« Management of In Kind Contributions»

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presentation at the

2nd European Workshop:
Exchange of Experiences between Preparatory Phase Projects

Brussels, October 30th 2009

Outline

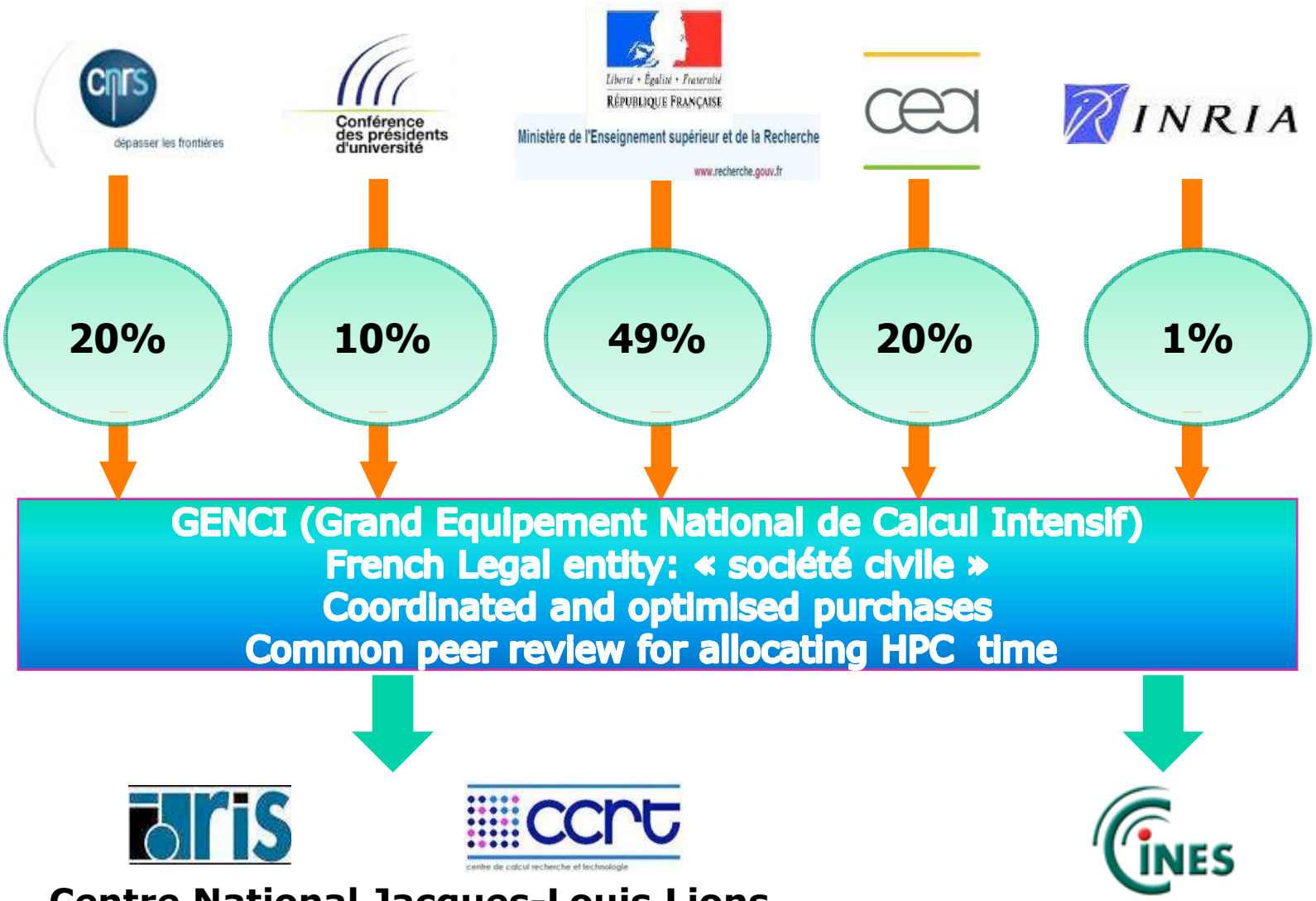
- Context: High Performance Computing
- Experience within GENCI
- Ideas from the PRACE Preparatory Phase

HPC is a "Key Technology"

