promote its usage, during 2021 the service was presented during the EGI Conference 2021 within a session related to the EGI-ACE WP6 services and a webinar "Data Management in EGI with Rucio and FTS", part of the EGI Webinar series[9]. In addition, a combined training on FTS and Rucio was held during the EGI Conference 2022.

2.3 EGI – CVMFS

Description	Software and data distribution service

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[9] https://indico.egi.eu/event/5711/

Task	6.2
URL	cvmfs-stratum0.gridpp.rl.ac.uk
Service Category	Federated Access Services
Service Catalogue	https://marketplace.eosc-portal.eu/services/stfc-cvmfs-content-distribution-service
Location	Rutherford Appleton Laboratory, UK
Duration	M01-M30
Modality of access	Software uploaded to Stratum 0 service at RAL - accessed using cvmfs client software installed on compute nodes.
Support offered	support/documentation/training will all be available
Operational since	2016
User definition	Any community that has software (including container images) that they need to run on EOSC resources

2.3.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of active Vos(total)	21	internal accounting, operations portal	22	23	23	24	27	28
No of files used	20,000,000	internal accounting,	22,999,486	26,160,094		29,125,402	32,136,947	34,838,239

		operations portal			26,938,408			
Total space used (TB)	2.3	internal accounting, operations portal	2.35	2,60	2.63	3	3.05	3.2
No of countries supporting VO	23	internal accounting, operations portal	23	23	23	23	23	23
Names of countries supporting VO	India, China, Netherlands, South Africa, Spain, Switzerland, Sweden, Australia,New Zealand, Malta,Finland, Ukraine, Japan, Russia, Check Republic, Slovakia, Italy, UK, Germany, Canada, Portugal, US, Mexico	internal accounting, operations portal	India, China, Netherlands, South Africa, Spain, Switzerland, Sweden, Australia,New Zealand, Malta,Finland, Ukraine, Japan, Russia, Check Republic, Slovakia, Italy, UK, Germany, Canada, Portugal, US, Mexico	India, China, Netherlands, South Africa, Spain, Switzerland, Sweden, Australia,New Zealand, Malta,Finland, Ukraine, Japan, Russia, Check Republic, Slovakia, Italy, UK, Germany, Canada, Portugal, US, Mexico	India, China, Netherlands, South Africa, Spain, Switzerland, Sweden, Australia,New Zealand, Malta,Finland, Ukraine, Japan, Russia, Check Republic, Slovakia, Italy, UK, Germany, Canada, Portugal, US, Mexico	India, China, Netherlands, South Africa, Spain, Switzerland, Sweden, Australia,New Zealand, Malta,Finland, Ukraine, Japan, Russia, Check Republic, Slovakia, Italy, UK, Germany, Canada, Portugal, US, Mexico	India, China, Netherlands, South Africa, Spain, Switzerland, Sweden, Australia,New Zealand, Malta,Finland, Ukraine, Japan, Russia, Check Republic, Slovakia, Italy, UK, Germany, Canada, Portugal, US, Mexico	India, China, Netherlands, South Africa, Spain, Switzerland, Sweden, Australia,New Zealand, Malta,Finland, Ukraine, Japan, Russia, Check Republic, Slovakia, Italy, UK, Germany, Canada, Portugal, US, Mexico

2.3.2 Assessment

The EGI CVMFS installation hosted at UKRI-STFC has seen an increase of usage from existing VOs, and new repositories from new Communities (SeaDataNet , EISCAT-3D, interTwin, etc) have been added during the project. In accordance the number of files and space used has increased (+74% and +39% respectively), with the new VOs covering the same geographical regions. The project estimation for this installation was to serve 8 new communities over 30 months, so the final result of 7 is quite inline with what has been

planned. The baseline for the metric about the number of active VOs has been revisited, as that number was incorrectly calculated during the project proposal preparation. The correct value (21) has been fixed with a project amendment.

The service initially has been migrated to a new hardware in order to improve the performances of publication and onboarded on the EOSC Portal[10] by M12. The documentation for end users has been included as planned in the EGI docs repository[11]. The service provider has been active in promoting the service, in particular during the EGI Conference 2021 and 2022.

In Q4 2021 and Q1 2022, the service integration with EGI Check-in was designed and the implementation started. The integration was completed at the end of 2022 and for access to the CVMFS publisher node switched to EGI Check-in identities during the first months of 2023.

