VSC Updates

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Vlaanderen
is supercomputing

VLAAMS
SUPERCOMPUTER
CENTRUM

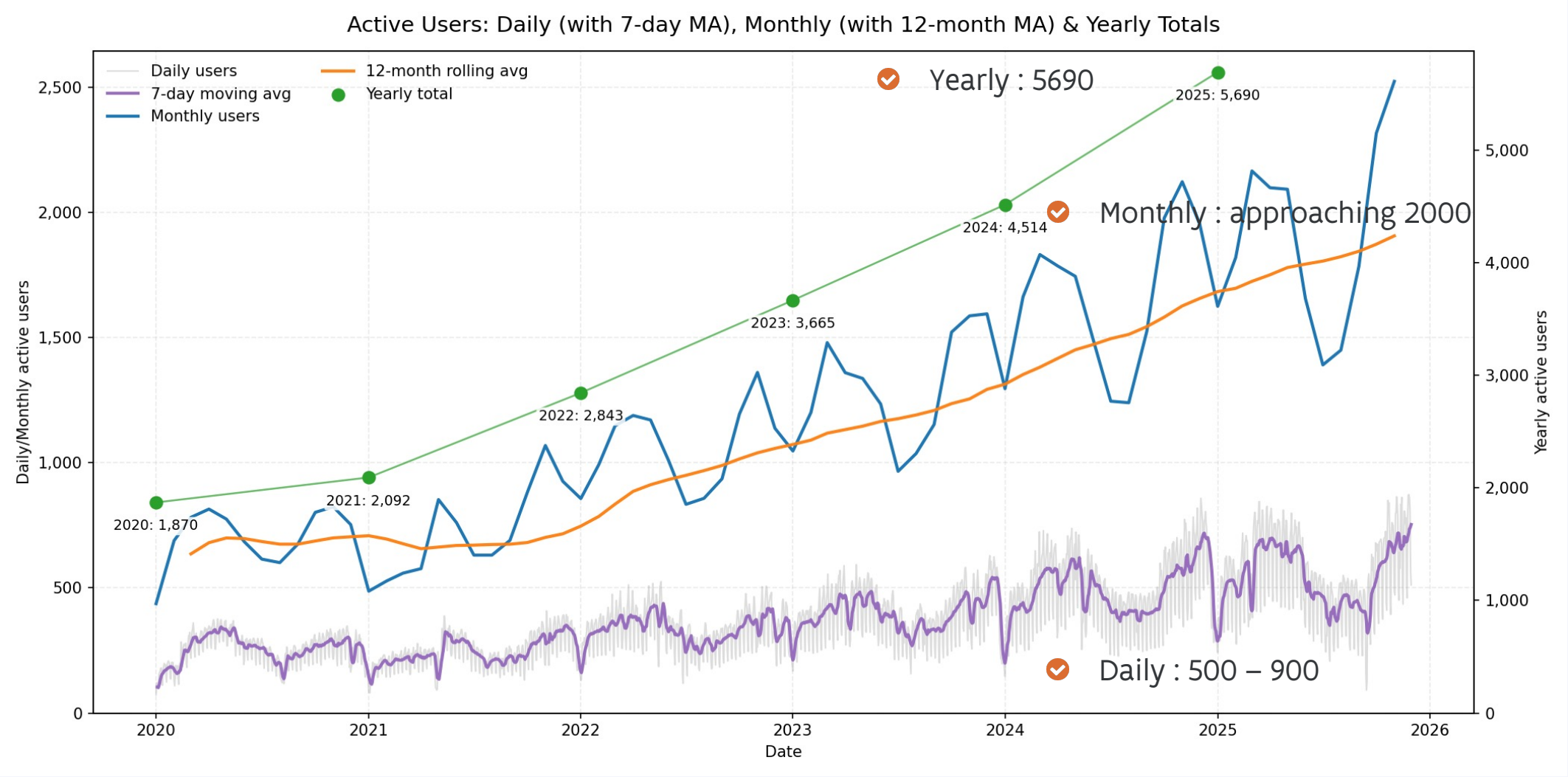
*Innovative Computing
for A Smarter Flanders*

vscentrum.be

Overview

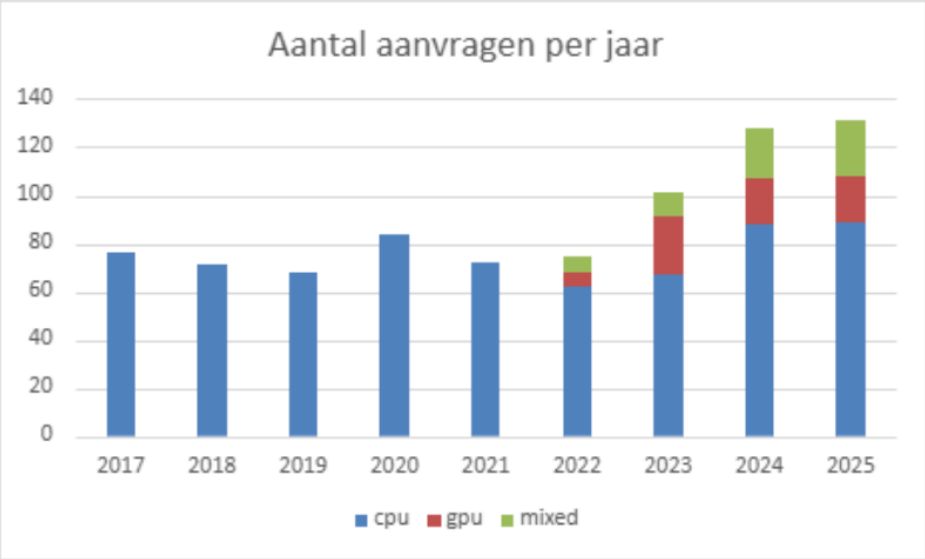
- VSC in a few numbers
- New infrastructure
- Some highlights
- Survey 2024 in review

