



# EGI Workload Manager Service

Development and service activity in EGI-ACE project

Gino MARCHETTI (CNRS/CC-IN2P3) - gino.marchetti@cc.in2p3.fr

## Virtual DIRAC Users' Workshop – May 9-10<sup>th</sup>, 2022

**Dissemination level:** Public

**Disclosing Party:** EGI-ACE Dirac team

**Recipient Party:** DIRAC community



EGI-ACE receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 101017567.

## ➤ Introduction

- IN2P3 Computing Centre
- EGI-ACE Project

## ➤ EGI-WMS activity

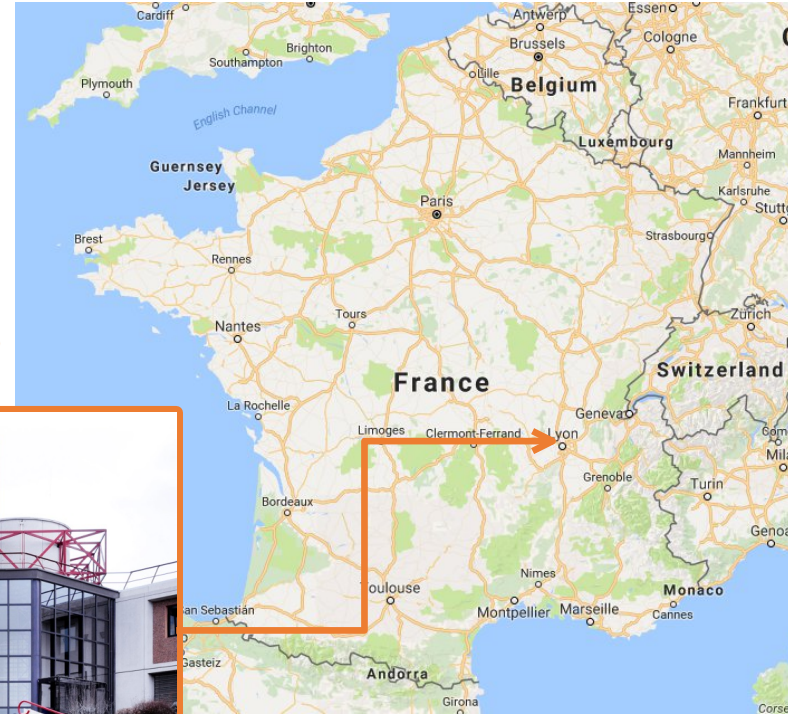
- Service description & status
- Development and Support summary

## ➤ Conclusion

- Questions & answers
- EGI-ACE call for use cases

# CC-IN2P3 at a glance

- Academic data center in Lyon, France
  - Compute (59kslots)
  - Storage (Disk 65 PB, MSS 100 PB)
  - IT services
- LHC Tier-1+ many other experiments (~70)
  - Mainly HEP but not only
- EOSC services hosting
  - Operations portals
  - EGI WMS



# EGI-ACE project

Implement the **Compute Platform of the European Open Science Cloud** and contribute to the **EOSC Data Commons** by delivering integrated computing, platforms, data spaces and tools as an integrated solution.



# EGI-ACE services



- EGI-ACE delivers the Compute platform in EOSC  
(31 different services from 61 providers)
  - Compute continuum with HTC, Cloud and HPC
  - Online data analytics services
  
- Most of the services are available in the EOSC Portal:  
[https://marketplace.eosc-portal.eu/services?related\\_platforms=52](https://marketplace.eosc-portal.eu/services?related_platforms=52)

# EGI-WMS activity

- *Service description*
- *Questions & answers (1 of 2)*
- *Development and Support summary*

# EGI Workload Manager



- One of the services in the EOCS Marketplace Catalogue

<https://marketplace.eosc-portal.eu/services/egi-workload-manager>

- Development team in CPPM
- Managing user jobs running on the EGI computing resources
- Based on the DIRAC Interware distributed computing framework



