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Type: **Oral**

Distributed parametric optimization using the Geneva library

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The Geneva library implements parallel and distributed parametric optimization algorithms, capable of running on devices ranging from multi-core systems over clusters all the way to Grids and Clouds. The generic design makes Grid-resources available to user groups that have formerly not been exposed to such environments.

Detailed analysis

Geneva ('Grid-enabled evolutionary algorithms') is a software library which enables users to solve large-scale parametric optimization problems on devices ranging from multi-core systems over clusters to Grids and Clouds. The generic design makes Geneva applicable to problem domains from a wide range of industrial and scientific application scenarios. From a user's perspective, parallel and multi-threaded execution can be achieved just as easily as serial execution on a single CPU-core, and does not require the user's evaluation functions to be aware of the parallel environment. Performance and extensibility are at the core of the C++-based, object-oriented design. The software has been shown to run in parallel with 1000 clients on a Linux cluster, each contributing a fraction of the overall solution. Given suitably complex optimization problems, scalability is almost linear. The code is available as Open Source, allowing customization under the terms of the Affero GPL v3.

Conclusions and Future Work

The optimization environment will be further expanded to become a clearing house of different optimization algorithms, all based on the same data structures and using the existing framework for Grid-aware parallelization.

Impact

The generic design makes Grid technologies accessible to users ranging from scientific to industrial application domains. It thus has a strong potential to bring new user groups to the Grid.

Keywords

Optimization Grid Cloud

URL for further information

<http://www.gemfony.com>

Justification for delivering demo and/or technical requirements (for demos)

The topic is sufficiently complex that it cannot be presented as a poster. Given sufficient network connectivity, a number of eye-catching demos can be presented.

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