# What does it take to deliver 24/7 services?

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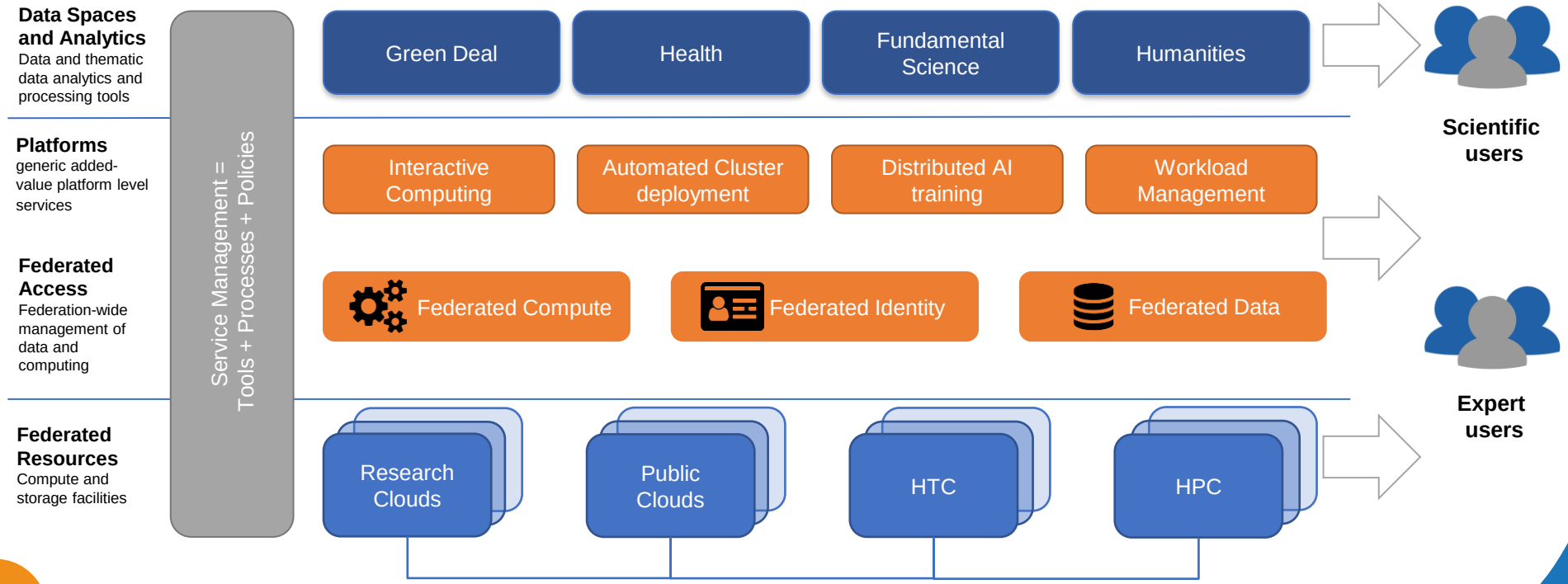
# Outline…

- The EOSC Compute Platform and the Service Management tools
- The integration of the EGI-ACE services
- Cloud integration programme
- Creation of Operational and Service Level Agreements
- Impact on open science and on skills and expertise

# The EOSC Compute Platform



# Services enabling federated computing in EOSC

| | |
|---|---|
| Configuration Database | Information about sites and hosted services |
| Authentication and Authorisation | Federated Access - Login with your own credentials |
| Accounting | Repository and Portal for usage records |
| Messaging | Real-time messaging service for exchanging information |
| Monitoring | Healthiness of our services |
| Operations Portal | Tools for supporting Operations and Security activities |
| Helpdesk | Point of contact to ask for support at EGI |
| Software Provisioning Infrastructure | Middleware Quality Assurance and distribution |
| Helpdesk Human support | 1st and 2nd level support |
| Operations Coordination | To guarantee a seamless federated infrastructure |
| Security Oversight | Security policies and monitoring, vulnerabilities and incidents handling |
| Green Computing | Task force, best practices to improve the energy efficiency |

