



**UNIVERSITEIT  
GENT**

# HPC-UGENT UPDATE

HPC-UGent user meeting  
[hpc@ugent.be](mailto:hpc@ugent.be)

19 May 2025  
<https://www.ugent.be/hpc>

# AGENDA

- Overview of HPC-UGent activities, future plans, best practices and VSC opportunities
- Review of user poll results
- Q&A
- Sandwich lunch after the meeting

# ABOUT HPC-UGENT

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# ABOUT HPC-UGENT

## **Mission**

HPC-UGent provides centralised **scientific computing** services, training, and support for researchers from Ghent University, industry, and other knowledge institutes.

HPC-UGent is part of the ICT functional domain of Ghent University, and is a strategic partner of the Flemish Supercomputer Center (VSC).

# ABOUT HPC-UGENT

## 1 Mission – 2 Teams

- *Support research and scientific computing*  
(service cluster: user relation management)
- *Compute infrastructure*  
(service cluster: service management and operations)

Functional Domain ICT

University Service Real Estate and Campus Facilities, ICT and Student Facilities' (UD3)

# ABOUT HPC-UGENT

## **Support research and scientific computing ('support')**

- Team leader Ewald Pauwels
- Currently 7 staff members
- Tasks include
  - Helpdesk for scientific computing
  - Resource and project follow-up
  - Documentation for scientific computing
  - Software installation as a service
  - Training and user outreach
  - UGent contribution in various EuroHPC projects
  - UGent representation in VSC

# ABOUT HPC-UGENT

## **Compute infrastructure ('ops')**


- Team leader Wouter Depypere
- Currently 8 staff members
  
- Tasks include
  - Maintain and upgrade HPC clusters, ensuring stability and availability
  - Allocate compute resources and storage capacity
  - Provide solutions for storing, securing, and accessing large data sets
  - Continuously improve and expand the HPC infrastructure to meet growing computing needs


# ACTIVITIES & UPDATES

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## Publications

Here you find a selection of our downloadable annual reports, promotional and support documents







VSC | Annual Report 2023  
(EN)



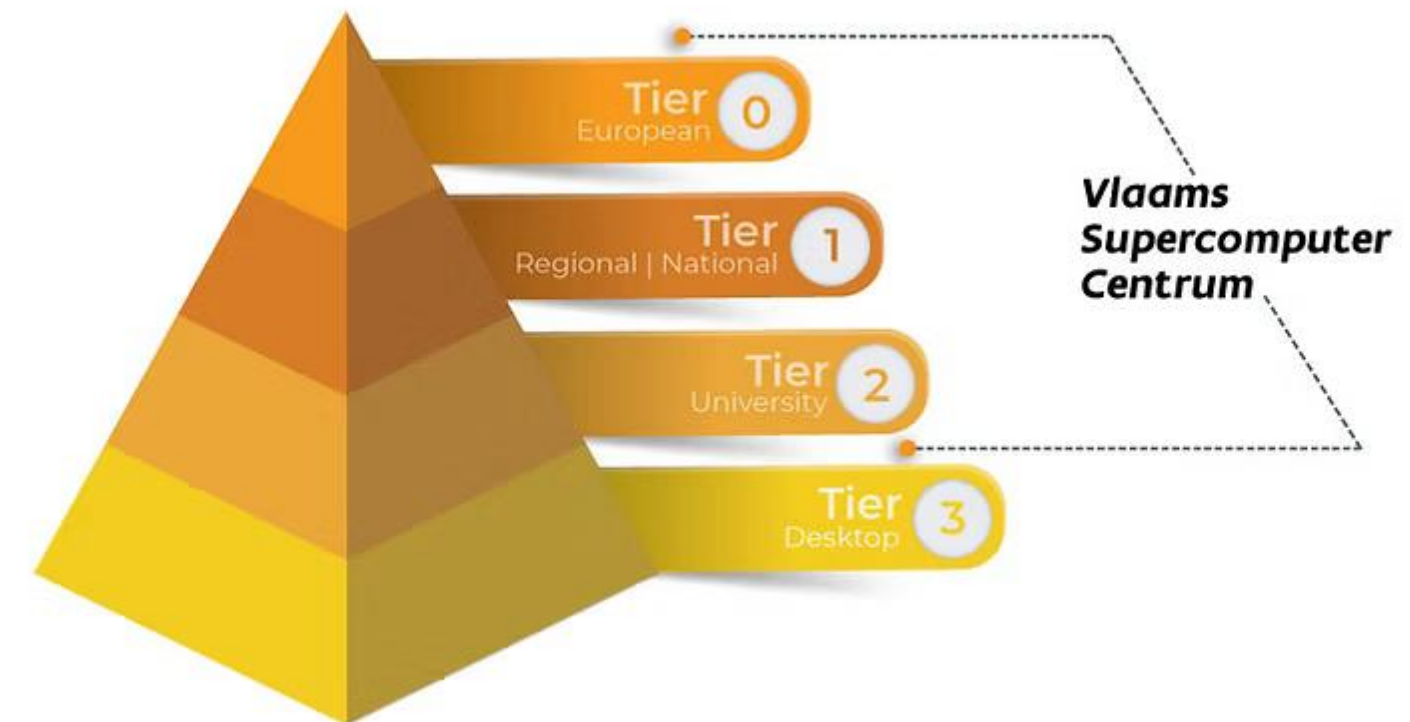
VSC | Annual Report 2023  
(NL)



Vlaams Supercomputer Centrum  
Annual Report  
2022



Vlaams Supercomputer Centrum  
Jaarverslag  
2022



# TIER2 INFRASTRUCTURE

Currently 7 clusters in production:

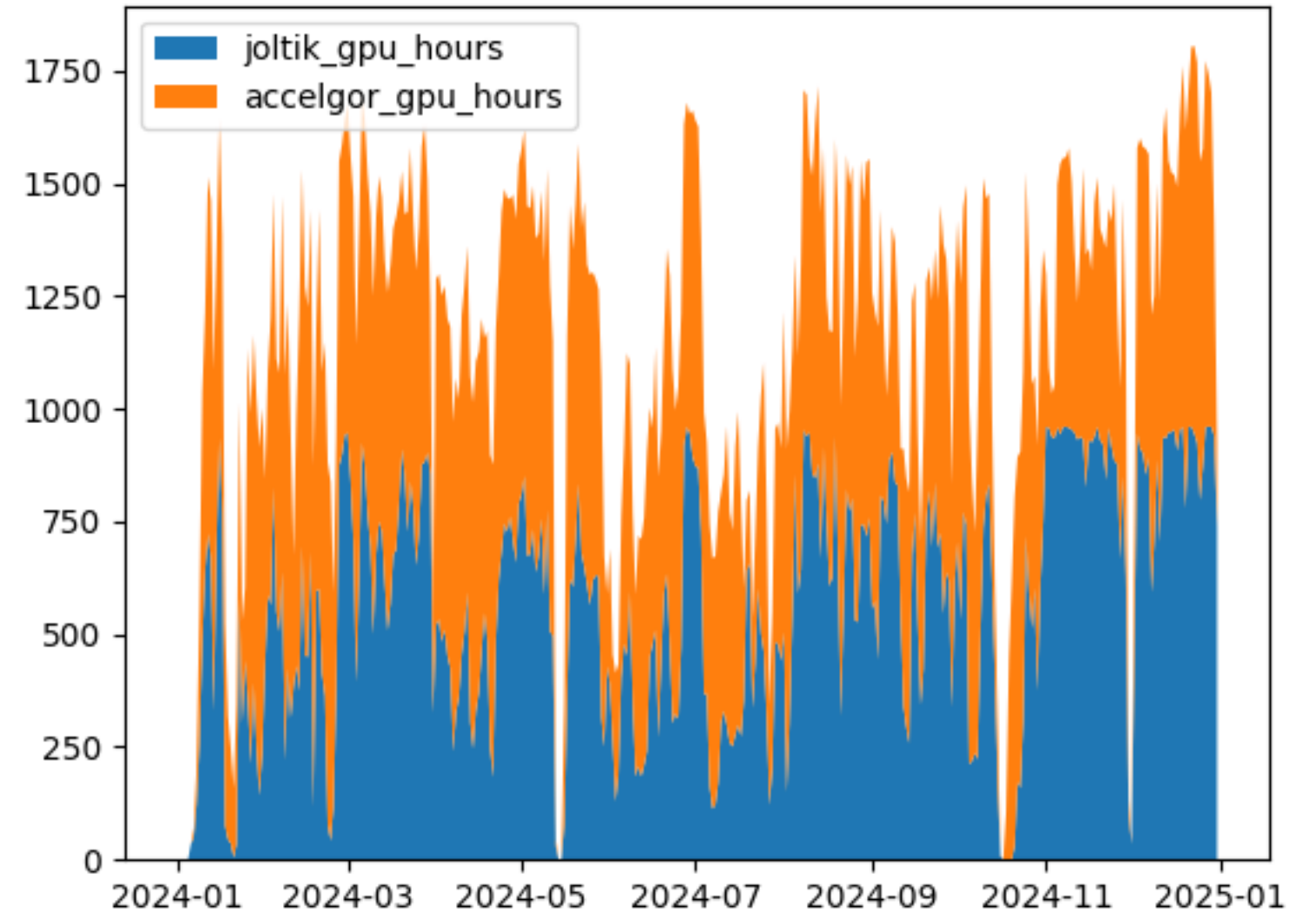
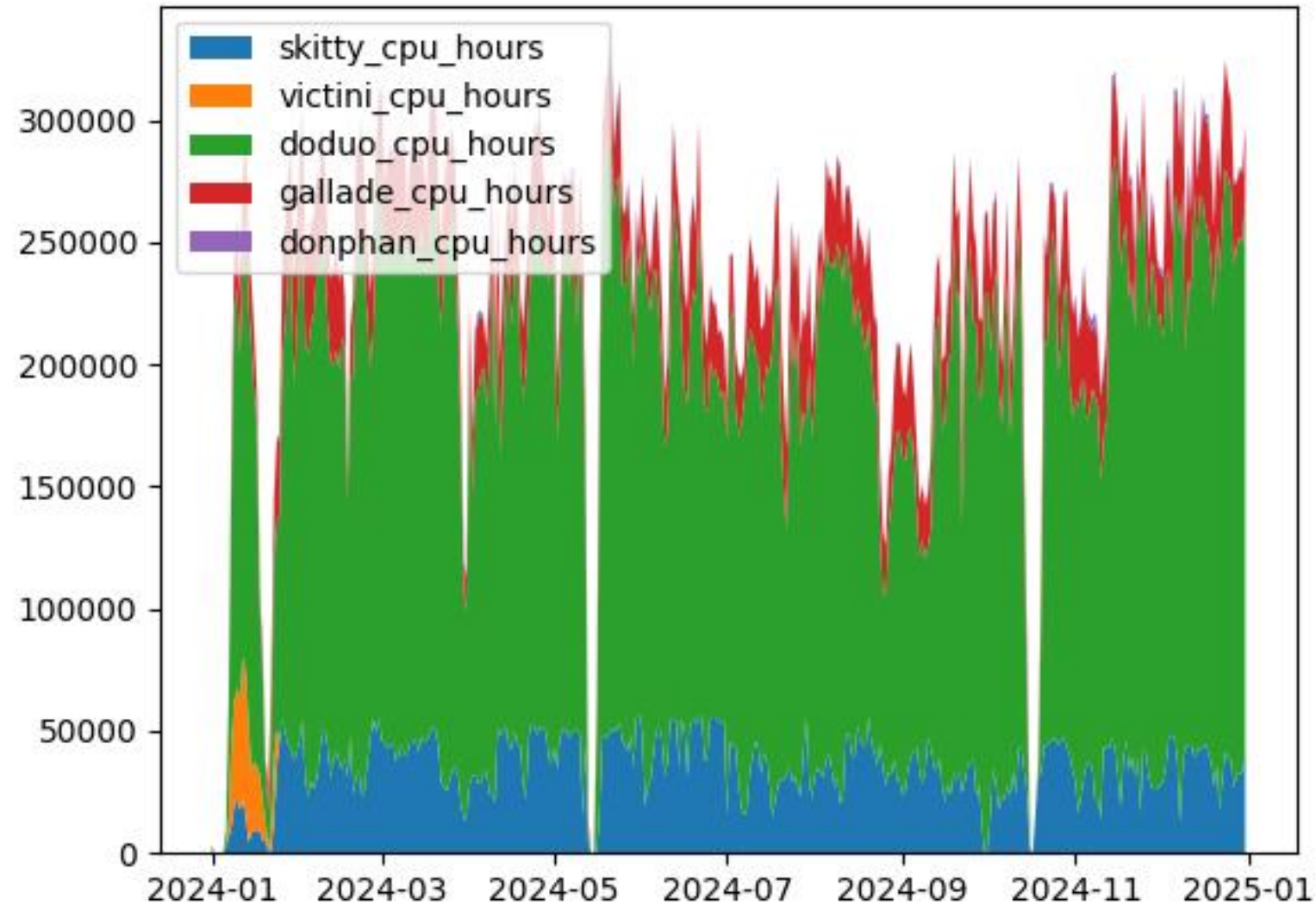
- 3 CPU clusters: *doduo*, *gallade*, *shinx* (~~*victini*~~, ~~*skitty*~~)
- 3 GPU clusters: *joltik*, *accelgor*, *litleo*
- 1 interactive debug cluster: *donphan*