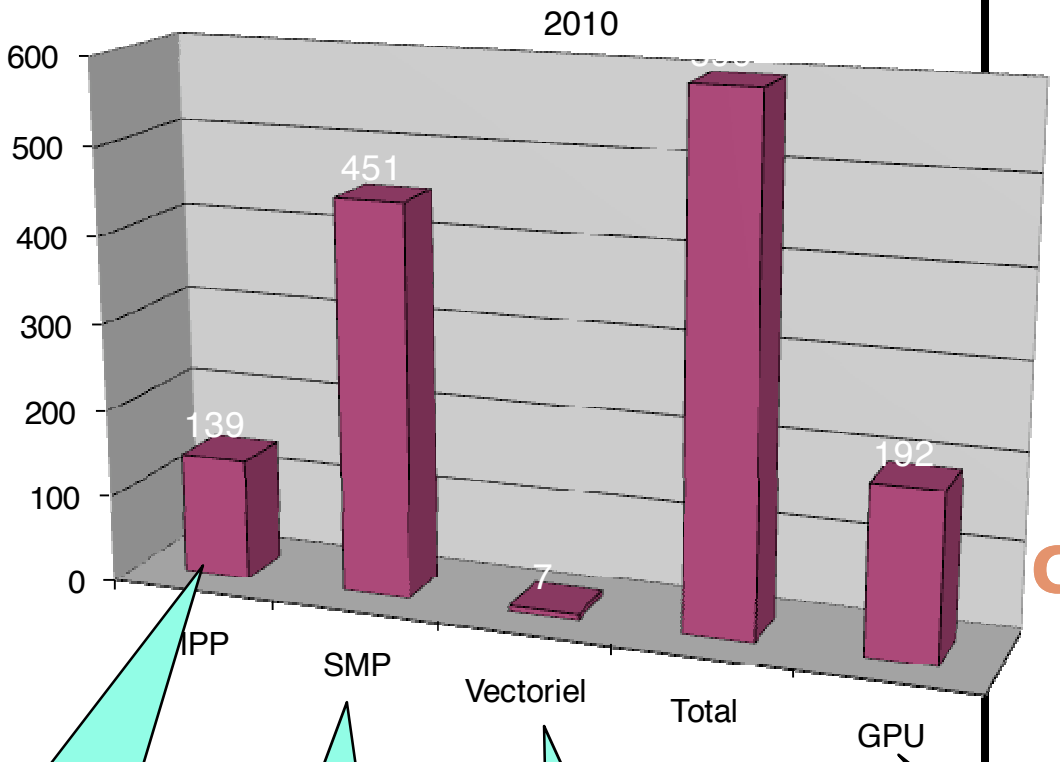
- Supercomputers are the tool for solving most challenging problems through simulations
- Access to High Performance Computer is essential for international competiveness in science and engineering
- Providing competitive HPC services is a continuous endeavor
- This has been acknowledged by leading industrial nations such as USA and Japan since the 1990's

France : GENCI has been set up as national funding entity
Europe : PRACE Project

Grand Equipement National de Calcul Intensif



Total capacity of Tier1 HPC ressources available for the french scientific community in 2010



596 Tflops

3 Computer Centres

Comprehensive set of system architectures

IBM BG/P Babel (IDRIS)

Cluster SGI ICE Jade (CINES)
Cluster IBM Hera (CINES)
Cluster BULL Titane (CCRT)
Cluster BULL Platine (CCRT)
Cluster IBM Vargas (IDRIS)

NEC SX8 Brodie (IDRIS)
NEC SX8R-SX9 Mercure (CCRT)

Cluster BULL Titane (CCRT)

In kind contributions in GENCI

- Used Form:
  - **Allocation of Supercomputer time** to GENCI
    - Block of computer time over multiple month period
    - Reporting on availability and utilisation
    - Valued in accordance with GENCI statutes (GENCI pays for acquisition and maintenance in the case of National equipment)

Topics relevant to "In kind contributions"

- Prerequisites:
  - Method to determine the value of contribution (supercomputer) or compensation (seconding)
  - Equality of treatment for partners
  - Transparency
- "In kind" is not "Cash":
  - "In kind" not always desirable
    - Money is required for some purposes (acquisitions, operation, large projects..)
  - "In kind" may be better than cash:
    - Facilitate sharing of equipment
      - To increase efficiency
      - To mitigate risk associated with very innovative designs (ex: early ports to GP-GPU)
- Long term issues that need to be fully understood:
  - Strategic aspects of ownership of key equipment

