

Vienna Scientific Cluster welcome & login

Claudia Blaas-Schenner

VSC Research Center, TU Wien

VSC Training Course: Linux Command Line, 7 March 2024

welcome & login to VSC

VSC

➡ Vienna Scientific Cluster

supercomputers

➡ what they are, how they look like, components

login

➡ login to the VSC clusters

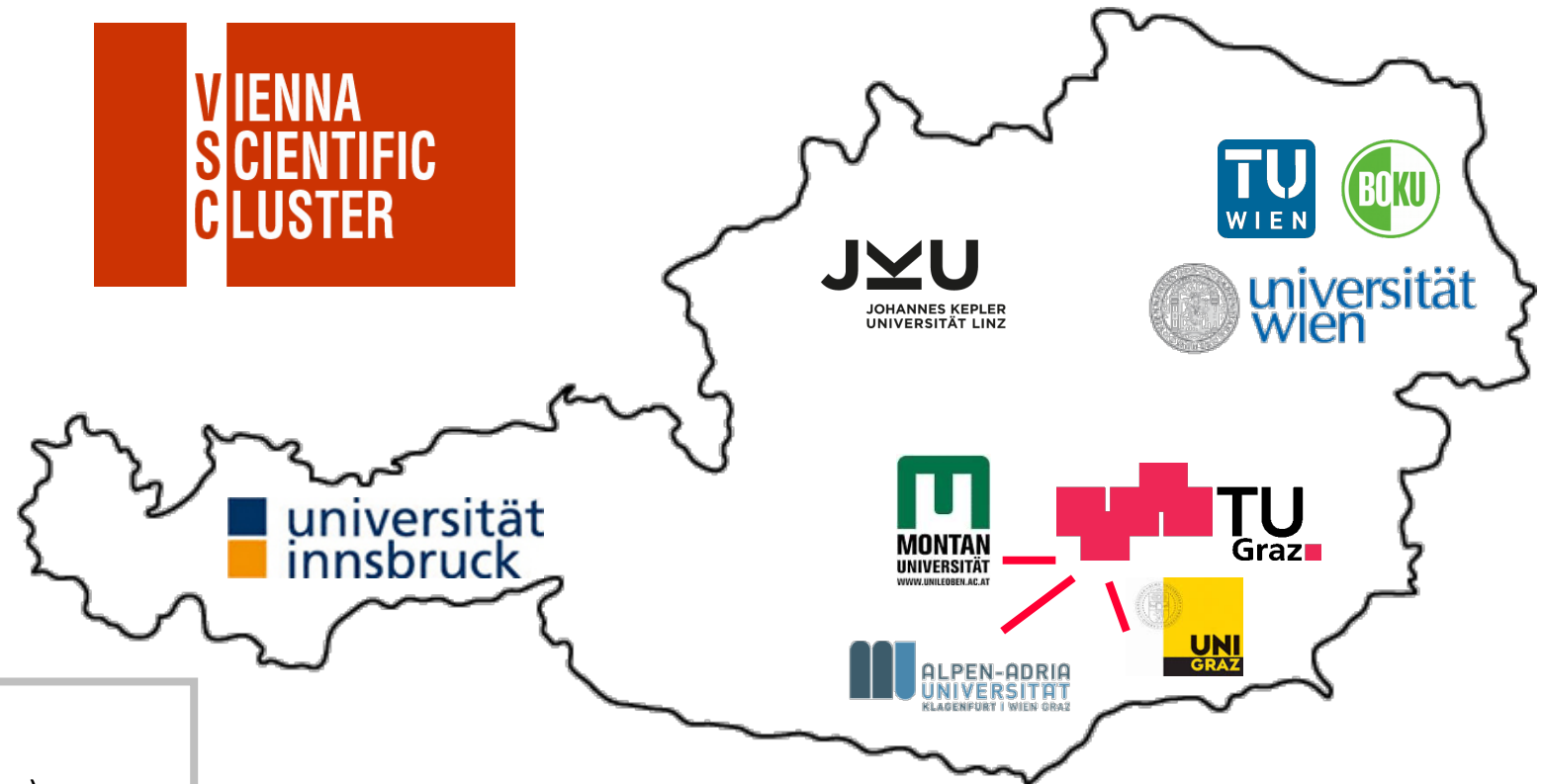
VSC – Vienna Scientific Cluster

VSC is a joint high performance computing (HPC) facility of **Austrian universities**.