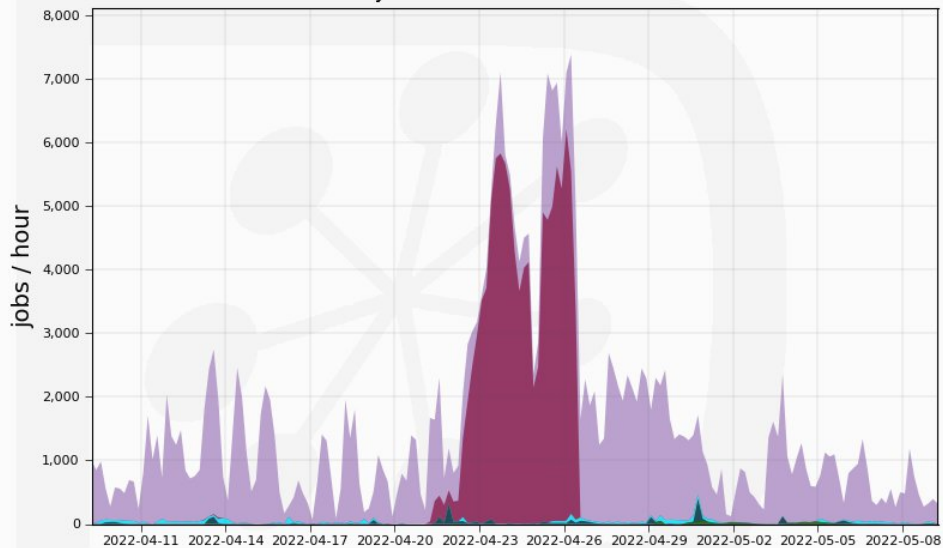
**EUROPEAN OPEN  
SCIENCE CLOUD**



# WMS last month activity



Jobs by UserGroup  
30 Days from 2022-04-09 to 2022-05-09

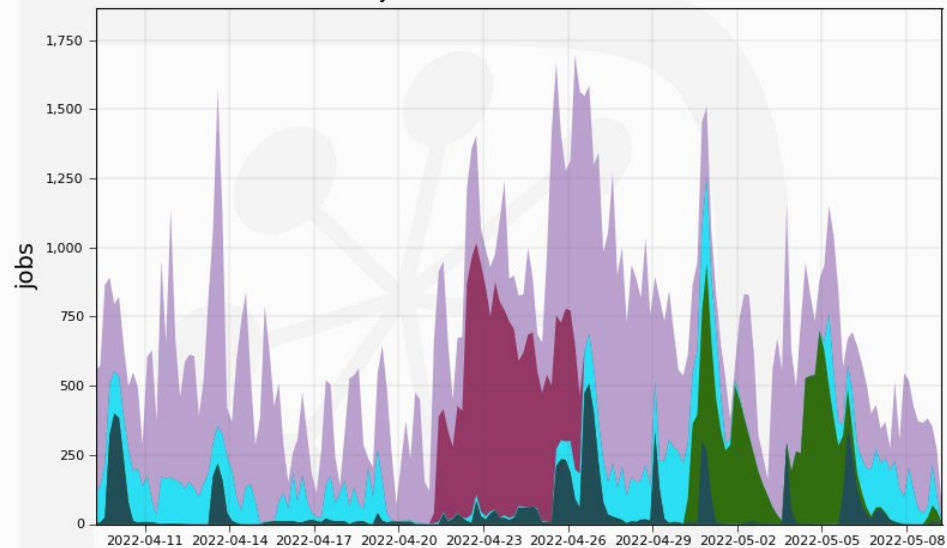


Max: 7,389, Min: 71.2, Average: 1,605, Current: 318

wenmr_user	61.0%	sbg_user	1.4%	hess_user	0.2%
complex_user	36.5%	biomed_user	0.9%		

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Running jobs by UserGroup  
30 Days from 2022-04-09 to 2022-05-09



Max: 1,697, Min: 66.7, Average: 697, Current: 66.7

wenmr_user	56.0%	sbg_user	13.5%	biomed_user	6.9%
complex_user	14.2%	hess_user	9.3%		

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# EGI Workload Manager (Q&A)



- Which DIRAC version do you use in production?
  - All servers are in v7r3p15
  - Migration to Python 3 almost completed for the client
- What do you use DIRAC for, and which DIRAC functionalities you don't use, and why?
  - A variety of user jobs from small to long ones often coming from application portals. Not used: Transformation/Production system; RMS systems (used only for failover)
- Do you have a DIRAC extension? Why?
  - EiscatDIRAC (custom FileCatalog ACL policies, DFC Web application)
  - EscapeDIRAC (special service to manage CORSIKA containers, Web application)
  - Some extensions already moved to vanilla DIRAC, e.g. FC Web application to select input data to be passed directly to the Job Launchpad app. Others are app specific so far.