2.4 EGI - Rucio

Description	Service for managing large scale data in a distributed environment
Task	6.2
URL	rucio-server.gridpp.rl.ac.uk
Service Category	Federated Access Services
Service Catalogue	https://marketplace.eosc-portal.eu/services/scd-stfc-rucio-data-management-service?q=STFC+Rucio+Data+Management+Service
Location	Rutherford Appleton Laboratory, UK
Duration	M01-M30

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[10] https://marketplace.eosc-portal.eu/services/stfc-cvmfs-content-distribution-service
[11] https://docs.egi.eu/users/compute/content-distribution/

Modality of access	CLI, Python API, Partially via web browser		
Support offered	Documentation and support will be provided. Training can be accessed through the community workshops.		
Operational since	April 2018		
User definition	Small to Medium Communities. Users that need to manage up to 10PB of data across multiple sites.		

2.4.1 Metrics

Metric name	Base line	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of VOs supported (total)	2	internal accounting, GOCDB	3	3	3	3	3	3
No of file used	10,00 0	internal accounting, GOCDB	14,621	98,762	223,670	199,218	36,563	33,422
Total space used (TB)	10	internal accounting, GOCDB	3.3	4.33	8	11	4	32
No of countries providing Rucio	3	internal accounting, GOCDB	3	3	3	3	3	3
Names of countries providing Rucio	UK, South Africa, Austra lia	internal accounting, GOCDB	UK, SouthAfrica, Australia	UK, SouthAfrica, Australia	UK, SouthAfrica, Australia	UK, SouthAfrica, Australia	UK, SouthAfrica, Australia	UK, SouthAfrica, Australia

2.4.2 Assessment

EGI Rucio is one of the services brought to EGI and EOSC with the start of the EGI-ACE project. Therefore, during the first period of the project, an activity to integrate the service with the EGI core services started. In particular the integration with EGI Helpdesk, the GOCDB for topology information and the ARGO service for monitoring. The service has then been successfully onboarded on the EOSC portal[12] since M12. During the project the service has been maintained and updated to the major and minor releases available upstream. The integration with the EGI Check-in service started, with the aim to be completed by M12 although, due to the low maturity of the Rucio OIDC integration, the integration has been slowed down and completed only in the last period of the project. Lastly the documentation for end users and service providers is now available in the EGI documentation repository[13].

The service has been presented at the EGI Conference 2021 as previously reported with a session related to the EGI-ACE WP6 services and as well during the webinar "Data Management in EGI with Rucio and FTS", part of the EGI Webinar series[14]. A training on Rucio and FTS has been done for the EGI conference 2022 to attract more usage of the service.

Three communities have been piloting the integration with Rucio, namely SKA, Gridpp and GAIA (LatticeQCD). In the latter case the piloting was done using the dteam VO. The service provider has given support for the exploitation of the service which, according to the estimation, should have been used by 3 new communities by the end of the project. Despite the trainings and webinars effort, only one new community has used the service for piloting activities (GAIA) since the beginning of the project. The main reason for the lower usage of the service has to be found in the need for distributed data management which was not one of the main requirements of the communities accessing the EOSC Compute Platform.

2.5 EGI - Onedata

Description	Integrated platform for distributed data management

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[12] https://marketplace.eosc-portal.eu/services/scd-stfc-rucio-data-management-service
[13] https://docs.egi.eu/users/data/management/rucio/
[14] https://indico.egi.eu/event/5711/

Task	6.2
URL	https://datahub.egi.eu
Service Category	Federated Access Services
Service Catalogue	https://www.egi.eu/services/datahub/ https://marketplace.eosc-portal.eu/services/egi-datahub
Location	Poland
Duration	M01-M30
Modality of access	Free Access for users who can authenticate using EGI Check-in
Support offered	Training, documentation based practises and direct support for the integrated larger users
Operational since	2018
User definition	We are dealing with communities or group of users which might be treated as a small community

2.5.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of communities (VOs) integrated (total)	6	Checkin, internal accounting, GOCDB	5	6	10	13	15	17

