



Contribution ID: 136

Type: Demo

Migrating Desktop Platform –graphical interactive framework for running grid applications

Tuesday 26 September 2006 17:00 (20 minutes)

Due to the dynamic and complex nature of the Grid, it's not easy to use it in a daily work. To attract new users, especially from scientific community, user friendly tools are needed to simplify access to the Grid. To solve this problem we introduce the concept of Migrating Desktop Platform which is a graphical, user oriented product that simplifies the use of the grid technology in the application area.

Migrating Desktop Platform (MD) is an advanced graphical user interface and a set of tools combined with user-friendly outlook, similar to window based operating systems. It hides the complexity of the grid middleware and allows to access grid resources in an easy and transparent way with focus on interactive and parallel grid applications. These applications are both compute- and data-intensive and are characterized by the interaction with a person in a processing loop. MD can attract new users by its features: easy to use, platform independent, accessible from anywhere, enables possibility to easily add new application that can be batch or interactive, sequential or parallel. Thanks to its open architecture it can easily integrate existing or incoming tools - for example supporting grid operations or enabling collaborative work. Number of grid applications has already been integrated with MD framework.

As a key product of CrossGrid project Migrating Desktop has proved its usefulness in everyday work of users' community. Migrating Desktop was used in Polish grid project –Progress and is now used as an integration platform in EU BalticGrid project. Interactivity and MPI support is also continually developed in EU int.eu.grid project, while tools from MD will become part of Eclipse based grid toolbox developed

by EU g Eclipse project.

Platform overview

The aim of Migrating Desktop is to provide scientists with a framework which hides the details of most of the Grid services and allows working with grid application in an easy and transparent way. The graphical user interface integrates and makes use of number of middleware and integrates the individual tools into a single product providing a complete grid front-end. It uses OSGi specification as a mechanism for discovering, integrating, and running modules called bundles. When MD is launched, the users can work with environment composed of the set of bundles. Usually a small tool is written as a single bundle, whereas a complex tool has its functionality split across several bundles. A bundle is the smallest unit of our platform that can be developed and delivered separately. Such approach allows increasing the functionality in an easy way without the need of architecture changes.

Migrating Desktop framework allows users to access transparently the Grid resources, run sequential or interactive, batch or MPI applications, to monitor and visualize applications, and manage data files. MD provides a front-end framework for embedding some of the application mechanisms and interfaces, and allows the user to have virtual access to Grid resources from other computational nodes.

MD is a front end to Roaming Access Server (RAS), which intermediates to communication with different grid middleware and applications. Roaming Access Server offers a well-defined set of web-services that can be used as an interface for accessing HPC systems and services (based on various technologies) in a common and standardized way. All the communication is based on the web services technology.

This platform can work with different grid testbeds: based on LCG 2.7, gLite 3.0, Progress 1.0. Due to its open nature it can be extended with support for other testbeds.

Applications:

Example application use case: interactive application (CrossGrid) - Parallel ANN training application.

This application is used to train an Artificial Neural Network (ANN) using simulated data for the DELPHI experiment. The ANN is trained to distinguish between signal (Higgs boson) events and background event (in the demo the background used includes WW and QCD events). The evolution of the training can be monitored using MD with a graphics presenting current error, and 4 small graphics that show the ANN value vs. an event variable (that can be selected by the user). The

application is compiled with MPICH-P4 for intracluster use and with MPICH-G2 for intercluster use. This application uses the interactive input channel to let the user make a clean stop of the training (instead of killing the job), and also the possibility of resetting the ANN weights to random values, to avoid local minima. Using MD, user can change parameters of this grid application while it is running.

Other application that are already working with MD are: Air Pollution (crossgrid), Medical (Grid-based Approach for Virtual Arteries, crossgrid), Flood Management Applications (crossgrid), Air Pollution Modeling (crossgrid), simple Magic application use-case, Planned in the nearest future are: Visualization of Plasma in Fusion Reactors, GAMESS.

Used technology
Migrating Desktop bases on the Java applet technology. It can be launched using the Java Webstart technology or using a web browser with the appropriate Java Plug-in included in the Java Runtime Environment (JRE). MD is based on Swing libraries for designing graphical user interface, Java CoG Kit version 1.2 is being used as an interface to Globus (for operation on proxy and GridFTP/FTP) functionality. Axis ver.1.2.1 web services client is used for communication with the Roaming Access Server. Migrating Desktop follows OSGi Service Platform specification version 4 (August 2005) and is based on the same plugin engine as Eclipse platform. Currently RAS for cooperation with EGEE infrastructure is using LCG2.7 and/or gLite 3.0 platform.

Primary authors: PLOCIENNIK, Marcin (PSNC); MEYER, Norbert (PSNC); WOLNIEWICZ, Pawel (PSNC)

Presenter: PLOCIENNIK, Marcin (PSNC)

Session Classification: Demo session

Track Classification: Users & Applications