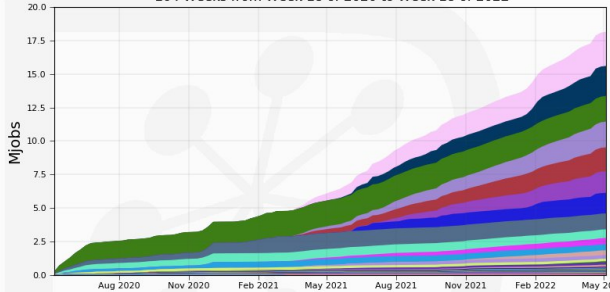
# WMS service status

➤ Q: In the last two years, what has been the DIRAC usage in terms of jobs ran, CPU (or wall time) used, and data transfers?

- Jobs (cumul): 18.2M [last year: 12.1M]
- CPU (cumul): 1865 years [last year: 782 y.]
- Data (cumul): 1.71 PB [last year: 1.2 PB]

Cumulative Jobs by Site

104 Weeks from Week 18 of 2020 to Week 18 of 2022



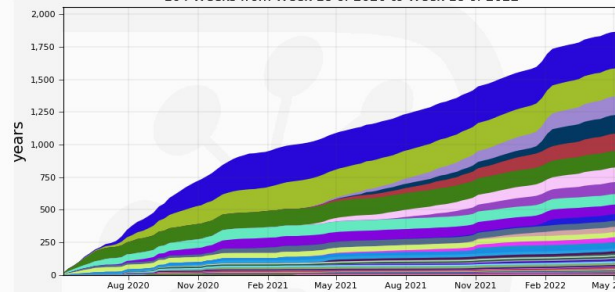
Max: 18.2, Min: 0.21, Average: 7.79, Current: 18.2

EG1 NIKHEF.nl	2.6	EG1 CPPM.fr	0.5	EG1 TRIESTE.it	0.1
EG1 GRIF.fr	2.2	LCG GRIF.fr	0.1	LCG CESNET.cz	0.1
LCG LPNHE.fr	1.9	EG1 IRES.fr	0.4	EG1 INGRID.pt	0.0
EG1 GRIDKA.de	1.9	OSG OSG.us	0.3	EG1 DESY2N.de	0.0
EG1 RAL.uk	1.8	LCG DESY2N.de	0.2	ARC RAL.uk	0.0
EG1 SARA.nl	1.6	EG1 CBPF.br	0.1	LCG LPNHE.fr	0.0
EG1 UKIAC.uk	1.5	EG1 ULB.be	0.1	EG1 ROMA3.it	0.0
LCG LAL.fr	1.2	LCG NIKHEF.nl	0.1	LCG LAPP.fr	0.0
LCG SBC.fr	0.6	EG1 LNL.it	0.1	plus 74 more	

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CPU used by Site

104 Weeks from Week 18 of 2020 to Week 18 of 2022



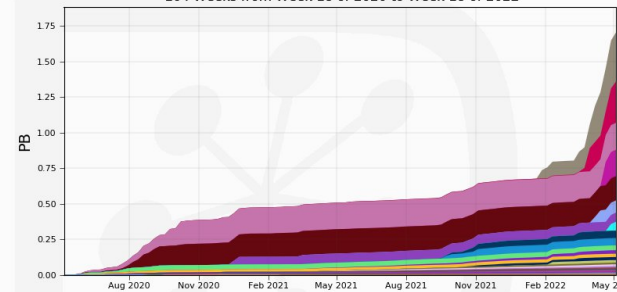
Max: 1,865, Min: 10.8, Average: 1,057, Current: 1,865

