



Friedrich-Alexander-Universität
Erlangen-Nürnberg

FRAUG

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1. Hardware

CPU	Dual Socket AMD EPYC high performance / watt ratio
Memory	2048GB DDR4 energy efficient
GPU	Nvidia A100 tunable high performance can achieve good performance / watt ratios
Drives	SSDs high bandwidth low latency power efficient

2. Software

Operating System	CentOS 7 setup with Anaconda Kickstart
Configuration Management	Ansible
File System	NFS
Software and Dependency Management	LMod
Batching System	SLURM

3. Our team's strategy

In general

- Agile teams of two to three students during preparation phase
- Swapping team members around every 1-2 weeks so everyone can work with everyone
- For the actual work on the competition hardware the principle stays the same, split up the work in smaller

groups and communicate/swap if there occur any problems



Figure 1: Friendly Amphibian Undergraduates

Preparation for SCC22

- The Friedrich-Alexander University Erlangen-Nürnberg, our university, created a course only to learn the relevant basics for competing in the Student Cluster Competition
- In this course we got hands-on experience on the computer clusters of the FAU to learn about working with benchmarks, and getting used to setting up a system from the ground
- With this practice done beforehand, recreating what we did before but now on the competition hardware was hardly a struggle
- Support and advice from past years' competitors and engineers from our sponsor Megware for creating a successful cluster
- Biggest advantage: us having worked out the basics of creating a cluster from ground up by ourselves, so we understand every step of the process and can try to enhance each part of our cluster

Power Limit

- We measured the power consumption of our system during test runs with different clock frequencies and



looked at the resulting performances

- These test results help us to find configurations that guarantee not to exceed the competition power limits while still granting us the most calculations possible for the given power
- For each of the different power settings, we have explored close to optimal CPU settings

4. Introduction to our University and Team

Friedrich Alexander Universität

- One of the largest research universities in Germany
- 37000 students, wide range of chairs
- e.g. Department of Computer Science: 15 chairs and extensive connectivity with other departments

Our Team

- Diversity in many ways like language, ethnicity and gender resulting in various skills involved in every one of us with respect to culture and education as well
- One veteran member with previous SCC experience strengthens the team practically
- Strong educational background in fields like Computer Science and Computational engineering with minors in Physics, Theoretical Computer Science and Artificial Intelligence
- Specialization: each student tasked to be the expert for two of the six topics while general knowledge of all topics (esp. system administration) is required for all
- Since all the team members have their minors in various fields we collect insights from every one of us and hence this is valuable contribution towards the team