



GridPP Event

March 2023

Power and Cooling – The new challenge in HPC



- Intel CPUs – 350W per CPU

700W per system for CPU power alone

- AMD CPUs – 360W per CPU

720W per system for CPU power alone

- GPU – 350W per GPU

Up to 3.5kW per system for GPU power alone

- PLUS the power for the other elements within the system

Power and Cooling in the DC

- Floorspace is at a premium
- We rack-mount servers for a reason
- Higher density means fewer servers per rack
- Connecting servers to switching becomes an issue

Three alternatives to reducing the number of servers per rack

- Rethink how we use conventional CPUs
- Improve cooling
- Reduce power

Rethink how we use conventional CPUs

- Best Cost/Performance for CPU alone may not be the optimal solution anymore
- Will need to account for Power, Cooling and Network optimisation when evaluating CPUs
- Dropping down on cores/frequencies may give us the optimal balance

Improve Cooling

- Rear Door Cooling will only get us so far
- Immersion Cooling requires a totally different way of working
- Close Coupled Cooling offers a middle ground

Reduce Power

- Alternative CPUs may provide a lower power overhead
- Alternative Server packages may be worth considering

Use XMA to help with the transition



- Access to all Intel and AMD CPUs for benchmarking
- Access to alternative CPU technology for testing
- Introduction to New technology