Main shared storage:

- \$VSC\_HOME            0.09 PB    (64% full)
- \$VSC\_DATA            1.9 PB    (83% full)
- \$VSC\_SCRATCH        1.7 PB    (77% full)

<https://docs.hpc.ugent.be/infrastructure/>

# TIER2 USAGE



Average usage (assuming 100% uptime, so underestimate):

doduo 57%

gallade 59%

accelgor 68%

joltik 59%

# TIER2 USAGE

## Usage across institutes in 2024

	#users	CPU	GPU
UAntwerpen	36	4.7%	3.4%
VUB	21	0.0%	0.5%
UGent	1945	94.9%	93.2%
KULeuven/UHasselt	50	0.1%	2.8%
Other institutes, companies	43	0.3%	0.1%

## Usage by personnel category

	#users	CPU	GPU
Students	1023	11.2%	9.9%
Researchers	1072	88.7%	90.1%

We welcome the usage of the HPC infrastructure for teaching and training

[https://docs.hpc.ugent.be/teaching\\_training](https://docs.hpc.ugent.be/teaching_training)

# TIER2 DATA POLICY

WELL BEFORE leaving university, users should offload their data

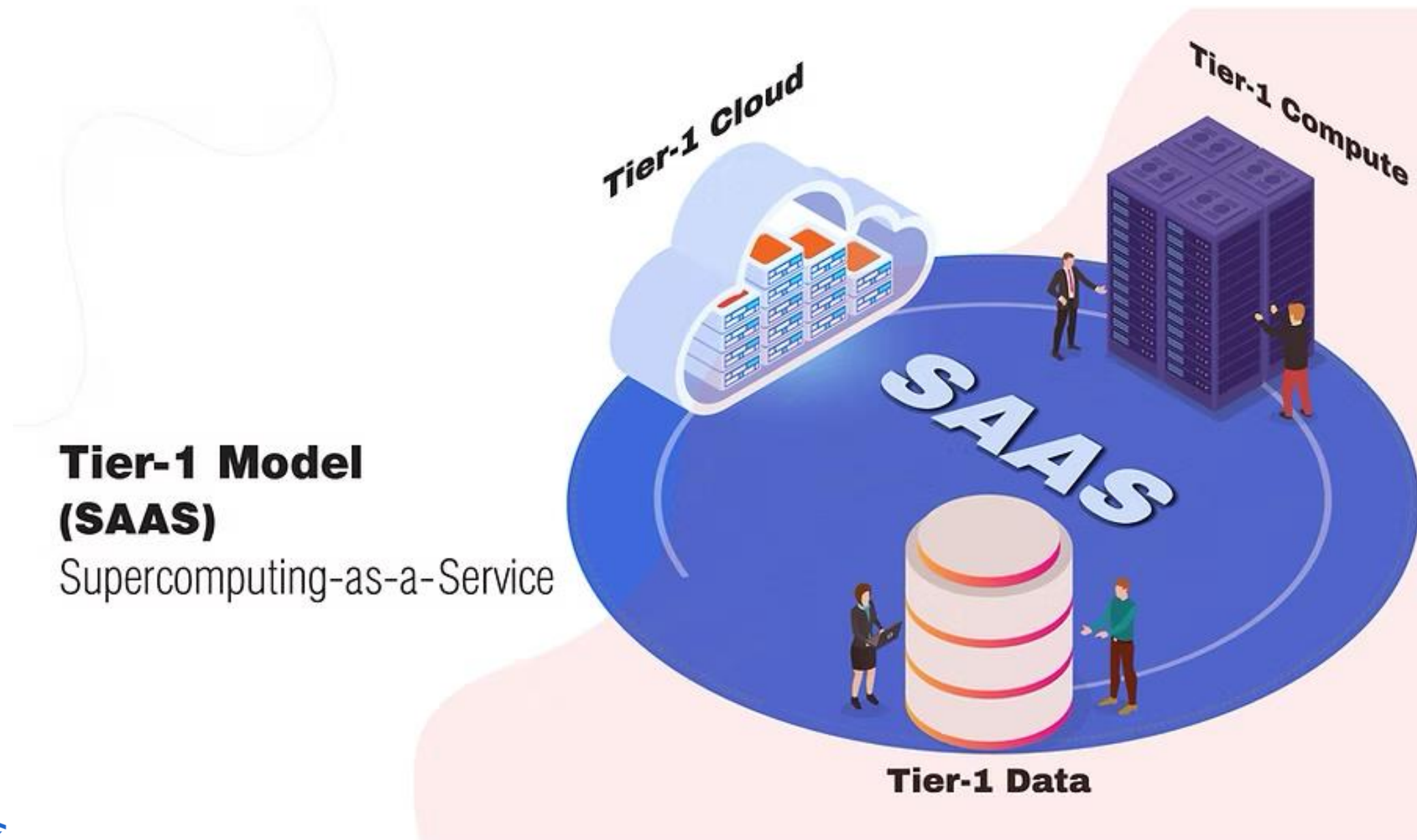
- Clean up (delete)
- Transfer data to coworkers
- Take personal backups

Data transfer by HPC staff should be last resort measure

- error-prone, manual process, risks storage integrity risks
- very time-consuming

[https://docs.hpc.ugent.be/sites/hpc\\_policies/#data-access-retention](https://docs.hpc.ugent.be/sites/hpc_policies/#data-access-retention)

