



Alex I. - Math and CS dual major who specializes in HPL and researches keyboard optimization. Returning member of GT's IndySCC '24 team.



Alex K. - Returning member of GT's IndySCC '24 team with a background in math and CS. Specializes in SLURM and Exascale Climate Sim.



Sahil S. - Educated in computer theory and intelligence and researches SAT solvers. Expertise with SST.



Aiden L. - Specializes in modeling simulation and sys arch. Worked with GT's PACE on HPC storage infrastructure and data migration.



Seth S. - Software lead with GT's Robojackets and is educated in information internetworks and sys arch. SST specialist.



Adi V. - Background in computational intelligence and information internetworks. Specializes in Exascale Climate Simulator.

Members

Preparation

- Weekly team meetings + VIP course exercises.
- Practice environment setup and SLURM installation using our personal 9-node cluster, "Pho" (pictured).
- Utilize GT's Phoenix and ICE clusters to compile, run, and debug applications prior to using JetStream2 resources.
- Work through each application's exercise, understand its output, and learn how to optimize for performance.
- Two returning members (Alex I. and Alex K.) are mentoring new teammates on how to approach the competition with strategies learned from IndySCC '24.



Strategies

- Utilize Apptainer on JS2 by containerizing SST and Exascale Climate Simulator to ensure proper installation on competition day.
- Have HPL makefiles of all compilations made prior to our Hero Run.
- Partition team into specialized groups for each benchmark.

LINPACK Benchmark



- Analyze performance under different combinations of MPI implementations, BLAS libraries, and C compilers.
- Automate HPL runs, aspects of tuning, and output parsing with custom Python scripts.

SST



- Prior to running competition SST exercises, we'll execute simple, yet informative simulations we've designed to ensure a properly functioning SST build.

Exascale Climate Emulator



- Adopt Tile Low-Rank (TLR) with GPU acceleration; tune TLR tolerance to balance speed and emulator accuracy.
- Reduce idle time and improve scalability of dataflow executions with ParSEC.

Mystery App



- While containers build, dedicate time to exploring and compiling the mystery app on the front end.
- Review and become familiar with benchmarks discussed in the webinar beforehand.

Resources

Jetstream2

CPU & GPU

AMD

AMD Milan 7713



NVIDIA

NVIDIA A100

Software

Ubuntu	OS (v24.04)
NFS	File System
SLURM	Scheduler
OpenMPI	v5.0.8
GCC	v15.2.0
AMD OCC	v5.0
Python	v3.12.3