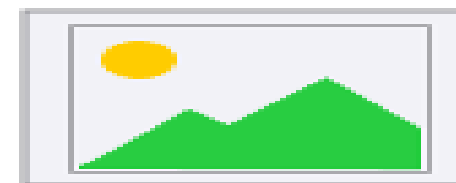
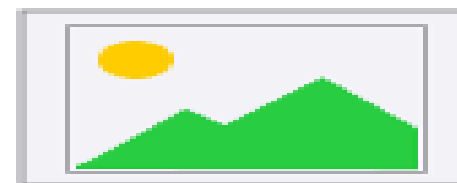
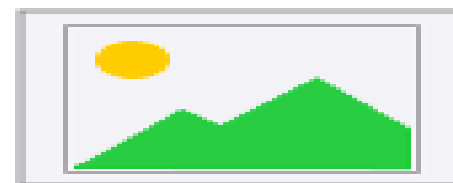
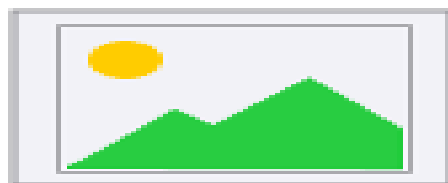




UNIVERSITEIT
GENT

TRAIN-THE-TRAINER: TEACHING USING HPC-UGENT

Info session 8 September 2026



ABOUT HPC-UGENT

Mission

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

Tasks

- User support
- Training
- Infrastructure installation & upkeep (software & hardware)
- Outreach + marketing
- Collaboration with other supercomputing centers

TEACHING USING HPC-UGENT – TL;DR

- Use the HPC-UGent Tier2 web portal <https://login.hpc.ugent.be>
- Jobs start instantly on cluster *donphan* (with limited resources)
- Lots of scientific software is preinstalled as modules (*module load*)
- Students make VSC account themselves, or we do based on UGent course id
- Always prepare a plan B – e.g. in case of unexpected power failure
- Still need a dedicated server?
Request VSC Tier1 Cloud VM(s) <https://www.vscentrum.be/cloud>

