Towards a European Training Network in Computational Science

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Training in HPC

• Training: Just as important as the hardware and the software for an HPC ecosystem
  – The users of HPC systems are experts in their scientific disciplines; not HPC
  – Utilizing the full potential of petaflop/s regime systems very non-trivial
Outline

• PRACE project in brief
• Training activities in the PRACE preparatory phase
• Building the training network: PRACE implementation phase
The European HPC service

- Tier-0: 3-5 European Centres
- Tier-1: National Centres
- Tier-2: Regional/University Centres
The European HPC service

- Creation of a European HPC ecosystem
  - HPC service providers on all tiers
  - Grid Infrastructures
  - Scientific and industrial user communities
  - The European HPC industry
PRACE objectives in a nutshell

• Provide world-class systems for world-class science
• Create a single European legal entity
• Deploy 3-5 systems of the highest performance level (tier-0)
  – With ensuring diversity of architectures
• Provide support and training
PRACE partners

**Principal partners**
- BSC  
  Spain
- CGS  
  Germany
- CINECA  
  Italy
- EPSRC  
  UK
- GENCI  
  France
- NCF  
  Netherlands

**General partners**
- CSC  
  Finland
- ETH Zürich  
  Switzerland
- GRNET  
  Greece
- GUP  
  Austria
- PSNC  
  Poland
- SNIC  
  Sweden
- UC-LCA  
  Portugal
- UNINETT Sigma  
  Norway

**Additional partners**
- BGSC  
  Bulgaria
- CSTRC  
  Cyprus
- ICHEC  
  Ireland
- IP  
  Serbia
- UYBHM  
  Turkey
- VSB  
  Czech Republic
Competence ~ competitiveness

• Important to compete also on delivering excellence in HPC training and education

• Potential of the PRACE ecosystem fully harnessed only with adequate user training and support

• The PRACE infrastructure will be complemented with a premier HPC training network
Review of activities in the Preparatory Phase

• Training survey
  – Among top-tier HPC users, 119 respondents
• Summer and Winter schools
• Porting workshops
  – Six workshops across Europe
  – 50 hours of video material available on the PRACE web site
HPC Training Survey

• Large demand for training in rudimentary HPC skills

• Users felt that they are not up-to-date with the development HPC techniques and hardware

• Need for coordinated HPC training programmes and supporting e-infrastructure
Towards a HPC training infrastructure

• In the 1st Implementation Phase of PRACE, the training activities are coordinated by Task 3.2

“This task will develop and maintain a European fully functioning training network in the field of computational science. Its key ingredients are solid contacts between the partner organisations and European research centres, as well as establishing new links to universities.”

• Continuing and consolidating the work begun in the PP
Face-to-face training

• Eight “seasonal schools” on contemporary HPC methodology across Europe
• Annual symposia targeted on specific user and developer communities
Not just workshops

• For a pan-European network, complementary activities to face-to-face workshops must be provided

• The PRACE Training Portal
  – Training materials, online seminars, news&events, discussion forums, articles&publications,…
  – www.prace-project.eu

• Remote learning

• Virtual learning environments
PRACE Centers for Advanced Training

• During the first IP, the concept for PRACE Advanced Training Centers will be outlined

• Aiming at 2-3 training hubs serving the whole European researcher community

• Coordinated, joint curricula
  – HPC methodology
  – Also application and discipline focused training
Concluding remarks

• PRACE is building a permanent, pan-European infrastructure for high-end scientific computing
  – A premier training ecosystem is paramount for the success of the infrastructure
• Training activities on the 1st Implementation Phase of PRACE
  – Workshops and schools
  – Education outreach programme
  – Training portal
  – PRACE Advanced Training Centers
CSC at a glance

• CSC - IT Center for Science Ltd.
  – Founded 1970, reorganized 1993 as a company, Center for Scientific Computing Ltd.
  – All shares owned by the Ministry of Education
  – Operates on a non-profit principle
• Provides national level, centralized IT services for science
• 5 service areas
  – 200 employees
  – Turnover ca. 25 M€
Miscellaneous facts

• Has hosted dozens of supercomputers
  – Highest rank in Top500 list 27 (1997)
  – Current main system a 100 TFlop/s Cray XT4/XT5

• Brought Internet to Finland 25 years ago
  – First www-pages in Finland

• Linux operating system found its way to world from the CSC server nic.funet.fi

• Some widely-used scientific software originated from CSC