



The P-GRADE Grid Portal

MTA SZTAKI
Computer and Automation Research Institute
Hungarian Academy of Sciences



www.portal.p-grade.hu
pgportal@lpds.sztaki.hu



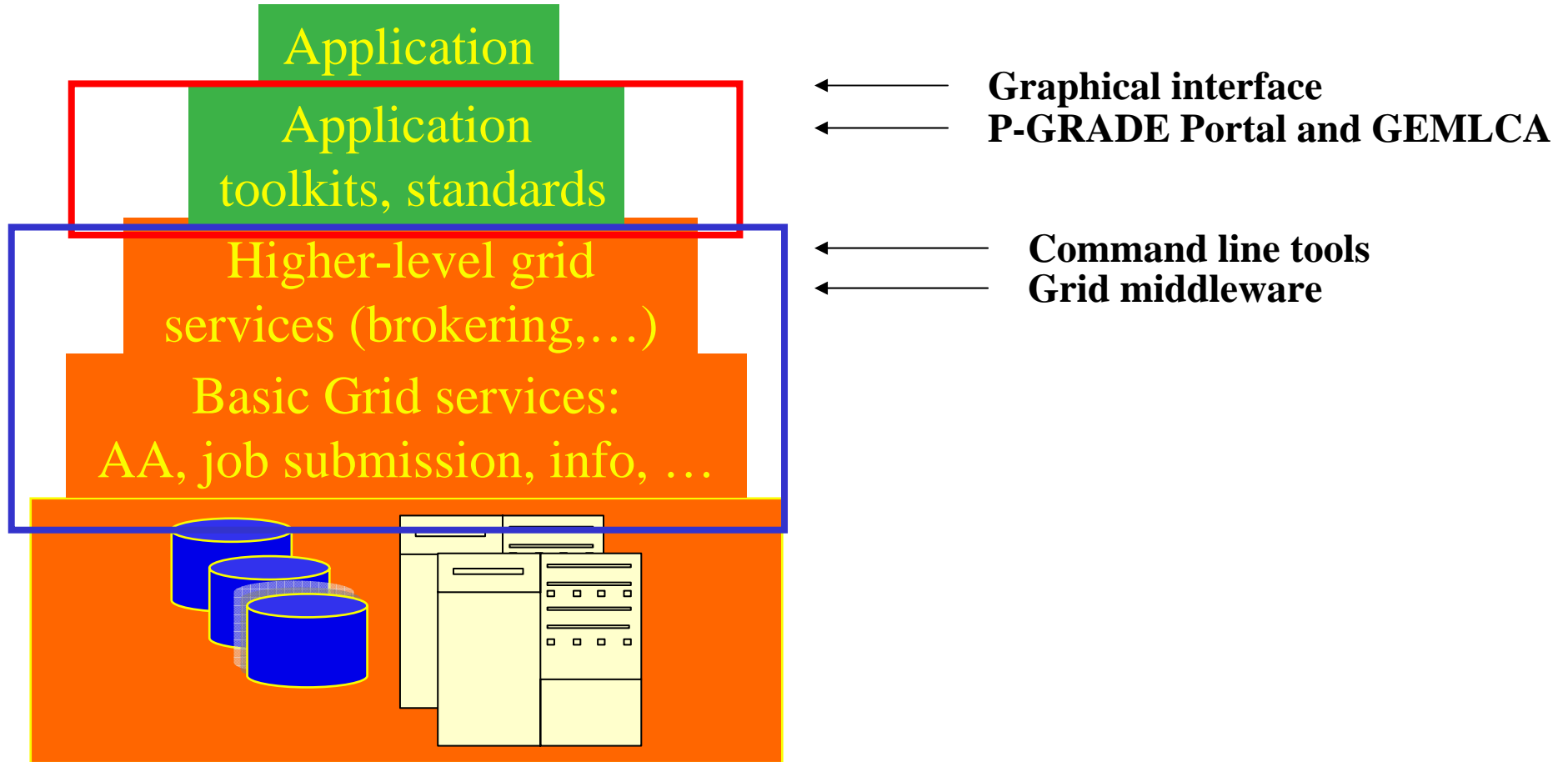
Contents

- Grid portals in context
- Motivations
- P-GRADE Portal in a nutshell
- Application development with the Portal
- Application execution with the Portal





