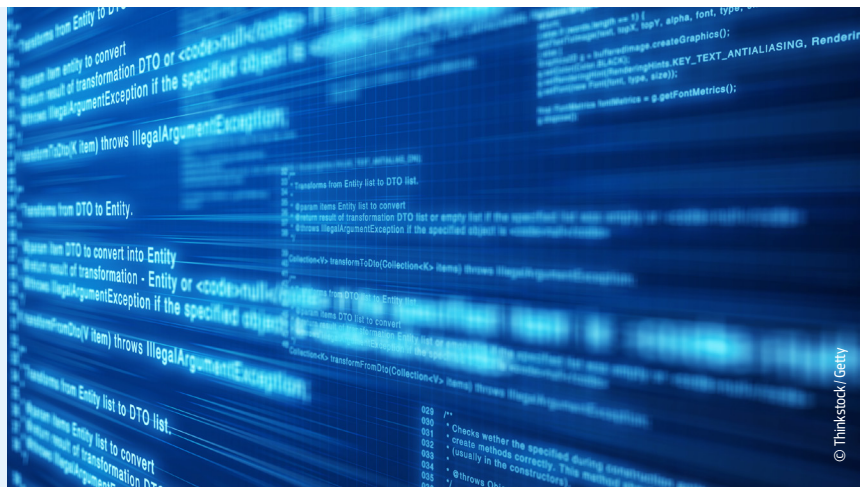


High Performance Computing PPP: Mastering the next generation of computing technologies for innovative products and scientific discovery

- HPC to tackle major scientific, societal and competitiveness challenges
- Innovative world-class industrial products and services in a cost effective way
- Underpinning scientific discovery through modelling and simulation



What is the challenge?

Modern societies increasingly face major challenges that involve processing enormous amounts of data and carrying out complex computations. High Performance Computing (HPC) is a powerful tool helping us to respond to these challenges in an effective way: researchers can study and understand complex phenomena with more precise simulations (e.g. designing new drugs “in silico” without animal testing); policy makers can take better decisions based on fast and accurate analysis (e.g. policies for transport planning or ageing population) , and enables industry (in particular SMEs) to innovate in products and services (e.g. modelling safer cars or predicting the need of surgery for Caesareans to avoid riskier decisions at childbirth).

Europe is a world-leader in HPC applications that are key for our society. We need to keep this privileged position by supporting excellence in HPC applications in Europe, placing computational science at the centre of scientific discovery and industrial competitiveness.

What is the HPC PPP about?

A PPP in HPC will bring together technology providers and users in the [European Technology Platform for HPC \(ETP4HPC\)](#) for (a) developing the next generation of HPC technologies, applications and systems towards exascale

(i.e. 10 to the power of 18 operations per second) and (b) achieving excellence in HPC applications. The PPP will work in cooperation with [PRACE](#) as the provider of a world-class Pan-European HPC infrastructure. The PPP is expected to start on 1 January 2014 and end in 2024.

What results and benefits do we expect?

The PPP will develop an ambitious R&I strategy aimed to achieve significant impacts on industrial competitiveness, sustainable growth and societal and economic benefits. The PPP will foster a European HPC ecosystem covering the full value chain, providing a globally competitive European HPC technology supporting EU leadership and world-wide excellence in key application domains. The PPP aims to expand the user base, especially SMEs, by facilitating access to HPC resources and technologies, and opening the possibilities for SMEs to participate in the provision of competitive HPC technology solutions; The PPP will foster additional investments to industrialize and commercialize the results of successful R&D leading to products; each public euro funded could result in a leveraged effort of up to 4 euros in the economy.

The PPP will support the development of innovative HPC technologies and HPC co-design, the creation of start-up and development of SMEs, and the creation of several Centres of Excellence in HPC applications in key scientific and industrial domains.

What will the new total budget be?

The estimated budget is €1.4 billion. EU contribution will be up to €700 million from the [Horizon 2020](#) programme budget, with the private sector contributing a further €700 million for the realisation of the R&D programme in the Strategic Research Agenda.

How will it be managed or run?

The HPC PPP is a contractual PPP, i.e. the implementation will remain the responsibility of the European Commission. The Commission will be responsible for selection and negotiation of proposals, monitoring of progress and payments to the projects. The financial rules are those of Horizon 2020 and open calls for proposals. The private side of the PPP is organised in the ETP4HPC Association, open to industry, research, academia and other HPC players. ETP4HPC is responsible for providing inputs on the scope of the research and innovation actions which will be addressed in the HPC part of the Horizon 2020 calls for proposals.

The public and private side will meet regularly in a Partnership Board to discuss the joint strategy, agree on the content of future call for proposals and monitor the performance, outputs and impact of the PPP.

What has been done so far for the PPP?

The ETP4HPC was created to improve Europe's position in HPC technologies and to foster collaboration among all players in the HPC supply chain. In preparation of the establishment of the PPP for HPC in Horizon 2020, the platform has elaborated a [Vision paper](#) and a [Strategic Research Agenda](#), outlining a roadmap of technology milestones for the HPC research areas and the timing for the different phases of its implementation.

Useful links

EP4HPC: www.etp4hpc.eu/

Mont-Blanc: www.montblanc-project.eu/

Mont-Blanc video: www.montblanc-project.eu/press-corner/multimedia

DEEP: www.deep-project.eu/

Mont-Blanc and DEEP: spearheading European efforts towards Exascale architectures

Exascale is the new frontier of computing. Due to the tremendous challenges at any single level of the chain, the transition to exascale computing will not be achieved by an extrapolation but by a revolution in computing technologies that requires fundamental science and technology developments. Europe has the technical and human-skills capabilities to tackle this big challenge. Two projects in FP7 are tackling the exascale challenge from different perspectives:

Energy efficiency is one of the primary concerns for the design of any computer system, even more for future exascale computers. [Mont Blanc](#) is designing a new type of computer architecture based on low-power components capable of setting future HPC standards that will deliver Exascale performance while using 15 to 30 times less energy. High throughput and scalability are major requirements for exascale applications. [DEEP](#) will develop a novel architecture, with a matching software stack and a set of optimized grand-challenge simulation applications. Thanks to an innovative, highly scalable accelerator cluster (the Booster) complementing a standard HPC cluster the DEEP architecture will enable unprecedented scalability.