Total storage supported (TB)	100	Checkin, internal accounting, GOCDB	100	101	105	114	128	1,130
No of countries with OneProvider installed	7	Checkin, internal accounting, GOCDB	7	7	7	8	8	8
Names of countries with OneProvider installed	Poland, Portugal, France, Spain, UK, Italy, Czech Republic	Checkin, internal accounting, GOCDB	Poland, Turkey, France, Spain, UK, Italy, Czech Republic	Poland, Turkey, France, Spain, UK, Italy, Czech Republic	Poland, Turkey, France, Spain, UK, Italy, Czech Republic	Poland, Turkey, France, Spain, UK, Italy, Czech Republic, Hungary	Poland, Turkey, France, Spain, UK, Italy, Czech Republic, Hungary	Poland, Turkey, France, Spain, UK, Italy, Czech Republic, Hungary

2.5.2 Assessment

The EGI Onedata service usage has increased during the project execution, with the integration of 11 new communities (Fusion, LABPLas, LETHE, Reliance, DIGITBrain to name a few) and also the installation of providers in new countries (Turkey and Hungary) and on already covered countries (Czech Republic, France , Poland and Italy). One of the providers, initially configured in Portugal, is no longer available and one community is no longer served (SeaDataNet). With the use cases supported till the end of the project, the estimated 10 new user communities have been reached. In addition, in the last period of the project a community (CEITEC CryoEM) has brought quite some capacity by installing dedicated Oneproviders, pushing the managed capacity of the service to 1.1 PB.

Lastly, the integration with the EGI Accounting system has started and on Q4 2022 a fist version of the accounting probes have been released. The integration with WP4 services (Notebooks and Binder) has been completed during 2021, allowing further exploitation of

the services combination (e.g. the Reliance project[15] is using both EGI Notebooks and the EGI Onedata so as to share data between notebooks users).

The installation, both the central component and the distributed providers, has been maintained and upgraded during the project to minor releases available upstream, which brought enhancements and bug fixes. In the last period of the project a new Major release has been brought to production, which included a lot of new functionalities like Directory accounting, Datasets Marketplace, Support for Archives and Workflow executions.

As for other installations, the service has been promoted at the EGI Conference 2021 and dedicated training sessions have been organised at EGI Conference 2022 and 2023.

2.6 MasterPortal (EGI - Check-in)

Description	Token translation and credential management services to access EGI services and resources that use PKIX, SSH, and OpenID credentials with federated login
Task	6.1
URL	https://aai.egi.eu/mp-oa2-server/register
Service Category	Federated Access Services
Service Catalogue	Supplied as component of https://www.egi.eu/services/check-in/
Location	https://aai.egi.eu/mp-oa2-server/
Duration	M01-M30

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[15] https://www.reliance-project.eu/

Modality of access	All the services are free at the point of use. Services require authentication and community portals require registration, using either institutional credentials or personal certificates released by IGTF federation.
Support offered	Technical support is provided via the helpdesk central support team, and on-line documentation. EGI Outreach activities include also webinars, trainings, and hands-on sessions during conferences and events
Operational since	01/01/2018
User definition	1. Individual researchers able to access the MasterPortal service 2. Research Community portals connected to the MasterPortal component

2.6.1 Metrics

Metric name	Bas eline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of researchers	37	Internal	10	6	5	8	6	4
No of user credentials deposited/month	20	Internal	0.4	2.6	2	3	8	4
No of countries which researchers access resources	n/a	Internal	n/a	n/a	n/a	5	3	3
Names of countries where researchers access resources	n/a	Internal	n/a	n/a	n/a	Greece, Netherlands, US, Czech	Greece, Netherlands, Switzerland	Netherlands, Greece, Germany

No of research community portals connected	5	Internal	7	7	7	7	7	7

2.6.2 Assessment

The MasterPortal installation is linked with the EGI Check-in installation as the service enables token translation and credentials management. The number of users during the project has been quite stable and 2 new research community portals connected since the beginning of the project. The estimated number of new user communities at the end of the project is 5, so the target has not been reached.

The usage of the service could be increased by lifting some security policy constraints. The RCauth[16] CA which is used by MasterPortal to generate short lived certificates, could be used only via Identity Providers which adheres to the SIRTFI[17] framework, which are a subset of the available Identity Providers. The possibility to access the service as well via Identity Providers not compliant with SIRTFI has not been accepted during the project lifetime by the EGI Security Policy Group[18], as EGI Check-in could provide an equivalent of SIRTFI for those users and thus allowing a broader usage of the service.