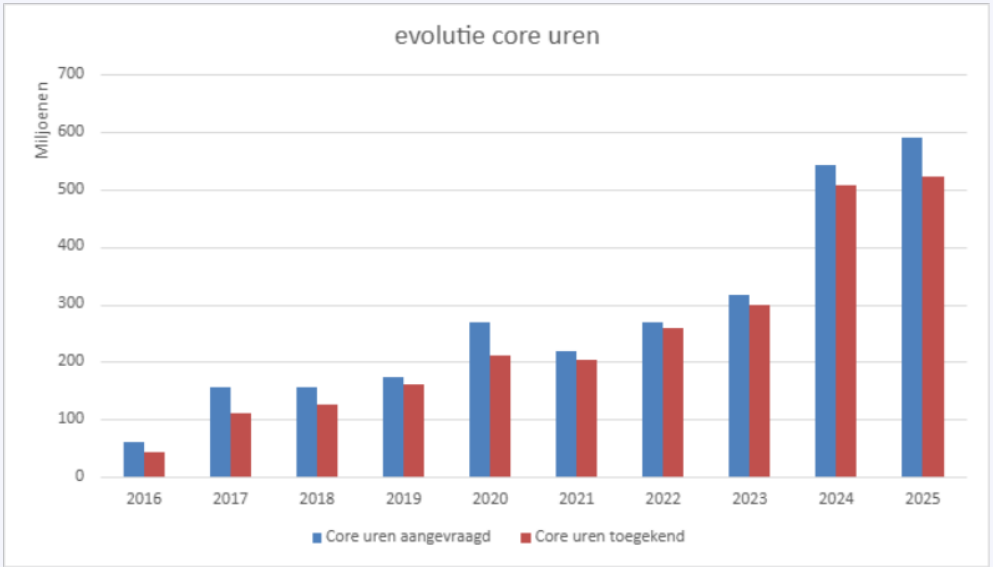
Evolution in number of users

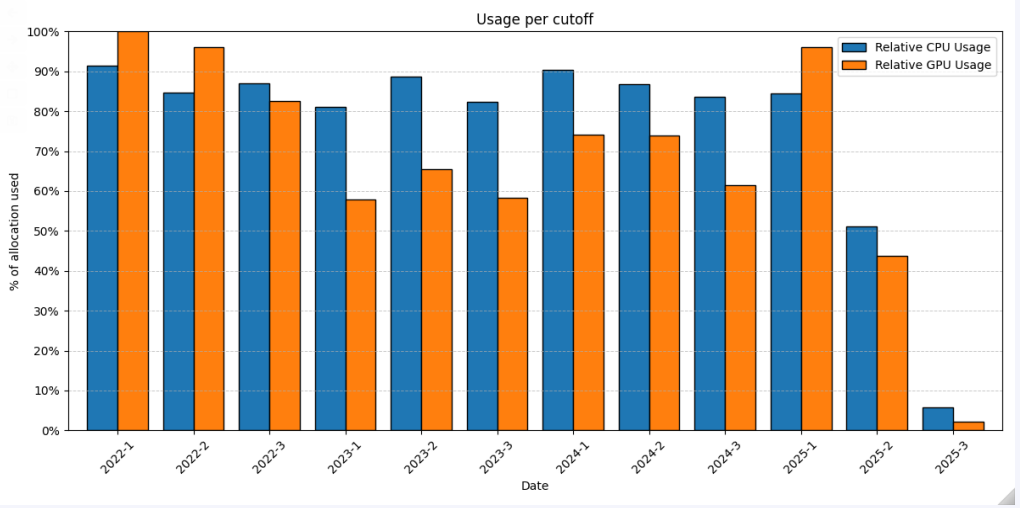


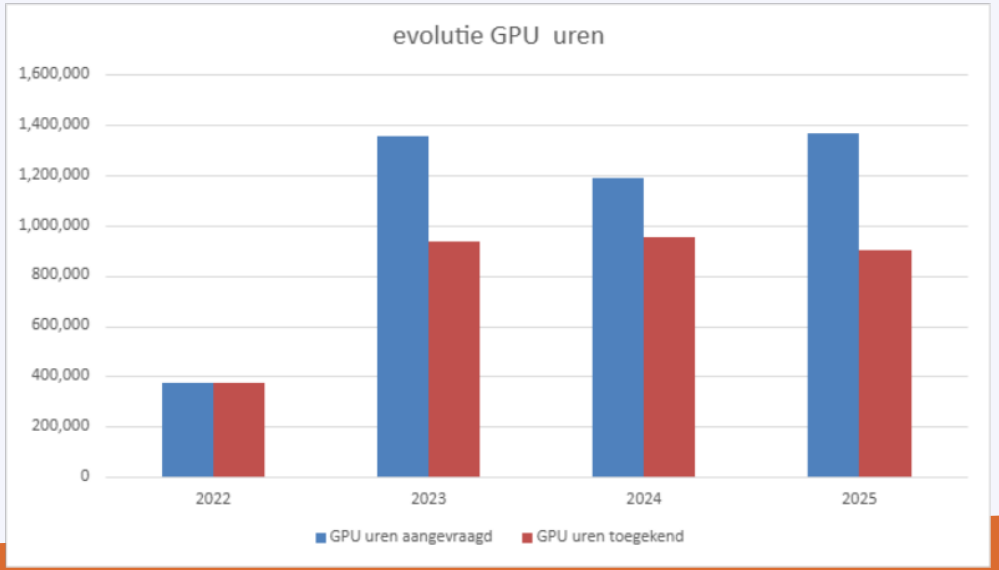
- Reminder VSC started 16 years ago

Tier-1 Compute









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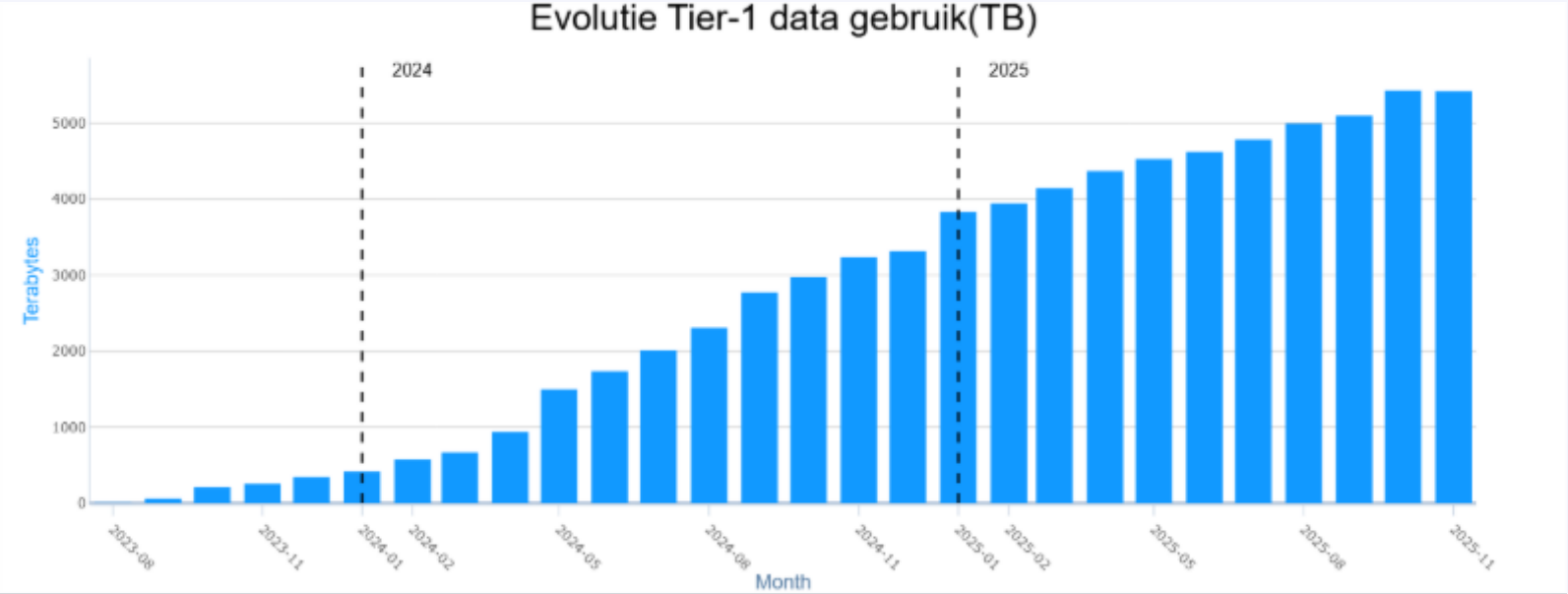
Tier-1 Compute Industry

- 21 exploratory grants
- From this 8 additional regular grants
- 16 regular grants continued, total of 41 active regular grants

Tier-1 Data

	2023			2024			2025		
Proposals	starting	regular	collab	starting	regular	collab	starting	regular	collab
Number	1	4	1	3	6	3	10	9	
Quota requested (TB)		730	2000	15	2670	7015	50	796	



