

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 #DEFINES used to replace calls to pthread
- Built compiler with changes.

To Do

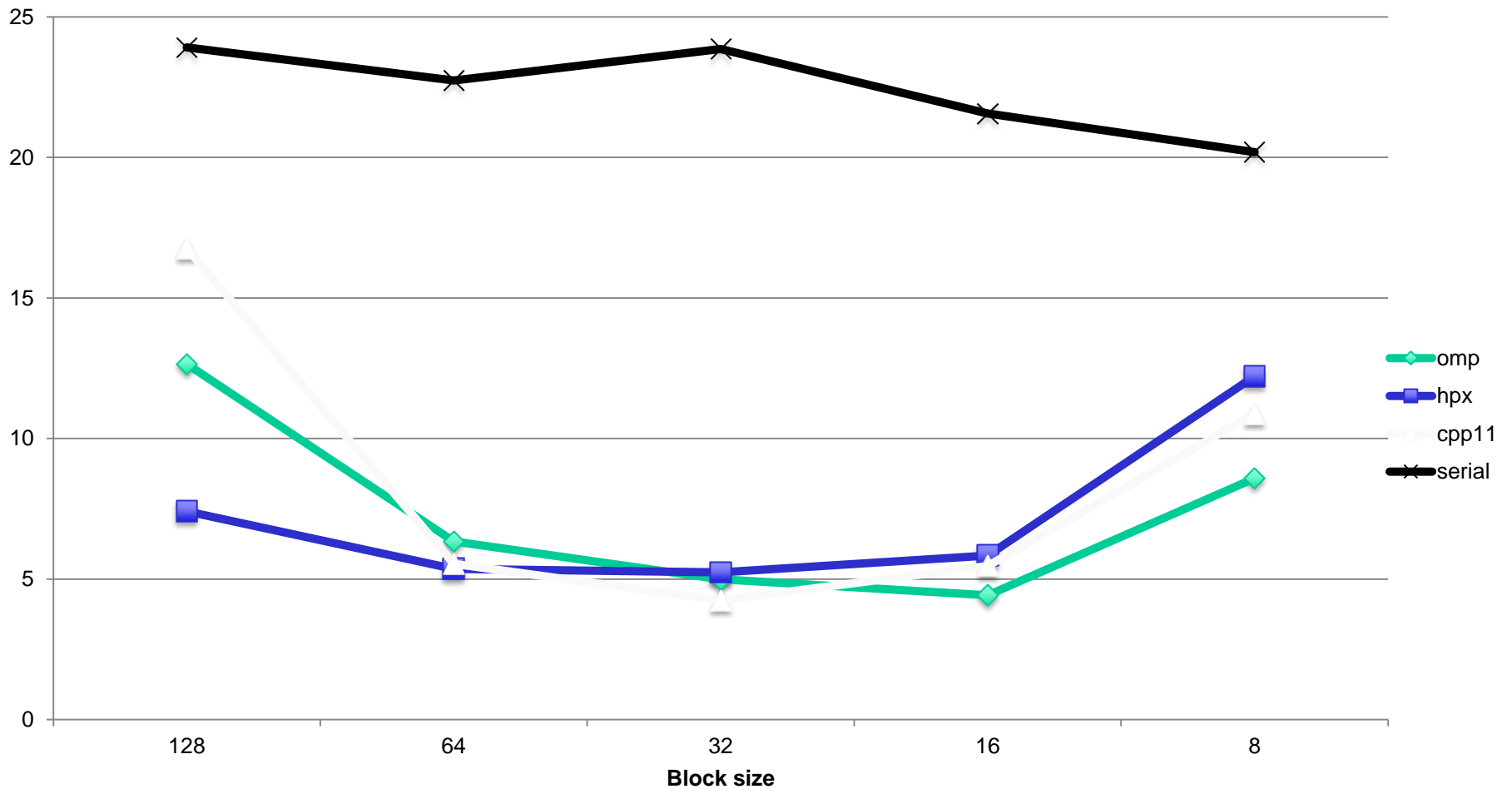
- 'Zero out' the affinity information inside the OpenUH runtime, and remove affinity related function calls.

