D6.3 Periodical assessment of Federated access services

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

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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 M15 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 first project period, which lasted 15 month long, with three times data collection: M01-M05, M06-M10 and M11-M15.

During the first fifteen months of activity, 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 2 (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 85 Virtual Organizations in the 1st period, resulting in a 340% 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 148 service providers and 7,748 users, a 420% and 387% increase in 15 months.
- EGI FTS didn't see so far, an increase of users communities during the project, (4 VOs using the service in the M06-M10 period). There is a new use case in the pipeline that is expected to improve this in the second period.
- EGI CVFMS has been used by 2 new communities, with the number of hosted files and storage occupied increased by 26% and 23 % respectively.
- EGI Rucio onboarded 1 new community using the service since the project starting date.
- EGI Onedata has been integrated into 5 new community use cases, with new providers installed in Turkey, France, Poland and Czech Republic.
- Master Portal has been integrated by 2 new portals.
- Orchestrator has been integrated by 1 community representing an EGI Data Space (SeaDataNet WebODV Data Analysis), reaching 47 deployments in the M11-M15 period.
- PERUN is now used by 577 new users.
- EC3 has been used both by WP5 Data Spaces installations and use case applications, with an average of 22 deployments orchestrated per year.
- openRDM has been deployed in EGI cloud and support to 9 research institutes has been given for their on-premises installations.

The missing installations not yet onboarded in the EOSC Portal have all completed the process by M12 (EGI Rucio, EGI CVMFS, openRDM).

To promote the uptake of new and existing WP6 installations, beside the Webinar programme[1] organized by the project, dedicated sessions have been organized at the EGI

[1] https://www.egi.eu/webinars/

Conference 2021[2] where each installation representative has presented their services and the work during the first part of the project. These activities, as reported in Section 3, played an important role in extending the user base in Europe as demonstrated by the metrics reported during the three periods of observations.

Additional dissemination activities will be organized during the second part of the project, focusing on those services that are below the expected level of usage so far: EGI Rucio, Master Portal, EGI FTS and Orchestrator.

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 4.53 out of 5[3] during the reference period.

[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	ONGOING	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
EGI CVMFS	ONGOING	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
EGI Rucio	ONGOING	DONE	DONE	DONE	ONGOING
EGI Onedata	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	ONGOING
MasterPortal (EGI Check-in)	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
Orchestrator	DONE	ONGOING	ONGOING	DONE	ONGOING
PERUN	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	pre EGI-ACE	n/a
EC3	pre EGI-ACE	DONE	DONE	DONE	ONGOING
openRDM	DONE	DONE	DONE	DONE	n/a

- Planned integration activities within the first 15 months of the project have not been completed between Check-in and CVMFS, FTS, and Rucio. The planned completion date of these activities is foreseen for Q2/Q3 2022.
- Planned integration activities of EGI Rucio, EGI Onedata, Orchestrator and EC3 with the EGI Accounting service did not complete in the first period of the project and are foreseen for Q3 2022.

1.2 Communities

Table 2 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 at the moment it serves individual researchers not linked to specific communities.

Table 2 - 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			X	
	VIP		X						
	WeNMR		X						
New	Deltares	X							
	C-Scale								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		
Thematic	CHIPSTER		X						
	COMET		X						
	DIGITBrain				X				
	EMPHASIS				X				
	ERIC-CLL								X
	EXTRAS-FP7		X						
	GLAST		X						
	GRIDPP		X	X		X			
	KM3NET		X						
	LAGO				X				
	LAPBLAS				X				

	MICE		X	X					
	NA62		X	X					
	NEUGRID		X						
	PaNOSC				X				
	PHENO		X						
	PRIMAGE				X				
	Protein pK	X							
	SKA					X			
	SOLIDEXPERIMENT		X						
	SUPER-NEMO		X						
	T2K		X						
WP2	EISCAT-3D		X						X
	Terradue (NextGeoss pilots)								X

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	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of registered researchers (total)	2,000	Internal	4,769	6,227	7,748
No of logins per month	1,500	Internal	3,870	4,900	4,484
No of countries which researchers access resources	60	Internal	102	105	102
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,	Algeria, Argentina, Armenia, Australia, Austria, Bahrain, Belarus, Belgium, Bermuda, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica,	Albania, Algeria, Anguilla, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bosnia and Herzegovina, Brazil,

			Canada, Chile, China, Colombia, Croatia, Cuba, Czechia, Denmark, Dominica, Dominican Republic, DR Congo, Ecuador, 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, Venezuela, Vietnam, Zambia	Croatia, Cyprus, Czechia, Denmark, Ecuador, Egypt, El Salvador, Estonia, Eswatini, Ethiopia, Finland, 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	Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cuba, 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, 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
No of research communities accessing resources	20	Internal	51	63	84
No of service providers offering resources	80	Internal	121	138	148

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 reference period, 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 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 is planned for May 2022.

