D3.3 Periodical assessment of Infrastructure services

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Deliverable Abstract

The report provides an assessment and statistics of all the Infrastructure services provided under virtual access in WP3.

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TERMINOLOGY

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Executive summary

This report provides an assessment at M15 of the WP3 installations provided by the EGI-ACE project under the Virtual Access (VA) mechanism. This assessment is based on the metrics collected by the 36 WP3 installations during the three periods of observations: M01-M05, M06-M10 and M11-M15.

WP3 installations can be classified in two groups:

- Enabling components that support the Cloud Compute service. These installations are: 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.
- Infrastructure providers that deliver computing and storage resources via Cloud or HTC interfaces. 16 different providers support 33 installations in this group. There is at least one installation delivering computing resources (CPU) per provider. Several providers count with dedicated installations for delivering storage resources and specialized GPU resources.

During the first 15 months of activity, WP3 services have been used by 44 Virtual organizations, 23 of those supporting completely new communities reaching the EOSC Compute Platform via the Open Calls of the project and the EOSC DIH. The installations have delivered a total of 19,707,305 CPU hours, 29,213 GPU node hours and 29,213 TB month for these communities with the VA instrument. Additional 22,265,922 CPU hours have been delivered by the broader EGI compute provider communities with local funding and pay-for-use mechanism.

The total capacity requested by (allocated for) the engaged communities exceed 219,000,000 CPU hours, out of which 78,962,614 CPU hours are allocated with VA, while 140,764,600 are allocated with local funding and pay-for-use. In the project DoA WP3 budgeted ~80 million CPU hours, therefore in the second part of the project WP3 will shift its focus from onboarding more communities to monitoring the uptake of computing by the already onboarded communities and reclaiming those allocations that were not actually used. This reallocation will ensure that new communities can be served with VA funding alongside the ‘local funding’ and ‘pay-for-use’ models.

To promote the uptake of new and existing WP3 installations, beside the Webinar program organized by the project, dedicated presentations have been organized at several events (EGI-ACE organised and externally organised), where services were presented. These activities are reported in Section 3. Additional dissemination activities will be organized during the second part of the project.

Section 4 finally describes the level of satisfaction by checking the orders received via the EOSC portal and the EGI Customer satisfaction reviews, which showed an average level of 4.45 out of 5 during the reference period.

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 datacenters 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 WP3.

1.1 Installations

Within EGI-ACE project 36 installations are part of Virtual Access work package 3. These installations support the baseline computing infrastructure of EGI-ACE as part of the following services:

- EGI Cloud Compute, EGI Cloud Container Compute and EGI Online Storage, supported by 31 installations: AppDB, MetaCentrumCloud - CPU, MetaCentrumCloud - GPU, MetaCentrumCloud - Storage, SCAI FedCloud v2, EGI - GSIOS, IN2P3-IRES-CPU, IN2P3-IRES-Storage, TR-FC1-ULAKBIM - CPU, TR-FC1-ULAKBIM-Storage, INFN-BARI-CPU, INFN-BARI-Storage, INFN-CNAF-CPU, INFN-CNAF-GPU, INFN-CNAF-Storage, INCD-Lisbon (NCG)-CPU, INCD-Lisbon (NCG)-Storage, EGI-IISAS-CPU, DESY-FedCloud, CESGA-CPU, CESGA-Storage, IFCA-LCG2-CPU, IFCA-LCG2-Storage, INCD-LIP-CPU, INCD-LIP-Storage, CYFRONET-CLOUD-CPU, CYFRONET-CLOUD-Storage, IICT-BAS-CPU, IICT-BAS-Storage, CLOUDIFIN-CPU, and CLOUDIFIN-Storage. Providers of these installations are listed as such in the EGI Cloud Compute entry of the EOSC Marketplace[1];

[1] https://marketplace.eosc-portal.eu/services/egi-cloud-compute

- EGI High Throughput Compute, supported by 3 installations at SURF: dCache, Spider Storage, Data Processing Compute. SURF is listed as provider in the EGI High Throughput Compute entry of the EOSC Marketplace[2];
- Infrastructure Manager[3], supported by IM installation; and
- Dynamic DNS[4], supported by the DynDNS installation.

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

- dCache - disk storage in units of TiB year - was changed from 3 units to 210 units. These new units were allocated to better accommodate the usage of the LOFAR and WeNMR Data Spaces at the installation as the expected usage was not matching the actual needs of these communities.
- Spider Storage - disk storage in units of TB year - was changed from 380 to 290 units in order to stay within budget. The 290 TB year can accommodate the current expected capacity needs of the supported communities in the installation.

The installations of EGI Cloud Compute, EGI Cloud Compute and EGI Online Storage have supported a total of 44 VOs with Virtual Access, which are distributed over the installations providers as shown in Table 1.

Table 1 - VOs supported at installations

VO	Type of community[5]	CESGA	MetaCentrumCloud	CLOUDIFIN	IFCA-LCG2	CYFRONET	DESY	EGI-GSIOS	IICT-BAS	EGI-ISAS	IN2P3-IRES	INCD	INFN-BARI	INFN-CNAF	SCAI	SURF	TR-FC1-ULAKBIM
biomed	WP5		X							X	X						
openrisknet.eu	WP5				X												
enmr.eu	WP5		X														
opencoast.eosc-hub.eu	WP5				X							X					
vo.enes.org	WP5																X
fusion	WP5		X														X
lofar	WP5															X	
vo.seadatanet.org	WP5												X				

[2] https://marketplace.eosc-portal.eu/services/egi-high-throughput-compute

[3] https://marketplace.eosc-portal.eu/services/infrastructure-manager-im

[4] https://marketplace.eosc-portal.eu/services/dynamic-dns-service

[5] WP5 - Thematic Service in WP5; Open Call - Approached EGI-ACE via the Open Call; WP2 - Early Adopter in WP2; LTOS - Long tail of science community from EOSC Portal; DIH - EOSC Digital Innovation Hub Business Pilot

vo.emso-eric.eu	WP5	X										X				
vo.emsodev.eu	WP5											X				
vo.lifewatch.eu	WP5				X						X					
vo.operas-eu.org	WP5									X						
eiscat.se	WP2															
geohazards.terradue.com	WP2											X				
vo.emphasisproject.eu	Open Call		X													
vo.europlanet-vespa.eu	WP2									X						
vo.access.egi.eu	LTOS	X		X	X	X		X		X	X		X		X		X
fedcloud.egi.eu	LTOS									X	X		X				
training.egi.eu	LTOS		X		X					X							
vo.deltares.nl	Open Call	X															
ehoney.infn.it	Open Call											X				
vo.agiliacenter.com	Open Call				X											X
cos4cloud-eosc.eu	Open Call				X											
perla-pv.ro	Open Call			X												
bioisi	Open Call	X									X					
vo.max-centre.eu	Open Call		X													
fermi-lat.infn.it	Open Call											X				
minka-sdg.org	Open Call				X											
vo.matrycs.eu	Open Call									X						
vo.plocan.eu	Open Call	X														
vo.nextgeoss.eu	WP2	X			X						X					
acc-comp.egi.eu	LTOS				X						X					
vo.openrdm.eu	LTOS						X									
digifarm.io	DIH												X			
vo.grapevine.eu	Open Call	X														
vo.binare-oy.eu	Open Call											X				
saps-vo.i3m.upv.es	Open Call										X					
vo.carouseldancing.org	Open Call		X													
vo.neanias.eu	Open Call		X													
vo.pangeo.eu	Open Call		X													
icecube	Open Call		X		X											
vo.cite.gr	DIH						X									
vo.environmental.egi.eu	WP5		X													
vo.i-nergy.eu	Open Call												X			

Out of the 44 VOs, 13 support the WP5 Thematic Services, 4 support the Early Adopters from WP2 and 4 support Long Tail of Science and piloting, i.e., they support individual users requesting access via the EGI or EOSC marketplace or support general training and piloting activities. The remaining 23 support new use cases that have reached the project through the Open Calls (21 VOs) or the EOSC DIH activities (2 VOs).

The following tables summarise the VA consumption over the M1-M15 for those installations delivering computing and storage resources under WP3. Table 2 shows for those installations delivering CPU resources, the number of units allocated in the project under VA (CPU hours), the consumption of those units at M15, the percentage of that consumption over the total, and the estimated requested units from the use cases supported by the project assigned for each of the providers. Until M15 a total of 19,707,305 CPU hours have been delivered (25% of the total available in VA). While this number is below the expected number of hours to be delivered by the project, the providers have been able to support the use cases relying on local funds that complement the project contribution.