- vsc.ac.at
- vsc.ac.at/access
- vsc.ac.at/training



VSC is primarily devoted to research.



	+ VSC
	+ INiTS (business incubator)
	+ ACA (Advanced Computing Austria)

VSC – mission

Within the limits of available resources we satisfy the **HPC needs of our users**.

Provide and maintain the **hardware** & all **services** that are needed to use it.

- VSC-1 (2009) – 35 TFlop/s – #156 (11/2009) – #1: 1.8 PFlop/s
- VSC-2 (2011) – 135 TFlop/s – #56 (06/2011) – #1: 8 PFlop/s
- VSC-3 (2014) – 596 TFlop/s – #85 (11/2014) – #1: 33 PFlop/s
- **VSC-4 (2019)** – 2.7 PFlop/s – #82 (06/2019) – #1: 148 PFlop/s → **#319 (11/2023)**
- **VSC-5 (2022)** – 2.3 PFlop/s – #301 (06/2022) – #1: 1.1 EFlop/s → **#416 (11/2023)**
CPU

→ MUSICA (Austria) & LEONARDO (EuroHPC@CINECA) & VSC-6 ...

VSC – how we deliver HPC training...

expect some changes
how we educate



HPC User Forum 2022 (Budapest, Nov 2022)

- online, hybrid, (onsite)
- **VSC-School I (ECTS):**
- VSC-Linux (this course)
- VSC-Intro (Oct 12 or Jan 16)
- **MPI (Nov 6-9, 2023)**



MPI course (hybrid mode) @VSC/TUW (Vienna, Nov 2022)

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VSC – systems



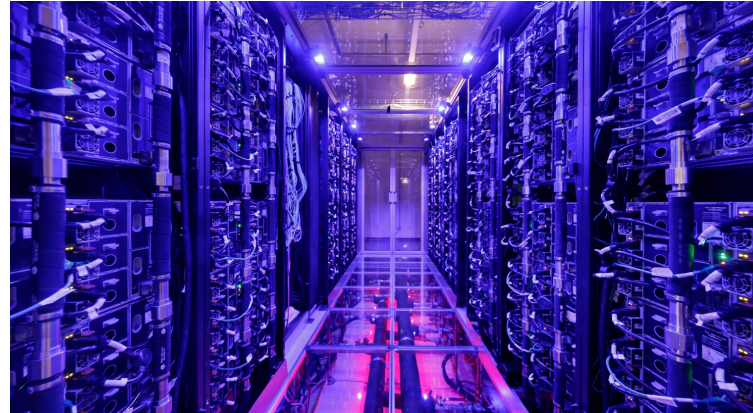
VSC-3 (2014 / 2018 → until 2022)

2020 nodes (2014)

- 2 x Intel Ivybridge CPUs
- 2 x 8 cores/CPU
- 64 GB/node (128 GB / 256 GB)

864 nodes (2018 + GPUs)

- 2 x Intel Ivybridge CPUs
- 2 x 10 cores/CPU
- 64 GB/node (256 GB)



VSC-4 (2019 → ...)

