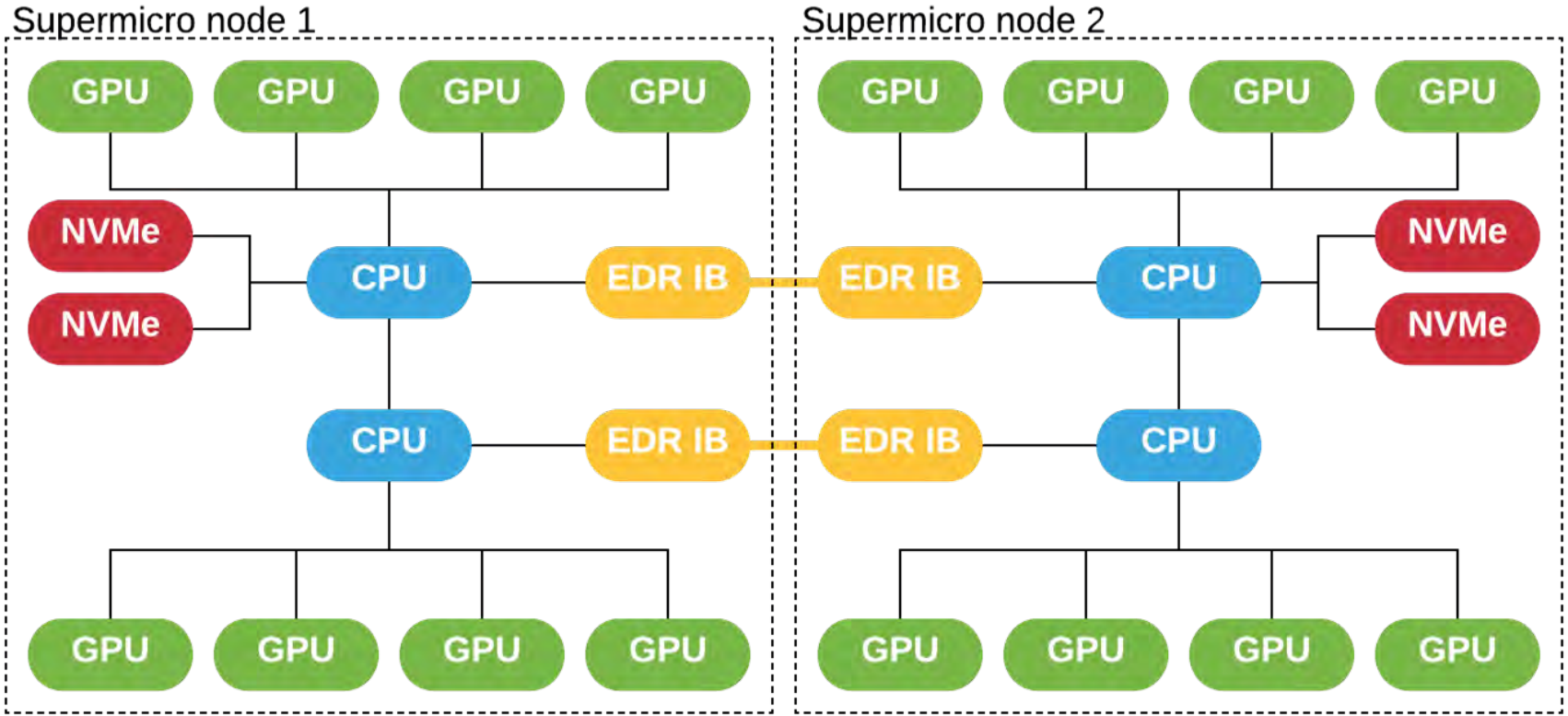
Team Supernova

Nanyang Technological University, Singapore

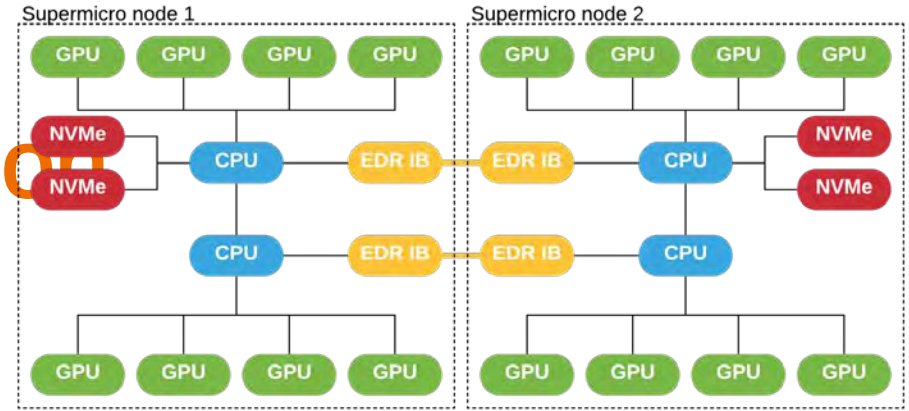
The Team

NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

Hardware Configuration



Hardware Configuration



	Supermicro 4029GP-TRT
CPU	Intel Xeon Platinum 8160 (24 cores) x 2
GPU	NVIDIA Tesla V100 x 8
Memory	256 DDR4 x 1
Interconnect	Mellanox Infiniband EDR x 2
Storage	Auxiliary Shared Data: 1TB NVME SSD Shared Parallel File System: 6.4TB across 4 NVMe SSDs

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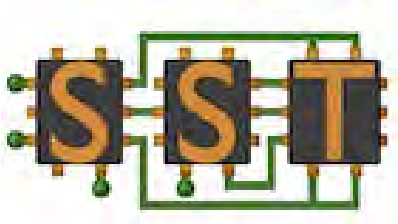
Cluster Software

Benchmarks

SST

- A simulation platform that provides a framework to connect multiple **simulated hardware objects** such as CPUs, network, memory etc.
- Our optimizations:
  - Explored different compilers, MPI implementations, compilation flags
  - Process/Thread binding

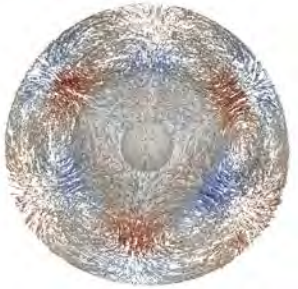


VPIC

- Particle-in-cell simulation code for **modeling kinetic plasmas in one, two or three spatial dimensions**
- Our optimizations
  - Explored different compilers, MPI implementations, compilation flags
  - Process/Thread binding
  - Hyper Threading
  - GPU Porting → 4% speed up in general

Reproducibility

- Normal Modes at Planetary Scales, which applied a combination of several highly parallel algorithms to **compute the planetary interior normal modes**
- We conducted experiments to test and verify the codes on the following aspects:
  - Weak scalability
  - Strong scalability

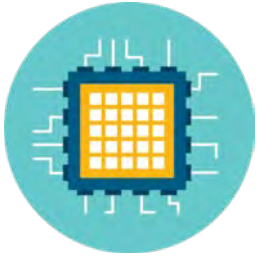


Why we will win?

Passion for HPC

Good team dynamics and collaboration

Learning from past experience



Powerful hardware and well-designed architecture

Special Thanks