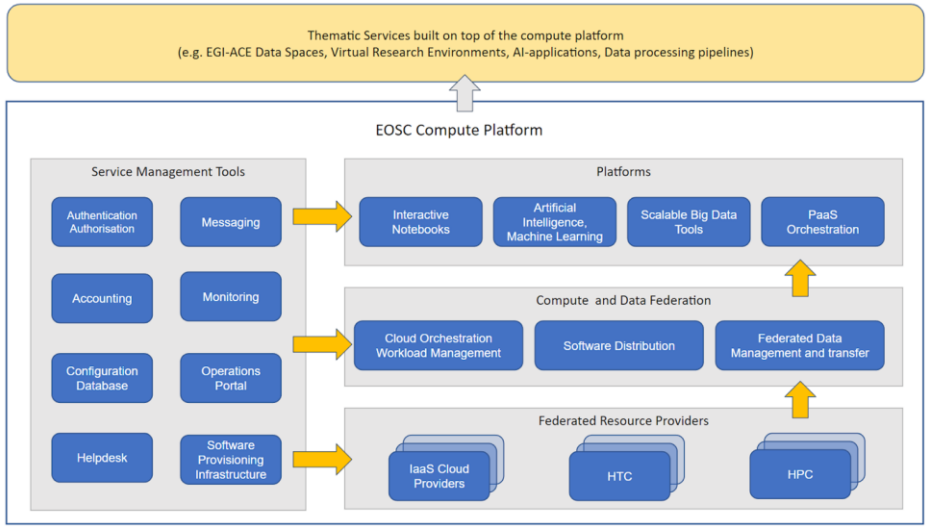
# The integration of the EGI-ACE services

EGI-ACE integrate services from:

- EGI Foundation
- EGI Community

EGI Foundation Service Management System based on IT Standards ISO/IEC 20000-1:2018 and FitSM

- Outlines the requirements for design, transition, delivery and improvement of IT services
- Provides value for both the customers and the service providers
- Certification obtained in 2016
- SMS structured and organised into processes and procedures according to the standard




Main objective of the EGI SMS:

- bring all the EGI-ACE Service Portfolio under the same umbrella
- raise the maturity of the service providers

# Integration with EGI F. SMS ISO20K/FitSM

*Compute, Data Federation, Platform, Access Federation Services*

- Lightweight approach
  - Not all of them might be included in the EGI Foundation portfolio
- Operational Level Agreements
  - Terms and conditions to operate the services
  - Description of the service, definition of Service Level Targets, provision of user support, etc…
- Registration in the Configuration database
  - Source of information for several services in the ECP
- Capacity plan, and Availability and Continuity plan
  - To assess and monitor the consumption of the resources
  - To assess and implement countermeasures to reduce the likelihood and the impact of availability and continuity risks
- Tracking incidents and service requests
  - Registration in the EGI Helpdesk
- Registration in the Suppliers Database
- Performance reports
  - According to requirements defined in the OLAs

# Integration with SMS of new services (I)

*EOSC Compute Platform: Compute and data federation services*

| EGI-ACE service | Monitored? | Has a Helpdesk support unit? | Has an entry in the Configuration Database? | Has a capacity plan? | Has an availability and continuity plan? |
|---|---|---|---|---|---|
| DynamicDNS | YES | YES | YES | YES | YES |
| AppDB | YES | YES | YES | YES | YES |
| Rucio | YES | YES | YES | YES | YES |
| OpenRDM | YES | YES | YES | NO | NO |
| CVMFS | YES | YES | YES | YES | YES |

# Integration with SMS of new services (II)

*EOSC Compute Platform: Platform services*

| EGI-ACE service | Monitored? | Has a Helpdesk support unit? | Has an entry in the Configuration Database? | Has a capacity plan? | Has an availability and continuity plan? |
|---|---|---|---|---|---|
| EC3 | YES | YES | YES | YES | YES |
| Infrastructure Manager | YES | YES | YES | YES | YES |
| DODAS | YES | YES | YES | NO | NO |
| Binder | YES | YES | YES | YES | YES |
| Indigo PaaS Orchestrator | YES | YES | YES | NO | NO |
| DEEP training solution | NO | NO | YES | NO | NO |

# Cloud integration programme

- The EGI Cloud federation, with 23 federated providers in 2021, was an important asset to the project.
- EGI-ACE has been running an ambitious extension programme to increase the capacity and geographical footprint of this federated infrastructure.