As reported by the metrics, the number of Service providers integrated reached 148 at M15 with an increase of 420% 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 first period of the project, and as well external services (deployed within the EGI Federation or operated by different entities).

The number of communities integrated reached 84 at M15 with an increase of 340% 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

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

has boosted to 7,748 in M15 with an increase of 387% 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 a Webinar[6] and sessions at EGI Conference 2021. Users[7] and service providers[8] documentations have also been improved. A dedicated session on AAI is also planned for the EGI Conference 2022.

2.2 EGI - FTS

Description	Service for scheduling and managing data transfers between facilities.
Task	6.2
URL	
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

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

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	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of Vos using the service(period)	8	internal monitoring, GOCDB	1	4	2
Daily files transferred	200,000	internal monitoring	211	179	732
Daily data volume (TB)	300	internal monitoring	0.23	0.15	0.23
No of countries where storage endpoints are contacted by FTS	30	internal monitoring, GOCDB	23	23	22

2.2.2 Assessment

The EGI FTS installation hosted at UKRI-STFC has not seen a 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 service currently hosted at UKRI-STFC has been maintained and upgraded to the latest available releases, in particular the latest release (3.11). During May 2022 the setup of a new dedicated instance for EGI will be completed with the intent of migrating the EGI Communities there. The latest release also contains fixes and enhancements to better integrate the service with EGI Check-in, an activity which is also planned for Q2 2022. The statistics related to the baseline takes into account the usage of the service by WLCG communities, while the number of VOs reported exclude them and concentrates only on the VOs which are EGI specific.

To further promote its usage the service is also planned to be used as pilot Data Transfer service in the EOSC Future project, which should increase the uptake and reach the 6 new user communities as initially planned during the 30 months of the project. During 2021 the service was promoted 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]. A training on data service is planned for the EGI Conference 2022, which is also going to include FTS training.

2.3 EGI – CVMFS

Description	Software and data distribution service
Task	6.2
URL	
Service Category	Federated Access Services

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

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
No of active Vos(total)	8	internal accounting, operations portal	22	23	23
No of files used	20,000,000	internal accounting, operations portal	22,999,486	26,160,094	26,938,408
Total space used (TB)	2	internal accounting, operations portal	2.35	2,60	2.63

No of countries supporting VO	23	internal accounting, operations portal	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

2.3.2 Assessment

The EGI CVMFS installation hosted at UKRI-STFC has seen an increase of usage from existing VOs, and new ones (SeaDataNet and EISCAT-3D) have been added during the reference period. In accordance the number of files and space used has increased (+26% and +23% respectively), with the new VOs covering the same geographical regions. The project estimates that this installation will serve 8 new communities over 30 months, so the final projection is slightly less than originally planned. More dissemination activities are going to be planned on the second part of the project in order to raise the uptake of the service.

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

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

has been active in promoting the service, in particular during the EGI Conference 2021 in the previously mentioned session related to the EGI-ACE WP6 services.

In Q4 2021 and Q1 2022, the service integration with EGI Check-in was designed and the implementation started. The integration is implemented for the access to the CVMFS publisher node, which is currently based on X.509 certificates.

2.4 EGI - Rucio

Description	Service for managing large scale data in a distributed environment
Task	6.2
URL	
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
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	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of VOs supported (total)	2	internal accounting, GOCDB	3	3	3
No of file used	10,000	internal accounting, GOCDB	14,621	98,762	223,670
Total space used (TB)	10	internal accounting, GOCDB	3.3	4.33	8
No of countries providing Rucio	3	internal accounting, GOCDB	3	3	3
Names of countries providing Rucio	UK, South Africa, Australia	internal accounting, GOCDB	UK, South Africa, Australia	UK, South Africa, Australia	UK, South Africa, Australia

2.4.2 Assessment

EGI Rucio is one of the new 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 reporting period the service has been maintained and updated to the minor releases available upstream and initially 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, it's completion is expected by Q2 2022. In addition the activity of integration with the EGI Accounting system started, with the aim to be completed by Q4 2022. 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 and 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 data service is planned for the EGI conference 2022, which is also going to include Rucio training.

