



# PPCESonline: Organization and Cluster Login

HPC.NRW Competence Network



THE COMPETENCE NETWORK FOR HIGH PERFORMANCE COMPUTING IN NRW.

# Course Organization

HPC.NRW Competence Network

## PPCESonline: Organization and Cluster Login

**Speaker:** Dr. rer. nat. Christian Terboven

Start	End	Topic
09:30	09:50	Welcome & OpenMP Overview
09:50	10:15	OpenMP Worksharing
10:15	10:35	OpenMP Scoping
10:35	10:45	Exercise Setup
10:45	11:00	Break
11:00	11:30	Exercises
11:30	12:00	OpenMP & NUMA
12:00	14:00	Lunch Break
14:00	14:30	OpenMP Tasking: Basics
14:30	15:00	OpenMP Tasking: Scoping & Synchronization
15:00	15:15	Exercises
15:15	15:30	Break
15:30	16:00	Exercises
16:00	16:30	Solutions to Exercises + Q & A

**Speaker:** Dr. rer. nat. Marc-André Hermanns

Start	End	Topic
09:30	09:40	Welcome & Overview (10 min)
09:40	10:00	MPI Basics (20 min)
10:00	10:35	Blocking Point-to-point communication (30 min)
10:35	11:45	Exercise Setup
10:45	11:00	Break
11:00	11:30	Exercises
11:30	12:00	Non-blocking (point-to-point) communication (30 min)
12:00	14:00	Lunch break
14:00	14:30	Collective Communication (30 min)
14:30	15:00	Exercises (30 min)
15:00	15:15	Break
15:15	15:45	ARM Performance Reports (30 min)
15:45	16:00	Exercises (Perf Reports) (15 min)
16:00	16:30	Solutions to Exercises + Q&A (30 min)

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

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- All course material is available at <https://doc.itc.rwth-aachen.de/display/VE/PPCES+2020>
  - We will continue to add course material during the event.

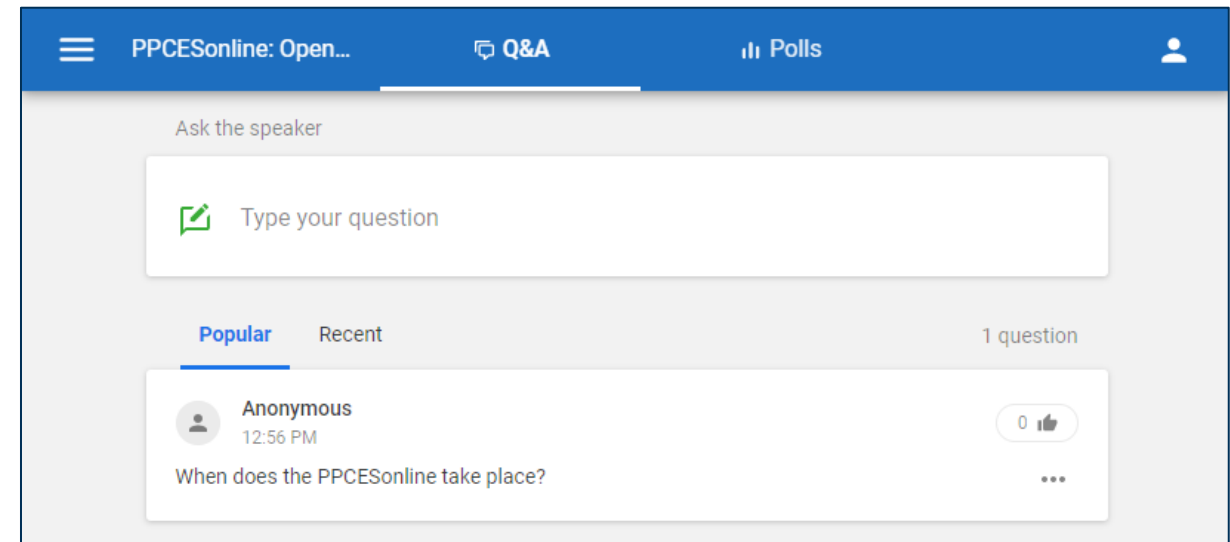
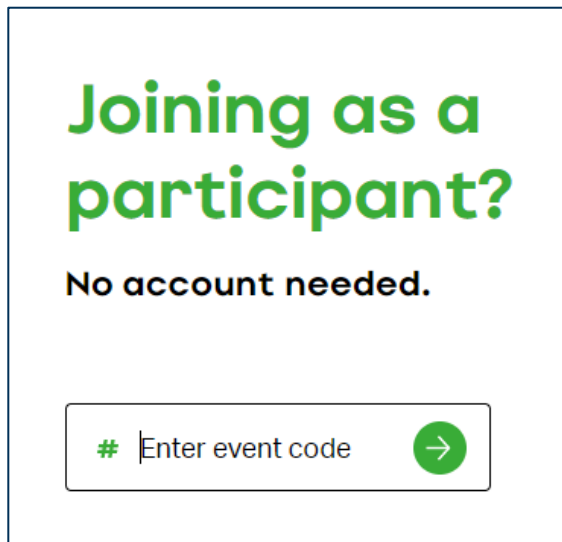
# Asking Questions