TEACHING USING HPC-UGENT – TL;DR

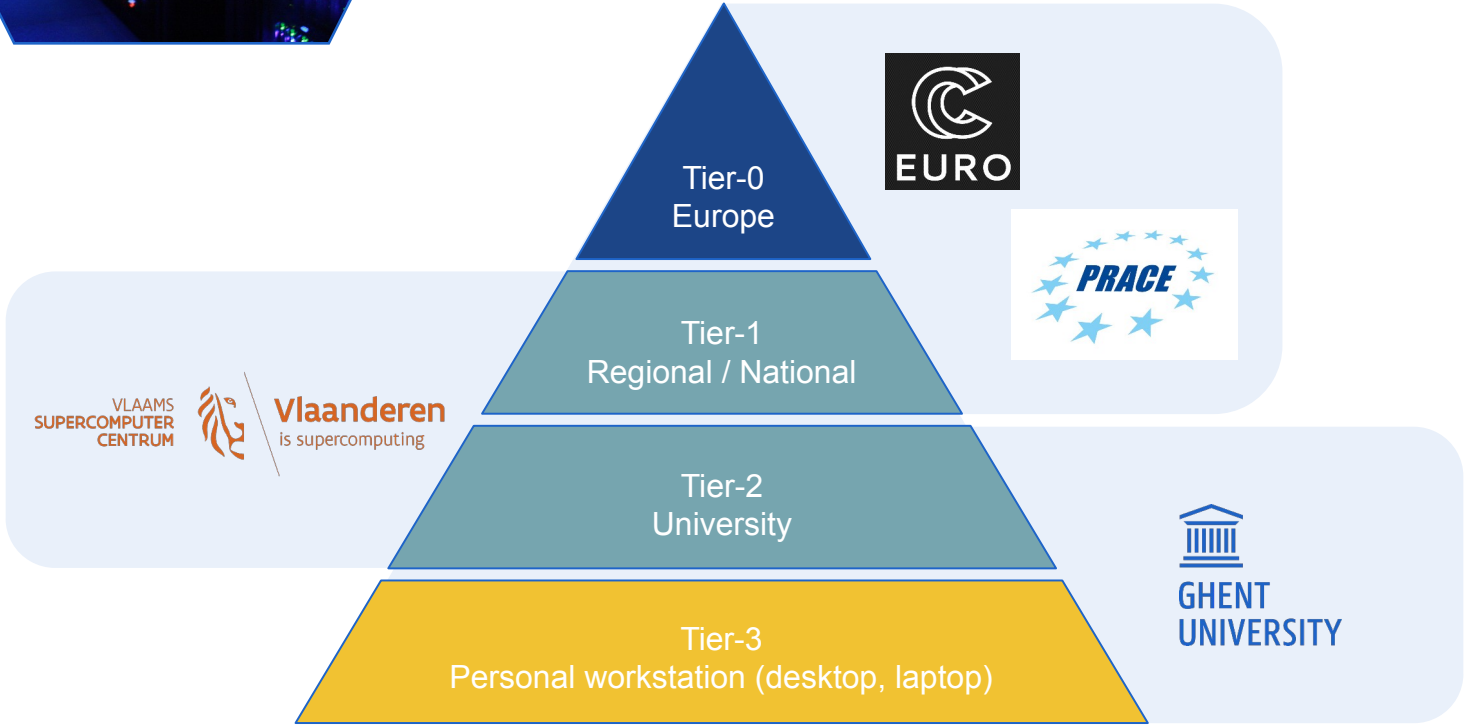
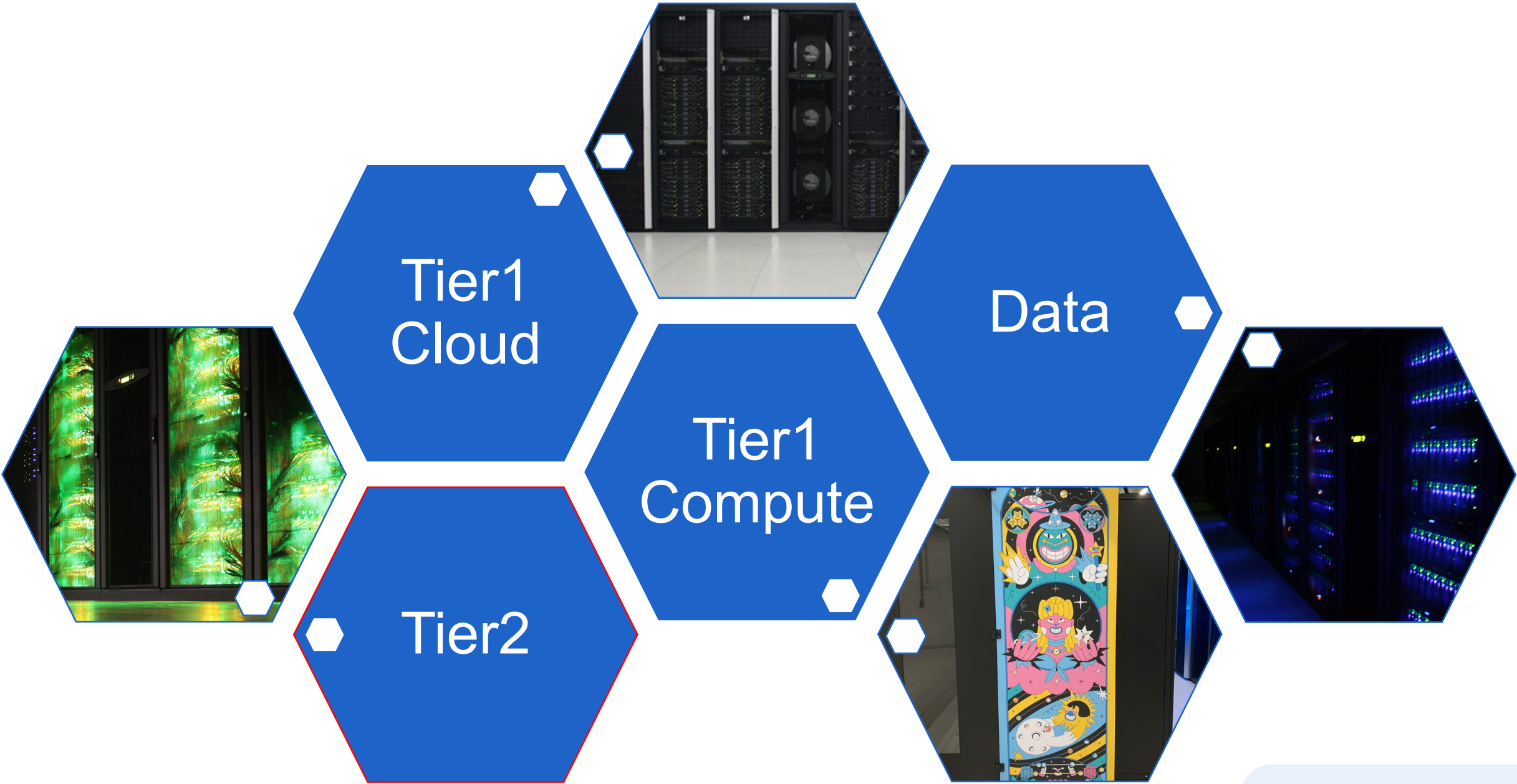
Inform hpc@ugent.be about your course

- Start- and end date of hands-on/course
- UGent course ID
- VSC account of group moderators

Please do this **well in advance** of start of your course
(weeks to months, not days/hours)

INFRASTRUCTURE

INFRASTRUCTURE MANAGED BY HPC-UGENT



TIER2 – UGENT HPC INFRASTRUCTURE

See <https://www.ugent.be/hpc/en/infrastructure>

8 clusters

- CPU-only compute clusters
- GPU clusters
- Interactive + debug cluster with CPUs and GPU