2.7 PaaS Orchestrator

Description	The PaaS Orchestrator service allows the users to deploy virtualized computing infrastructures with complex topologies (such as clusters of virtual machines or applications packaged as Docker containers) using standardised interfaces based on REST APIs and adopting the TOSCA (Topology and Orchestration Specification for Cloud Applications) templating language for the description of Cloud-based applications. The PaaS Orchestrator features advanced federation and scheduling capabilities ensuring the transparent access to the different IaaS back-ends including on-premises Cloud Management Frameworks such as OpenStack and OpenNebula, public Cloud providers such as Amazon Web Services and Microsoft Azure and, finally, Container Orchestration Platforms such as Apache Mesos

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[16] https://rcauth.eu/
[17] https://refeds.org/sirtfi
[18] https://confluence.egi.eu/display/EGIBG/SPG

	and Kubernetes. The selection of the best cloud provider to fulfil the user request is performed considering criteria like the user's SLAs, the services availability and the data location. The service comes with a set of application/service topologies ready-to-use that can be deployed through a user-friendly web interface.
Task	6.3
URL	https://indigo-paas.cloud.ba.infn.it/
Service Category	Federated Access Services
Service Catalogue	https://marketplace.eosc-portal.eu/services/paas-orchestrator
Location	INFN-Bari
Duration	M01-M30
Modality of access	Free at the point of use
Support offered	INFN team will provide both live support and online documentation to all the users and communities willing to leverage this service for their workloads. Links to documentation: https://indigo-dc.gitbook.io/indigo-paas-orchestrator/ https://indigo-dc.github.io/orchestrator/restdocs/
Operational since	2019
User definition	Researcher, Small communities, big communities and resources providers, and developers willing to implement new services

2.7.1 Metrics

Metric name	Base line	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of users	20	Service internal DB	1	1	1	5	3	n/a
No of communities	3	Service internal DB	1	1	1	2	4	n/a
No of services deployed/year	15	Service internal DB	1	3	47	11	123	n/a
No of countries with services deployed	2	Service internal DB	1	1	1	1	4	n/a
Names of countries with services deployed	Italy, Spain	Service internal DB	Italy	Italy	Italy	Italy	Italy, Portugal, Czech Republic, Slovakia	n/a

2.7.2 Assessment

During the first period of the project the integration of the PaaS Orchestrator service with the EGI core services has started. In particular, the integration with EGI Helpdesk, the GOCDB for topology information and the EGI Check-in has been completed successfully. The Integration with ARGO Monitoring has started and completed by Q2 2022. g. For what concerns its usage, the service has been selected by the SeaDataNet WebODV Data Space for integration, in order to deploy transparently private instances of the data analysis software on IAAS Cloud enhanced with private workspaces. The installation support effort in the first part of the project has been mainly dedicated to this use case which required the configuration of the TOSCA templates for the deployment of the service, with several iterations with the Data Space team to optimise the deployment and the integration of the PaaS Orchestrator REST API with the Data Space portal. During the second part of the project, the usage increased due to users and communities from the C-SCale project. The project expected for the installation 350 deployments per year, which has been almost reached in the second part of the project also thanks to an activity of promoting the service to new communities and the SeaDataNet WebODV Data Space registration in EOSC which happened at M20. The service installation was affected by a cloud outage right at the end of the project, and unfortunately the logs of the service used to calculate the metrics got lost. The communities and users did noy increase compared to the previous period, so the services deployed have been considered to be more or less the same.

In particular, for the promotion of the service, a talk[19] has been given at the EGI Conference 2021 together with a Webinar[20] part of the EGI Webinar series in 2021. A session at EGI Conference 2022 and as well a demo at EGI conference 2023 were held.