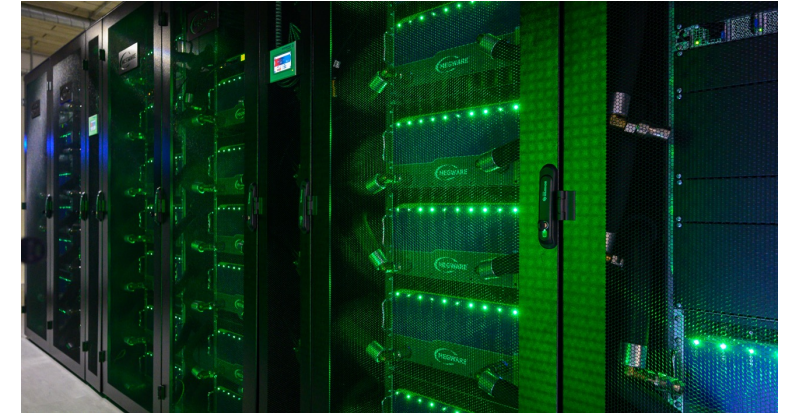
790 nodes

- 2 x Intel **Skylake** Platinum CPUs
- 2 x 24 cores/CPU
- 96 GB/node (384 GB / 768 GB)

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48 nodes (2022 @VSC-5)

- 2 x Intel **Cascadelake** CPUs
- 2 x 48 cores/CPU
- 384 GB/node



VSC-5 (2022 → ...)

770 nodes

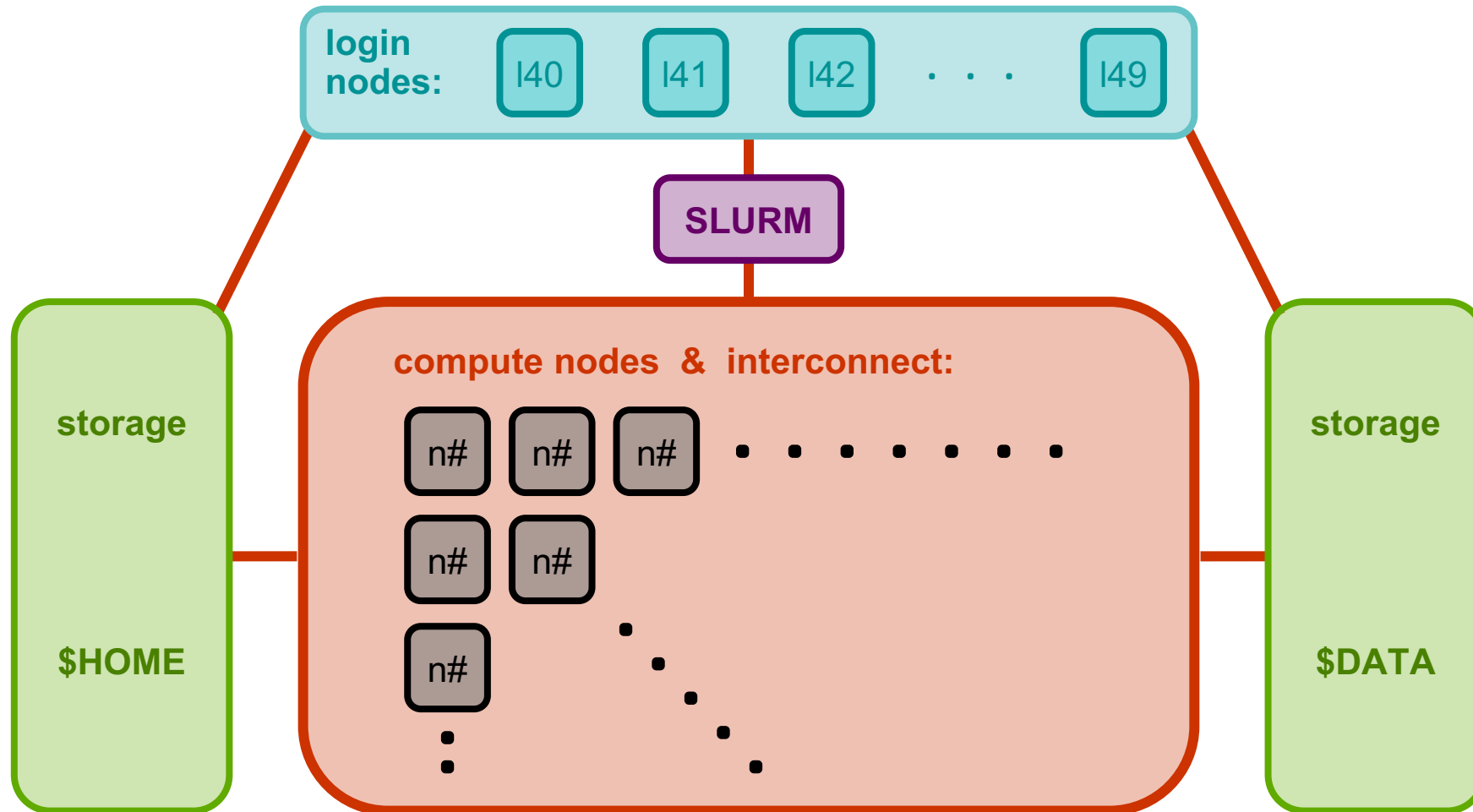
- 2 x AMD EPYC Milan (**Zen3**)
- 2 x 64 cores/CPU
- 512 GB/node (1 TB / 2 TB)

