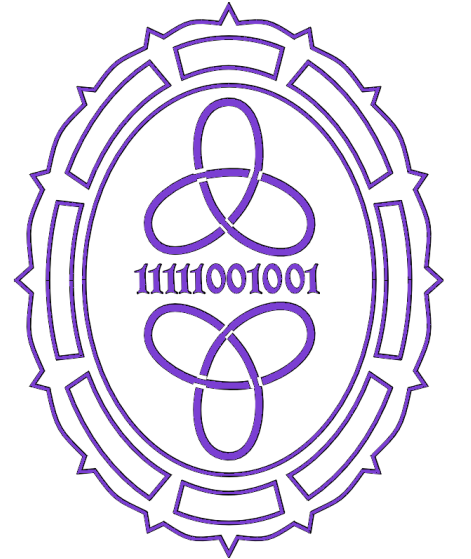# Running local jobs in the UNICORE workflows

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Introduction

Poster presents a gridbean for the UNICORE (Uniform Interface to Computing Resources) which enables to run workflows with local jobs, that is jobs which can be run on the user's computer.

Workflows

Workflows can be seen as analysis pipelines: the output data of the one sub-task may be the input for other jobs. That is why they are used for multi-stage research in many scientific disciplines like biology, chemistry or physics.

There exists many grid workflow systems such as Taverna, Kepler or Triana. They may differ, for example, on workflow structure, composition system, architecture of scheduling.

Workflows in the UNICORE

One of the most important feature of the UNICORE middleware is the ability to build and run workflows. The Unicore Rich Client allows users to design workflows in a graphical way. UNICORE Workflow Engine translates a workflow description into the set of single jobs which are run in the specific order. For finding the most suitable sites for particular tasks the UNICORE Service Orchestrator is used. It also monitors states of the execution.
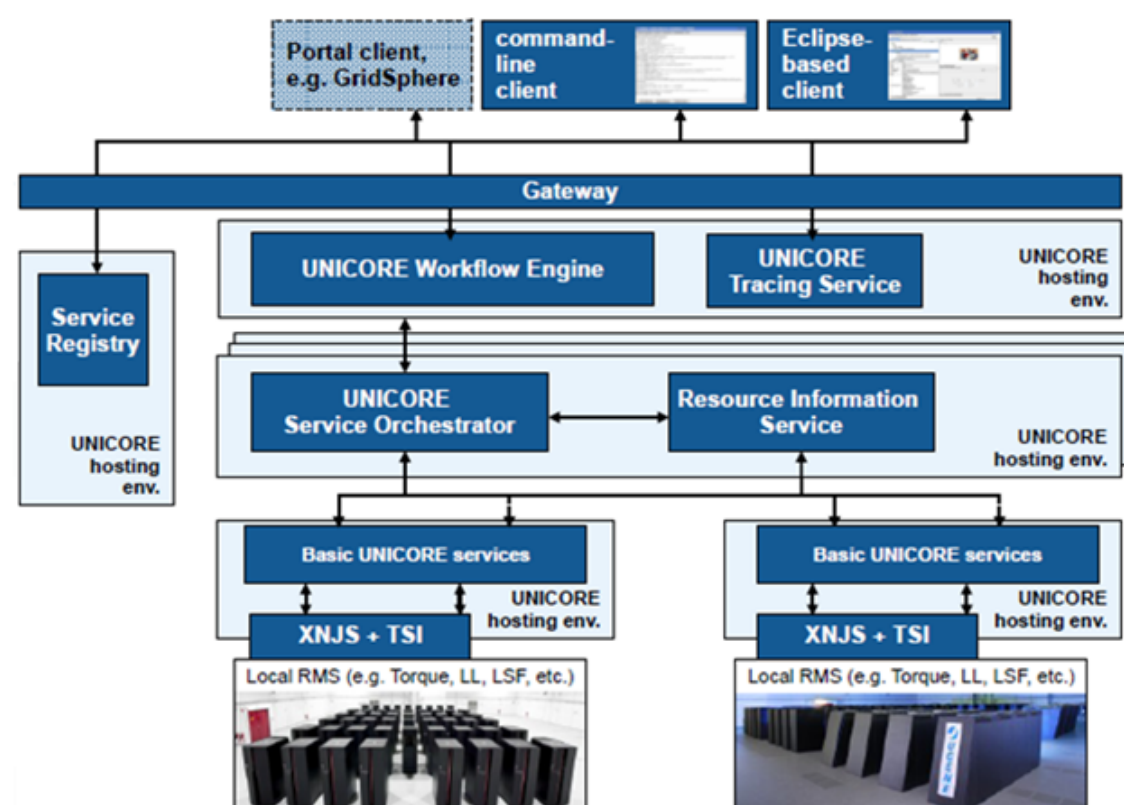

Figure 1: *Workflow architecture: www.unicore.eu*

Motivation

Subtasks of the workflow can be run on different target systems. However, some needed applications may be very specific and may not be available on the Grid, for example interactive graphical tools. In that situation user can execute a program on his own computer by downloading the necessary data, running the application locally and then uploading the results. Such scenario demands to run two separate workflows: one before and one after running the program on the computer.

