

PicsouGrid - A Framework for Financial Computations on the Grid

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Computing in financial services consists of a combination of time-critical computations completed during trading hours, such as Monte Carlo simulations for option pricing, and over-night calculations on massive data sets, such as those required for market risk measurement. To date, this has typically been done using traditional parallel or cluster computing techniques. The French National Research Agency (ANR), along with several banks and financial software companies have partnered with INRIA to explore the application of grid computing to this domain. The PicsouGrid project utilises the ProActive Java distributed computing library to seamlessly parallelize and distribute Monte Carlo option pricing simulations, concurrently utilising 10^2 - 10^3 workers. PicsouGrid is deployed on Grid5000 and the EGEE grid to demonstrate the feasibility of a performant, multi-grid application. Issues arising from the heterogeneity and layering of grid infrastructures are addressed via an abstract process model which is applied at each layer. Timings of both the algorithms and the grid infrastructures are carefully measured to provide better insight into the behaviour and utilisation of computational grids.

Keywords: computational grid, computational finance, multi-grid, Grid5000, EGEE