LCG CESNET.cz	280.9	LCG UNAM.mx	74.6	EG1 PRAGUE.cz	15.8
LCG NIKHEF.nl	215.3	EG1 UKIAC.uk	49.6	EG1 CBPF.br	12.9
EG1 GRIDKA.de	142.8	LCG LAL.fr	46.4	LCG ROISS.ro	10.8
EG1 GRIF.fr	142.6	EG1 IRES.fr	41.0	ARC RAL.uk	10.3
EG1 RAL.uk	132.8	LCG DESY2N.de	39.3	OSG OSG.us	10.2
LCG LPNHE.fr	127.5	EG1 CPPM.fr	37.3	EG1 LAPP.fr	9.1
EG1 NIKHEF.nl	112.2	EG1 DESY2N.de	24.7	EG1 ULB.be	8.4
EG1 SARA.nl	92.0	LCG FZU.cz	24.1	LCG IPN.fr	7.7
LCG SBC.fr	80.7	LCG GRIF.fr	21.3	plus 74 more	

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Transferred data by Destination

104 Weeks from Week 18 of 2020 to Week 18 of 2022



Max: 1.71, Min: 0.00, Average: 0.51, Current: 1.71

LPNHE-disk	0.3	EG1 DESY2N.de	0.1	EG1 RAL.uk	0.0
DIRAC.Client.fr	0.3	CESNET-disk	0.0	NIKHEF-disk	0.0
DIRAC.Client.cz	0.2	DIRAC.Client.local	0.0	EG1 SARA.nl	0.0
POL-GRID-disk	0.2	DIRAC.USER	0.0	CPPM-disk	0.0
FZU-disk	0.2	EG1 LAPP.fr	0.0	FZU-disk	0.0
GRIF-disk	0.1	LAL-disk	0.0	R2P3-disk	0.0
LCG IN2P3.fr	0.1	DIRAC.Client.cluster	0.0	EG1 CPPM.fr	0.0
DIRAC.Client.de	0.1	EG1 NIKHEF.nl	0.0	SEG-disk	0.0
EG1 GRIF.fr	0.1	EG1 GRIDKA.de	0.0	plus 103 more	

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[bigger graphs in the backslides]

# Development summary

*For the EGI communities*



- **Check-In based AAI**
  - Generalised for Indigo AIM afterwards
- **Token based cloud access**
  - Partly in production
- **COMDIRAC**
  - Python3, pip installable
- **Jupyter notebooks with DIRAC clients**
  - From CVMFS or not
- **More features to be added**
  - HPC access (SSH + PoolCE)
  - Token based CE (HTCondorCE, ARC) and (later) CE access

# Support summary

*Examples for EGI communities*



## ➤ Biomed

- Cloud resources, SSH access
- Running applications in containers

## ➤ Eiscat 3D

- AAI web portal access
- Data management

## ➤ WeNMR

- Setting up DIRAC environment at the WeNMR App portal

# Conclusion

- *Questions & answers (2 of 2)*
- *EGI-ACE Use cases call*
- *Acknowledgements*

## Q&A (2 of 2)



- **What is your biggest frustration with DIRAC?**
  - Last year's was the occasional VOMS extension adding failures... It was solved with a Nagios probe.
- **Any notable operations incident in the last year?**
  - Pilots blocked on hold because of unnotified changes in sites parametrization and status
- **You can magically add one feature to DIRAC, what is it?**
  - Central pilot logging
  - Centralized sites and VO source of information (not DIRAC itself, but it will help a lot!)
- **To support your "Grid", do you have to use other systems than DIRAC?**
  - External MySQL, ELK, Nagios

# EGI-ACE Call for Use Cases



<https://www.egi.eu/projects/egi-ace/call-for-use-cases/>

## ➤ Who should apply

- International researchers, research projects, communities and infrastructures, as well as national research groups needing services and support for:
  - Large-scale data processing, scientific analysis, visualization
  - Hosting data analysis platforms and applications in the cloud
  - Federate and make accessible community-specific compute services in EOSC

## ➤ Timeline

- The call is kept open during 2021 and 2022.
- Cut-off dates with 2-monthly frequency, followed by the evaluation (within 1 month) of the submitted applications.

