High Performance ParalleX (HPX) and runtime support boosts application performance
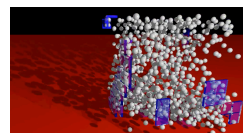
Comparisons/Results

- N-body Simulation

  1.4x over MPI (16,384 cores)

- Mini-Ghost: Boundary Exchange Mini-app

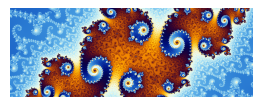 **1.13x** over MPI+OpenMP (1024 cores)

- Kernel: Stream benchmark
  Kernel: Matrix transposition

  1.4x over OpenMP
  2.5x over MPI+OpenMP

- Data analytics miniapp (miniTri)

  1.14x over OpenMP

- Distributed GPU work

  1.5x over native CUDA on 16 GPUs

- Lulesh: Shock Hydrodynamics

  1.2x over MPI on Cori (128 cores)
  Same as MPI on Cori (4000 cores)

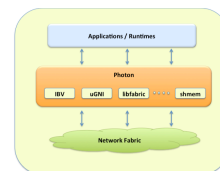- DSEL and MTL for HPX
  – Same Portable code GPU / CPU

  DSL for linear algebra through
  DOE NNSA DE-NA0002377 (PSAAP2)

  Same as MPI (256 cores)

- Photon: Integrated Communication Library

  1.34x for 16 byte puts
  1.37x for 16 byte gets
  over MPI-3 one-sided