2.8 PERUN

Description	System which manages user identities and access to the resources.
Task	6.1
URL	http://perun.egi.eu/
Service Category	Federated Access Services
Service Catalogue	Supplied as component of https://www.egi.eu/services/check-in/
Location	CESNET, Czech Republic
Duration	M01-M30
Modality of access	Federated login
Support offered	Support is available during office hours. Training is provided on request and documentation is available at htts://perun-aai.org
Operational since	2012

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[19] https://indico.egi.eu/event/5464/contributions/15635/
[20] https://indico.egi.eu/event/5720/

User definition	Small and big communities

2.8.1 Metrics

Metric name	Base line	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of registered users	1,600	Internal	573	555	577	593	618	644
No of processed user support requests/year	100	Internal	10	14	7	2	11	8
No of countries reach	N/A	Internal	N/A	N/A	N/A	N/A	N/A	N/A
Names of countries reach	N/A	Internal	N/A	N/A	N/A	N/A	N/A	N/A
No of small supported communities (<100)	10	Internal	15	15	17	19	26	23
No of big supported communities (>100)	2	Internal	2	2	2	2	2	2

2.8.2 Assessment

The PERUN installation is linked with the EGI Check-in installation as the service is one of the possible components in EGI Check-in implementing group management. During the project, the service has been maintained and new releases brought to production including

enhancements requested by communities. It has been decided to deploy an instance dedicated for EGI communities to separate it from what CESNET is delivering locally. The deployment of the new instance has been completed by M30.

Documentation has been prepared in order to be integrated in the EGI document repository[21]. In terms of users, new communities have been supported since the beginning of the project, in particular the EGI-ACE Early Adopter EISCAT-3D together with 5 communities (waterwatch.c-scale.eu, terrascope.c-scale.eu, return.c-scale.eu, HighResLandSurf.c-scale.eu, aquamonitor.c-scale.eu) from the C-SCALE project[22] and users from the PITHIA-NRF project[23]. The estimated number of new users for the installation at the end of the project was 650, which has been reached with 644 new users since the beginning of the project..

For the promotion of the service, talks have been given at the EGI Conferences 2021, 2022 and 2023.

2.9 EC3

Description	The EC3 dashboard is a service that enables users from the EGI Access Virtual Organization to deploy self-managed clusters in the resources of EGI Cloud Compute that supports this VO. The clusters are enlarged and shrinked automatically depending on the workload. The dashboard uses publicly available recipes that support SLURM, TORQUE, Apache Mesos and Kubernetes clusters, among others.
Task	6.3
URL	https://servproject.i3m.upv.es/ec3/
Service Category	Federated Access Services
Service Catalogue	https://marketplace.eosc-portal.eu/services/elastic-cloud-compute-cluster-ec3

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[21] https://docs.egi.eu/users/aai/check-in/vos/perun/
[22] https://c-scale.eu/
[23] https://pithia-nrf.eu/

Location	The service is located in the premises of the GRyCAP (High Performance and Grid Computing Group) of the Institute of Instrumentation for Molecular Imaging of the Universitat Politècnica de València.
Duration	M01-M30
Modality of access	Access is freely available to users provided of valid EGI check-in credentials and membership to the EGI Access VO
Support offered	- Documentation: https://docs.egi.eu/users/compute/orchestration/ec3/ - Sample videos: https://www.youtube.com/channel/UCQD6RJBs57Giz4Xm8dhDczQ - Source repository including the recipes: https://github.com/grycap/ec3/tree/master/templates
Operational since	April 2017
User definition	Typically we are serving Long Tail of Science Users, although the service could be applied to other communities. It is only limited by the VO capacity and policy. During the project, it will be offered to any Virtual Organization, extending notably the variety of users.

2.9.1 Metrics

Metric name	Base line	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of active users/quarter	20	Internal logs / Google analytics	20	9	12	17	6	12
No of clusters deployments/quarter	60	Internal logs / Google analytics	21	6	1	198	133	126
No of countries of precedence of users	3	Check-in / Google analytics	8	5	7	7	7	4
Names of countries	N/A	Check-in / Google analytics	Spain, Italy,	Spain, Italy,		Spain, Greece,	Spain, Portugal,	Spain,

of precedence of users			Netherlands, Germany, Poland, Slovakia, Sweden, United Kingdom	Netherlands, Greece, United Kingdom.	Spain, South Africa, Finland, Indonesia, Poland, Thailand, United Kingdom	Italy, Austria, Netherlands, Romania, Switzerland	Croatia, France, Netherlands, United Kingdom, United States	Netherlands, France, Italy

2.9.2 Assessment

The EC3 installation has been maintained and enhanced during the project together with the maintenance and upgrade of the recipes for deployment. In addition, some activities to complete the integration in the EGI ecosystem have been performed, like the integration with ARGO Monitoring that was missing prior to the project. An enhanced documentation for end users is now available on the EGI Documentation repository[24]. As far as usage by user communities, the service has been integrated by the ENES Data Space first to automatically deploy SLURM clusters, then to automatically install and scale Kubernetes clusters. During the project the service has also been requested by 3 applicants from the project Open call, and support has been given for the deployment of the SLURM and Kubernetes autoscaling clusters.