Context





Current situation and trends in Grid computing

- Fast evolution of Grid systems and middleware:
 - **GT2, OGSA, GT3 (OGSI), GT4 (WSRF), LCG-2, gLite, ...**
- Many production Grid systems are built with them
 - EGEE (**LCG-2** → **gLite**), UK NGS (**GT2**), Open Science Grid (**GT2** → **GT4**), NorduGrid (~**GT2**)
- Although **the same set of core services** are available everywhere, they **are implemented in different ways**
 - Data services
 - Computation services
 - Security services (single sign-on)
 - (Brokers)





E-scientists' concerns



- How to concentrate own **my own research** if the tool I would like to use is in continuous change?
- How can I learn and understand **the usage of the Grid**?
- How can I **develop Grid applications**?
- How can I **execute grid applications**?
- How to **tackle performance issues**?
- How to **use several Grids at the same time**?
- How to **migrate my application** from one grid to another?
- How can I **collaborate with fellow researchers**?

The P-GRADE Grid Portal gives you the answers!





Motivations to the P-GRADE Portal

- Provide a technology-neutral intuitive graphical interface for the most common Grid middleware technologies
- Provide complex extra tools as part of the portal to make the life of Grid application developers easier

**P-GRADE = Parallel Grid Run-time and
Application Developer Environment**





P-GRADE Portal in a nutshell

- General purpose computational Grid portal for workflow based applications (*parameter study support from v2.5*)
- Based on standard portlet framework (GridSphere 2)
- Contains several extra services. It is not only an interface!
- Main services provided by the P-GRADE portal:

Service	Globus grids	EGEE grids	ARC grids
Job execution	GRAM	Computing Element	Computing Service
File storage	GridFTP server	Storage Element	"Regular" Storage Service
Proxy management	MyProxy, VOMS		
Information system	MDS	BDII	Grid Index Info Service
Brokering	GTBroker	Workload Management System	Brokering client
Application monitoring	Mercury		
Application services	GEMLCA		---
Workflow & job progress visualization	PROVE		

