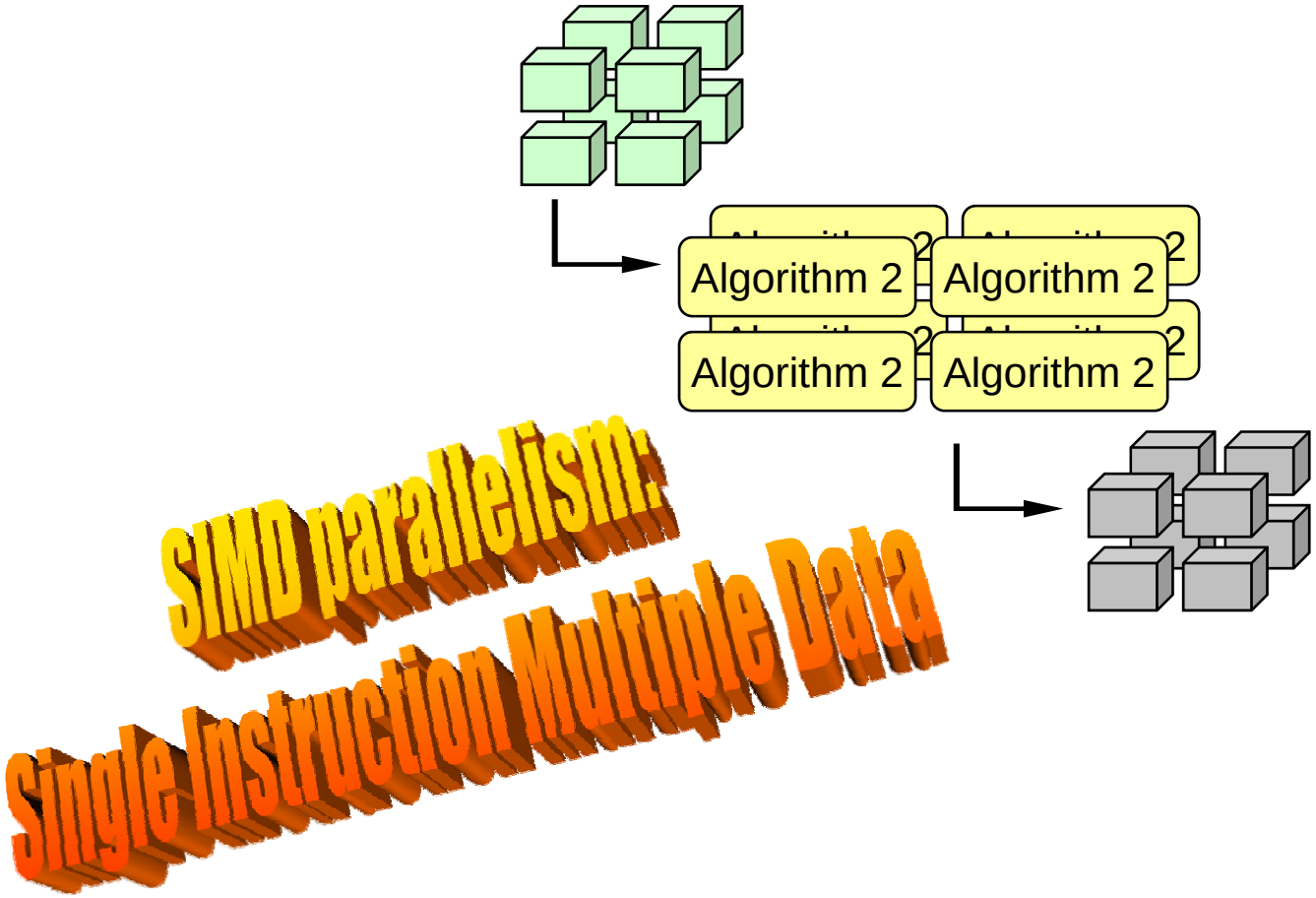
Support for parameter study applications in the P-GRADE Portal

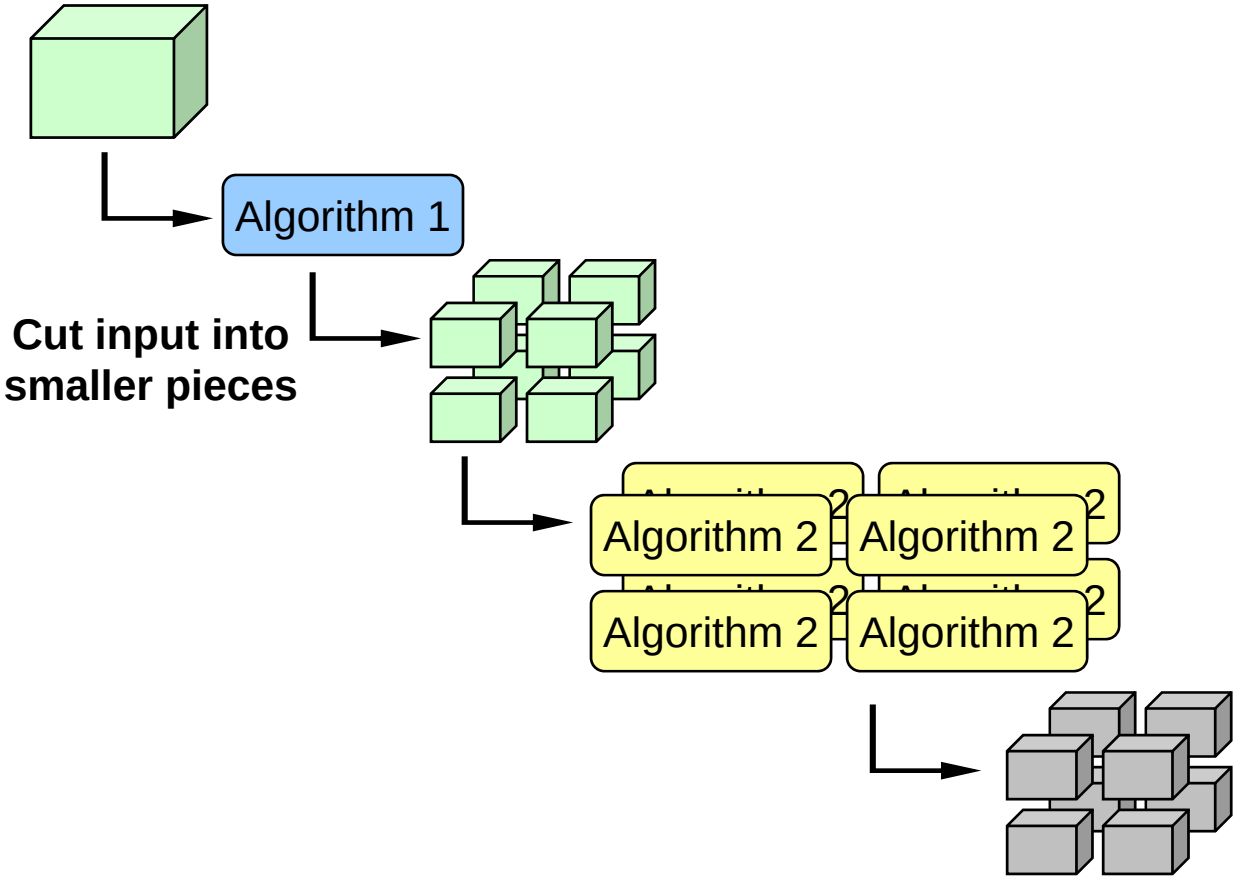
Gergely Sipos
sipos@sztaki.hu

MTA SZTAKI (Hungarian Academy of Sciences)

