

Users in the Grid Computing Environment

Bulakh B.¹

¹IASA, National Technical University of Ukraine "Kyiv Polytechnic Institute", 37
Peremogy Avenue., Kyiv, Ukraine, bogdan_bulakh@ukr.net

Over the last decade the progress in the area of parallel and distributed computing has resulted in emerging and rapid development of Grid Computing. Grid system may deal with different user communities, such as developers, scientists, administrators, regular users etc. Each of these groups has its own requirements to Grid functionality and set of operations to be performed: simply run Grid jobs, develop Grid-aware programs and middleware, solve problems in specialized Problem-Solving Environments (PSE) and so on.

While it still can be possible to develop Grid applications with traditional programming tools it is obvious that much more effectively this goal can be achieved with specialized solutions for distributed and parallel programming. The latter can be classified in many ways: shared state models (JavaSpaces), message-passing models – two sided (MPI solutions: Grid-enabled MPICH, MagPIe), one-sided message-passing (MPI-2, also in form of RMI, RPC), peer-to-peer models (JXTA), combined models (with OpenMP or so) to name some. Several advanced framework and Grid portal solutions have already emerged.

While the tools developed in the last twenty years of parallel and distributed computing have become established, and will continue to play an important role in the development of grid software, the expanded resource richness of the grid means that middleware will emerge as an equally important class of tools. Middleware will typically be built on top of the established tools to provide additional useful abstractions to the grid programmer. Today there are a lot of middleware packages (Globus Toolkit, EGEE gLite, NorduGrid ARC, UNICORE are most popular) – most of them are ready-for-use, with rich functionality. They provide the set of basic already implemented services on authorization, security, data transfer, resource brokering. But the very important problem (particular for Ukrainian) is to provide interoperability for those different packages in order to link different existing Grid infrastructures into national or larger Grids.