Given the requested units from the use cases, we expect that the VA funds will be completely exhausted by the end of the project for those providers with more capacity requested than their available capacity (see Requested units from use cases column). However, several installations still do not have enough use cases allocation to cover their VA budget by the end of the project. In order to overcome this issue, the project will first reassess all the communities currently supported to obtain new figures for the requested units from each of them that better match the real needs as most of the use cases have not been able to consume the capacity initially requested. The gained experience after the first 15 months of the project will allow for providing a more accurate measure of the actual needs of the communities that can be used for planning the next steps. With that information, use cases assigned to overloaded providers will be redistributed to make federated usage of the providers and rebalance the VA consumption across all providers. After this analysis and reassignment, the VA allocation will be reviewed to redistribute units if there are still providers that will not be able to consume the VA units with the foreseeable demand (i.e. the available units for the installation are more than the actual physical capacity available at the installation or not use cases can be allocated to the provider).

Table 2 - VA CPU Consumption

Installation	VA units available in EGI-ACE	VA at M15	% VA consumption	Requested units from use cases
CESGA-CPU	4,500,000	1,319,781	29.33%	9,171,808
MetaCentrumCloud - CPU	8,760,000	1,570,581	17.93%	14,884,089
CLOUDIFIN-CPU	5,000,000	2,451,907	49.04%	5,513,760
IFCA-LCG2-CPU	2,500,000	4,314,449	172.58%	6,917,280
CYFRONET-CLOUD-CPU	8,500,000	207,304	2.44%	1,093,200
DESY-FedCloud	2,000,000	20,302	1.02%	843,648
EGI - GSIOS	2,000,000	72,264	3.61%	1,093,200
IICT-BAS-CPU	7,708,800	0	0.00%	0

EGI-IISAS-CPU	6,132,000	901,816	14.71%	3,245,760
IN2P3-IRES-CPU	6,132,000	737,500	12.03%	1,913,568
INCD-Lisbon (NCG)-CPU	3,066,000	1,888,486	61.59%	3,430,080
INFN-BARI-CPU	4,380,000	3,415,879	77.99%	9,014,760
INFN-CNAF-CPU	4,380,000	520,426	11.88%	919,296
SCAI FedCloud v2	2,000,000	0	0.00%	5,947,008
Data Processing Compute	5,500,000	22,505	0.41%	4,083,330
TR-FC1-ULAKBIM - CPU	6,132,000	2,264,105	36.92%	11,114,496
TOTALS	**78,690,800**	**19,707,305**	**25.04%**	**77,543,683**

Table 3. VA GPU Consumption shows GPU usage. Similarly to the CPU consumption, the table shows the installation name, the number of units allocated in the project under VA (GPU node hours), the consumption of those units at M15, the percentage of that consumption over the total, and the estimated requested units from the use cases supported by the project assigned for each of the providers. We expect the usage and requests of GPU resources to increase here due to the recent promotion campaign of these resources.

Table 3 - VA GPU Consumption

Installation	VA units available in EGI-ACE	VA at M15	% VA consumption	Requested units from use cases
MetaCentrumCloud - GPU	204,400	20,448	10.00%	43,782
INFN-CNAF-GPU	43,800	8,765	20.01%	25,536
TOTALS	**248,200**	**29,213**	**11.77%**	**69,318**

Storage usage is summarised in Table 4. Again, the table shows the installation name, the number of units allocated in the project under VA (TB month), the consumption of those units at M15, the percentage of that consumption over the total, and the estimated requested units from the use cases supported by the project assigned for each of the providers. Overall the usage of storage resources in the project is still low and it's expected that this will grow as several of the thematic services and data spaces of the project started to become operational by M12.

Table 4 - Storage VA Consumption

Installation	VA units available in EGI-ACE	VA at M15	% VA consumption	Requested units from use cases
CESGA-Storage	950	281	29.60%	109,376
MetaCentrumCloud - Storage	6,500	25	0.39%	714
CLOUDIFIN-Storage	12,000	1	0.06%	1
IFCA-LCG2-Storage	1,700	25	1.47%	33
CYFRONET-CLOUD-Storage	4,500	1	0.03%	0
IN2P3-IRES-Storage	4,200	24	0.57%	1,728
INCD-Lisbon (NCG)-Storage	2,450	200	8.15%	46

INFN-BARI-Storage	1,650	24	1.45%	906
INFN-CNAF-Storage	4,950	217	4.39%	60
TR-FC1-ULAKBIM-Storage	4,200	2,481	59.07%	8,750
SURF	2,520	1,500	59.52%	2,500
SURF	3,480	750	21.55%	1,500
TOTALS	**248,200**	**29,213**	**11.28%**	**122,363**

1.2 Metrics definition

For each installation several metrics has been defined between the provider and WP3 leader, considering 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 of 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 metrics is to provide information about how often the service is being ordered via EOSC Marketplace
    - This metric is not applicable to federation services due to the nature of the service. Federation services are enabling federation and are supporting delivery of customer facing services. Thus, cannot be ordered.

2 Installations

2.1 IM

Description	IM is a tool that eases the access and the usability of IaaS clouds by automating the VMI selection, deployment, configuration, software installation, monitoring and update of Virtual Appliances. It supports APIs from a large number of virtual platforms, making user applications cloud-agnostic. In addition it integrates a contextualization system to enable the installation and configuration of all the user required applications providing the user with a fully functional infrastructure.
Task	3.1
URL	
Service Category	Infrastructure service
Service Catalogue	
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	M1-M30
Modality of access	Access is freely available to any user. Also users who provided valid EGI check-in credentials.

Support offered	* Documentation: https://imdocs.readthedocs.io/en/latest/ * Sample videos: https://www.youtube.com/playlist?list=PLgPH186Qwh_37AMhEruhVKZSfoYpHkrUp * IM service Source repository: https://github.com/grycap/im/ * IM web portal Source repository: https://github.com/grycap/im-web/ * IM client Source repository: https://github.com/grycap/im-client/ * IM dashboard Source repository: https://github.com/grycap/im-dashboard/
Operational since	May 2018.
User definition	Any user with access to any Cloud platform that wants to deploy virtual infrastructures.

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 users per quarter	10	Internal service database	90	123	70
No of infrastructures deployed per quarter	40	Internal logs	265	161	101
No of countries reach	3	Check-in	13	9	12
Names of countries reach	Spain, Italy, Portugal	Check-in	Spain, Germany, Czechia, Italy, Hungary, Netherlands, Poland, Portugal. Slovakia. Brazil, Indonesia,	Spain, United Kingdom, Germany, Czechia, Italy, India, Portugal. Slovakia,	Spain, Italy, United Kingdom, Czechia, Germany, France, Hungary, Netherlands, Poland, Slovakia, Norway, Indonesia

			Russia, USA	Romania.	

2.1.2 Assessment

The IM installation provides VM orchestration in the EGI Federated Cloud via API and web dashboard. During the first 15 months of EGI-ACE, it has significantly increased the numbers of users beyond the baseline (560% increase in the last period M11-M15). The installation is actively used to deploy more than 100 infrastructures per quarter (253% increase over the baseline for the last period) and has a broad geographical coverage. The installation is used internally by several services of the EOSC Compute Platform: EC3, PaaS Orchestrator, DODAS, and AppDB rely on IM for the management of VMs on the infrastructure. IM is also actively used by new communities of EGI-ACE from the open calls (OpenBioMaps, Large sample testing of high resolution distributed hydrological model, Cos4Cloud and PLOCAN), WP5 Data Spaces (Operas) and individual users.

The service is available in the EOSC Marketplace since the start of the project and is fully integrated with the EGI ecosystem: it uses Check-in for authentication, it is monitored by ARGO and it's documented in the EGI Documentation repository. It is constantly updated and maintained as part of the regular operation of the service.

For promotion and training for the service, a webinar on IM was delivered in May 2021[6].

2.2 DynDNS

Description	This activity will provide a Dynamic DNS service that allows assigning names under preconfigured domains to VM instances running on the EGI Cloud providers. The service shall provide: • a HA-setup of DNS servers distributed across different NGIs of the EGI infrastructure. • a web-based interface for managing DNS entries for fedcloud.eu and subdomains. • expiration of hosts if not updated after a configurable period of time.

[6] https://indico.egi.eu/event/5495/

Task	3.1
URL	https://nsupdate.fedcloud.eu/
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Main service is located at IISAS (Slovakia), backup servers at EGI or other partner for High availability
Duration	M1-M30
Modality of access	Registration of hostnames via GUI portal, DNS update via REST API
Support offered	Detailed documentation about service and API, use guide, tutorial, presentations/training during events or on requests
Operational since	01.01.2021
User definition	All types of users: individual users, small and big user communities - Individual users: register hostnames in generic domains/subdomains, assign hostnames to VMs - Small communities: separate subdomains in generic domain fedcloud.eu (e.g. wenmr.fedcloud.eu) for the communities - Big communities: integrate DNS service with domain owned by the communities (e.g. fedcloud.eosc-synergy.eu)

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 researchers	50	Internal logs	71	83	97
No of hostnames registered	100	Internal logs	149	173	197

2.2.2 Assessment

The Dynamic DNS installation provides self-managed registration of hostnames for VMs running on EGI's infrastructure. The service can be used by any registered Check-in user and can also support specific communities with the need of registering domain names under new domains. During the M1-M15 period the service supported the registration of 197 host names (158% increase over baseline) by nearly 100 users (155% increase over baseline period before the project).