# Acknowledgements

- This work is co-funded by the **EOSC-hub** project (Horizon 2020) under Grant number 777536
- **EGI-ACE** receives funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement no. 101017567
- Fellow **EGI-WMS** admins and **IN2P3 DIRAC project** team members







**Thank you for your time**

*Any questions?*



# Thank you!

Contact: [egi-ace-po@mailman.egi.eu](mailto:egi-ace-po@mailman.egi.eu)  
Website: [www.egi.eu/projects/egi-ace](http://www.egi.eu/projects/egi-ace)



[EGI Foundation](#)



[@EGI\\_einfra](#)

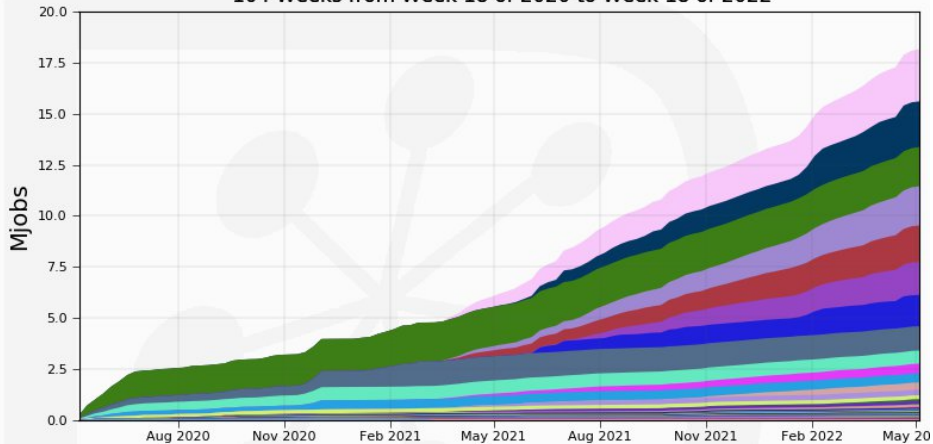


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# Backslides

- *Instance behaviour (1 & 2 years)*
  - *Jobs*
  - *CPU*
  - *Data*

Cumulative Jobs by Site  
104 Weeks from Week 18 of 2020 to Week 18 of 2022

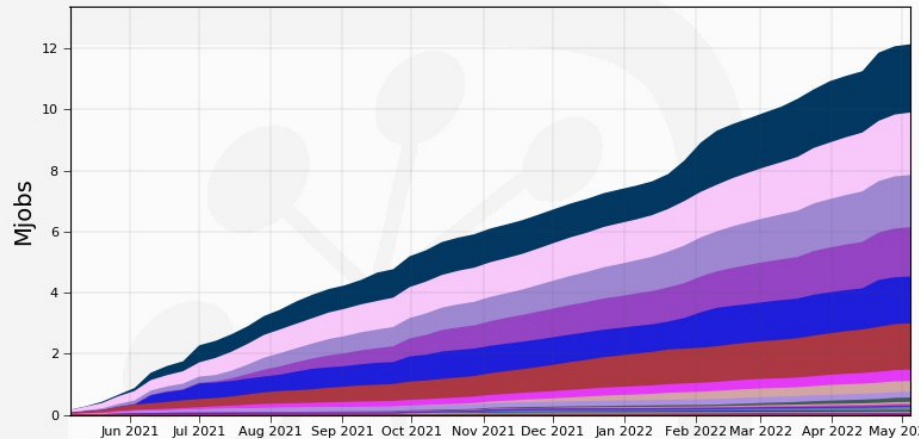


Max: 18.2, Min: 0.21, Average: 7.79, Current: 18.2

EGI_NIKHEF.nl	2.6	EGI_CPPM.fr	0.5	EGI_TRIESTE.it	0.1
EGI_GRIF.fr	2.2	EGI_GRIF.fr	0.4	EGI_CESNET.cz	0.1
LCG_LPNHE.fr	1.9	EGI_IRES.fr	0.4	EGI_INGRID.pt	0.0
EGI_GRIDKA.de	1.9	OSG_OSG.us	0.3	EGI_DESYZN.de	0.0
EGI_RAL.uk	1.8	LCG_DESYZN.de	0.2	ARC_RAL.uk	0.0
EGI_SARA.nl	1.6	EGI_CBPF.br	0.1	LCG_IPN.fr	0.0
EGI_UKIAC.uk	1.5	EGI_ULB.be	0.1	EGI_ROMA3.it	0.0
LCG_LAL.fr	1.2	LCG_NIKHEFE.nl	0.1	LCG_LAPP.fr	0.0
LCG_SBG.fr	0.6	EGI_LNL.it	0.1	... plus 74 more	0.0

