Introduction to the PRACE Project 2016143321: "SREDIT - Simulations of Radiated Emissions in Densely Integrated Technologies"

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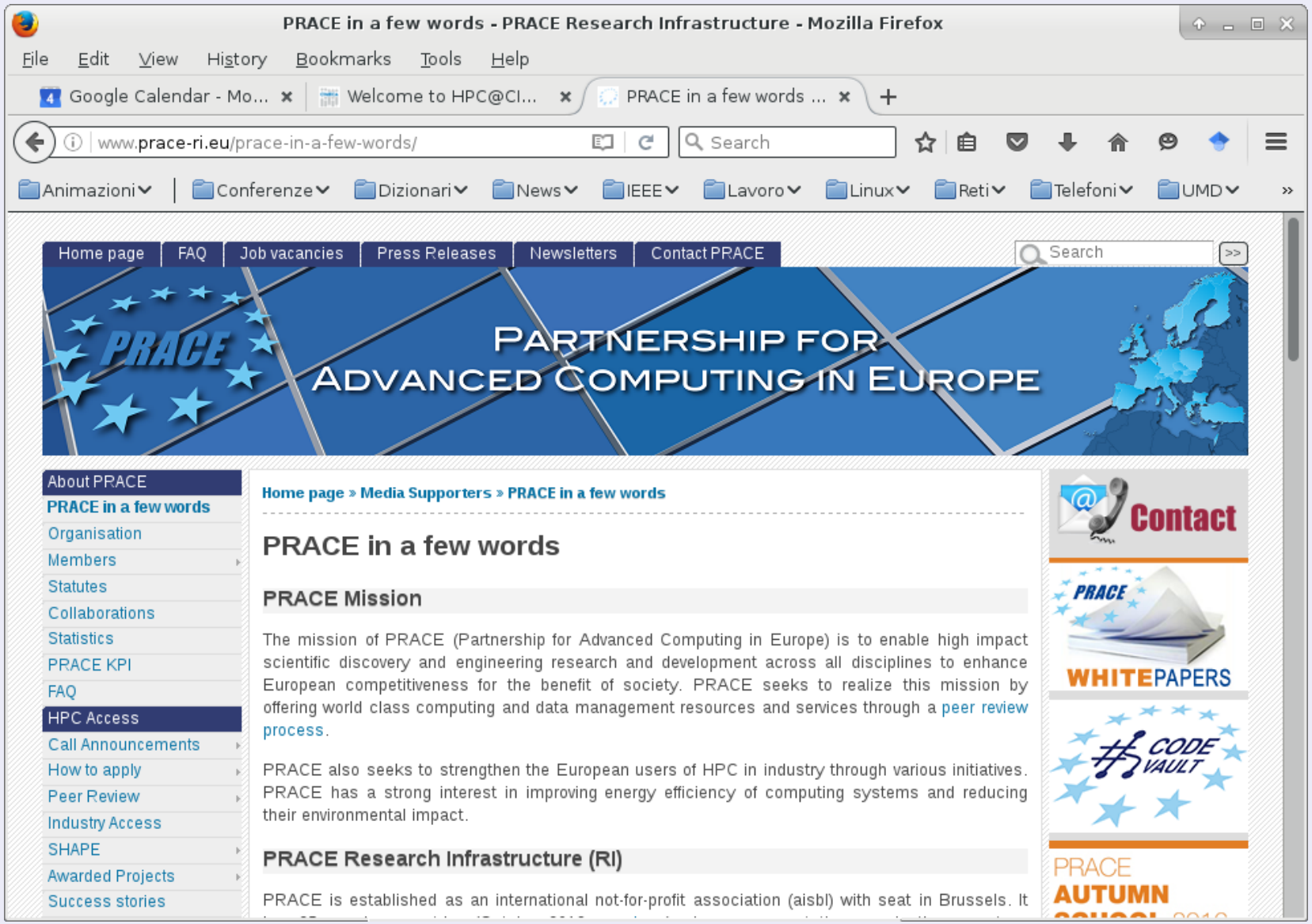
Introduction