**Entry level**
- Joining the ‘AAI federation’
- It provides single sign-on across clouds and between EGI-ACE and EOSC services.

Target by commercial providers:

- CloudFerro
- T-Sytems

**Medium level**
- joining the application federation (through AppDB) and the data federation (through DataHub) besides the AAI federation
- enable the exchange of applications and scientific datasets between EOSC and those national clouds

Targeted by national cloud providers of:
- Moldova
- Latvia
- Armenia
- Georgia

**Full integration**
- Integration with Federating Services, and coord. Activities
- Involvement in international resource allocation and delivery scenarios with Service Level Agreements.

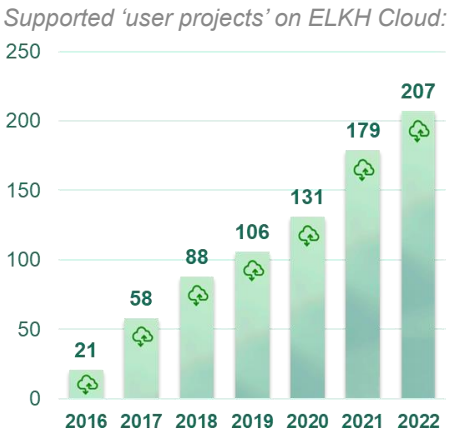
Reached by OpenStack clouds from:
- Greece (GRNET)
- Italy (INFN CNAF),
- Germany (GSI)
- Hungary (ELKH Cloud),
- Ireland (Walton Institute)
- China (CSTCloud)
- South Africa (ILIFU)

# A fully integrated cloud: ELKH Cloud in Hungary

| | ELKH Cloud |
|---|---|
| vCPU | 5900 |
| vGPU | 512* |
| RAM | 28 TB |
| SSD | 338 TB |
| HDD | 1250 TB |
| Network speed | 100 Gbps |

*theoretical maximum 2060

- For Hungarian researchers from the Eötvös Loránd Research Network (ELKH) AND their international collaborators
- Setup started in 2015, established in 3 phases, operation since 2021




Supported community from EGI-ACE:

OpenBioMaps
sustainable diversity

Elevating integration for:

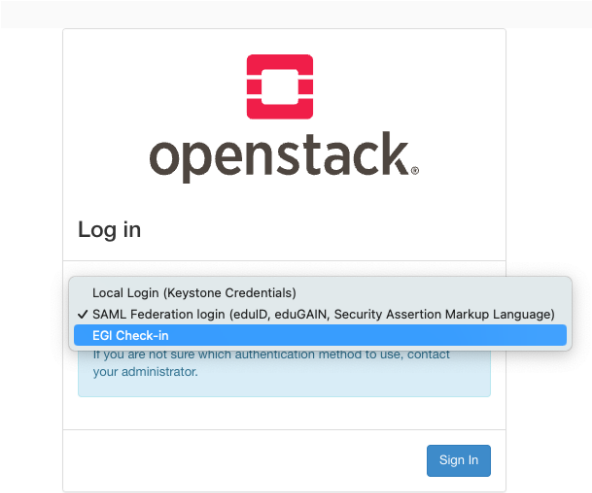
AI4PublicPolicy

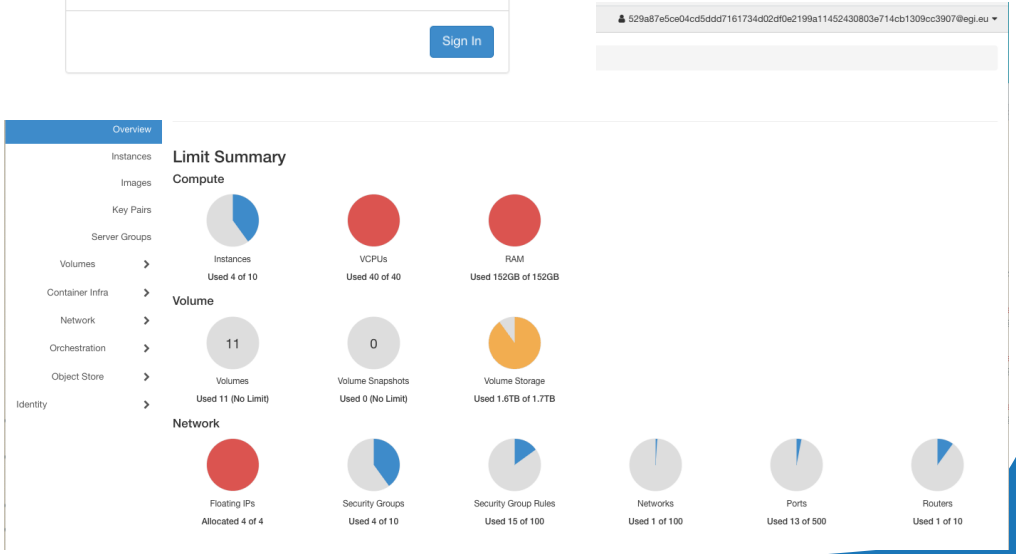
(A pay-for-use SLA)