# TIER1 – VSC INFRASTRUCTURE



## **Tier-1 Model (SAAS)**

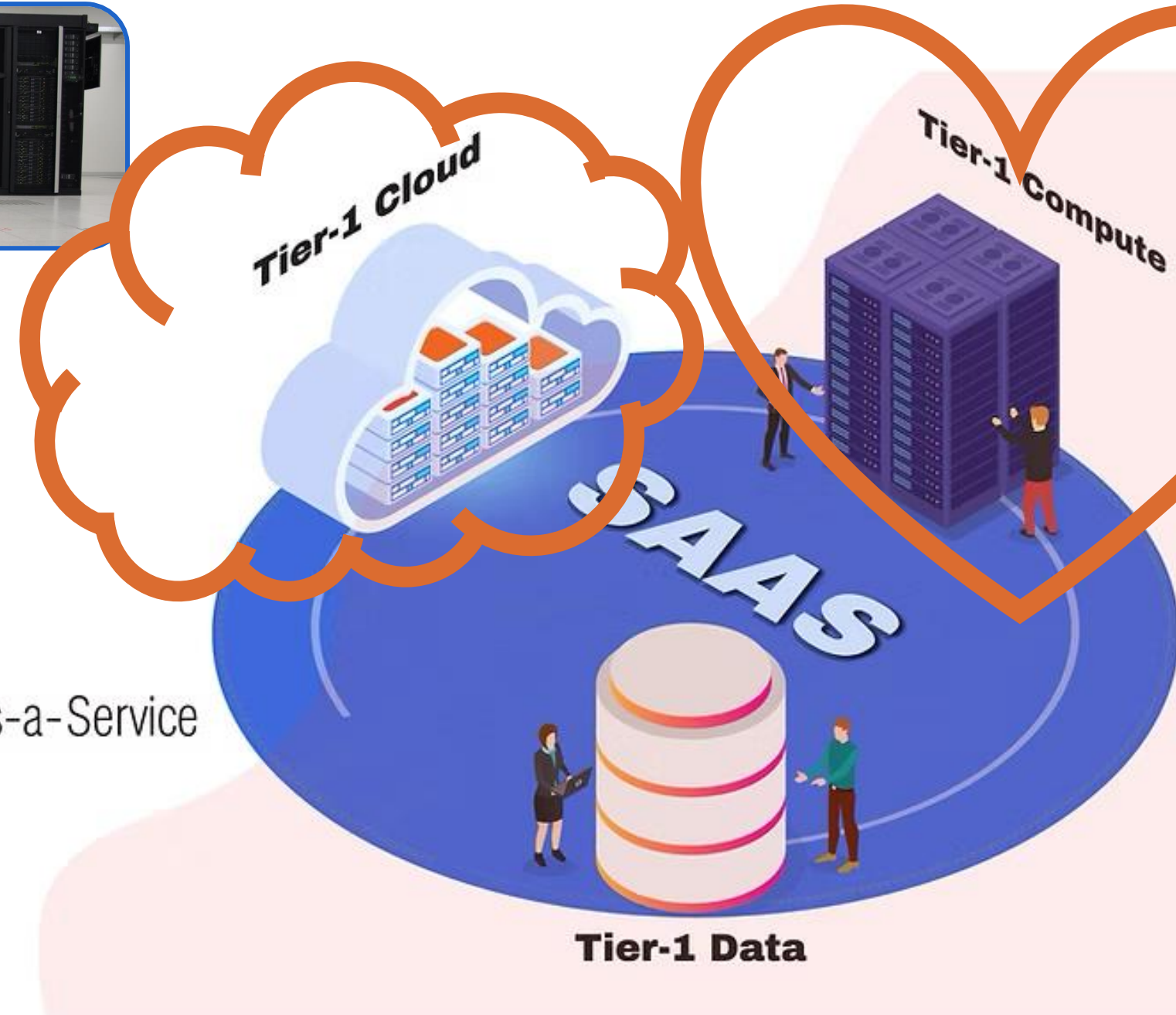
Supercomputing-as-a-Service

# TIER1 – VSC INFRASTRUCTURE

Maintenance and support by HPC-UGent teams



**Tier-1 Model (SAAS)**  
Supercomputing-as-a-Service



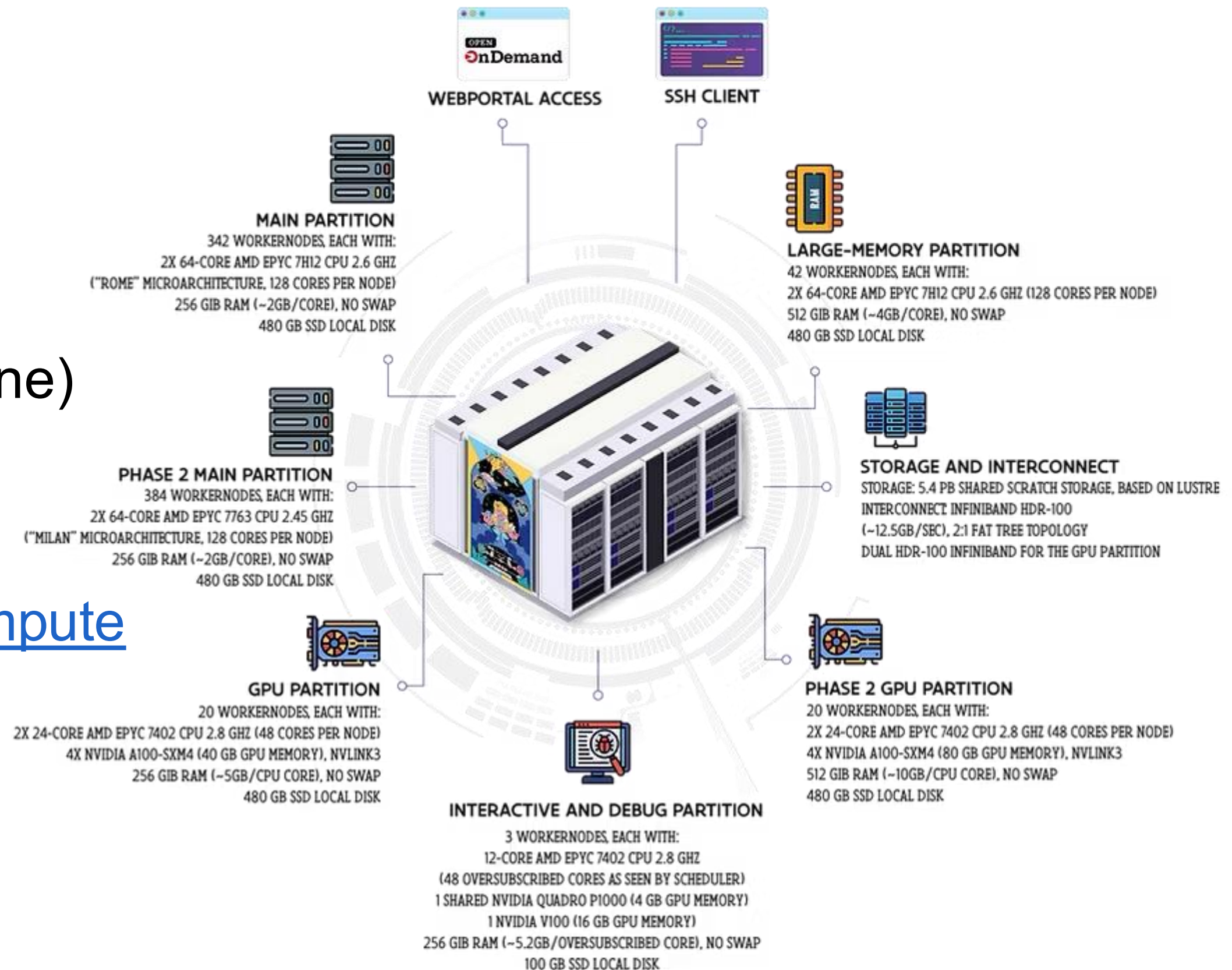
# TIER1 COMPUTE HORTENSE

+100.000 cores and 80 GPUs

## Project based access

- Starting grant
- Project (next cutoff: 2 June)
- Collaborative grant
- Industry

<https://www.vscentrum.be/compute>



# TIER1 COMPUTE HORTENSE

5 - 14 May: resolving cooling issues

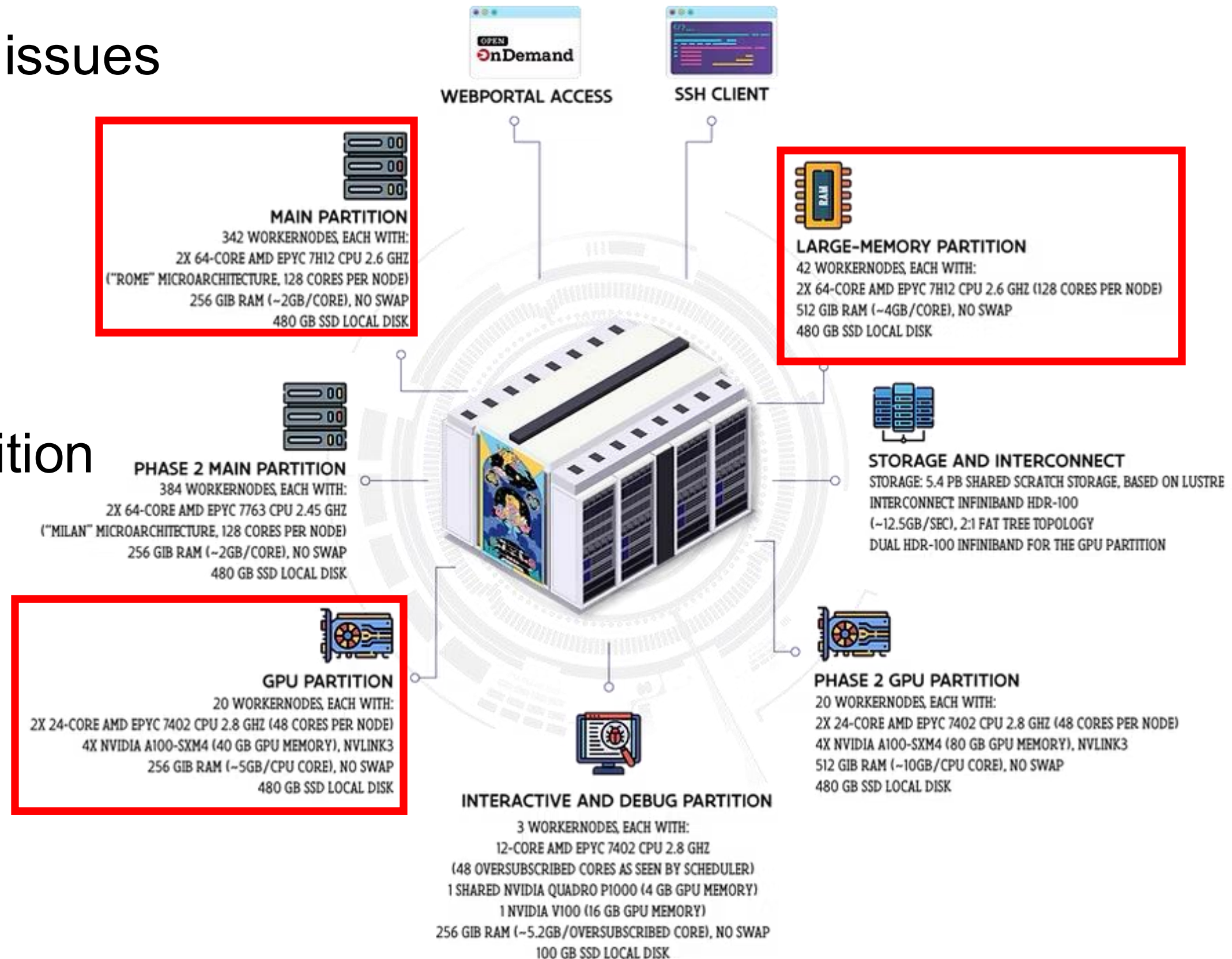
RHEL9 for all Milan nodes

Nov 2025:

Decommissioning Rome partition

End 2025:

New Tier1 at VUB



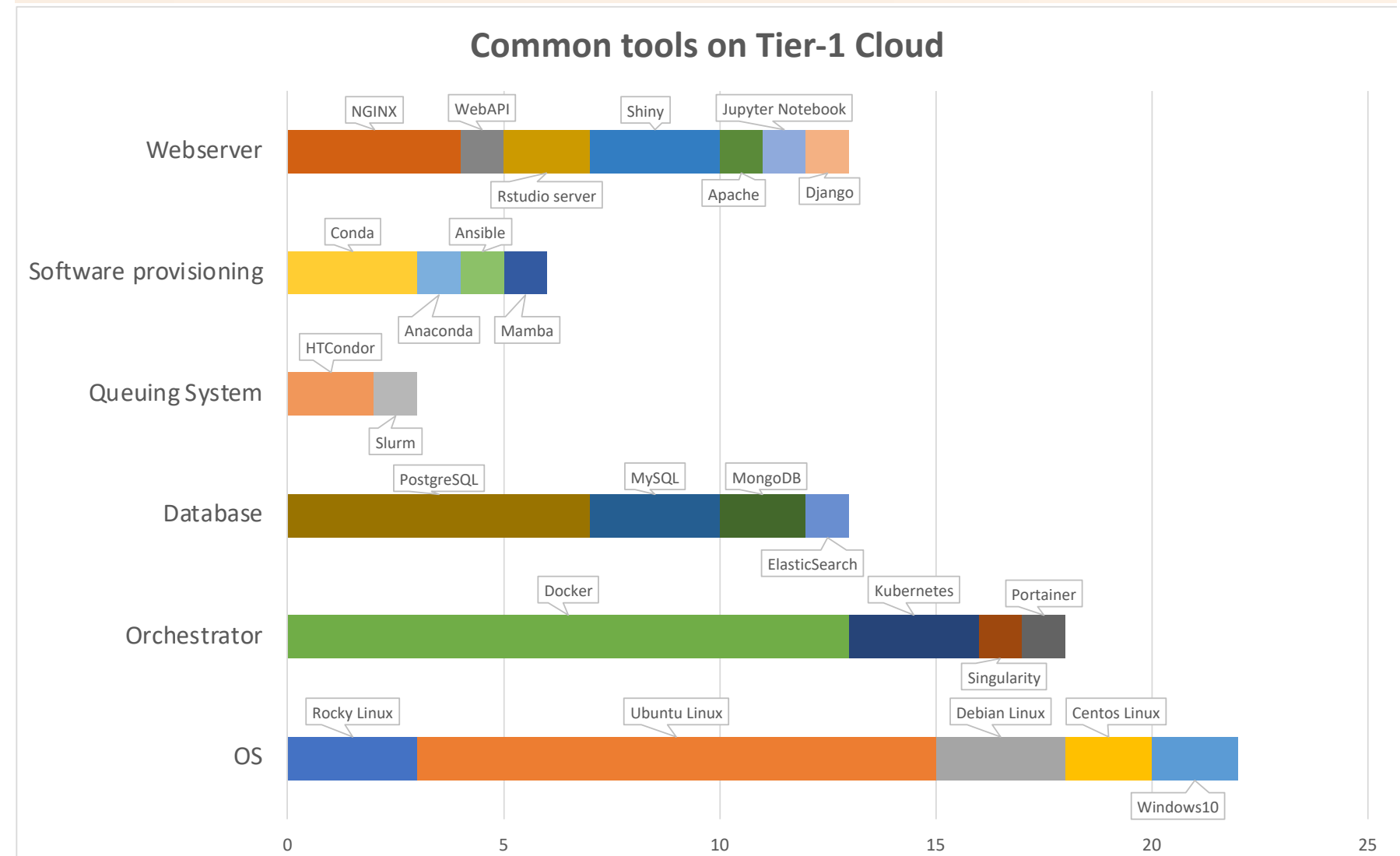
# TIER1 CLOUD

Unmanaged VMs  
For power users

Project based access

- Starting grant
- Project (no cutoffs)

<https://www.vscentrum.be/cloud>



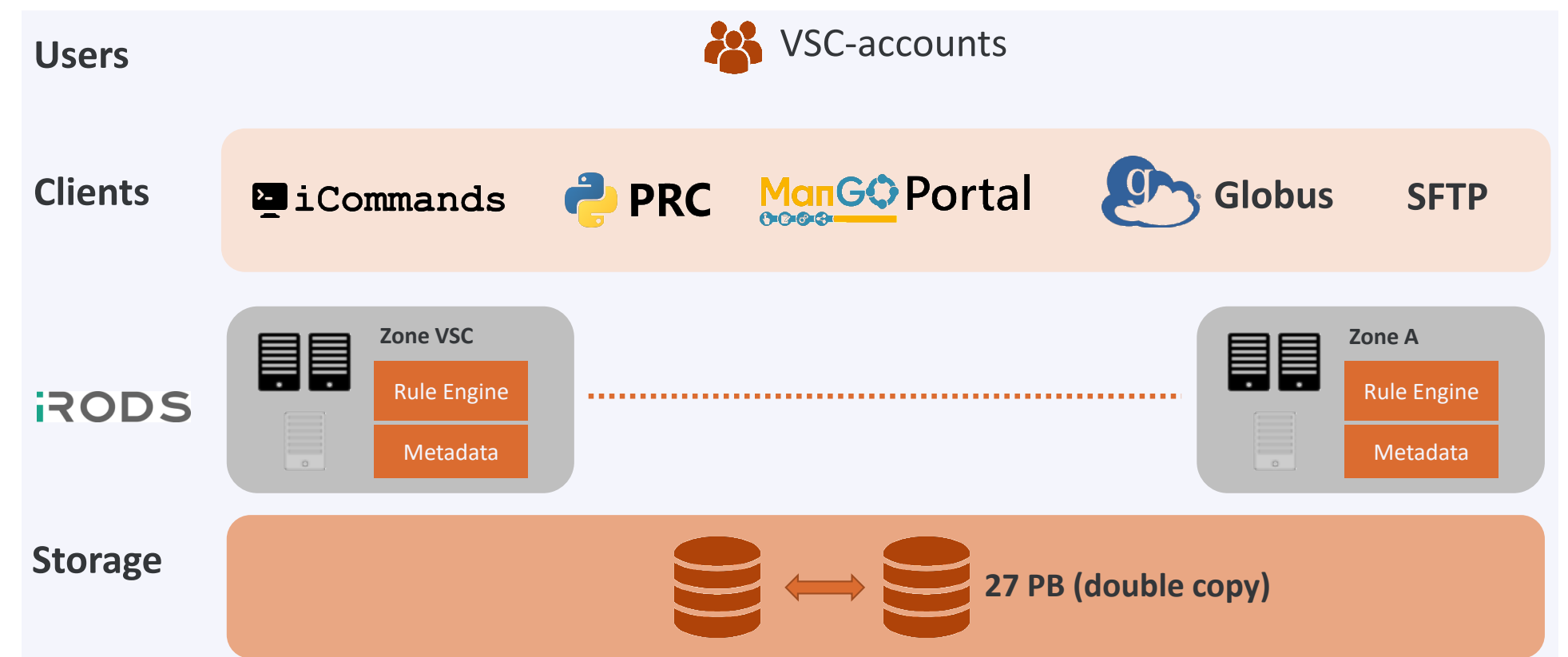
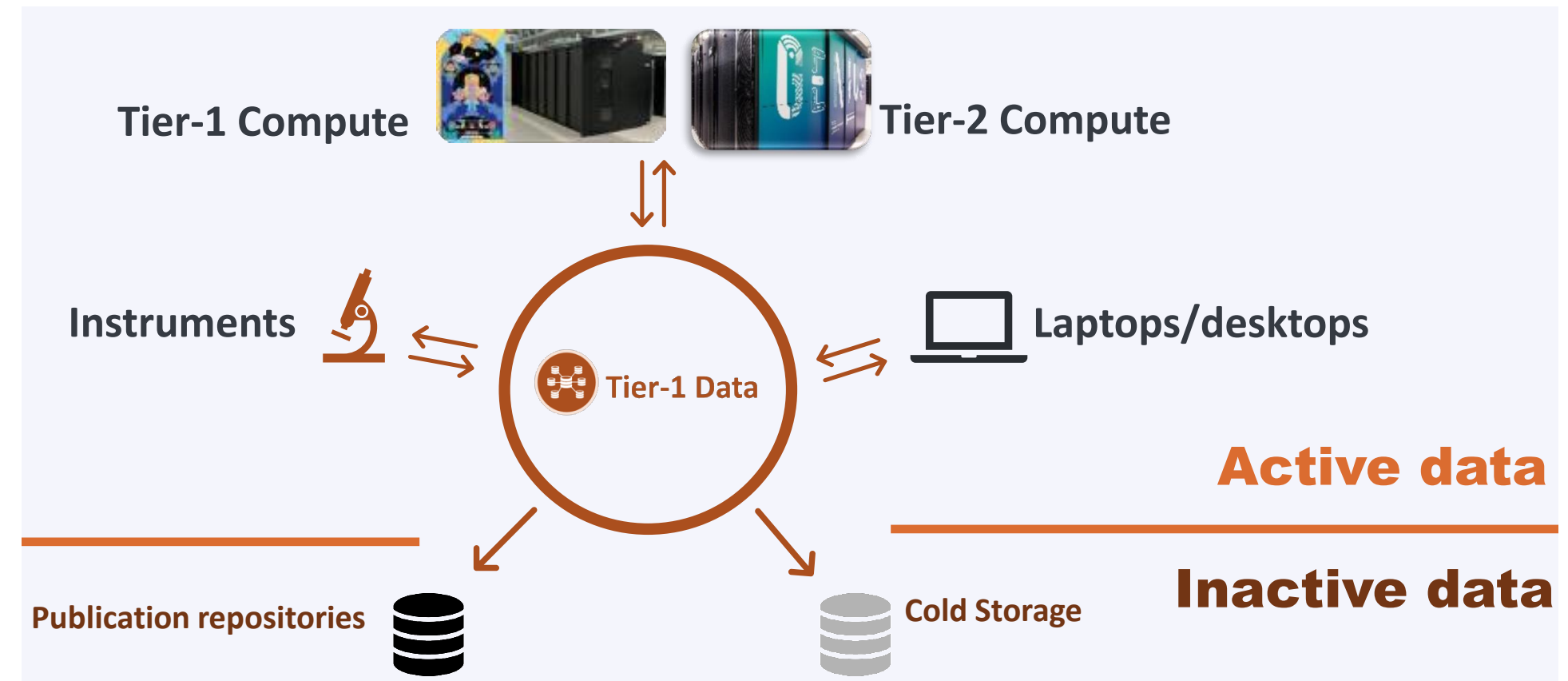
# TIER1 DATA

Storage management platform  
Active (HPC) research data  
Metadata, automation, sharing