The service is available via the EOSC marketplace and has been integrated with EGI Check-in and ARGO Monitoring during the initial months of the project. Documentation is available under the common EGI Documentation web and a webinar for its promotion in June 2021[7].

2.3 AppDB

Description	The EGI Applications Database (AppDB) is service that stores and provides to the public, information about: ● software solutions in the form of native software products and virtual appliances, ● the programmers and the scientists who are involved, and ● publications derived from the registered solutions

[7] https://indico.egi.eu/event/5559/

	Reusing software products registered in the AppDB means that scientists and developers may find a solution that can be directly utilized on the European Grid & Cloud Infrastructures without reinventing the wheel. This way, scientists can spend less or even no time developing, porting or even using a software solution to the Distributed Computing Infrastructures (DCIs). AppDB, thus, aims to avoid duplication of effort across the DCI communities, and to inspire scientists less familiar with DCI programming and usage. Moreover, AppDB provides added value through sub-services, such as enabling users to deploy and manage Virtual Machines on the EGI Cloud infrastructure from its VMOps dashboard
Task	3.1
URL	https://appdb.egi.eu/
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	IASA (Greece)
Duration	M1-M30
Modality of access	All the services are free at the point of use. The catalogues do not require any registration. Other services may require authentication and in some cases registration, using EGI Check-In
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	2008
User definition	Three types of users have been identified:

	(a) researchers (account owners), (b) typical visitors (anyone with or without account), (c) Cloud Resource Providers

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 researchers	1111	Internal logs	1196	1217	1237
No of cloud providers	34	Internal logs	28	28	28
No of visits	93694	Internal logs	48542	60218	68,704
No of items added/updated	14	Internal logs	24	18	11
No of items released/submitted	65	Internal logs	34	21	16
No of countries reach	104	Check-in	24	19	22
Names of countries reach		Check-in	Spain, Greece, Italy, Slovakia, Netherlands, Germany, France, Poland, Czechia, Turkey, Romania, Japan, Austria, Sweden, Indonesia, Hungary, Denmark, Canada, Switzerland, Portugal, Iran,	China, Croatia, Czechia, Finland, France, Germany, Greece, Indonesia, Ireland, Italy, Netherlands, Romania, Slovakia, South Africa, Spain,	China, Croatia, Czechia, Finland, France, Germany, Greece, Hungary, Indonesia, Italy, Japan, Netherlands, Portugal, Romania, Slovakia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom

			Finland, United States, United Kingdom	Switzerland, Turkey, United Kingdom, United States	

2.3.2 Assessment

AppDB is an installation part of the EGI Cloud Compute service. It facilitates the reuse of software in the infrastructure by providing a software catalogue that is automatically distributed to providers in the form of Virtual Machine images. AppDB at M15 supported 1237 users (111% over baseline) adding/updating a total of 53 software entries (303% increase over baseline) and 71 were released as completely new entries (87% over baseline). As containers have become a major technology for sharing software, the usage of AppDB has not increased as expected. New features to support the registration of containers are under development to better support the reuse of software in the community using AppDB.

A total of 28 cloud providers are fully integrated with AppDB to synchronise software and to deliver information about their capacity and capabilities to the AppDB Information System. As an integral part of the EGI Cloud Compute Service, AppDB does not have an individual entry in the EOSC marketplace yet. Although plans for creating an individual entry in the EOSC Marketplace are being considered to increase its promotion and expand the reuse of software across the EOSC ecosystem. It's fully integrated with the EGI ecosystem since the start of the project.

2.4 MetaCentrumCloud - CPU

Description	CESNET is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CESNET is a certified resource center of EGI, fully integrated with the federation.
Task	3.2
URL	https://cloud.metacentrum.cz/

Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Czech Republic
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, trainings, webinars and hands-on sessions during conferences and events.
Operational since	01/07/2019
User definition	

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 users	550	Internal service database	1	46	64
CPU/hours	10,909,709	Accounting	35,712	818,874	715,995

No of countries reach	14	Check-in	13	12	16
Names of countries reach	Canada China Croatia Czech Republic France Greece Ireland Italy Netherlands Russian Federation Slovakia Spain Switzerland United States	Check-in	Croatia Czechia France Germany Greece Indonesia Italy Netherlands Singapore Slovakia Spain Switzerland United Kingdom	Czechia, France, Germany, Indonesia, Italy, Netherlands, Portugal, Romania, Slovakia, Spain, Switzerland, United Kingdom	Czechia, Denmark, Finland, France, Germany, Greece, Indonesia, Italy, Netherlands, Norway, Poland, Slovakia, Spain, Switzerland, United Kingdom, United States

2.4.2 Assessment

MetaCentrum - CPU is one of the installations of CESNET supporting the EGI Cloud Compute service in the EOSC Marketplace. This installation has delivered 1,256,465 of the initially planned 8,760,000 CPU hours during the complete project (18% of the available VA capacity for the installation was consumed). The following VOs were supported over the period: biomed, enmr.eu, fusion, icecube, training.egi.eu, vo.emphasisproject.eu, vo.environmental.egi.eu, vo.max-centre.eu, vo.neanias.eu, vo.pangeo.eu with a total of 64 users

from 16 countries directly interacting with the installation. Considering the existing communities at the installation, all the available VA capacity should be consumed before the end of the project.

2.5 MetaCentrumCloud - GPU

Description	CESNET is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CESNET is a certified resource center of EGI, fully integrated with the federation.
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Czech Republic
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	01/09/2019

User definition	

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 users	550	Internal service database	0	1	1
GPU node/hours	31,104	Accounting	0	11,016	9,432
No of countries reach	14	Check-in	0	1	1
Names of countries reach	Canada China Croatia Czech Republic France Greece Ireland Italy Netherlands Russian Federation Slovakia Spain Switzerland	Check-in	-	United Kingdom	United Kingdom

	United States				

2.5.2 Assessment

MetaCentrum - GPU supports the usage of GPU resources on the CESNET provider as part of the EGI Cloud Compute service. This installation has delivered 20,448 of the initially planned 204,400 GPU node hours during the complete project (10% of the available VA capacity for the installation was consumed). The fusion VO was supported over the period with one single user directly interacting with the installation. The usage of GPU resources is expected to grow with new use cases already allocated to this installation for the next period.

2.6 MetaCentrumCloud - Storage

Description	CESNET is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CESNET is a certified resource center of EGI, fully integrated with the federation.
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage
Location	Czech Republic
Duration	M1-M30

Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	01/07/2019
User definition	

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 users	550	Internal service database	1	46	64
TB/month	375,587,796	Accounting	1.2	10.24	14
No of countries reach	14	Check-in	1	12	16
Names of countries reach	Canada China Croatia Czech Republic France	Check-in	Croatia Czechia France Germany Greece Indonesia	Czechia, France, Germany, Indonesia, Italy, Netherlands, Portugal, Romania, Slovakia,	Czechia, Denmark, Finland, France, Germany, Greece, Indonesia, Italy, Netherlands, Norway, Poland, Slovakia, Spain, Switzerland, United Kingdom, United States

	Greece Ireland Italy Netherlands Russian Federation Slovakia Spain Switzerland United States		Italy Netherlands Singapore Slovakia Spain Switzerland United Kingdom	Spain, Switzerland, United Kingdom	

2.6.2 Assessment

MetaCentrum - Storage supports the associated storage resources to the cloud resources on CESNET as part of the EGI Online Storage service. This installation has delivered 25 of the initially planned 6500 TB month during the complete project (0.4% of the available VA capacity for the installation was consumed). The installation is used in conjunction with the MetaCentrum - CPU so VOs and users are common: biomed, enmr.eu, fusion, icecube, training.egi.eu, vo.emphasisproject.eu, vo.environmental.egi.eu, vo.max-centre.eu, vo.neanias.eu, vo.pangeo.eu VOs were supported with a total of 64 users from 16 countries directly interacting with the installation.

2.7 SCAI FedCloud v2

Description	The Installation is an OpenStack Cloud Cluster for Infrastructure-as-a-Service Cloud services connected to the EGI Federated Cloud Compute Service. While SCAI is a certified resource center of EGI, fully integrated with the federation, this VA is about providing access to a new installation that is until now only provided for biomedical research (Neuroscience).
Task	3.2

URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Germany
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	While SCAI has been an early FedCloud Site since 2016, this VA is from the end of 2018 / beginning of 2019, not yet connected to FedCloud.
User definition	Not reserved, but currently serving small communities with this installation.

