RUNNING ON THE GRID USING MIGRATING DESKTOP

BEGINNER'S GUIDE

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Abstract: This document presents Migrating Desktop (MD) tutorial. This tutorial is dedicated for beginners.

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1. Introduction

The Migrating Desktop is an advanced user-friendly environment that serves as a uniform grid working environment independent of any specific grid infrastructure. Java based GUI is designed especially for mobile users and is independent of any platform (MS Windows, Linux, Solaris). It is a complex environment that integrates many tools and allows working with many grids transparently and simultaneously. The main functionality concerns interactive grid application support, local and grid file management, security assurance, authorization of access to resources and applications, and single sign-on technology based on X509 certificates.

2. Obtain a grid certificate

In order to authenticate to the Grid you must be a member of the Virtual Organization and obtain a valid certificate. Please consult your Virtual Organization for further details. For EGEE more details can be found at http://cern.ch/egee-sa1/Users.htm, for BalticGrid more details can be found at http://voms.balticgrid.org/.

To authenticate to the Migrating Desktop you will have to have on a local workstation: a valid certificate and private key or a valid proxy file or access to the MyProxy server that your certificate is stored on.

3. Setup the Migrating Desktop environment

3.1 Requirements

Operating Requirements

The Migrating Desktop requires access to the Roaming Access Server (RAS). RAS is a part of the CrossGrid software publicly available under the CROSSGRID license. For detailed installation and maintenance instructions see the RAS Installation Guide [http://www.eu-crossgrid.org/installation_guides/CG3.1-v3.0-PSNC MigratingDesktop_RASInstallationGuide.doc].

Local hardware Requirements

Application requires system ready to launch the java runtime environment.
Optimal requirements:

- Minimum Memory: 256MB RAM
- Processor – any (e.g. Intel P3, 1GHz or equivalent in performance).

Local software requirements

Currently, there are two ways of launching MD: a web browser and Java Web Start.

- A Java-enabled web browser (for example Netscape Navigator, Internet Explorer etc. with the Java plug-in version 1.4.2). Under a web browser use the proper address of the Migrating Desktop web page. Remember to keep the Java Plug-in cache (JAR cache) disabled!
- Java Web Start (JWS 1.4.2).

It has been proved that running MD from Java Web Start is much faster than using a Web Browser launcher. A remarkable advantage of JWS is the caching of entire applications on a local workstation.

Network requirements

- For proper working with the grid environment, MD should invoke services from middleware deployed in a testbed. Network bandwidth requirement for MD: min. 256 kb/s
- Open the firewalls for 8443 port.
- If you want to use direct connections to GridFTP servers, open the pool of port: 13000-17000, 2811 in both directions between your local workstation and remote SE(s).

3.2 Login process

The user should do the following simple steps in order to start his work with the Migrating Desktop application:

Currently, there are two ways of launching MD: a web browser and Java Web Start.

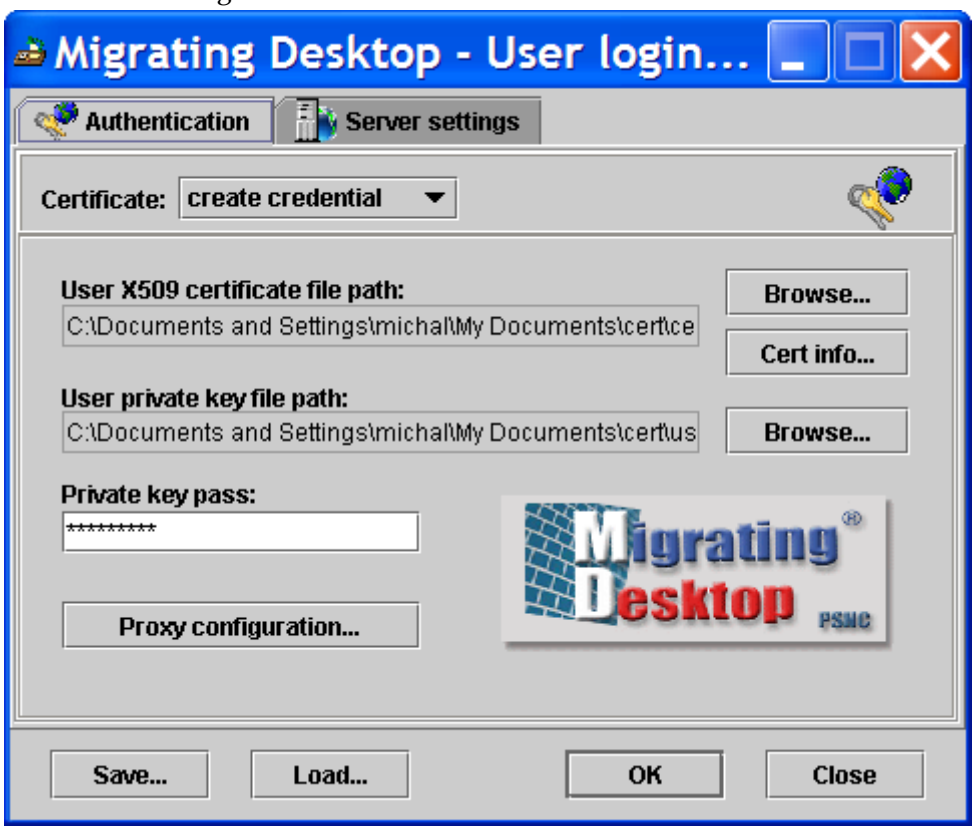
- A Java-enabled web browser (for example Netscape Navigator, Internet Explorer etc. with the Java plug-in version 1.4.2 or newer). Under a web browser use the proper address of the Migrating Desktop web page (currently: http://<RAS-host>/crossgrid). Remember to keep the Java Plug-in cache (JAR cache) disabled!
- Java Web Start (JWS 1.4.2 or newer). Run MD from this location: http://<RAS-host>/crossgrid/JWS/MigratingDesktop.jnlp

If you see this warning message: "Failed to verify certificate" **do not use the CLOSE** button - use the window upper right "x" button!

The User Login Dialog collects data about the localization of user certificates, and location of RAS web services (host and port).

a) Choose localization of user certificate
b) Choose localization of user key
c) Specify password to private key
d) Select option VOMS proxy

e) Write name of Virtual Organization
f) Choose server settings

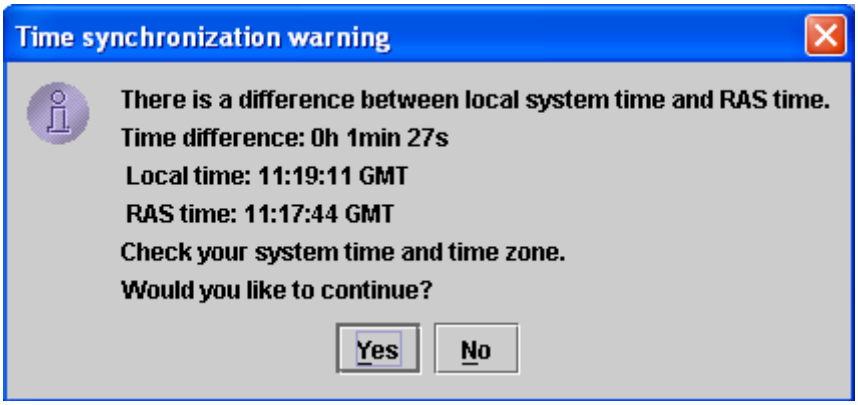


g) Specify host address, for example: willow.crossgrid.man.poznan.pl
h) Specify port : default is 8443

i) It is possible to save the settings, so next time all these settings will be chosen as default. Remember that saving the password is always insecure, so before saving leave the password field empty.