60 GPU nodes 2 x NVIDIA **A100** (Zen3)

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40 GPU nodes 2 x NVIDIA **A40** (Zen2)

VSC-4 – components of a supercomputer



welcome & login to VSC

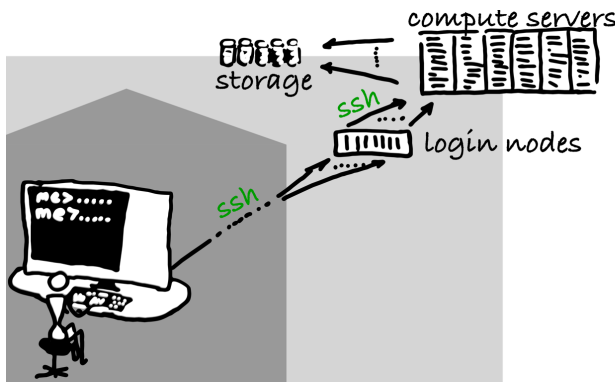
- VSC ➡ Vienna Scientific Cluster
- supercomputers ➡ what they are, how they look like, components

login to the VSC clusters

- ssh ... ➡ Linux command-line access
- ssh -X ... ➡ graphical user interface (Xserver, Xquartz, Xming)
- NoMachine ➡ TUcoLAB-link: [Interactive Access to VSC \(GUI nodes\)](#)
- VSC JupyterHub ➡ Wiki-link: [JupyterHub](#)

VSC – login

- username & [password](#)
 - ➡ mobile phone number
- restricted IPs (firewall)
 - ➡ at a VSC partner uni / jump host / VPN
- two-factor authentication
 - ➡ OTP sent as SMS ➡ every 12 hours
- terminal
 - ➡ xterm, terminal, PuTTY



- Wiki-links: [login](#) & [ssh-keys](#) (ssh -p 27)

```
# login to VSC-4:
ssh <username>@vsc4.vsc.ac.at

# dedicated login node (10):
ssh <username>@l40.vsc.ac.at
...
ssh <username>@l49.vsc.ac.at
```

```
# login to VSC-5:
ssh <username>@vsc5.vsc.ac.at

# dedicated login node (10):
ssh <username>@l50.vsc.ac.at
...
ssh <username>@l59.vsc.ac.at
```

```
# recommended setup (cp over writes!):
cp ~training/bashrc_recommended ~/.bashrc
source ~/.bashrc
```

VSC – training – login → everyone logged in ?

username: trainee## (⇒ ## ⇒ ID)
password:## (⇒ see email)

standard ssh (inside IP range of a VSC partner university):

```
ssh trainee##@vsc4.vsc.ac.at
```