Project based access

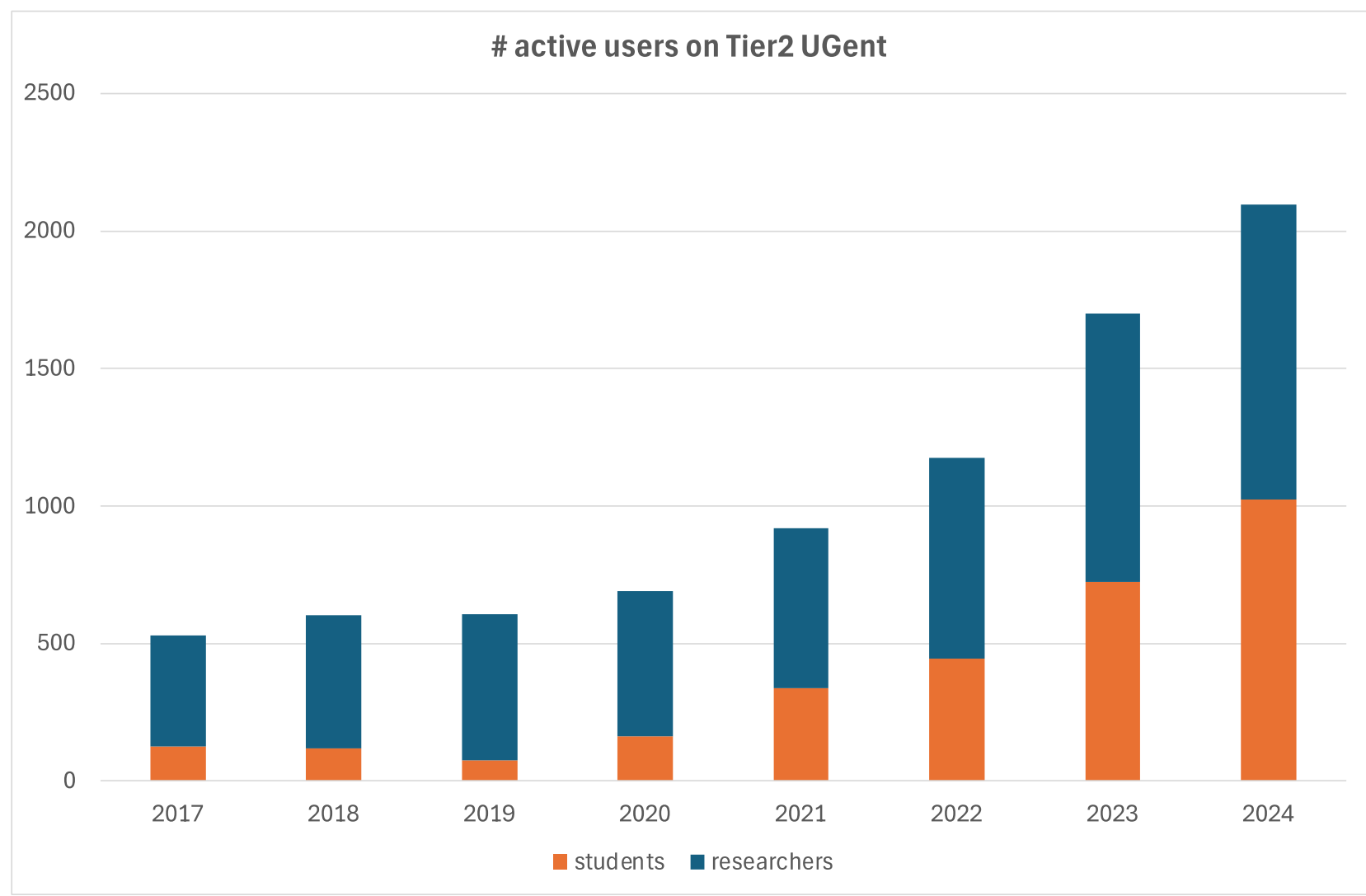
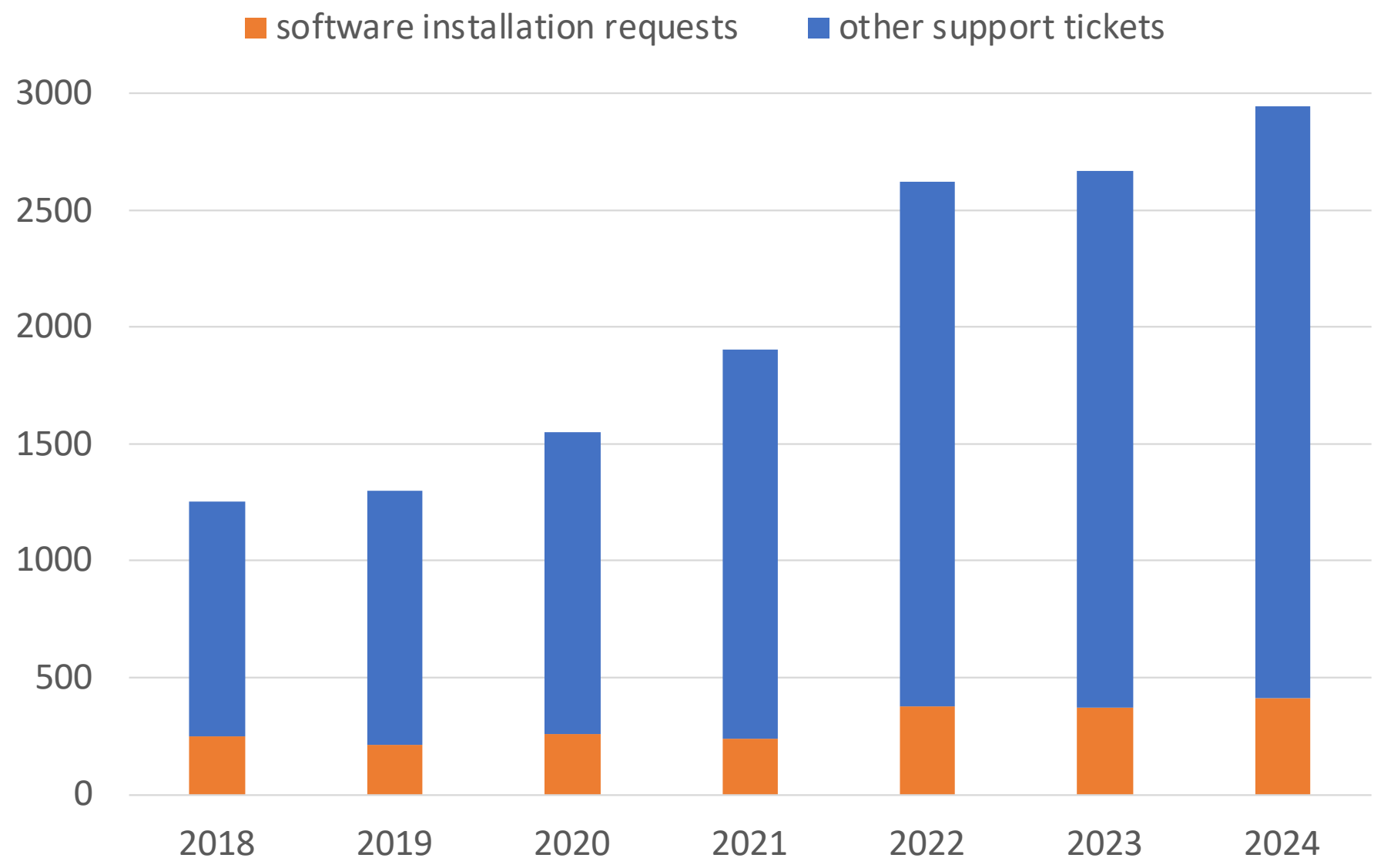
- Starting grant
  - 8 months
- Project (no cutoffs)
  - 4 years
  - 5 TB – 1 PB

<https://www.vscentrum.be/data>



# HELPDESK

# HELPDESK



# HELPDESK

In 2024, we tackled:

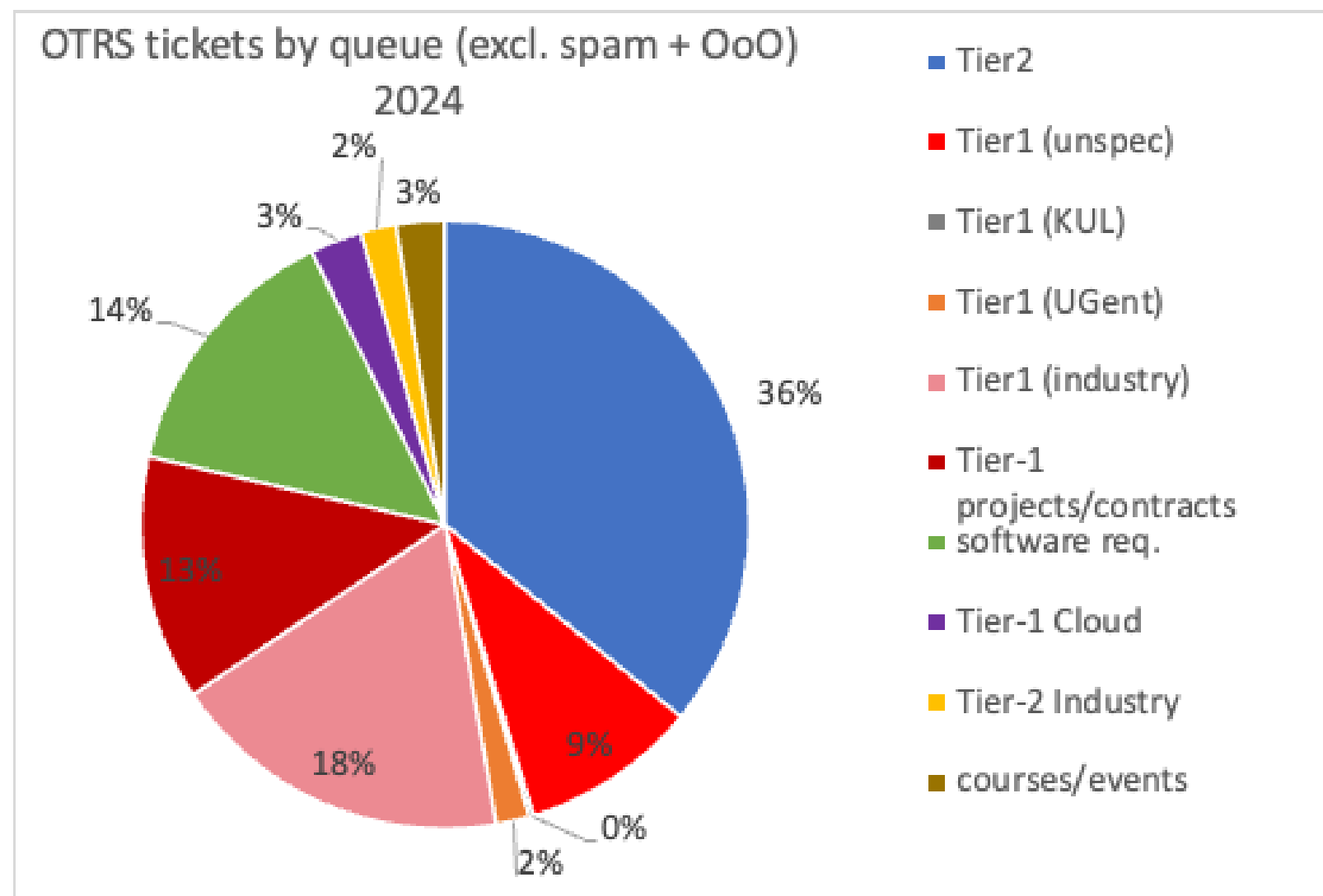
- 2.710 tickets related to Tier2 UGent
- 667 tickets related to Tier1 Compute
- 87 tickets related to Tier1 Cloud
- 474 software installation requests (Tier1+Tier2)

[hpc@ugent.be](mailto:hpc@ugent.be)