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Cumulative Jobs by Site  
52 Weeks from Week 18 of 2021 to Week 18 of 2022



Max: 12.1, Min: 0.16, Average: 6.07, Current: 12.1

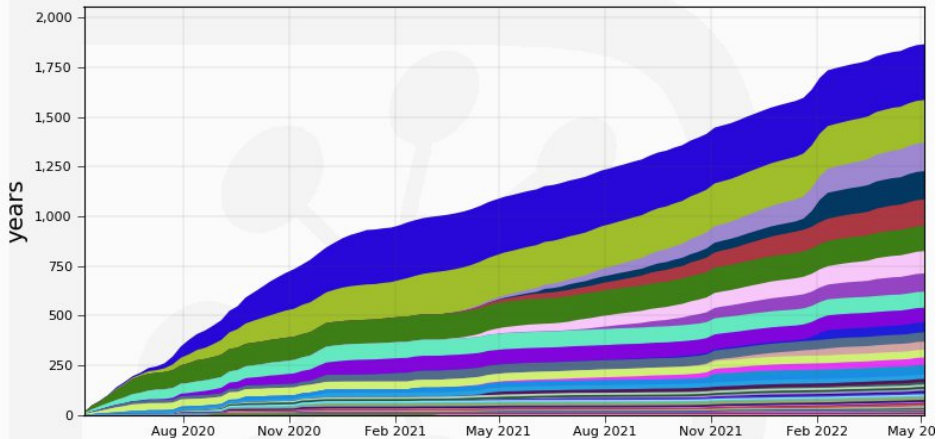
EGI_GRIF.fr	2.2	EGI_CBPF.br	0.1	EGI_UKIR.uk	0.0
EGI_NIKHEF.nl	2.0	EGI_LNL.it	0.1	Cloud_PADOVA.it	0.0
EGI_GRIDKA.de	1.7	EGI_TRIESTE.it	0.1	EGI_UKIM.uk	0.0
EGI_SARA.nl	1.6	EGI_ULB.be	0.1	EGI_LPC.fr	0.0
EGI_UKIAC.uk	1.5	EGI_DESYZN.de	0.0	EGI_UKIB.uk	0.0
EGI_RAL.uk	1.5	EGI_INGRID.pt	0.0	EGI_CC-TEST.fr	0.0
EGI_CPPM.fr	0.4	EGI_ROMA3.it	0.0	EGI_UKIRALPP.uk	0.0
EGI_IRES.fr	0.4	EGI_CIRMMMP.it	0.0	EGI_CESNET.cz	0.0
OSG_OSG.us	0.2	EGI_LAPP.fr	0.0	... plus 25 more	0.0

