Intel Xeon Phi Programming

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Goal: Multithreading on Intel Xeon Phi co-processor
Two Supercomputing Parties in the US

**GPU**

Titan: Oak Ridge Nat’l Lab
17.6 Petaflop/s
AMD Opteron + NVIDIA K20x

**Phi**

Aurora: Argonne Nat’l Lab (2019)
180 Petaflop/s
Intel Xeon Phi

GPU vs. Phi
Other Forthcoming Architectures

China

Tianhe (天河), Guanzhou
TH-2: Intel Xeon Phi (33.9 Petaflop/s)
TH-2A: GPDSP, China Accelerator

Japan

Post-K (京), Kobe
ARM/Fujitsu

DSP vs. ARM
Intel Xeon Phi Co-Processor
Intel Xeon Phi Software
1. Start a process on host CPU
2. Allocate memory in Phi co-processor
3. Send input data from host to co-processor
   #pragma offload target(mic) in(data:length(size))
4. Execute a function on co-processor using OpenMP multithreading
   #pragma omp
5. Send output data from co-processor back to host