

Parallel Programming in Chapel: The Cascade High-Productivity Language

Chapel Team, Cray Inc.

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What is Chapel?

- A new parallel programming language
 - Design and development led by Cray Inc.
 - Initiated under the DARPA HPCS program
- **Overall goal:** Improve programmer productivity
 - Improve the **programmability** of parallel computers
 - Match or beat the **performance** of current programming models
 - Support better **portability** than current programming models
 - Improve the **robustness** of parallel codes
- A work-in-progress

Chapel's Implementation

- Being developed as open-source at SourceForge
- Licensed as BSD software
- **Target Architectures:**
 - multicore desktops and laptops
 - clusters of commodity processors
 - Cray architectures
 - systems from other vendors
 - (more recently: CPU+GPU hybrids)



Today's Goals

- Introduce you to the Chapel language in-depth
- Give you experience...
 - ...using the Chapel compiler
 - ...writing Chapel code
- Get your feedback on Chapel
- Point you toward resources for future reference



Who Are You?

- Name
- Institution
- Role (student, postdoc, professor, researcher, ...)
- Favorite Programming Languages
- Parallel Programming Models (MPI, OpenMP, ...)

Rough Schedule

- 11:00 – Welcome
- 11:05 – [Background](#)
- 11:30 – [Language Basics](#)
- 12:00 – [Data Parallelism](#)
- 12:30 – Hands-On I
- 13:00 – Lunch
- 14:30 – [Task Parallelism](#)
- 15:00 – [Locales](#) and [Domain Maps](#)
- 15:30 – [Summary](#) and [Sample Codes](#)
- 16:00 – Hands-On II