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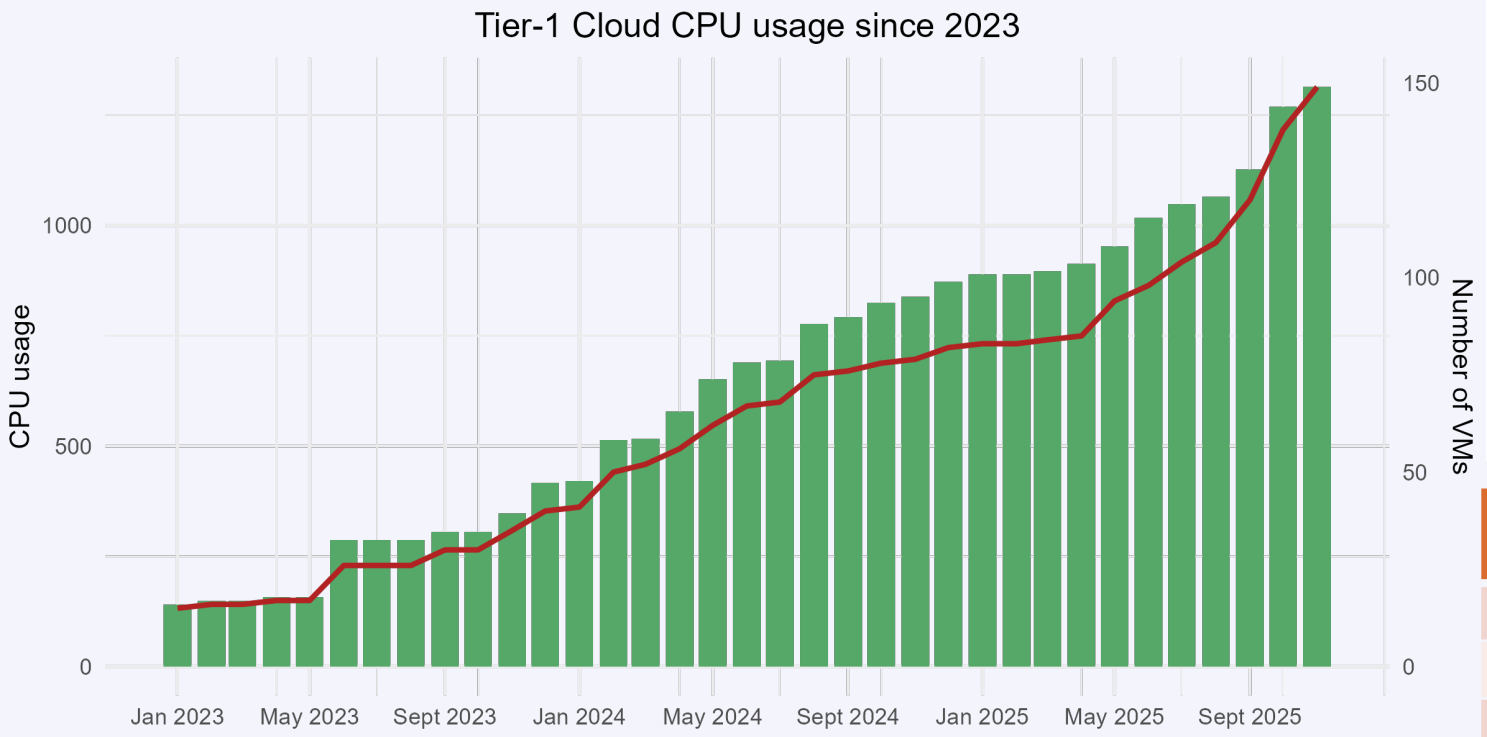
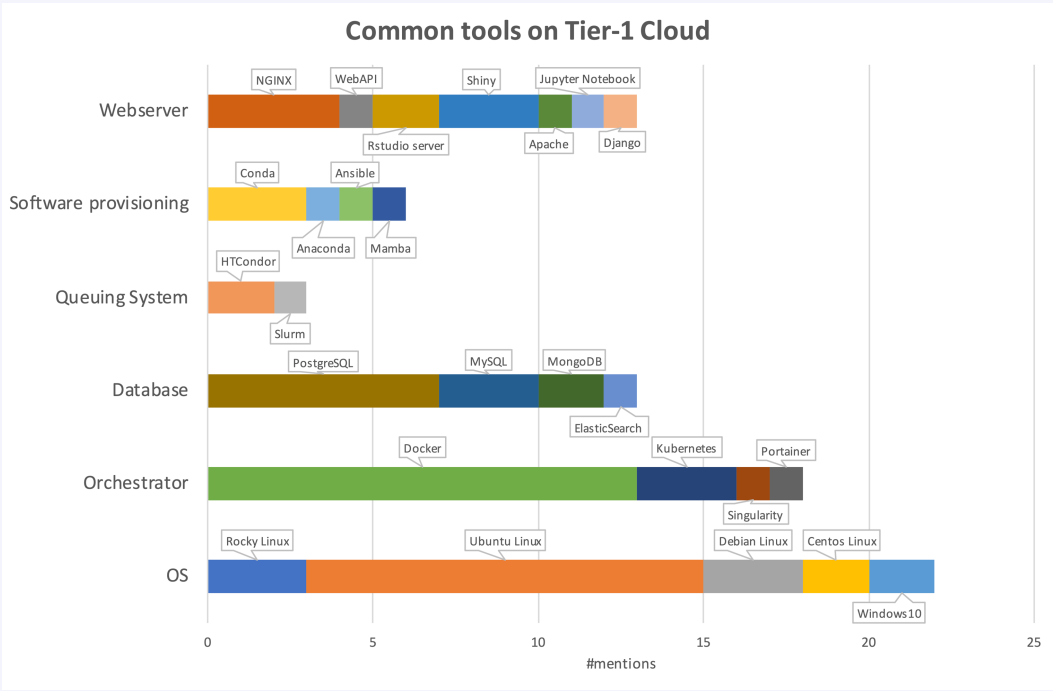
Tier-1 Cloud





	#projects	#starting grants	#industry projects	#collaboration grants
2022	5		1	
2023	2	7		
2024	9	7	1	1
2025	2	10	1	

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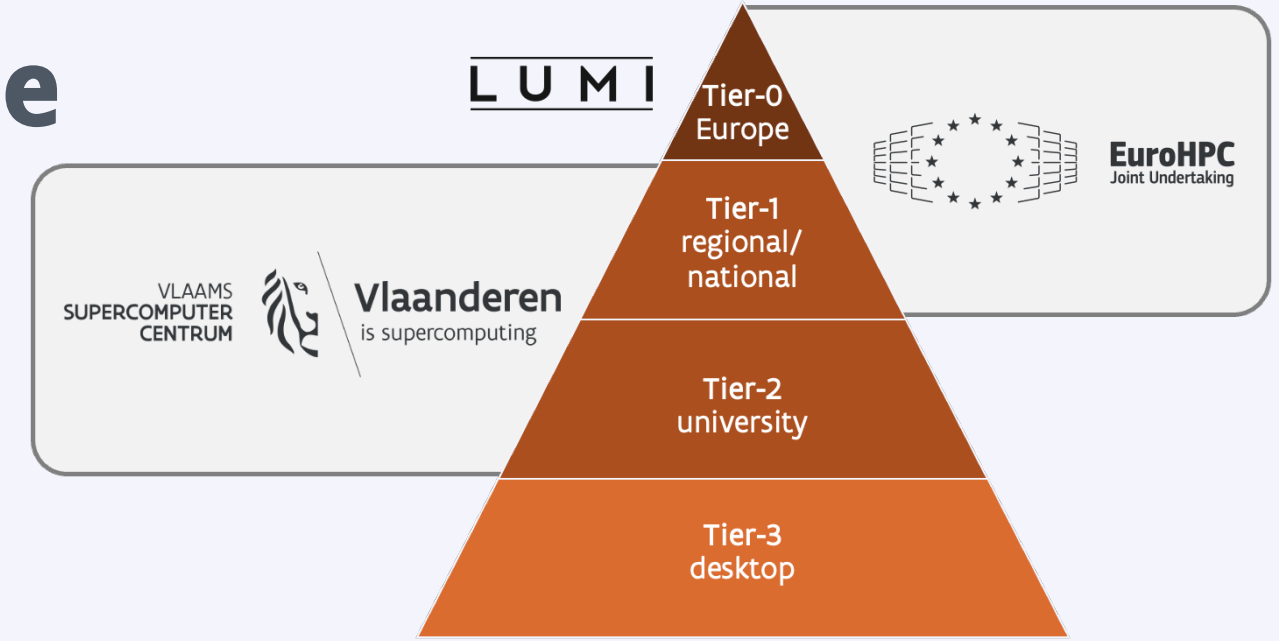
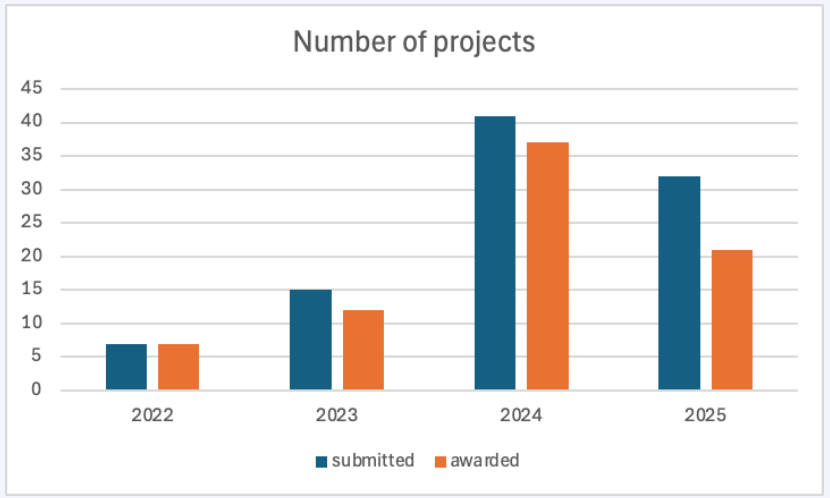
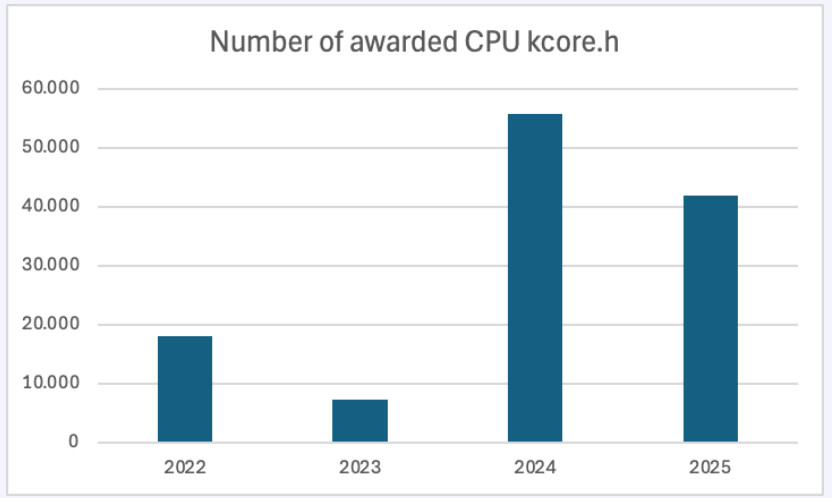
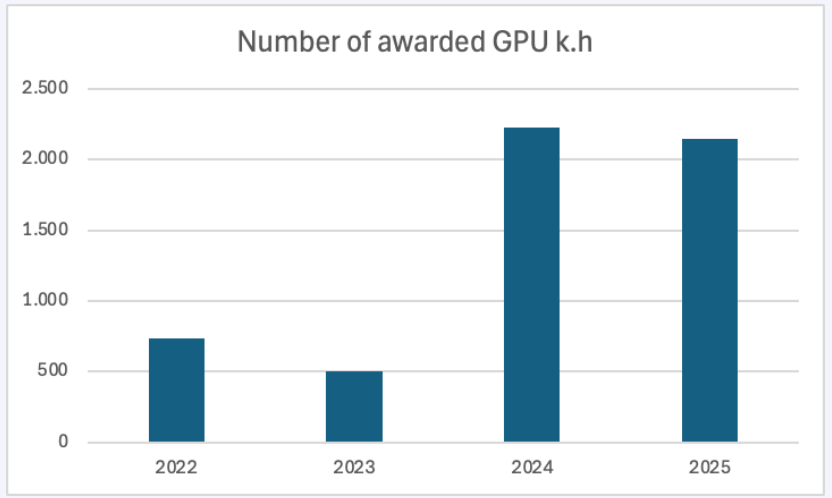
Flanders' LUMI usage