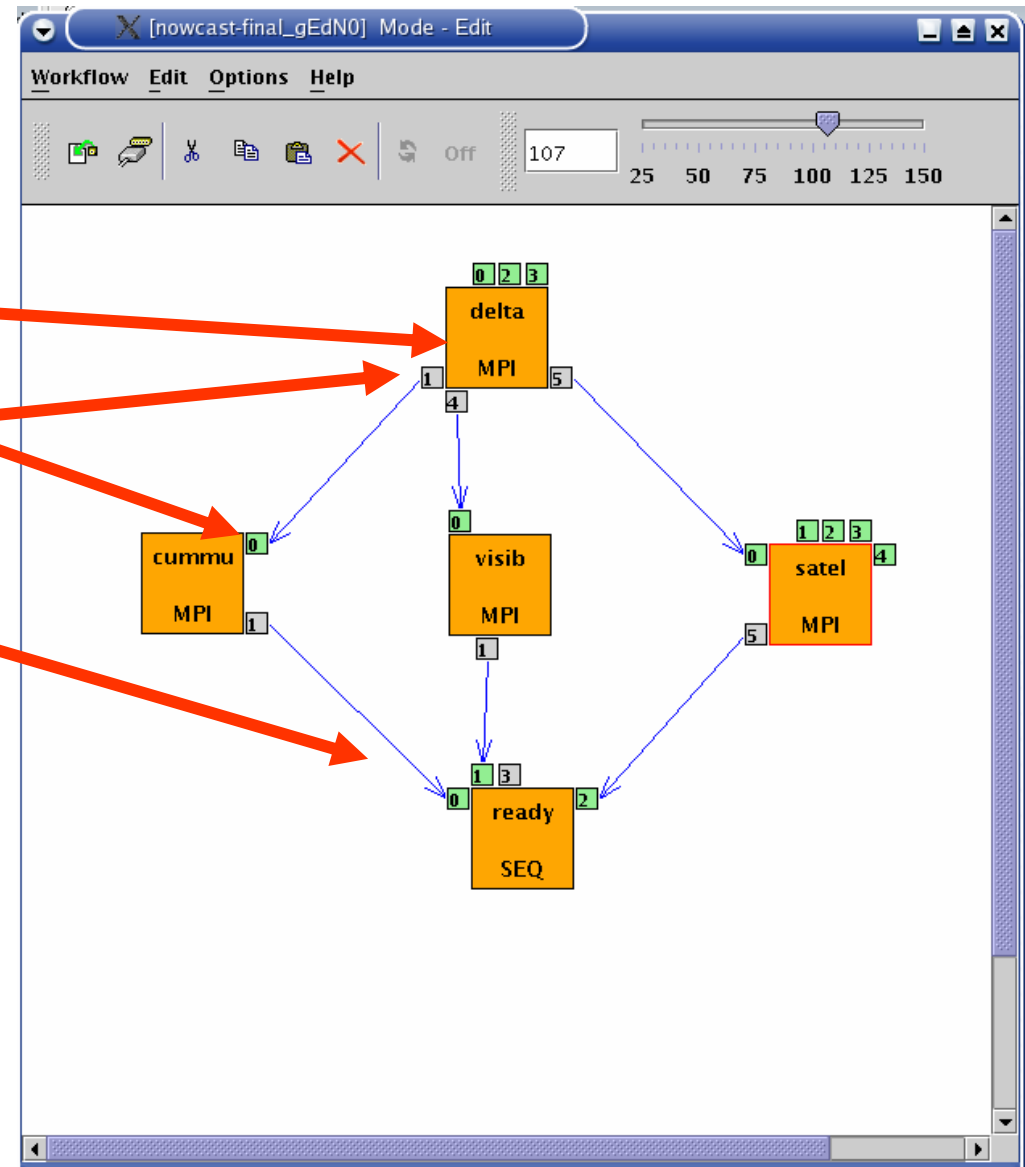


P-GRADE Portal hides middleware technologies and solves the Grid interoperability problem at the workflow level!



What is a P-GRADE Portal workflow?

- **a directed acyclic graph where**
 - Nodes represent jobs (batch programs to be executed on a computing element)
 - Ports represent input/output files the jobs expect/produce
 - Arcs represent file transfer operations
- **semantics of the workflow:**
 - A job can be executed if all of its input files are available