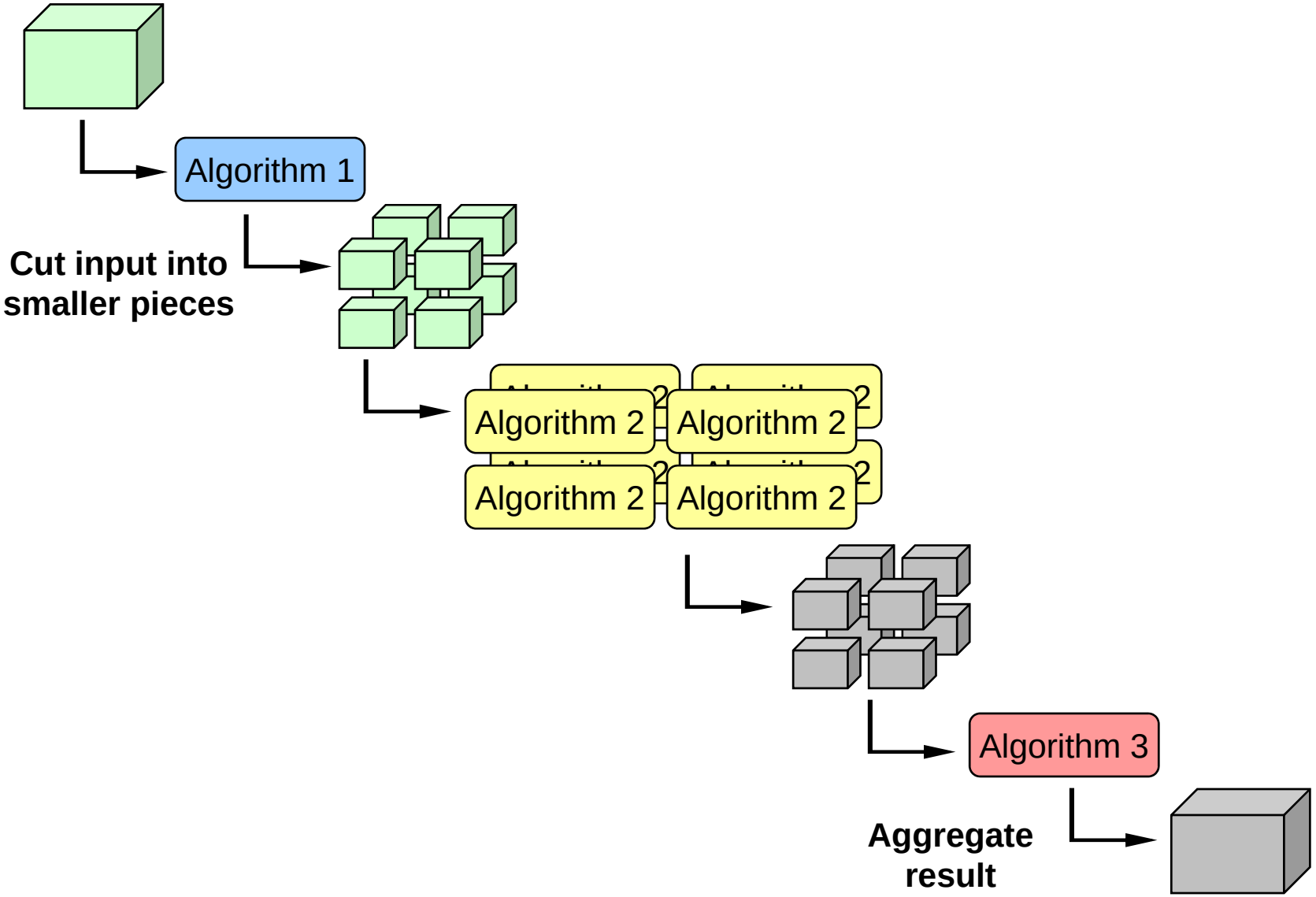
General structure of a PS applications



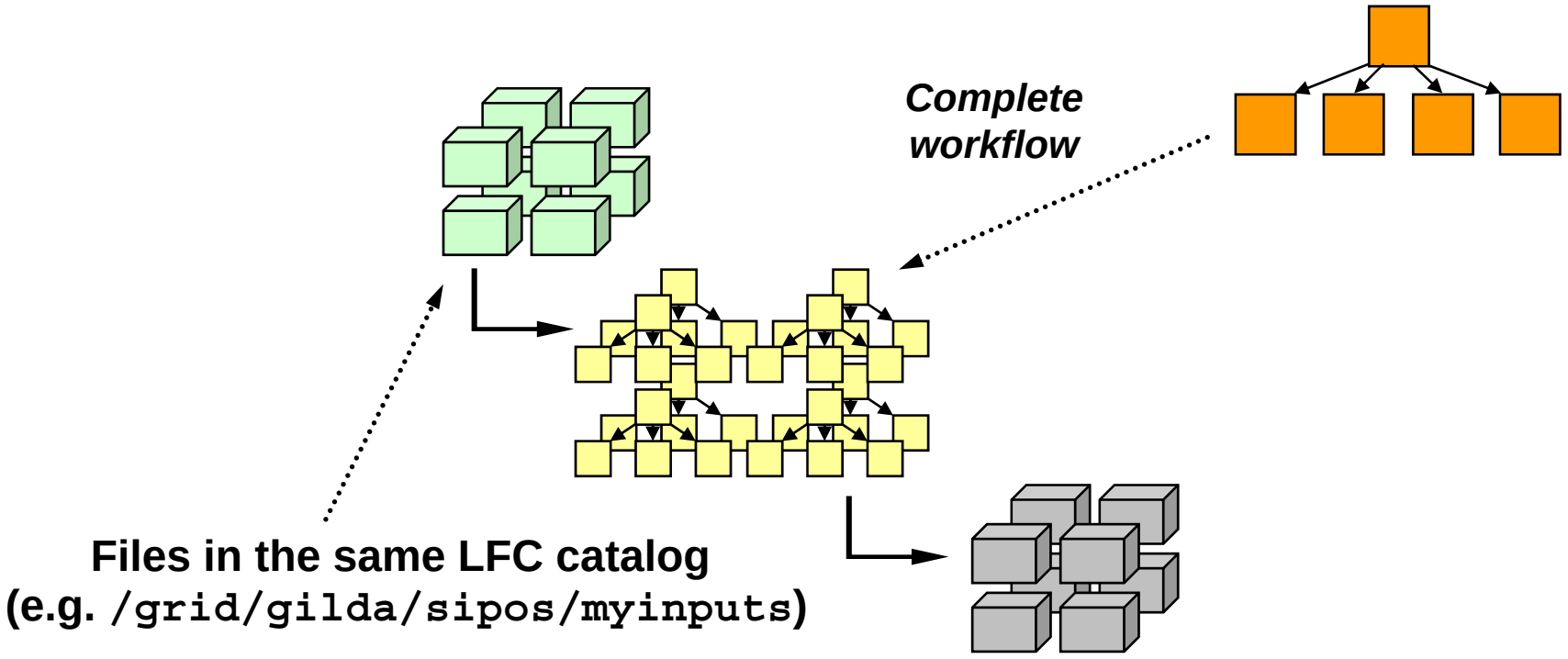
Advanced PS applications



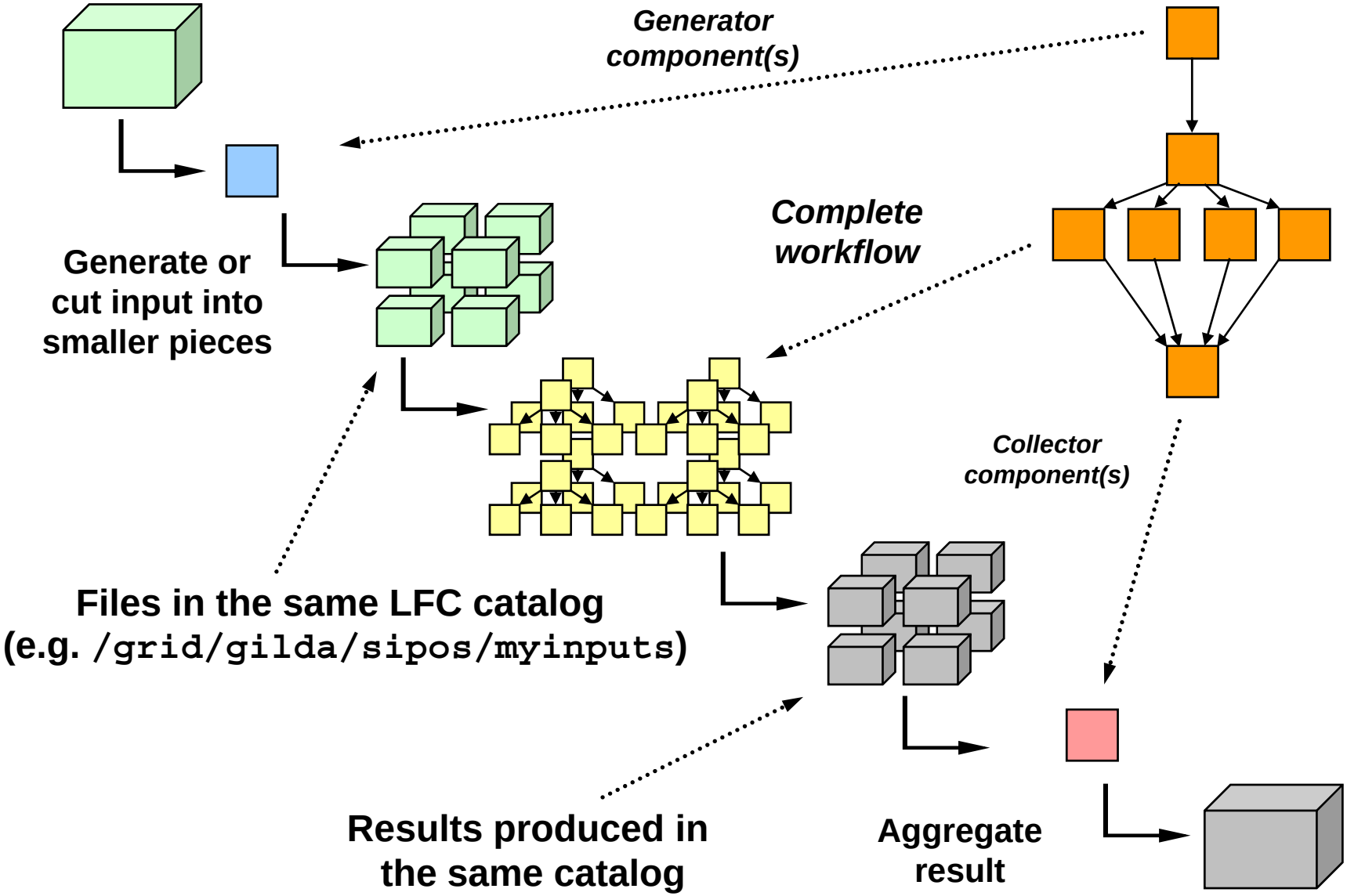
Advanced PS applications



PS applications in P-GRADE Portal 2.5



