Microsoft C++ AMP

By: Brian Hinkle

What is it?

- Microsoft C++ AMP can increase the speed of your programs by utilizing the GPU for certain tasks.
- Extension of C++ (libraries)

How does it work?

- #include <amp.h>
- concurrency::parallel_for_each(extent, lambda)
  - Main function
  - Non-blocking
  - Extent specifies number of threads
  - lambda represents the function passed in to be executed
- Any function to be ran must be marked with restrict(amp).
  - Tells compiler to check that the function only uses language features supported by gpu.

How does it help HPC?

- When known when to utilize gpu for calculations, it can speed up your program significantly.
- Highly advantageous to use C++ AMP for doing multiple calculations where each calculation doesn’t have an influence on the other.
  - ie. calculating vertices’ positions
  - Each calculation can be done in parallel.
  - Accelerated Massive Parallelism

How does this relate (or use) MPI, BLAS, and OpenCL

- They all achieve High Performance Computing using the gpu

Why is this software package useful over MPI/BLAS

- Microsoft C++ AMP is vender independent (can work with any GPU).
  - Loss of some features specific from GPUs
- Uses C++

How popular is it? Who uses it?

- Microsoft C++ AMP has lost momentum.
- Previous microsoft developer:
  - “It seemed like there was a loss of momentum around C++AMP. I have no plans to do further work on the project. Make of this what you will. Perhaps someone from Microsoft can clarify things?”