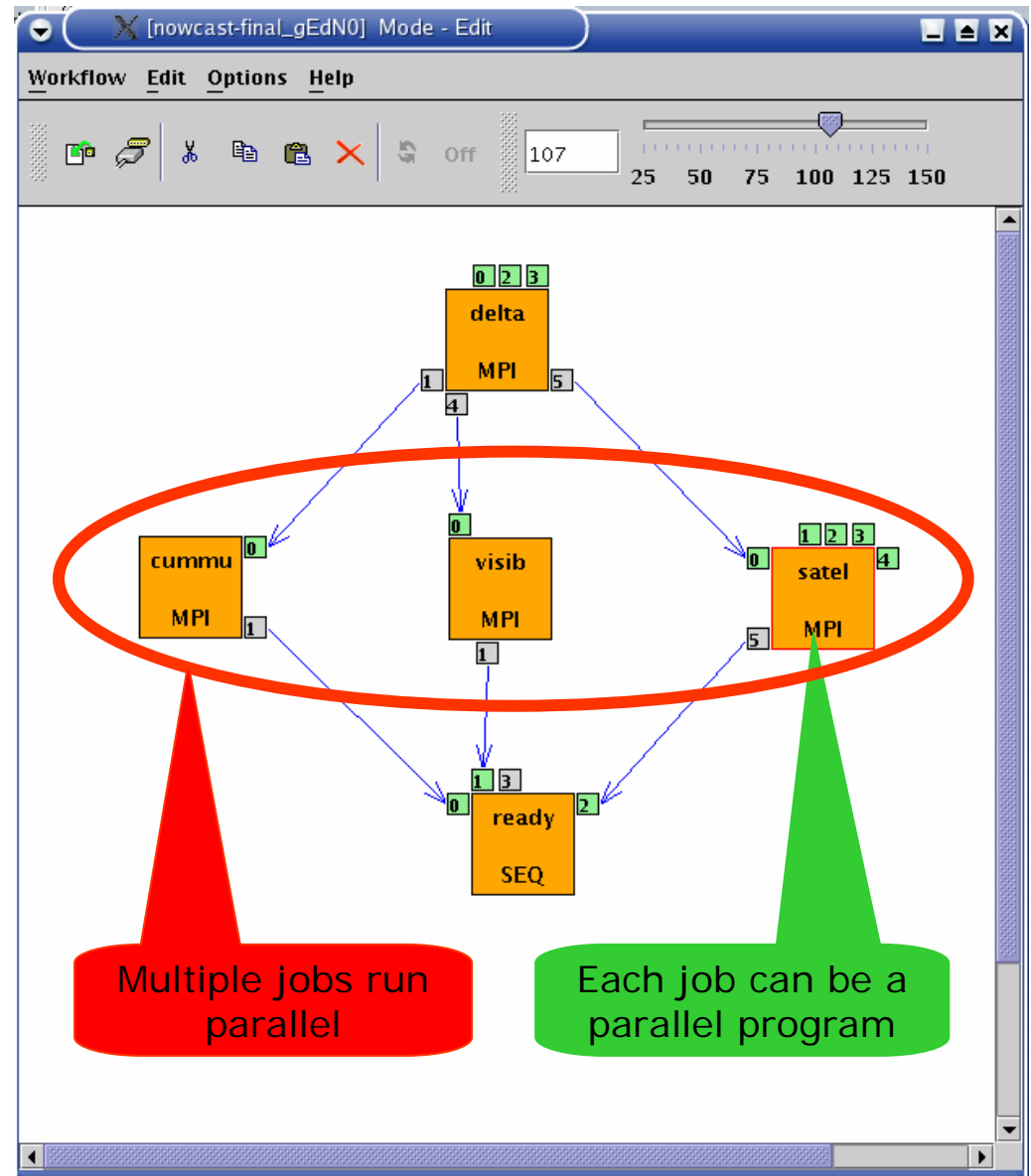


Two levels of parallelism by a workflow – v2.4

- The P-GRADE Portal concept enables the efficient parallelization of complex problems