What is PRACE? http://www.prace-ri.eu/prace-in-a-few-words/



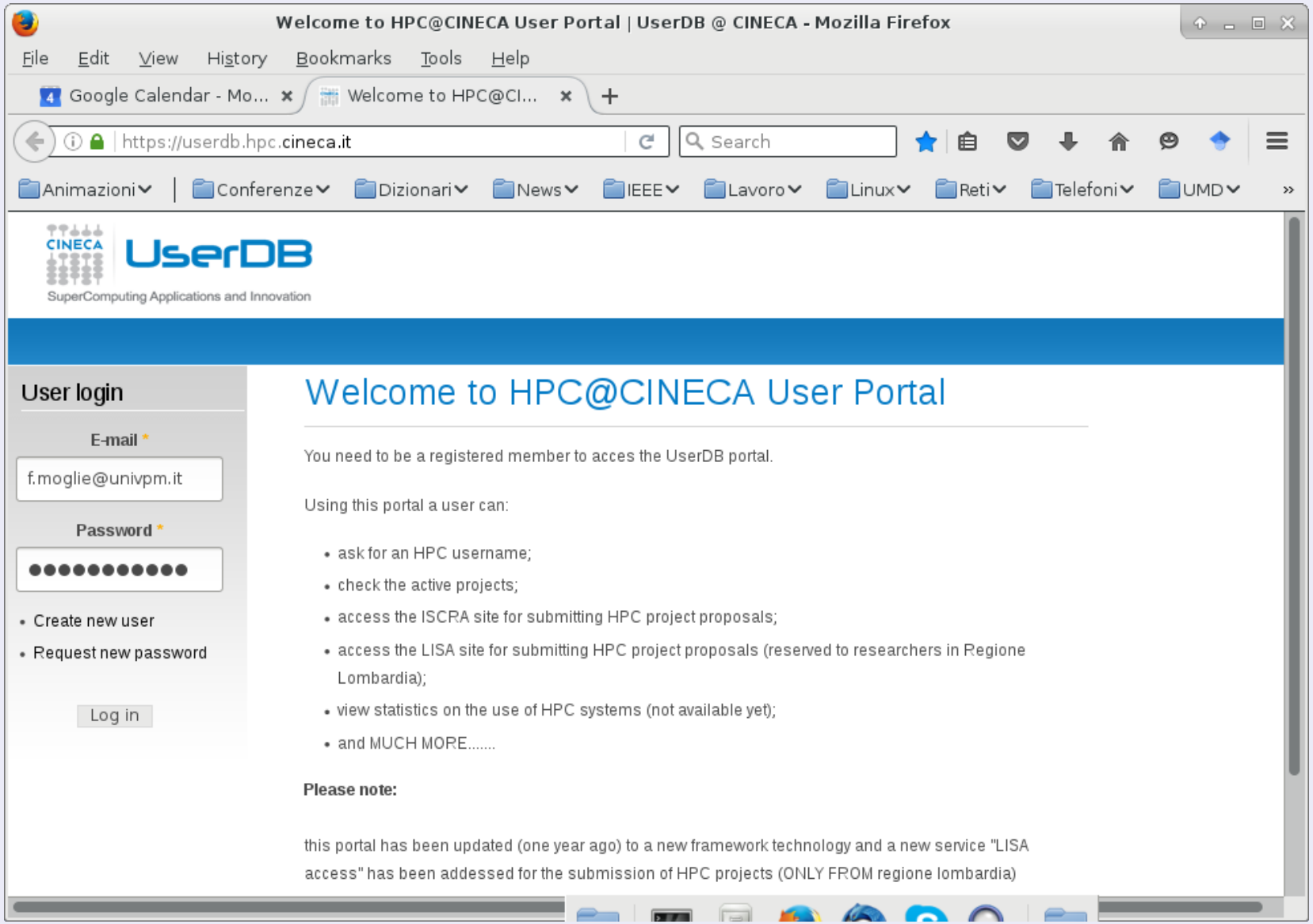
Introduction

This project

- Four groups: Ancona, Granada, Nottingham, York.
- Three year long. From September 1 2016 to August 31 2019.
- Granted CPU time: 12,353,536 core hours for the first year.
- Value: about 77,000 Euro (to be better defined).
- Machine: Marconi KNL (CINECA, Italy)
- Cluster characteristics:
  - Based on the LENOVO NeXtScale platform and the next generation of the Intel Xeon Phi product family.
  - Partition A2, KNL 68 Cores, 1.4 GHz, 3600 nodes, 11 PFs.
  - Operating system: GNU/Linux.
  - Distribution: CentOS Linux 7 (Core).

Access to the resources

First step: registration in https://userdb.hpc.cineca.it/



Our Code

Simulations

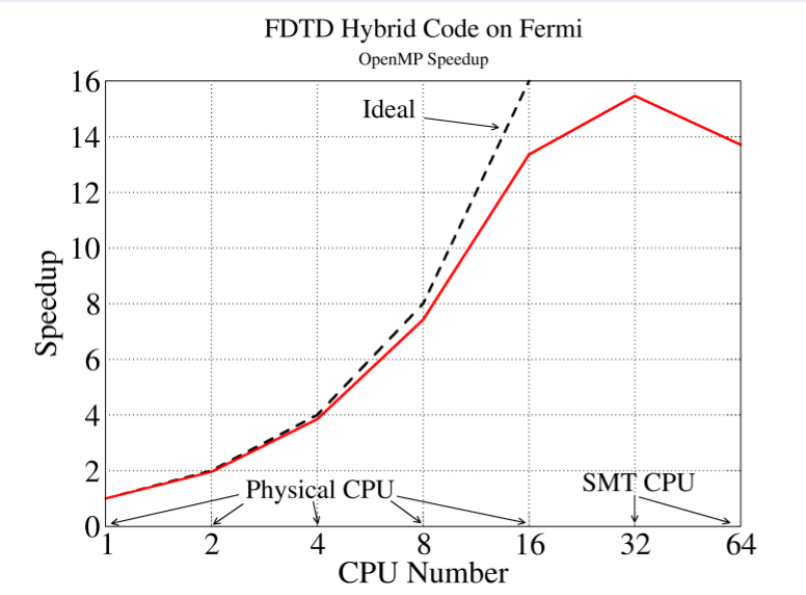
- The whole reverberation chambers, including stirrers, antennas, and devices.
- A device in an ideal reverberation chamber, by applying the plane wave superposition.

Modules

- The numerical simulation is divided into three modules that are managed by a unique, single-step job.
- An electromagnetic solver based on the finite difference time domain (FDTD) method.
- A fast Fourier transform (FFT) module to obtain the frequency domain behavior.
- A statistical module to obtain the reverberation chamber properties.

Code Performance

OpenMP speedup on FERMI



MPI speedup on MARCONI A1