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	20-30	Internal service database	0	0	0

CPU/hours	4,919,616	Accounting	0	0	0
No of countries reach	5	Check-in	0	0	0
Names of countries reach	Germany, France, Italy, Spain, UK	Check-in	0	0	0

2.7.2 Assessment

SCAI is one of the providers of the EGI Cloud Compute service. This provider had during 2021 a long downtime due to the upgrade of the cluster supporting the infrastructure that was largely delayed due to COVID restrictions that complicated the setup of the new hardware. For that reason no consumption of VA was recorded so far. In early 2022 the provider managed to restore their system and new use cases are being allocated to the installation currently.

2.8 EGI - GSIOS

Description	GSI will become a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. GSI will undergo all necessary certification steps before becoming operational.
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/

Location	Germany
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	
User definition	Single researchers, 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 users	0	Internal service database	8	114	15
CPU/hours	0	Accounting	183	20,193	51,888
No of countries reach	0	Check-in	N/A	4	6
Names of countries reach	0	Check-in	N/A	Germany, Italy, Spain, UK	Germany, Indonesia, Italy, Netherlands, Spain, UK

2.8.2 Assessment

EGI-GSIOS became a provider of the EGI Cloud Compute service at the end of the first VA reporting period (M5), since then it has started supporting the vo.access.egi.eu VO for piloting and LToS activities consuming a total of 72,264 CPU hours (3.9% of the available VA capacity for the installation was consumed). Further VOs are being negotiated for support by the installation, so the usage is expected to grow in the coming periods.

2.9 IN2P3-IRES-CPU

Description	IN2P3-IRES is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. IN2P3-IRES is a certified resource center of EGI, fully integrated with the federation.
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	France
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.

Operational since	Dec 2014
User definition	Single researchers, small and big communities

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 users	120	Internal service database	17	24	28
CPU/hours	3,095,735	Accounting	187252	262420	287,828
No of countries reach	5	Check-in	6	9	11
Names of countries reach	CH, FR, IT, NL, SE	Check-in	DE,ES,FR,HU,IT,NL	DE,ES,FRHU,IT,NL,RO,UK	BR,DE,ES,FR,GR,ID,IT,NL,MK,PT,SE

2.9.2 Assessment

IN2P3-IRES-CPU is one of the installations of IN2P3-IRES supporting the EGI Cloud Compute service in the EOSC Marketplace. It has delivered a total of 737,500 CPU hours from the 6,132,000 available (12% of the available VA capacity for the installation was consumed). The installation supported: bioisi, biomed, fedcloud.egi.eu, saps-vo.i3m.upv.es, vo.access.egi.eu, vo.europlanet-vespa.eu, and vo.operas-eu.org VOs with 28 users from 11 different countries. The installation has unallocated capacity available to host new use cases of the project.

2.10 IN2P3-IRES-Storage

Description	IN2P3-IRES is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. IN2P3-IRES is a certified resource center of EGI, fully integrated with the federation.
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage
Location	France
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	July 2018
User definition	Single researchers, small and big communities

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 users	25	Internal service database	8	24	28
TB/month	5	Accounting	7.754	8.648	8
No of countries reach	5	Check-in	6	9	11
Names of countries reach	FR, IT, NL, ,SE, UK	Check-in	DE,ES,FR,HU,IT,NL	DE,ES,FR,HU, IT,NL,RO,UK	BR,DE,ES,FR,GR,ID,IT,NL,MK, PT,SE

2.10.2 Assessment

IN2P3-IRES-Storage supports the associated storage resources to the cloud resources on IN2P3 as part of the EGI Online Storage service. This installation has delivered 24 of the initially planned 4200 TB month during the complete project (0.6% of the available VA capacity for the installation was consumed). The installation is used in conjunction with the IN2P3-IRES-CPU, hence VOs and users are common: bioisi, biomed, fedcloud.egi.eu, saps-vo.i3m.upv.es, vo.access.egi.eu, vo.europlanet-vespa.eu, and vo.operas-eu.org VOs with 28 users from 11 different countries.

2.11 TR-FC1-ULAKBIM - CPU

Description	TR-FC1-ULAKBIM is installed as an Federated Cloud Site and operated with its federated structure in order to provide computing infrastructure over cloud services.
Task	3.2

URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Turkey
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	2014
User definition	Single researchers, small and big communities

2.11.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	27	Internal service database	14	27	29

CPU/hours	76	Accounting	2951	915750	1,345,404
No of countries reach	9	Check-in	1	7	8
Names of countries reach	GR, IT, ES, DE, HU,TR, HR, UK,SE	Check-in	Spain	France, Greece, Italy, Spain, Sweden, Turkey, United Kingdom	France, Italy, Netherlands, North Macedonia, Spain, Sweden, Turkey, United Kingdom

2.11.2 Assessment

TR-FC1-ULAKBIM - CPU is the installation of TUBITAK supporting the EGI Cloud Compute service in the EOSC Marketplace. It has delivered a total of 2,264,105 CPU hours from the 6,132,000 available (37% of the available VA capacity for the installation was consumed). The installation supported: fusion, vo.access.egi.eu and vo.enes.org VOs, with 29 different users from 8 countries. These VOs are expected to increase their usage in the coming period, therefore the installation should be able to exhaust its VA allocation by the end of the project.

2.12 TR-FC1-ULAKBIM - Storage

Description	TR-FC1-ULAKBIM is installed as an Federated Cloud Site and operated with its federated structure in order to provide computing infrastructure over cloud services.
Task	3.2
URL	
Service Category	Infrastructure service

Service Catalogue	https://www.egi.eu/services/online-storage
Location	Turkey
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	2014
User definition	Single researchers, small and big communities

2.12.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	27	Internal service database	4	27	29
TB/month	4	Accounting	15.08	204.43	276.68
No of countries reach	9	Check-in	1	7	8
Names of countries reach	GR, IT, ES, DE,	Check-in	Spain	France, Greece, Italy,	France, Italy, Netherlands, North Macedonia, Spain, Sweden,

	HU,TR, HR, UK,SE			Spain, Sweden, Turkey, United Kingdom	Turkey, United Kingdom

2.12.2 Assessment

TR-FC1-ULAKBIM - Storage supports the associated storage resources to the cloud resources on TUBITAK as part of the EGI Online Storage service. This installation has delivered 2481 of the initially planned 4200 TB month during the complete project (59% of the available VA capacity for the installation was consumed). The installation is used in conjunction with the TR-FC1-ULAKBIM - CPU so VOs and users are common: fusion, vo.access.egi.eu and vo.enes.org VOs, with 29 different users from 8 countries.

2.13 dCache

Description	dCache. This installation concerns an external, disk storage system, managed by the dCache front end solution, for high throughput cluster (HTC) computing.
Task	3.2
URL	https://surf.nl/
Service Category	Infrastructure service
Service Catalogue	
Location	Amsterdam (NL)
Duration	M1-M30

Modality of access	ssh keys, tokens and X.509
Support offered	Standard support in the form of operations, helpdesk and online documentation is provided.
Operational since	1-Sep-05
User definition	Collaborative research teams with a focus on HTC computing.

2.13.1 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	0	Extracted from local accounting of the provider	6	7	7
TB*month	0	Extracted from local accounting of the provider	500	500	500
Degree of users satisfaction	0	Satisfaction survey sent to users	3	4	4

2.13.2 Assessment

dCache is a new installation from SURF that supports the EGI Online Storage service for those users running workloads on the High Throughput Computing cluster supported by the Data Processing Compute installation. Over the first 15 months of the project the installation supported 7 new users of the lofar VO that have allocated 1500 TB month over the reporting period (59% of the available VA

capacity for the installation was consumed). It is expected that the consumption rate stays stable until the end of the project and the complete VA capacity will be exhausted by then.

2.14 Spider Storage

Description	Spider Storage. This installation concerns the shared, disk storage system, managed by Ceph/CephFS, for high throughput cluster (HTC) computing.
Task	3.2
URL	https://surf.nl/
Service Category	Infrastructure service
Service Catalogue	
Location	Amsterdam (NL)
Duration	M1-M30
Modality of access	ssh keys
Support offered	Standard support in the form of operations, helpdesk and online documentation is provided.
Operational since	15-Mar-20

User definition	Collaborative research teams with a focus on HTC computing.

2.14.1 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	0	Extracted from local accounting of the provider	6	9	9
TB*month	0	Extracted from local accounting of the provider	250	250	250
Degree of users satisfaction	0	Satisfaction survey sent to users	4	3	3

2.14.2 Assessment

Spider Storage is the second storage installation from SURF supporting users running workloads on the High Throughput Computing cluster supported by the Data Processing Compute installation. Over the first 15 months of the project the installation supported 9 new users of the lofar VO that have allocated 750 TB month over the reporting period (21.5% of the available VA capacity for the installation was consumed). This consumption is expected to grow in the next period as lofar data space has just started its online presence.