All running Red Hat Enterprise Linux 9 (RHEL9) as operating system

Free of charge for academic researchers

Industry/commercial use: <https://www.vscentrum.be/vsc4business>

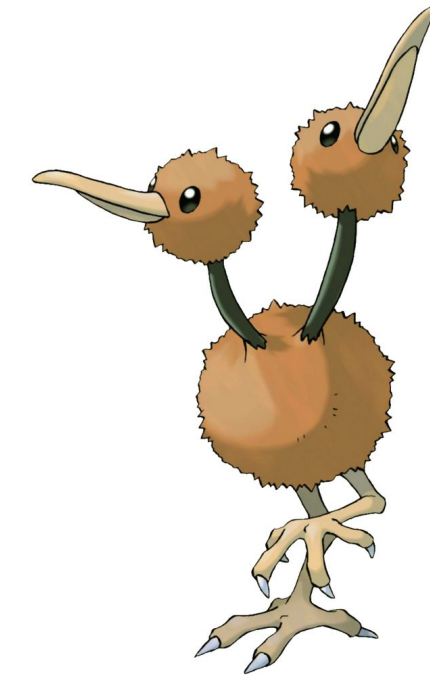
TIER2 – UGENT HPC INFRASTRUCTURE

Example CPU cluster: *doduo*

128 workernodes, each with:

- 96 cores (AMD Rome)
- 250 GB of RAM

= 12.288 compute cores & 24 TB RAM available for you !



High-speed InfiniBand network between nodes

Fast access to shared filesystems

TIER2 – UGENT HPC INFRASTRUCTURE

Example GPU cluster: *accelgor*

9 workernodes, each with:

- 48 CPU cores (AMD Milan)
- 4 NVIDIA A100 GPUs (80GB GPU memory)
- ~500 GB of RAM



High-speed InfiniBand network between nodes

Fast access to shared filesystems

And there are many more, check out:

<https://www.ugent.be/hpc/en/infrastructure>

TIER2 – UGENT HPC INFRASTRUCTURE

Interactive/debug cluster *donphan*

16 workernodes, each with:

- 36 CPU cores (Intel Cascade Lake)
- 1 shared NVIDIA Ampere A2 GPU (16GB GPU memory)
- ~700 GB of RAM



High-speed InfiniBand network between nodes

Fast access to shared filesystems

Strict user limits (max 3 jobs running, 5 in queue, 8 cores in use at a time)

No waiting time for jobs to start!

Ideal for debugging/visualization and for teaching.

TIER2 – UGENT HPC INFRASTRUCTURE

Using Tier2 for teaching/exam purposes – disclaimer

- Definitely possible, but caution!
- No guarantee on HPC availability (e.g. power outage)
- Have a backup plan at hand
- Advisable teaching/exam formula = longer-term project work

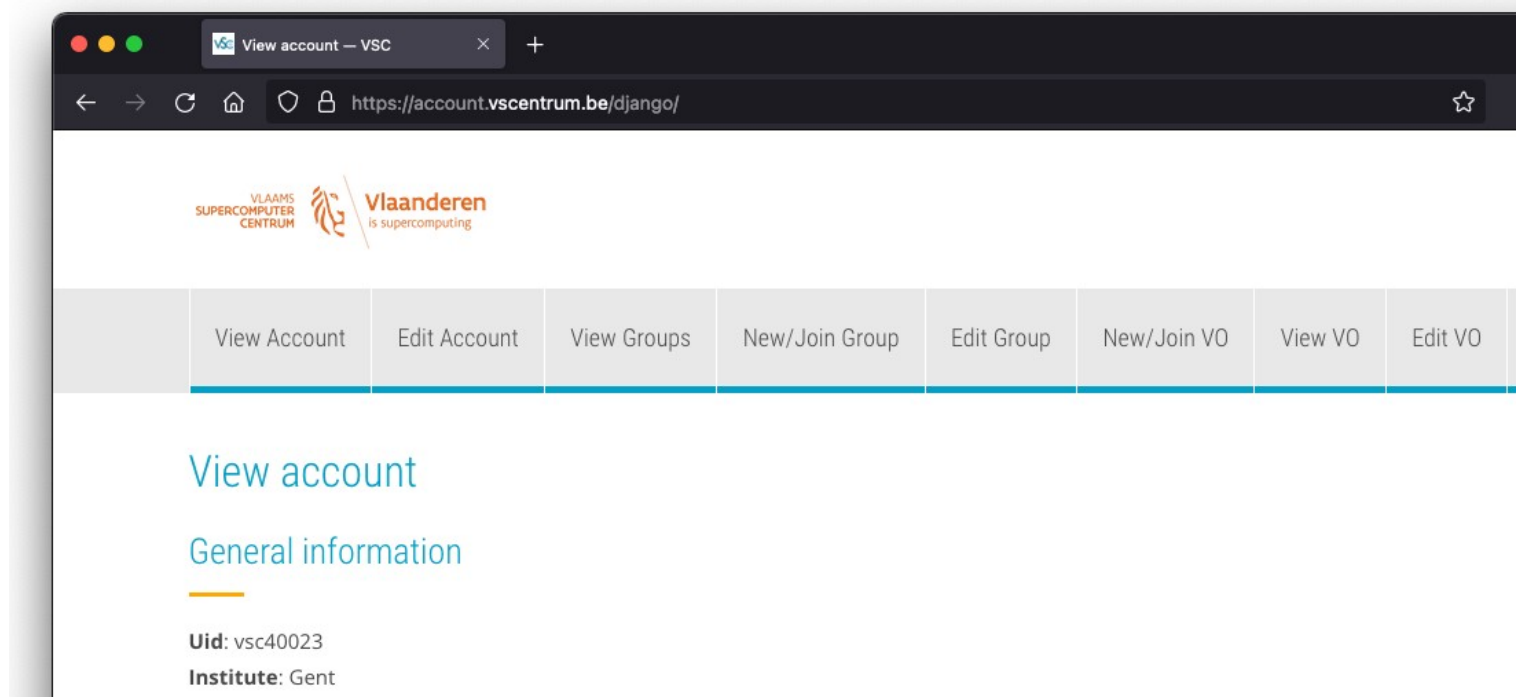
- HPC-UGent abides by UGent “sperperiode” rules
- Uptime of HPC-UGent Tier2 infrastructure is relatively high
- But unexpected outages DO happen

