Exa-scale computing, software and simulation: Objective in FP7 ICT Call 7

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Exa-Scale objective in FP7

- First objective in FP7 dedicated specifically to exa-scale computing
- Marks the commitment of the EC to support research at the leading edge of High-Performance Computing
  - PRACE in HPC infrastructures
  - Other objectives related to HPC (FET, Computing...)
  - Ongoing support to international collaboration of European R&D stakeholders with International Exa-Scale Software Project (IESP) through support action EESI (European Exascale Software Initiative)
- Important action: response to this objective will influence future EC support to exa-scale efforts

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Exa-Scale objective in FP7: What?

R&D (through Integrated Projects (IP)):

- To develop a small number of advanced computing platforms (100 petaflop/s in 2014 with potential for exa-scale by 2020),
  - Platforms relying on vendors' proprietary hardware or on COTS.
- To develop optimised application codes driven by the computational needs of science and engineering and of today's grand challenges (e.g. climate change, energy,…)
- Proposals should address major challenges of extreme parallelism with millions of cores (programming models, compilers, performance analysis, algorithms, power consumption ...)

Support (through Coordination and Support Action (CSA)):

- For a common European strategy and a driving role for European stakeholders in international efforts of extreme-scale HPC systems.

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Exa-Scale objective in FP7: Why?

Impact:

- Put Europe in the frontline of international efforts for the development of HPC system software and tools
- Strengthened European industry supplying and operating HPC systems: preparing European industry and research organisations to achieve world-leadership in this area.
- European excellence in exa-scale level simulation codes for the benefit of society, industrial competitiveness and policy making;: emergence of EU top-class simulation centres for exa-scale systems
- Reinforced cooperation in international endeavours on exa-scale software and systems.

Reap the benefits of the new big opportunities created by the transition to peta-scale and exa-scale computing!

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Exa-Scale objective in FP7: Who?

Each Integrated Project should bring together:

a) one or more supercomputing centres with a leading role in system software development;

b) technology and system suppliers, whether these are academic centres or private companies, including system vendor(s) in case of targeting particular vendors' machines;

c) industrial or academic centres to co-develop a small number of exa-scaled application codes.

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Exa-Scale objective in FP7: How?

Integrated Project Proposals characteristics:

- All software should be developed as open source.
- Splitting the effort roughly 40/60 in applications and simulation vs. systems development.
- Demonstrating synergies with efforts under the Capacities programme on the deployment of leadership-class HPC systems.
- Proposals may include international cooperation components that are essential and complementary to European expertise.

Selection

- Two to three Integrated Projects are expected to be selected.
- attempting a balance between application domains and exa-scale computing approaches

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Exa-Scale objective in FP7: When/How much?

- **Work Programme 2011-12**: Cooperation (ICT – Information and Communications Technologies) *(expected to be approved by the end of July 2010)*
  - **ICT Call 7:**
    - *Date of publication: 28 September 2010 (tbc)*
    - *Deadline: 18 January 2011 (tbc)*
- Exa-scale topic: “Objective ICT-2011.9.13 Exa-scale computing, software and simulation “
- **Indicative budget distribution** (total 25 m€):
  - Integrated Projects: 24 m€
  - Coordination and Support Action (CSA): 1 m€

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