Three communities have been piloting the integration with Rucio, namely SKA, Gridpp and GAIA (LatticeQGC). In the latter case the piloting is done using the dteam VO. The service provider has given support for the exploitation of the service which, according to the estimation, should be used by 3 new communities by the end of the project.

The service is planned to be further showcased and disseminated during the second period of the project, including the Data Management clinic session during the EOSC Compute Platform User Support Workshop[15] scheduled for M16.

2.5 EGI - Onedata

Description	Integrated platform for distributed data management
Task	6.2
URL	https://datahub.egi.eu

[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/
[15] https://indico.egi.eu/event/5822/

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
No of communities (VOs) integrated (total)	6	Check-in, internal accounting, GOCDB	5	6	

					10
Total storage supported (TB)	100	Check-in, internal accounting, GOCDB	100	101	105
No of countries with OneProvider installed	7	Check-in, internal accounting, GOCDB	7	7	7
Names of countries with OneProvider installed	Poland, Portugal, France, Spain, UK, Italy, Czech Republic	Check-in, 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

2.5.2 Assessment

The EGI Onedata service usage has increased during the reference period, with the integration of 5 new communities (Fusion, LABPlas, LETHE, Reliance, DIGITBrain) and also the installation of providers in new countries (Tubitak, Turkey) and 3 on already covered countries (Czech Republic, France and Poland). One of the providers, initially configured in Portugal, is no longer available and one community is no longer served (SeaDataNet). In addition, 2 WP5 Data Spaces (ENES and useGalaxy.eu) plan integration during the second part of the EGI-ACE project. With these new use cases it is expected to reach the estimated 10 new user communities by the end of the project.

The installation, both the central component and the distributed providers, has been maintained and upgraded during the reference period to minor releases available upstream, which brought enhancements and bug fixes. In addition, the integration with the EGI Accounting system has started and will be completed by Q3 2022. 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[16] is using both EGI Notebooks and the EGI Onedata so as to share data between notebooks users).

As for other installations, the service has been promoted at the EGI Conference 2021 and a dedicated webinar is planned during 2022, together with a training session at EGI Conference 2022

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	
Duration	M01-M30
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.

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

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	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of researchers	2,000	Internal	10	6	5
No of user credentials deposited/month	20	Internal	0.4	2.6	2
No of countries which researchers access resources	n/a	Internal	n/a	n/a	n/a
Names of countries where researchers access resources	n/a	Internal	n/a	n/a	n/a

No of research community portals connected	5	Internal	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 period has been quite stable with a slight drop during the last 2 periods 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 we are almost in line with what has been defined at proposal time. The baseline for the metric about the number of researchers is going to be revisited, as that number refers to the number of users that eventually can access the service via EGI Check-in, so it has the same value as the baseline for the EGI Check-in users. The correct value (37) will be proposed to the future project amendment.

The usage of the service can also be increased by lifting some security policy constraints. The RCauth[17] CA which is used by MasterPortal to generate short lived certificates, can now be used only via Identity Providers which adheres to the SIRTFI[18] 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 is under discussion by the EGI Security Policy Group[19], 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

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

	OpenNebula, public Cloud providers such as Amazon Web Services and Microsoft Azure and, finally, Container Orchestration Platforms such as Apache Mesos 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	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	20	Service internal DB	1	1	1
No of communities	3	Service internal DB	1	1	1
No of services deployed/year	15	Service internal DB	1	3	47
No of countries with services deployed	2	Service internal DB	1	1	1
Names of countries with services deployed	Italy, Spain	Service internal DB	Italy	Italy	Italy

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 is planned to be completed by Q2 2022 together with the integration with EGI Accounting. 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 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. The project expects for the installation 350 deployments per year, which at the

moment is far from being reached. An activity of promoting the service to new communities and the SeaDataNet WebODV Data Space registration in EOSC will boost the usage.

For the promotion of the service, a talk[20] has been given at the EGI Conference 2021 together with a Webinar[21] part of the EGI Webinar series in 2021 and a session at EGI Conference 2022 is planned.

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

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

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
User definition	Small and big communities

2.8.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of registered users	1,600	Internal	573	555	577
No of processed user support requests/year	100	Internal	10	14	7
No of countries reach	N/A	Internal	N/A	N/A	N/A
Names of countries reach	N/A	Internal	N/A	N/A	N/A
No of small, supported communities (<100)	10	Internal	15	15	17
No of big, supported communities (>100)	2	Internal	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 first period of the project, the service has been maintained and new releases brought to production including enhancements requested by communities. Documentation has been prepared in order to be integrated in the EGI document repository and it's currently under review[22]. Work started also to have a dedicated deployment of a PERUN instance for EGI-ACE. 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[23]. The estimated number of new users for the installation at the end of the project is 650, hence the current 577 new users served has almost reached the full projection.