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## PPCESonline: Organization and Cluster Login

# Asking Questions – slido

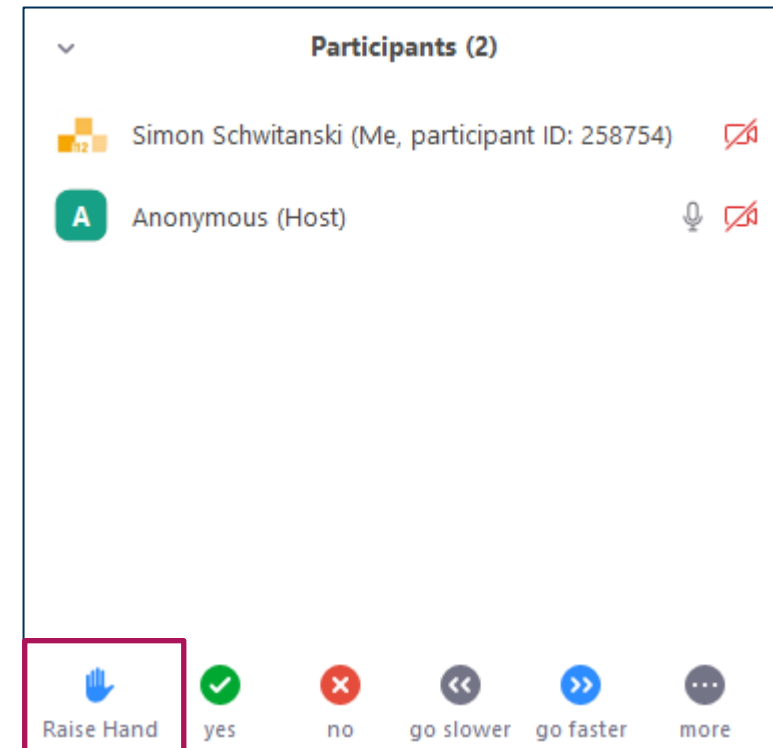
- We will use the service “slido” to enhance the meeting with a Q&A feature.
- Joining the Q&A session in slido
  - Go to <https://sli.do>, enter the event code **91904**
  - Or use this link: <https://app.sli.do/event/xrmxyqpq>
- Ask your questions here, we will answer them in the discussion or via text.





# Asking Questions – Zoom Meeting

- There is a **raise your hand** feature in the participants list.
- Click on the button if you have a question that you would like to ask “live”.
  - **Do not forget to unmute yourself**
- You can also use the Zoom chat.
  - **However: We encourage you to use the slido Q&A module for written questions.**
  - **Simplifies management of questions for participants and presenters.**



# Exercise Sessions

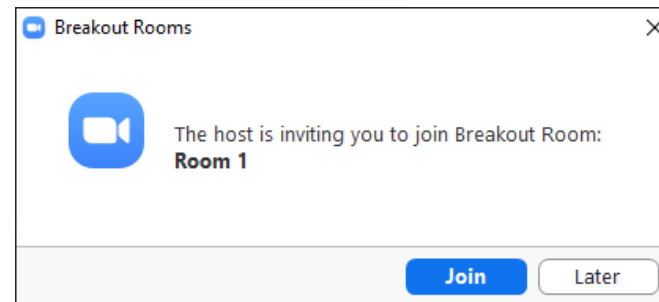
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## PPCESonline: Organization and Cluster Login

