



# PPCES 2021: Organization and Cluster Login

HPC.NRW Competence Network



THE COMPETENCE NETWORK FOR HIGH PERFORMANCE COMPUTING IN NRW.

# Course Organization

HPC.NRW Competence Network

## PPCES 2021: Organization and Cluster Login

## Monday, March 22

Start	End	Topic	Speaker
09:00	10:30	Welcome & OpenMP Basics Part 1	Christian Terboven
10:30	11:00	Break	
11:00	12:00	OpenMP Basics Part 2 (incl. Lab)	Christian Terboven
12:00	14:00	Lunch Break	
14:00	15:30	OpenMP Basics Part 3 (incl. Lab)	Christian Terboven
15:30	16:00	Break	
16:00	17:00	OpenMP Basics Part 4 (incl. Lab)	Christian Terboven

## Tuesday, March 23

Start	End	Topic	Speaker
09:00	10:30	Getting OpenMP up to speed	Ruud van der Pas
10:30	11:00	Break	
11:00	12:00	OpenMP SIMD	Christian Terboven
12:00	14:00	Lunch Break	
14:00	15:30	OpenMP Advanced Tasking (incl. Lab)	Christian Terboven
15:30	16:00	Break	
16:00	17:00	OpenMP for Accelerators	Christian Terboven

## Wednesday, March 24

Start	End	Topic	Speaker
09:00	10:30	Introduction to MPI	Marc-André Hermanns
10:30	11:00	Break	
11:00	12:00	Blocking Point-to-Point Communication I	Marc-André Hermanns
12:00	14:00	Lunch Break	
14:00	15:30	Blocking Point-to-Point Communication II	Marc-André Hermanns
15:30	16:00	Break	
16:00	17:00	Non-blocking Point-to-Point Communication	Marc-André Hermanns

## Thursday, March 25

Start	End	Topic	Speaker
09:00	10:30	Blocking Collective Communication	Marc-André Hermanns
10:30	11:00	Break	
11:00	12:00	Communicator Basics	Marc-André Hermanns
12:00	14:00	Lunch Break	
14:00	15:30	Hybrid Programming	Marc-André Hermanns
15:30	16:00	Break	
16:00	17:00	Outlook on Advanced Topics & Wrap-Up	Marc-André Hermanns

**Friday,  
March 26**

Start	End	Topic	Speaker
09:00	09:45	Introduction to scikit-learn	Georg Zitzlsberger
09:45	10:00	Getting Started on the Cluster	Georg Zitzlsberger
10:00	10:30	Hands-on scikit-learn examples	Georg Zitzlsberger
10:30	11:00	Break	
11:00	12:00	Introduction to Deep Neural Networks	Georg Zitzlsberger
12:00	13:00	Lunch Break	
13:00	14:00	Tensorflow/Keras Exercises (short intro + Hands-on exercise) <ul style="list-style-type: none"><li>• Define Data Pipeline with Dataset</li><li>• Build a Model</li><li>• Train &amp; Visualize with Tensorboard</li></ul>	Georg Zitzlsberger
14:00	14:45	Multi-GPU with Horovod (incl. short Hands-on)	Georg Zitzlsberger
14:45	15:00	Q & A	Georg Zitzlsberger

- This event will be organized in alternating **lecture** and **lab** sessions.
- Lecture session
  - Roughly 30 – 45 minutes
  - Presenting contents of a certain topic
  - Short general discussion at the end
- Exercise session
  - Applying learned concepts in practice (with help from supervisors)
  - Individual discussions possible

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- All course material is available at <https://doc.itc.rwth-aachen.de/display/VE/PPCES+2021>
  - We will continue to add course material during the event.

