

Thesis / Interdisciplinary Project (IDP) / Research Practice / Study Project

to assist with the

Containerization of (Computational Fluid Dynamics) Workflows on High-performance Computing Systems

for TUM-students within

Informatics, Aerospace, Mechanical Engineering, Data Science or similar

Part of good scientific practice, is ensuring reproducibility of conducted research. In this work, the workflow of a CFD simulation from compilation over parallel execution to post-processing is moved into a container-based equivalent. The containerized setup is analyzed for practicability and performance on the compute resources provided by the Leibniz Supercomputing Centre (LRZ), Jülich Supercomputing Centre (JSC) and High-Performance Computing Center Stuttgart (HLRS).

Tasks

- Familiarization with HPC workflows
- Familiarization with LRZ Linux-Cluster and Slurm job scheduling
- Familiarization with container software
- Container setup and performance using different codes
- Container setup and performance comparison at different HPC centers (e.g. Jülich Supercomputing Centre)



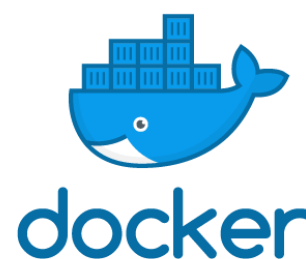
Image: SuperMUC (Hohenegger / LRZ)

Requirements

- Knowledge of python
- Knowledge of Linux-CL
- Knowledge of containers (e.g. Docker)
- Experience with HPC-clusters (beneficial)

Benefits

- Flexible working hours, remote work
- Recognition within your study program (thesis / internships / projects etc.)
- Joint-mentoring by TUM and LRZ: exclusive experience with HPC-clusters
- Experience with state-of-the art container concepts
- Insight into a nationwide research project



Links

- Virtualization and Containers @LRZ: <https://doku.lrz.de/virtualization-and-containers-10745964.html>
- NFDI4Ing research group: <https://www.epc.ed.tum.de/en/aer/research-groups/nfdi4ing/>

Contact

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