

Introduction to Chapel

A Next-Generation HPC Language

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Cray Inc.

What is Chapel?

- A new parallel language
 - Under development at Cray Inc.
 - Supported through the DARPA HPCS program
- Goals
 - Improve the programmability of parallel computers
 - Match or improve performance of MPI/UPC/CAF
 - Provide better portability than MPI/UPC/CAF
 - Improve robustness of parallel codes
 - Support multi-core and multi-node systems

The Chapel Team

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- Steve Deitz



- David Iten



- Lee Prokowich



- Greg Titus



- Former Team Members

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- Interns

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Andy Stone ('08 – Colorado St.)
Jacob Nelson ('09 – U. Wash.)
Albert Sidelnik ('09 – UIUC)
Jonathan Turner ('10 – U. Colorado)

Goals For Today

- Introduce you to Chapel with a focus on
 - Task parallelism
 - Data parallelism
 - Multi-locale parallelism
- Provide hands-on experience with Chapel Version 1.1
- Get your feedback on Chapel
- Look for collaboration opportunities
- Point you towards resources to use after today

Rough Outline

- 8:00 – Productivity Overview
- 9:00 – [Chapel Background](#)
- 9:30 – [Language Basics](#)
- 10:00 – [Break](#)
- 10:15 – [Task Parallelism](#)
- 10:45 – [Hands-On Time](#)
- 11:45 – [Locality and Affinity](#)
- 12:15 – Lunch
- 1:00 – [Data Parallelism](#)
- 1:45 – [Distributions and Layouts](#)
- 2:30 – [Break](#)
- 2:45 – [Status, HPCC, and SSCA #2](#)
- 3:30 – [More Hands-On Time](#)
- 4:30 – Feedback and Q & A