Advanced PS applications in P-GRADE Portal 2.5

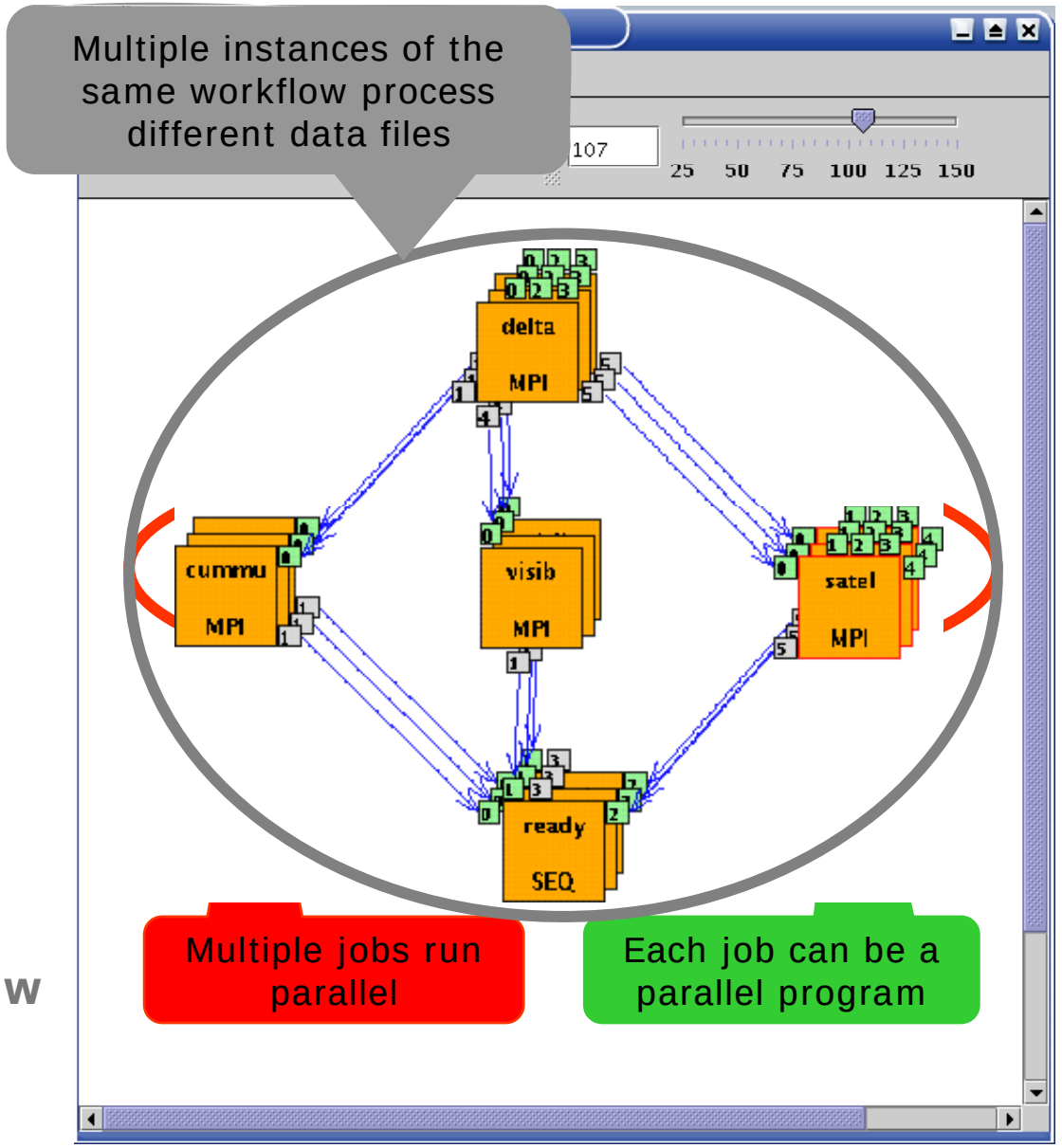


Third level of parallelism

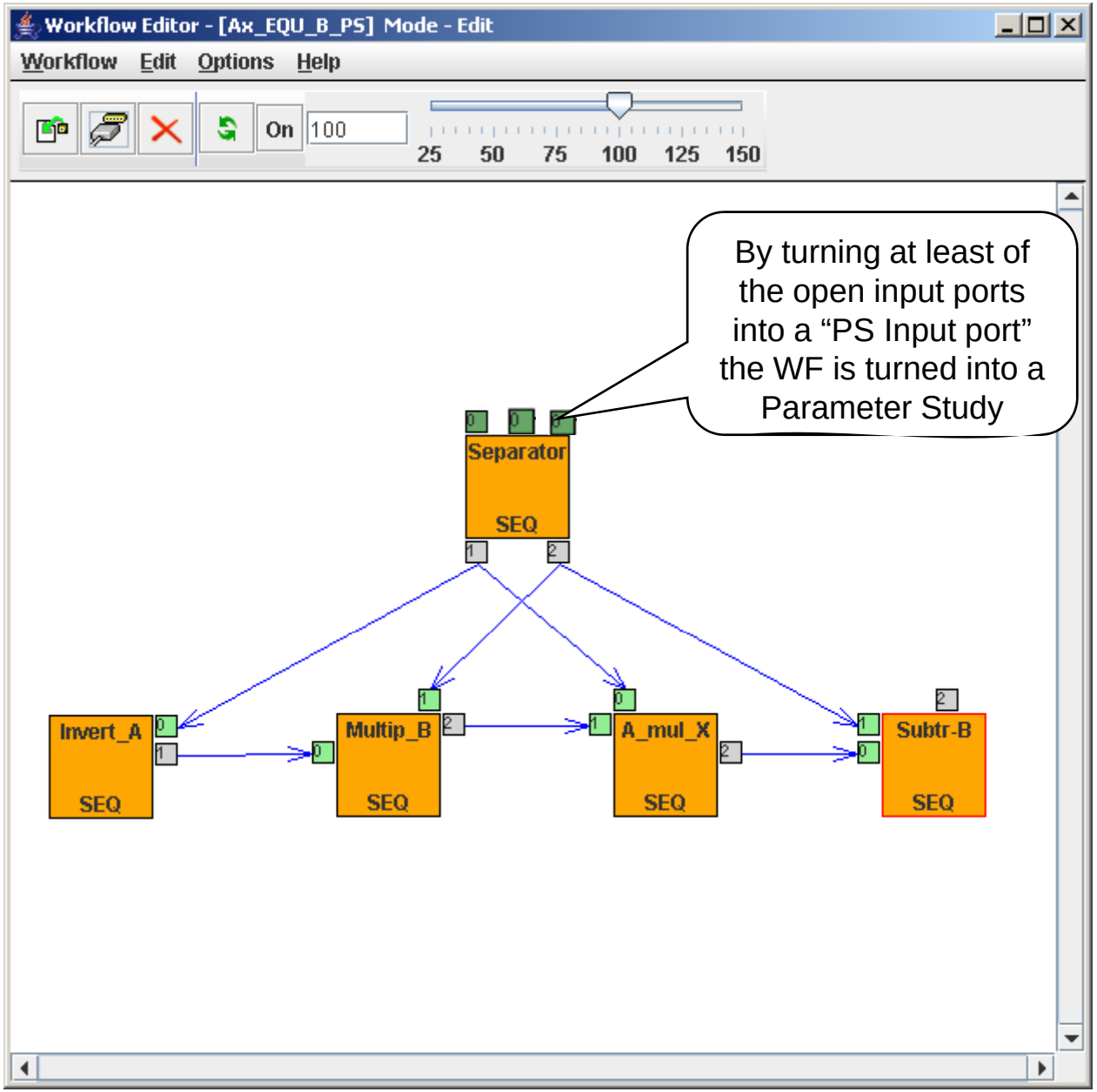
– **Parallel execution inside a workflow node (SIMD/MIMD/MISD)**

