Computing School 2009 CEA-EDF-INRIA

lundi 8 juin 2009 - vendredi 19 juin 2009

Programme Scientifique

Emerging grid middleware standards:

High Performance computing, High Throughput computing and large scale data analysis using grids.

Introduction

Grid computing is a concept for high throughput computing and data management which was born a few years ago. This still active field of development aims at associating and leveraging distributed computing facilities ranging from "low level" capacity (local facilities, regional facilities) to "high level" capacity (HPC national or international centres). To achieve this goal different middleware layers have been developed to allow transparent access to the computing and data management capacities, and today different kinds of applications have been enabled in such a context.
This Summer School is an opportunity to highlight the state of the art and achievements in this area, and to envision current issues and forthcoming challenges.

Objectives

Through lectures from different stakeholders, hands-on sessions on the Grid5000, EGEE and DEISA infrastructures using various middleware, and a selection of focused conferences, this school will give attendees the opportunity to:

• understand the basics of grid computing,

• get acquainted with the different mechanisms of grids,

• be aware of challenges and scientific perspectives of grid usage

• be able to use grid environments and/or to port their own application on a grid infrastructure

Target audiences

This school is designed for computational scientists and end users from any application discipline as well as for computer scientists in the field of distributed systems and will be built on this diversity. Some background in programming and computer science is the only prerequisite.
Grid newcomers and beginners are welcome, but people already involved in grid projects should also benefit from this school.

Lecture 1: Introduction to grid computing: softwares, issues, challenges and perspectives (6 hours, Frédéric Desprez, INRIA)

Nowadays grids are widely used but beside the name « grid », there are plenty of different use cases, tools, and services. Lecture 1 should give an overview of existing grids and perspectives.

Lecture 2: Data Management (9 hours, Gabriel Antoniu, INRIA)

Data management is one of the main challenges in grids: in many disciplines the amount of data is increasing (more precision in the data itself, more redundancy). This data can be spread over laboratories or centralised in data centre; storing and accessing this data will be discussed during this lecture.

Lecture 3: Basic Grid Services (7h30, Hamza Mehammed, National e-Science Centre)

Services that are needed to link together computing resources, storage elements, and provide the mechanism needed to access them will be explored during this lecture. The current situation with different existing middleware, will lead the discussion to standards and interoperability.

Lecture 4: Grid Scheduling (7h30, Wolfgang Ziegler, SCAI fraunhofer)

In order to make coherent and coordinated use of heterogeneous computing resources, grid scheduling is essential. Grid scheduling will be explored through existing grid schedulers and their integration with grid middleware. The discussion will be focused on standards and interoperability.