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# EGI - CPU



CPU used by Site  
104 Weeks from Week 18 of 2020 to Week 18 of 2022

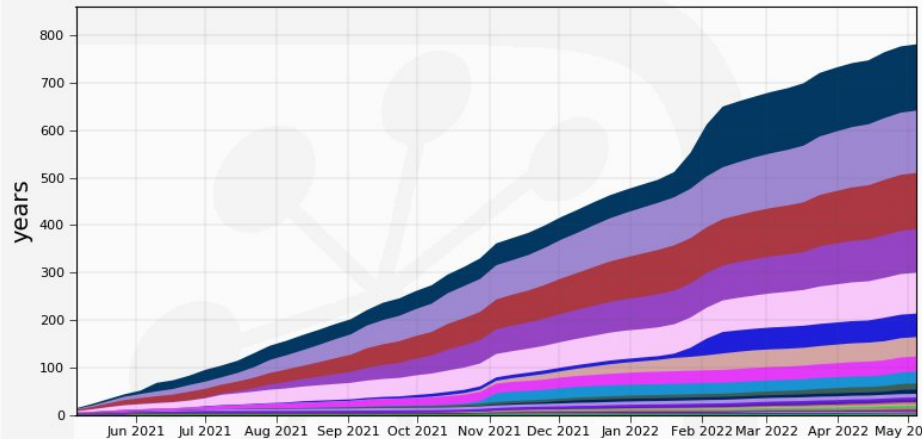


Max: 1,865, Min: 10.8, Average: 1,057, Current: 1,865

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LCG.NIKHEFE.nl	215.3	EGI.UKIAC.uk	49.6	EGI.CBPF.br	12.9
EGI.GRIDKA.de	142.8	LCG.LAL.fr	46.4	LCG.ROISS.ro	10.8
EGI.GRIF.fr	142.6	EGI.IRES.fr	41.0	ARC.RAL.uk	10.3
EGI.RAL.uk	132.8	LCG.DESYZN.de	39.3	OSG.OSG.us	10.2
LCG.LPNHE.fr	127.5	EGI.CPPM.fr	37.3	EGI.LAPP.fr	9.1
EGI.NIKHEF.nl	112.2	EGI.DESYZN.de	24.7	EGI.ULB.be	8.4
EGI.SARA.nl	92.0	LCG.FZU.cz	24.1	LCG.IPN.fr	7.7
LCG.SBG.fr	80.7	LCG.GRIF.fr	21.9	...	plus 74 more

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CPU used by Site  
52 Weeks from Week 18 of 2021 to Week 18 of 2022



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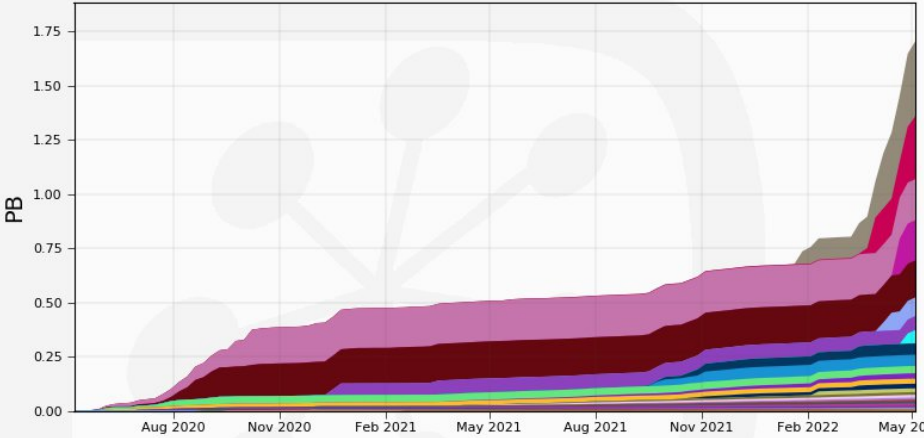
EGI.GRIF.fr	140.1	EGI.CBPF.br	12.9	EGI.UKIR.uk	2.1
EGI.GRIDKA.de	131.6	EGI.LAPP.fr	9.1	EGI.INGRID.pt	1.8
EGI.RAL.uk	119.0	OSG.OSG.us	7.8	Cloud.PADOVA.it	1.7
EGI.SARA.nl	91.5	EGI.ULB.be	4.9	EGI.PRAGUE.cz	1.6
EGI.NIKHEF.nl	86.2	EGI.CIRMMP.it	4.6	EGI.UKIB.uk	1.6
EGI.UKIAC.uk	49.6	EGI.TRIESTE.it	3.9	EGI.UKIM.uk	1.3
EGI.IRES.fr	41.0	EGI.LNL.it	2.9	EGI.UKIRALPP.uk	0.9
EGI.CPPM.fr	32.1	EGI.LPC.fr	2.5	EGI.ROISS.ro	0.9
EGI.DESYZN.de	24.7	EGI.ROMA3.it	2.3	...	plus 25 more

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# EGI - Data



Transferred data by Destination  
104 Weeks from Week 18 of 2020 to Week 18 of 2022