The project estimation for the usage of the services was 320 cluster deployments per year. The data shown in the metrics depicts for the first half of the project only the deployments made with the EC3 web portal. Deployments made using the EC3 command line client could not be measured since they access the Infrastructure Manager (IM, WP3) service for the deployment of cloud resources directly. At the IM level, it was not possible to distinguish the application that creates the infrastructure, so we could not know how many clusters have been launched in this way (e.g. ENES Data Space uses the command line tool). This situation has been fixed in the second half of the project as shown in the numbers. For this reason the metrics values for the first half of the project are rather low (22 deployment per year), while in the second half with the accounting fixed, it reached 304 deployments per year. We are confident that with the correct

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accounting in place also for the first period of the project, the target deployments per year should have been almost reached also during that period.

For the promotion of the service during the first project period, a talk[25] has been given at the EGI Conference 2021 as well as presentations at the EGI Conferences 2022 and 2023.

2.10   openRDM

Description	Research Data Management service
Task	6.2
URL	https://openbis-egi-ace.openrdm.eu
Service Category	Federated Access Services
Service Catalogue	https://marketplace.eosc-portal.eu/services/openrdm-eu
Location	CH
Duration	M01-M30
Modality of access	Web interfaces
Support offered	1st level support on the central installation. Training for end-users and for administrators. Support for an on-premise deployment.
Operational since	beginning 2019 on CH switchengine infrastructure

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[25] https://indico.egi.eu/event/5464/contributions/15797/

User definition	Experimental laboratories, biology-related facilities, single research groups

2.10.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15	Period 4 M16-M20	Period 5 M21-M25	Period 6 M26-M30
No of deployments	0	internal accounting, GOCDB	1	1	9	9	9	9
No of users/lab	7-10	internal accounting, GOCDB	n/a	n/a	n/a	n/a	n/a	n/a
No of research laboratories	4	internal accounting, GOCDB	4	5	9	9	9	9
Access to imported data	0	internal accounting, GOCDB	n/a	n/a	n/a	n/a	n/a	n/a
No of countries where the services is deployed	2	internal accounting, GOCDB	1	1	1	1	1	1
Names of countries where the services is deployed	Switzerland, Germany	internal accounting, GOCDB	Germany	Germany	Germany	Germany	Germany	Germany

2.10.2 Assessment

openRDM is one of the new services brought to EGI and EOSC with the start of the EGI-ACE project. The service offering comprises a demo or preview instance that has been deployed at EGI cloud (DESY-CC) and in parallel integrated with the EGI core services. In

particular the integration with EGI Helpdesk, the GOCDB for topology information and the ARGO service for monitoring. The service has then been successfully onboarded on the EOSC Portal[26] since M9. Integration with EGI Check-in also started and completed by M12.

The main offering of the service is the support for in-house installation and data model customization, which has started and continued during the reference period. A number of institutions have been supported, reaching 9 at project mid-term which have been supported till the end of the project. The number quite matches the 10 initially defined as an estimation for the end of the project. The totality of the organisations are based in Germany.

The metrics reported in the table above refers to both service offerings. In particular, the forth, fifth and sixth metrics refer to the instance deployed on the EGI Cloud, while the first 3 refer to the supported in house installations.

For what concerns the promotion of the service, it has been promoted during the previously mentioned EGI Conference 2021 session on Federated Data access services, but also participation to EGI Conference 2022 and 2023 with talks and demos. A webinar[27] part of the EGI Webinar series has also been held in Q1 2022.

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[26] https://marketplace.eosc-portal.eu/services/openrdm-eu
[27] https://indico.egi.eu/event/5753/

3 Dissemination

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In this section we report the list of events in the context of EGI-ACE WP6 organised during the projects, some of them also mentioned previously, reporting the number of attendees to measure the possible user interests.

