OpenMP Extensions and Integration with HPX
Topics

- Legacy migration
  - OpenUH OpenMP runtime with HPX

- Data-driven computation
  - Explore both HPX and OpenMP

- GPGPU support
  - OpenACC compiler
OpenUH OpenMP runtime with HPX : Planned

- Use pragmas to replace calls to pthread_* with calls to hpxc_*
- Build compiler
- Build simple OpenMP program
- Run program
Done

- Headers and #DEFINE used to replace calls to pthread
- Built compiler with changes.
To Do

- 'Zero out' the affinity information inside the OpenUH runtime, and remove affinity related function calls.
Data-driven computation

- OpenMP task dependency
  - 
  #pragma omp task depend (in|out|inout: list) [ other clauses], in OpenMP 4.0
- Did in our OpenUH compiler
- C++11 async/future
  - Future as a handle of a task
- HPX async/future
Data-driven LU

LU 4096x4096, execution time (s)
LU data-driven computation

Data-driven LU, 4096x4096
OpenACC compiler work
Discussion

• C vs C++
  • C++ version of LU with async/future make it harder to understand
  • C plus pragma is still much easier to understand
• XPI