GETTING ACCESS

VSC ACCOUNT

See <https://www.ugent.be/hpc/en/access>

- ALL UGent staff + students can request a VSC account can be used to access HPC infrastructure throughout VSC
- VSC account does NOT require SSH key (e.g. not needed for webportal access)
- <https://account.vscentrum.be> to manage your VSC account:
 - Join/leave user groups
 - Consult storage usage
 - Request more storage quota
 - Manage virtual organisation (VO)
 - ...



UP FRONT ACCOUNT MANAGEMENT

Provide hpc@ugent.be information (well in advance)

- Start- and end date of hands-on/course
- UGent course ID
- Group moderator vsc-ids

HPC-UGent offloads your VSC account management

- We make a dedicated group for the course
- We assign chosen moderators to the group
- We create VSC accounts (without ssh keys) for all registered students

TRAININGS AND WORKSHOPS

Possible on UGent Tier2 systems

- workshop/training by and for UGent staff and researchers
- free of charge or simple service fee
- contact hpc@ugent.be
- https://docs.hpc.ugent.be/teaching_training/#trainings-and-workshops

Possible on VSC Tier1 system

- workshop/training by or for (mainly) non-UGent staff and researchers
- charged more than a service fee
- contact compute@vscentrum.be
- https://docs.vscentrum.be/gent/tier1_hortense.html#workshops-trainings

Do inform the relevant helpdesk **at least 2 weeks** before the workshop

SCIENTIFIC SOFTWARE

SCIENTIFIC SOFTWARE

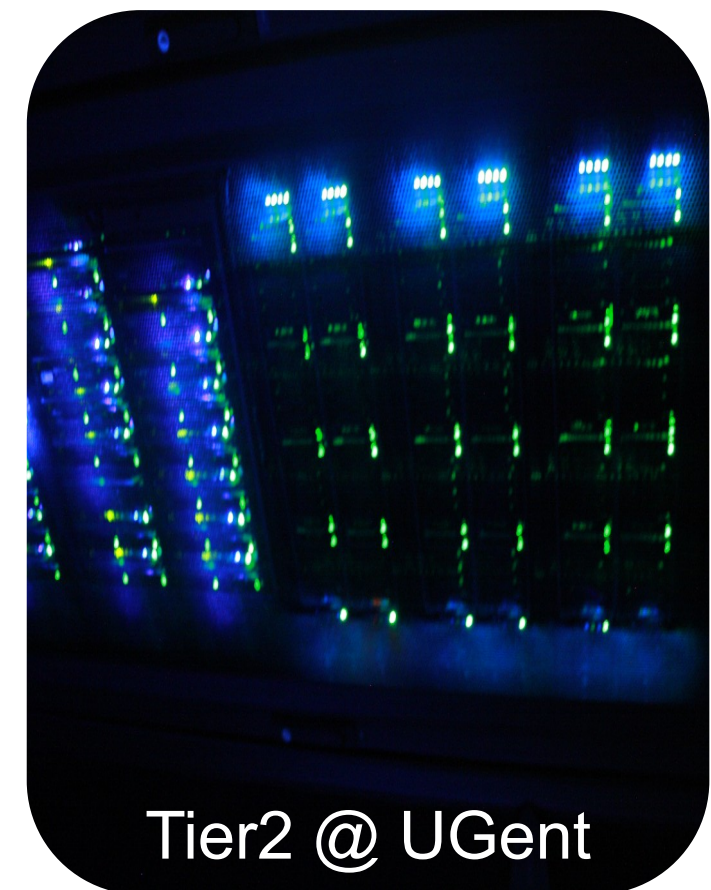
Lots of software is already available on Tier2 HPC-UGent

Currently **~1580 software (modules)** available on different clusters

Complete list available at

https://docs.hpc.ugent.be/available_software/

Or run command: **> module avail**



SCIENTIFIC SOFTWARE INSTALLATION

At HPC-UGent:

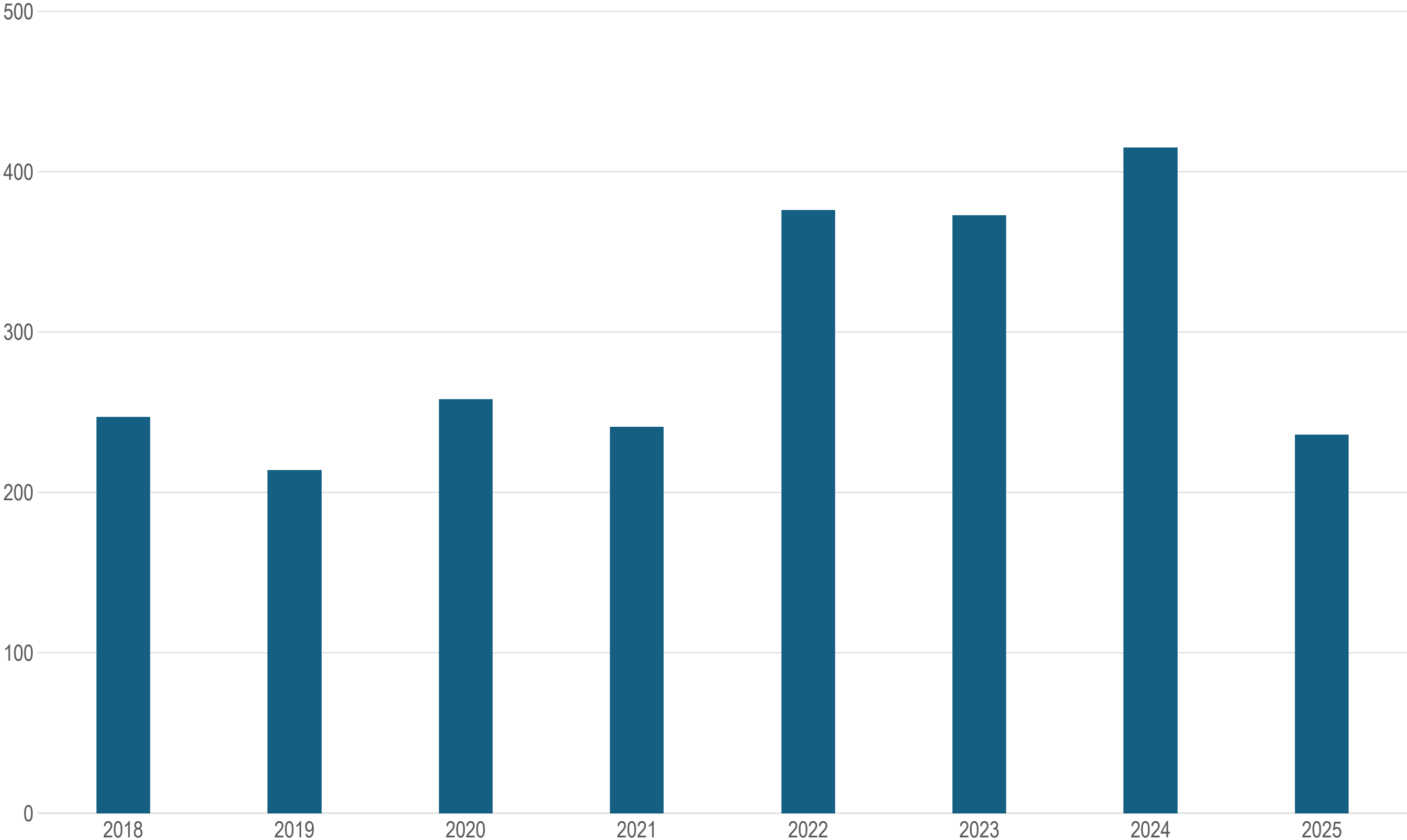
- Central software installation as a service
https://docs.hpc.ugent.be/software_installation_requests
- As much and as swiftly as possible, but **best effort**
- Researcher saves time and can focus on research

Limitations:

- Windows software
 - Consider Linux alternatives
 - Try on [VSC Tier1 Cloud](#)
- Licensed software = bring your own license
- Waiting time to get software centrally installed

SCIENTIFIC SOFTWARE INSTALLATION

Software installation requests for HPC-UGent systems (Tier-2 + Tier-1)



SCIENTIFIC SOFTWARE INSTALLATION

There are more installation requests than available human resources to complete these requests

In 2025:

- In-depth analysis of installations performed
- Cost reporting to requestor

“This installation took about <> hours of effort, which is roughly equivalent to <> Euro of institutional cost.”

