Project Proposal
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Power Benchmarking Xeon Phi (Knights Landing) vs Xeon Phi (Knights Corner)

What problems will you investigate?

We are proposing to use benchmarks to study power efficiency of Xeon Phi manycore coprocessors. Xeon Phi (Knights Landing) is new architecture and analysing its capabilities would be important for further research. We aim to use benchmarks to analyse both the processors and make comparison. We would use parameters like Performance to Power ratio for comparison.
Intel Xeon Phi Family processors are flagship products by Intel in high performance computing. Intel Xeon Phi allows rapid code migration compared with GPU's, also some applications can be more suitable for multi/manycore architectures than GPUs.
There are three ways in which we can measure power for Intel Xeon Phi family processors:
- Measuring Intel Xeon Phi coprocessor power using micsmc
- Measuring cluster power consumption using the PAPI RAPL API
- Measuring Power: Using the micras syssf nodes for the Intel Xeon Phi coprocessor

We would explore best way to get maximum and relevant information for our application.
We would also explore benchmark applications we could use:
- SPEC OMP 2012 (If available)
- OpenDwarfs
- ParallelDwarfs_Beta

How are you going to evaluate it?
We will analyze power to performance ratio on Xeon Phi KNL and KNC processors.
We would analyse our results with already published results for consistency. We would use our results to compare two architectures.

Why is the problem important?
Intel KNL is new architecture and analysing capabilities of it would be beneficial for further research.

What is your objective?
To benchmark both Intel Phi KNC and KNL for power parameters.

How do you plan to achieve it?
We would use Intel Phi KNC-SandyBridge and KNL nodes on TACC Stampede cluster for our experiments. We would also use Palmetto nodes having KNCs if needed.

What timeline will you follow?
Exploration of Benchmarks/Tools etc   Feb 22
Initial results   March 23
Finalization of results   April 13
Documentation of results   April 20

Reference -
[1] https://portal.tacc.utexas.edu/user-guides/stampede#stampede-knl-cluster
[2]
https://software.intel.com/en-us/articles/measuring-power-on-intel-xeon-phi-product-family-devices
[3] https://www.spec.org/omp2012/
[4] https://paralleldwarfs.codeplex.com/