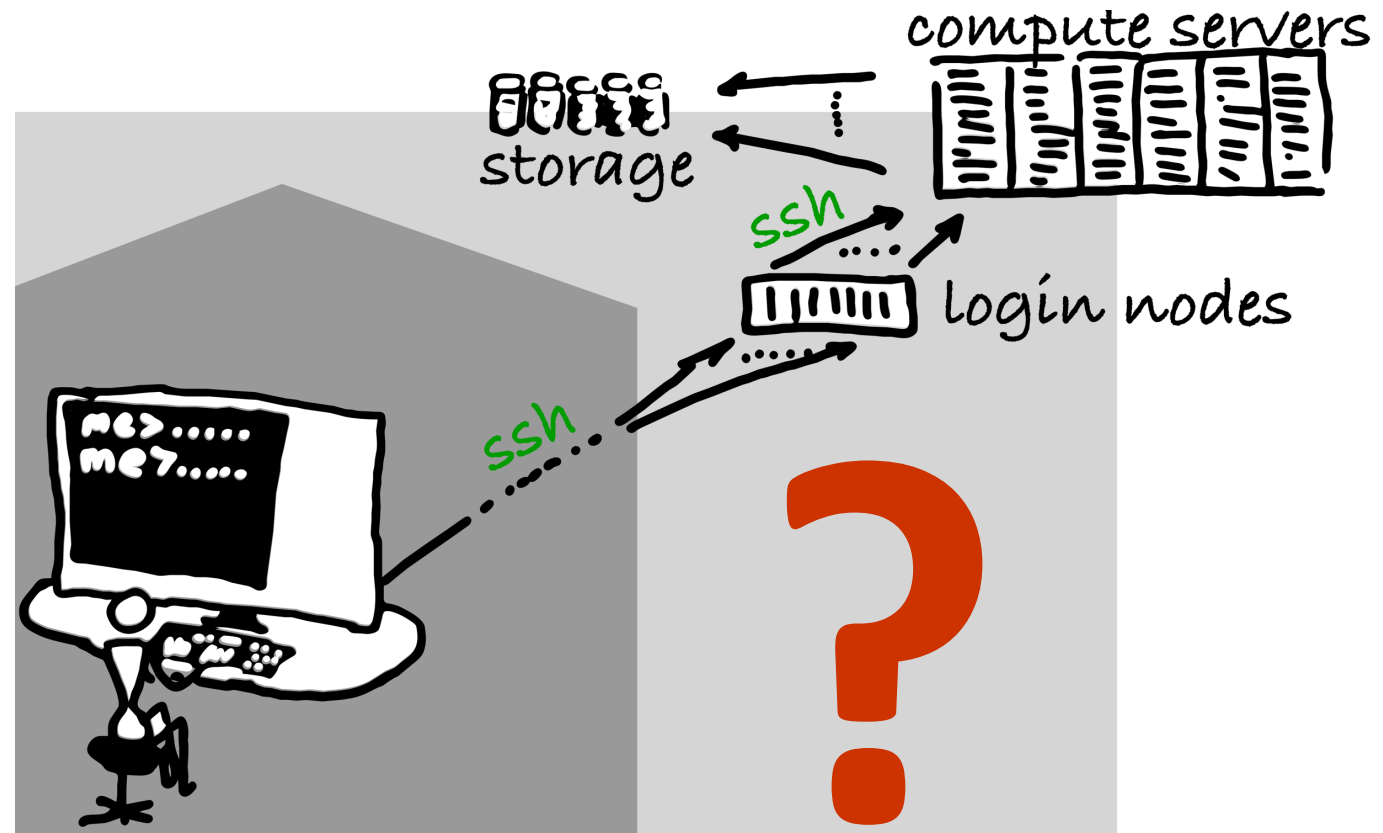
trainee users only (no IP range restrictions):

```
ssh -t trainee##@vmos.vsc.ac.at vsc4
```

if you can't use ssh during the course:

<https://jupyterhub.vsc.ac.at>

(just hit "Start" & open a terminal)



Enjoy 😊 ➡ Linux Command Line

Thank you for your attention!

Please provide an anonymous feedback (at the end of the course)

➡ <https://events.vsc.ac.at/event/124/surveys/116>