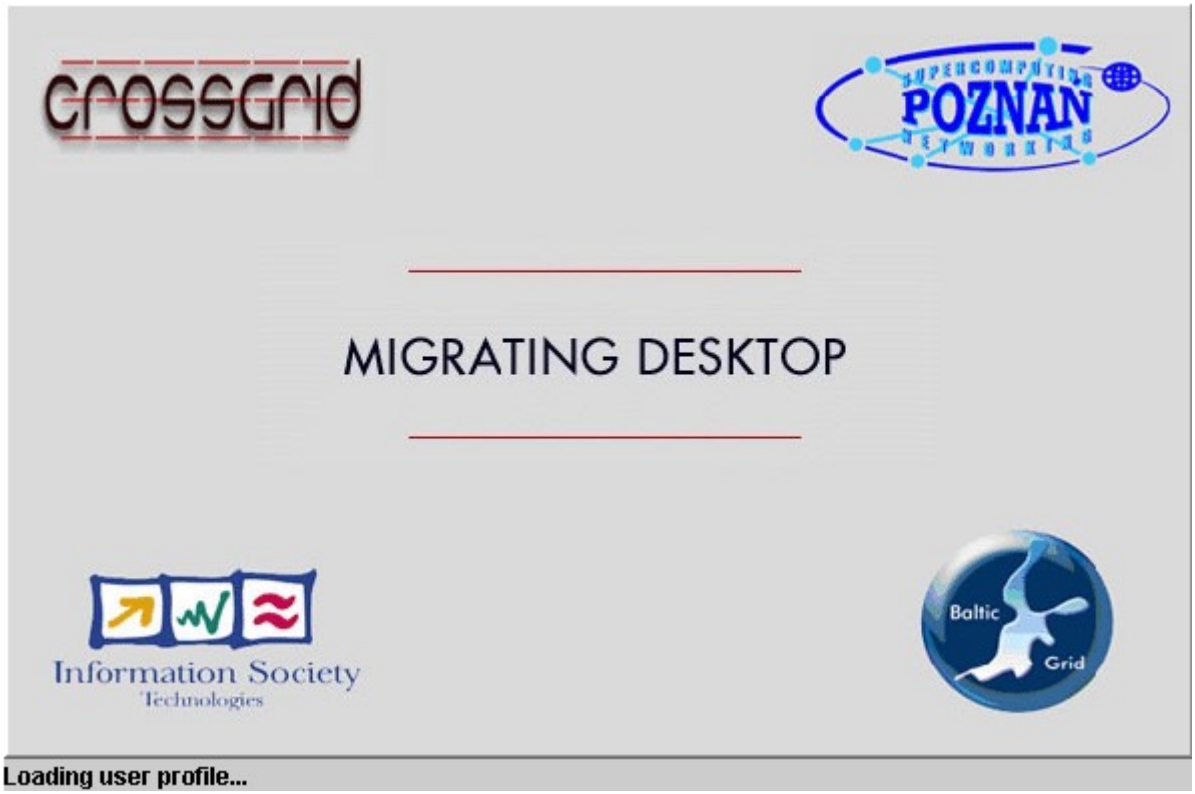
Remember to save your settings! This will speed-up the startup process next time you are running the Migrating Desktop.

A message about the time difference may appear if time on the local machine is not proper (not synchronized with the NIST server). Such difference can cause some problems during the Migrating Desktop runtime.



> If there is a time difference, remember to perform time synchronization on your local system before running the Migrating Desktop.

Now the desktop is starting. The splash screen of the Migrating Desktop will appear. It has a status bar containing some messages which will inform the user about the progress of the application initialization.



If the user worked with the Migrating Desktop before, his/her personal settings of the graphic user interface will be restored. In the other case a default user profile will be created by the application and the main empty Desktop will appear.

3.3 Configuration of user personal profile

In order to configure your personal profile please follow the steps listed below:

a) Open “New Grid Window” from toolbar

b) From pop-up menu (right-click in the Desktop area) choose “Properties”
c) In tab description give a new name for a desktop (example “tutorial window”)
d) Go to background tab, and select one of predefined wallpapers

e) Close the properties dialog. Save your profile by clicking on “Store User Profile” icon from toolbar

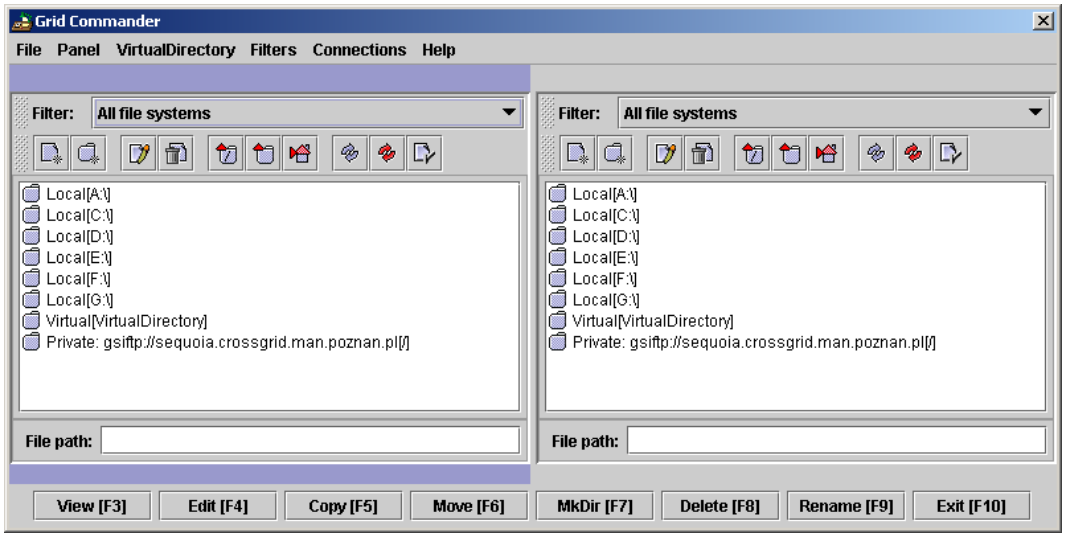
Remember that you can always save your profile. Saving preferences makes it easier to use the Migrating Desktop.

4. Data management (simplified)

4.1 Using Grid Commander

The main file Management tool in the Migrating Desktop is called Grid Commander. The Grid Commander is a two-panel application similar to the Commander family tools. A single panel can represent a local directory, GridFTP or ftp directory, or other protocol to the native storage. Each protocol is defined as a plug-in that makes file management in MD easy to extend to other protocols.

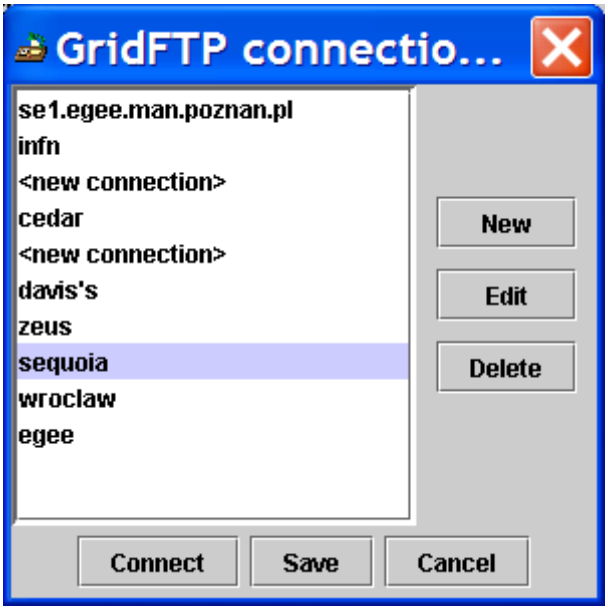
a) Open Grid Commander from toolbar or from menu.



