



Team Members



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Skills

- Expertise in Linux Cluster Maintenance

We have highly experienced professionals specializing in cluster operation and maintenance.

- Program and Compilation Optimization Proficiency

We excel in optimizing applications and selecting the best compilation options for both CPU and GPU programs.

- Strong Coding Skills

We have a solid background in computer science, mathematics, and physics, enabling them to solve complex challenges effectively.

Diversity

- Culture diversity: With members hailing from various cultural province of China, across thousands of kilometers, we bring a unique blend of ideas to the table. We are here because of our passion for pushing the boundaries of supercomputing.

- Gender diversity: We are committed to fostering an inclusive environment where everyone, regardless of gender or ethnicity, is encouraged to contribute their skills and creativity.



Strategies

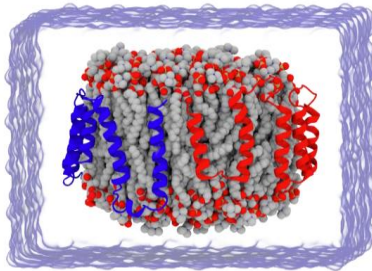
General Approaches

- Application compiling
 - Benchmarking and hotspot detection
 - Applications performance tuning
- Fine tuning including not only the configuration of the application itself but the fitness between the application and the system hardware and software.
- Compilation optimization

Using different version of compilers and the binding of different compilation flags to get the best performance to the application.

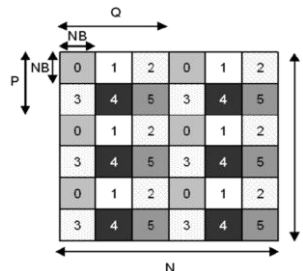
NAMD

- Analyze the hotspots of the entire program.
- Recompile NAMD using different compilers, compilation options, and math libraries.
- Test the network latency between nodes and select appropriate nodes for MPI.
- Tune configurations to achieve maximum performance of hardware units.



HPL

- Fine-tune configurations to maximize hardware performance.
- Leverage various MPI and BLAS implementations.
- Achieve optimal balance between OpenMP threads and MPI processes.
- Apply advanced runtime & compiler optimizations.



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- Hotspots Analysis

Analyze timer reports to identify CPU-intensive sections and load imbalances.

- Tuning For Specified architecture:

Test different compilers and flags, as well as all tunable configurations for a better performance.

- Load Balancing and MPI Optimization:

Find a better load balancing scheme and optimize task distribution between components to fully utilize the compute resources.

Team Preparation

- Cross complementation collaboration.

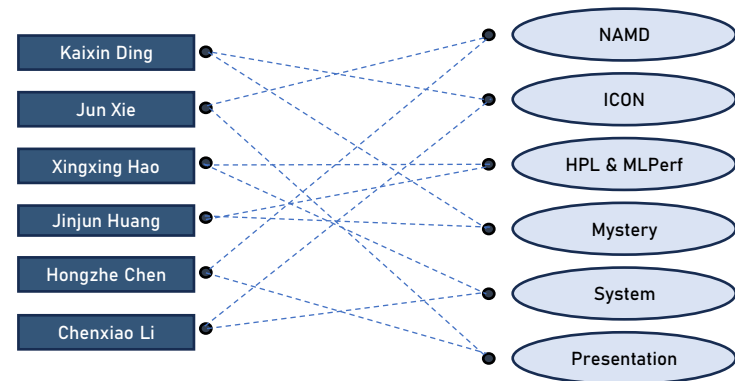
Each task has multiple responsible members, with one of them being the main in-charge. Everyone has their own main responsibility, but can also collaborate together to solve challenges.

- Weekly meetings on application progress sharing and final competition strategy plan.

- Rapid application testing and iterative optimization with full utilization on both Chameleon cloud and self-constructed clusters.

- Best configuration scheme testing for each application on different software and hardware environments.

- Learning from previous competitions and team seminars from members over the years.



Why will we win?

- Practical experience and insights from in-site experience in prior ASC, ISC, and SC competitions.
- Tailored unique optimizing methods to boost performance and efficiency under competitive settings.
- Diverse sets of professional skills equipped by each teammate.
- A collaborative environment ensured balanced and effective optimization to each task.

Leveraging the synergy of our combined skills, practical experience, and customized optimization strategies, we're confident in our capability to conquer and thrive in complex challenges.