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`

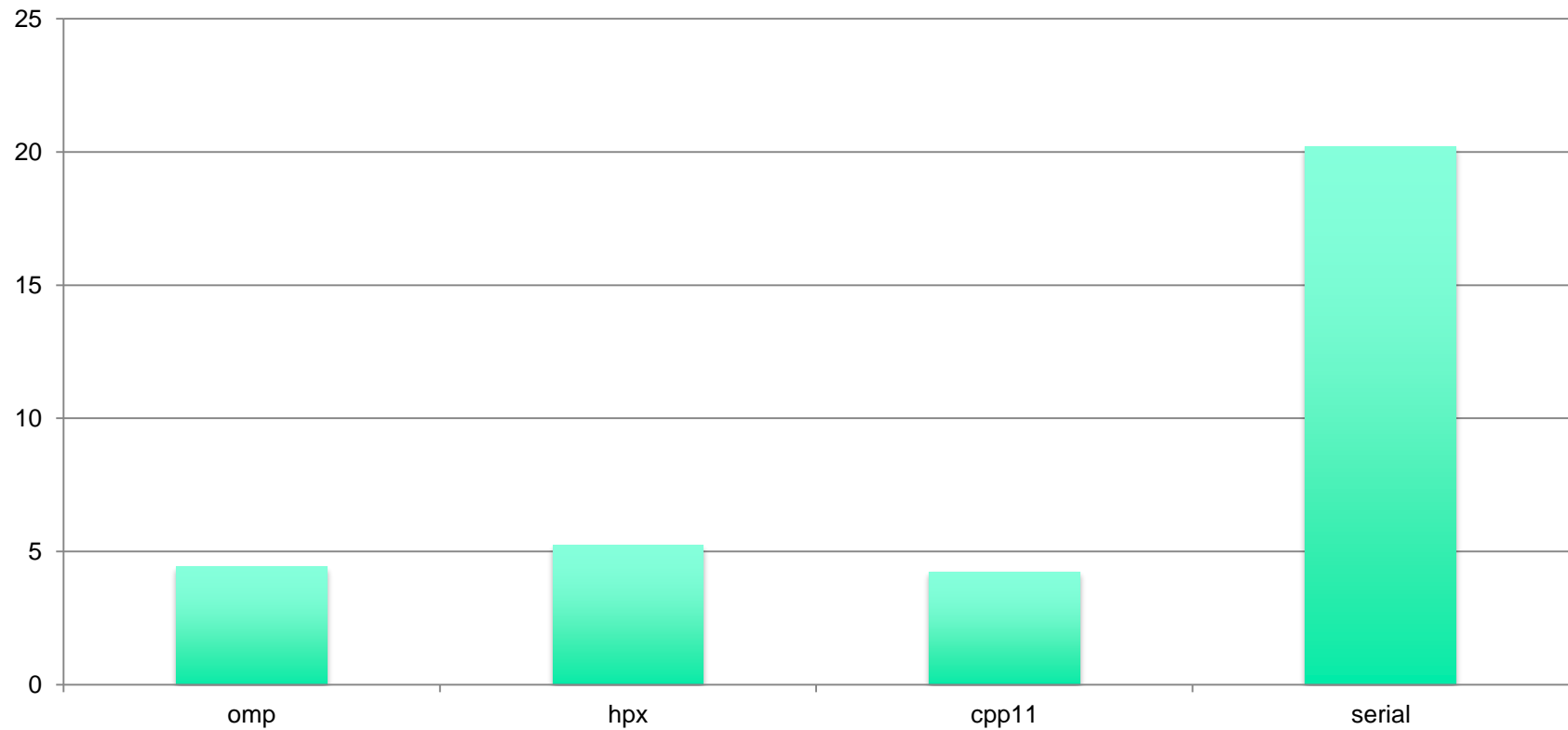
Data-driven LU

LU 4096x4096, execution time (s)



LU data-driven computation

Data-driven LU, 4096x4096



OpenACC compiler work

Disucssion

- 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