Local gridbean

The gridbean for local jobs makes it easier to run this kind of tasks as a part of the workflow allowing also user interaction. After the local subtask is started, all indicated files are moved to the local job directory and the application can be launched on the user's computer. When the program is successfully completed, the output files are uploaded to the job directory and the following subtask can be started by the Workflow Engine. To work in such a way, the site configuration had to be slightly adopted, which points out needed changes to

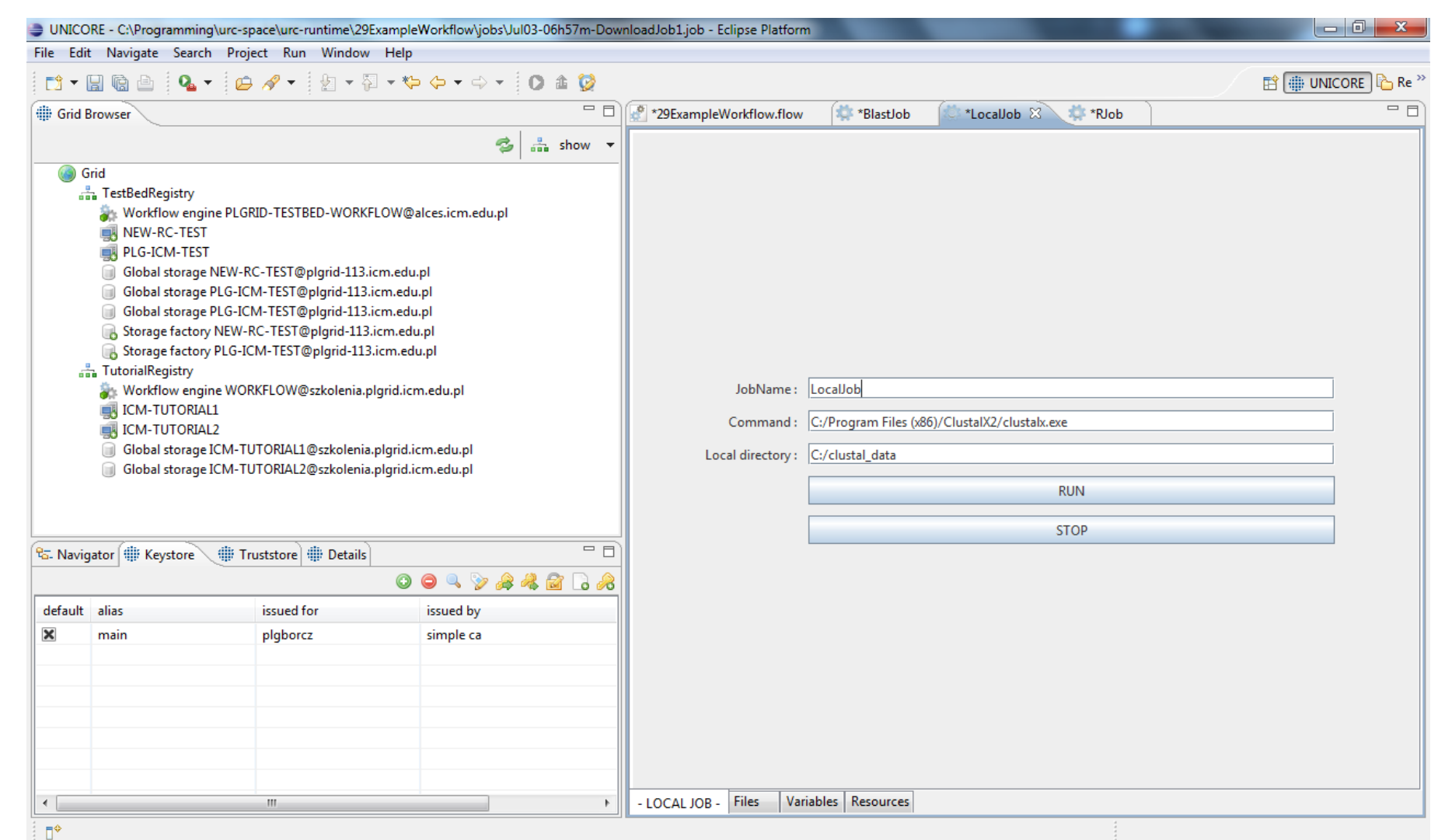fully support interactive workflows by the UNICORE Workflow System.

