Report on CHIUW: The Chapel Implementers and Users Workshop

Brad Chamberlain, Chapel Team, Cray Inc.
PGAS BoF, SC16
November 16, 2016
CHIUW 2016 in a Nutshell

● CHIUW 2016: Third annual Chapel user + dev workshop

● An IPDPS 2016 workshop, Chicago IL
  ● May 27: full-day mini-conference
  ● May 28: half-day code camp / pair-programming

● New for CHIUW 2016:
  ● accepted research papers, published in IPDPS workshop proceedings
  ● also accepted talk-only options as in past years

● Acceptance rates:
  ● 4 of 6 papers and 10 of 12 talks accepted
  ● topics included: apps, perf tuning, tools, resilience, accelerators, …

● Over a dozen institutions represented
Chapel in the (Cosmological) Wild
Nikhil Padmanabhan, Yale University Professor, Physics & Astronomy

Abstract: This talk aims to present my personal experiences using Chapel in my research. My research interests are in observational cosmology; more specifically, I use large surveys of galaxies to constrain the evolution of the Universe and to probe the physics underlying that evolution. Operationally, this involves measuring a number of spatial statistics of the distribution of galaxies, both on actual observations, but also on large numbers of simulated universes.

I'll start by presenting a whirlwind introduction to cosmology, the problems that keep me up at night and our approaches to solving these. I'll then discuss what attracted me to Chapel—the ability to prototype algorithms quickly and the promised ease and flexibility of writing parallel programs. I'll then present a worked example of Chapel being used in a real-world application, discussing some of these aspects as well highlighting its interoperability with existing libraries, as well as some of the challenges. I'll conclude with what it would take for me to switch over to using Chapel all of the time.
Join us for CHIUW 2017!

CHIUW 2017: 4th Annual Chapel Implementers and Users Workshop

- an IPDPS 2017 workshop
- Orlando, FL, June 2
  - (also likely to hold a code camp on June 3)
- submissions due Jan 20
  - like CHIUW 2016, accepting both research papers and talk-only abstracts
Recent Chapel Highlights

Brad Chamberlain, Chapel Team, Cray Inc.
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Chapel Highlights Since SC15
(“It’s high time to give Chapel another look”)

- Marked performance and scalability improvements:
  - Chapel Versus Reference Timing: LULESH
  - binarytrees: Chapel versus Reference
  - HPCC: RA-atomics Perf (GUPS) n=2^{21}, N_U=10^8

- Closed long-term memory leaks:

- Modern online documentation

- Improved interoperability features

- Many new libraries: BLAS, BigInt, ZeroMQ, MPI, PCG, …

- Selected for Google Summer of Code 2016

- Added to the Computer Language Benchmarks Game
  - fastest entries: 1 #1 entry + 2 in top-5 + 2 in top-10 + 3 in top-20
  - smallest entries: 2 #1 entries + 2 in top-5 + 4 in top-20