ELKH Cloud SZTAKI Wigner ELKH Eötvös Loránd Research Network

# Check-in integration

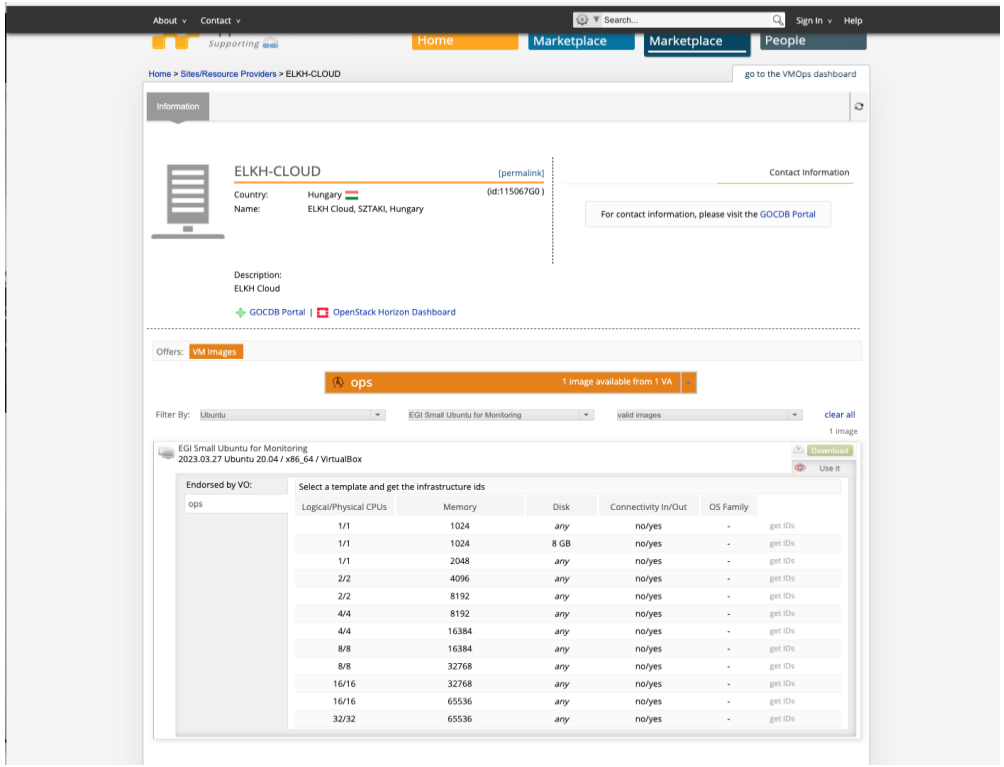
- **Enables EGI users to access the resources**
  - Via dashboard and API/CLI
- **Site maps EGI users to local projects**
  - Based on the EGI VO membership



# AppDB integration

- *Images from AppDB are sync'ed to the supported VO projects*
  - Automatically updated
  - Automated discovery with ids of flavors and images so users can start VMs right away
  - Also provides link to OpenStack dashboard