# Asking Questions

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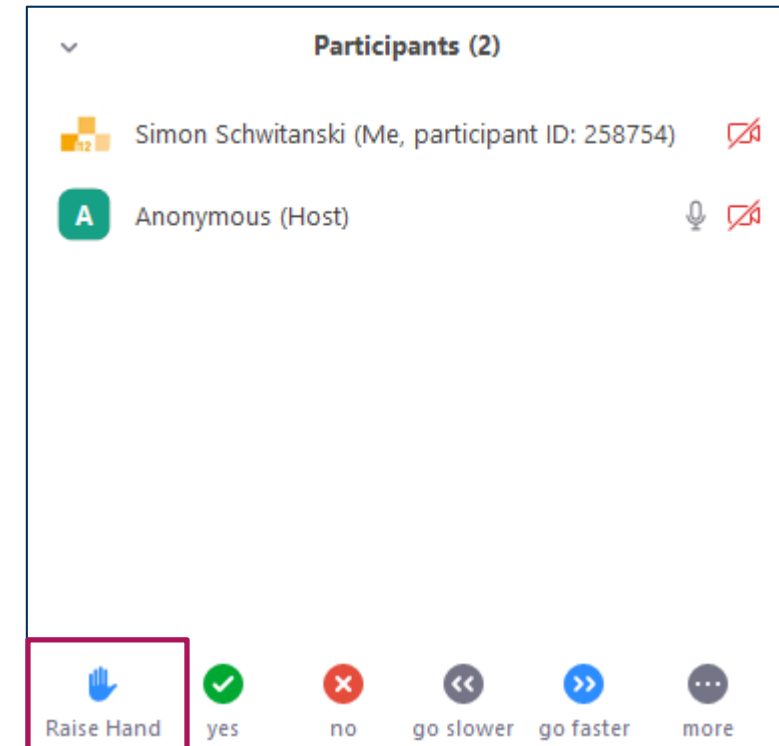
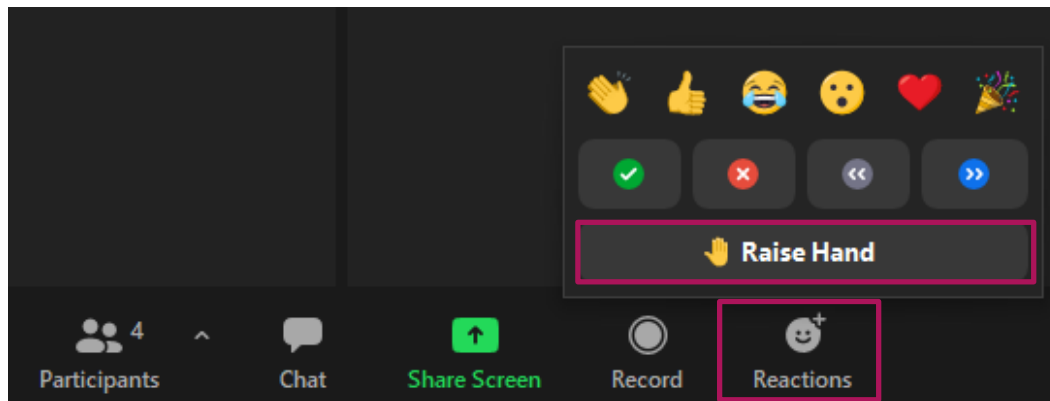
## PPCES 2021: Organization and Cluster Login



- We will use Slack as communication channel for discussions and Q&A during the lectures and exercises.
- Joining Slack
  - [https://join.slack.com/t/ppces2021/shared\\_invite/zt-nv2ry9mq-GAphp64VxQG18oWQmQbjKw](https://join.slack.com/t/ppces2021/shared_invite/zt-nv2ry9mq-GAphp64VxQG18oWQmQbjKw)
  - We will answer your questions live or via text.
  - Individual discussions also possible.
- Please try to avoid the Zoom chat as it is hard to follow discussions there.

# Asking Questions – Zoom Meeting

- You can also ask questions via microphone.
- There is a **raise your hand** feature in Zoom.
- Click on the button if you have a question that you would like to ask “live”.
  - **Do not forget to unmute yourself**



# Exercise Sessions

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- Will also take place in the main **Zoom session**
- Use the **raise your hand feature** to ask questions, use the **slido Q&A module**, or use the **Zoom chat**
- For individual problems or discussions, we offer **breakout rooms** on demand.

# Accessing the RWTH Compute Cluster “CLAIX”

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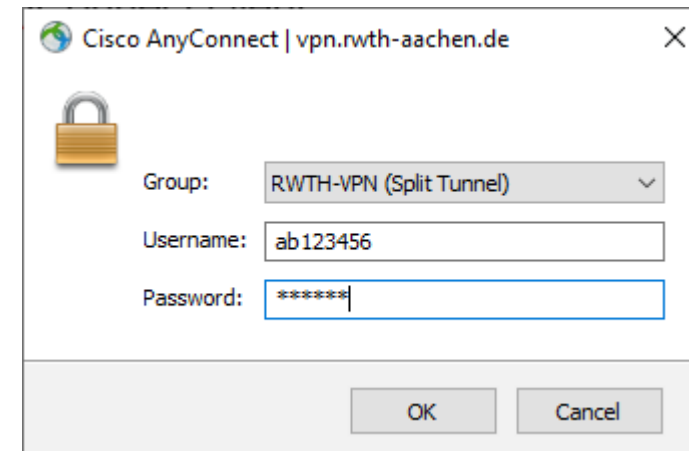
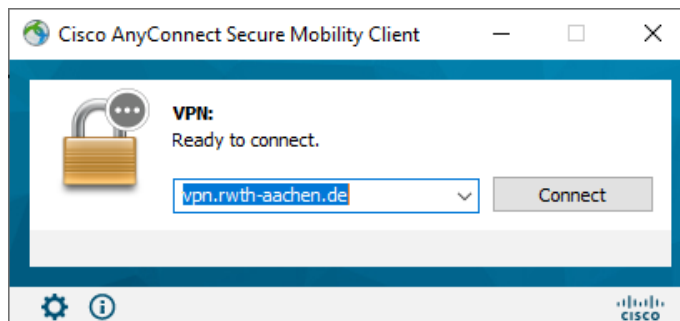