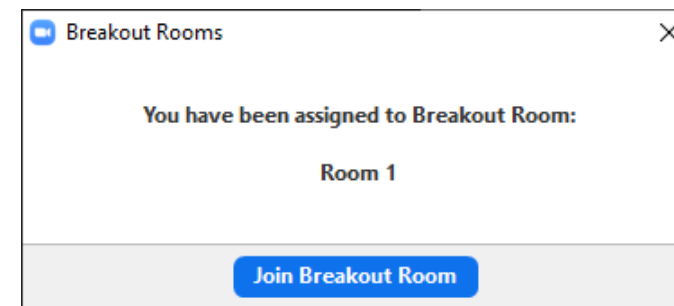
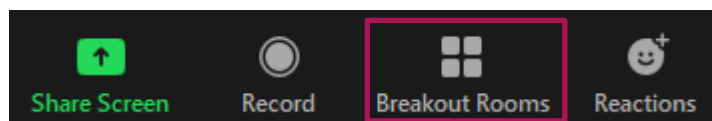
- Organized in **Zoom breakout sessions**
- Separate rooms with ~10 participants and **at least** one supervisor
  - **Discuss tasks and exercise questions in smaller groups individually**
  - **Resolve technical issues with the cluster access**
- Group assignment to breakout rooms is done by us, will stay fixed
- After exercise session ended: Everyone will “automatically” return to the main session.

# Joining Breakout Sessions

- When the exercise session begins, a window will appear asking you to join the room.
- Click on the “Join” button to get into that room.

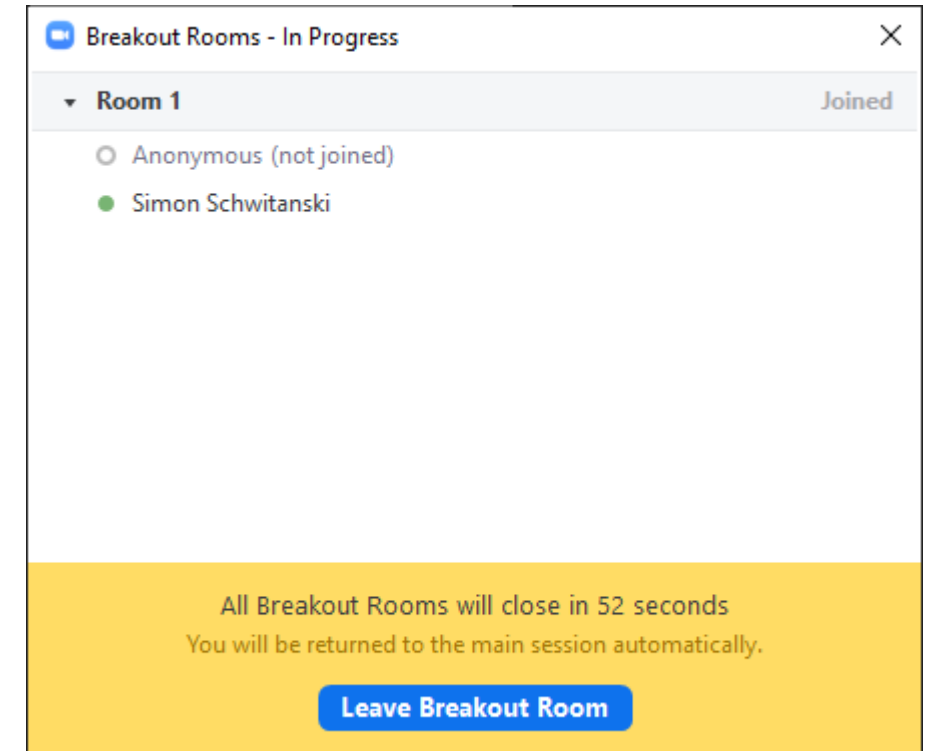
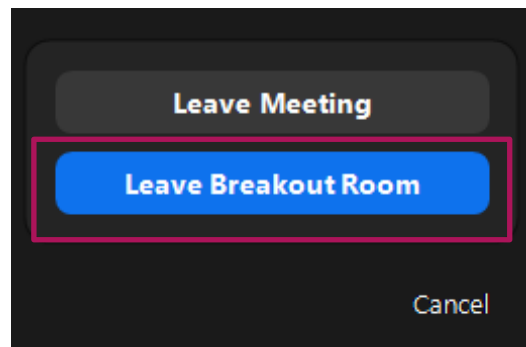


