Partnership for Advanced Computing in Europe

International HPC Summer School 2019

Kobe, 08.07.2019

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PRACE Board of Directors
Hiroshima

- What would you do first in order to reach peace in the world?
PRACE - OVERVIEW
PRACE | what we do

- Open access to world-class HPC systems to EU scientists and researchers
- Variety of architectures to support the different scientific communities
- High standards in computational science and engineering
- Peer Review at European level to foster scientific excellence
- Robust and persistent funding scheme for HPC supported by national governments and European Commission (EC)
- Support the development of intellectual property rights (IPR) in Europe by working with industry and public services
- Collaborate with European HPC industrial users and suppliers
PRACE | achievements

- 688 scientific projects enabled
- >21 000 000 000 (thousand million) core hours awarded since 2010
- Of which 63% led by another PI nationality than the HM
- R&D access to industrial users with >50 companies supported
- >12 000 people trained through PRACE Training
- ~110 Petaflops of peak performance on 7 world-class systems
- 26 PRACE members, including 5 Hosting Members (France, Germany, Italy, Spain and Switzerland)
- PRACE is the only e-infrastructure Landmark on the ESFRI Roadmap 2016
PRACE | Tier-0 Systems in 2019

MareNostrum: IBM BSC, Barcelona, Spain #25 Top 500

Piz Daint: Cray XC50 CSCS, Lugano, Switzerland #5 Top 500

NEW ENTRY 2018
JOLIOT CURIE: Bull Sequana GENCI/CEA, Bruyères-le-Châtel, France #40 Top 500

NEW ENTRY 2018
JUWELS (Module 1): Bull Sequana GAUSS @ FZJ, Jülich, Germany #26 Top 500

NEW ENTRY 2018/2019
SuperMUC NG: Lenovo cluster GAUSS @ LRZ, Garching, Germany #8 Top 500

Hazel Hen: Cray GAUSS/HLRS, Stuttgart, Germany #30 Top 500

MARCONI: Lenovo CINECA, Bologna, Italy #19 Top 500

Close to 110 Petaflops cumulated peak performance
The European HPC Systems Map (t.b.p.)

Belgium
Bulgaria
Cyprus
Czech Republic
Denmark
Finland
Greece
Hungary
Ireland
Israel
Luxembourg
Netherlands
Norway
Poland
Portugal
Slovakia
Slovenia
Sweden
Turkey
United Kingdom
France
Germany
Italy
Spain
Switzerland
PRACE’s support to science

Data up to and including Call 16, % of total projects awarded (Project Access)

- Chemical Sciences & Materials: 27%
- Universe Sciences: 16%
- Earth System Sciences: 7%
- Mathematical & Computer Sciences: 3%
- Engineering: 17%
- Biochemistry, Bioinformatics & Life Sciences: 14%
- Fundamental Constituents of Matter: 15%
PRACE – Scientific Case

- Scientific applications
  - urgent need for more compute cycles, AND
  - huge demands memory bandwidth & I/O

- Need new approaches
  - scaling via ensembles, deep learning, and statistical models
  - systems able to handle tens of thousands of active jobs and large I/O requests

- Software & algorithms take longer to change than hardware
  - PRACE & Europe need a much more ambitious strategy to develop the SW part of next-generation computing

“Future Infrastructures and operations will need to be much more diverse to support HPC, Data Science and different types of accelerators - but we also need to avoid fragmentation.” - PRACE Scientific CASE
Access through PRACE Peer Review

Free-of-charge BUT required to publish results at the end of the award period

Preparatory Access (2 or 6 months)

SHAPE Programme (2 or 6 months)

Project Access (12, 24 or 36 months)
PRACE TRAINING
PRACE Training Offerings

Seasonal Schools

CodeVault

PRACE Training Centres

IHPCSS

MOOCs

Training Portal

On-demand Events

PRACE Training Material Copyright

Training events are advertised on the following pages:

- PRACE Training Events
- PRACE Partners' Training Events
- PATC 2016-2017 Training Programme

Access the PRACE Best Practise Guides

Visit the HPCSS Summer School

Visit the CodeVault Portal

Visit the Compute Canada Portal

Visit the XSEDE Training Portal
Seasonal Schools

- Have been running since 2008
- Offering top-quality face-to-face training events
- Organised around / all over Europe
- Topics range from generic intermediate to advanced
- From programming techniques to more specialised topical schools

Last Seasonal Schools

- 10 Jun - 13 Jun 2019
  - PRACE/BioExcel Seasonal School 2019, KTH, Stockholm, Sweden - HPC for Life Sciences
PTC Programme

- 90 – 100 courses in each term
- PRACE Training Centres
  - PRACE Advanced Training Centres renamed
  - Common annual planning
- Go on: [http://www.prace-ri.eu/patcs-courses-calendar?start=20190701](http://www.prace-ri.eu/patcs-courses-calendar?start=20190701) to see the current PATs courses events calendar
Training and Events Portal

- www.training.prace-ri.eu
- Single hub for the PRACE training events, training material and tutorials
- Will change soon: www.hpc-in-europe.eu
CodeVault and More

- Repository of Open Source code samples
  - Examples and model solutions of common HPC programming tasks
    - Possible to utilise in training and as building blocks of real-world applications
  - Anonymous read access
- Best Practice Guides
- White Papers
  - [http://www.prace-ri.eu/white-papers/](http://www.prace-ri.eu/white-papers/)
Future Training Activities

▶ On-demand events addressing the needs of the CoEs
  - Needs for basic, intermediate, and advanced training

▶ Massive Open Online Courses (MOOCs)
  - Supercomputing, coordinated by EPCC
  - Managing Big Data with R and Hadoop, coordinated by Univ. Ljubljana

In preparation:
  - High-performance computing with Python, coordinated by CSC
  - Defensive programming and debugging, coordinated by KU Leuven
  - MPI-3 Shared Memory Programming, coordinated by HLRS

▶ PRACE Training Centres (PTCs)
  - Cover basic and advanced needs across Europe
Goal: To inspire the next generation of software engineering, system administrators, and general users of HPC
PRACE – JOB OPPORTUNITIES
Job Opportunities

- PRACE is an association of 26 members with over 50 HPC centres involved
- Job offers are announced on the HiPEAC jobs portal:
  - https://www.hipeac.net/jobs/
- Approximately one job announcements every week by PRACE
Who brought running shoes to IHPCSS?
THANK YOU!

QUESTIONS?