Table 2: Dissemination activities related to WP6 installations

Type of Activity	Title	Date	Name of Event	Location	Type of Audience	Reach	Scale
Workshop	EGI Checkin user enrollment workflow	2021/05/10	EISCAT_3D access WS	Online	Developers, admins, users	15	European
Presentation	EGI Multi-VO Rucio	2021/09/30	4th Rucio Community Workshop	Online	Developers, service admins, users	110	Worldwide
Workshop	EGI-ACE Federated data access services	2021/10/21	EGI Conference 2021	Online	IT providers, Research Community reps.	40	Global (mostly European)

Presentation	Deploying virtual elastic clusters on the EGI Cloud Compute	2021/10/20	EGI Conference 2021	Online	IT providers, Research Community reps.	40	Global (mostly European)
Presentation	Data storage on the EOSC platform	2022/02/01	EOSC Future Ask me anything session on Data Storage	Online	IT providers, Research Community reps.	130	European
Webinar	openRDM	2022/01/12	EGI Webinar 2022	Online	Scientific communities Developers, integrators and end users	Num. of Participants: 20 Num. of Countries: 9	worldwide
Webinar	Data Management in EGI with Rucio and FTS	2021/10/06	EGI Webinar 2021	Online	Scientific communities, developers, integrators and end users	Num. of Participants: 50 Num. of Countries: 17	worldwide

Webinar	How to orchestrate services in the EOSC Compute Platform with the INDIGO PaaS	2021/10/27	EGI Webinar 2021	Online	Scientific communities, developers, integrators and end users	Num. of Participants: 33 Num. of Countries: 8	worldwide
Webinar	Providing controlled access to distributed resources and services with EGI Check-in: the provider perspective	2021/05/05	EGI Webinar 2021	Online	Scientific communities and IT-service providers who operate IdP for them.	Num. of Registrations: 43 Num. of Participants: 35 (81.39%) Num. of Countries: 13	worldwide
Webinar	Access and analyze data from the EGI DataHub with Jupyter notebooks and	2021/05/12	EGI Webinar 2021	Online	Scientific communities and IT-service providers who support research and	Num. of Registrations: 39 Num. of Participants: 27 (69.23%)	worldwide

	MATLAB				education	Num. of Countries: 10	
Training	Training: Federating and serving distributed data for computational users with EGI DataHub	2022/09/22	EGI Conference 2022	Prague, Czech Republic	Researchers, Scientists	10	Europe
Training	Data management with FTS and RUCIO	2022/09/22	EGI Conference 2022	Prague, Czech Republic	Researchers, Scientists	10	Europe
Presentation + demo	Introduction and demo of openBIS	2022/12/08	NFDI-MatWerk event on Electronic Lab Notebooks	Online	Researchers, Scientists	170	Germany

4 Satisfaction

In this chapter we report the satisfaction on the WP6 installations as reported by EGI Customers interviews and the number of service orders coming from the EOSC Portal Marketplace.

4.1 EOSC Marketplace orders

For the services that have been registered on the EOSC Portal, we report here the statistics of the orders during the first 15 months of the project. The following information should be considered when interpreting the numbers:

- PERUN and MasterPortal installations are part of the EGI Check-in service in EOSC Marketplace as subcomponents, so it is not possible to have separate statistics for them.
- EGI CVMFS and EGI Rucio installations have been onboarded on the EOSC Portal in December 2021.
- openRDM installation has been onboarded in the EOSC Portal Marketplace in June 2021.

Table 3: Number of Service Orders from the EOSC Portal Marketplace related to WP6 installations

WP6 installation	Number of orders
EGI Check-in	19
EGI Onedata	5
EGI FTS	4

openRDM	3
EGI Rucio	1
Orchestrator	1

4.2 EGI Customer satisfaction reviews

EGI is regularly interviewing the Communities using the services with an active Service Level Agreement (SLA), in order to measure the satisfaction level, collect suggestions for improvement, and discuss possible issues. The level of satisfaction is measured from 1 (min) to 5 (max)

The communities using EGI-ACE WP6 services interviewed are reported in Table 4. In case of more than one interview with the community during the project lifetime, only the latest interview is reported.

