



Project Profile

COLOC

Getting the best out of computational power

The ITEA 2 COLOC consortium aims to provide simulation software developers with methodologies and tools to optimise their applications and HPC users to gain the most value from expensive and heterogeneous computing resources.

ADDRESSING THE CHALLENGE

The current trend in the supercomputer industry is to provide more and more computational cores as well as even more heterogeneous systems and consequently an increasing amount of time is spent on communication rather than computation. To allow applications to fully exploit the power of modern multi/many-core processors, COLOC seeks to design, implement and validate new approaches to optimise process placement and data locality management (data distribution, data transfer, and data storage)...

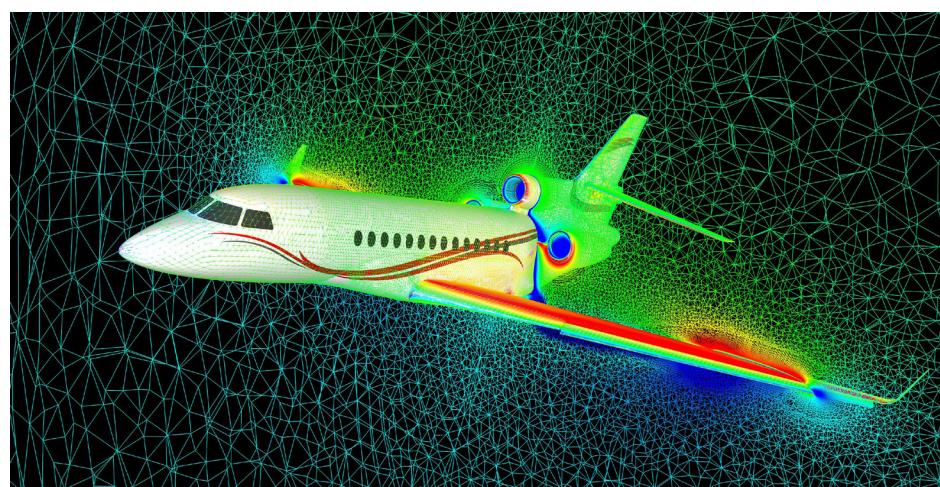
PROPOSED SOLUTIONS

The project will work on disruptive and innovative approaches to manage thread concurrency and input/out (I/O) locality on large-scale platforms, including memory management, CPU usage, accelerator technology, the network and storage, especially I/O, by taking all of these aspects into account concurrently and in relation to each other in order to optimise the use of applications and high-performance computing resources on all levels. Continuous updating of the state of the art to keep track of major changes in science, technology and industry will result in a public deliverable that extends and develops this state of the art. The project has assembled the most renowned European supercomputing centres and HPC research, dynamic HPC software tool editors, a range of HPC users to validate the proposed technology in real applications and Europe's only HPC provider.

PROJECTED RESULTS AND IMPACT

The major expected outcomes are new algorithms, libraries and tools that will be developed to enhance existing resource managers and runtime systems, with a special focus on efficient mapping of data to processes or vice versa. The project will advance a set of technologies ranging from

As a result, all partners are expected to strengthen their position: Bull gaining a stronger position as an HPC platform provider, ESI Group as a simulation software editor, Scilab Enterprises as a numerical software provider, while Dassault Aviation and the Swedish Defence Research Agency