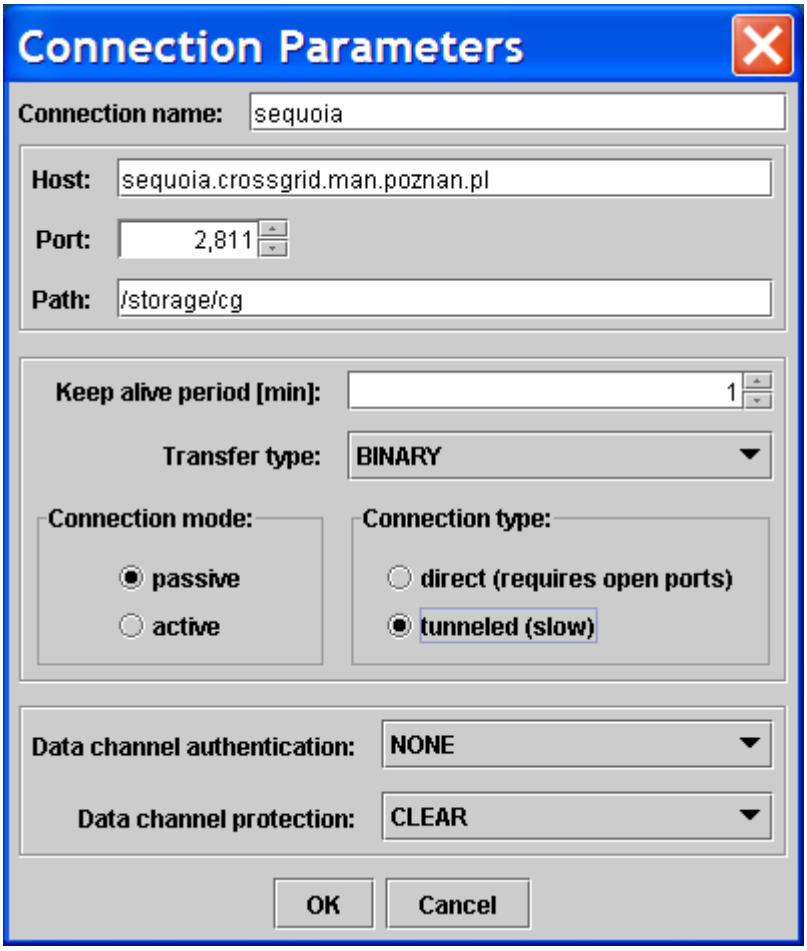
4.2 Using GridFTP

In order to use GridFTP, follow the instructions below:

a) open Grid Commander
b) choose “Connections”, “GridFTP manager” from menu



c) choose “Connections”, “GridFTP manager” from menu
d) choose “New”



e) fill “connection name”, “host”, “path”
f) if there are firewall set passive and tunneled
g) after adding new site press “Connect” and then “Save”

Remember to save your settings. This will save your time next time you are connecting to the GridFTP server.

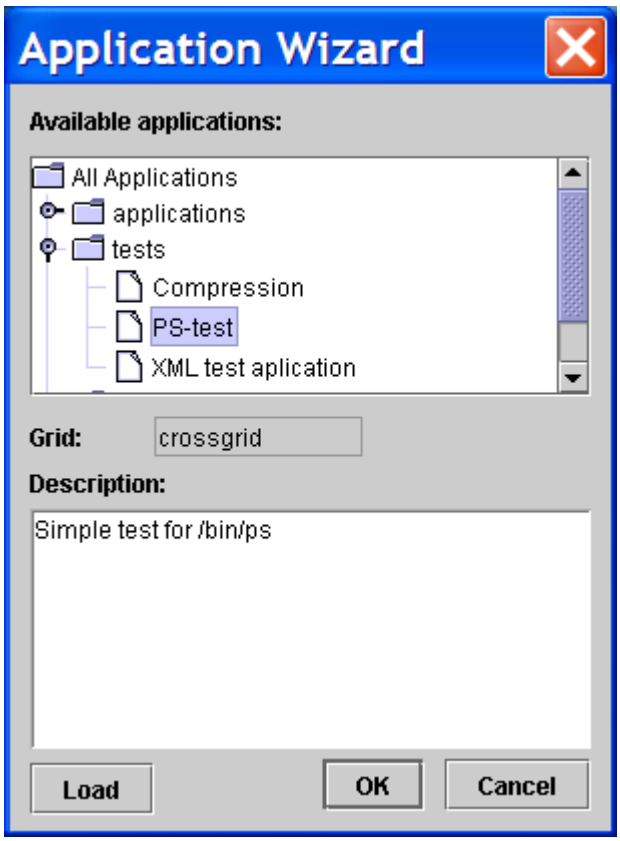
h) In Grid Commander go to root, select new created GridFTP connection
i) Press home button
j) Create new directory, called test, create a file
k) Select local file on the other panel. Copy this file to GridFTP server

5. Running jobs on the grid using Migrating Desktop

5.1 Create and run your first job

Grid applications available for users are grouped in a user-friendly way in a Job Wizard in MD. An application can be selected from a tree control (with default settings) or loaded from the previously recorded template (non-default settings)

a) Open "Application Wizard" from toolbar



b) Choose "All Applications", "tests", "PS-test"

c) Press Ok. Job Submission Wizard will appear.

5.2 Passing arguments to programs submitted on the grid

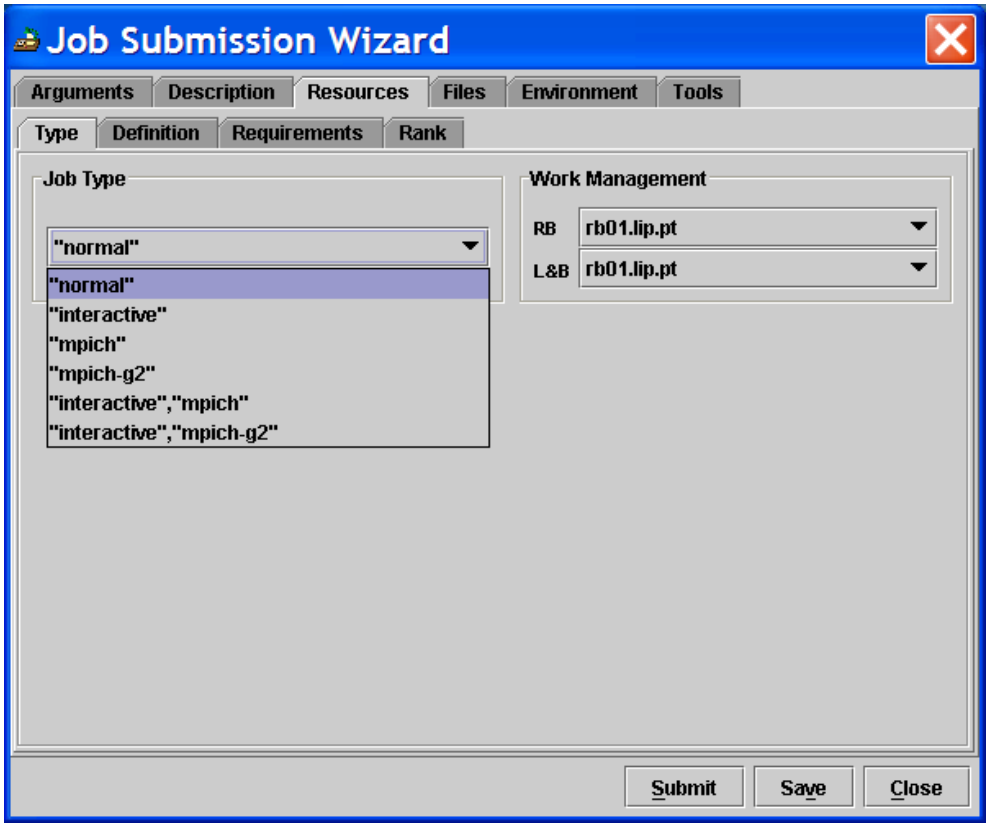
This Job Submission Wizard simplifies the process of specifying parameters and limits, suggesting user defaults or recently used parameters. The Wizard is responsible for proper preparation of the user's job and consists of several panels. One panel is an application-specific plug-in, and the rest can be used to set job information, resource requirements, files and environment variables. The application plug-in asks the user for application parameters and these parameters are then passed to the command line.