– **Parallel execution among workflow nodes (SIMD/MIMD/MISD)**

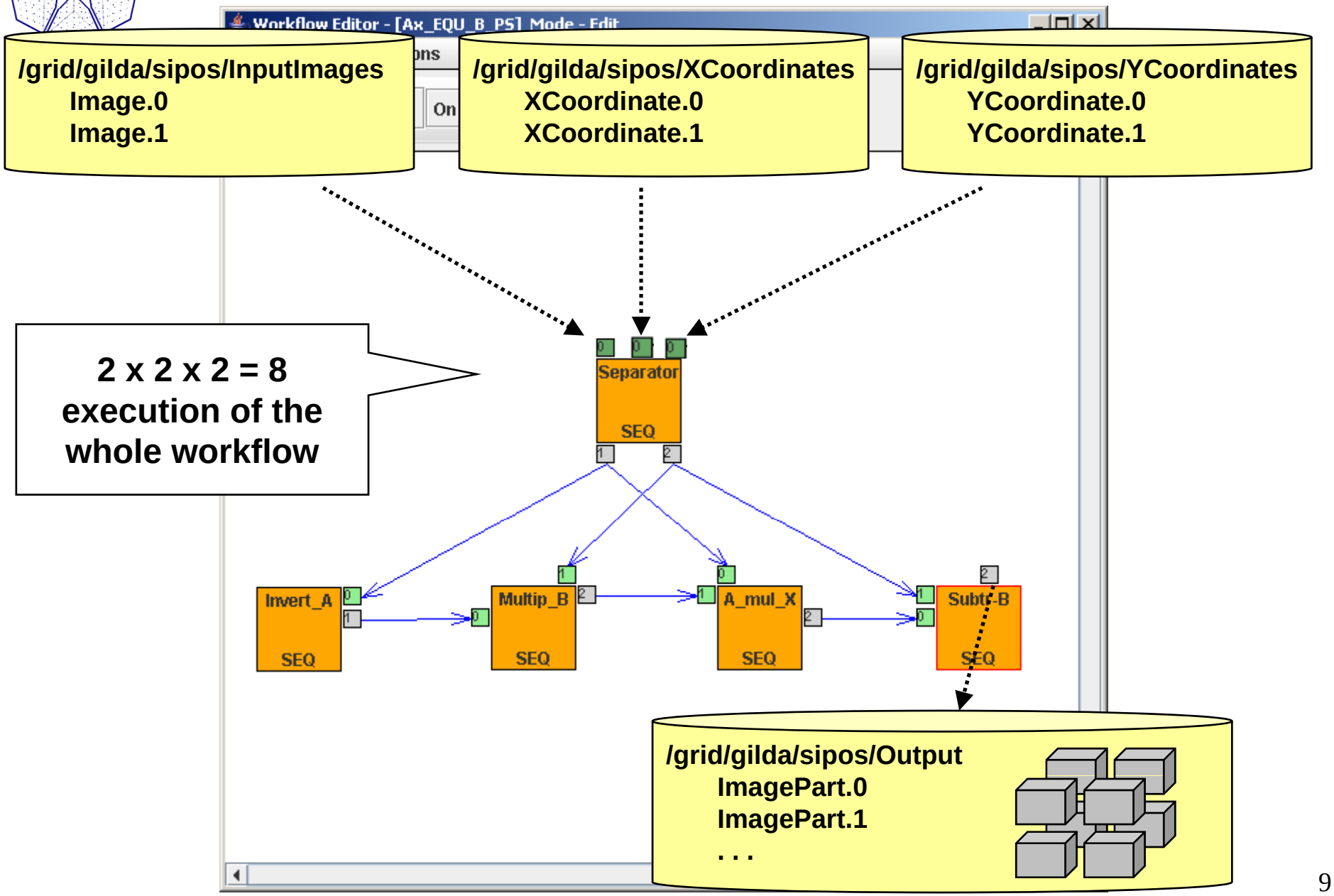
– **Parameter study execution of the workflow (SIMD)**