2.15 Data Processing Compute

Description	Data Processing. This installation concerns customizable platform as a service (PaaS) solutions for high throughput cluster (HTC) computing.
Task	3.2

URL	https://surf.nl/
Service Category	Infrastructure service
Service Catalogue	
Location	Amsterdam (NL)
Duration	M1-M30
Modality of access	ssh keys
Support offered	Standard support in the form of operations, helpdesk and online documentation is provided.
Operational since	15-Mar-20
User definition	Collaborative research teams with a focus on HTC computing.

2.15.1 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	0	Extracted from local accounting of the provider	6	9	9

CPU*hours	0	Extracted from local accounting of the provider	3373	7291	11841
Degree of users satisfaction	0	Satisfaction survey sent to users	5	4	4

2.15.2 Assessment

Data Processing is a new flavour for the EGI High Throughput Computing service delivered by SURF. This installation brings a customisable computing facility for supporting users in Platform as a Service (PaaS) that runs on top of an internal elastic cloud. It is a feature-rich platform that provides users with a batch processing cluster (based on Slurm) for generic data processing applications, high performance data access, fast network connectivity to internal and external data centers, support for containers, Jupyter notebooks and many other user-centric features. In EGI-ACE the installation has supported 9 different users from the lofar VO and has delivered 22,505 CPU hours out of the 5,500,000 available (0,41% of the available VA capacity for the installation was consumed). The uptake of the service from the lofar community was lower than expected due to delays in the developments from the community. Additional workloads related to lofar are being discussed to increase the consumption of resources. Moreover, additional communities targeting HTC like WeNMR are being contacted to also use the service.

2.16 INFN-BARI-CPU

Description	200 CPU cores
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/

Location	INFN-Bari (Bari)
Duration	M1-M30
Modality of access	authentication and authentication required, possible configuration to be defined
Support offered	Yes
Operational since	
User definition	

2.16.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users communities	0	Internal service configuration	2	7	9
CPU/hours	0	Accounting	879,461	432,854	2,103,563
No of countries reach	0	Check-in	4	4	8
Names of countries reach	0	Check-in	Italy, Spain, Germany, Netherland	Italy, Spain, Germany, Netherland	Finland, Germany, Indonesia, Italy, Netherlands, Portugal, Spain, Sweden

2.16.2 Assessment

INFN-BARI-CPU delivers CPU resources as part of the EGI Cloud Compute service in the EOSC Marketplace from INFN-BARI. It has delivered a total of 3,415,879 CPU hours from the 4,380,000 available (78% of the available VA capacity for the installation was consumed). The installation supported 9 different user communities from the following VOs: ehoney.infn.it, fedcloud.egi.eu, fermi-lat.infn.it, geohazards.terradue.com, vo.access.egi.eu, vo.binare-oy.eu, vo.emso-eric.eu, vo.emsodev.eu, and vo.seadatanet.org reaching 8 different countries. The rate of VA consumption of the installation will make it possible to reach the total amount of VA units available within the next months.

2.17 INFN-BARI-Storage

Description	55 TB net disk space (69 raw)
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage/
Location	INFN-Bari (Bari)
Duration	M1-M30
Modality of access	authentication and authentication required, possible configuration to be defined

Support offered	Yes
Operational since	
User definition	

2.17.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users communities	0	Internal service configuration	2	7	9
TB/month	0	Accounting	1	5	18
No of countries reach	0	Check-in	4	4	8
Names of countries reach	0	Check-in	Italy, Spain, Germany, Netherland	Italy, Spain, Germany, Netherland	Finland, Germany, Indonesia, Italy, Netherlands, Portugal, Spain, Sweden

2.17.2 Assessment

INFN-BARI-Storage supports the associated storage resources to the cloud resources on INFN-BARI as part of the EGI Online Storage service. This installation has delivered 24 of the initially planned 1650 TB month during the complete project (1.45% of the available VA capacity for the installation was consumed). The installation is used in conjunction with the INFN-BARI-CPU so VOs and users are common: ehoney.infn.it, fedcloud.egi.eu, fermi-lat.infn.it, geohazards.terradue.com, vo.access.egi.eu, vo.binare-oy.eu, vo.emso-eric.eu,

vo.emsodev.eu, and vo.seadatanet.org reaching 8 different countries. Storage usage is expected to increase for these communities as they mature their services.

2.18 INFN-CNAF-CPU

Description	200 CPU cores
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	INFN-CNAF (Bologna)
Duration	M1-M30
Modality of access	authentication and authentication required, possible configuration to be defined
Support offered	Yes
Operational since	

User definition	

2.18.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users communities	0	Internal service configuration	0	2	4
CPU/hours	0	Accounting	0	148,379	372,047
No of countries reach	0	Check-in	0	1	4
Names of countries reach	0	Check-in	-	Italy	Italy, India, Spain, Norway

2.18.2 Assessment

INFN-CNAF is a new provider of the EGI Cloud Compute service that finalised its integration at the end of the second VA reporting period (M10) and started delivering capacity once the integration was completed. Since then, it provided 520,426 CPU hours out of the total 4,380,000 available (11.9% of the available VA capacity for the installation was consumed). INAF-CNAF was engaged with four user communities: digifarm.io from the EOSC-DIH and vo.inactive-sarscov2.eu, vo.i-energy.eu, fermi-lat.infn.it from the project's Open Calls. These bring four users from four different countries As the installation was included later in the project, the capacity reserved for the current communities is still low and there is room for assigning more communities in the coming months.

2.19 INFN-CNAF-GPU

Description	2 GPUs per server
Task	3.2

URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	INFN-CNAF (Bologna)
Duration	M1-M30
Modality of access	authentication and authentication required, possible configuration to be defined
Support offered	Yes
Operational since	
User definition	

2.19.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users communities	0	Internal service configuration	0	0	1

GPU node/hours	0	Accounting	0	0	8,765
No of countries reach	0	Check-in	0	0	1
Names of countries reach	0	Check-in	-	-	Norway

2.19.2 Assessment

INFN-CNAF-GPU supports the GPU resources in the INFN-CNAF providers that are used in conjunction with the INFN-CNAF-CPU and INFN-CNAF-Storage. This installation has delivered 8,765 of the initially planned 43,800 GPU node hours during the complete project (20% of the available VA capacity for the installation was consumed). So far the installation was used by one community with one Norwegian user (from the digifarm.io VO). There is an expected increase in the usage of the installation as several use cases have expressed their interest in using GPU resources for their workloads.

2.20 INFN-CNAF-Storage

Description	55 TB of net storage space (69 raw)
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage/
Location	INFN-CNAF (Bologna)

Duration	M1-M30
Modality of access	authentication and authentication required, possible configuration to be defined
Support offered	Yes
Operational since	
User definition	

2.20.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users communities	0	Internal service configuration	0	2	4
TB/month	0	Accounting	0	85.76	132
No of countries reach	0	Check-in	0	1	4
Names of countries reach	0	Check-in	-	Italy	Italy, India, Spain, Norway

2.20.2 Assessment

INFN-CNAF-Storage supports the associated storage resources to the cloud resources on INFN-CNAF as part of the EGI Online Storage service. This installation has delivered 217.76 of the initially planned 4950 TB month during the complete project (13,18% of the available

VA capacity for the installation was consumed). The installation is used in conjunction with the INFN-CNAF-CPU so VOs and users are common.

2.21 INCD-Lisbon (NCG)-CPU

Description	Portuguese National Distributed Computing Infrastructure Openstack IaaS cloud computing service (virtual machines)
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Portugal
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	2014

User definition	Single researchers, small and big communities

2.21.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	50	Internal service database	14	10	26
CPU/hours	4,751,023	Accounting	486,912	738,166	663,408
No of countries reach	1	Check-in	6	5	8
Names of countries reach	Portugal	Check-in	Germany, Indonesia, Netherlands, Portugal, Slovakia, Spain	Brasil, Portugal, Indonesia, Germany, Chile	Germany, Indonesia, Netherlands, Portugal, Slovakia, Spain, UK, Italy

2.21.2 Assessment

INCD-Lisbon (NCG)-CPU delivers CPU resources for the EGI Cloud Compute service. The installation supports mainly two of the WP5 Data Spaces VOs: opencoast.eosc-hub.eu and vo.lifewatch.eu. Together they support 26 users from 8 different countries. INCD-Lisbon (NCG)-CPU has provided 2,183,597 CPU hours out of the total 3,066,000 available (61.59% of the available VA capacity for the installation was consumed). The supported communities are expected to keep their usage constant until the end of the project and therefore consume all the VA capacity from the installation before the end of the project is reached. Some workload will be migrated to providers without enough capacity allocated at the moment.