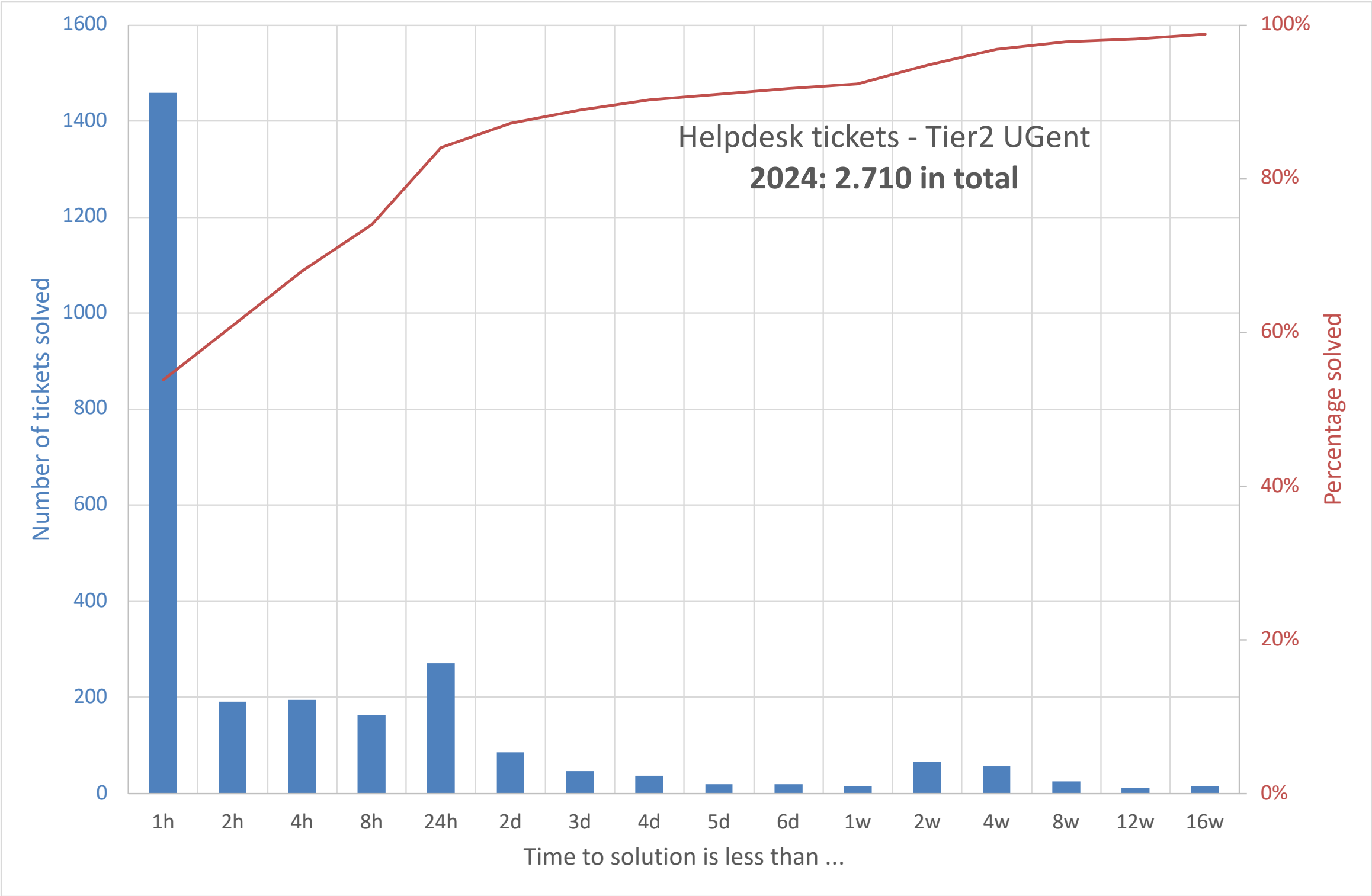
[compute@vscentrum.be](mailto:compute@vscentrum.be)

[cloud@vscentrum.be](mailto:cloud@vscentrum.be)

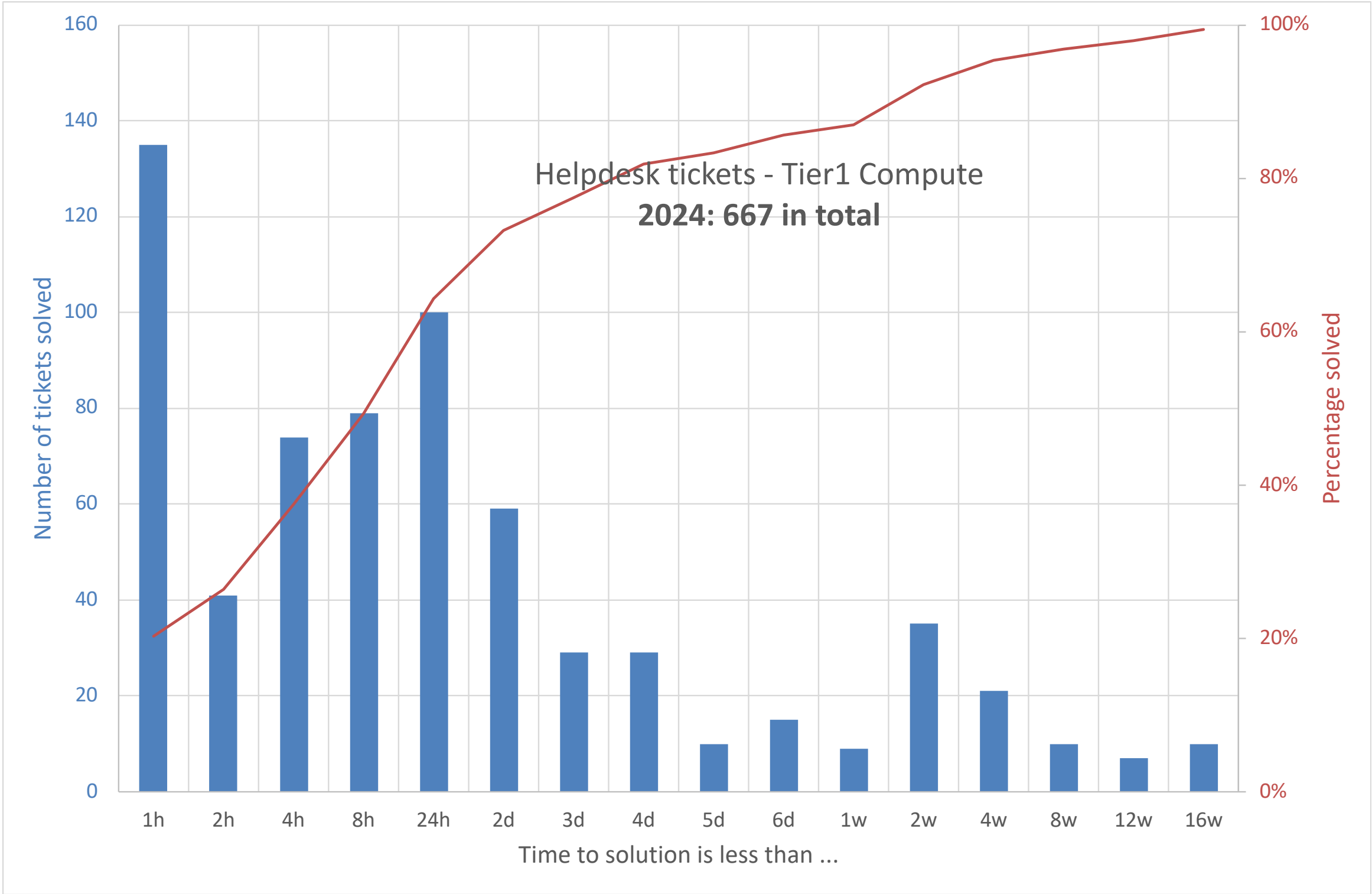
- 320 active Tier1 Compute projects
- 28 active Tier1 Cloud projects