Remark: not all data for 2025 is processed yet.

Current status

Tier-2	UAntwerpen	VUB	UGent	KU Leuven/ UHasselt
# cores	17 436	4 808	25 264	27 300
# GPU devices	16	28	108	125
Cluster filesystems	0.6 PB	0.7 PB	2.7 PB	4.5 PB

Tier-1	Hortense	...		
# cores	129 252			
# GPU devices	160			
Cluster filesystems	5.4 PB			

Welcome Sofia!

Located in the Nexus datacenter in the Research Park Zellik, managed by VUB.

Currently the testing process is ongoing

Investment of € 8,6 million

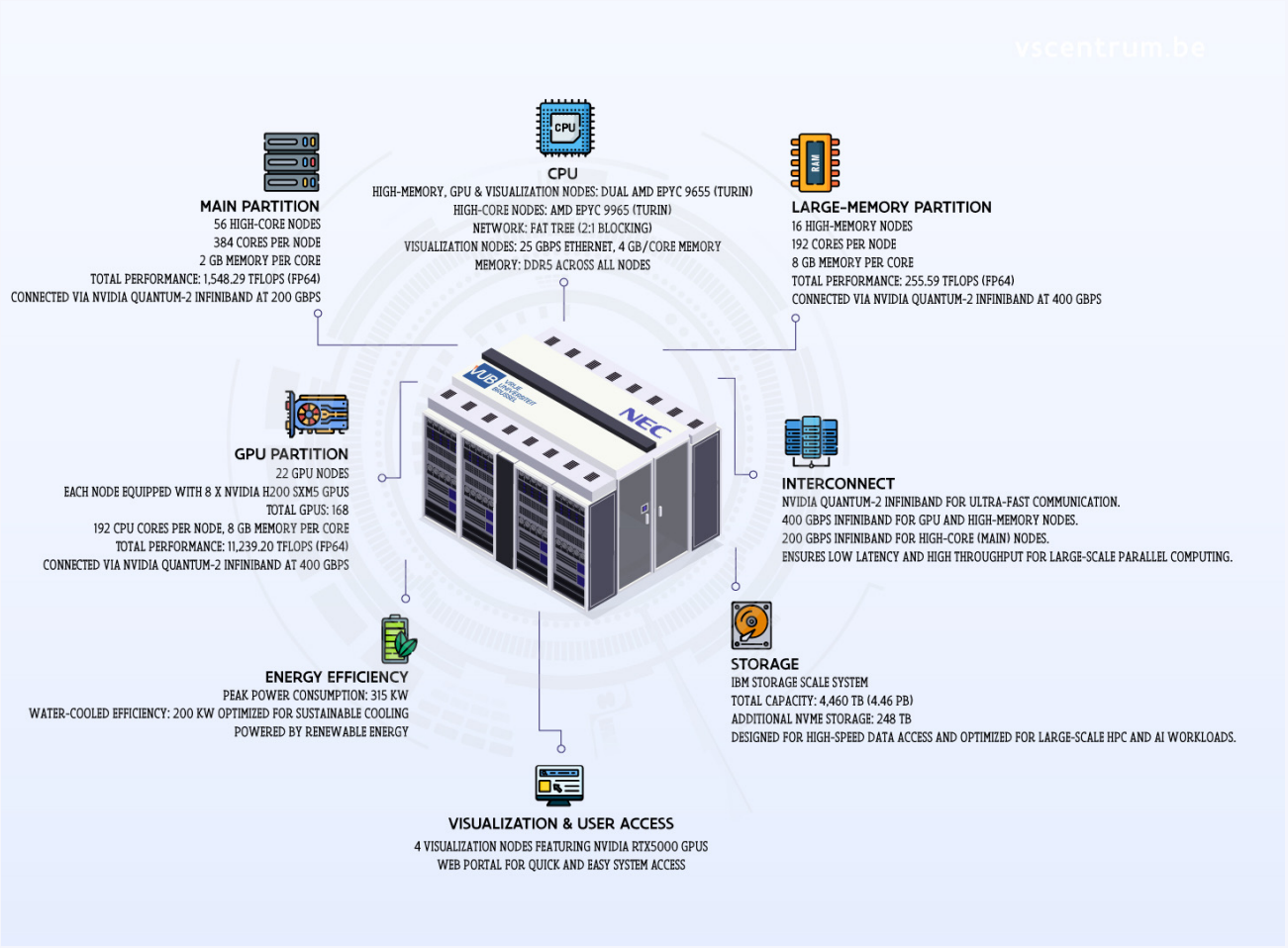
Welcome Sofia!

Focus on Artificial Intelligence: 176 H200's GPU
21 504 CPU cores with 2 GB of memory/core
3072 CPU cores with 8 GB of memory/core

Infiniband interconnected (200/400 Gbps)

Testing period: March-April
If you have crazy ideas that could keep 176 GPUs busy, contact us!