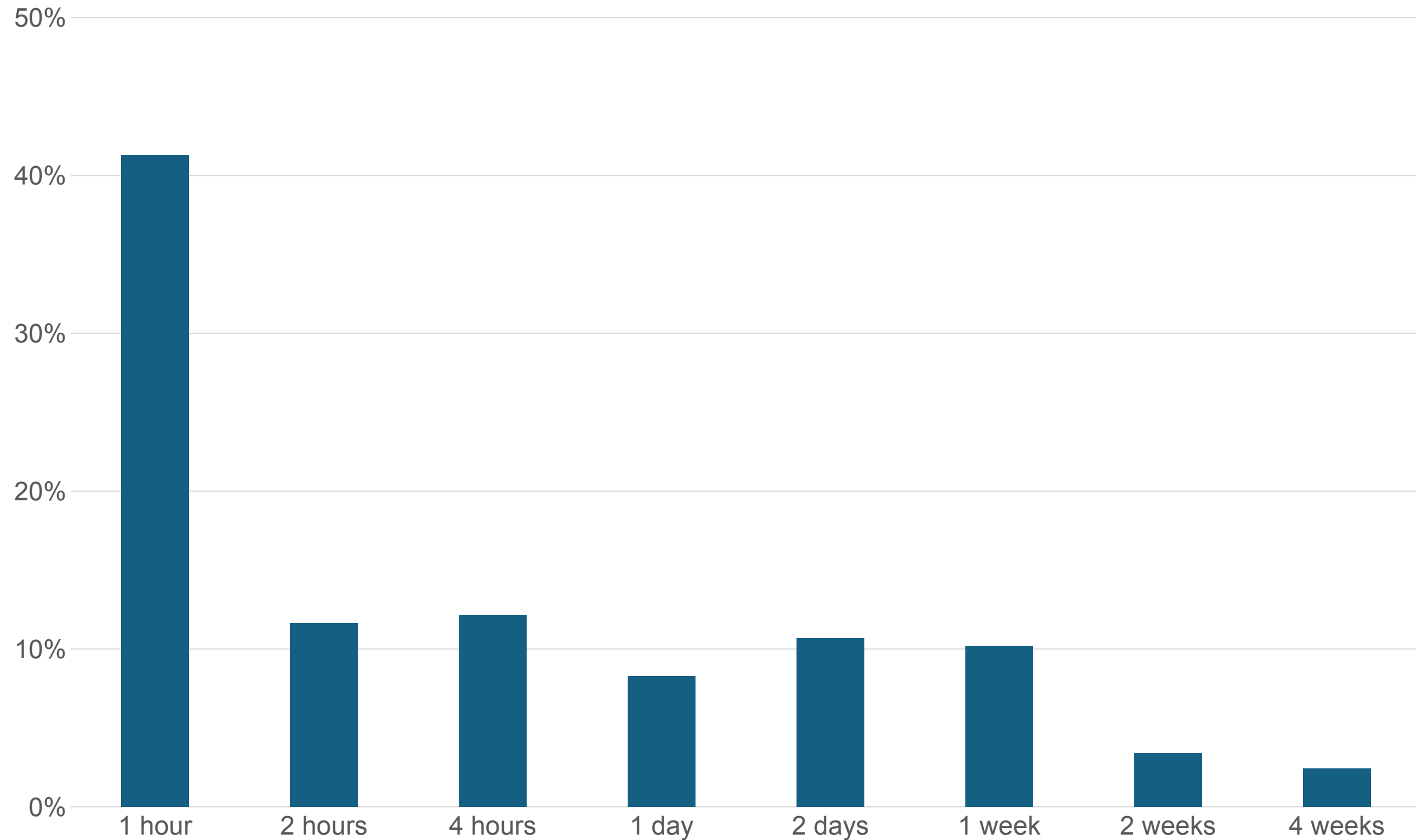
- Requesting software usage report

“By submitting a software installation request, you are committing to sending back a software usage report.”