- Only members of RWTH (or affiliated persons) can access the RWTH Computer Cluster
  - If you have not already created an HPC account (“Hochleistungsrechnen”) in the SelfService, please do so here: <http://www.rwth-aachen.de/selfservice>
- External participant have to use their own Linux environment
  - Instructions have been sent via mail

- Connect to the RWTH university network via VPN
- If not done: Configure VPN password in SelfService: <https://rwth-aachen.de/selfservice>
- Download VPN client (Cisco AnyConnect) from [https://webspaces.noc.rwth-aachen.de/shib/Cisco\\_Anyconnect/](https://webspaces.noc.rwth-aachen.de/shib/Cisco_Anyconnect/)
  - Alternative: Any compatible OpenConnect client

## VPN Connection (2)


- Connect to [vpn.rwth-aachen.de](https://vpn.rwth-aachen.de) with your RWTH User ID and your password
  - Choose “Split Tunnel” group such that only traffic to RWTH network is routed through VPN
  - Connecting to the VPN might interrupt your connection for some seconds





- FastX: Remote graphical desktop sessions, simple and convenient to use
- X-Session systems: login18-x-{1,2}.hpc.itc.rwth-aachen.de
- Browser-based solution (**recommended**): Use the following links
  - <http://login18-x-1.hpc.itc.rwth-aachen.de:3000/>
  - <http://login18-x-2.hpc.itc.rwth-aachen.de:3000/>
  - Login with your RWTH user ID (format: ab123456)
- Alternative: Desktop client
  - <https://www.starnet.com/fastx/current-client>

- Specify your **RWTH user id** and password in the login screen and click on “**Log In**”



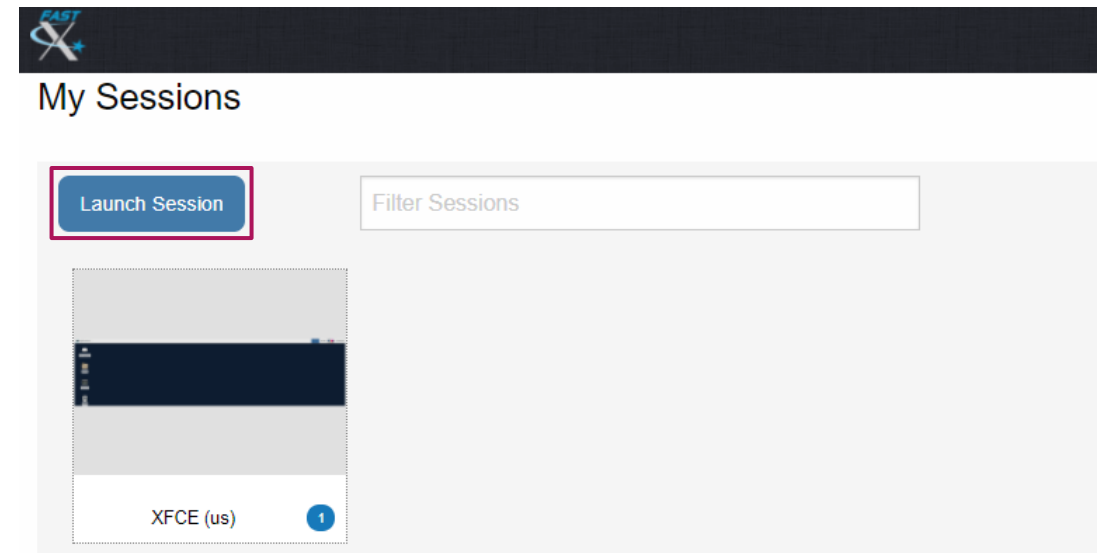
User Name

Password

Use Public Key Authentication  
[Manage Private Keys](#)

[Admin Login](#)  
Build: 2.4.14

- You can create multiple graphical sessions on the system
- Click on “Launch Session”
  - Select “MATE (us)” (English) or “MATE (de)” (German) for a full desktop environment
  - Alternative: Xfce (other desktop environment) or xterm (X11 terminal)
  - Tab with graphical session will open
- After you are done with your work
  - “Log out” in the graphical session to terminate it
  - Or: Close the browser window, you can resume the session later
- Beware: Dialog systems are rebooted every Monday morning, data that is not stored (e.g., from running applications) will be lost



- SSH from Linux or macOS (or Linux WSL)

```
$ ssh -Y ab123456@login18-1.hpc.itc.rwth-aachen.de
```

- PuTTY for Windows: <http://www.putty.org/>

- But: No complete desktop environment by default, only recommended for experienced users.

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- If you have any problems with the cluster login, do not hesitate to ask via Slack or raise your hand.
  - We can help you individually in a breakout session.

# Have Fun and Happy Coding!

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- We are looking forward to introducing you to the world of parallel programming!
- Visit us at our webpage: <https://hpc.dh.nrw>
- Visit our YouTube channel for more HPC content: <https://hpc.dh.nrw/youtube>