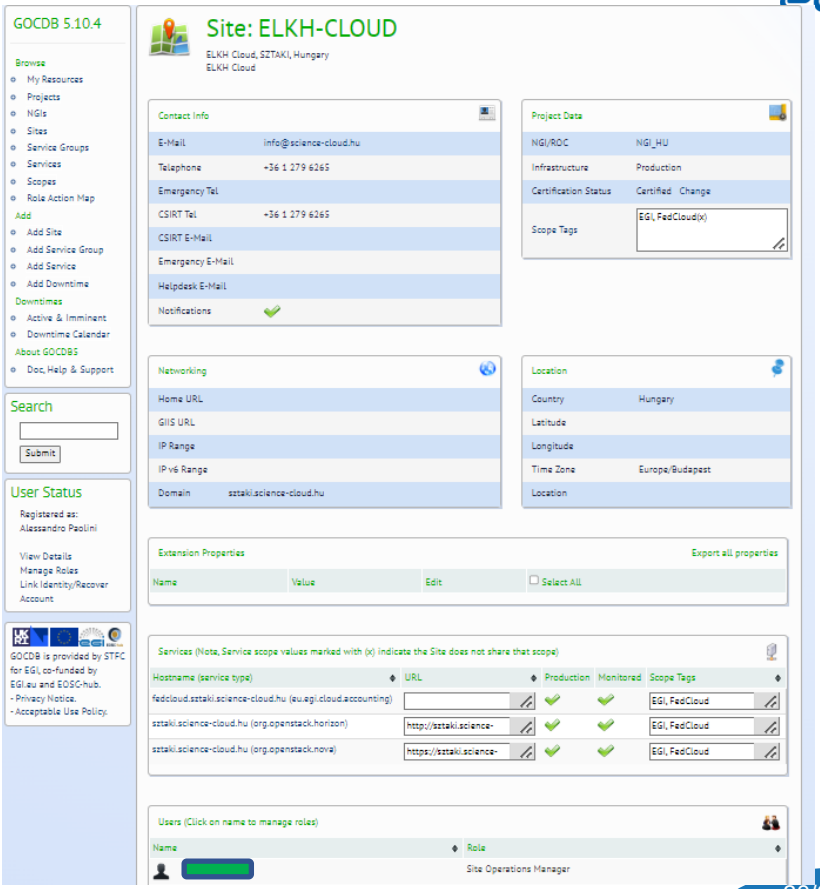



https://appdb.egi.eu/store/site/elkh-cloud

# Preliminary step for expert level: Registration in the EGI Configuration DB (GOCDB) as a Resource Centre

- *PROC09 - Creates entry in GOCDB*
  - Status: certified
  - Infrastructure: Production
  - Scope tags: EGI, FedCloud
- *Enables monitoring, accounting and cloud-info discovery*
- *3 endpoints registered*
  - org.openstack.nova - main entry point for EGI users
  - org.openstack.horizon - discoverability of dashboard
  - eu.egi.cloud.accounting - enables accounting

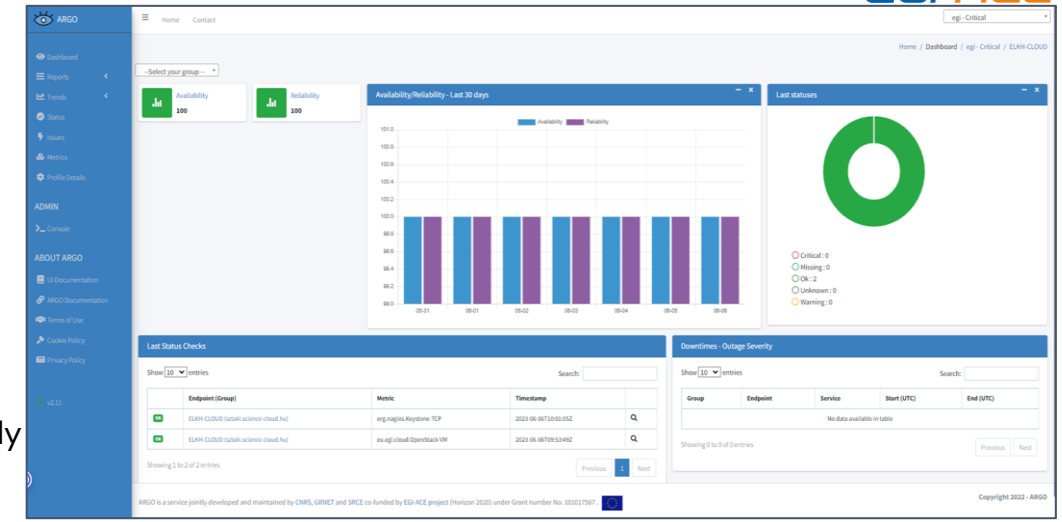
https://goc.egi.eu/portal/index.php?Page_Type=Site&id=3553

