

High Performance Computing Workshop

Timothy H. Kaiser, Ph.D.
tkaiser@mines.edu

Schedule



Where? When? What?

- Where?
 - Here, this room
 - Slides and Examples at <http://geco.mines.edu/workshop>
- When?
 - 8:30-12:30 with breaks as needed Monday - Friday
 - Some sessions might be short
 - I'll be available in the afternoons for discussions

What?

- Workshop is designed to enable you to use High Performance Computing techniques in your research
- Show you how those techniques can be used on the GECO computing platform Ra and Mio
- At the end of this week you will be able to run parallel HPC applications on Ra and Mio and be able to feel comfortable on other platforms

What?

- Parallel Programming
 - Why?
 - Why not?
- Machine overviews, Ra, Mio, and others
- Styles of Parallel Programming
 - Message Passing MPI
 - Shared memory programming with OpenMP
 - Hybrid

What?

- MPI from the basics to the advanced
- How do you run applications of Ra and Mio
- Debugging
- OpenMP
- Hybrid
- Topics of interest

Credits

- New Ra and Mio specific information
- Taken from various invited talks
- Previous workshops
 - SDSC/NPACI/Teragrid
 - NAVO

Schedule for Monday

Subject	Time
Introductions	0.25
Course Overview	0.5
Introduction to Parallel Computing	1.0
Local Resource	0.5
Quick Start (login, build, run)	0.75
Other Resources, Now and the Future	0.5
Total	3.5

Schedule for Tuesday

Subject	Time
Basic MPI	0.75
Batch Scripts submitting and monitoring	0.5
Running Interactive	0.25
MPI 2a	1.0
MPI 2b	1.0
Assignment 1 discussion	0.25
Total	3.75

Schedule for Wednesday

Subject	Time
Assignment 1 discussion	0.25
Intro to the Stommel Model	0.25
Stommel 1d and 2d	1.0
Tour	0.05
Stommel variations	1.0
Debugging – DDT	1.0
Assignment 2	0.25
Total	4.25

Schedule for Thursday

Subject	Time
MPMD Scripts	0.5
OpenMP	1.0
Scripts for OpenMP	0.25
Hybrid OpenMP / MPI (lab time)	1.0
Stommel in OpenMP (lab time)	0.25
Scripting Tricks	0.75
Total	3.75

Schedule for Friday

Subject	Time
Bag of Tasks	0.25
Libraries	0.75
GPU Programming and Libraries	0.75
Tau and Profiling	0.5
Parallel Genetic Algorithm	0.75
MPI-IO	0.5
Total	3.5