- The semantics enables three levels of parallelism:

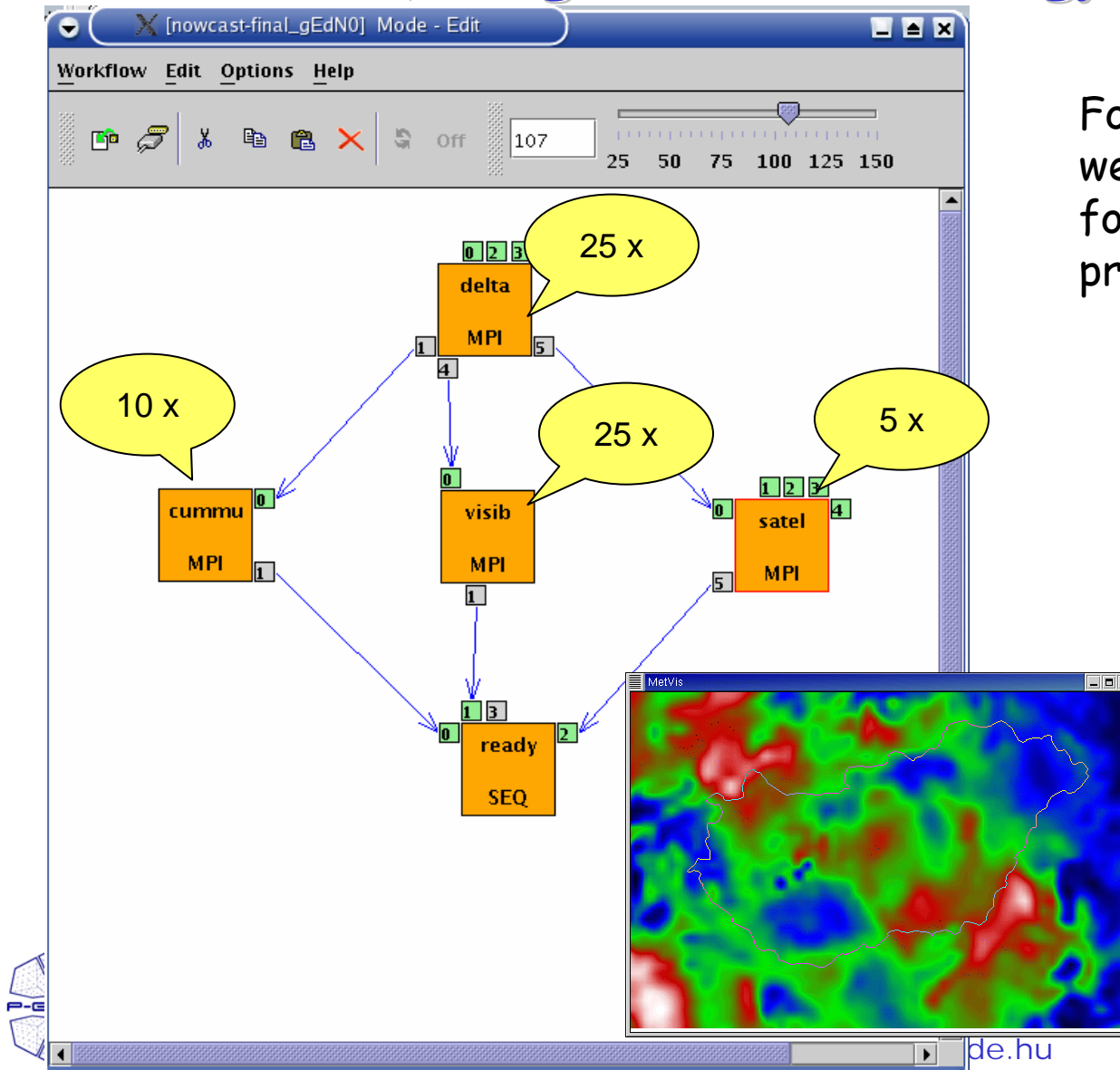
– Parallel execution inside a workflow node