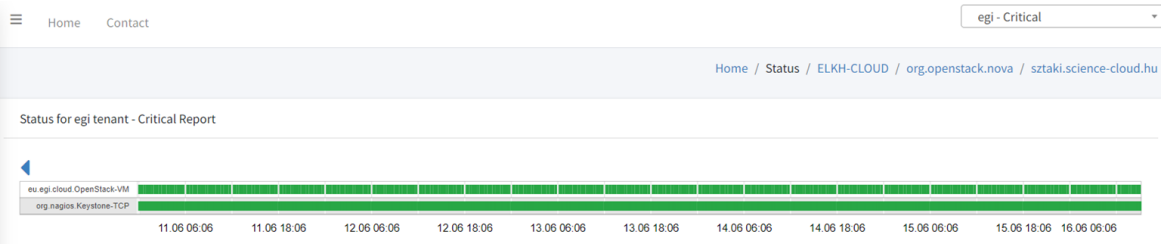


https://argo.egi.eu/egi/dashboard/Critical/ELKH-CLOUD

# Monitoring

- ***Check 1: service is reachable***
  - Just tries to connect to the HTTPS endpoint
- ***Check 2: starts a VM***
  - Needs Check-in and AppDB Sync to work
  - Tests from a user perspective using the “ops” VO
- **Check 3: accounting freshness**
  - Checks if accounting records were sent recently
- **Check 4: discovery freshness**
  - Checks if the AppDB has recent information about the site



# Overall EGI Cloud uptake during EGI-ACE (CPU-hours)

*From 23 to 29 federated cloud sites*

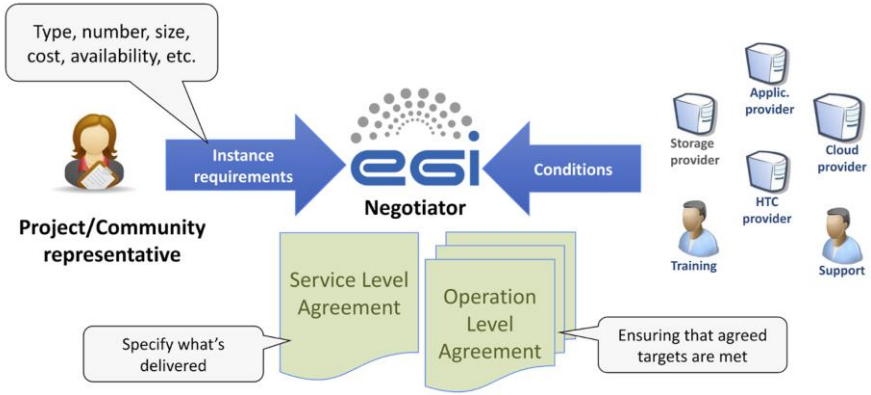
**159 Million CPU-hours delivered since Jan 2021**
**102 Million CPU-hours for EGI-ACE users**

- Virtual Access: 72 Mill CPUh
- Local funds: 25 Mill CPUh
- Pay-for-use: 5 Mill CPUh

} **+40% on top of VA**

# Resource Centres, OLAs, VO SLAs (I)

- RCs read, understand, and accept the:
  - Resource Centres Operational Level Agreement that defined the minimum set of operational services and the respective quality parameters to provide
    - i.e. monthy Availability/Reliability targets: 80%/85%
    - Ticket response time according to tickets priority
  - Security Policies defined in EGI to guarantee that all the security aspects with the service delivery are fulfilled and enforced.
- EGI F. as a matchmaker between
  - service expectations and needs of the Virtual Organisations (VOs)
  - the capabilities of the RCs
- selection of the providers through an open call
  - technical requirements collected from the customer(s)



# Resource Centres, OLAs, VO SLAs (II)

- Set-up of a VO Operational Level Agreement(s) (OLA) between the RCs and the EGI Foundation for providing the services through the EGI Portfolio to support the user community.
- Creation of a VO Service Level Agreement (SLA) between EGI F. and the given user community for the provisioning of the requested service