https://docs.hpc.ugent.be/software_installation_requests

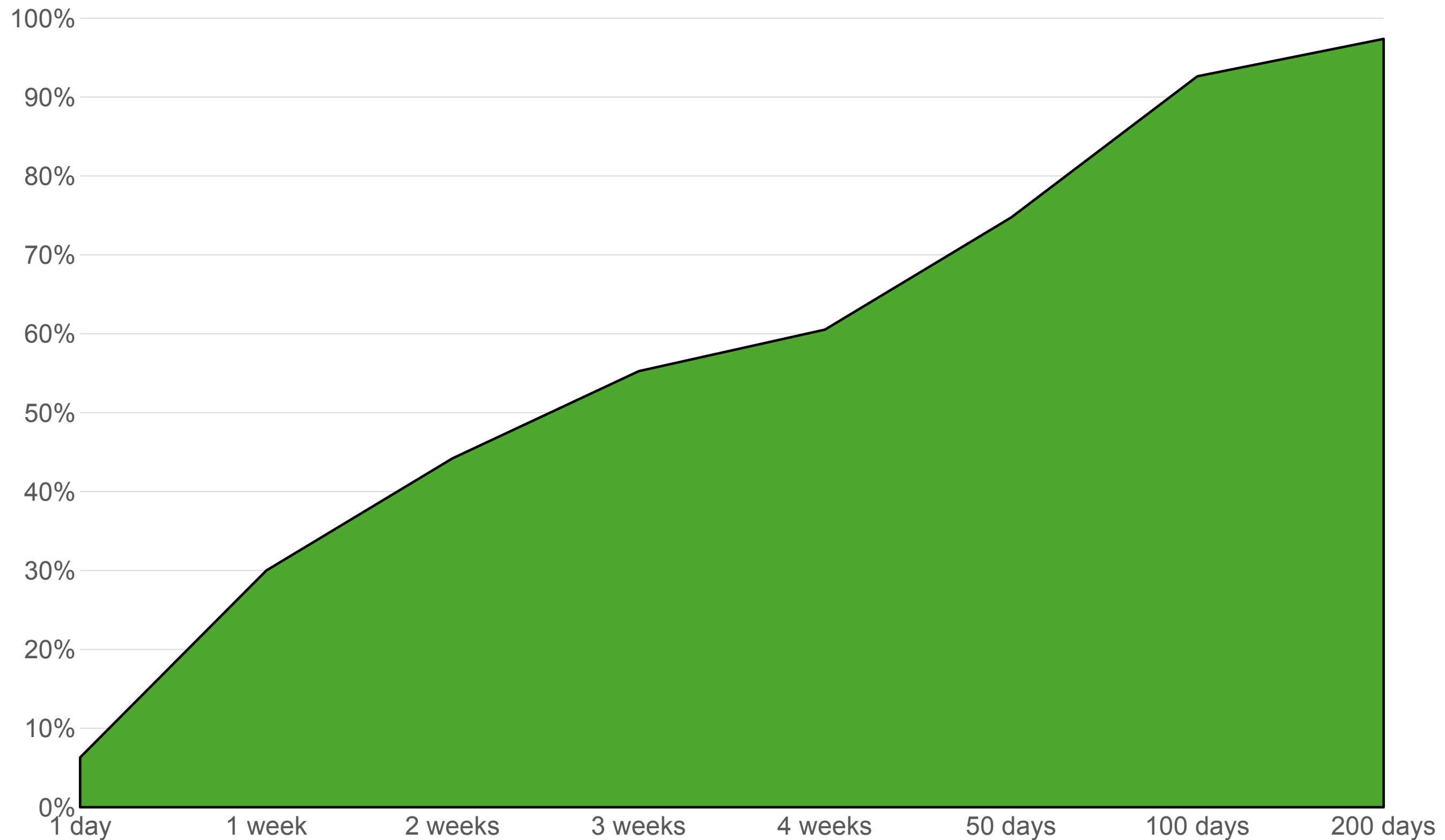
HELPDESK - SOFTWARE INSTALLATION

Effort required to complete software installation request



HELPDESK - SOFTWARE INSTALLATION

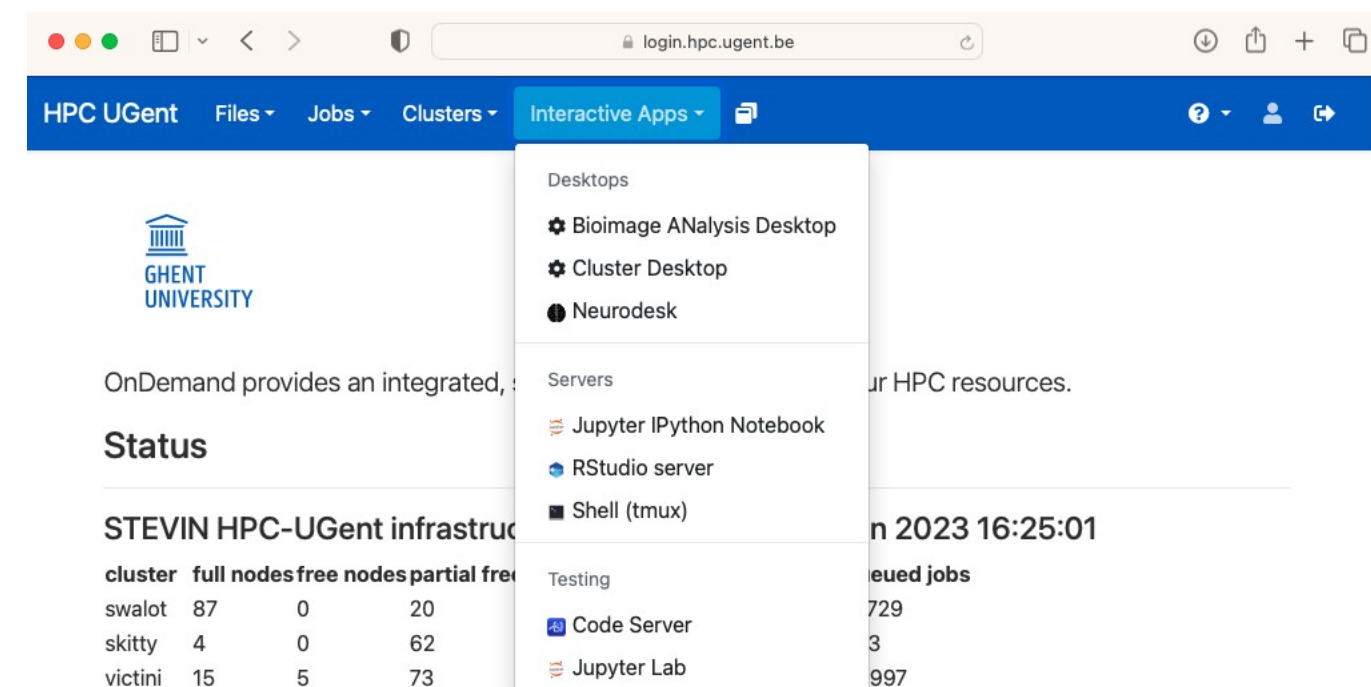
Waiting time between request & installation



SCIENTIFIC SOFTWARE

Interactive applications on web portal

- Popular generic applications are already available
- Customized interactive applications are possible (but also take time to install)
 - Options are locked down and prefilled
 - Benefit: students make less mistakes, no slow down
 - Downside: students don't learn to use the generic application
 - Removed at end of course