– Parallel execution among workflow nodes





Ultra-short range weather forecast (Hungarian Meteorology Service)



Forecasting dangerous weather situations (storms, fog, etc.), crucial task in the protection of life and property

Processed information:
surface level measurements, high-altitude measurements, radar, satellite, lightning, results of previous computed models

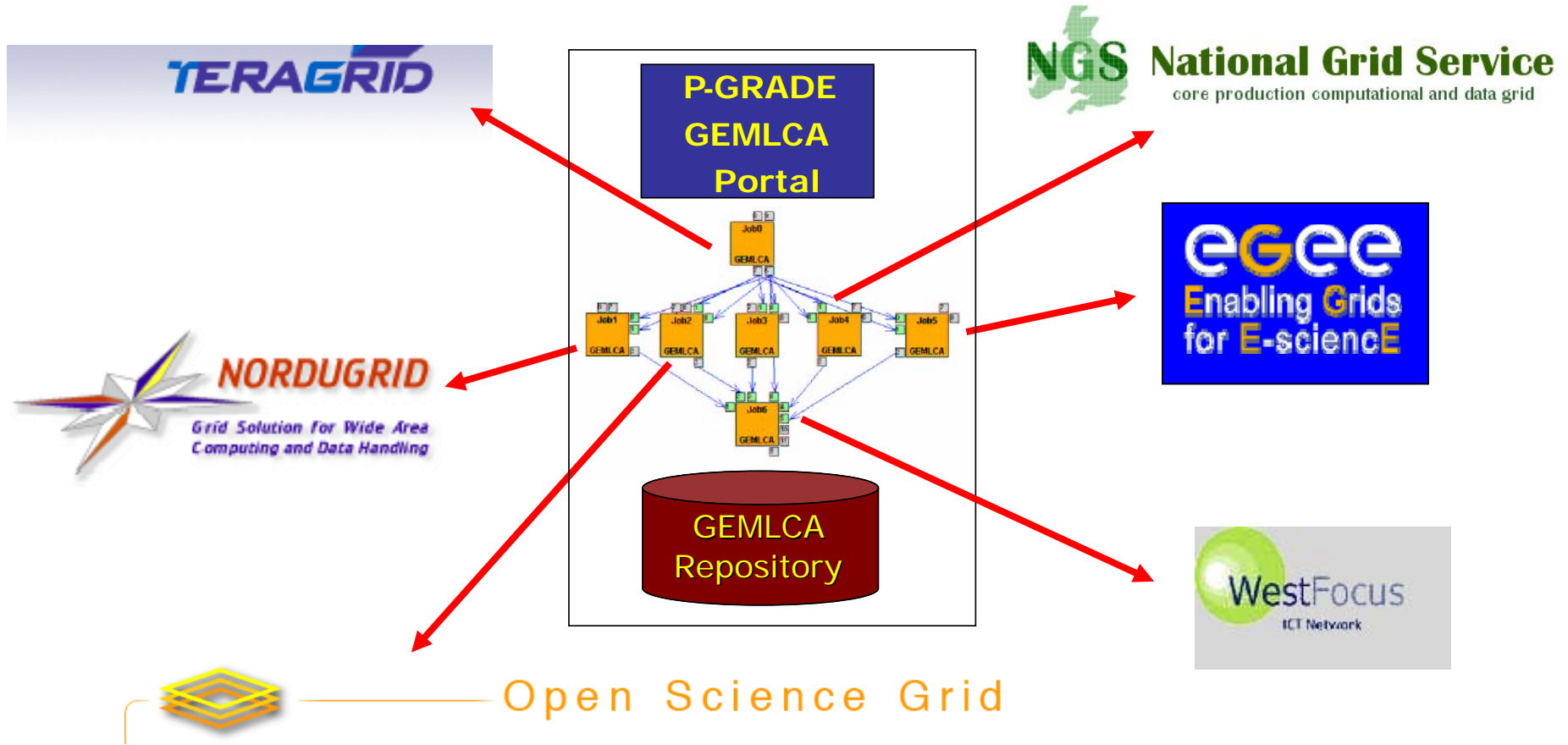
Requirements:

