PRACE’s vision on Centres of Excellence

Catherine Rivière, Chair of the Council of PRACE

Workshop on HPC Centres of Excellence, 18th October 2012, European Commission, DG CONNECT, Brussels
Workshop objectives

• Position the European HPC e-infrastructure as an enabler of high quality and scalable HPC software development

“This e-infrastructure should further consolidate the EU’s strong position in HPC applications by coordinating and stimulating parallel software code development and scaling, and by ensuring the availability of quality HPC software to users”

• Establish Centres of Excellence for the applications of HPC in scientific or industrial domains that are most important for Europe
PRACE’s view on CoEs for HPC

- **Centres of Excellence for applications** in science and industrial applications are essential:
  - PRACE proposes to build up partnerships with existing CoEs
    - Ex: HWW (High Performance Computing Centre Stuttgart); the European Centre for Medium-Range Weather Forecasts (ECMWF); European Network for Earth Systems Modelling (ENES); European Centre for Research and Advanced Training in Scientific Computation (CERFACS); EFDA (fusion), EBI (biology), CECAM (molecular chemistry) …

- **Centres of Excellence for HPC** and related computational sciences need strong communities, supported by CoEs:
  - PRACE will work towards the recognition of the CoEs of its own members
    - Ex: the Exascale software center; the Italian Research Laboratory on Exascale Computing (CINECA, INFN, OGS, ISAS-SISSA, FBK); Maison de la Simulation; the Forschungsszentrum Jülich (simulation laboratories)
What CoEs for application brings to EU?

- **Community codes:**
  - European leadership and independence in leading HPC application
  - Embody large volume of knowledge in a relevant form to further scientific discovery and industrial products and services

  "HPC is indispensable for science and technology advances in a wide range of areas (biosciences, climate, health..) and when addressing great scientific and societal challenges (management of resources such as water, energy fuels, materials), weather prediction, earth sciences, life sciences, energy, …)."

- **Skills and training to industry**
  - PRACE provides access to leading edge systems to Open R&D projects, and through training and informative fora.
  - PRACE is setting up an Industrial Advisory Committee where industries will give inputs and feedbacks on the initiatives and services PRACE would have to implement towards industries. PRACE will give access to its resources and competencies, enabling EU industries to gain competitiveness through HPC.

- **Express users’ needs to the ETP**
What CoEs for HPC brings to Europe?

- Co-design
  - At the leading edge, co-design of architectures, hardware, software and applications is necessary for producing highly effective and usable HPC products, notably on the Exaflop Roadmap.

- Resources for community codes:
  - Skills
  - Knowledge (computational science, algorithms, simulation methods)
  - Software tools (parallel languages and libraries,..)

- New applications development methods and tools: the exa-scale challenge (software, development methods, architectures)
Conclusion: PRACE relations with CoEs are key to support the EC initiative in HPC

- PRACE’s assets to address EU 2020 challenges
  - Worldwide visibility and credibility in HPC enabled science and technology
  - Unique capabilities of its member states and their CoEs
  - Well trained HPC expertise and well developed technology…

- PRACE wishes to extend its relations with CoEs using HPC

- PRACE and its members are keen to contribute through their own CoEs and by cooperating with CoE in HPC