Figure 2: *Local gridbean panel*

Example

An example of a workflow using local task can be a multi-stage job, which starts with the Blast application. After the program is finished, user can choose appropriate sequences from the output file and run the graphical ClustalX application on his computer to align them. Finally, results are statistically processed by the R program.
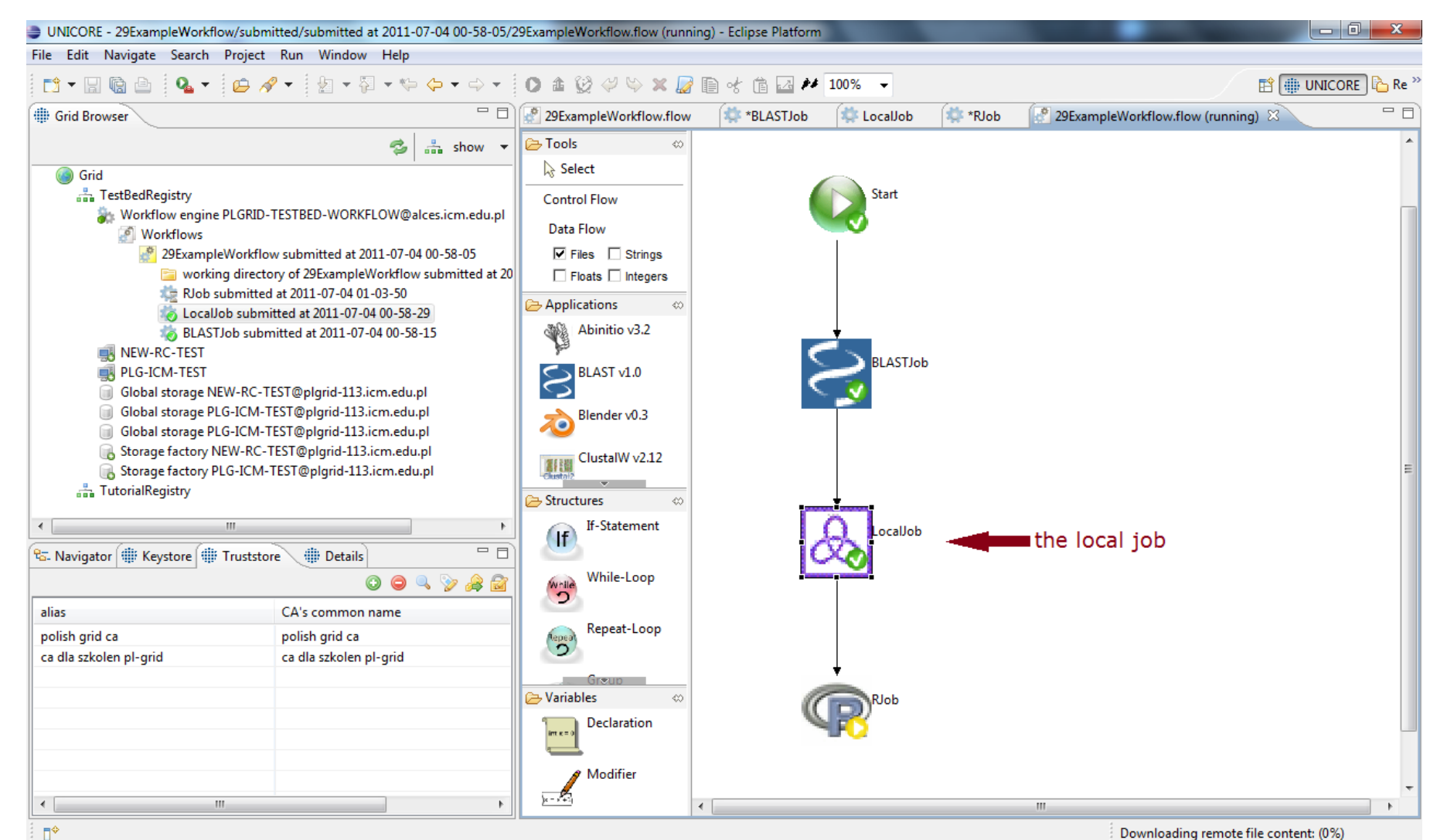

Figure 3: *Example of the workflow with local job*

References

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[3] Foster, I., Kesselman, C. (1999) The Grid: Blueprint for a New Computing Infrastructure. Morgan Kaufmann Publishers.

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