Extrait du Laboratoire Leprince-Ringuet

http://www.llr.in2p3.fr/spip.php?article1752

GridCL Project

- Activités Techniques - Informatique -

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Description :

Funded by the labex P2IO (http://www.labex-p2io.fr/), the project aim is the evaluation of many-core coprocessors (Kepler & MIC) performances within a computing grid, using the standard OpenCL. The target applications are the ones of the labex partners, especially high energy and astroparticle physics.

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Computing industry still continuously improves processors performances, although it is not any more thanks to a frequency rise. The trend is now to increase the number of cores. This is cheaper for what concerns power consumption, yet those new cores are lighter than traditional processors, and individually benefit from a smaller memory. In this future many-core era, the huge legacy code of high energy physics could turn completely unusable, unless we deeply refactor it so to embrace massive parallelism.

This aim of GridCL project is to study the transformation of P2IO software applications in order to exploit efficiently today what looks like most the future many-core hardware : the graphics coprocessors from NVIDIA and/or AMD, and the new "Many Integrated Core" architecture from Intel. We plan the integration of such hardware in computing grids, which are inherently heterogeneous. This is why we favor portable software solutions such as OpenCL, rather than specific dedicated products such as CUDA or TBB. Also, we are aware that not the whole legacy code of our scientific domain can be redesigned, so we specifically study how to parallelize some critical subsets within a global software system which stays sequential.

Actions :
 - rally new partners, identify new pilot applications
 - pursue parallelization of current applications, evaluate software tools,
 - acquire a Kepler-MIC R&D hardware cluster
 - adapt grid middleware
 - cooperate with foreign groups (CERN) and other scientific domains
 - share knowledge and results with P2IO partners.