- You can also click on “Later” and join the room by clicking on “Breakout Rooms”
- It is always possible to re-join a room later (e.g., if you re-joined the meeting)



# Leaving Breakout Sessions

- Breakout sessions will end automatically for all participants when the next lecture is about to start
  - Countdown of 60 seconds
  - You will return to the main session.
- You can also leave the breakout room by yourself and return to the main session at any time.
  - Click on “Exit Room” and then “Leave Breakout Room”



# Accessing the RWTH Compute Cluster “CLAIX”

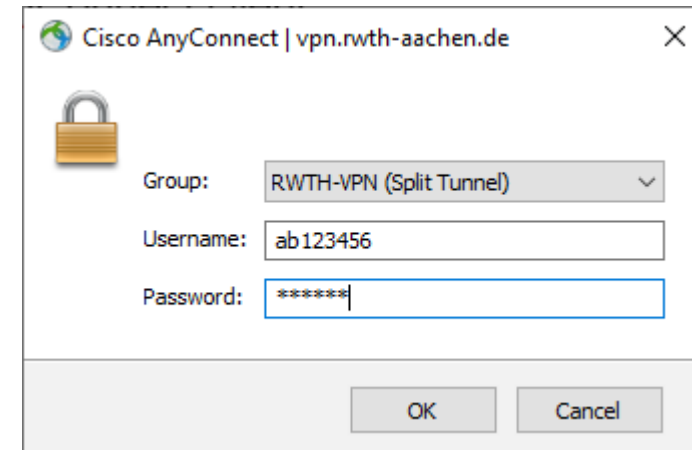
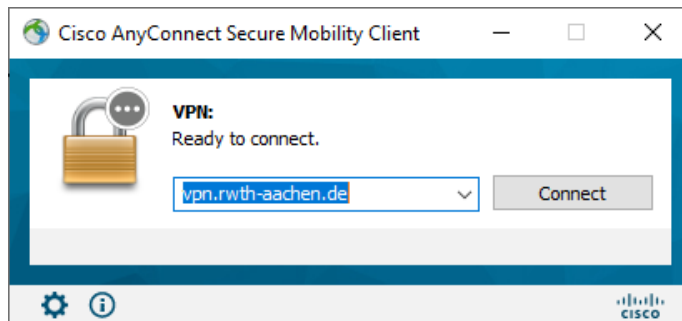
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- Connect to the RWTH university network via VPN
- External participants: You should have received an RWTH User ID (e.g., ab123456).
- If not done: Configure VPN password in SelfService: <https://rwth-aachen.de/selfservice>
- Download VPN client (Cisco AnyConnect) from [https://webpace.noc.rwth-aachen.de/shib/Cisco\\_Anyconnect/](https://webpace.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