Turning a WF into a parameter study

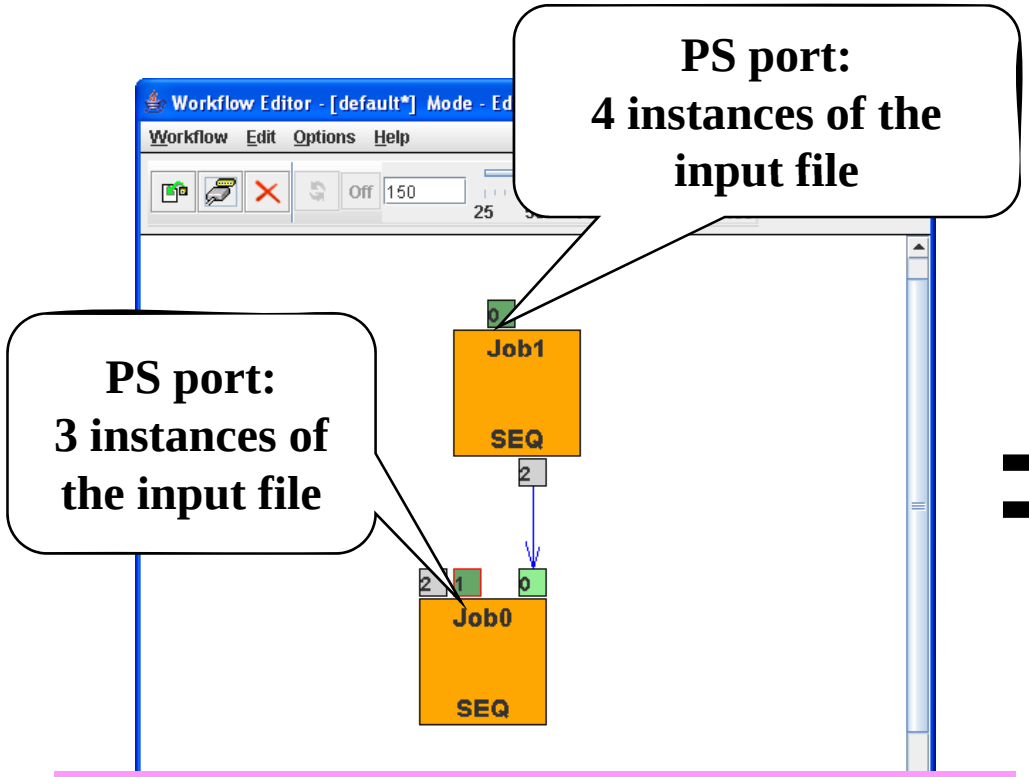


Turning a WF into a parameter study



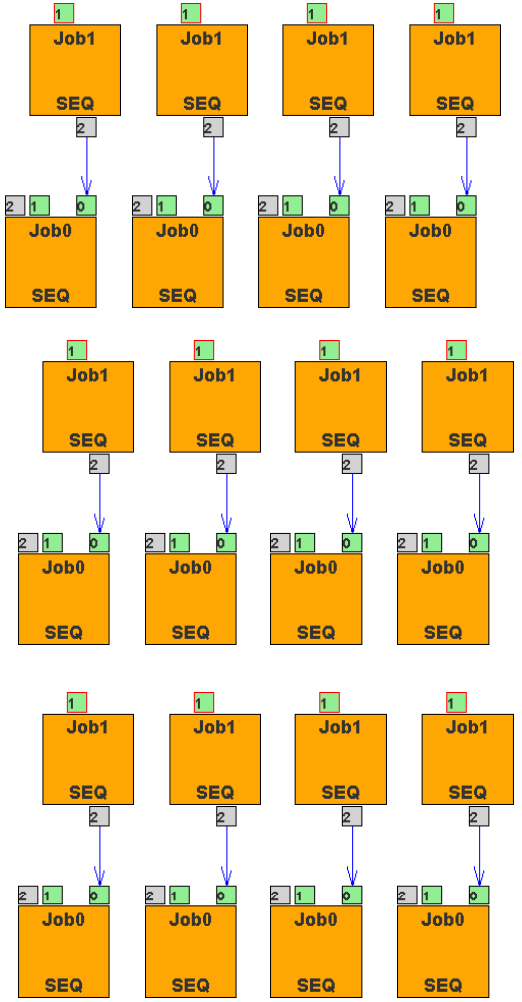
Parameter sweep (PS) workflows

1 PS workflow execution

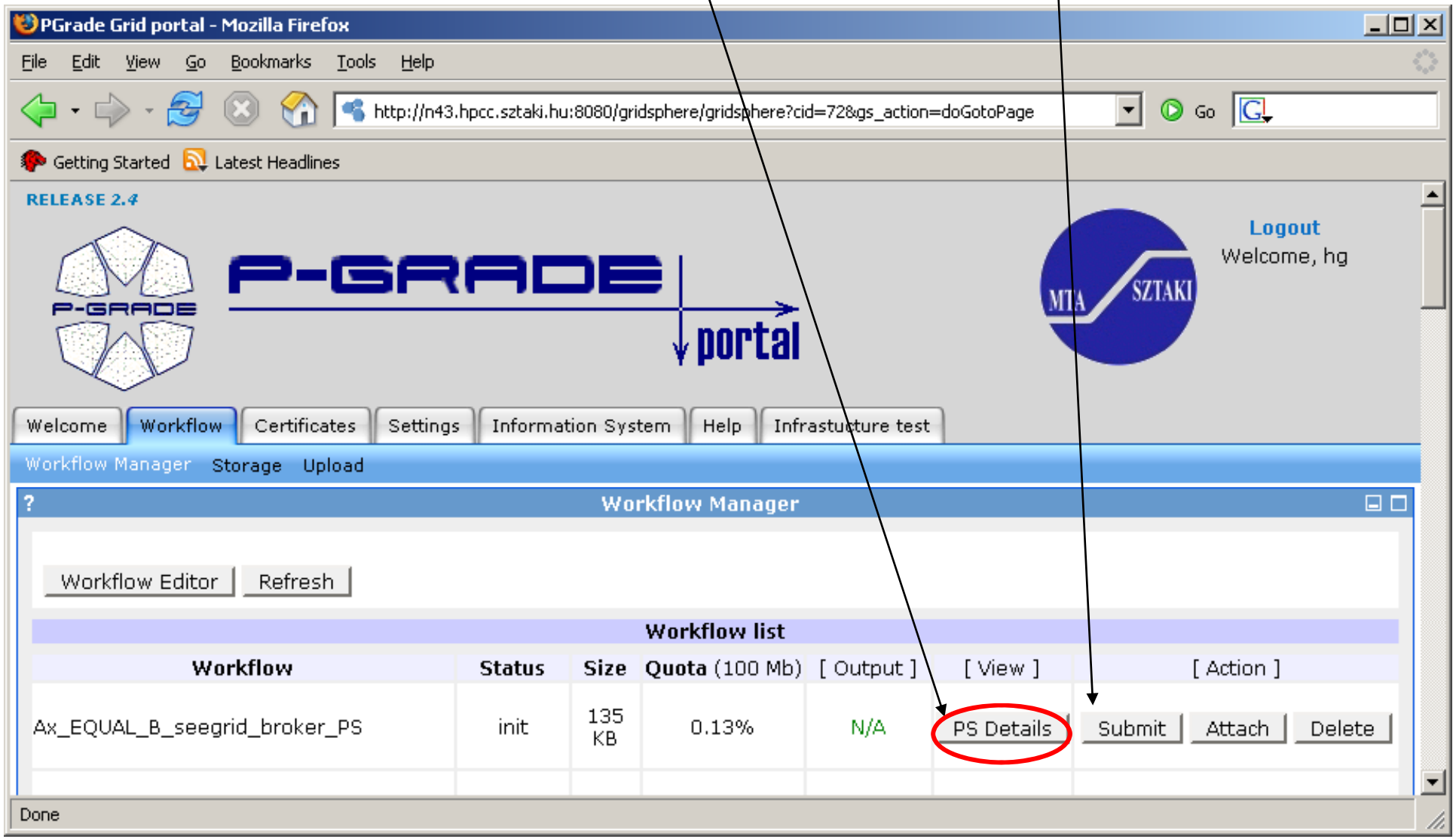


This provides the 3rd level of parallelism resulting a very large demand for Grid resources

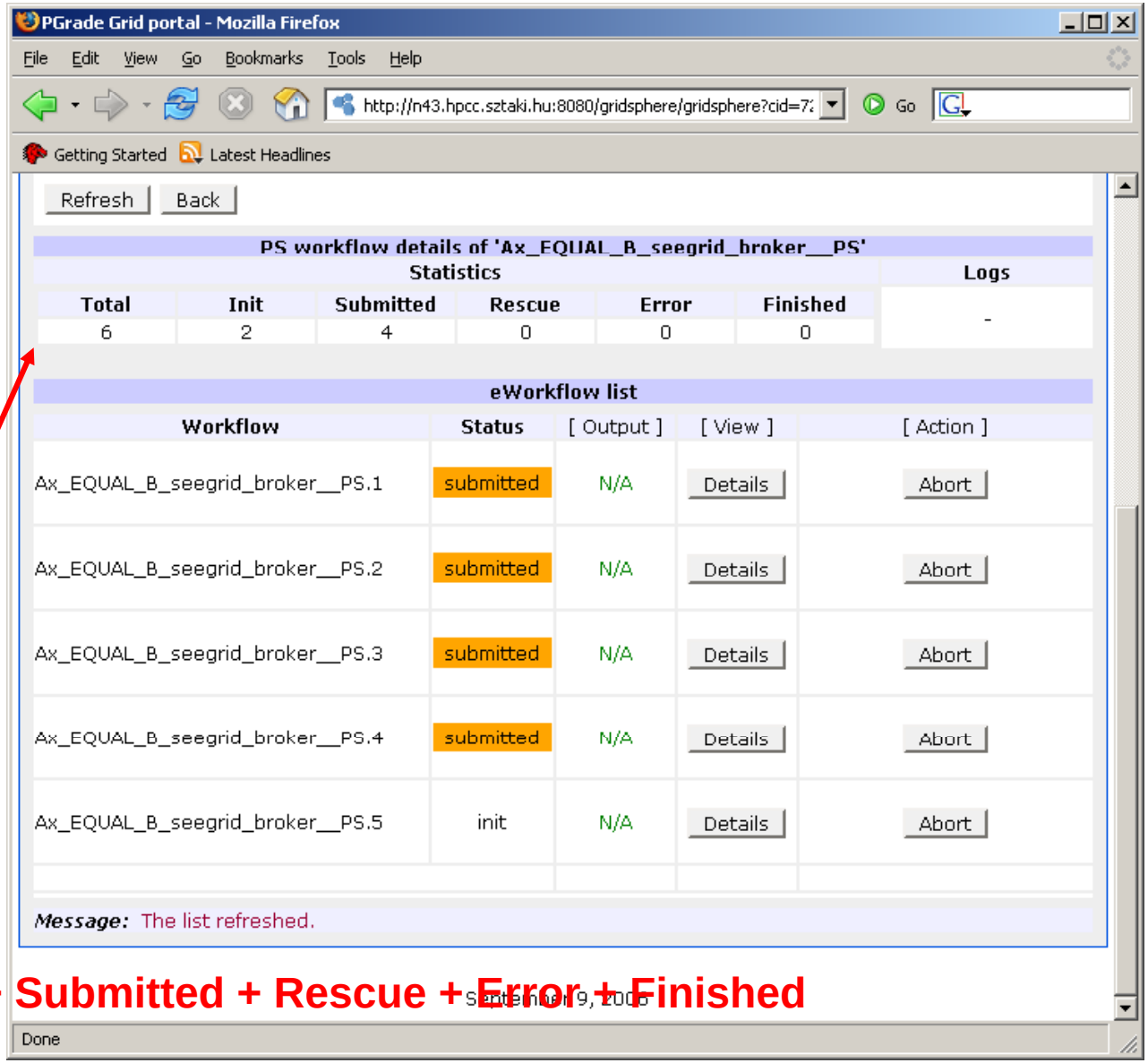
4 x 3 normal workflow execution



PS Workflow execution



PS workflow detailed view - eWorkflows



Total = Init + Submitted + Rescue + Error + Finished

Generators

- Generate input files for parameter study workflows
- Saves these files on SEs, register them with LFNs into the LFC catalog

Auto generator

- Pre defined program logic (static binary)
- Generates text files
- User can control text file content by templates and patterns