sofia
SUPERCOMPUTER



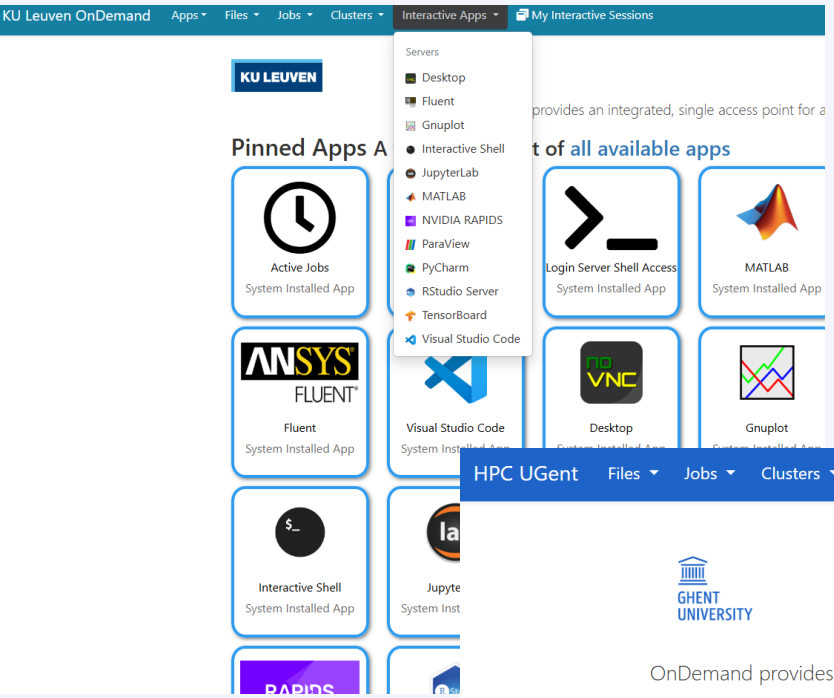
Other new infrastructure @ VSC

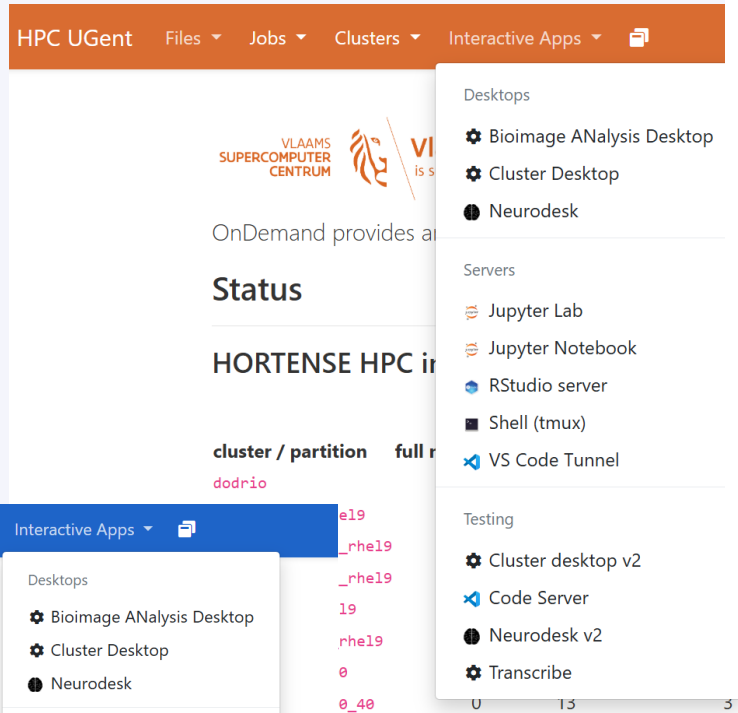
- New Tier-2 operations @ UGent
  - Litleo (16 H100 GPU's)
- New Tier-2 @ VUB
  - 20+4 AMD Turin (6144 cores): 4 with 1,5 TB memory
  - 10 H200 GPU's in pilot
- New Tier-2 coming @ KU Leuven
  - 50 Intel Granite Rapids (9600 cores)
  - 3 with 8xNVIDIA B200
  - New 5.8 PB parallel filesystem
- Tender procedure ongoing @ UAntwerp

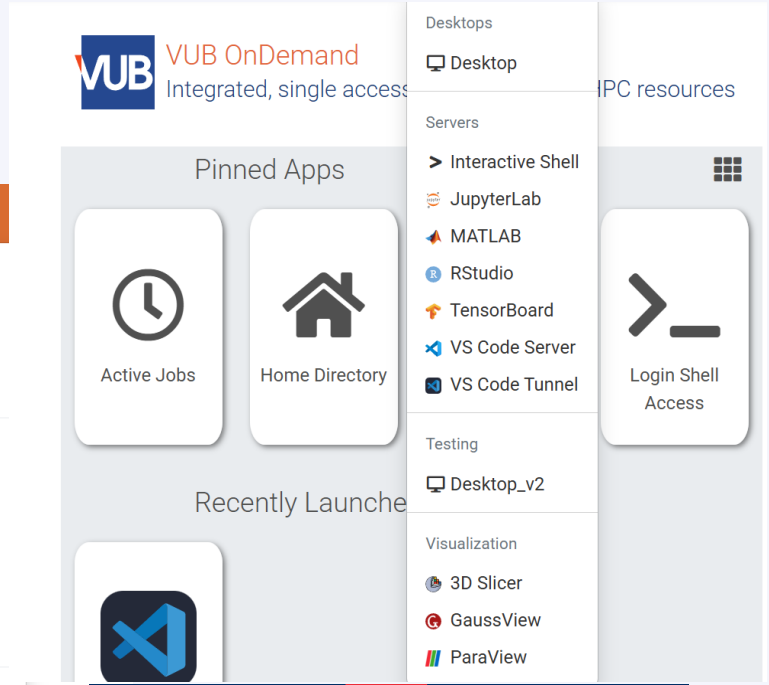
Tier-2 Highlight

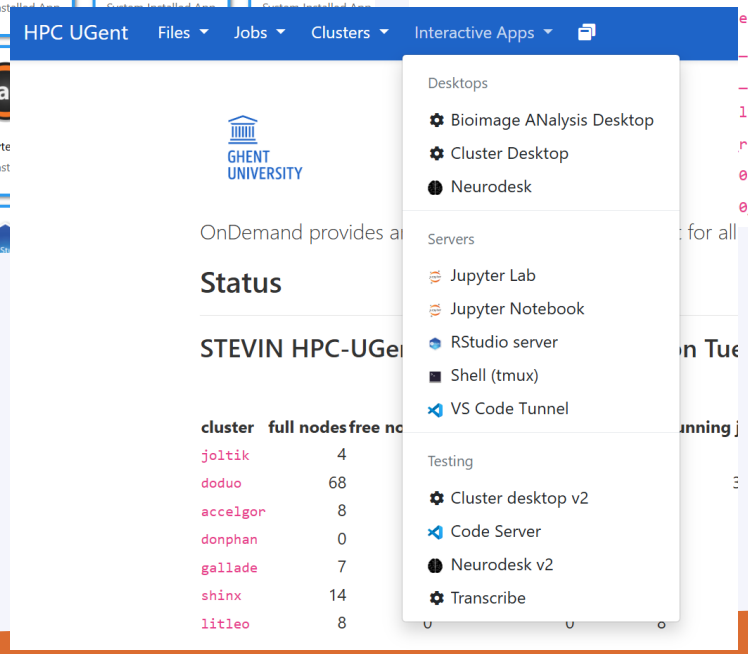
- Open OnDemand Portal is becoming standard access to our systems
  - All sites have a portal:
    - KU Leuven: https://ondemand.hpc.kuleuven.be/
    - UGent: https://login.hpc.ugent.be/
    - VUB: https://portal.hpc.vub.be/
    - U Antwerpen: https://portal.hpc.uantwerpen.be
  - New Apps have been added
  - More can be added: ask your Tier-2 support

