

A Programmer's Introduction to Chapel

Brad Chamberlain ACCU 2017, Bristol UK





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Organizational Notes



- Chapel Quick reference sheet
 - also available online
- Chapel microfiber cloths for cleaning screens/glasses
- Chapel stickers
- Cray Marketing Partner Network agreement
 - optionally, for using Cray accounts





What is Chapel?



Chapel: A productive parallel programming language

Goals:

- Support general parallel programming
- Make parallel programming at scale far more productive





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Who Am I?

Brad Chamberlain

- principal engineer at Cray Inc.
- founding member and technical lead of the Chapel project
- affiliate Computer Science & Engineering professor at UW

"Professional Brad"



"Typical Brad"





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Who Are You?



- Place of Employment / Position?
- Types of Computations?

• Favorite Programming Languages / Models?

- For work? For fun?
- C? C++? Python? Java? Fortran? Matlab? R? ...?
- MPI? SHMEM? UPC? CAF? OpenMP? CUDA? Spark? ...?



My goals today



• To teach you as much about Chapel as I'm able:

- What it is and how to use it
- Chapel resources
- Hands-on experience: on laptops / on a Cray
- Current status / Future plans

• To get your feedback on Chapel

- What aspects of it do you find attractive? Think need improvement?
- What would make Chapel more useful / usable for you?

Ground rules:

- Please don't hesitate to interrupt me with questions
- Give me feedback on the pace so I don't go too fast or slow



Today's Schedule

- 9:30: Arrival Tea and Coffee
- 10:00: Welcome and Introductions
- **10:10: Chapel Background & Overview**
- 11:00: Resources for Hands-on
 - (online at: http://chapel.cray.com/tmp/ACCU2017)
- 11:15: Hands-on I: Hello worlds
- 11:30: Break
- 11:45: Base Language
- 12:15: Data Parallelism
- 12:45: Hands-on II: Ray Tracing
- 13:00: Lunch
- 13:45: Hands-on II (continued)
- 14:00: Task Parallelism
- 14:30: Locality / Affinity Features
- 15:00: Hands-on III: Multi-Producer / Consumer Bounded Buffer
- 15:30: Break
- **16:00:** Data Parallelism with Locality: Domain Maps / Distributions
- 16:30: Q & A, Project Status, and Wrap-up



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Questions at this (high) level?



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