a) Leave default or change parameters for this test application

5.3 Expressing requirements for a job

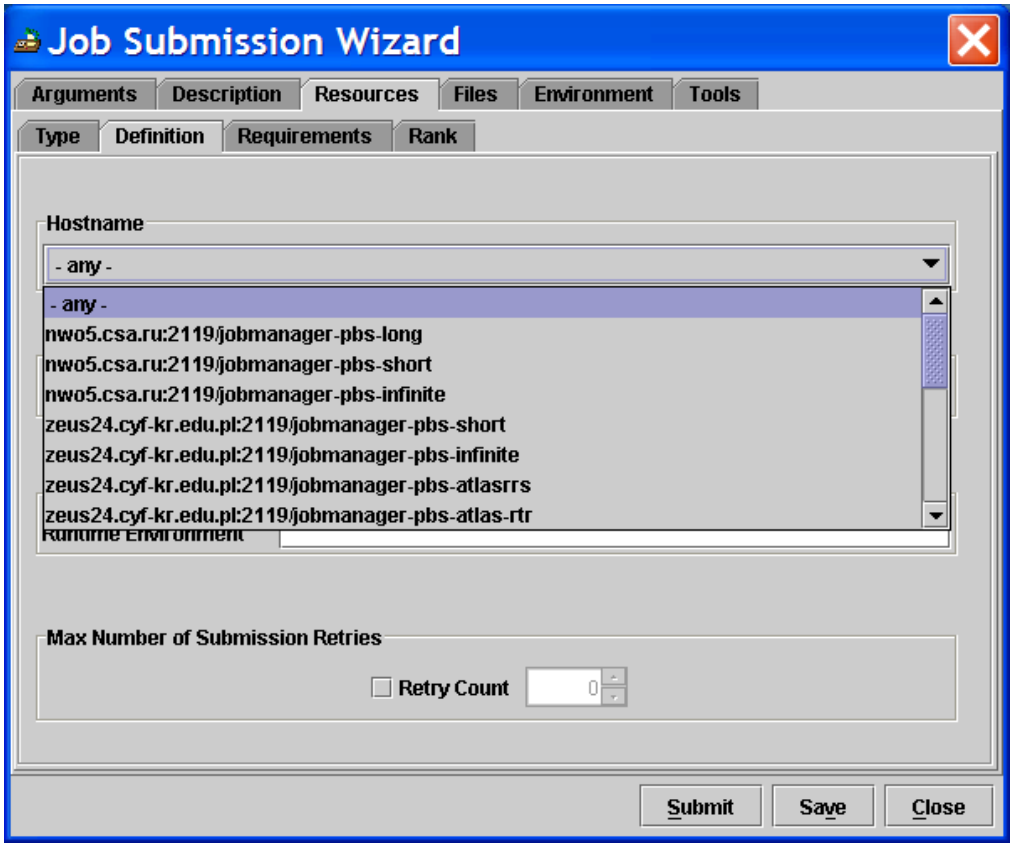
There is a common set of job requirements that can be specified in the same way for a different kind of applications. There are several tabs in the JobSubmission Dialog for specifying different types of parameters.

a) Choose tab “Resource”, “Type”
b) Choose type of job – in this use case select “normal”
c) Choose Resource Broker server and Logging and Bookkeeping server (for example: grid3.mif.vu.lt)

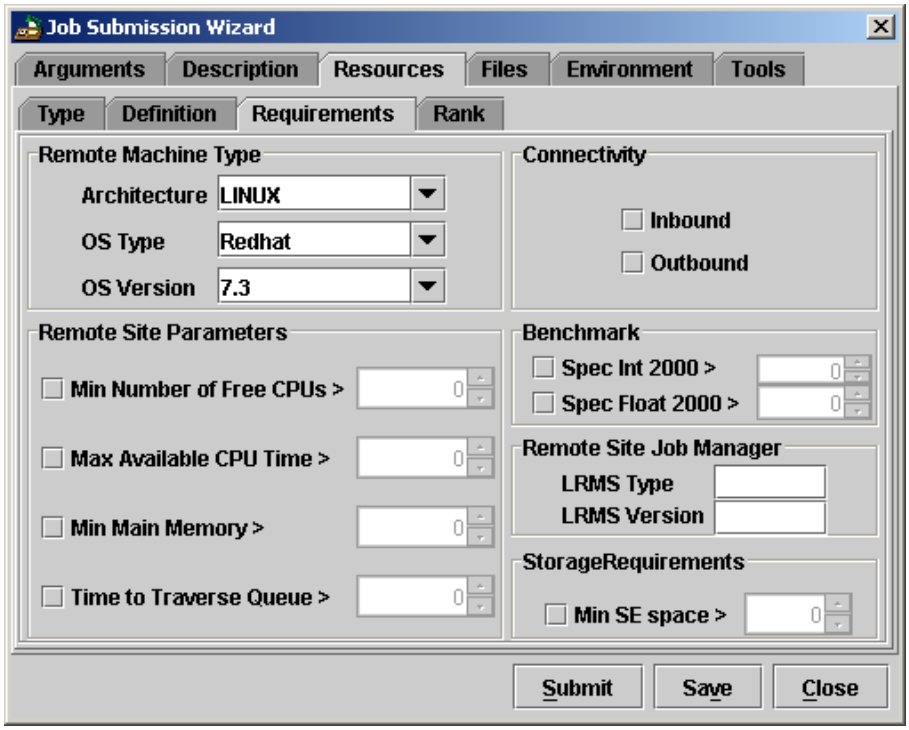


Remember to set Work Management parameters (RB and L&B) as it is the user who defines these parameters. These are required for the job submission.

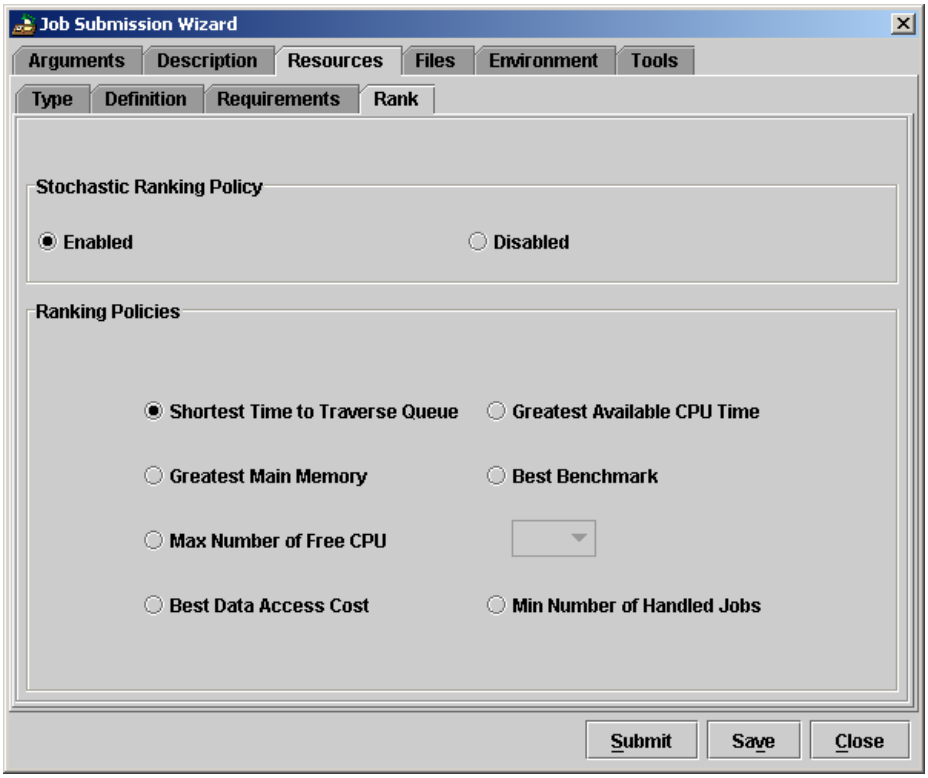
d) Change tab to “Definition”
e) Select hostname you want your job to run on (CE) or leave “any” if this decision should be taken by the Resource Broker.