USER SUPPORT TRAINING

USER SUPPORT & TRAINING

HPC-UGent tutorial documentation: <https://docs.hpc.ugent.be>

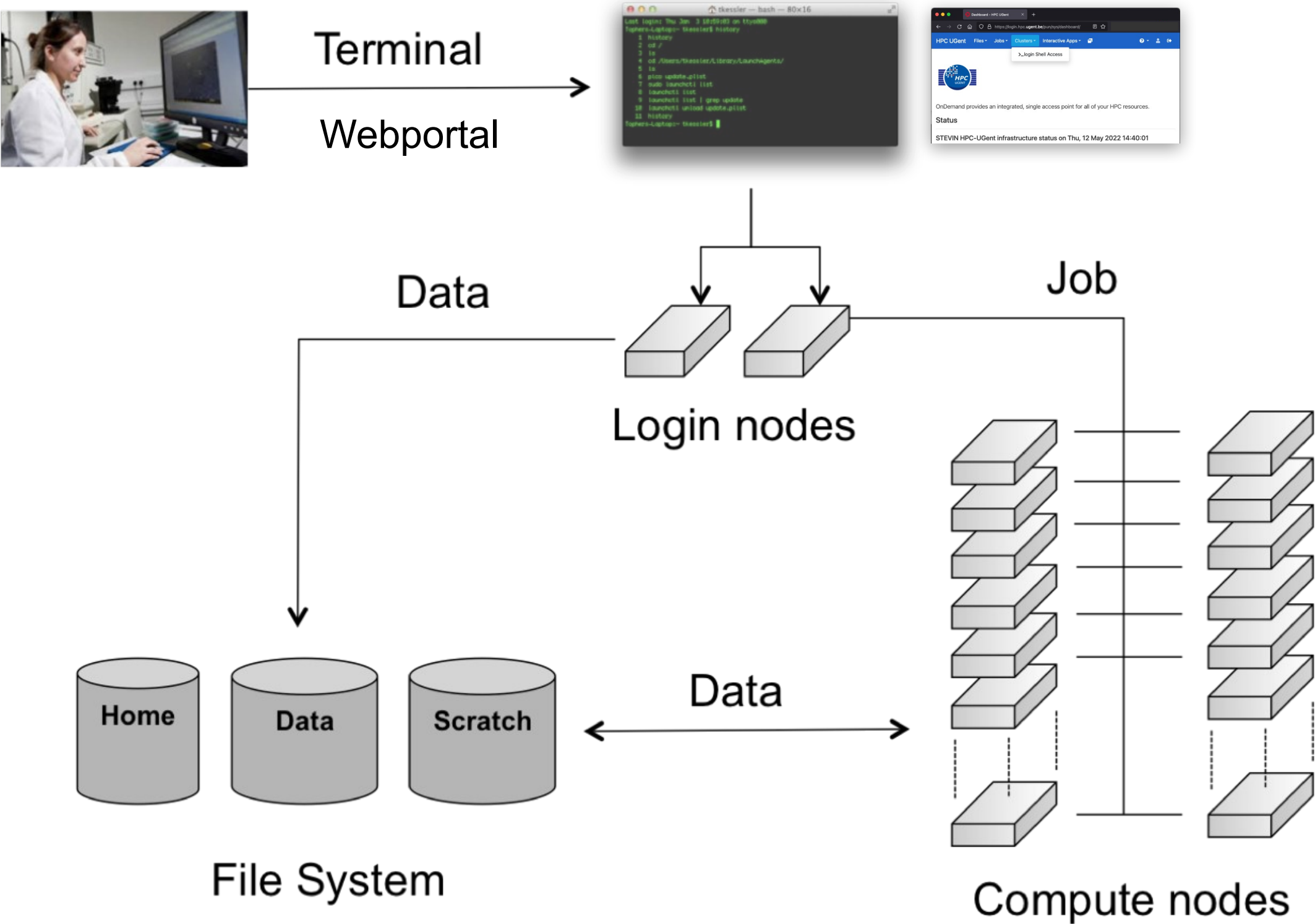
Introductory training (recording available):

<https://www.ugent.be/hpc/en/training/introhpcugent-recording>

Dedicated helpdesk: hpc@ugent.be

HOW TO USE ?

HIGH-LEVEL OVERVIEW



WORKFLOW IN A NUTSHELL

See <https://www.ugent.be/hpc/en/training/2026/introhpcugent>

- Connect to login nodes (ssh / webportal)
- Wrap your computational task in a jobscript
 - Specify resources (#cores, #mem, wallclock time, etc.)
 - Load relevant software module
- Submit it to the job scheduler
- Or use web portal and interactive apps that hide this complexity
- **Maximum wallclock time of jobs: 72 hours (3 days)**

SOUNDS COMPLICATED?

DEMO TIME

- Connection via webportal (in a browser)
- Easy file access, drag and drop
- Terminal shell in a browser, submitting a job
- Interactive application (Jupyter notebook)
- Interactive GUI usage on cluster desktop

Q&A

Dr. Ewald Pauwels

Scientific coordinator HPC @ Ghent University

HPC-UGent

E hpc@ugent.be

www.ugent.be/hpc