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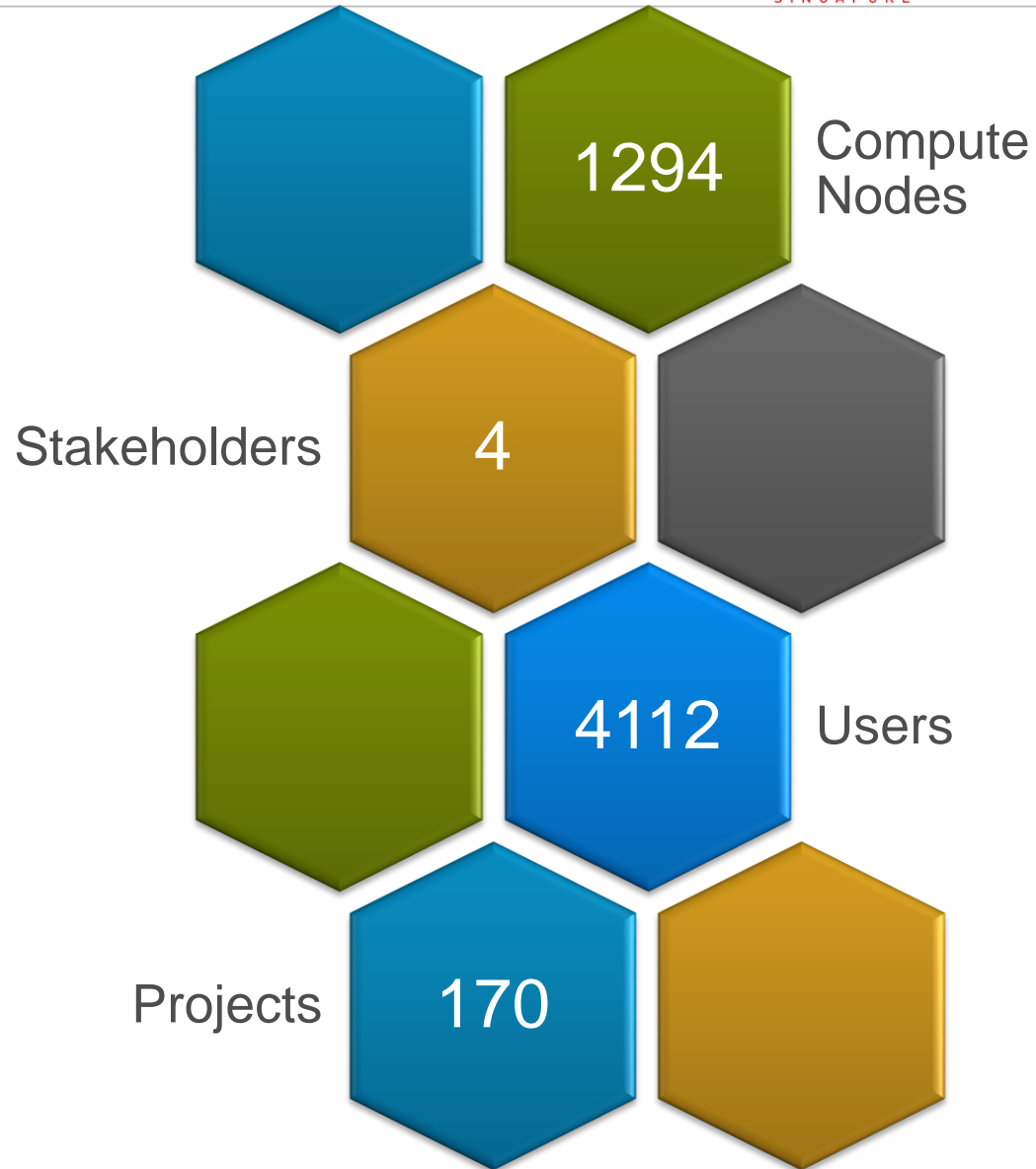
Unified accounting and health checking with Altair PBS Professional