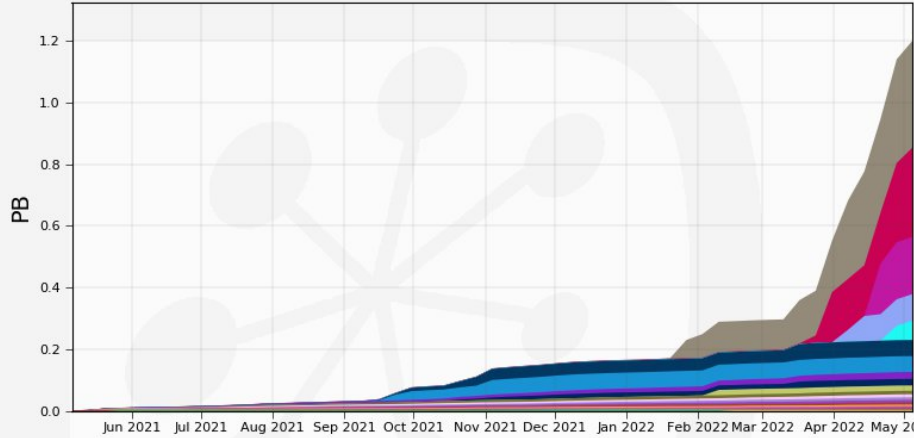


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- |                   |     |                        |     |                   |     |
|-------------------|-----|------------------------|-----|-------------------|-----|
| ■ LPNHE-disk      | 0.3 | ■ EGI.DESYZN.de        | 0.1 | ■ EGI.RAL.uk      | 0.0 |
| ■ DIRAC.Client.fr | 0.3 | ■ CESNET-disk          | 0.0 | ■ NIKHEF-disk     | 0.0 |
| ■ DIRAC.Client.cz | 0.2 | ■ DIRAC.Client.local   | 0.0 | ■ EGI.SARA.nl     | 0.0 |
| ■ POLGRID-disk    | 0.2 | ■ DIRAC-USER           | 0.0 | ■ CPPM-disk       | 0.0 |
| ■ FZU-disk        | 0.2 | ■ EGI.LAPP.fr          | 0.0 | ■ FZK-disk        | 0.0 |
| ■ GRIF-disk       | 0.1 | ■ LAL-disk             | 0.0 | ■ IN2P3-disk      | 0.0 |
| ■ LCG.IN2P3.fr    | 0.1 | ■ DIRAC.Client.cluster | 0.0 | ■ EGI.CPPM.fr     | 0.0 |
| ■ DIRAC.Client.de | 0.1 | ■ EGI.NIKHEF.nl        | 0.0 | ■ SBG-disk        | 0.0 |
| ■ EGI.GRIF.fr     | 0.1 | ■ EGI.GRIDKA.de        | 0.0 | ... plus 103 more |     |

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Transferred data by Destination  
52 Weeks from Week 18 of 2021 to Week 18 of 2022



Max: 1.20, Min: 0.00, Average: 0.20, Current: 1.20

- |                      |     |                        |     |                  |     |
|----------------------|-----|------------------------|-----|------------------|-----|
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| ■ DIRAC.Client.fr    | 0.3 | ■ DIRAC.Client.cluster | 0.0 | ■ NIKHEF-disk    | 0.0 |
| ■ POLGRID-disk       | 0.2 | ■ EGI.NIKHEF.nl        | 0.0 | ■ EGI.PSNC.pl    | 0.0 |
| ■ GRIF-disk          | 0.1 | ■ EGI.GRIDKA.de        | 0.0 | ■ OSG.OSG.us     | 0.0 |
| ■ DIRAC.Client.de    | 0.1 | ■ EGI.SARA.nl          | 0.0 | ■ EGI.CBPF.br    | 0.0 |
| ■ EGI.GRIF.fr        | 0.1 | ■ EGI.RAL.uk           | 0.0 | ■ EGI.CCIN2P3.fr | 0.0 |
| ■ EGI.DESYZN.de      | 0.1 | ■ DIRAC-USER           | 0.0 | ■ EGI.TRIESTE.it | 0.0 |
| ■ DIRAC.Client.local | 0.0 | ■ DIRAC.Client.cz      | 0.0 | ■ EGI.ROMA3.it   | 0.0 |
| ■ EGI.LAPP.fr        | 0.0 | ■ CPPM-disk            | 0.0 | ... plus 52 more |     |

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