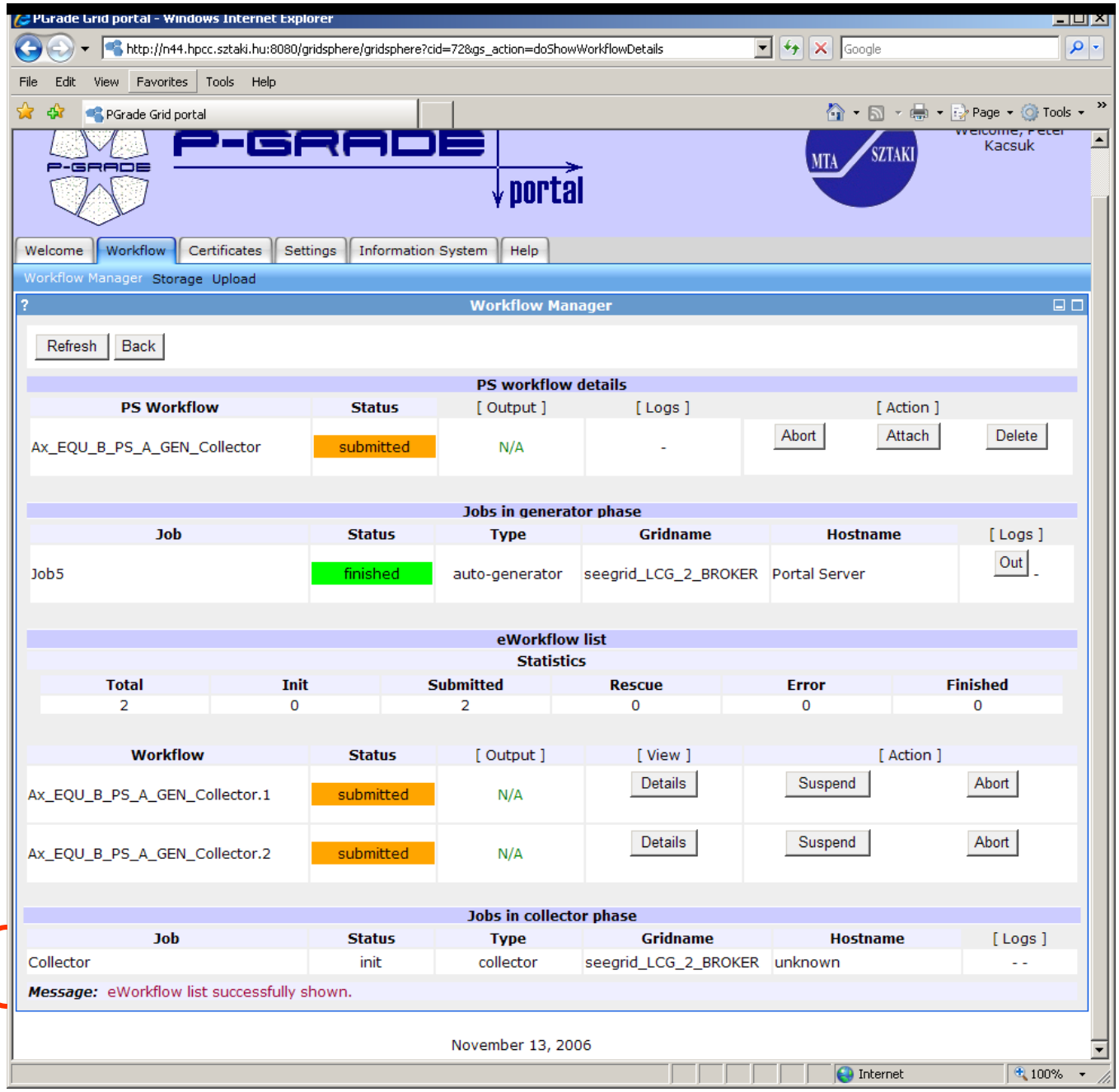
Custom generator

- User provides generator program logic
- Useful to generate binary content (e.g. image files, audio files, …)

Collector

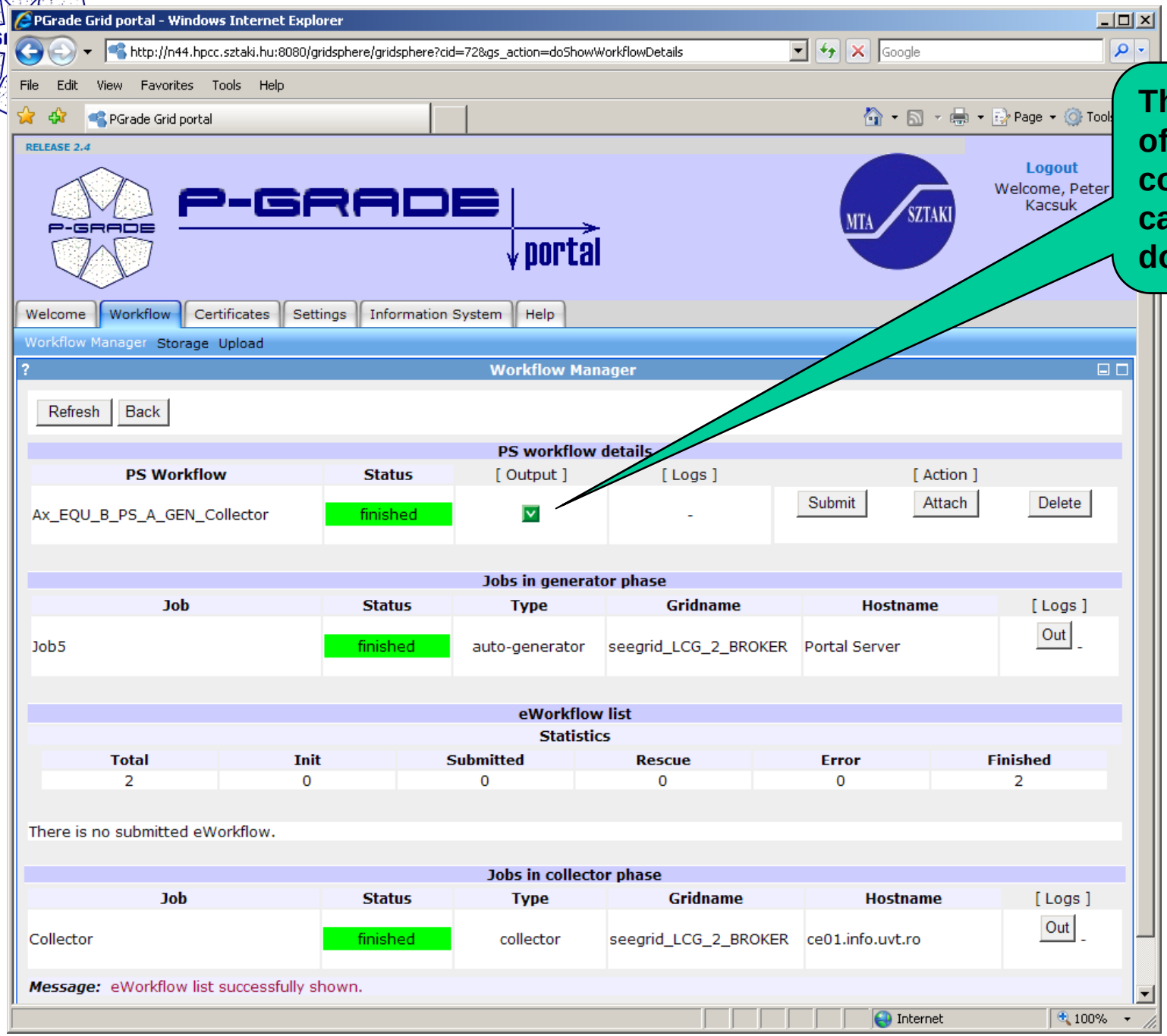
- Collects output files and perform collective operation on them. E.g.
  - Standard deviation
  - Average
  - Statistics
  - Evaluation and find the “best” result
  - …
- User provides the program logic
- Portal provides data transfer
  - Refer in your code to input files as local files
  - No need to use any Grid API in your code