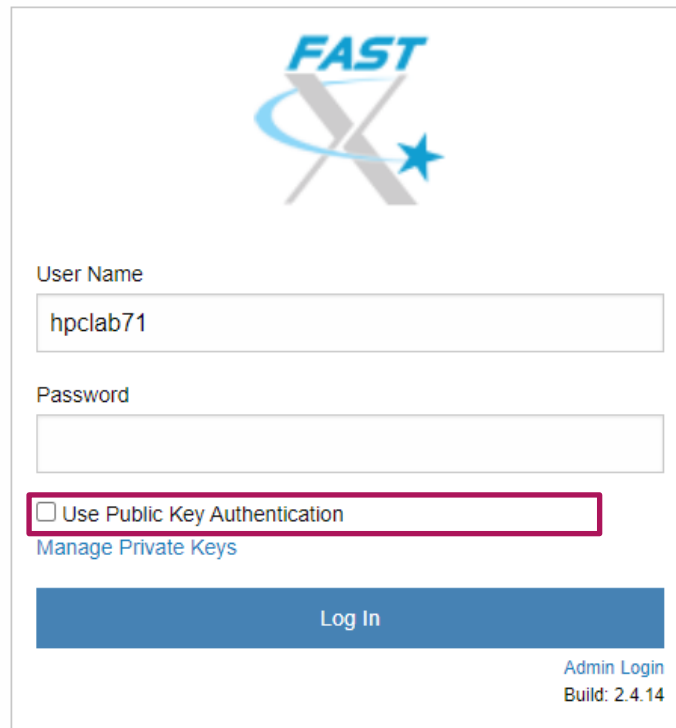




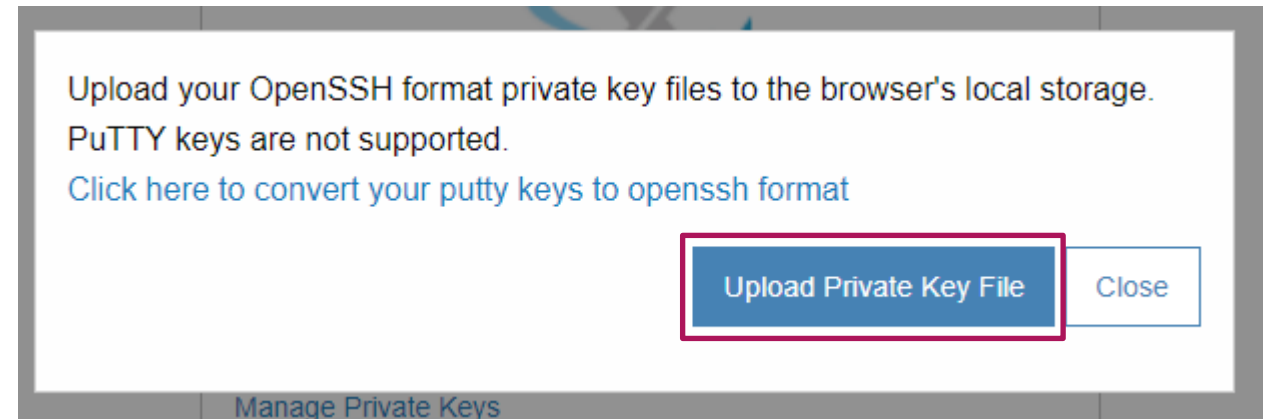
- FastX: Remote graphical desktop sessions, simple and convenient to use
- X-Session systems: login18-x-{1,2}.hpc.itc.rwth-aachen.de
- Browser-based solution (**recommended**): Use the following links
  - <http://login18-x-1.hpc.itc.rwth-aachen.de:3000/>
  - <http://login18-x-2.hpc.itc.rwth-aachen.de:3000/>
  - Login with your hpclabXX account
- Alternative: Desktop client
  - <https://www.starnet.com/fastx/current-client>
  - Note: Configuration with public key authentication also requires PuTTY to be installed.

# FastX Session (2) – Browser Session

- Specify your **hpclabXX** username in the login screen
- Tick the **Use Public Key Authentication** checkbox
- A window will appear to **upload your private key file** (has been sent via mail to you)