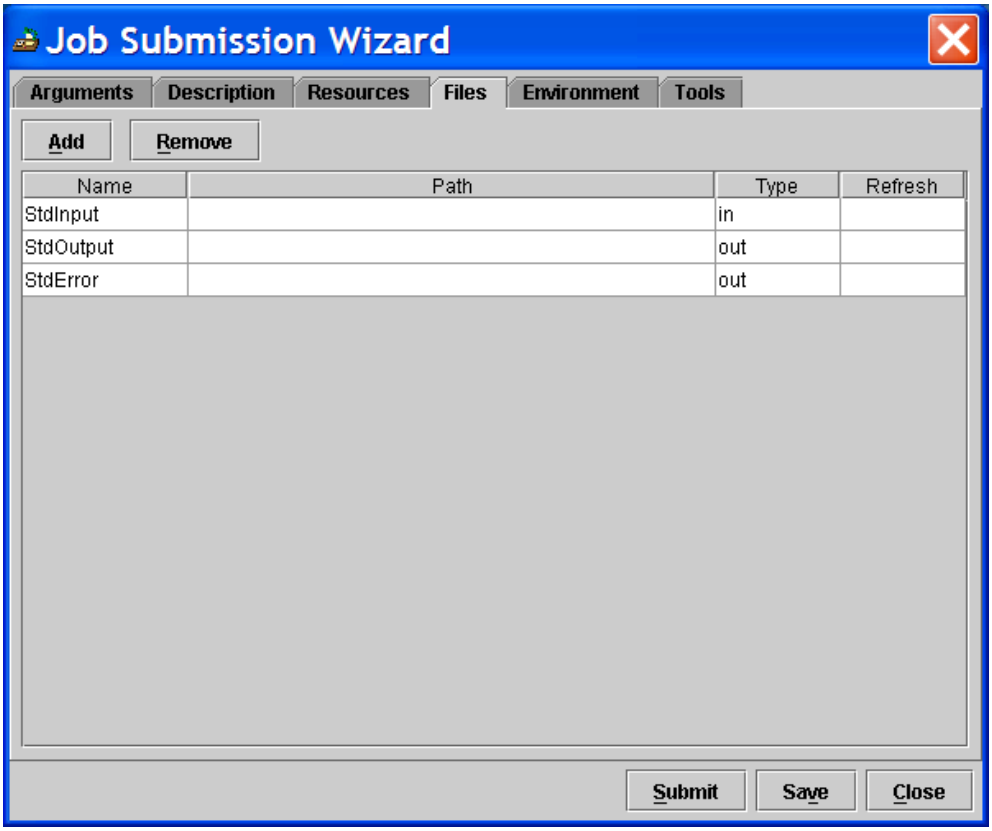
f) Change tab to “Requirements”
g) Leave the settings or change any of the requirements



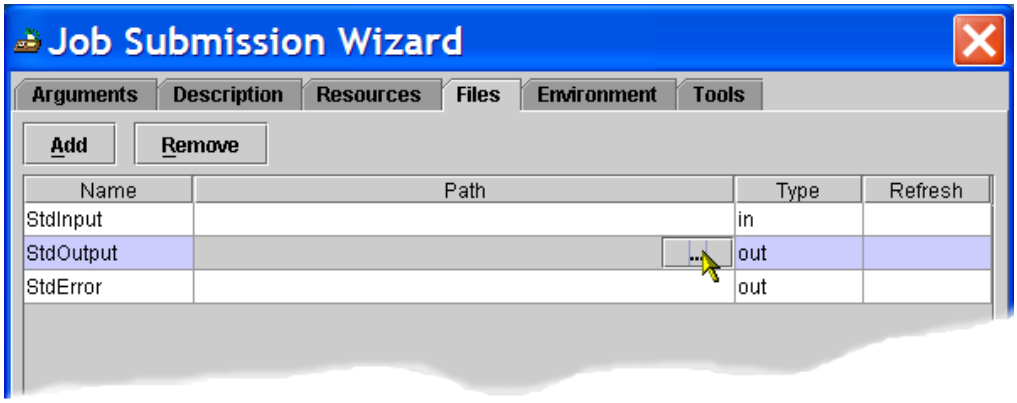
h) Change tab to “Rank”
i) Leave the settings or change ranking policies



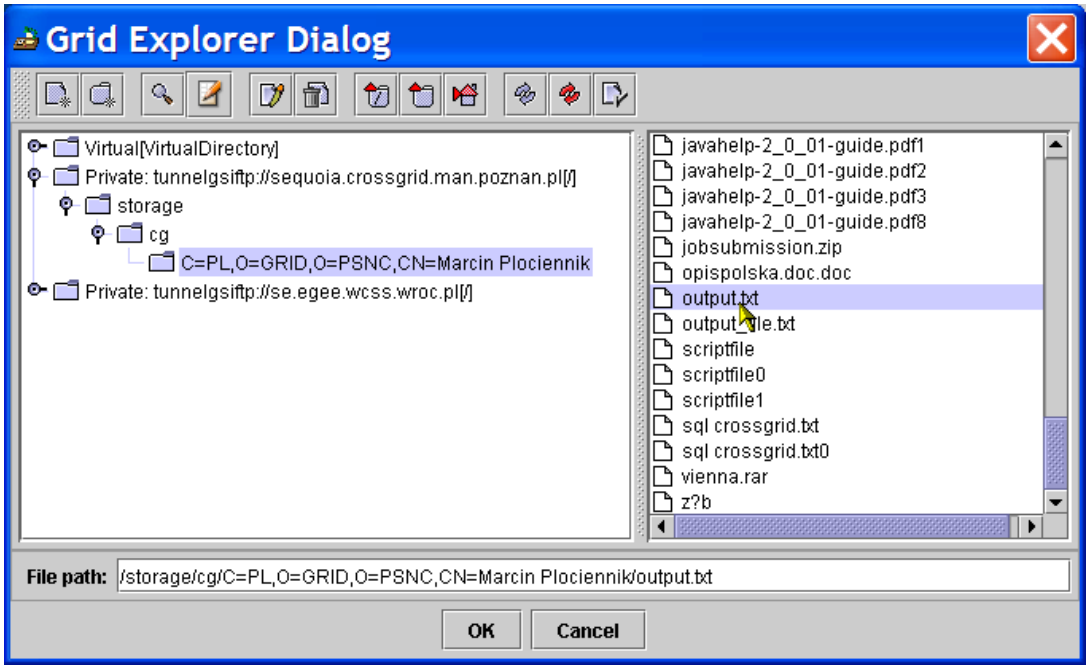
j) Set input/output files by specifying files from GridFTP



k) Choose output file



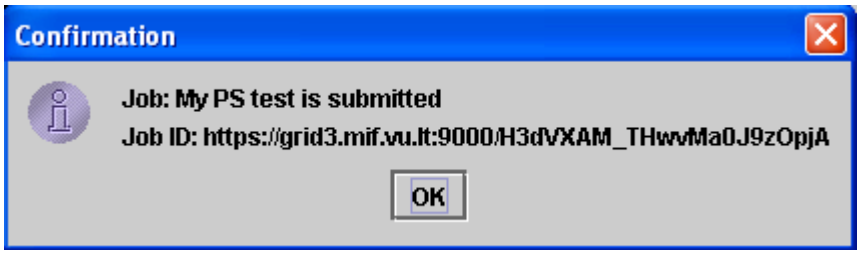
l) Choose file from GridFTP explorer



m) Follow step j), k) and l) for error file

n) Submit the job by pressing “Submit” button

o) Wait for job submission confirmation. It can take a few seconds and this time depends on Resource Broker response.

