Advanced School In High Performance Computing Tools for e-Science

5 - 16 March 2007
Miramare, Trieste, Italy

PURPOSE AND NATURE

Although many leading applications of high performance computing (HPC) are in the area of computational science, few scientists and engineers receive formal training in computational science. This is especially true for students and researches coming from the developing world, where access to HPC resources may be limited and experience in using computational physics tools not yet as widespread.

The ICTP workshop in HPC tools for e-science is designed to teach students and researchers basic and advanced computer science skills with emphasis on using and building HPC resources for scientific applications.

We will provide an introduction to computer software and hardware, with the goal of teaching participants how to effectively set up, use and program computers for their research. Special focus will be put on freely available open source software and how to design and construct their own computational facilities to be robust, failure tolerant and cost efficient.

TOPICS

The following topics will be discussed:

Linux OS: overview and installation procedure – configuring a linux workstation for scientific computing - running scientific application on linux

Tools for scientific computing on Linux: Makefile - compilers - mathematical and high performance libraries - debuggers etc..

Profiling and optimization techniques for Linux platforms

Parallel approach to scientific computations: openMP and MPI tutorials

Configuring and benchmarking machines with various types of high speed network technology and hardware for parallel application.

Hardware and software for managing large quantites of data.

Using HPC resources: batch systems for cluster and grid computing

PROGRAM

The School will consist of theoretical lectures given in the morning, and laboratory sessions in the afternoon. First week of the school will focus on the needs of beginner and intermediate level participants whereas the second will be dedicated to more advanced topics and giving researchers the opportunity to apply the techniques learned in the first week to their own projects.. Applicants should specify if they are interested in first, second or both weeks upon registering. Previous background using the Linux Operating System is not required for the first week. Participants should be prepared to work with software applications related to their own scietiffic interests. during lab hours in the second week. Participants will be required to present their results on specific tasks assigned during the course. Applicants from the 2005 workshop "Tools for Computational Physics" (smr1743) who were not accepted are encourgaed to re-apply whereas those that were accepted may consider the second week activities.

PARTICIPATION

Scientists and students from all countries which are members of the United Nations, UNESCO or IAEA may attend the Workshop. As it will be conducted in English, participants should have an adequate working knowledge of this language. Although the main purpose of the Centre is to help research workers from developing countries, through a program of training activities within a framework of international cooperation, a limited number of students and post-doctoral scientists from developed countries are also welcome to attend.

As a rule, travel and subsistence expenses of the participants should be borne by the home institution. Every effort should be made by candidates to secure support for their fare (or at least half-fare). However, limited funds are available for some participants, who are nationals of, and working in, a developing country and who are not more than 45 years of age. Such support is available only for those who attend the entire activity. There is no registration fee.

The **Application Form** is obtainable from the ICTP WWW server: http://cdsagenda5.ictp.trieste.it/full_display.php?smr=0&ida=a06192 (which will be constantly up-dated) or from the activity Secretariat. It should be completed and returned before **20 November 2006** to:

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for e-Science (SMR 1830)
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or
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DEADLINE
for requesting participation

20 November 2006

August 2006