Table 4: Communities interviewed during the EGI-ACE project

Community	WP6 installations used	Level of satisfactions and comments	Issues reported with WP6 installations
ECRIN-ERIC	EGI Onedata EGI Check-in	5. Very satisfied Good technical support received from the provider/shepherd via the Helpdesk	n/a

D4Science	EGI Check-in	5. Very Satisfied	n/a
EMPHASIS	EGI Check-in EGI Onedata	4. Satisfied. Good technical support offered by EGI to the customer. As soon as the EGI services matching the EMPHASIS requirements were identified the activity started smoothly.	n/a
EISCAT-3D	EGI Check-in PERUN EGI CVMFS	5. Very Satisfied	n/a
C-SCALE	PERUN EGI-Check-in Orchestrator	4. Satisfied	Configuration changes in PERUN should be better handled/communicated to avoid service disruption to end users (e.g. not being able to log into OpenStack Horizon dashboard).

Biomed	EGI Check-in, EGI CVMFS	5: Very satisfied People are active and helpful but there is room for improvement	n/a
WenMR	EGI Check-in EGI Onedata	5. Very Satisfied	n/a
NBIS	EGI Check-in PERUN	5. Very Satisfied	n/a
AiiDALab	EGI Check-in	4: Satisfied	EGI Check-in UX is not the best
VESPA EAP Use Case	EGI Check-in	5. Very Satisfied	n/a
ENES	EGI Onedata, EGI Check-in, EC3	4: Satisfied	Complex legal framework that makes it hard to reach agreement for integration with Check-in, this has an impact at the end on the service delivered.

PeachNote	EGI Check-in	4: Satisfied	n/a
Clarin	EGI Check-in	5. Very Satisfied	n/a
DigitBrain	EGI Onedata, EGI Check-in	5. Very Satisfied	n/a
OBSEA	EGI Check-in	5. Very Satisfied	n/a
EOSC Synergy	EGI Check-in	4: Satisfied	n/a
Perovskite material studies	EGI Check-in	5. Very Satisfied	n/a
Terradue	EGi Check-in	3: Somewhat satisfied	The customer had not time to full exploit the resources allocated by EGI, in particular due to dependencies of the original business case with the EGI Check-in (API automation)

Belle-II	EGi Check-in	5. Very Satisfied	n/a
Cos4Cloud	EGI Check-in	4: Satisfied	n/a
Fusion	EGI Check-in, EGI Onedata	3: Somewhat satisfied	DataHub: Issues reported by users with oneclient mount got stale after weeks/ a month EGI Check-in: The service is great, but in the new version of the Federation Registry the management of the configuration for development and demo instances should be more straightforward. In the previous version it was easier
NBIS	EGI Check-in	4: Satisfied	n/a
EMSO-ERIC	EGI Check-in	4: Satisfied	n/a

openBioMaps	EGI Check-in	5. Very Satisfied	n/a
CEITEC CryoEM	EGI Onedata	4: Satisfied	n/a

Appendix A

Table 5: Communities integration matrix with EGI-ACE WP6 installations.

Community type	Community supported	EC3	EGI - CVMFS	EGI - FTS	EGI - Onedata	EGI - Rucio	OpenRDM-EGI	Orchestrator	PERUN
WP5	ENES	X			X				
	PROMINENCE				X				
	SeaDataNet		X					X	
	VIP		X						
	WeNMR		X						
New	Deltares	X							
	interTwin		X						
	C-Scale							X	X
	PITHIA -NFR				X				X
	Openscreen ERIC				X				
	CEITEC CryoEM				X				
	AI4PublicPolicy				X				
	DECIDO				X				

	Regreen				X				
	Eureka 3d				X				
	LETHE				X				
	BAM Pilot						X		
	BfR Germany						X		
	FAU						X		
	Fraunhofer IWB						X		
	HMGU						X		
	OpenRDM						X		
	PTB						X		
	Reliance				X				
	RICN						X		
	SAPS	X							
	Simtech						X		
	LABPLAS				X				
	DIGITBrain				X				
Thematic	CHIPSTER		X						
	COMET		X						
	EMPHASIS				X				
	ERIC-CLL								X

	EXTRAS-FP7		X						
	GLAST		X						
	GRIDPP		X	X		X			
	KM3NET		X						
	LAGO				X				
	MICE		X	X					
	NA62		X	X					
	NEUGRID		X						
	PHENO		X						
	PRIMAGE				X				
	Protein pK	X							
	SKA					X			
	SOLID EXPERIMENT		X						
	SUPER- NEMO		X						
	T2K		X						
WP2	EISCAT-3D		X						X
	Terradue(NextGeoss pilots)								X