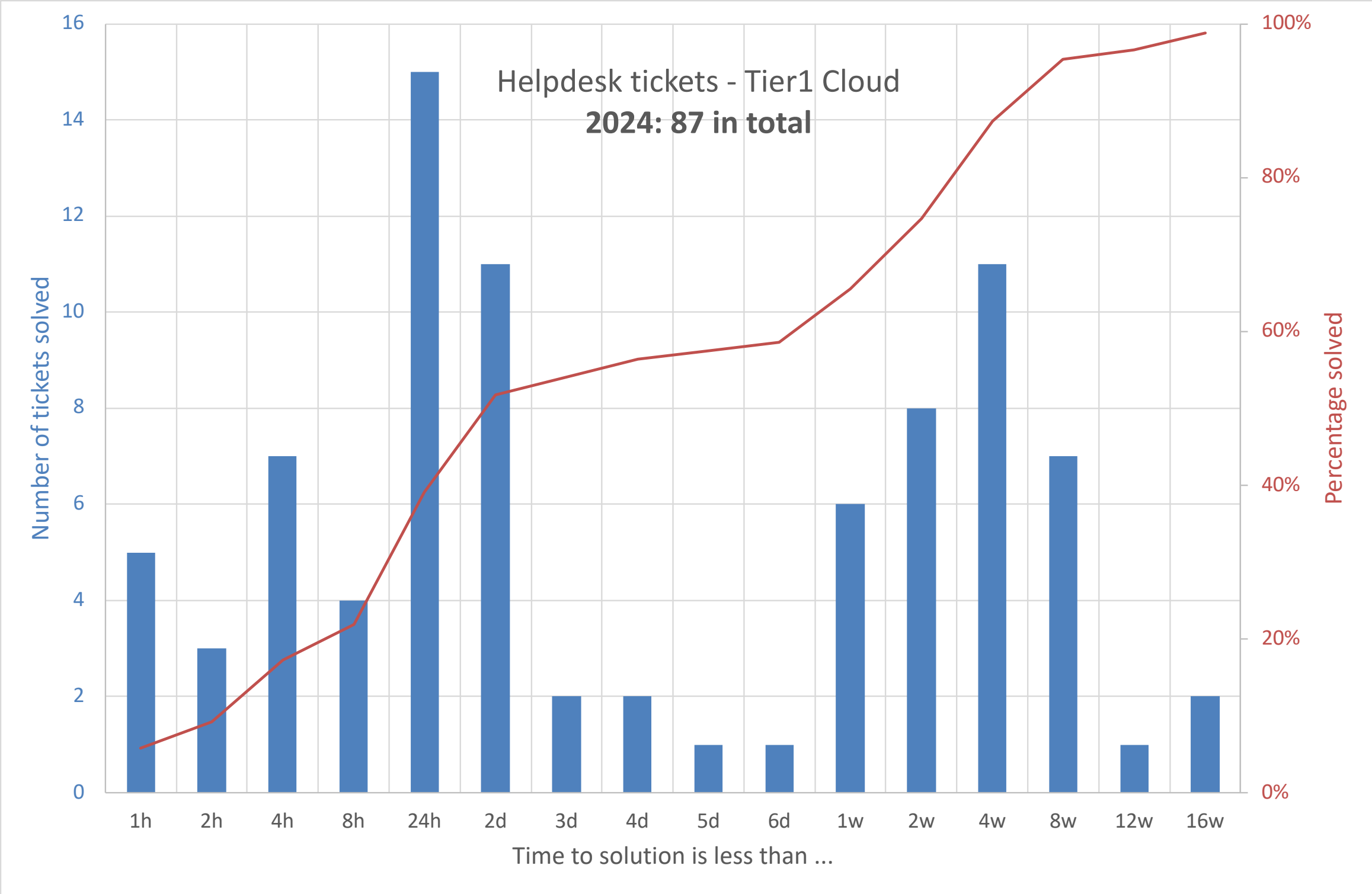
# HELPDESK



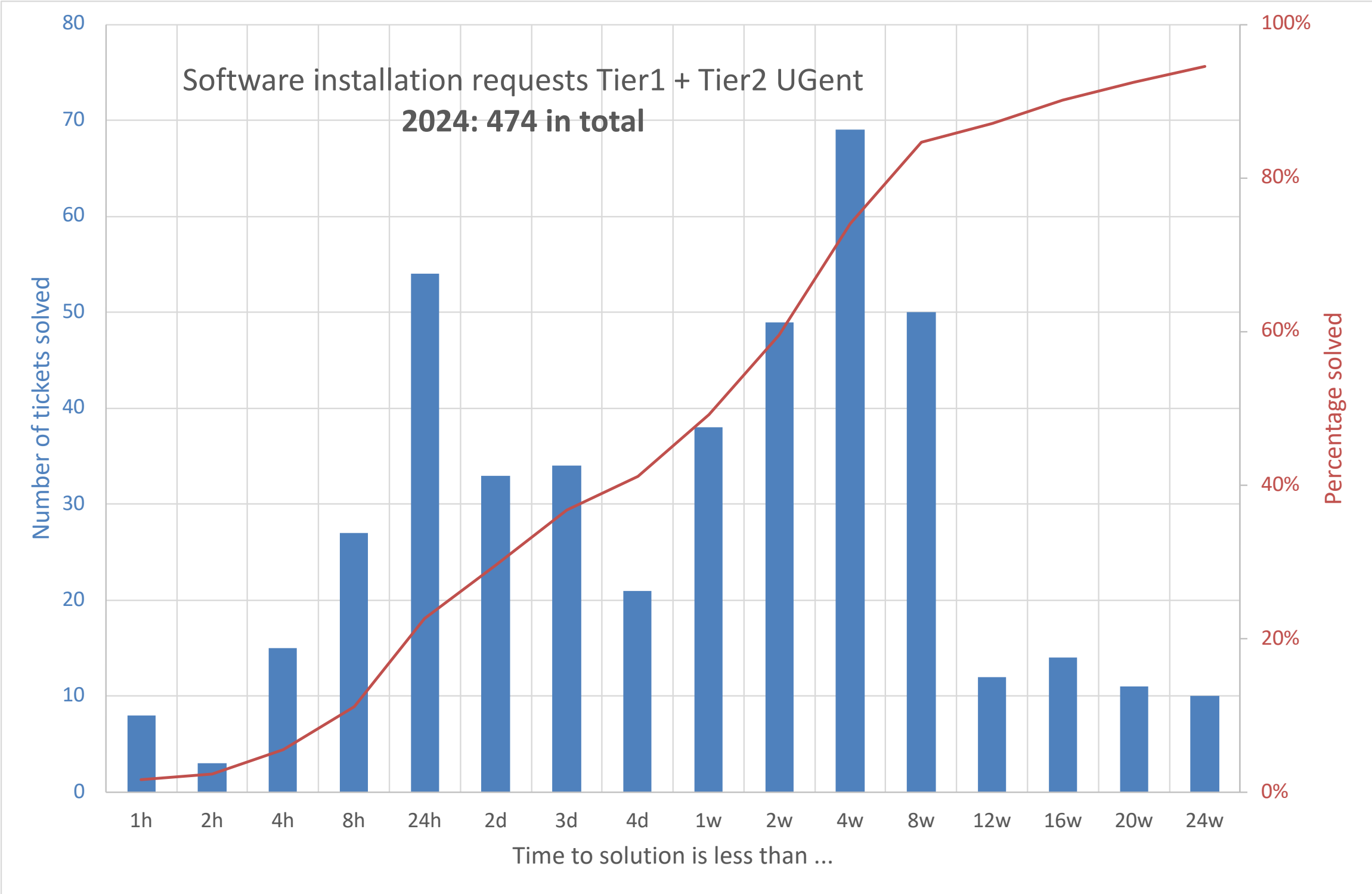
# HELPDESK



# HELPDESK



# HELPDESK



# SOFTWARE INSTALLATION

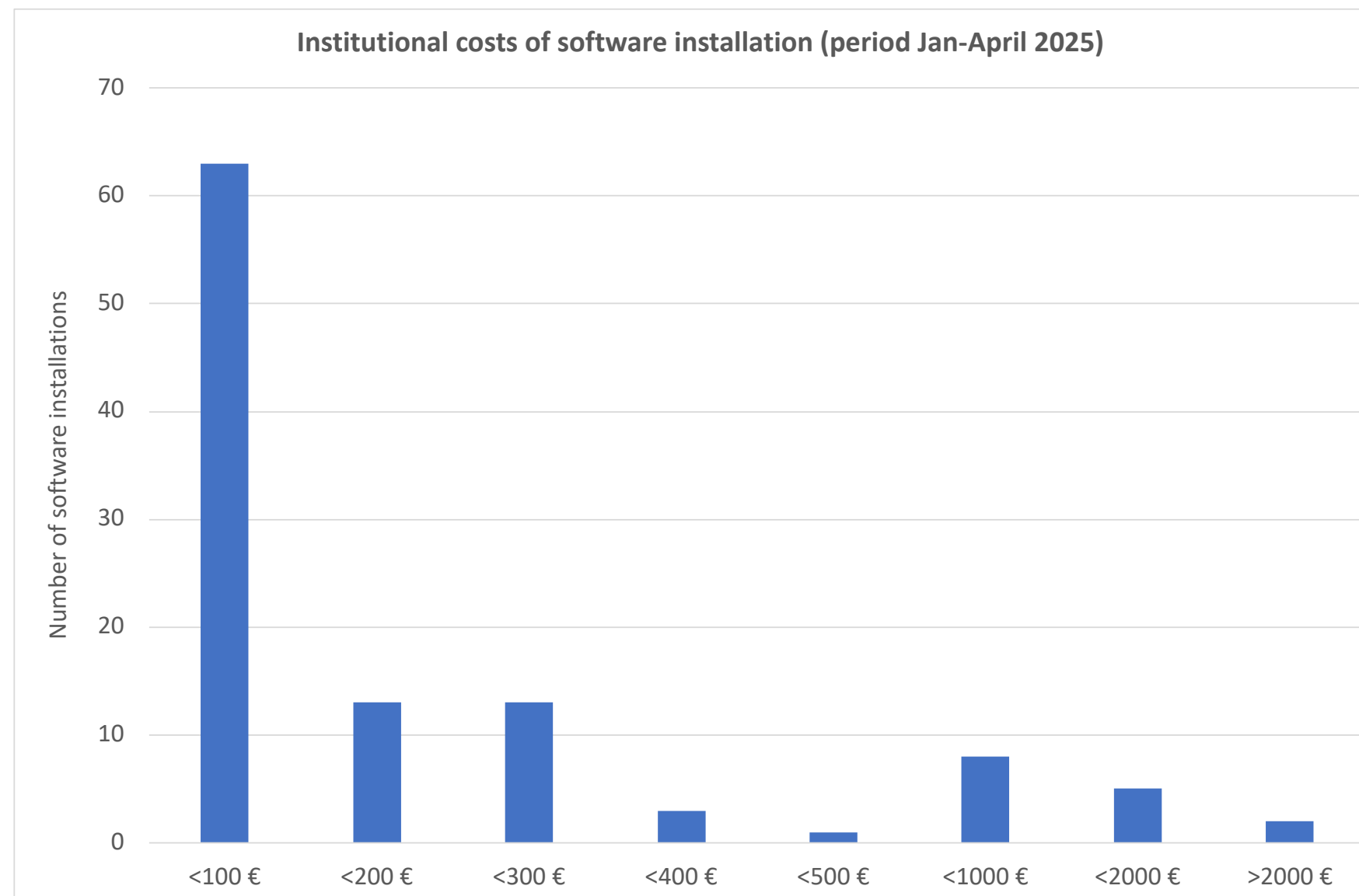
2023 analysis indicated: ~30% installed software modules is **never** used  
Starting 2025, we are looking closer at software installation requests.

- Cost reporting
  - “This installation took about <> hours of effort, which is roughly equivalent to <> Euro of institutional cost.”*
- Requesting software usage report
  - “By submitting a software installation request, you are committing to sending back a software usage report.”*

# SOFTWARE INSTALLATION

So far in 2025:

- 112 software installation requests received
- 89 installations executed
- 25 software usage reports received