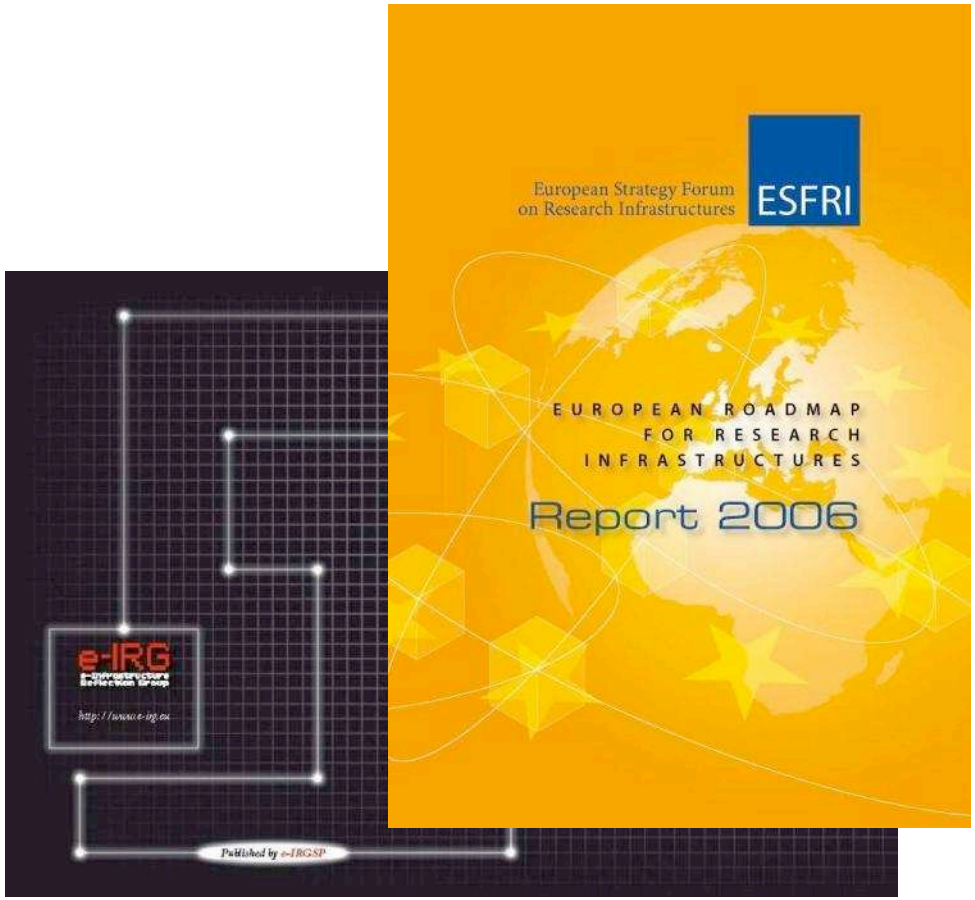
The PRACE project receives funding from the EU's (FP7/2007-2013) under grant agreement n° RI-211528.

What about « In Kind » in PRACE ?

CAPACITIES

e-infrastructure

HPC-Service is an item on the ESFRI Roadmap



The European Roadmap for Research Infrastructures is the first comprehensive definition at the European level

Research Infrastructures are one of the crucial pillars of the European Research Area

A European HPC service – impact foreseen:

- strategic competitiveness
- attractiveness for researchers
- supporting industrial development

Many partners, with different expectations

- **2007 April, 16: Memorandum of Understanding signed by 14 European member states in Berlin**
- **2008: France, Germany, Spain, The Netherlands and UK reconfirmed their commitment for establishing an European HPC Research Infrastructure**
- **Italy became Principal Partner in September 2009**
- **2009: 6 new countries member have joined the PRACE Initiative: Bulgaria, Cyprus, Czech Republic, Ireland, Serbia, Turkey**

A large variety of system architectures is required

IBM BlueGene/P (FZJ)
01-2008 (MPP)

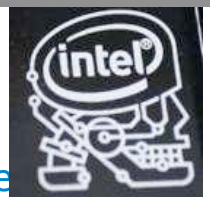
IBM Power6 (SARA)
07-2008

Cray XT5 (CSC)
11-2008

IBM Cell/Power
(BSC)
12-2008

IBM Cell/Power
(BSC)

Intel Nehalem/Xeon (CEA/FZJ): installation date April 2009



What´s so special about PRACE?

