# TEXT: Towards EXaflop applicaTions

## Description

With top systems reaching the PFlop barrier, the next challenge is to understand how applications have to be implemented and be prepared for the ExaFlop target. Multicore chips are already here but will grow in the next decade to several hundreds of cores. Hundreds of thousands of nodes based on them will constitute the future exascale systems.

TEXT was centered on the vision that the key component to support high productivity and efficient use of a system is the programming model, and the project team at the time defended MPI/SMPSs as a hybrid approach that can be demonstrated and can show the way to follow on the path to exascale. The SMPSs model provided the necessary support for asynchrony and heterogeneity as well as enabling incremental parallelization, modularity and portability of applications. By integrating it within MPI the team were able to propagate its characteristics to the global application level. This was also a way to leverage and provide a smooth migration path for the huge number of applications today written in MPI.

The focus of the TEXT project was to install the MPI/SMPSs environment at several HPC facilities of partners and demonstrate how seven real and relevant applications/libraries can be improved using it. The codes fell in the areas of basic linear algebra libraries, geophysics, plasma physics, engineering and molecular dynamics. They were selected considering the impact in their respective scientific communities. The project validated this claim by evaluating the ported applications with different end users and collected their feedback to further improve the technology.

The project also promoted the use of the model to other application developers beyond what is feasible to integrate as committed project partners. In order to exploit the opportunity window and really achieve global impact the project was for 2 years. The TEXT proposal was composed of three networking activities, three service activities and two joint research activities.

Barcelona Supercomputing Center - Centro Nacional de Supercomputación