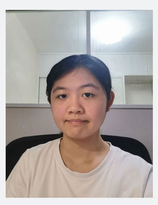
Zhejiang University

ZJUSCT

SC22 Dallas, TX | hpc accelerates.

Team Introduction

Zihan Yang | Yi Chen | Kaiqi Chen | Xingjian Qian



Yun Pan

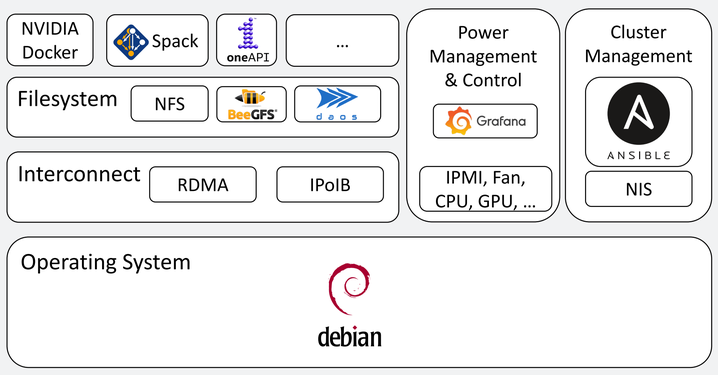
Shaojun Xu

Our Team ZJUSCT

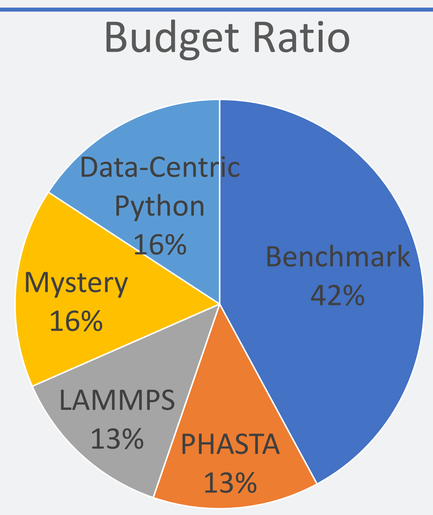
- Interest in HPC
  - For every one of Zhejiang University who interested in HPC
- Diversity
  - Underrepresentation of women and minorities
- Confidence to Win
  - Experienced members in other HPC competition
  - Well prepared

Software Overview

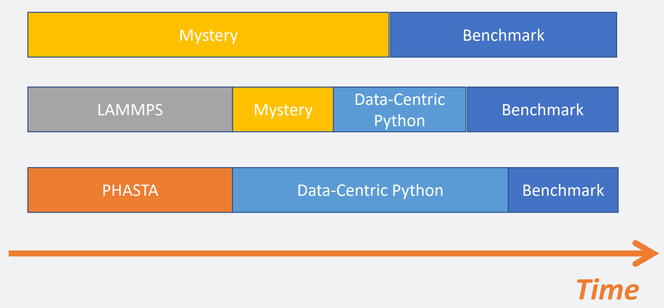
- OS
  - Easy to use, clean and tidy, with lots of wiki and community support
- Distributed File System
  - **NFS** easy to configure, share codes and binaries
  - **BeeGFS** a leading parallel cluster file system, share large data files
  - **DAOS** a high performance storage file system developed by Intel, IO500 benchmark
- Ansible
  - A simple way to automate apps and IT infrastructure. It can save our time in the cluster configuration and application deployment
- Grafana
  - Monitor the status of the cluster, better utilize the hardware resources, and accelerates troubleshooting
- Container
  - Keep the environment for each application to be isolated
- Spack
  - Manage multiple versions of compiler and libraries



Schedule



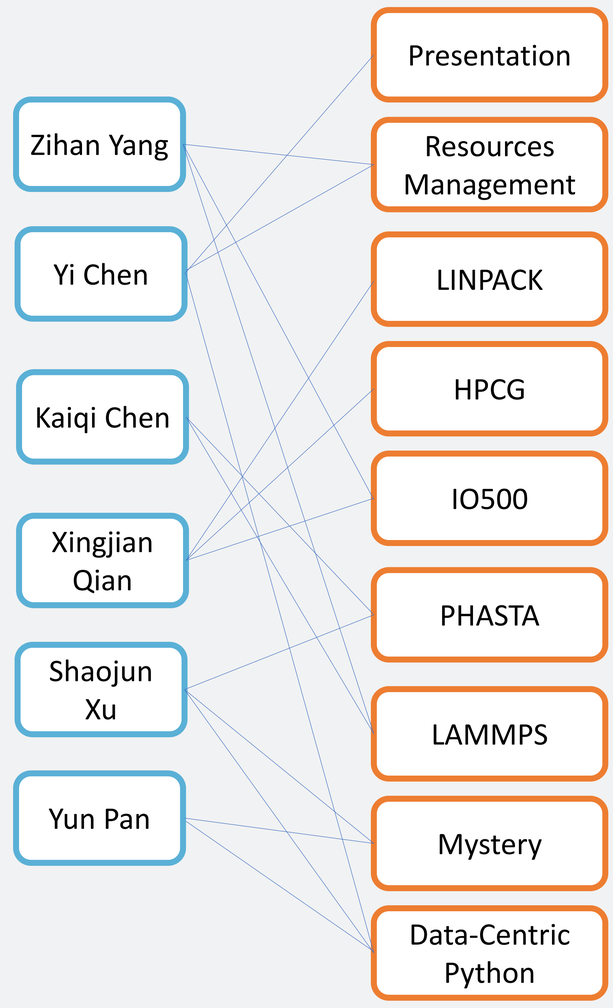
6 members, 3 parallel workflows



Applications Strategy

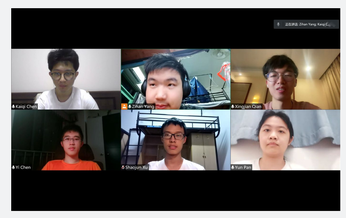
- LINPACK
  - Compute-bound application
  - Accelerated by GPUs with high flops
  - Tuning configurations to make full use of hardware units
- HPCG
  - Memory-bound application
  - Accelerated by GPUs with high bandwidth memory
  - Equipped with InfiniBand with high bandwidth and low latency network
- IO500
  - Deep insight into NVMe SSDs
  - Parameter tuning for peak performance
- PHASTA
  - Organize the source code and comprehensively understand the structure of PHASTA
  - Try combinations of compiler kits, MPI libraries and CMake configurations
  - Profiling to optimize hot code
- LAMMPS
  - Investigate accelerator packages in LAMMPS and compare different packages to find the best combination
  - Equilibrate OpenMP threads and MPI processes for best scaling on cloud architecture
  - Decide GPU usages for higher efficiency
- Data-Centric Python
  - Rich Python programming and optimization experience
  - Interact with the paper's authors and understand details in the paper
- Mystery Application
  - Adaptive to challenge
  - Enough resources scheduled

Collaboration



Weekly Meeting

- Meet once a week
- Work and solve challenge together



All Managements in One Panel

- Grafana to gather resources usage information
- Easy to control budgets consumption

They support us

Team Advisors

- Jianhai Chen
  - Primary advisor
  - Cloud computing & Scheduling
- Zeke Wang
  - Reconfigurable Computing for Machine Learning Lab
  - Heterogeneous Computing
- Yin Zhang
- Shuibing He
- Weiwei Xu
- Chong Zeng

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