2.22 INCD-Lisbon (NCG)-Storage

Description	Portuguese National Distributed Computing Infrastructure Openstack IaaS cloud computing service (storage backend)
Task	3.2
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage/
Location	Portugal
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	2014
User definition	Single researchers, small and big communities

2.22.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	50	Internal service database	14	10	26
TB/month	110	Accounting	26.5	86	87
No of countries reach	1	Check-in	6	5	8
Names of countries reach	Portugal	Check-in	Germany, Indonesia, Netherlands, Portugal, Slovakia, Spain	Brasil, Portugal, Indonesia, Germany, Chile	Germany, Indonesia, Netherlands, Portugal, Slovakia, Spain, UK, Italy

2.22.2 Assessment

INCD-Lisbon (NCG)-Storage delivers storage resources associated with the INCD-Lisbon (NCG)-CPU installation as part of the EGI Online Storage service. The installation supports the same communities and users as the CPU one. During the reporting period, it has provided 200 TB months out of the total 2450 available (8,15% of the available VA capacity for the installation was consumed).

2.23 EGI-IISAS-CPU

Description	IISAS is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. IISAS is a certified resource center of EGI, fully integrated with the federation.
Task	3.2
URL	

Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Bratislava, Slovakia
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service requires registration as an EGI user on Check-in and enrollment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, trainings, webinars and hands-on sessions during conferences and events.
Operational since	2012
User definition	

2.23.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	74	Internal service database	4	13	16
CPU/hours	658,000	Accounting	216,676	220,692	506,049

No of countries reach	13	Check-in	4	7	13
Names of countries reach	UK, UA, SE, SK, NL, IT, HU, GR, FR, ES, DE, CZ	Check-in	Italy,Slovakia,Spain, Indonesia	Czechia,France,Germany,Indonesia,Italy,Slovakia,Spain	Albania,France,Germany,Greece,Indonesia,Italy,Kosovo,Netherlands,Serbia,Slovakia,Slovenia,Spain,United Kingdom

2.23.2 Assessment

EGI-IISAS-CPU is an installation supporting the Slovakian IISAS provider of the EGI Cloud Compute service in the EOSC Marketplace. The installation delivers CPU resources as Virtual Machines for seven VOs: biomed, vo.access.egi.eu, fedcloud.egi.eu, training.egi.eu, vo.matrycs.eu, vo.nextgeoss.eu and acc-comp.egi.eu. 16 users from 13 different countries have accessed the installation in the reporting period.

It has delivered a total of 958,366 CPU hours from the 6,132,000 available (14.7% of the available VA capacity for the installation was consumed). The current assigned communities to this installation should be able to reach 3,2 M CPU hours consumption so there is still room for assigning more use cases to the installation as they reach the project.

2.24 DESY-FedCloud

Description	DESY is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. DESY is a certified resource center of EGI, fully integrated with the federation.
Task	3.2
URL	
Service Category	Infrastructure service

Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Germany
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, trainings, webinars and hands-on sessions during conferences and events.
Operational since	Jan 2018
User definition	Single researchers, small and big communities

2.24.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	40	Internal service database	0	25	53
CPU/hours	2,102,400	Accounting	0	6,573	14,497
No of countries reach	7	Check-in	0	5	8
Names of countries reach	Germany (XFEL,	Check-in	-	Germany, Italy, Netherlands,	Austria, Denmark, Germany, Hungary, Italy, Netherlands,

	CFEL), France (ESRF, ILL) UK (STFC), Sweden (ESS), Czech Republic (ELI), Netherlands (EGI), Canada (UVIC)			Switzerland, United Kingdom	Romania, Switzerland

2.24.2 Assessment

DESY-Fedcloud supports the delivery of CPU resources from DESY within the EGI Cloud Compute service. The installation has engaged with two communities: vo.openrdm.eu and vo.cite.gr supporting 53 different users from 8 countries. Overall the installation provided 21,070 CPU hours from the 2,000,000 available (1% of the available VA capacity for the installation was consumed). The current assigned communities to this installation will reach 843,000 CPU hours so there is still room for assigning more use cases to the installation as they reach the project.

2.25 CESGA-CPU

Description	CESGA is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CESGA is a certified resource center of EGI, fully integrated with the federation.
Task	3.3
URL	

Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Santiago, Spain
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	2015
User definition	Single researchers, small and big communities

2.25.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	46	Internal service database	18	21	18
CPU/hours	3,465,332	Accounting	426,181	327,860	565,740

No of countries reach	10	Check-in	8	8	8
Names of countries reach	Poland, Germany, Netherlands, Cyprus, China, USA, Greece, Italy, Spain, Portugal	Check-in	Germany, Greece, Indonesia, Italy, Netherlands, Slovakia, Spain, United Kingdom	France, Germany, Greece, Indonesia, Italy, Netherlands, Slovakia, Spain, United Kingdom	Germany, Indonesia, Italy, Netherlands, Portugal, Slovakia, Spain, United Kingdom

2.25.2 Assessment

CESGA-CPU is the installation of CESGA supporting the EGI Cloud Compute service in the EOSC Marketplace. This installation has delivered 1,319,781 of the initially planned 4,500,000 CPU hours during the complete project (29% of the available VA capacity for the installation was consumed). The following VOs were supported over the period: vo.emso-eric.eu, vo.access.egi.eu, vo.deltares.nl, bioisi, and vo.plocan.eu, with a total of 18 users from 8 countries directly interacting with the installation. The existing communities are expected to continue their consumption rate and all the available VA capacity should be consumed before the end of the project.

2.26 CESGA-Storage

Description	CESGA is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CESGA is a certified resource center of EGI, fully integrated with the federation.
Task	3.3
URL	

Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage/
Location	Santiago, Spain
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	2015
User definition	Single researchers, small and big communities

2.26.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	46	Internal service database	46	28	28
TB/month	89	Accounting	93	93	94

No of countries reach	10	Check-in	8	8	8
Names of countries reach	Poland, Germany, Netherlands, Cyprus, China, USA, Greece, Italy, Spain, Portugal	Check-in	Germany, Greece, Indonesia, Italy, Netherlands, Slovakia, Spain, United Kingdom	France, Germany, Greece, Indonesia, Italy, Netherlands, Slovakia, Spain, United Kingdom	Germany, Indonesia, Italy, Netherlands, Portugal, Slovakia, Spain, United Kingdom

2.26.2 Assessment

CSEGA-Storage is the installation associated to CESGA-CPU supporting the EGI Online Storage service. This installation has delivered 281 TB month of the initially planned 905 TB month during the complete project (29% of the available VA capacity for the installation was consumed). The following VOs were supported over the period: vo.emso-eric.eu, vo.access.egi.eu, vo.deltares.nl, bioisi, and vo.plocan.eu, with a total of 18 users from 8 countries directly interacting with the installation.

2.27 IFCA-LCG2-CPU

Description	IFCA-LCG2 is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. IFCA-LCG2 is a certified resource center of EGI, fully integrated with the federation.
Task	3.3
URL	

Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Spain
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	06/2012
User definition	Single researchers, small and big communities

2.27.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	>200	Internal service database	35	41	47
CPU/hours	4,000,000	Accounting	1,217,099	1,778,936	1,318,414

No of countries reach	> 8	Check-in	9	10	12
Names of countries reach	ES, PT, IT, FR, GE, PL, SK, NL	Check-in	Spain, Portugal, Germany, Hungary, Italy, Netherlands, Slovakia, Switzerland, UK	Spain, Portugal, Hungary, Germany, Italy, Switzerland, Netherlands, Nigeria, Slovakia	EEUU, France, Germany, Hungary, Italy, Netherlands, Nigeria, Portugal, Slovakia, Spain, Switzerland, UK

2.27.2 Assessment

IFCA-LCG2 - CPU supports CSIC participation in the EGI Cloud Compute service. The installation has been successfully engaging with eight VOs: openrisknet.eu, opencoast.eosc-hub.eu, vo.access.egi.eu, training.egi.eu, vo.lifewatch.eu, cos4cloud-eosc.eu, minka-sdg.org, and icecube. These brought 47 users from 12 different countries over the reporting period. The installation has exhausted its VA capacity by delivering 4,314,449 CPU hours (172% of the available VA capacity for the installation). As such, some of these communities that can be migrated to other installations will be migrated to better rebalance the consumption for all the installations of the EGI Cloud.

