



# PARTNERSHIP FOR ADVANCED COMPUTING IN EUROPE

## PRACE – An overview

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4<sup>th</sup> Workshop on HPC Best Practices, San Francisco, 28-29 September



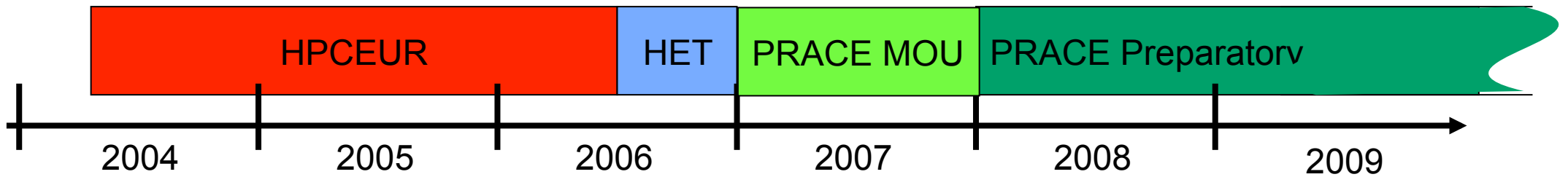
## Outline

- Overview of PRACE
- Infrastructure projects of some PRACE partners
- European workshop on HPC Infrastructure

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# History and First Steps



April 23<sup>rd</sup> 2010 foundation of the PRACE Int. non-profit Association under Belgian law (AISBL)



# The PRACE members

2007: 15 states sign MOU

2008: 16 partners from 14 countries in project

2010: 20 partners from 20 countries in project



The image displays a collage of logos and flags for PRACE members. The logos include: Johannes Kepler Universität Linz (JKU), BGSC (Bulgarian Supercomputing Centre), The Cyprus Institute, CSC, GENCi (Grand Équipement National de Calcul Intensif), GCS (Gauss Centre for Supercomputing), grnet (Networking Research and Education), ICHEC (Irish Centre for High-End Computing), CINECA, NWO, POZNAŃ SUPERCOMPUTING NETWORKING, UCL, BSC (Barcelona Supercomputing Center / Centro Nacional de Supercomputación), SNIC, CSCS (Swiss National Supercomputing Centre), UYBHM, EPSRC (Pioneering research and skills), and UNINETT. The flags shown are those of Austria, Hungary, Bulgaria, Cyprus, Czech Republic, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Poland, Romania, Spain, Sweden, Switzerland, Turkey, United Kingdom, and Norway. At the bottom, the logos for the European Union, CAPACITIES, and e-infrastructure are also visible.



## Hosting members\*

- France
- Germany
- Italy
- Spain
  
- Netherlands (pending decision)

## Non-hosting members

- Austria
- Bulgaria
- Cyprus
- Czech Republic
- Finland
- Greece
- Ireland
- Poland
  
- Portugal
- Serbia
- Sweden
- Switzerland
- Turkey
- United Kingdom
- Norway (pending)

\* Hosting members: partners that will host the Tier-0 systems

## PRACE – a partnership with a vision

- Provide world-class HPC systems for world-class science
- Support Europe in attaining global leadership in public and private R&D

### ... and a mission

- Create a world-leading persistent high-end HPC infrastructure managed as a single entity
  - Deploy systems of highest performance level (Tier-0)
  - Ensure diversity of architectures to meet needs of European user communities
  - Collaborate with ISVs and vendors on strategic HPC technologies
  - Provide support and training

## STRATOS - PRACE advisory group for **Strategic Technologies**

- permanent HPC research and technology platform
- foster collaboration between PRACE partners and industry
- foster the development of HPC (High Performance Computing) technologies in Europe



## Where we stand

- First Implementation project is underway
- Search for PRACE director – currently interviewing
- First PRACE allocation round on JSC Tier-0 system – 320 million cpu hours awarded to 10 projects



## Infrastructures in PRACE

- 14 sites reviewed in PRACE-Project during 2008
- Start of infrastructure exchange in Europe
- Creation of annual workshop on HPC Infrastructure



## Key indicators from infrastructure review

Number of sites planning extension or new buildings	7 with completion planned between 2009 and 2012
Range of machine room size	250sqm – 2000sqm
Range of electrical capacity	< 1MW - ~12MW
Air cooling	All sites
Liquid cooling	All but 2 sites
Range of PUE values	1.2 -1.8
Connectivity	2/3 have 10GBit, rest smaller
Options for expansion	2/3 of sites can expand

