Iowa High Performance Computing Summer School

Gregory G. Howes
Department of Physics and Astronomy
University of Iowa

2523 UCC Training Room
University of Iowa
25-26 May 2010

Thank you

Jerry Prothero	Information Technology Services
Jeff DeReus	Information Technology Services
Mary Grabe	Information Technology Services
Bill Whitson	Purdue University

and

Rosen Center for Advanced Computing, Purdue University

Great Lakes Consortium for Petascale Computing

Outline

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- Welcome and Introductions
- Aims of this Summer School
- Comments
- Getting Online

Welcome and Introductions

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- Students from a wide range of departments:
  - Biochemistry
  - Biomedical Engineering
  - Chemistry
  - Chemical and Biochemical Engineering
  - Economics
  - Electrical and Computer Engineering
  - Geography
  - Hydroscience and Engineering
  - Industrial Engineering
  - Institute for Clinical and Translational Science
  - Management Sciences
  - Mechanical Engineering
  - Physics and Astronomy
  - Statistics and Actuarial Science
- Please Introduce yourselves:
  - Name
  - Department
  - Academic Status and Year (ex. graduate student, 3rd year)
  - High Performance Computing Experience
  - Research Topic

Aims of this Summer School

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To enable you to apply parallel computing to your own research

General Comments:

- Much of this material may be familiar to you

- I plan to explain things from a very basic level to make sure this group from such diverse backgrounds can follow

Comments

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A few comments before we get started are in order:

1) Terminology: Terminology in this field is *not* standardized.
   - This field is new and evolves rapidly.

2) HPC is valuable to a wide range of fields:
   - Many examples I use will come from the field of physics.
   - I will try to present the specific problems in a relatively abstract way so that you can consider them simply mathematical problems to be solved.

3) Software (programming) vs. Hardware (computers):
   - I am not going to talk a lot about different hardware options, but will focus on the software side, specfically how to design and implement parallel algorithms.

Comments

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4) Common approaches vs. Exhaustive coverage:

-This will not be an exhaustive review of all possible HPC approaches

- I will focus on the most important and widely used approaches

- In particular, we will talk a lot about MPI and some about OpenMP

5) Specificity vs. Generality:

- I will try to strike a balance between specific examples, which are often most illuminating, vs. general considerations which may apply to a more wide variety of HPC applications

Getting Online

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Each participant has accounts set up on several computers:

University of Iowa, Research Services:

- Research Clusters

  `rs-001.its.uiowa.edu` (32 bit, 44 cores)

  `rs-003.its.uiowa.edu` (64 bit, 64 cores)

Rosen Center for Advanced Computing, Purdue University:

- Moffet: SiCortex 5832
  756 compute nodes (4536 cores)

  `moffett.rcac.purdue.edu`

- Detailed information for running on Moffett is available at

`http://www.rcac.purdue.edu/userinfo/resources/moffett/newuser.cfm`

- See handout for information on getting online and submitting both interactive and batch jobs