2.28 IFCA-LCG2-Storage

Description	IFCA-LCG2 is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. IFCA-LCG2 is a certified resource center of EGI, fully integrated with the federation.
Task	3.3
URL	
Service Category	Infrastructure service

Service Catalogue	https://www.egi.eu/services/online-storage/
Location	Spain
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	06/2012
User definition	Single researchers, small and big communities

2.28.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	>200	Internal service database	35	41	47
TB/month	500	Accounting	2	9	14
No of countries reach	> 8	Check-in	9	10	11
Names of countries reach	ES, PT, IT, FR,	Check-in	Spain, Portugal, Germany, Hungary,	Spain, Portugal, Hungary,	EEUU, Germany, Hungary, Italy, Netherlands, Nigeria, Portugal,

	GE, PL, SK, NL		Italy, Netherlands, Slovakia, Switzerland, UK	Germany, Italy, Switzerland, Netherlands, Nigeria, Slovakia	Slovakia, Spain, Switzerland, UK

2.28.2 Assessment

IFCA-LCG2 - Storage is the associated installation to IFCA-LCG2 - CPU of the EGI Online Storage service. CSIC participation in the EGI Cloud Compute service and as such it's used by the same communities and users. The installation has delivered 25 TB months over the reporting period out of the total 1,700 available (1.47% of the available VA capacity for the installation was consumed). The supported use cases are expected to increase their storage usage over the coming months to improve the uptake of the installation. A close followup of the use cases will be performed to ensure this consumption takes place.

2.29 INCD-LIP-CPU

Description	Portuguese National Distributed Computing Infrastructure Openstack IaaS cloud computing service (virtual machines)
Task	3.3
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Portugal

Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	2014
User definition	Single researchers, small and big communities

2.29.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	50	Internal service database	14	10	26
CPU/hours	4,751,023	Accounting	486,912	738,166	663,408
No of countries reach	1	Check-in	6	5	8
Names of countries reach	Portugal	Check-in	Germany, Indonesia, Netherlands, Portugal, Slovakia, Spain	Brasil, Portugal, Indonesia, Germany, Chile	Germany, Indonesia, Netherlands, Portugal, Slovakia, Spain, UK, Italy

2.29.2 Assessment

This service is the same as 2.21, assessment is provided in section 2.21.2.

2.30 INCD-LIP-Storage

Description	Portuguese National Distributed Computing Infrastructure Openstack IaaS cloud computing service (storage backend)
Task	3.3
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage/
Location	Portugal
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	2014

User definition	Single researchers, small and big communities

2.30.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	50	Internal service database	14	10	26
TB/month	110	Accounting	27	86	87
No of countries reach	1	Check-in	6	5	8
Names of countries reach	Portugal	Check-in	Germany, Indonesia, Netherlands, Portugal, Slovakia, Spain	Brasil, Portugal, Indonesia, Germany, Chile	Germany, Indonesia, Netherlands, Portugal, Slovakia, Spain, UK, Italy

2.30.2 Assessment

This service is the same as 2.22, assessment is provided in section 2.22.2.

2.31 CYFRONET-CLOUD-CPU

Description	CYFRONET-CLOUD is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CYFRONET-CLOUD is a certified resource center of EGI, fully integrated with the federation.
Task	3.3

URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Krakow, PL
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	08/2014
User definition	Single researchers, small and big communities

2.31.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	3	Internal service database	1	6	27

CPU/hours	253,294	Accounting	34,306	117,504	55,495
No of countries reach	3	Check-in	1	4	1
Names of countries reach	FR, IT,PL	Check-in	UK	IT, PL, ES, UK	ID

2.31.2 Assessment

CYFRONET-CLOUD-CPU is the installation of CYFRONET supporting the EGI Cloud Compute service in the EOSC Marketplace. This installation has delivered 207,304 of the initially planned 8,500,000 CPU hours during the complete project (2.44% of the available VA capacity for the installation was consumed). The provider has engaged with the vo.access.egi.eu VO that supports piloting activities for 27 users from 2 different countries. The allocated capacity for this piloting activity at the provider is not enough to cover all the VA units available at the provider and therefore use cases running at providers reaching their limits in capacity will be rebalanced to also use CYFRONET-CLOUD-CPU. New use cases reaching the project should be also allocated to the installation.

2.32 CYFRONET-CLOUD-Storage

Description	CYFRONET-CLOUD is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CYFRONET-CLOUD is a certified resource center of EGI, fully integrated with the federation.
Task	3.3
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage/

Location	Krakow, PL
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	08/2014
User definition	Single researchers, small and big communities

2.32.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users communities supported from EGI VOs	3	Internal service database	1	1	1
TB/month	120	Accounting	0.63	0.39	0.2
No of countries reach	3	Check-in	1	1	1
Names of countries reach	FR, IT,PL	Check-in	United Kingdom	United Kingdom	Indonesia

2.32.2 Assessment

CYFRONET-CLOUD-Storage is the associated installation to CYFRONET-CLOUD-CPU supporting the EGI Online Storage. This installation has delivered 1 TB month of the initially planned 4,500 during the complete project (0.03% of the available VA capacity for the installation was consumed). Similarly to the CPU installation, the allocated capacity for this piloting activity at the provider is not enough to cover all the VA units available at the provider and therefore use cases running at providers reaching their limits in capacity will be rebalanced to also use CYFRONET-CLOUD-Storage. Additionally, to increase the usage, the WP6 DataHub installation will rely on this installation for increasing its capacity to support new use cases.

2.33 IICT-BAS-CPU

Description	The Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences (IICT-BAS) has a leading position among the scientific institutions in Bulgaria in the fields of Grid, Cloud and HPC computing, linguistic and semantic technologies, intelligent systems, signal and image processing. The institute is operating the supercomputer system Avitohol, which took 331st place in the top 500 list in June 2015 with a peak performance of 264,2 Tflops.
Task	3.3
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Bulgaria
Duration	M1-M30

Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	Jun 2015
User definition	Single researchers, small and big communities

2.33.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	150	Internal service database	0	0	0
CPU/hours	7,257,600	Accounting	0	0	0
No of countries reach	3	Check-in	0	0	0
Names of countries reach	Bulgaria, Albania, Germany, Romania, Russia, Serbia, UK	Check-in	-	-	-

2.33.2 Assessment

IICT-BAS is a new provider of the EGI Cloud Compute service. Due to staffing issues, it has not yet managed to integrate with the rest of the infrastructure and hasn't been able to deliver any capacity. A mitigation plan considering redistribution of the allocated VA budget to providers reaching the limits of their capacity is being developed at the moment.

2.34 IICT-BAS-Storage

Description	The Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences (IICT-BAS) has a leading position among the scientific institutions in Bulgaria in the fields of Grid, Cloud and HPC computing, linguistic and semantic technologies, intelligent systems, signal and image processing. The institute is operating the supercomputer system Avitohol, which took 331st place in the top 500 list in June 2015 with a peak performance of 264,2 Tflops.
Task	3.3
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage/
Location	Bulgaria-GSIOS
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation

Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	June 2015
User definition	Single researchers, small and big communities

2.34.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	150	Internal service database	0	0	0
TB/month	180	Accounting	0	0	0
No of countries reach	3	Check-in	0	0	0
Names of countries reach	Bulgaria, Albania, Germany, Romania, Russia, Serbia, UK	Check-in	-	-	-

2.34.2 Assessment

This installation is associated with IICT-BAS-CPU and as such has not been able to deliver any capacity.

2.35 CLOUDIFIN-CPU

Description	CLOUDIFIN is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CLOUDIFIN is a certified resource center of EGI, fully integrated with the federation.
Task	3.3
URL	
Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/cloud-compute/
Location	Romania
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, training, webinars and hands-on sessions during conferences and events.
Operational since	Mar 2017
User definition	Single researchers, small and big communities

2.35.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	7	Internal service database	4	7	7
CPU/hours	17,849	Accounting	106,901	516,443	1,828,563
No of countries reach	2	Check-in	1	2	2
Names of countries reach	RO, IT	Check-in	Romania	Iceland, Romania	Iceland, Romania

2.35.2 Assessment

CLOUDIFIN-CPU is the installation of IFIN-HH supporting the EGI Cloud Compute service in the EOSC Marketplace. This installation has delivered 2,451,907 of the initially planned 5,000,000 CPU hours during the complete project (49.04% of the available VA capacity for the installation was consumed). The following VOs were supported over the period: vo.access.egi.eu and perla-pv.ro, supporting 7 users from 2 countries. The consumption trend of the perla-pv.ro community assures the consumption of all the VA capacity before the end of the project.