Siyuan Liu
Research Engineer, NSCC

NSCC resources and users

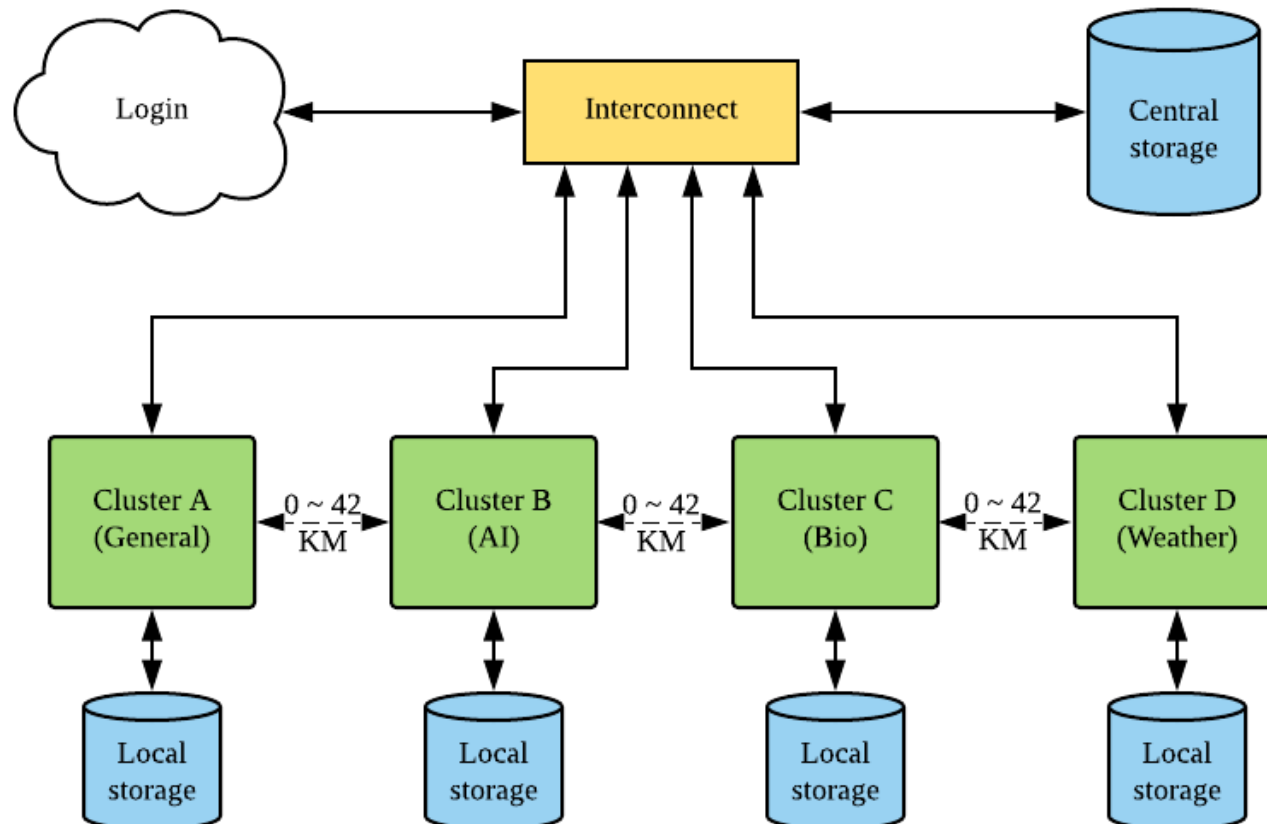


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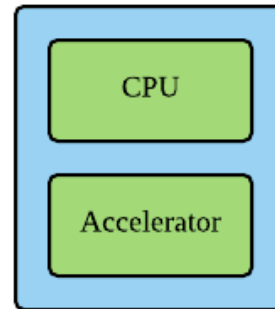
A tentative blue print for NSCC 2.0

- Multi-cluster design
- Central & local storage
- Peer scheduling among clusters

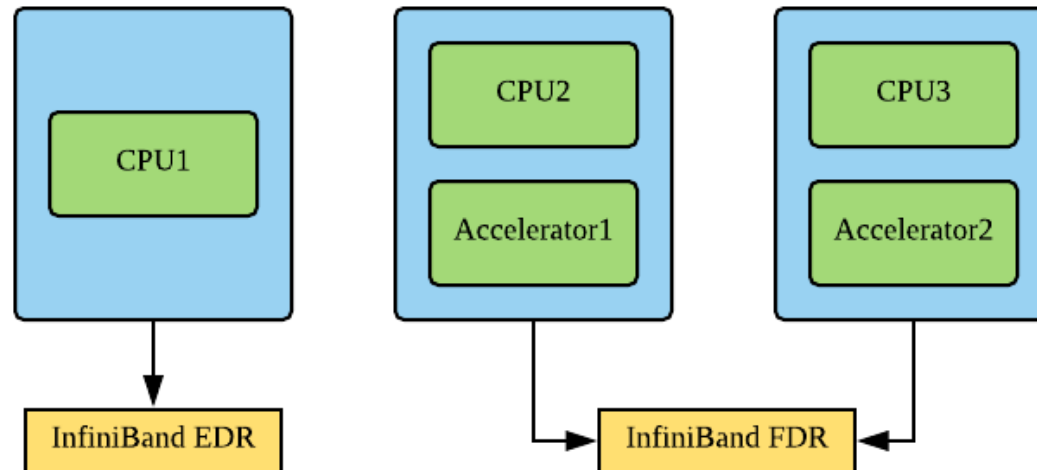


Increasingly complicated architecture

- **Heterogeneous architecture in a single cluster**



- **Heterogeneous architecture across different clusters**



Accounting for usage



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- **Account for GPU usage with CPU core hours?**
 - Cannot accurately measure GPU usage
 - Treating a single GPU as a node -> resource under-utilization
 - Rely on number of cores user requests -> user can ask for 1 CPU core
- **Separate accounting schemes for different subsystems?**
 - Current system not flexible enough
- **Ideally, we should account for all resources with a single unit of measurement**