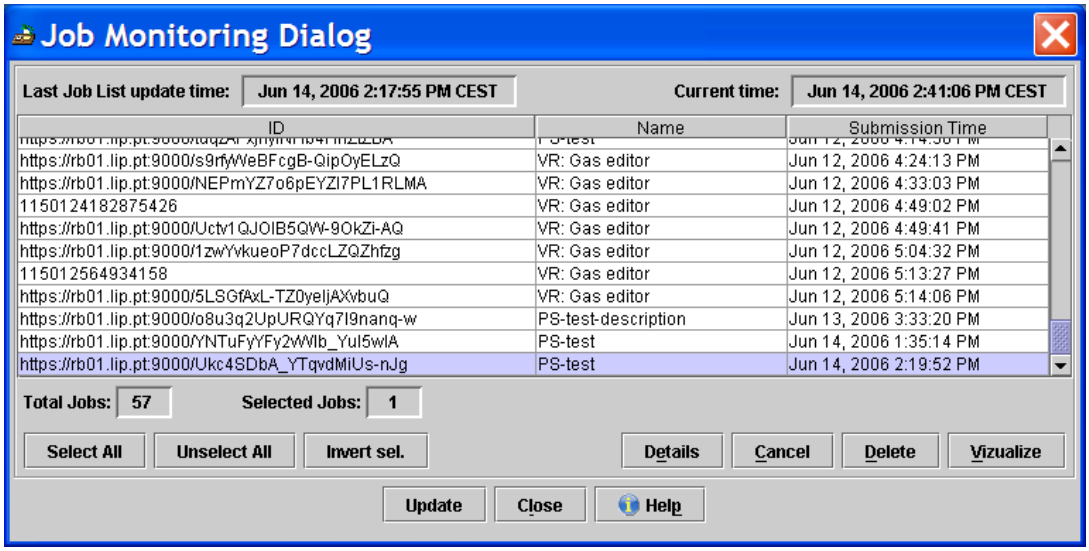


6. Job status and data data vizualization

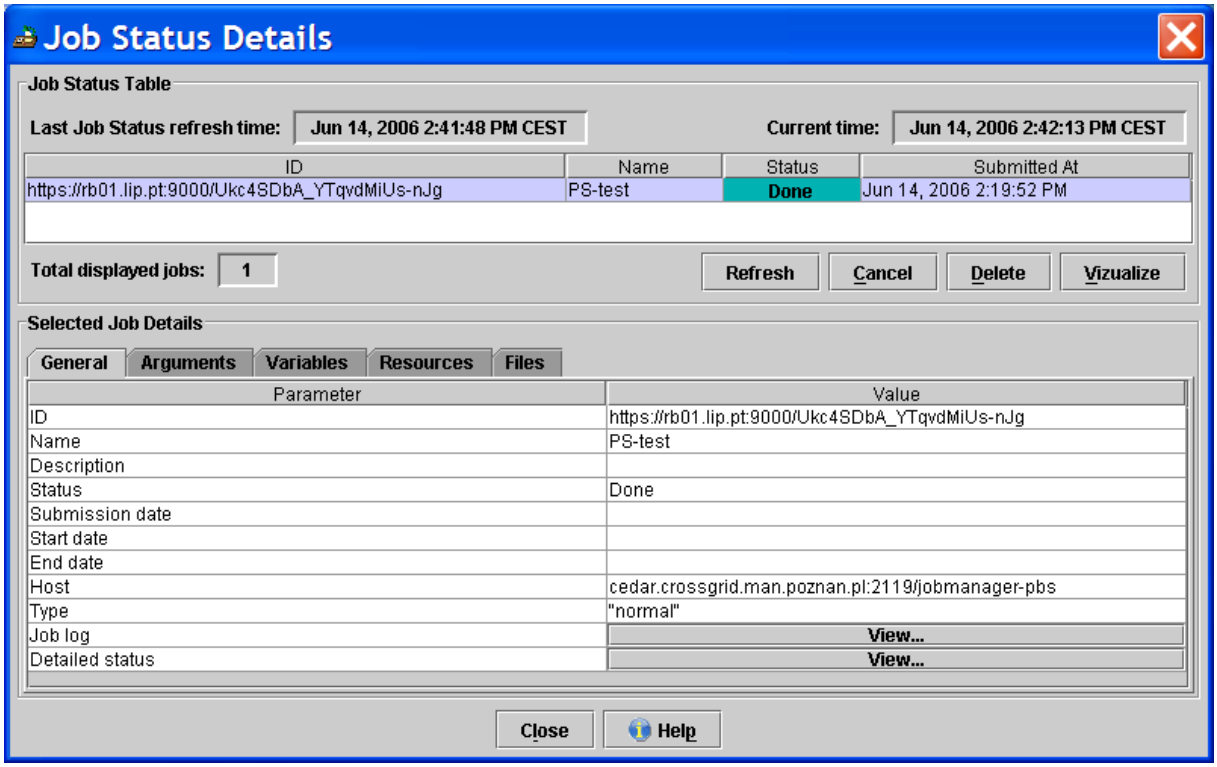
6.1 Checking status of the job

In order to check the job status you have to choose the Job Monitoring dialog from the menu or toolbar. The Job Monitoring dialog is a tool for tracing the status, viewing details, logs and parameters of the previously submitted jobs. This dialog contains all the information about the submitted job (its full description and status embedded in the jobs table)

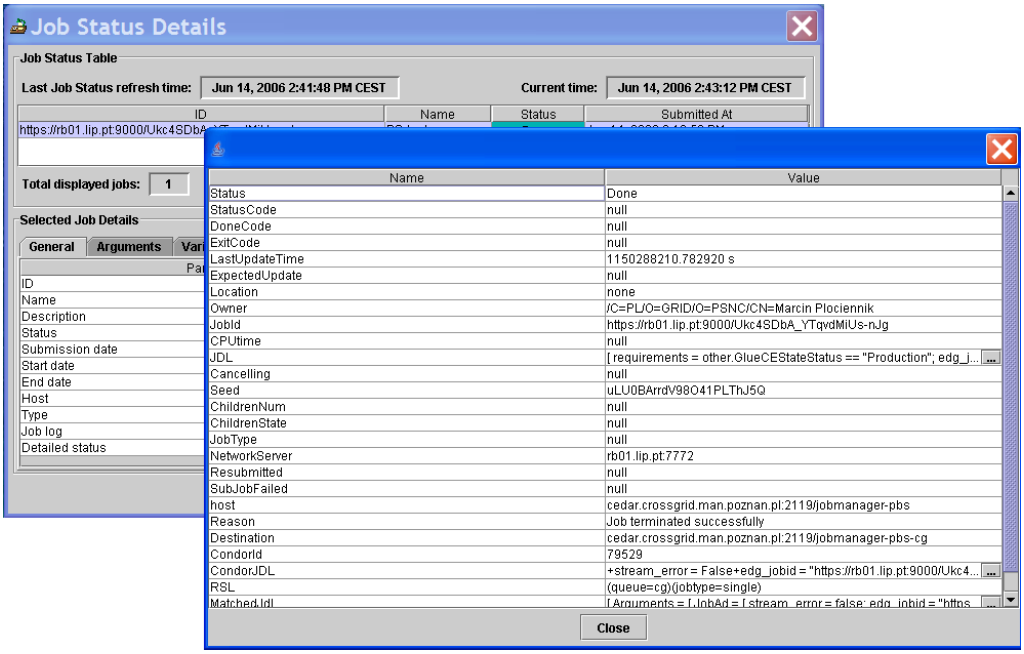
a) Open Monitoring Dialog from toolbar
b) Select your job (one or more) (recognized by id or by more user-friendly field “Name”)



c) Press “Details” button for checking status of the job and other detailed information like submission parameters, files, variables



d) There is also a possibility to check extended details of running jobs basing on information that comes from Logging and Bookkeeping. Press detailed status “View...”

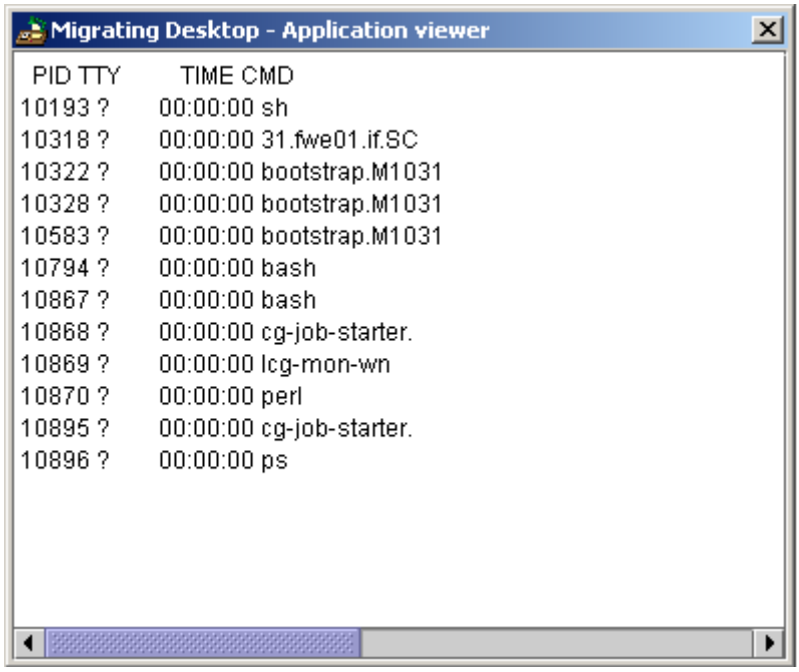


e) In order to check logs of the running job basing on information that comes from Logging and Bookkeeping. Press job log “View...”.