# USER POLL RESULTS

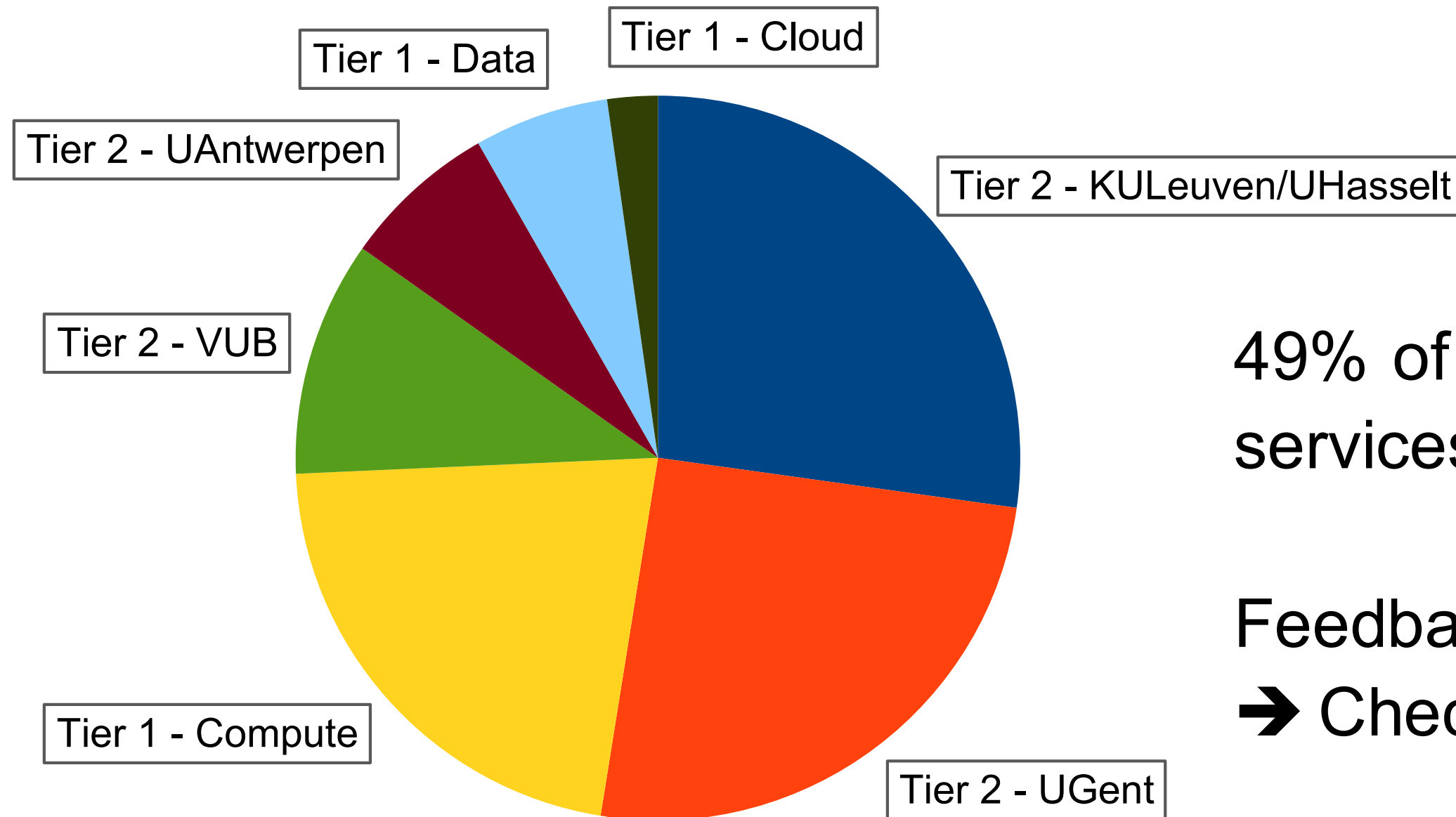
# USER POLL RESULTS

- As part of broader VSC poll
- Will be done yearly
- Sent out 5 Nov 2024
- Closed 17 Dec 2024
- In total: 534 respondents

Affiliation	Count
Association - UGent	181
Association - KU Leuven	160
Association - VUB	64
Association - UAntwerpen	44
Private company	21
Other Research Institute	16
Multiple Universities	15
Association - UHasselt	10
SOC - VIB	9
Public Sector organization	5
SOC - imec	4
SOC - VITO	2
SOC - FlandersMake	2
<b>Total</b>	<b>534</b>

# USER POLL RESULTS

**Which VSC services are you using ?**



49% of VSC respondents indicate using services managed by HPC-UGent

Feedback on Tier1 services

➔ Check out VSC year report

Focusing on UGent Tier2 feedback

# USER POLL RESULTS

## Users reporting service as good/excellent:

90% (85/95) - Quality

79% (73/92) - Response time

85% (103/121) - Correspondence to expectations

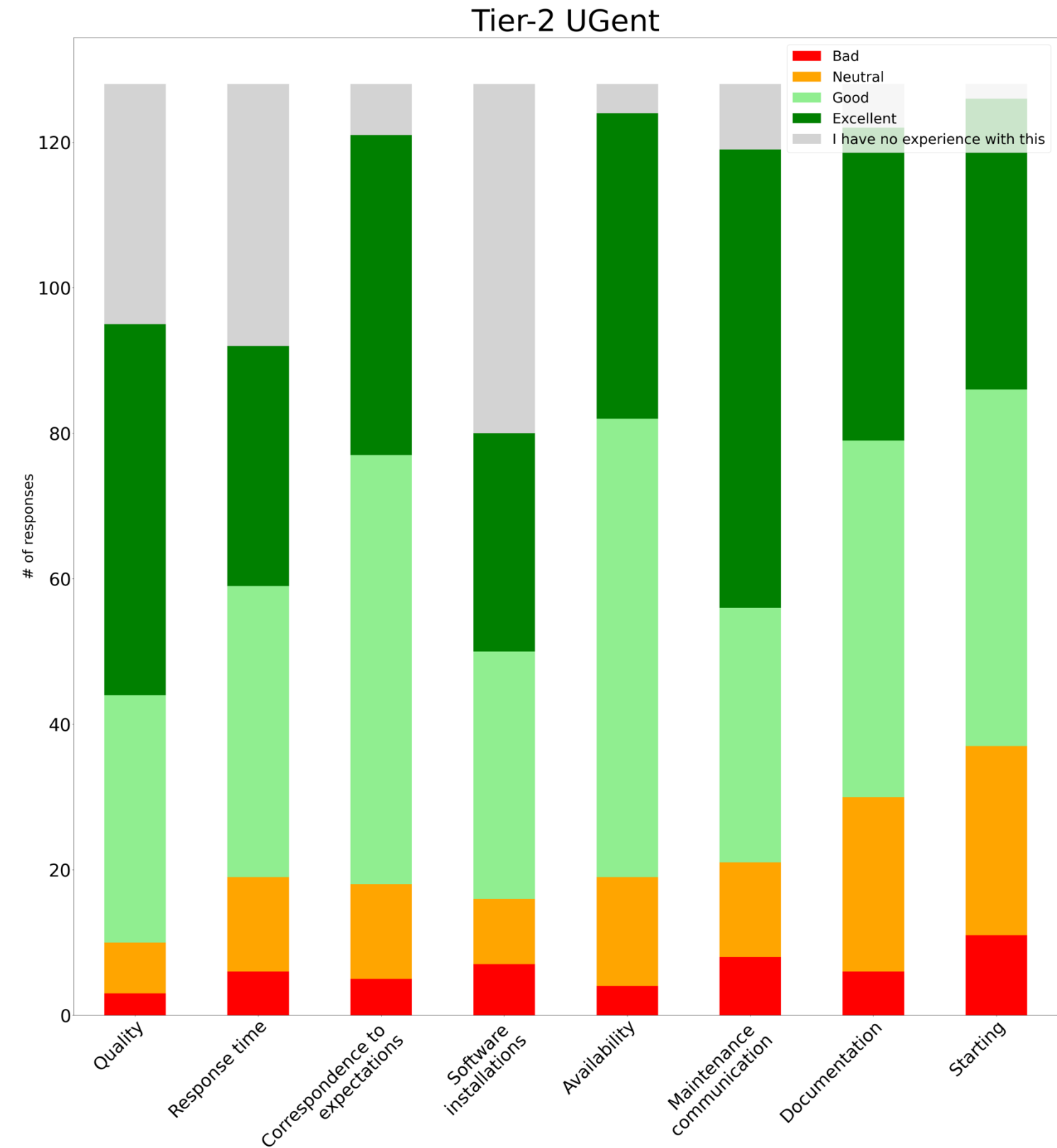
80% (64/80) - Software installations

85% (105/124) - Availability

82% (98/119) - Maintenance communication

75% (92/122) - Documentation

71% (89/126) - Starting



# USER POLL RESULTS

## **Suggestions to improve HPC-UGent services?**

### Infrastructure

- More GPUs (2)

# USER POLL RESULTS

## **Suggestions to improve HPC-UGent services?**

### Documentation

- Simpler documentation, cheat sheets (2)
- Update existing documentation (1)
- Better documentation for the webportal (1)
  
- Shared documentation for applications (1)
- More application-specific practical examples (1)
- Documentation/best practices for conda (2), docker (1), Rstudio (1), Slurm (1), Dask (1), Nextflow (1)

# USER POLL RESULTS

## Suggestions to improve HPC-UGent services?

### User experience

- Consult cluster status on VSC status page (1)
- Way to consult power usage footprint of jobs (1)
- Increase timeout duration in web portal (2)
  
- Way to estimate queue time (1)
- Reduce (GPU) queuing times (5)
  
- Allocate more staff for the helpdesk (5)
- More patience with (beginning) users (1)

# USER POLL RESULTS

## Suggestions to improve HPC-UGent services?

### Software

- Faster response time for software installation requests (5)
- Container images for popular software (1)
- Easier way to work with different modules and toolchains (e.g. conda) (1)
- Support for Pixi (1)
- Homogeneous toolchains/software over all clusters (1)
- Improve speed of standard BLAS for AMD CPUs (1)
- MKL for AMD and enable AVX2 (1)

# USER POLL RESULTS

## **Suggestions to improve HPC-UGent services?**

### Data

- Way to delete data of ex-user (1)
- Clarify sharing permissions in documentation (1)
- Shared database repositories (1)
- Share research data across VOs or with researchers without vsc-id (1)

# USER POLL RESULTS

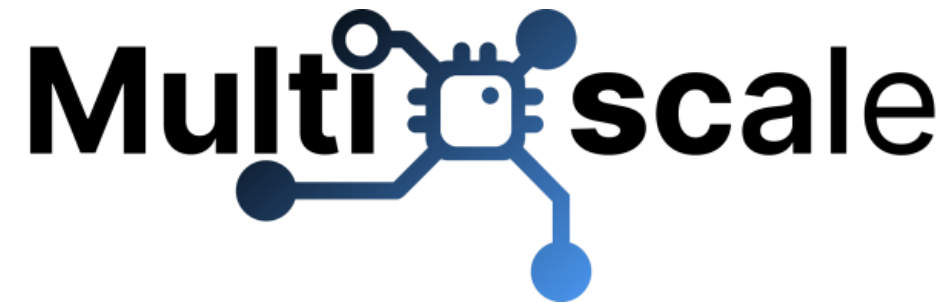
## Suggestions for specific training?

- Domain-specific training (2)
  - E.g. bioinformatics, MD, DFT
- Specific scientific software training (2)
  - Rstudio, Gaussian,
- Custom environments (conda) (1)
- Containers (1)
- Parallel computing (1)

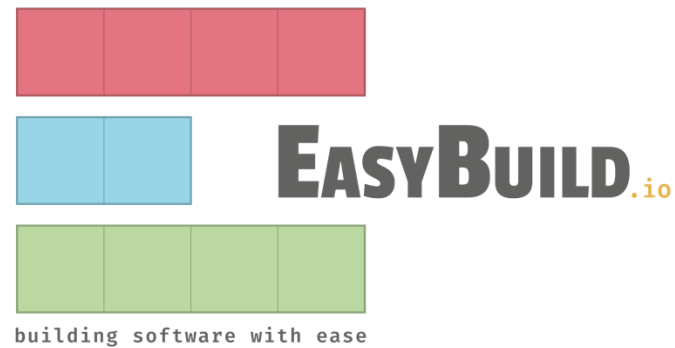
# EUROPEAN EFFORTS

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# HPC-UGENT CONTRIBUTES TO EUROHPC



<https://www.multixscale.eu>



<https://easybuild.io>



<https://eessi.io>



**E E S S I**  
EUROPEAN ENVIRONMENT FOR  
SCIENTIFIC SOFTWARE INSTALLATIONS



## Consortium:

- CSC-IT Centre for Science
- GÉANT
- IT4Innovations National Supercomputing Center
- University of Tartu
- Ghent University
- NORDUnet

QUESTIONS ?

FEEDBACK ?

COMMENTS ?