Workflow Management Window showing Generator and Collector



Collector phase is inactive until each eWorkflow has terminated

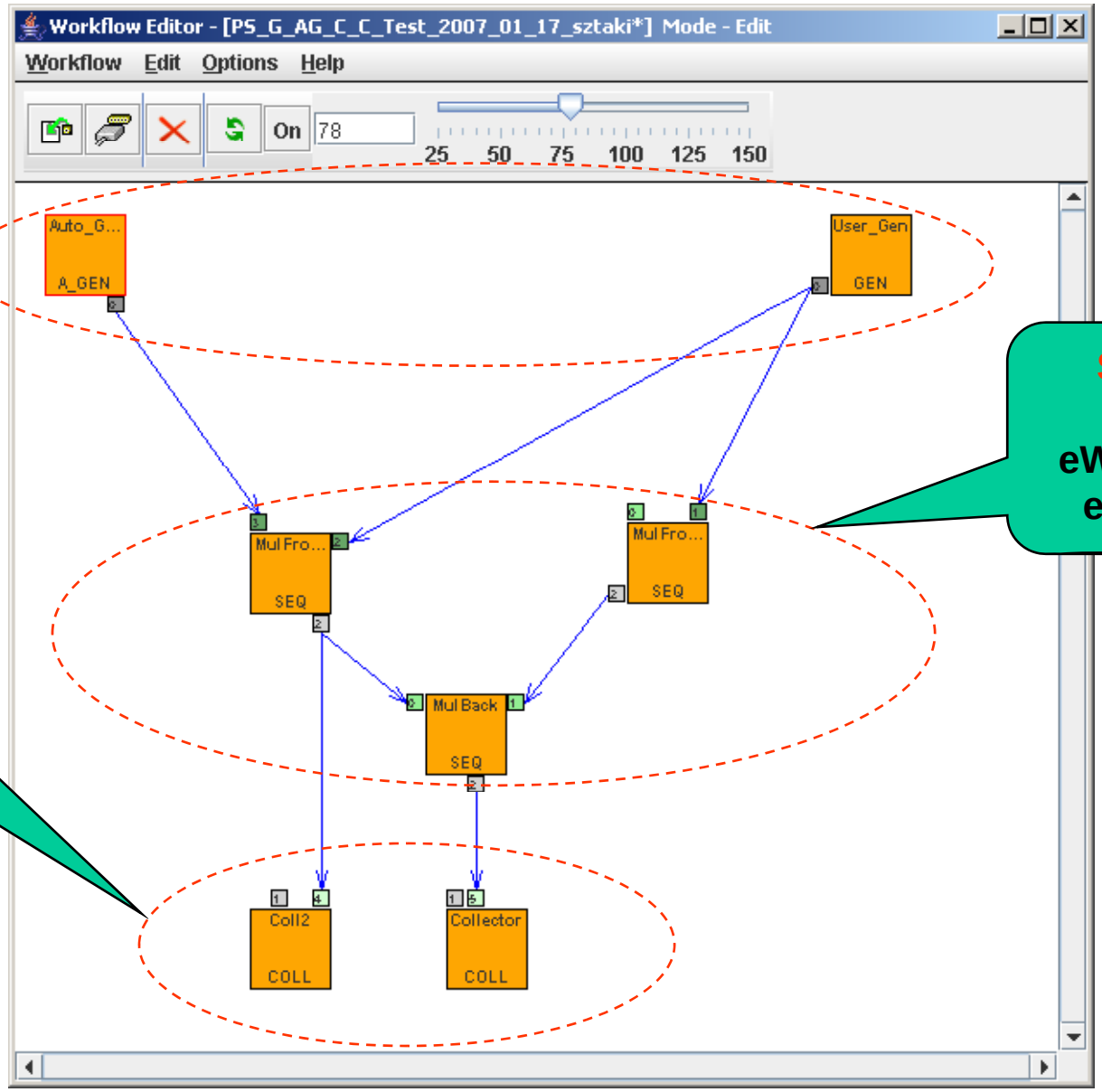
Workflow Management Window showing terminated Generator and Collector



The Output(s) of the collector(s) can be downloaded.