6.2 Visualization of outputs

When the job has been terminated successfully and the job status in the monitoring Dialog is “done”, the user can check the output of the job. It can be visualized if there is an adequate visualization plug-in. There are ready to use predefined plug-ins for the visualization of text file, jpg file, and svg format.

a) If the status of the job has been marked as done, select “files” tab in job monitoring details dialog
b) Select one of the output files (example StdOutput)
c) Press “Visualize”?
d) File viewer will appear with content of the output file

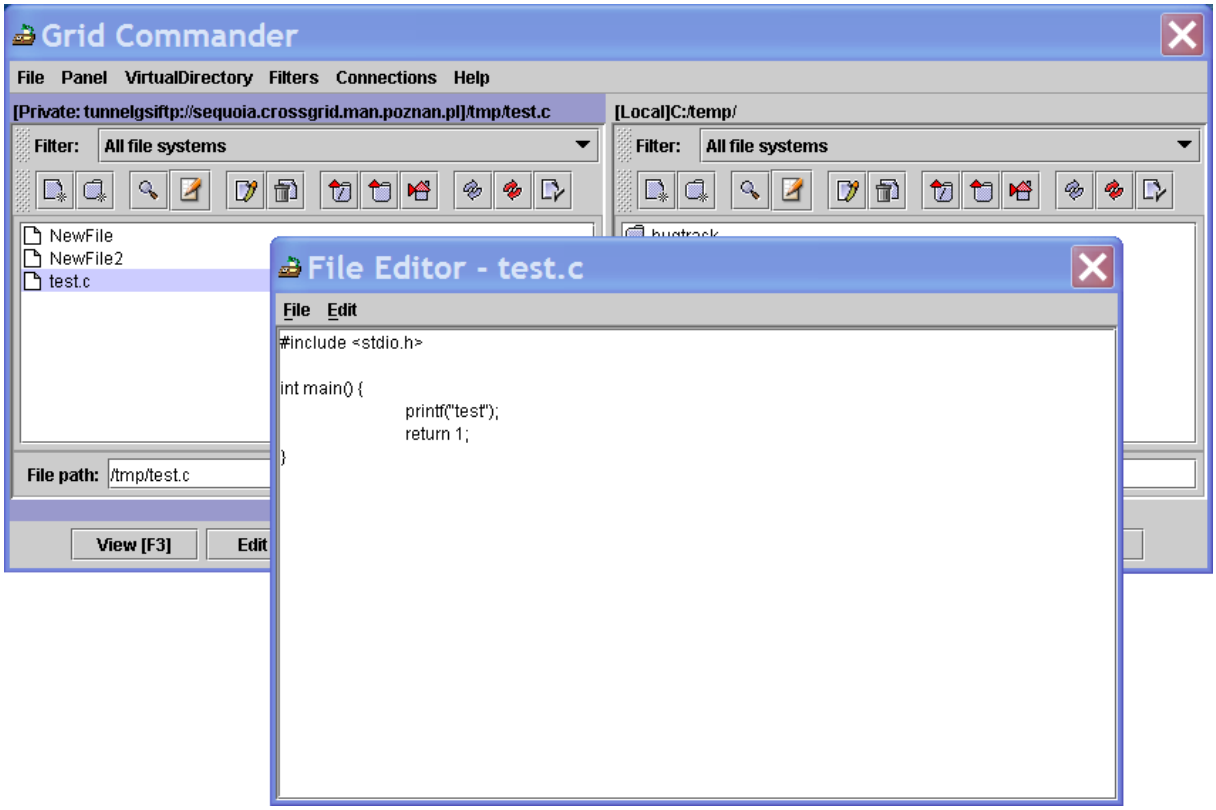


6.3 Running any application using command line plug-in

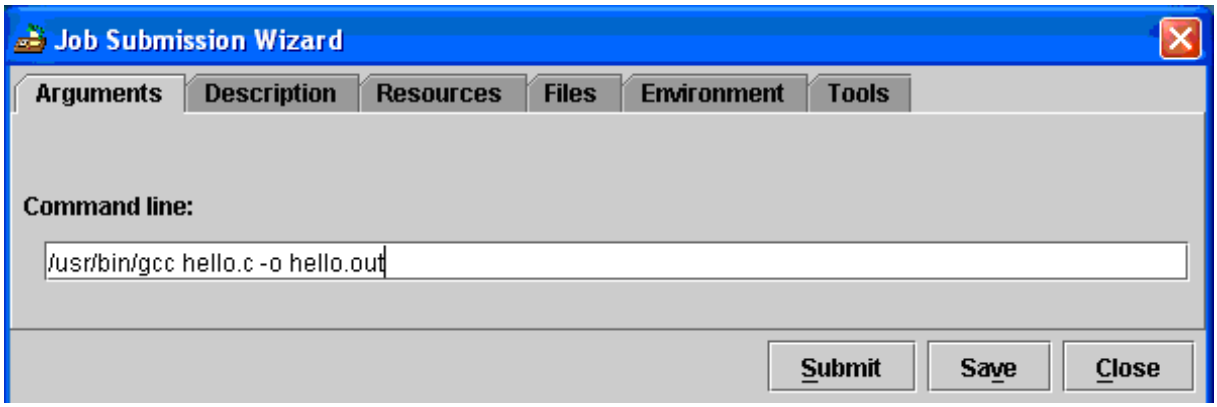
This use case shows how to use ready-to-use command line plug-in provided in default installation of the Migrating Desktop. As an example a sample C program will be written and then compiled using gcc.

Please follow the procedure:

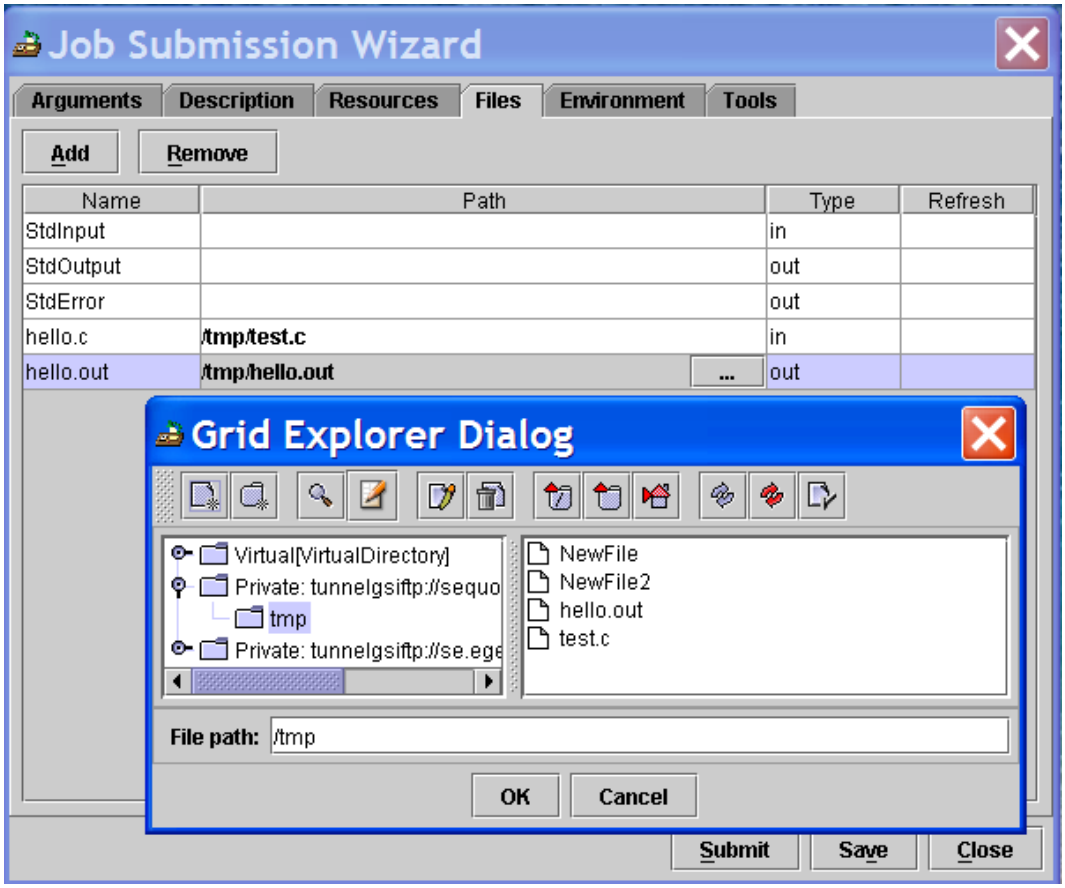
a) Open Grid Commnder
b) In GridFTP create new file
c) Edit file, write simply hello world program in C (example on screenshot)
d) Save this file



e) Open Application Wizard, choose Test->General->Command line
f) In Job Submission Wizard choose arguments tab
g) In command line please type: "/usr/bin/gcc hello.c -o hello.out"



h) choose "files" tab
i) add new item by pressing add, in the column name type "hello.c", choose type as "in", in column "path" browse GridFTP and choose "helloworld.c"

