Distributed Parametric Optimization Using the Geneva Library

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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.

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. Additional licensing options are available. The talk focusses on the Geneva library and associated programming techniques and introduces Gemfony scientific, an upcoming Cloud spin-off from Karlsruhe Institute of Technology, whose business model is centered around the Geneva library.

If sufficient network connectivity is available, the presentation will include a demonstration of Geneva.