The generic PS workflow application

First phase: Generators executed



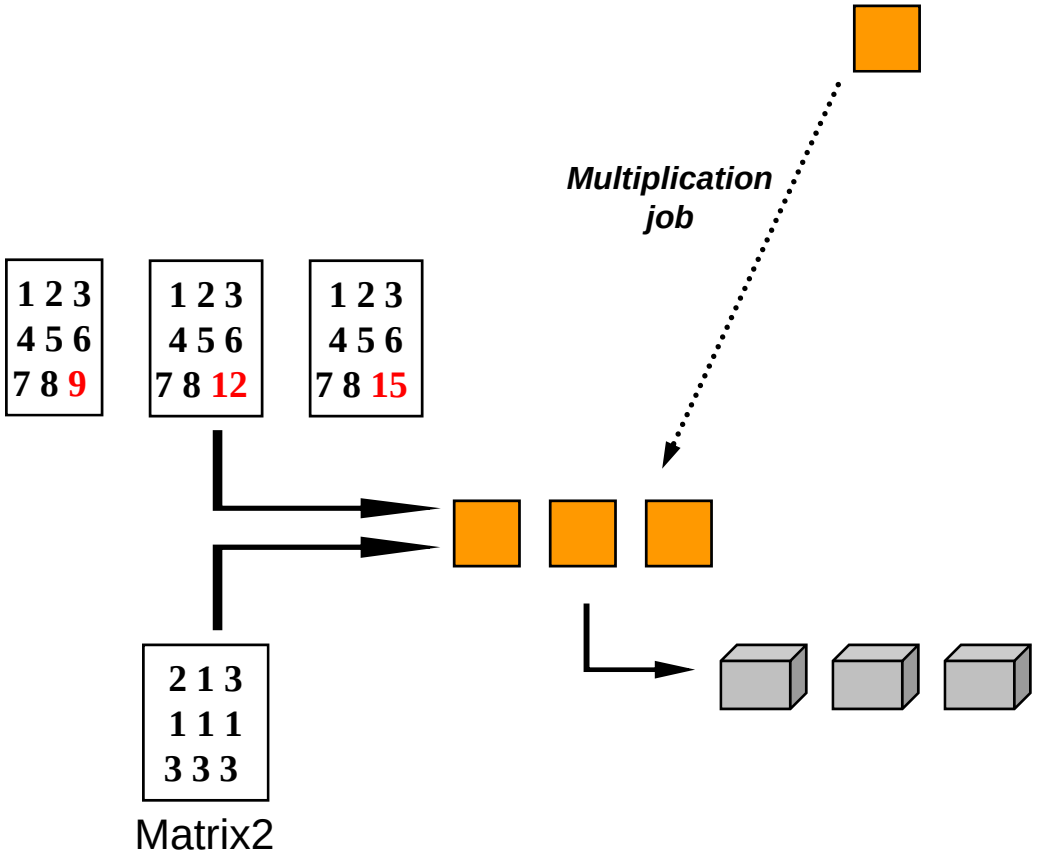
Second phase: eWorkflows executed

Third phase: collectors executed

Introduction to the practicals

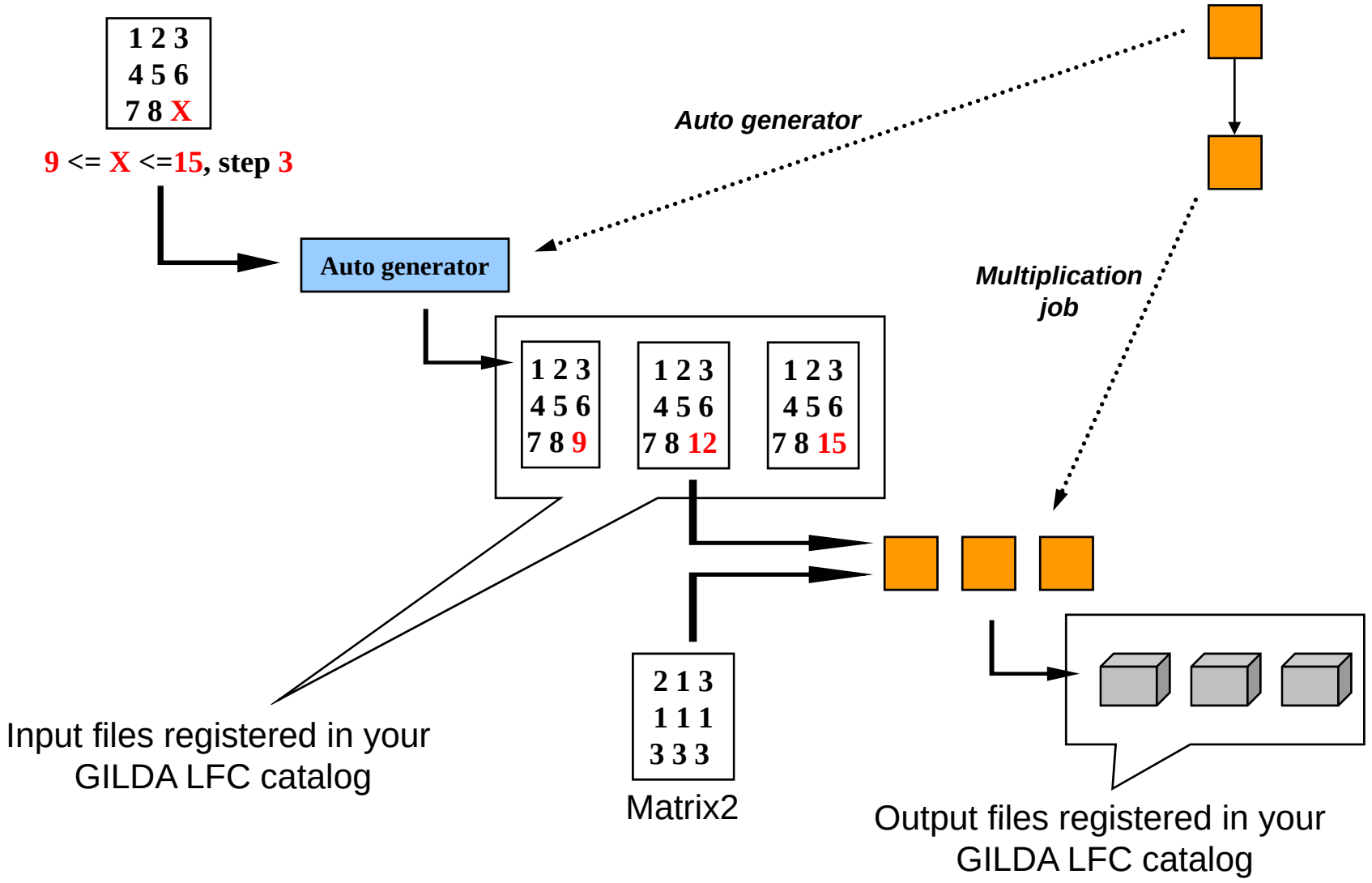
Hands-on exercise

Matrix multiplication PS



Hands-on exercise

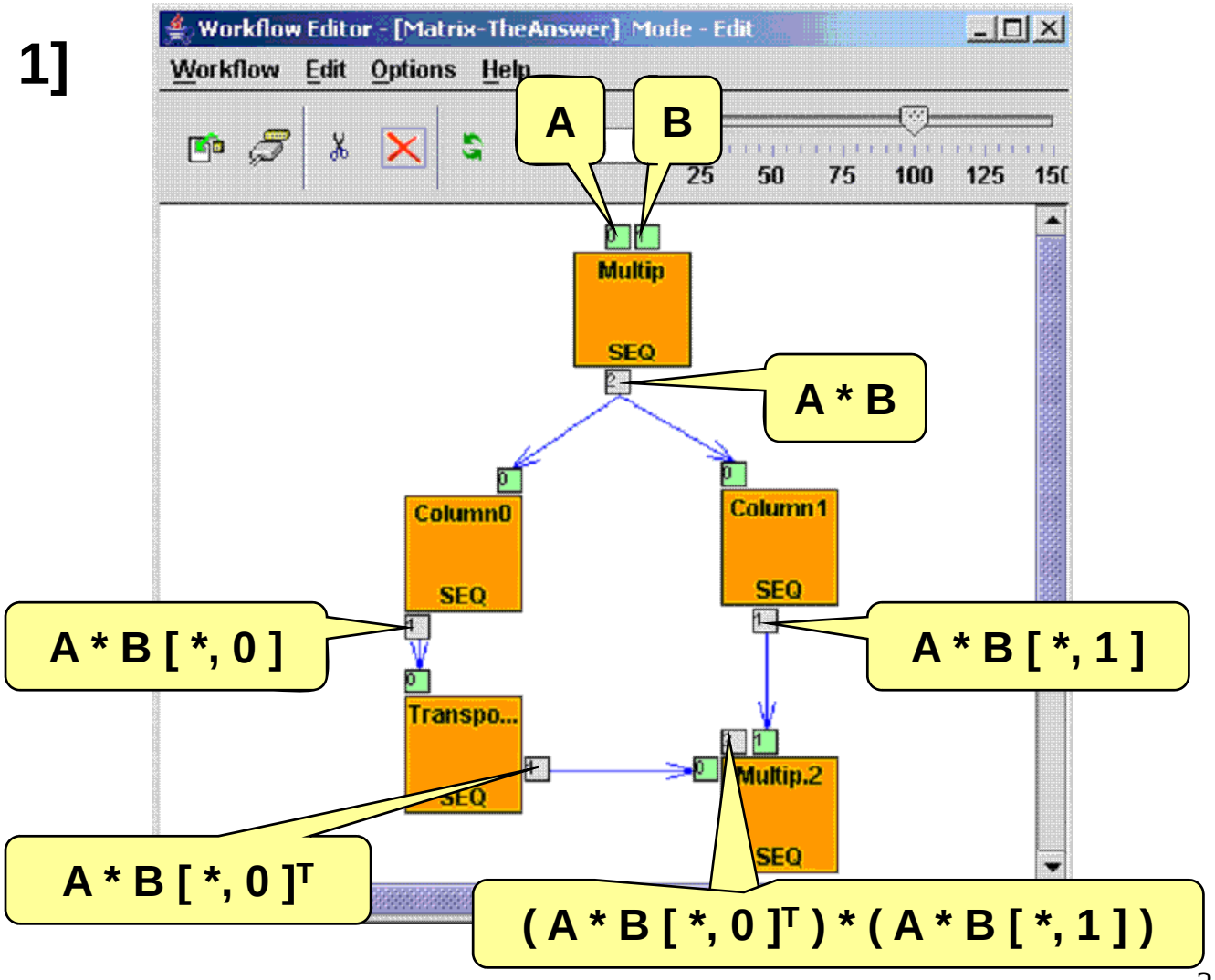
Matrix multiplication PS



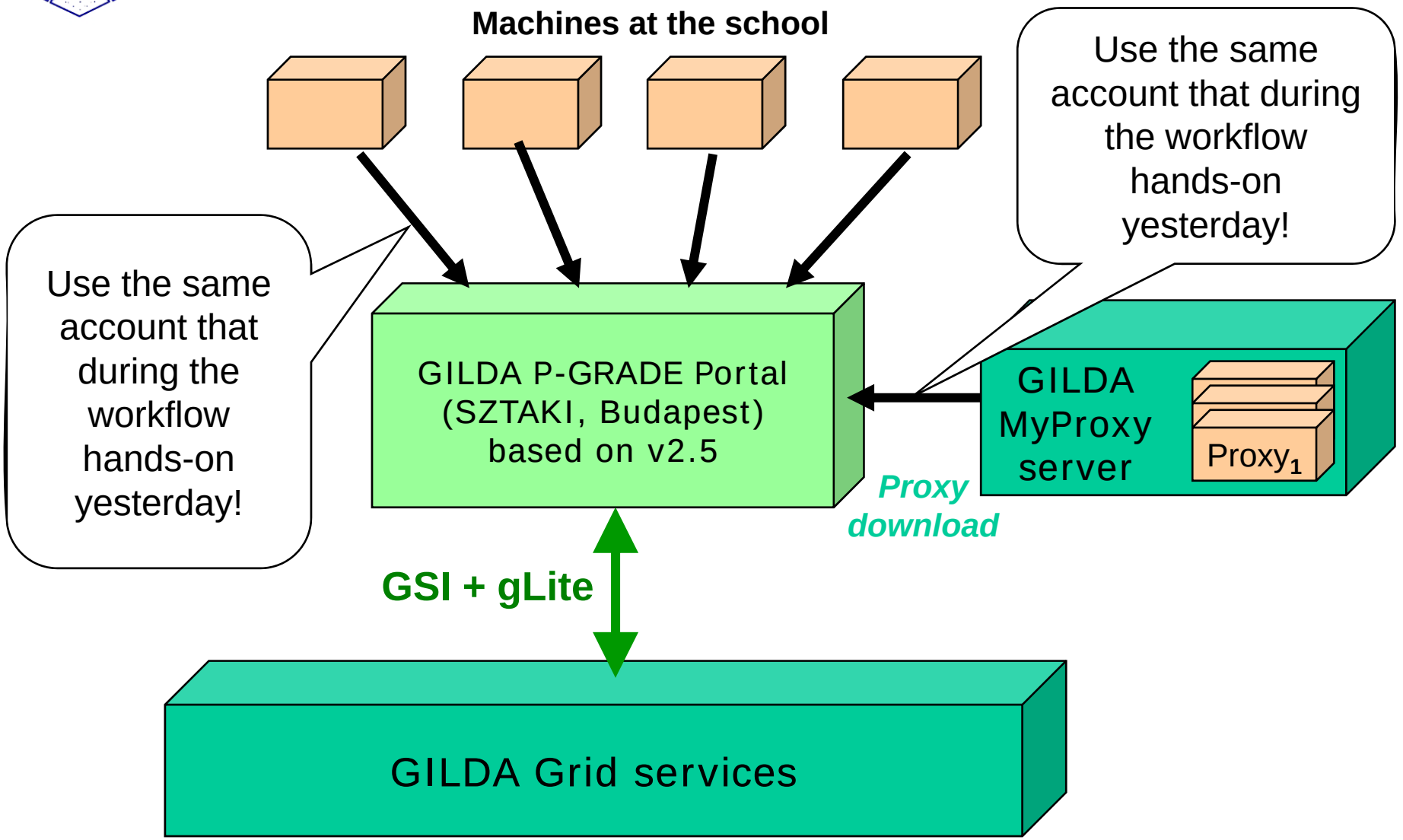
Hands-on exercise 2

Turn the matrix operations WF into a parameter study

$AB[*, 0]^T * AB[*, 1]$



Infrastructure for the hands-on



Open the parameter study practicals from the agenda page

Use the same portal and MyProxy accounts than yesterday!