

Parameter study practical with the P-GRADE Portal

Turn an existing workflow into parameter study and execute it

This practical demonstrates the parameter study services of P-GRADE Portal. It is assumed that you finished the development of the Matrix multiplication workflow as it is described on the Workflow hands-on exercise sheet.

Use the same portal and the same portal user account that you did for the workflow hands-on.

The “Multiply” workflow is able to multiply two matrixes: $INPUT1 * INPUT2$. What we need now are 10 matrix multiplications: $INPUT1_{version1} * INPUT2$; $INPUT1_{version2} * INPUT2$; $INPUT1_{version3} * INPUT2$, ... For this purpose a copy of the Multiply workflow has to be turned into a parameter study.

3.1 Open the Multiply workflow in the workflow editor and save it as a different workflow:

Workflow menu → Save as → MultiplyPS

3.2 Extend the workflow with an auto input generator and configure it for PS execution

Switch Port 0 of the multiplier job to “PS” by right clicking on the Port.

Add a new job to the workflow and turn it first to a “generator” by right clicking on the component then into an “automatic” by another right click.

3.2.1 Set the main properties of the generator:

Job name: Matrix1Gen
Input file text:

```

3 3
1 2 3
4 5 6
7 8 <Y>

```

Click on “**Parse**”, then double click on “**Y**” in the “Keys” window

Set the range values:

```

From: 9
To: 21
By: 3

```

Click on “**Generate**” → Parameter space is displayed in “Generated items”

Close the Parameter key definition window by clicking the OK button.

3.2.2 Set the properties of the PS output port of the generator:

Double click on the output port of the generator job.

Set Directory to

`/grid/hungrid/userXX/MatrixPS/GeneratedInputs`

(Do not add “/” to the end of the pathname! **XX** still means your student number)

Set internal file name: Matrix1

Close the port property window by clicking the OK button.

3.3 Set the Parameter properties of the workflow

Open the PS property window in the “Workflow” menu of the editor. Set the following:

Output Directory: `/grid/hungrid/userXX/MatrixPS/Results`
 (Do not put a “/” to the end of the directory name!)
Grid: `< hungrid_GLITE_BROKER >`
LCG Catalog Type: `lfc` (EGEE specific setting)
LFC Host: `grid155.kfki.hu` (VO specific setting)
SE: write the same Storage Element name that you chose above.

3.4 Connect the output port of the generator to the PS input of the Matrix job

3.5 Open the property window of the generator. Click on the “Attributes Editor” button. Set the following:

Click on the **Output Data** tab:
 Define an **Output SE** at the bottom of the window to :

grid143.kfki.hu

Other Storage Elements can be selected by:

- Browsing the Information system portlet in P-GRADE Portal for Storage Elements

(OR it could be obtained by executing the “`lcg-infosites --vo hungrid se`” command on the User Interface machine of GILDA)

Close the attributes editor window by clicking the OK button.

Close the Properties window by clicking the OK button.

3.6 Define a new job, set to Collector and adjust the following parameters:

Name: Collector
 Job type: SEQ
 Job executable: local path of the previously downloaded collector_output.sh file
 Grid: hungrid_GLITE_BROKER

3.7 Define a new port for this job and connect it to port 2 of job Multiply and set the following parameter to this port:

Internal File Name (case sensitive): output

3.8 Define a new port for this job with the following parameters:

Port Name: 1
 Type: Out
 File type: Local
 Internal File Name (case sensitive): output.outs
 File Storage Type : Permanent.

Save and submit the workflow. Monitor and visualize the progress of execution.

Notice the difference in the Workflow portlet for normal and PS workflows: generators and real jobs are separated. (Collectors too but currently we do not have any.)

Check the existence of the generated parameter files and the result files using the File Management portlet:

- Open the File Management portlet
- Set “Select Grid” listbox to hungrid, then click on View in the same line
- Set “Select VO” listbox to hungrid, then click on View in the same line

- Select grid155.kfki.hu LFC host and click on List
- Be patient, then navigate into the **userXX** directory with the “File Browser” and the “Change Directory” buttons.
- Navigate into the
 - **MatrixPS/GeneratedInputs** directory to see the generated input matrixes
 - **MatrixPS/Results** directory where the final output files are saved

3.8 Download and unzip the result files or download the final output file that is compressed by the Collector job.