PRESS RELEASE

The Arcane numerical code framework for HPC
first results from the CEA and IFP Energies Nouvelles co-development.

A new version of the TemisFlow™ software, developed by the IFP Energies nouvelles (IFPEN) and dedicated to the oilfield modeling, has just been marketed by Beicip-Franlab, an IFPEN’s subsidiary. This software is based on the Arcane numerical code framework for HPC which is developed by both CEA and IFPEN.

Arcane is a numerical code framework for HPC that has been first designed by CEA since 2000 as part of the CEA’s simulation program (http://www.cea.fr/english-portal/defense). In 2007, IFPEN and CEA signed an agreement of collaboration in order to make evolution in Arcane and to share the technological profits.

Thanks to Arcane, TemisFlow™’s features were extended with a new simulator to take into account the complex geological structures. Other numerical codes based on Arcane are under development. One of them is dedicated to the numerical simulation of the carbon dioxide underground storage.

Arcane’s goal is to free numerical codes of the burden of some technical parts such as low level parallelism, memory management, I/O, and basics 3D unstructured mesh management. All its parts are highly optimised such as to provide good performance for the numerical codes running on several thousands of cores. Arcane’s object oriented design gave modularity and agility to numerical simulation code design. Arcane provides the opportunity to focus on their core business to the actors of the development process (physicist, numerical analyst and computer scientist). This methodology leads to faster delivery of innovative scientific software.

The collaboration between CEA and IFPEN allowed to enhance Arcane’s in particular for the management of 3D meshes and graphs. It contributed to strengthen the framework quality and to define common good development practices. This makes Arcane ready for the next generation of massively manycores HPC computers.

With the help of Arcane, both CEA and IFPEN are going to develop the next generation software with greater numerical performances and will meet the increasing needs for numerical simulation related to new challenges in science and energy.

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