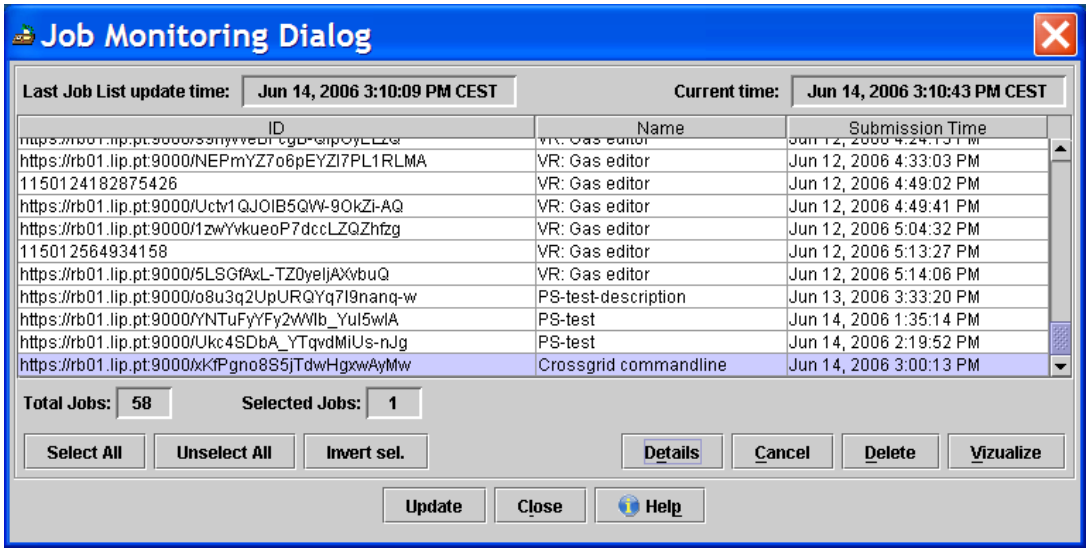


j) add new item by pressing add, in the column name type “hello.out”, choose type as “out”, in column “path” browse GridFTP and choose “helloworld.out”

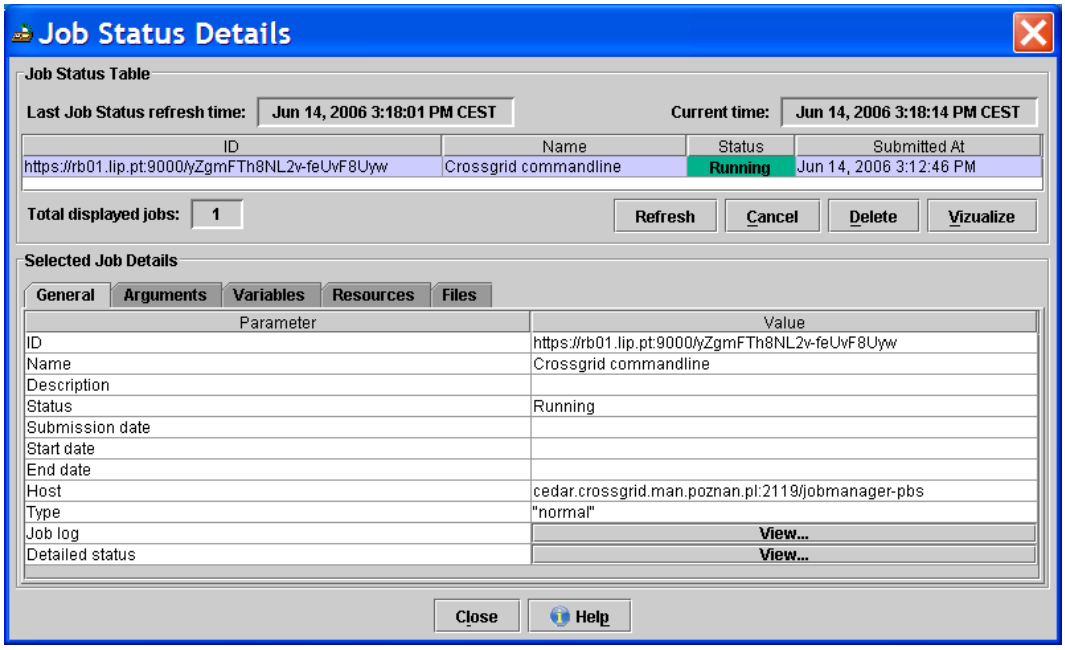
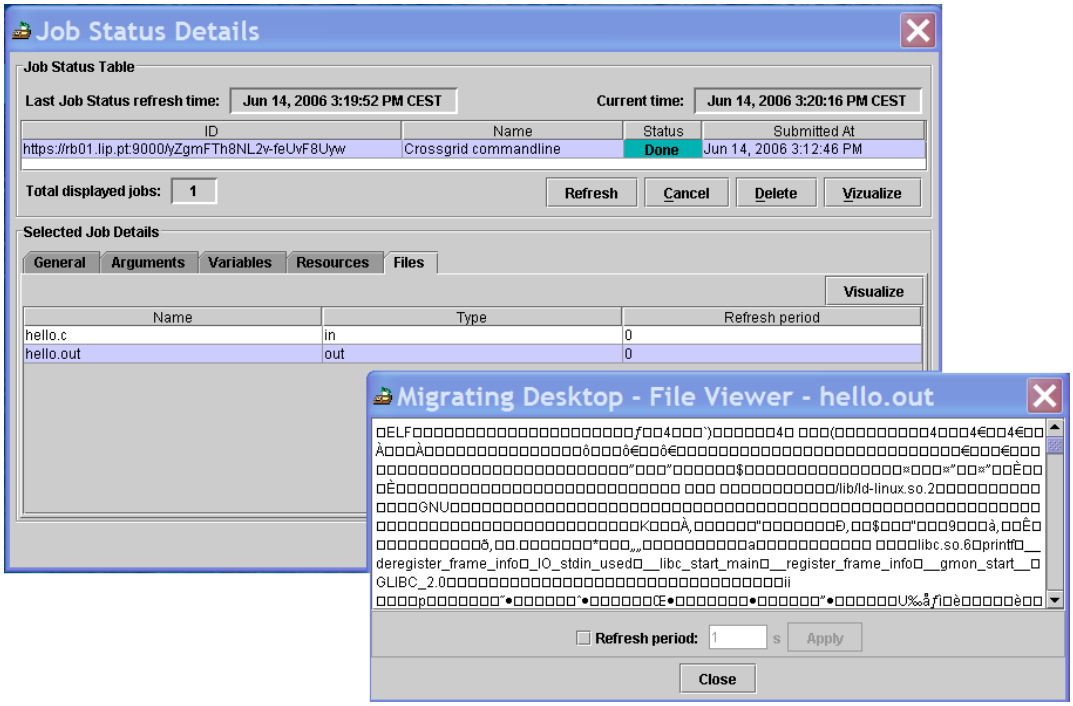
k) submit the job

f) Open Monitoring Dialog from toolbar

g) Select your job



h) Press “Details” button for checking status of the job



i) If the status of the job is done, go to files tab, select hello.out and press visualise