

**HPS**

<https://hps.vi4io.org>

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with support of many from the GWDG

## High-Performance Computing System Administration

Welcome to the Block Course

# Overview

## High-Level Goals

- To practice (Linux) administration in a safe environment
- To gain proficiency in managing your own computer systems effectively
- The goal is NOT to become expert in ONE tool but rather look into many

## Attendees

- Computer science students from the University of Göttingen
  - ▶ Will receive ECTS credits
- (Young) researchers, IT experts, data center employees
  - ▶ May receive a certificate, must provide us with your email to give consent

## Practical: Learning Objectives

- Discuss theoretic facts related to networking, compute and storage resources
- Integrate cluster hardware consisting of multiple compute and storage nodes into a “supercomputer”
- Configure system services that allow the efficient management of the cluster hardware and software including network services such as DHCP, DNS, NFS, IPMI, SSHD
- Install software and provide it to multiple users
- Compile end-user applications and execute it on multiple nodes
- Analyze system and application performance using benchmarks and tools
- Formulate security policies and good practice for administrators
- Apply tools for hardening the system such as firewalls and intrusion detection
- Describe and document the system configuration

# For Students Obtaining Credits Attending the Course

- The module consists of the parts:
  - ▶ Two 4-hour sessions (beginning of term) - introduction (virtual)
  - ▶ Administrative topic - Choose a topic
    - Individual work on a topic - but collaborate!
  - ▶ **5-day block course (end of term)**
    - Hands-on building a cluster with its software stack
    - Quick presentation of your results (10+5 min), not marked
  - ▶ 100% marks: Report about the topic and your results
    - 10-15 pages (core content, without appendix)
- We aim to publish all presentations and reports on our webpage
- Please check also [organisational remarks](#)

# Organization

- Agenda: [https://hps.vi4io.org/teaching/autumn\\_term\\_2022/hpcs](https://hps.vi4io.org/teaching/autumn_term_2022/hpcs)
- Typically from 9:00-18:00

## Breaks

- During lectures/between sessions explicitly scheduled
- Can be taken during exercise anytime!

## Types of sessions

- Lecture: Presentation by the lecturer
- Tutorial: Step-by-step exercise "on rails" with students replicating steps of the lecturer
- Exercise: Interactive/collaborative work done in learning groups

# Supporting Learning

## Study Group

- We'll group peers into learning groups of 5 people each
- Purpose: to discuss tasks and help each other, also it is fun
- Groups for: Students, GWDG academy users
- Supported by one GWDG staff each
- Practically: we will create one breakout group per study group

## Support Strategy

- Level 1 support: Talk within your study group
- Level 2 support: Utilize our [hpcsa-support channel](#) to discuss issues
- Level 3 support: Lecturers will join your breakout group if necessary
- Don't worry if something doesn't work, 80% is definitively good enough

## A Typical Session (1 hour)

- 15 min Lecture – lecturer introduces basics/tool/how to install/use
- 15 min Tutorial – lecturer walks you through typical starting issues
- 20 min Exercise – students work in study group on exercise sheets
- 10 min Plenary – 1-2 students show their result, discussion of issues

### How you interacted

- (main) The lecture/tutorial is given in this main room
- (support) You discuss in your study group in breakout rooms using screen sharing and mic – problems are posted in the support room chat
- (main) Lecturer announces something in the otherwise quiet main channel
  - ▶ Example: several groups had problem X, solution is Y
- (main) Lecturer reminds that we now share results in the plenary
  - ▶ You volunteer and screen share or post any remaining question on the chat

# Interactivity

## Advise to attendees

- You will have to use Linux and learn it, persevere, it is not easy!
- Engage! Interact with the lecturer and the material
- Volunteer for the plenaries or post (difficult) questions
- Post questions in the chat anytime
- Interact with your peers in the learning group
- Don't feel afraid to post a question
- Don't feel afraid to break sth. try it!
- You can screen share in the study group and/or work together

## With other words

- We want to empower you to DO stuff, to practice means to DO stuff



# The First Exercise

- Goal: get used to the format, introduce yourself in the learning groups
- Time: 10 minute
- Exercise sheet is linked on the webpage next to our session