2.36 CLOUDIFIN-Storage

Description	CLOUDIFIN is a federated IaaS Cloud provider of the EGI Cloud Compute service that offers users scalable and elastic resources on-demand controlled via APIs. CLOUDIFIN is a certified resource center of EGI, fully integrated with the federation.
Task	3.3
URL	

Service Category	Infrastructure service
Service Catalogue	https://www.egi.eu/services/online-storage/
Location	Romania
Duration	M1-M30
Modality of access	Services are free at the point of use. Access to the service require registration as an EGI user on Check-in and enrolment into a Virtual Organisation for authorisation
Support offered	Technical support is provided via the helpdesk central support team, and by the support team at the installation. EGI provides central documentation, trainings, webinars and hands-on sessions during conferences and events.
Operational since	Mar 2017
User definition	Single researchers, small and big communities

2.36.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of users	7	Internal service database	2	7	7
TB/month	0.32	Accounting	5	0.96	1

No of countries reach	2	Check-in	1	2	2
Names of countries reach	RO, IT	Check-in	Romania	Iceland, RO	Iceland, Romania

2.36.2 Assessment

CLOUDIFIN-Storage is the associated installation to CLOUDIFIN-CPU (IFIN-HH) supporting the EGI Online Storage. This installation has delivered 7 TB month. During the analysis of the available units for this installation, it was discovered an overestimation in the number of units to be delivered (12,000 TB month initially) which is currently being under analysis for a future amendment that will fix the issue. Even with the reduction that will stem from this amendment, the installation requires new use cases that can consume the available capacity as the existing use cases are not demanding enough storage resources: the eli-np community which participates via IFIN-HH in the HPC integration task (T7.3) has been contacted as a candidate to increase uptake of the installation.

3. Dissemination

In this section we report the list of events in the context of EGI-ACE that WP3 partners contributed to this period, some of them also mentioned previously, reporting the number of attendees to measure the possible user interests.

Table 5 - Dissemination activities related to WP3 installations

Type of Activity	Title	Date	Name of Event	Location	Type of Audience	Reach	Scale
Presentation	Infrastructure services: Highlights from the compute, data, security areas	2021/02/05	EGI-ACE public launch event	Online	Scientific Community, General Public	250	worldwide
Workshop	EGI-ACE Communities Workshop	2021/02/16-17	EGI-ACE Communities Workshop	Online	Scientific Community, General Public	150 people	worldwide
Webinar	Managing Singularity, Docker and udocker containers, and Kubernetes clusters in the EGI Cloud	2021/04/28	EGI Webinar 2021	Online	Scientific communities, and programmers who support research and education.	Num. of Participants: 39 Num. of Countries: 14	worldwide
Webinar	Deploying virtual infrastructures with	2021/05/26	EGI Webinar 2021	Online	Scientific communities, for programmers	Num. of Participants: 20 Num. of	worldwide

	Infrastructure Manager (IM)				and IT-service providers who support research and education.	Countries: 10	
Webinar	Using Dynamic DNS service in EGI Cloud infrastructure	2021/06/16	EGI Webinar 2021	Online	Scientific communities, developers, integrators, and end users	Num. of Participants: 20 Num. of Countries: 8	worldwide
Webinar	Using EGI Cloud infrastructure with fedcloudclient	2021/09/29	EGI Webinar 2021	Online	Scientific communities, developers, integrators, and end users	Num. of Participants: 29 Num. of Countries: 13	
Presentation	Dealing with dynamic and mixed workloads	2021/09/20-24	HTCondor Workshop Autumn 2021	Online	Developers, service admins, users	~100	Worldwide
Training event	Open stage - Show Us Your Toolbox	2021/09/20-24	HTCondor Workshop Autumn 2021	Online	Developers, service admins, users	~100	Worldwide
Panel discussion	HTCondor philosophy and architecture	2021/09/20-24	HTCondor Workshop Autumn 2021	Online	Developers, service admins, users	~100	Worldwide
Presentation	Running containers and Kubernetes in the EGI Federation	2021/11/10	ARCOS Symposium	Online	Other: Australian providers, supporters of use cases	25	Australia
Presentation	The EGI	2021/10/19	EGI	Online	IT providers,	40	Global

	Federated Cloud: benefits for service providers and customers		Conference 2021		Research Community reps.		(mostly European)
Presentation	Using EGI Cloud infrastructure with fedcloudclient	2021/10/20	EGI Conference 2021	Online	IT providers, Research Community reps.	40	Global (mostly European)
Presentation	Using Dynamic DNS service in EGI Cloud infrastructure	2021/10/20	EGI Conference 2021	Online	IT providers, Research Community reps.	40	Global (mostly European)
Presentation	The EGI-ACE Cloud and HTC providers	2021/10/20	EGI Conference 2021	Online	IT providers, Research Community reps.	40	Global (mostly European)

4. Satisfaction

In this chapter we report the satisfaction on the WP3 installations are reported by EGI Customer interviews and the number of orders coming from the EOSC Portal.

4.1. EGI Customer satisfaction reviews

EGI regularly interviews Communities using the services with an active Service Level Agreement (SLA), in order to measure the satisfaction 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 WP3 services interviewed are reported in table 6 (for those communities with several interviews in the period, only the last one is reported). Those issues or feature requests collected in the table are processed and added as technical requirements for the EGI services affected. Over this period 12 of these feature requests have been registered. Operational issues are registered via the EGI Helpdesk.

Table 6 - Communities interviewed during the first 15 months of EGI-ACE project

Community	WP3 installations used	Level of satisfactions and comments	Issues/feature requests reported with WP3 installations
VESPA	EGI Cloud Compute EGI Online Storage	5. Very satisfied	
AiiDAlab	EGI Cloud Container Compute EGI Online Storage	3: Somewhat satisfied Hard to navigate through the process steps, find the documents once generated and understanding how all the EGI components work together	Get access to Kubernetes deployment recipes for managing it in case of need Monitoring of Kubernetes needs improvement
EMSO-ERIC	EGI Cloud Compute EGI Online Storage	4: Satisfied The process didn't require	During the resources provisioning it should be

		significant overhead for the customer.	possible to select which HW type fits the community needs.
NBIS	EGI Cloud Compute	4: Satisfied Robustness and technical support of services are good.	Documentation for creating custom VA in the EGI AppDB (exporting and importing functionalities). Needed support to use Terraform in EGI. Sharing documentations and material.
OpenBioMap	EGI Cloud Compute EGI Online Storage	5 very satisfied No problem VMs so far, we didn't use it very intensive	
BioMed (LSGC)	EGI Cloud Compute EGI High Throughput Compute EGI Online Storage	5. Very satisfied People are active and helpful but space for improvements	
WeNMR	EGI Cloud Compute EGI High Throughput Compute EGI Online Storage	5. Very satisfied Nothing to report since the last review. Things are going smoothly over the year.	Move from X.509 certificates to token-based authentication
BELLE-II	EGI Cloud Compute	5: Very Satisfied	
EISCAT-3D	EGI Cloud Compute	5 Very satisfied We do not have other Cloud providers, so we cannot	

		compare. But the Cloud service received is fine.	
Fusion	EGI Cloud Compute	5: Very satisfied	Availability of cloud benchmarks would be a nice to have, to guide the customers when selecting the resources
OBSEA	EGI Cloud Compute EGI Online Storage	3: Somewhat satisfied Due to incidents in the cloud provider. Currently negotiating the migration to a new provider in the EGI Federation.	
Terradue	EGI Cloud Compute EGI Online Storage	4. Satisfied	Consider having a dashboard to monitor the status of the customer resources/requests.
EMPHASIS	EGI Cloud Compute EGI Online Storage	4: Satisfied. Good technical support offered by EGI to the customer. The integration of EGI services in the EMPHASIS Information System is still continuing.	
ExTraS	EGI Cloud Compute EGI Online Storage	5: Very satisfied	
Peachnote	EGI Cloud Compute EGI Online Storage	5. Very satisfied	The customer suggested having a way to easily resize the volumes.
CLARIN	EGI Cloud Compute	4: Satisfied.	MTU support in Docker

	EGI Online Storage	The customer reported a delay in the communication with the provider.	sometimes is a pain in OpenStack providers Some data was lost at INFN-BARI because the VM was corrupted. In Jan. 2021 there were temporarily issues at CESGA. The provider didn't support the authentication with Check-In.
BioISI	EGI Cloud Compute EGI Online Storage	5: Very Satisfied	
ECRIN-ERIC	EGI Cloud Compute EGI Online Storage	5. Very satisfied Good technical support received from the provider/shepherd via the Helpdesk The connection with the servers was fast.	
STARS4ALL	EGI Cloud Compute EGI Online Storage	5: Very satisfied The process is efficient, effective, and easy to follow for the user communities	
GoSafe	EGI Cloud Compute EGI Online Storage	5. Very satisfied	
LOFAR	EGI High Throughput Compute EGI Online Storage	4: Satisfied (Compute and dCache installations) 3: Somewhat satisfied (Spider Storage)	

4.2. EOSC Portal 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. EGI Cloud Compute is the service with more orders in the EOSC Portal during the M1-M15 period (13% of the total number of the orders placed within the EOSC Marketplace were submitted to this service).

Table 7 - Number of Orders from the EOSC Marketplace related to WP3 installations

EOSC Portal Service	Number of orders
EGI Cloud Compute	39
EGI Cloud Container Compute	6
EGI Online Storage	20
EGI High Throughput Compute	3
Infrastructure Manager	2