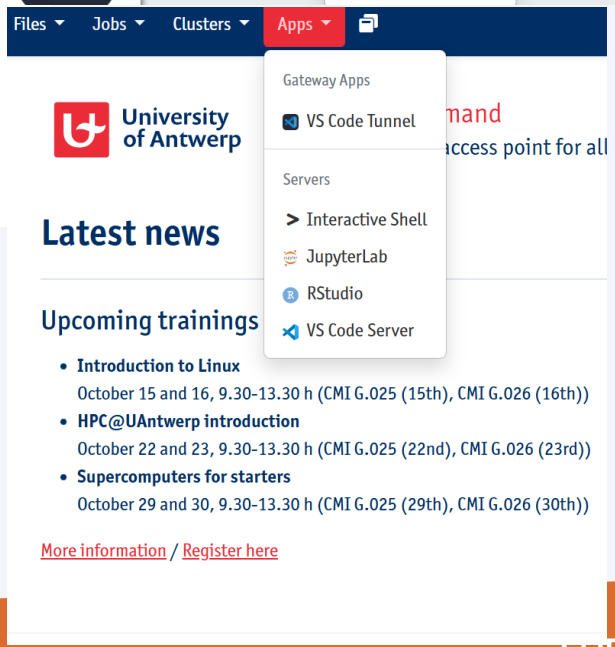
Tier-2 Highlight











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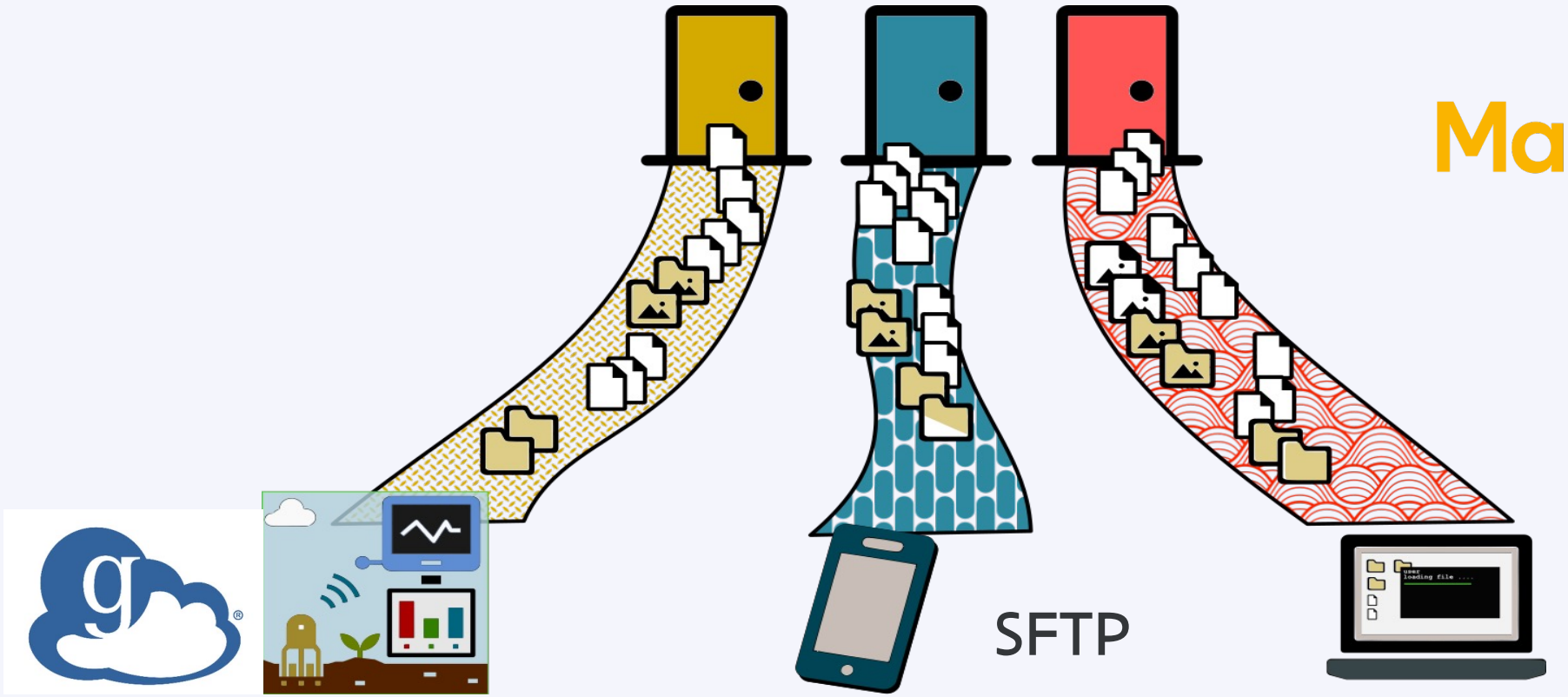
Tier-1 Data Highlight - Automatic ingest

Tier-1 Data

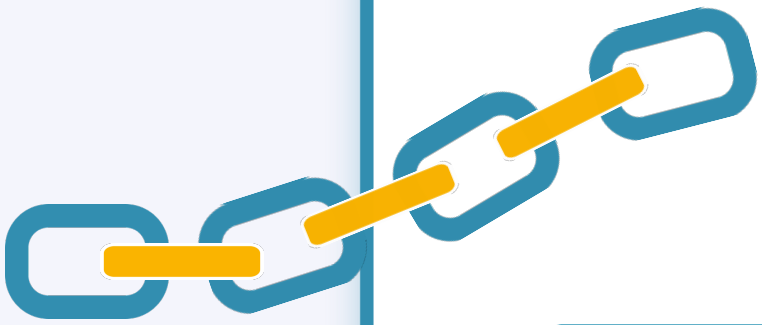


ManGO ingest

```
--observer
--filter-func
--ignore
--sync
--verify-checksum
--metadata-handler
--restart
--dry-run
```

Server-side automation

iRODS rules



ManGO Flow

Changes

files

metadata

Files

- Copy
- Move
- Validate

Metadata

- Extract
- Validate
- Normalize

Reporting

- Metadata
- Email
- Files

Challenges

- Data management is becoming more crucial than ever
- Tier-1 and Tier-2 PFS systems are around maximum capacity
- Storage is not getting cheaper
  - don’t expect massive storage growth for the HPC systems
- Experiments output dataset volume keeps increasing in rate and volume

Challenges

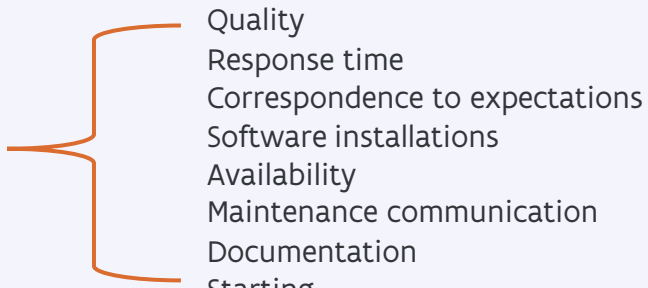
- Security is more important than ever
- Universities are involved in NIS2 (Network and Information Systems Directive 2)
- MFA-enforcement is important
- We keep user-friendliness in mind, but some changes have an impact that we can't avoid

VSC user survey 2024

Results and actions

VSC User Survey Results 2024

- Main topics
  - Tier-1 services
  - Tier-2 services
  - Training



- Improvement of the survey
  - Explicit request for comments per service
  - Question about how difficult it is to start with the service

VSC User Survey Results 2024

- Overall good response
- 413 completed surveys (4514 users in 2024)
  - Higher than 2023 (+11%)

VSC User Survey Results 2024

- Respondents from all organisations

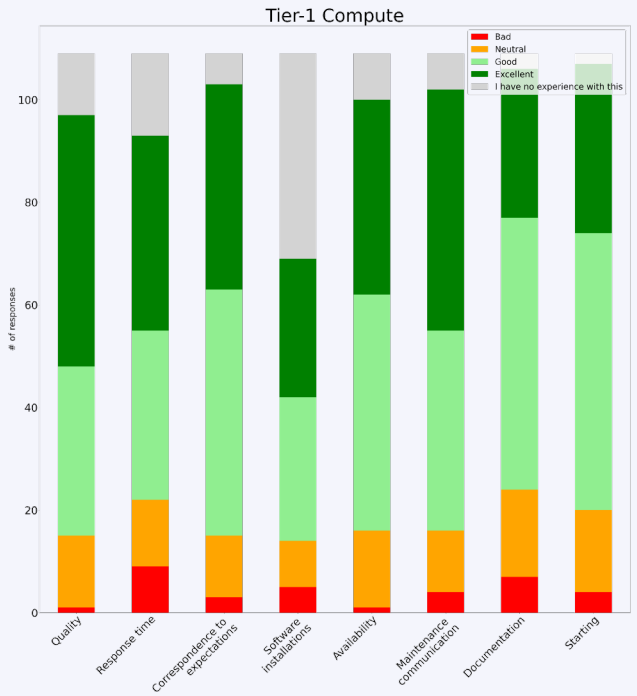
University association	**88%**
KU Leuven	31%
UGent	31%
VUB	13%
UAntwerpen	9%
Multiple Universities	3%
UHasselt	2%
Private	**5%**
Private company	5%
SOC	**3%**
VIB	2%
VITO	1%
imec	0%
FlandersMake	0%
Other RI	**3%**
Other Research Institute	3%
Public	**1%**
Public Sector organization	1%

Survey of 2024 versus 2023

2024 vs 2023	Tier -1			Tier-2			
	Compute	Cloud	Data	UAntwerpen	VUB	UGent	KU Leuven
Quality	-1%	-10%	13%	19%	5%	7%	12%
Response time	1%	0%	8%	16%	15%	3%	12%
Correspondence to expectations	7%	-6%	16%	7%	-3%	7%	9%
Software installations	19%	-13%	10%	9%	4%	6%	2%
Availability	11%	-22%	2%	14%	7%	2%	13%
Maintenance communication	-1%	0%	4%	9%	6%	-10%	8%
Documentation	7%	6%	6%	4%	8%	-8%	15%