For the promotion of the service, a talk[24] has been given at the EGI Conference 2021.

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 shrinks 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/

[22] https://github.com/EGI-Federation/documentation/pull/398
[23] https://c-scale.eu/
[24] https://indico.egi.eu/event/5464/contributions/15662/

Service Category	Federated Access Services
Service Catalogue	https://marketplace.eosc-portal.eu/services/elastic-cloud-compute-cluster-ec3
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	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of active users/quarter	20	Internal logs / Google analytics	20	9	12
No of clusters deployments/quarter	60	Internal logs / Google analytics	21	6	1
No of countries of precedence of users	3	Check-in / Google analytics	8	5	7
Names of countries of precedence of users	N/A	Check-in / Google analytics	Spain, Italy, Netherlands, Germany, Poland, Slovakia, Sweden, United Kingdom	Spain, Italy, Netherlands, Greece, United Kingdom.	Spain, South Africa, Finland, Indonesia, Poland, Thailand, United Kingdom

2.9.2 Assessment

The EC3 installation has been maintained and enhanced during the reference period 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[25]. 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 first period of the

[25] https://docs.egi.eu/users/compute/orchestration/ec3/

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 estimates for the service are 320 cluster deployments per year. The current metrics value has reached a minimum of 1 deployment in the period M11-M15, which brings the average per year to 22. The data shown in the metrics depicts 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, currently it is not possible to distinguish the application that creates the infrastructure, so we cannot know how many clusters have been launched in this way (e.g. ENES Data Space uses the command line tool). Integration with EGI Accounting is in process jointly with the PaaS Orchestrator service to get more precise information.

For the promotion of the service during the first project period, a talk[26] has been given at the EGI Conference 2021. More dissemination activities will be performed during the second half of the project to increase the uptake of the service among user communities,

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

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

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-premises deployment.
Operational since	beginning 2019 on CH switchengine infrastructure
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
No of deployments	0	internal accounting, GOCDB	1	1	9
No of users/lab	7-10	internal accounting, GOCDB	n/a	n/a	n/a
No of research laboratories	4	internal accounting, GOCDB	4	5	9
Access to imported data	0	internal accounting, GOCDB	n/a	n/a	n/a
No of countries where the services is deployed	2	internal accounting, GOCDB	1	1	1

Names of countries where the services are deployed	Switzerland, Germany	internal accounting, GOCDB	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[27] 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 in the last 5 months of the period which is close to the 10 initially defined as an estimation for the end of the project. The totality of the organisations is based in Germany.

The metrics reported in the table above refers to both service offerings. In particular, the fourth, 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 session on Federated Data access services and with a webinar[28] part of the EGI Webinar series in Q1 2022.

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

3 Dissemination

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

Table 3 - Dissemination activities related to WP6 installations

Type of Activity	Title	Date	Name of Event	Location	Type of Audience	Reach	Scale
Workshop	EGI Check-in user enrolment 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

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

WP6 installation	Number of orders
EGI Check-in	7
EGI Onedata	4
openRDM	2
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). For what concerns the first period of the EGI-ACE project the communities using EGI-ACE WP6 services interviewed are reported in Table 5.

Table 5 - Communities interviewed during the first 15 months of 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
EMSO-ERIC	EGI Check-in	4. Satisfied Satisfied with the level of technical support, response time and QoS.	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
Terradue	EGI Check-in	4: Satisfied	n/a
OBSEA	EGI Check-in	4. Satisfied	Issues with EGI Check-in solved between May and July 2021
Fusion	EGI Check-in EGI Onedata	5. Very Satisfied	EGI Check-in support for Fusion is still missing (Fixed in December 2021)
EISCAT-3D	EGI Check-in PERUN EGI CVMFS	5. Very Satisfied	n/a
C-SCALE	PERUN EGI-Check-in	4. Satisfied	Configuration changes in PERUN should be better handled/communicate

			d to avoid service disruption to end users (e.g. not being able to log into OpenStack Horizon dashboard).
Biomed	EGI Check-in	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 Services are providing the expected features and quality, but some improvements could be implemented in the future.	EGI Check-in UX is not the best