**HPC-Cloud-based design of centrifugal pumps**

### The Challenge

The numerical simulation of centrifugal pumps is not easy, it requires a high-fidelity Computational Fluid Dynamics model, very fine computational grids and the analysis of transient flows. The challenge is to demonstrate an attractive solution in terms of cost, effectiveness and relevance for those SMEs which do not have the resources to perform the necessary simulations on their own.

### The Solution

- A simulation model has been implemented for a centrifugal pump using a commercially available software package, the model has been developed to run on a Cloud-based HPC system.
- Through a series of experimental runs the benefits of simulation using Cloud-based HPC system have been demonstrated.

### The Benefits

- The test runs have shown that the use of HPC-based simulation using a Cloud and external expertise results in a return on investment in less than six months.
- The design and optimisation of a single pump can be completed in shorter time, using simulations can give Enginsoft a significant commercial advantage.
- Due to this improvement in the design process, Enginsoft expects to increase its market share.