To monitor evolutions,
we need your yearly response to the same questions

VSC User Survey Results 2024 – Tier-1



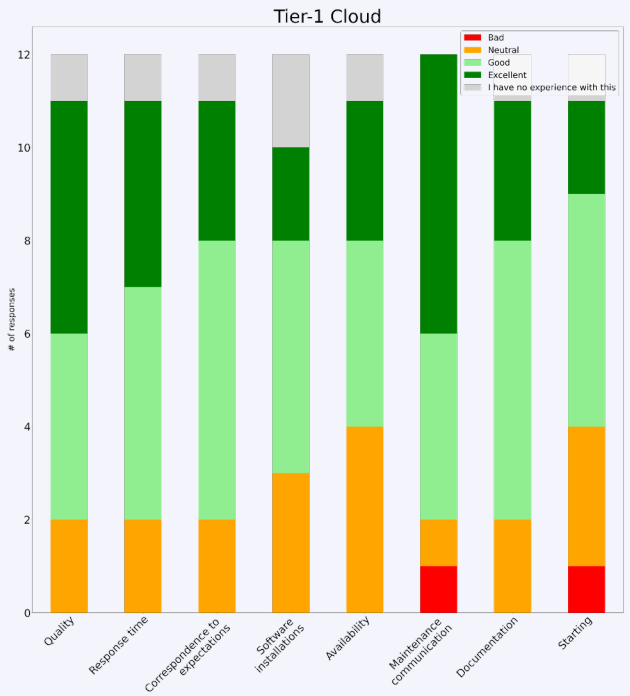
112 (-9%)

Response time software installations

More GPU nodes

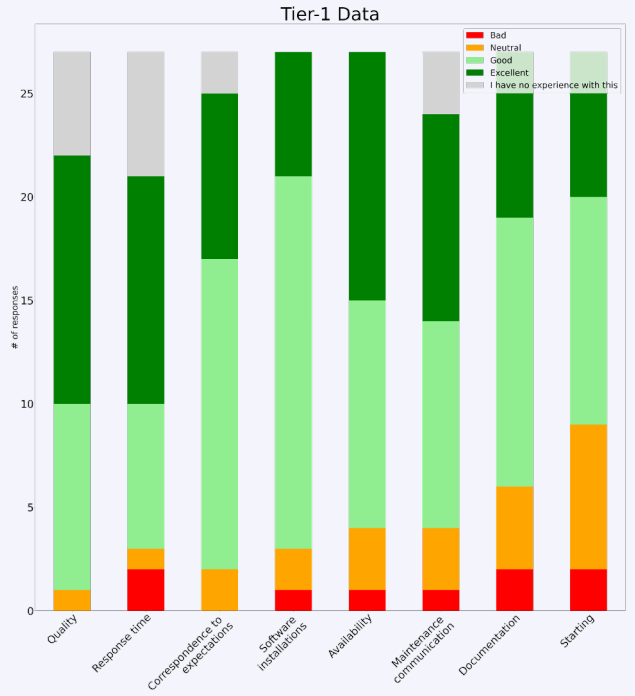
More examples and workflows

More support staff / faster response



12 (-71%)

Larger VM flavors



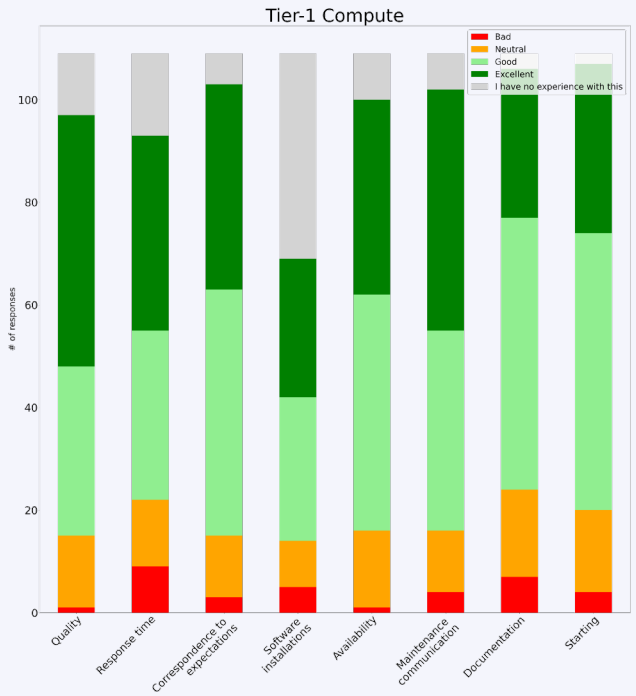
32 (-49%)

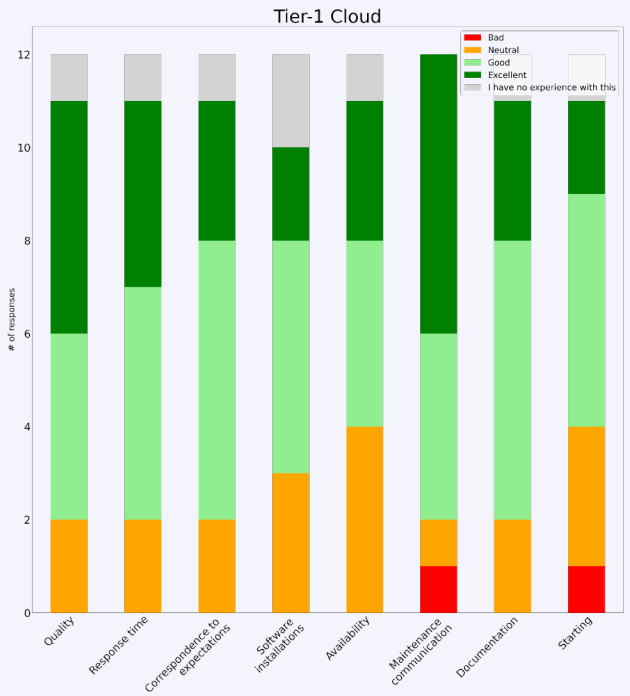
Globus documentation hard to find

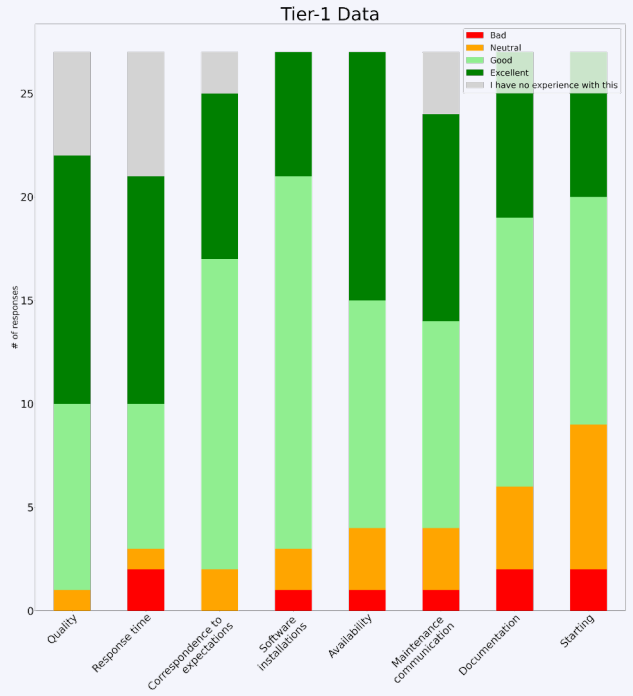
Mounting solutions

Data transfer rate

VSC User Survey Results 2024 – Tier-1







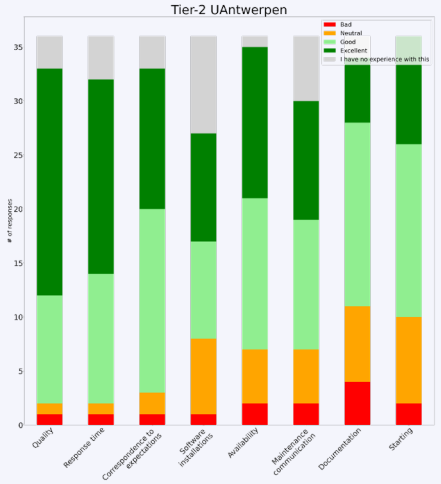
New procedure for software installations -> reduction of requests