## Main infrastructure projects of hosting members and Switzerland

Country	Project
France	CEA new facility – completion 2010
Germany	JSC – water-cooling completed 2008  Extension at LRZ in Garching Completion planned mid 2011
Spain	BSC new facility – completion planned 2012
Switzerland	CSCS new facility – completion 12/2011

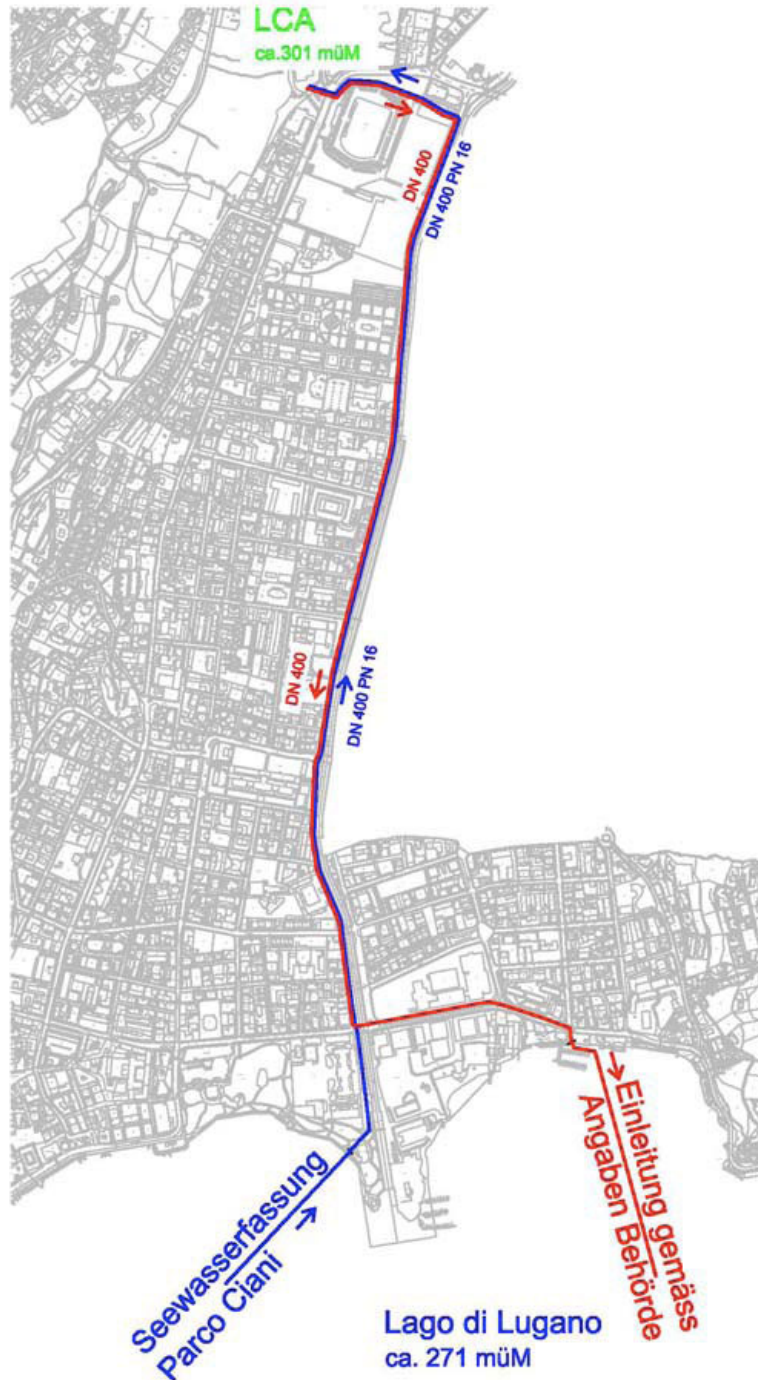
## CSCS new building

- Completion due 12/2011
- Target PUE max 1.23
- Use of lake-water for cooling (14MW total capacity)
- Electrical capacity 16MW (expandable to 25MW)
- Floor space 2000sqm (expandable to 2500sqm)
- UPS limited to critical parts
- Flywheels and diesel generators can be added
- Office space for 60 FTE
- VESDA but no fire extinguishing system
- Raised floor = 5m high installation deck



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## Lake-water cooling

- Waste heat is offered for urban heating network
- Line provides numerous sites with cold and hot water



## 2<sup>nd</sup> European workshop on HPC infrastructure

- Hosted by CEA in Dourdan, France
- Dates: 6-8<sup>th</sup> October 2010
- <http://www-hpc.cea.fr/en/events/Workshop-HPC-2010.htm>
- Interested in the 2011 workshop? Send me an e-mail: [lgilly@cscs.ch](mailto:lgilly@cscs.ch)