[ONLINE] PATC: Parallel Programming Workshop

Objectives

The objectives of this course are to understand the fundamental concepts supporting message-passing and shared memory programming models. The course covers the two widely used programming models: MPI for the distributed-memory environments, and OpenMP for the shared-memory architectures. The course also presents the main tools developed at BSC to get information and analyze the execution of parallel applications, Paraver and Extrae.

It also presents the Parallware Assistant tool, which is able to automatically parallelize a large number of program structures, and provide hints to the programmer with respect to how to change the code to improve parallelization. It deals with debugging alternatives, including the use of GDB and Totalview. The use of OpenMP in conjunction with MPI to better exploit the shared-memory capabilities of current compute nodes in clustered architectures is also considered. Paraver will be used along the course as the tool to understand the behavior and performance of parallelized codes. The course is taught using formal lectures and practical/programming sessions to reinforce the key concepts and set up the compilation/execution environment.

Requirements

Prerequisites: *Fortran, C or C++* programming. All examples in the course will be done in C. Attendants can bring their own applications and work with them during the course for parallelization and analysis.

Please download and carefully read the following **instructions** regarding the logistics participants enrolling online PATC at BSC are expected to follow.

Software requirements: Zoom (recommended), SSH client (to connect HPC systems), X Server (enabling remote visual tools).

Learning Outcomes

The students who finish this course will be able to develop benchmarks and applications with the MPI, OpenMP and mixed MPI/OpenMP programming models, as well as analyze their execution and tune their behaviour in parallel architectures.

Academic Staff

Course Convener: Xavier Martorell, CS/Programming Models

Lecturers:

BSC - Computer Sciences department

Judit Giménez - Performance Tools - Group Manager
German Llort - Performance Tools - Senior Researcher
Marc Jordà - Accelerators and Communications for High Performance Computing - Research Engineer
Antonio Peña - Accelerators and Communications for High Performance Computing - Senior Researcher
Javier Teruel - Best Practices for Performance and Programmability - Group Coordinator
Xavier Martorell - Programming Models - Parallel programming model - Group Manager

Materials

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Further information

All PATC Courses at BSC do not charge fees.
PLEASE BRING YOUR OWN LAPTOP.

CONTACT US for further details about MSc, PhD, Post Doc studies, exchanges and collaboration in education and training with BSC.

For further details about Postgraduate Studies in UPC - Barcelona School of Informatics (FiB), visit the website.

Sponsors:BSC and PRACE 5IP project are funding the PATC @ BSC training events.
If you want to learn more about PRACE Project, visit the website.

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