Status quo support staff

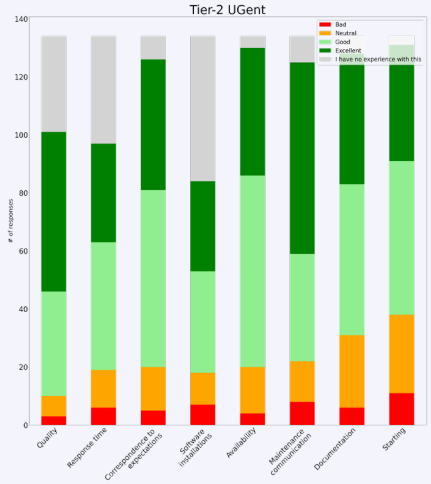
Largest VM sizes are
- CPUv1.4xlarge
- GPUv3.2xlarge
- UPSv1.3xlarge

Globus documentation prominent
Mount possible for specific cases
Hardware changes ongoing to improve
Globus – Tier-1 data transfer rate

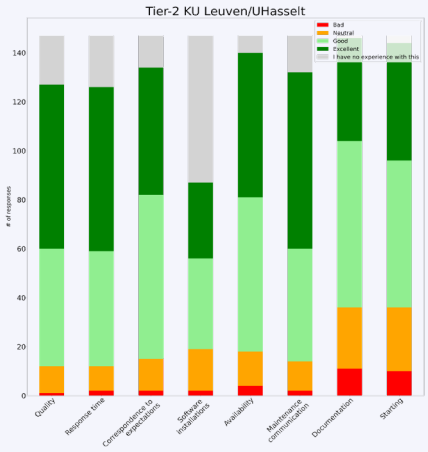
VSC User Survey Results 2024 – Tier-2



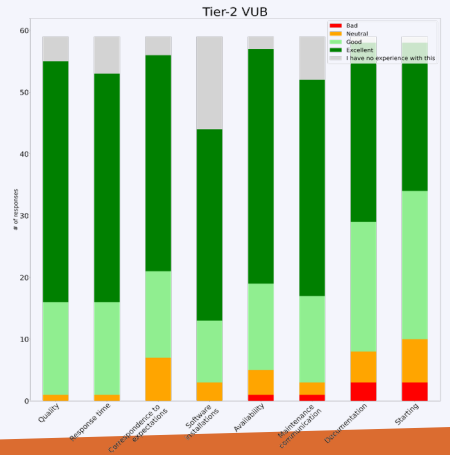
36 (-10%)
Conda support
Provide web portal
Slow login nodes
More basic intro courses



131 (+11%)
More GPUs
Simpler documentation
Best practices
Faster response time for software installation
More support staff / swifter response

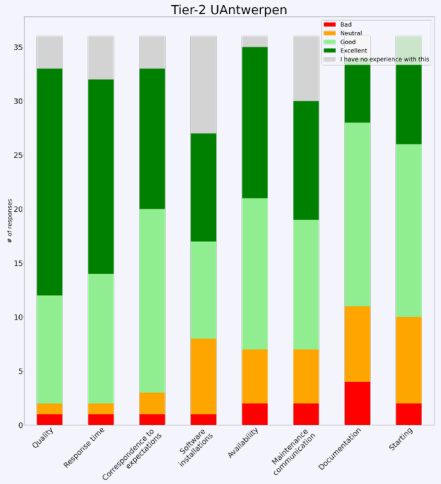


147 (+27%)
More GPU's
Performance login nodes
Documentation
more examples, job scripts



58 (=)
More CPU's & GPU's
Queueing times
Provide web portal

VSC User Survey Results 2024 – Tier-2



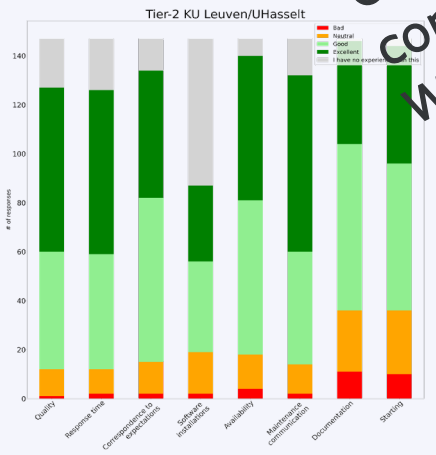
Intro course adapted, more hands-on
Slow login nodes resolved
Alternatives for conda environments

New GPU cluster litleo

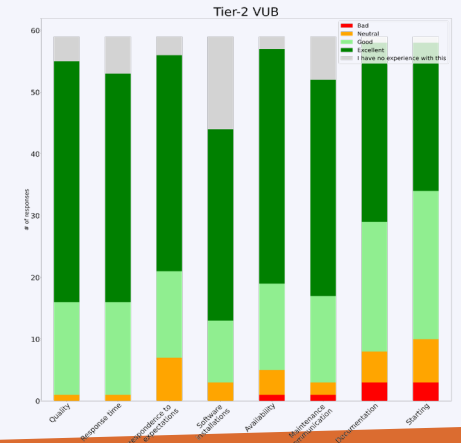
New procedure for software installations -> reduction of requests

Reallocation of Tier2 helpdesk tasks

Overall actions : restructure of documentation pages, continuous updates
Website update information for industry



H100 were added
LMOD caching on login
Monitoring NFS filesystem
Service catalog restructured
Credit calculator
Additional Slurm examples on hpc-intro GitHub repository



New CPU nodes added
New GPU nodes in pilot

New nodes for interactive cluster with 'zero' queue time

Continues work on documentation
More outreach

VSC User Survey Results 2024 – Training

Many specific suggestions show that the current training offer is not known enough.

Additional trainings

- Workflows
- Domain specific trainings
- More short lunch-like sessions / short videos targeting different audiences

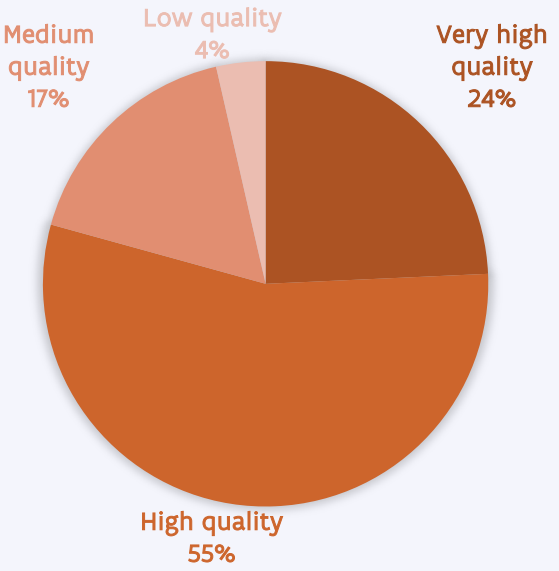
New courses

- Scientific C
- MLOps-on-HPC
- Deploying-LLMs-locally
- GPU-offloading with OpenMP
- Heterogenous programming with Kokkos
- Workflows on HPC
- Best practices for data science on HPC

Fortran MOOC reactivated

VSC Software installations

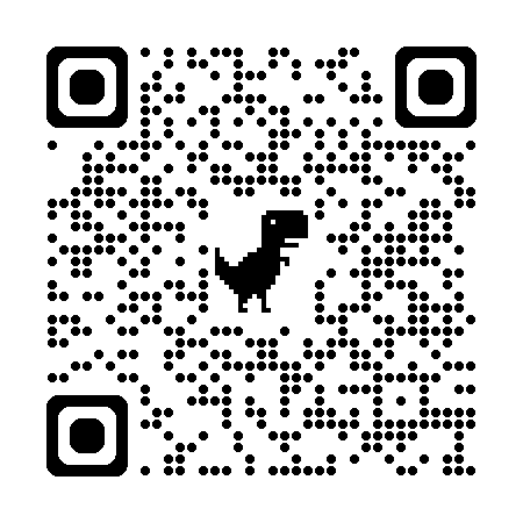
Course quality ratings



VSC User Survey – overall remarks

- Check VSC-status page : https://status.vscentrum.be/
  - And possibly local university status pages

- Don't forget to use the search field in the documentation, a lot of issues were already described

VSC User Survey – 2025 survey is active

- If not yet participated, there is still time: