



The Abdus Salam International Centre for Theoretical Physics


United Nations
Educational, Scientific
and Cultural Organization


International Atomic
Energy Agency

ICTP-ELETTRA-INAF/OATs Advanced Training Workshop on Instruments and Sensors on the Grid 23 – 28 April 2007

ICTP - Trieste, Italy

The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy in collaboration with ELETTRA and INAF/OATs, Trieste, Italy are jointly organizing the above mentioned Workshop, to be held at ICTP, Trieste, Italy, from 23 to 28 April 2007.

PURPOSE AND NATURE

Grid research has focused on the marshaling of computation and data, and their interactions at hubs of analysis and synthesis. This focus has spawned the notion of computational and data Grids, respectively. As the technology for these has matured, however, increasing attention is being directed towards the actual sources of data: the instruments and sensors. Scientific instruments and sensors provide the raw observations used to develop, falsify, and verify scientific theories; and thus drive scientific progress. The scientific process begins not with the data, however, but rather with the preceding data collection. This collection is not a rote procedure, and often interacts profoundly with interpretation and analysis, whether by human or machine. Ignoring this interaction can lead to inefficient use of computational and human resources.

Another important trend is the increasing use of in silico experiments, and the integration of model-based simulation with physical sensors. These projects further couple the collection of data with analysis and simulation. In these scenarios, a unified paradigm for Grid-enabling both physical instruments and virtual instruments will result in flexible, extensible systems for exploiting the tremendous potential of information technology.

The above considerations suggest that we seek to push the Grid to the edges of the practice of science: to the point where data is collected, and to the point where the scientist uses the data; and thus creates an end-to-end Grid environment for scientific activity. Many instruments and sensors are already digitally-accessible, but they are poorly integrated into the Grid.

Instruments and sensors are qualitatively distinct from computation and data, however, and thus impose some unique challenges and issues to current Grid technologies. For example, operational models may range from remotely-accessing a one-stop, full-service instrument site to dynamically composing distributed instrument, data, and analysis services into a virtual instrument organization.

MAIN OBJECTIVES

The Workshop aims at offering an opportunity to learn how to address these issues and challenges, as they encompass both real and virtual instruments and sensors.

The topics covered will include the following:

- Integration of instruments and sensors into the Grid
- Interoperability and compatibility of Grid-enabled instrumentation and applications
- Representation and/or control of instruments and sensors using Grid and Web services
- Remote access to instrumentation and sensors using Grid or alternative approaches
- Virtual organization and security issues of instruments and sensors on the Grid
- Data transport, management, provenance, and handling of Grid-enabled instruments and sensors
- Real-time instrument and sensor systems
- Control and safety issues of instruments and sensors

PARTICIPATION

Participants will be selected on the basis of their own scientific applications and computational requirements. We are aiming at quite motivated participants and for immediate results at the end of the Workshop. 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 programme 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 old. Such support is available only for those who attend the entire activity.

There is no registration fee.

The **Application Form** obtainable from the ICTP WWW server:
<http://agenda.ictp.it/smr.php?1869> (**under: application_form**)
should be completed and returned before 10 January 2007:

either by post to:

2007 Training Workshop on Instruments and sensors on the Grid (smr1869)
(c/o Ms. Federica Delconte)
the Abdus Salam International Centre for Theoretical Physics
Strada Costiera 11, 34014 Trieste, Italy.

or by email to:

smr1869@ictp.it
(please send file attachments as: either pdf -preferably- or RTF zipped or .doc)
(recent photograph & signature of the candidate are compulsory)

Course Secretariat: tel. +39 040 22409932 (afternoons only); fax +39 040 224600; e-mail smr1869@ictp.it
ICTP Home Page: <http://www.ictp.it/>

Trieste, October 2006



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PROGRAMME

The Workshop will comprise
two different actions:

• the first 2 days will be spent in discovering the available approaches to instrumenting the Grid by listening to talks by leading international scientist in the field;

• the rest of the Workshop will then be devoted to an hands-on session consisting in real exercises based on use cases some of them prepared by the teachers and others suggested by participants on real instruments or simulators of real instruments.

**Deadline for Requesting
Participation**

10 January 2007