SLA reports

Date Range: 2022-10-01 / 2023-04-30

< Backwards

Column visibility | Export | EGI Template

Search:

| SLA Reports | Site | 2022-10 | | 2022-11 | | 2022-12 | | 2023-01 | | 2023-02 | | 2023-03 | | 2023-04 | | Violations | Thresholds | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Av | Re | Av | Re | Av | Re | Av | Re | Av | Re | Av | Re | Av | Re | | Av | Re |
| cloud.recas.ba.infn.it | INFN-CLOUD-BARI | 100 | 100 | 98.46 | 98.46 | 99.91 | 99.91 | 99.96 | 99.96 | 99.57 | 99.57 | 99.64 | 99.64 | 99.72 | 99.72 | 0 | 90 | 95 |
| cloud.ui.savba.sk | IISAS-FedCloud | 99.87 | 99.87 | 99.81 | 99.81 | 100 | 100 | 99.93 | 99.93 | 99.6 | 99.6 | 99.67 | 99.67 | 100 | 100 | 0 | 95 | 95 |

Service performance reports for the given VO SLA

# Impact on Skills and Expertise

*Improved service maturity through FitSM*

- EGI-ACE delivered FitSM training to increase the maturity of service management within the consortium and among IT service providers of EOSC in general.
- Since January 2021, the project has delivered 18 FitSM training sessions
  - 13 foundation levels
  - 5 advanced levels
- 11 courses were held as 'in-house training', dedicated to the staff of a certain organisation/project/community
- 2 were 'open courses', being open for any attendee.

**over 200 participants who gained 167 FitSM Foundation Certificates and 46 FitSM Advanced Certificates**

**FitSM** is a lightweight standard for IT service management. It brings order and traceability with simple, practical support. It provides a standard conceptual and process model setting out realistic requirements and pragmatic implementation.

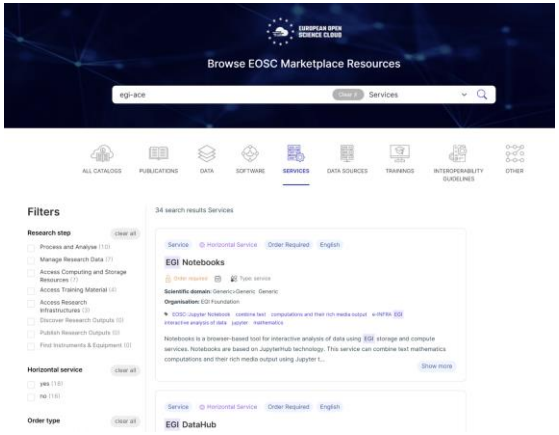
# Impact on Open Science

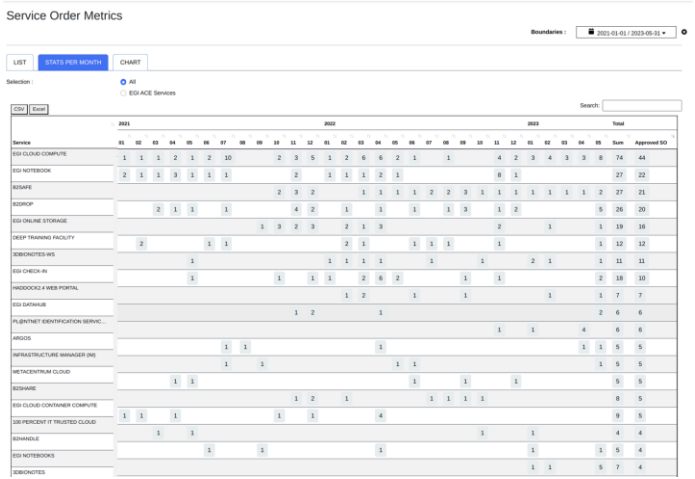
*Objective: "...deliver integrated computing, platforms data spaces and tools as an integrated solution aligned with major European cloud federation projects and HPC initiatives.*

***36 EGI-ACE services in EOSC out of 413 (9%)***

***194 EGI-ACE orders out of 560 (34.6%)***
***10 services in the 'most ordered top 20'***

The EGI-ACE services are made available for users through the EOSC Portal and its Marketplace, as well as through an 'Open Call' which is a web form that is continuously available on the EGI-ACE website and attracts user communities to describe their access request alongside the usage case.



# Thank you!

Contact: **egi-ace-po@mailman.egi.eu**
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