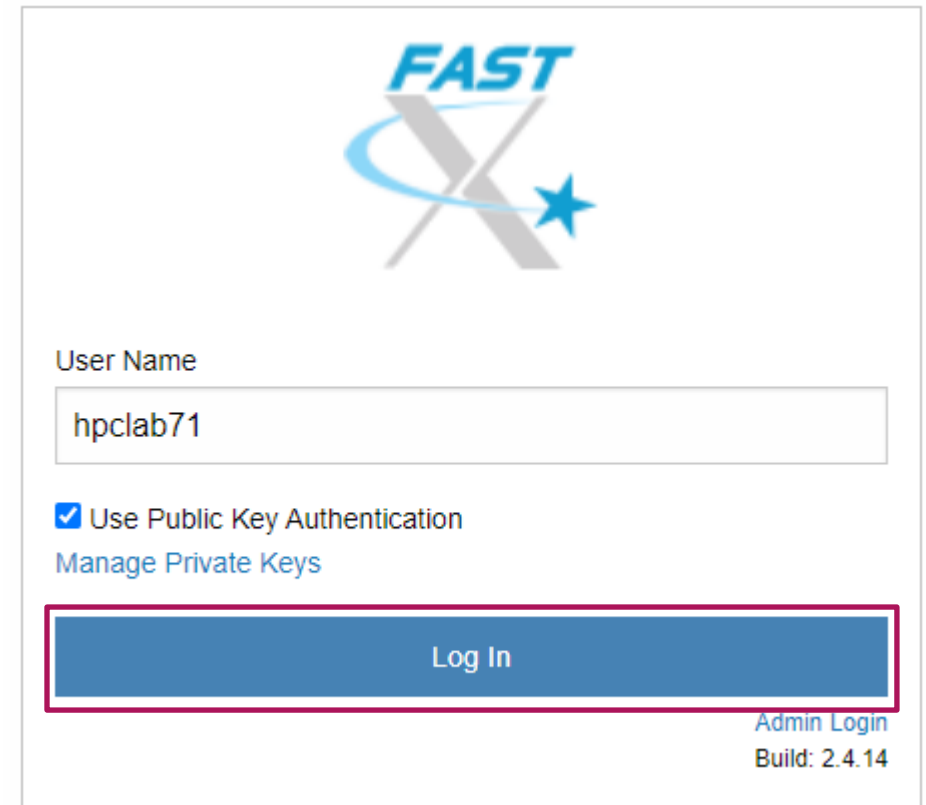
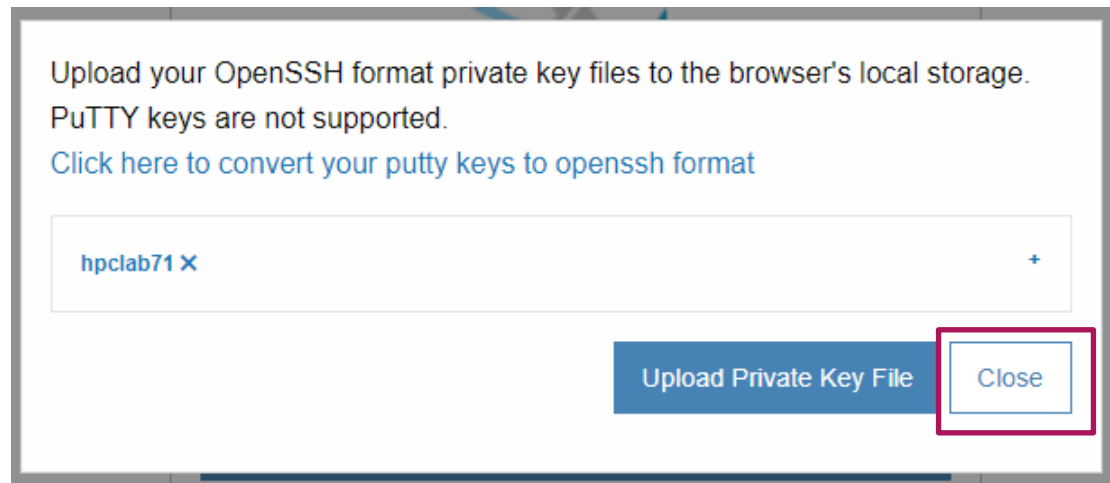
The screenshot shows the FAST login interface. At the top is the FAST logo. Below it are two input fields: 'User Name' containing 'hpclab71' and an empty 'Password' field. A checkbox labeled 'Use Public Key Authentication' is checked and highlighted with a red border. Below the checkbox is a link 'Manage Private Keys'. At the bottom is a blue 'Log In' button. In the bottom right corner, it says 'Admin Login Build: 2.4.14'.



