Introductions To OpenMP and MPI

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November 3-4, 2008
University of Ottawa
Desmarais Building, Waller St & Ave Laurier, Room 7170
Ottawa, Ontario

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Queen's University
HPCVL Main Offices, 993 Princess St., Suite 115
Kingston, Ontario

On-Site Registration at 8:30 am, Lectures 9 am – 4 pm

The first part of the workshop introduces the OpenMP compiler directives to scientists who are interested in writing programs for shared-memory parallel computers, or who want to convert existing serial code to parallel. No previous knowledge about parallel programming is required, but we assume some basic background in programming. The use of OpenMP has become the de facto industry standard for parallel programming on shared-memory machines, such as HPCVL's Sun servers. Examples are in Fortran, C, and C++. Here is a short outline of the contents:

- Introduction to parallel programming, especially on SMP machines
- OpenMP compiler directives
- Problems and Pitfalls of shared-memory programming and how to avoid them
- Loop parallelism
- Explicit parallel regions
- Synchronization
- Summary: Introduction to MPI

The second part of the workshop introduces the Message Passage Interface (MPI) and is directed at programmers and scientists, with a basic background in programming, who want to acquire basic skills in "parallelizing" code for multiprocessor clusters such as the HPCVL Victoria Falls and Beowulf clusters. No prior knowledge of MPI or other message-passing systems is required. However, some background in Unix operating systems and programming in Fortran, C, or other languages would be helpful. The following subjects will be addressed:

- MPI Basics (Programming Environments, Data Types, Communication)
- Runtime Environments
- Parallel Principles and Programming Steps
- Combination of MPI with OpenMP
- Parallel Scheduling
- User-Defined Data Types
- All examples are in Fortran, C and C++

For **registration**, agenda, and further details, see http://www.hpcvl.org/training/