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Exact calculation of a posteriori probability distribution with distributed computing systems

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We'd like to present a specific grid infrastructure and web application development and deployment. The purpose of infrastructure and web application is to solve particular geophysical problems that require heavy computational resources. Here we cover technology overview and connector framework internals. The connector framework links problem-specific routines with middleware in a manner that developer of application doesn't have to be aware of any particular grid software. That is, the web application built with this framework acts as an interface between the user 's web browser and Grid's (often very) own middleware.
Our distributed computing system is built around Gridway metascheduler. The metascheduler is connected to TORQUE resource managers of virtual compute nodes that are being run atop of compute cluster utilizing the virtualization technology. Such approach offers several notable features that are unavailable to bare-metal compute clusters.
The first application we've integrated with our framework is seismic anisotropic parameters determination by inversion of SKS and converted phases. We've used probabilistic approach to inverse problem solution based on a posteriory probability distribution function (APDF) formalism. To get the exact solution of the problem we have to compute the values of multidimensional function. Within our implementation we used brute-force APDF calculation on rectangular grid across parameter space. The result of computation is stored in relational DBMS and then represented in familiar human-readable form. Application provides several instruments to allow analysis of function's shape by computational results: maximum value distribution, 2D cross-sections of APDF, 2D marginals and a few other tools. During the tests we've run the application against both synthetic and observed data.

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