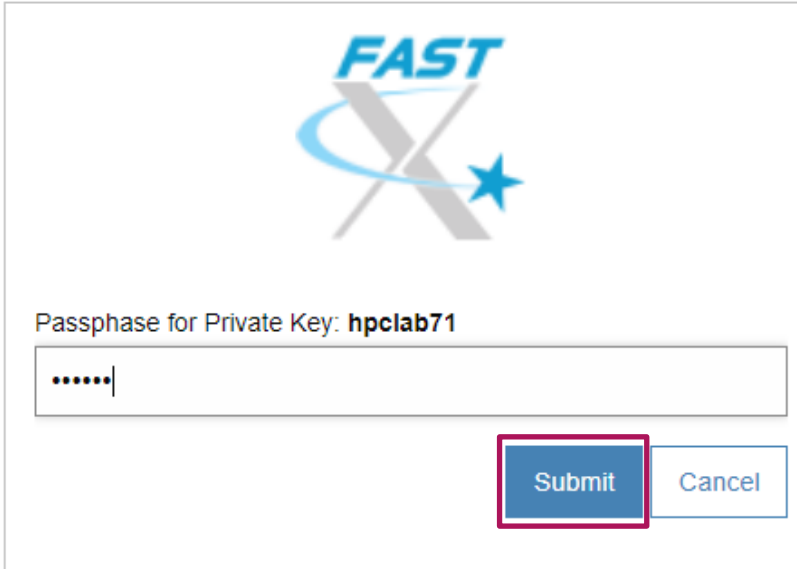
The dialog box contains the following text: 'Upload your OpenSSH format private key files to the browser's local storage. PuTTY keys are not supported. Click here to convert your putty keys to openssh format'. At the bottom right, there are two buttons: 'Upload Private Key File' (highlighted with a red border) and 'Close'. The text 'Manage Private Keys' is visible at the bottom of the dialog box.

## FastX Session (3) – Browser Session

- After you uploaded the private key file, click on the **Close** button
- Click on the **Login** button



- You have to enter a **passphrase for the private key**.
- We will provide the password in the **Zoom chat** (or in the breakout rooms).
- Note: If you are **not** asked for the **passphrase for the private key**, but instead for the **password for the user account**, make sure you ticked public key authentication.
- Then: Click on the **Submit** button.

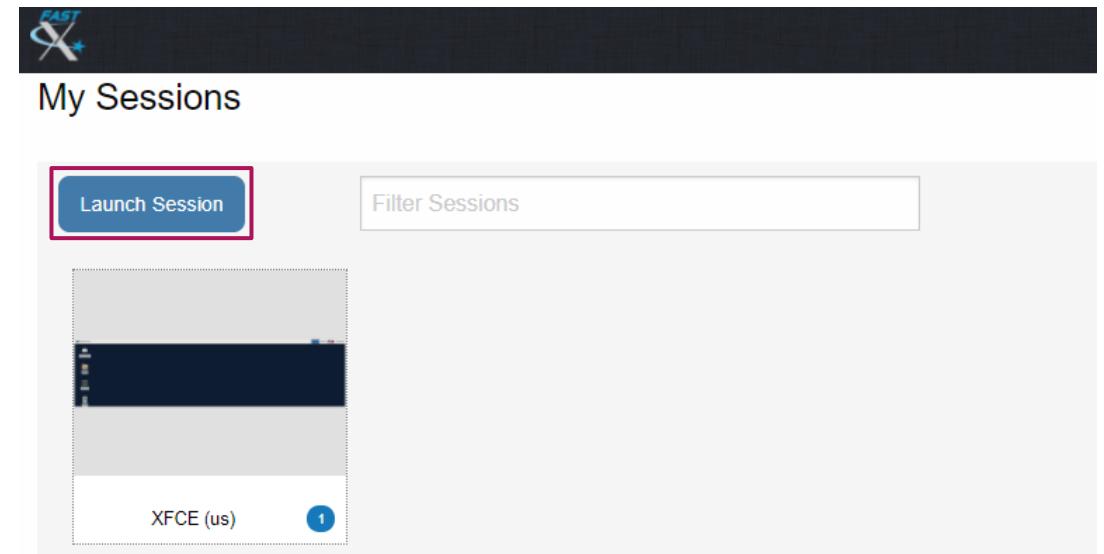


FAST X

Passphrase for Private Key: **hpclab71**

Submit Cancel

- 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 -i /path/to/hpclabXX -Y hpclabXX@login18-1.hpc.itc.rwth-aachen.de
```

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

- Convert private key for hpclab account to PPK format with PuTTYgen
  - Specify private key in the “Connection” settings
  - Specify “Host Name” (see previous slide)
- But: No complete desktop environment by default, only recommended for experienced users.

- If you have any problems with the cluster login, do not hesitate to ask in the breakout sessions.
- We can help you to set everything up.

# 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>