- **PRACE needs the skills for peta- and exascale computing of all member states and not only of those which can afford to build up their own peta- and exascale installation for national use.**

- **Skills required in many domains, including**
  - **Application optimisation and design, (incl. planning for lifecycle > 10 Years)**
  - **Optimised and parallel community codes,**
  - **System and Application software and libraries,**
  - **Computer and system architecture,**
  - **Facilities design, procurement and operation, (power efficiency),**
  - **Evaluation of technologies and forthcoming products,**
  - **Training at all levels from student to expert,**
  - **Outreach, interface with key industrial users,.....**

« In Kind » contributions in PRACE

- Hosting partners may be delegated the procurement, installation and operation of supercomputers
  - Leverage the expertise at national centres
  - Facilitate sharing of existing facilities for cost reduction, risk reduction ....
  - These are “In kind contributions” evaluated with total cost of ownership and operation of the supercomputers.
- Other “In Kind” contributions
  - Encompass the complete range of services and expertise
  - Evaluated based on usefulness to the RI and consistence with plan and budget
  - Decision made transparently by the Council

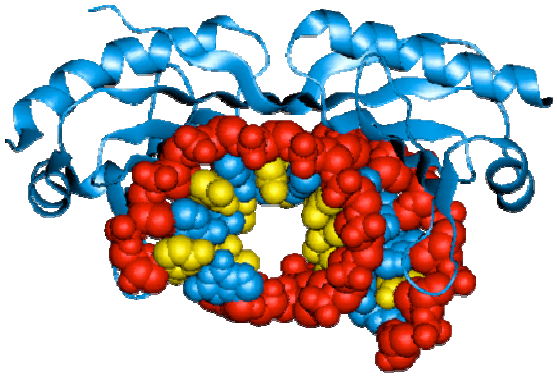
Significance of « In Kind » contributions

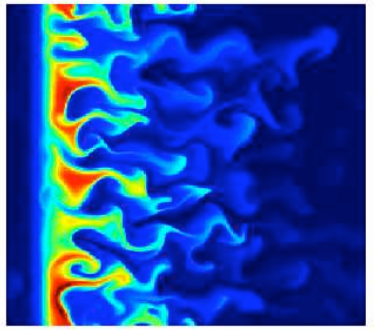
- Hosting partners:
  - Facilitate cost sharing and leverage expertise
  - Widen the skills base through contribution of other (non hosting) partners
- Non hosting partners:
  - Highly valued contributions (special skills, participation in key subprojects and workpackages….)
  - Facilitate investment in their skills base and local facilities
  - « In kind » contribution
    - Rewarded by increased size of PRACE resources available to the partner
    - Rewarded by increased voting rights in PRACE bodies
    - Permits to leverage funding by funding agencies, including EC FP7-8,..

CONCLUSION

- **PRACE envisions « In Kind » contributions as a means**
  - To enhance participation and engagement of all parties, including hosting partners
  - To increase the skills base of each partners and to value many forms of contributions
  - To mitigate risks associated with « bleeding – edge » designs allowing better interaction with innovative vendors
  - To enhance accessibility of PRACE resources by all researchers

PRACE has devised an organisation that has been approved by its Management Board and that is now ready to come into existence



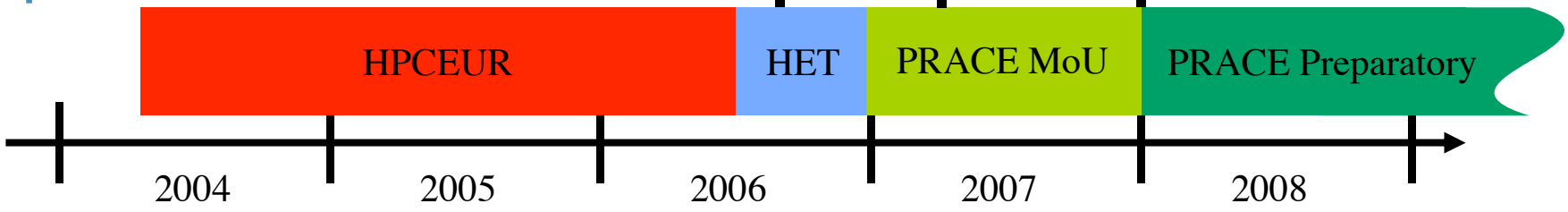


The End

GENCI
GRAND EQUIPEMENT NATIONAL DE CALCUL INTENSIF

PRACE

PRACE is ready for implementation and operation



EU-Grant: INFSO-RI-211528, 10 Mio. €

PRACE

Foreseen: > 3 PRACE centres providing HPC-capability service in a legal entity