Introducing the concept of Compute currency

Compute currency



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- **A unified measure of all computing resources (CPUs, accelerators, memories, interconnects)**
- **Flexibility in charging**
 - Users can fully utilize their quota
 - Resources are more accurately charged
 - GPU is not charged based on CPU core hours
- **New challenges arise with compute currency**

How do we define the unit of compute currency?



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A simple idea to start with

- **How do you define one currency unit?**
- **Benchmark various CPUs & accelerators?**
 - DGEMM?
 - STREAM?
- **Problems**
 - How to compare different resource types?
 - Computing resources (CPU, accelerators)
 - Network resources
 - What benchmarks are necessary to measure the performance of hardware?
 - How do we weigh the results of different benchmarks?

More ideas are welcome!



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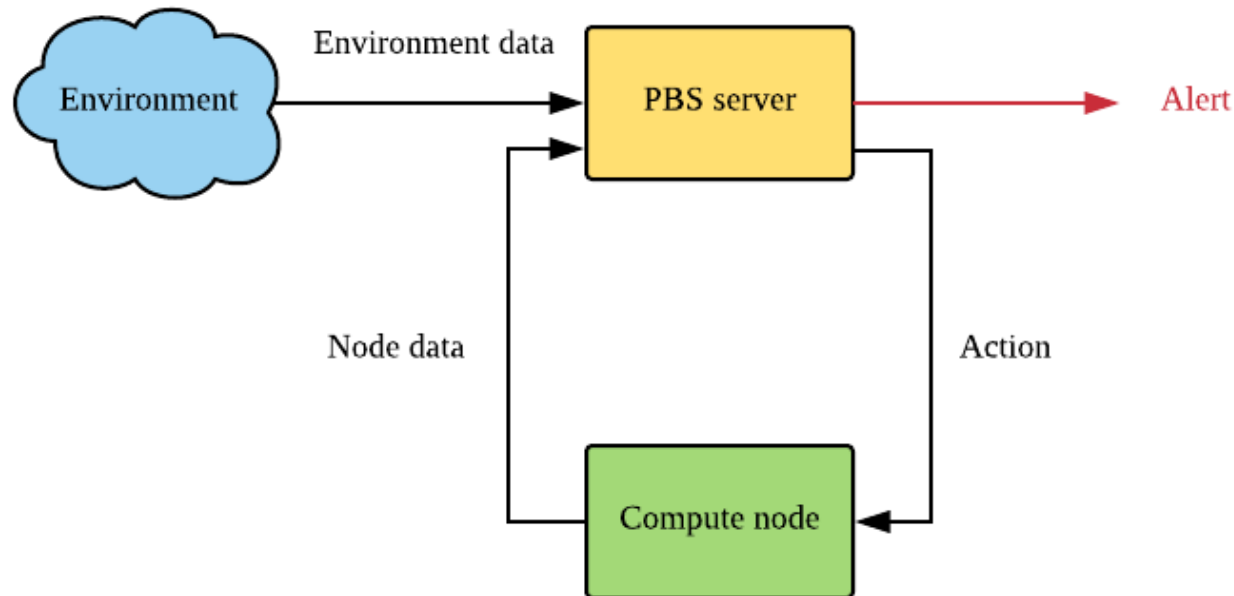


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Health checking with PBS

PBS for emergency orchestration

- **PBS, as the job scheduler, naturally has access to all compute nodes**
- **PBS can already instruct compute nodes to perform actions like shutdown and reboot**
- **Why not add additional capability to utilize PBS for orchestrating emergency shutdown?**



HPC Futures - Hyperscalers, Exa, AI & Quantum and Beyond

KEYNOTE SPEAKERS



Dr Christine Ouyang
Distinguished Engineer
IBM Quantum Computing
Master Inventor and IBM
Academy of Technology



Prof Lu Yutao



Prof Jiahua
Mathematics, Stony
Brook University

CO-LOCATED EVENTS

- Asia Pacific Research Platform (APRP) Conference
- ASEAN HPC Workshop

PROGRAMME HIGHLIGHTS

- Quantum Computing
- Precision Medicine
- Hyperscalers
- Green Data Centre
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Questions?