Introduction to Chapel
A Next-Generation HPC Language

Steve Deitz

Cray Inc.

- 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

- Brad Chamberlain

- Steve Deitz

- Samuel Figueroa

- David Iten

- Lee Prokowich

- Interns
  - Robert Bocchino ('06 – UIUC)
  - James Dinan ('07 – Ohio St.)
  - Mackale Joyner ('05 – Rice)
  - Andy Stone ('08 – Colorado St.)
- Alumni
  - David Callahan
  - Roxana Diaconescu
  - Samuel Figueroa
  - Shannon Hoffswell
  - Mary Beth Hribar
  - Mark James
  - John Plevyak
  - Wayne Wong
  - Hans Zima

- Introduce you to Chapel with a focus on
  - Task parallelism
  - Data parallelism
  - Multi-locale parallelism
- Provide hands-on experience with Chapel Version 0.9
- Get your feedback on Chapel
- Look for collaboration opportunities
- Point you towards resources to use after today

Rough Outline

10:00 – Welcome

10:15 – Chapel Background

10:45 – Language Basics

11:15 – Coffee Break

11:30 – Task Parallelism

12:00 – Data Parallelism

12:30 – Locality and Affinity

13:00 – Lunch

14:00 – HPCC Case Study

14:30 – Compiler Overview

14:45 – Hands-On Session

16:00 – End of Workshop