

Exascale activities in FP7



- Keeping the pace with exascale efforts worldwide, marking the EC commitment to support R&D at the leading edge of High-Performance Computing (HPC)
 - R&D:
 - First exascale objective in 2011 FP7 Call (three IP projects)
 - other objectives related to HPC (Computing systems, FET...)
 - PRACE in HPC infrastructures
 - Ongoing support to international collaboration of European R&D stakeholders (support actions EESI and EESI2 - European Exascale Software Initiative)

Exascale R&D objective in FP7



- New exascale objective in 2013 Call that supports
 - a) systems development work in hardware and software (Integrated Projects IPs)
 - b) the bridging of critical exascale technological gaps with disruptive and innovative approaches (STREPs)

Budget 22 m€, with a minimum of 70% for IPs (a) and 25% for STREPs (b)

Current projects in first exascale computing objective funded by FP7

Collaborative **R**esearch into **E**xascale **S**ystemware, **T**ools and **A**pplications

Start: 1st Oct 2011 - Duration: 3 years

13 partners, EPCC project coordinator

Budget: 12 M€ - €8.57 M€ funded by EU

<http://www.cresta-project.eu>

Developing techniques and solutions which address the most difficult challenges that computing at the exascale can provide

- Building and exploring appropriate *systemware* for exascale platforms
- Enabling a set of key *co-design* applications for exascale

Focus is predominately on software not hardware

Dynamical Exascale Entry Platform -Design of an architecture leading to Exascale

16 partners from 8 countries (3 PRACE Hosting Members, 5 industry partners)

Coordinator: Forschungszentrum Jülich

Start: 1st Dec 2011 - Duration: 3 years

Budget: 18.5 M€ (8.03 M€ funded by EU)

<http://www.deep-project.eu/>

Development of hardware:

- Implementation of a Booster based on MIC processors and EXTOLL interconnect

Energy-aware integration of components (Hot-water cooling)

Cluster Management System

Programming environment, programming models

Libraries and performance analysis tools

Porting Applications

European exascale approach based on embedded power-efficient technology

9 EU partners - Coordinator: Barcelona Supercomputing Centre

Start: 1st Oct 2011 - Duration: 3 years

Budget: 14.5 M€ (8.1 M€ EC contribution),

<http://www.montblanc-project.eu/>





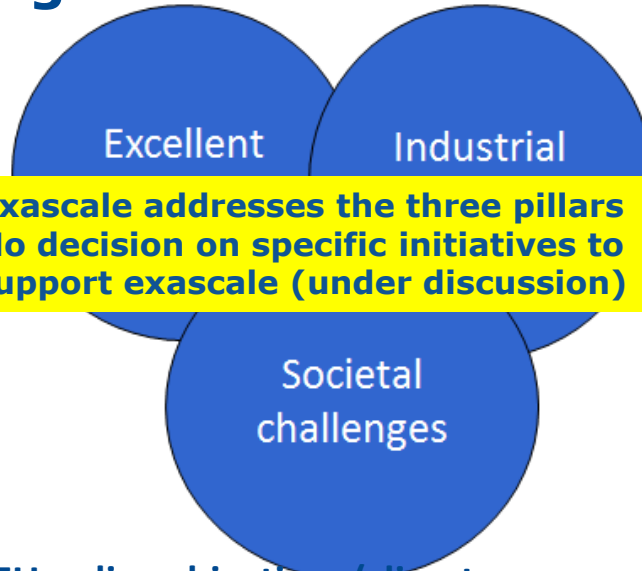
HPC Strategy: EC Communication "HPC: Europe's place in a global race" (Feb.2012)



- **Must double spending (MS, EU, industry)**
- **Development of EU native supply capability**
 - A European Technology Platform for the EU HPC industry
 - Pre-commercial procurement, jointly with EU support
 - Level-playing field for EU supply industry
- **Develop & deploy HPC services**
 - PRACE (services to academia and industry)
 - Competence centres for HPC services to SMEs
 - Workforce well trained in HPC
- **Excellence in HPC applications**
 - Centres of excellence for HPC applications
 - Hardware / software co-design centres

EC proposal (expected to be approved in 2013) for 7 years R&I programme 2014-2020 of ~80 B€

- World class science is the foundation of tomorrow's technologies, jobs and wellbeing
 - Europe needs to develop, attract and retain research talent
 - Researchers need access to the best infrastructures
- ~ 24.5 B€



- Strategic investments in key technologies (e.g. advanced manufacturing, micro-electronics) underpin innovation across existing and emerging sectors
 - Europe needs to attract more private investment in research and innovation
 - Europe needs more innovative SMEs to create growth and jobs
- ~18 B€

- Concerns of citizens and society/EU policy objectives (climate, environment, energy, transport etc) cannot be achieved without innovation
- Breakthrough solutions come from multi-disciplinary collaborations, including social sciences & humanities
- Promising solutions need to be tested, demonstrated and scaled up

~32 B€