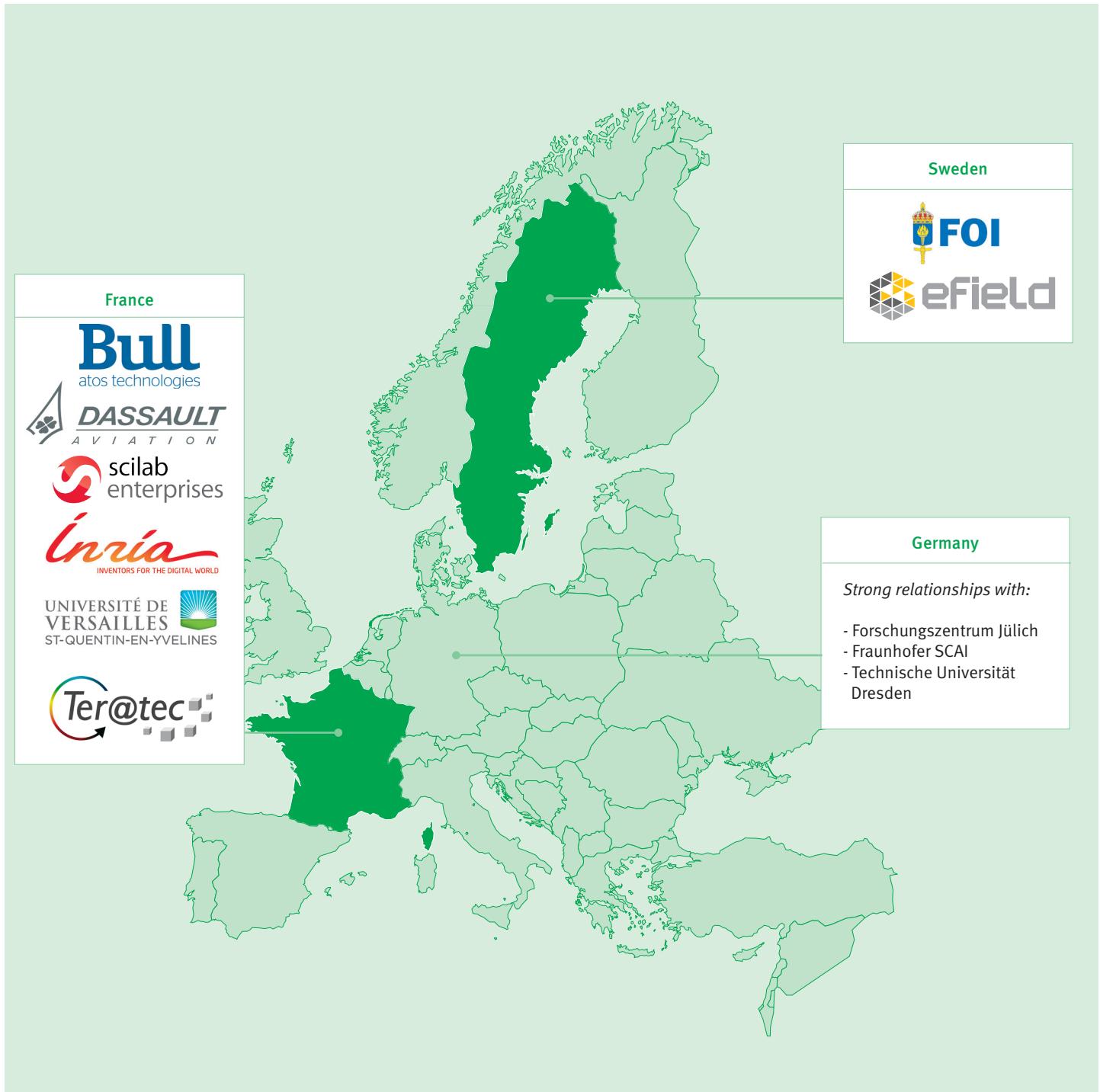


Flow around a business jet aircraft with complex shock-boundary layer interaction, as captured in a section through the CFD unstructured mesh - © Dassault Aviation

programming models to performance and resource optimisation using data locality and extended analysis tools.

Expected impacts include the ability to address larger simulation problems, to reduce simulation time and to provide ways to use HPC infrastructure resources more efficiently.

(FOI) as users of state-of-the-art HPC solutions will reinforce their position in the aeronautics industry and Defence. HPC Research labs (INRIA and UVSQ) will also fortify their expertise and position in the worldwide HPC ecosystem.

**Project start**

July 2014

Project end

October 2017

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Project website<http://www.coloc-itea.org>

ITEA is the EUREKA Cluster programme supporting innovative, industry-driven, pre-competitive R&D projects in the area of Software-intensive Systems & Services (SiSS). ITEA stimulates projects in an open community of large industry, SMEs, universities, research institutes and user organisations. As ITEA is a EUREKA Cluster, the community is founded in Europe based on the EUREKA principles and is open to participants worldwide.