- Execution time < 10 min
- High resolution (1km)



Multi-grid feature: the same portal is connected to multiple Grids

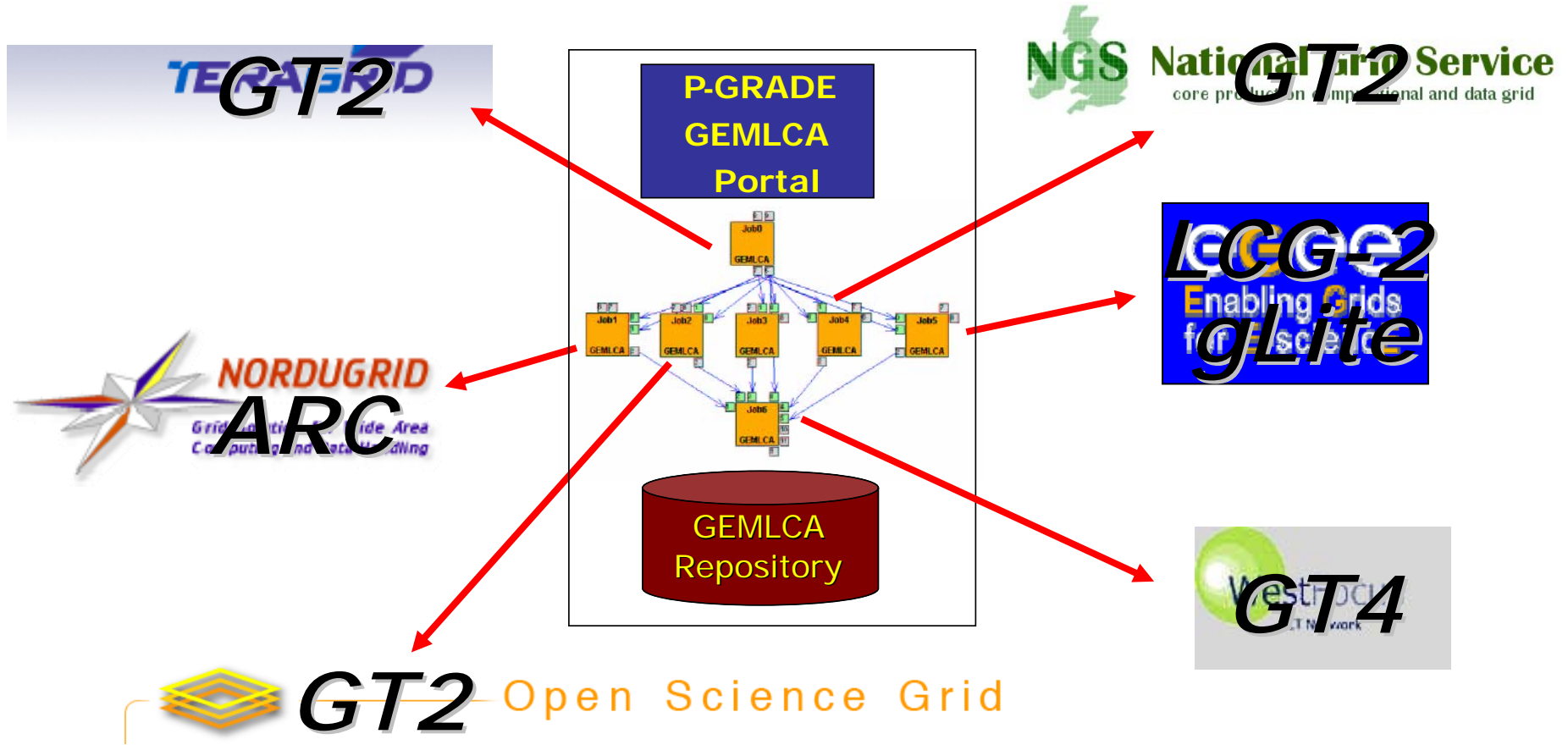
Demo @ GGF18 & SC06





Multi-grid feature: the same portal is connected to multiple Grids

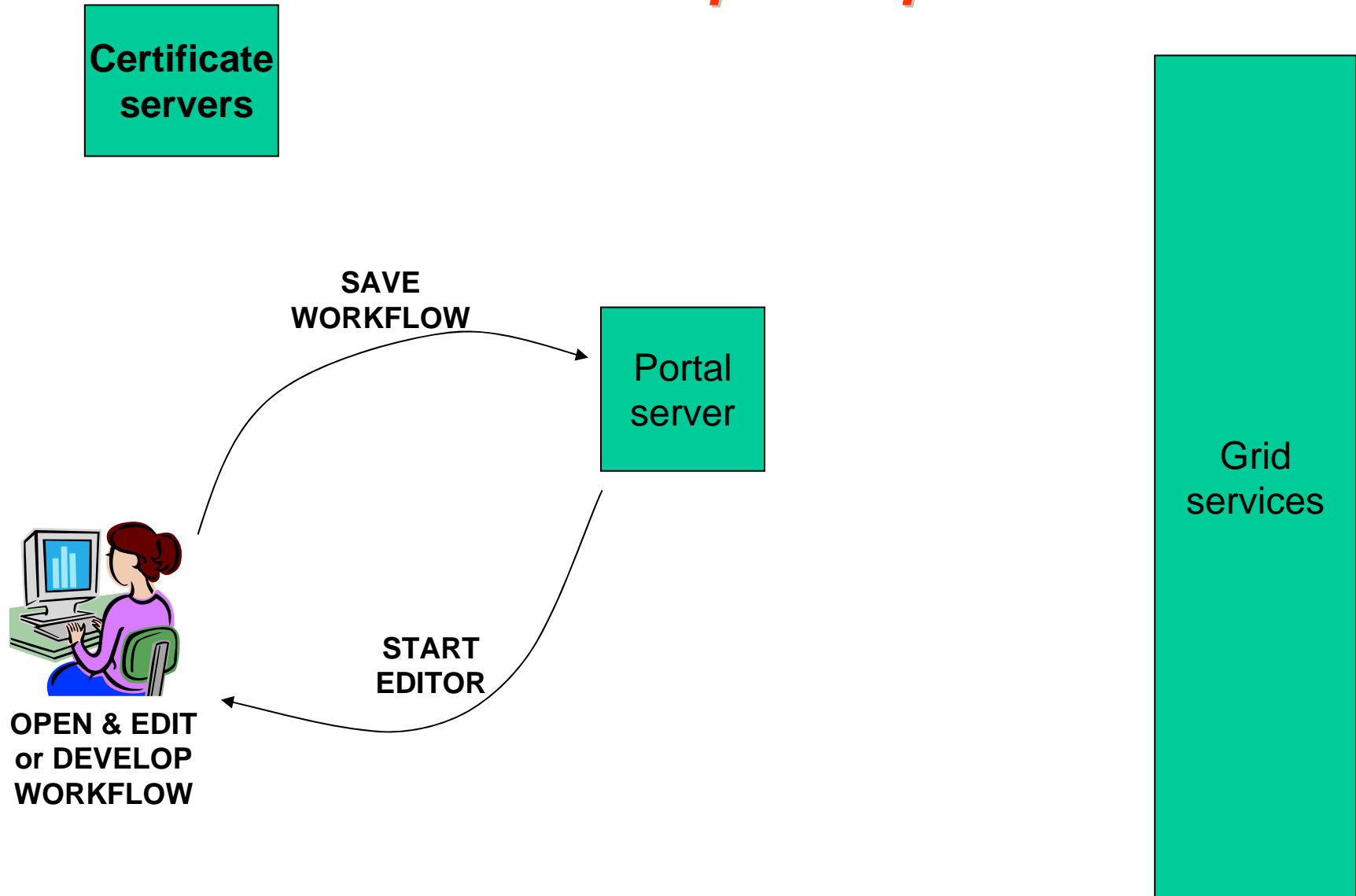
Demo @ GGF18 & SC06





The typical user scenario

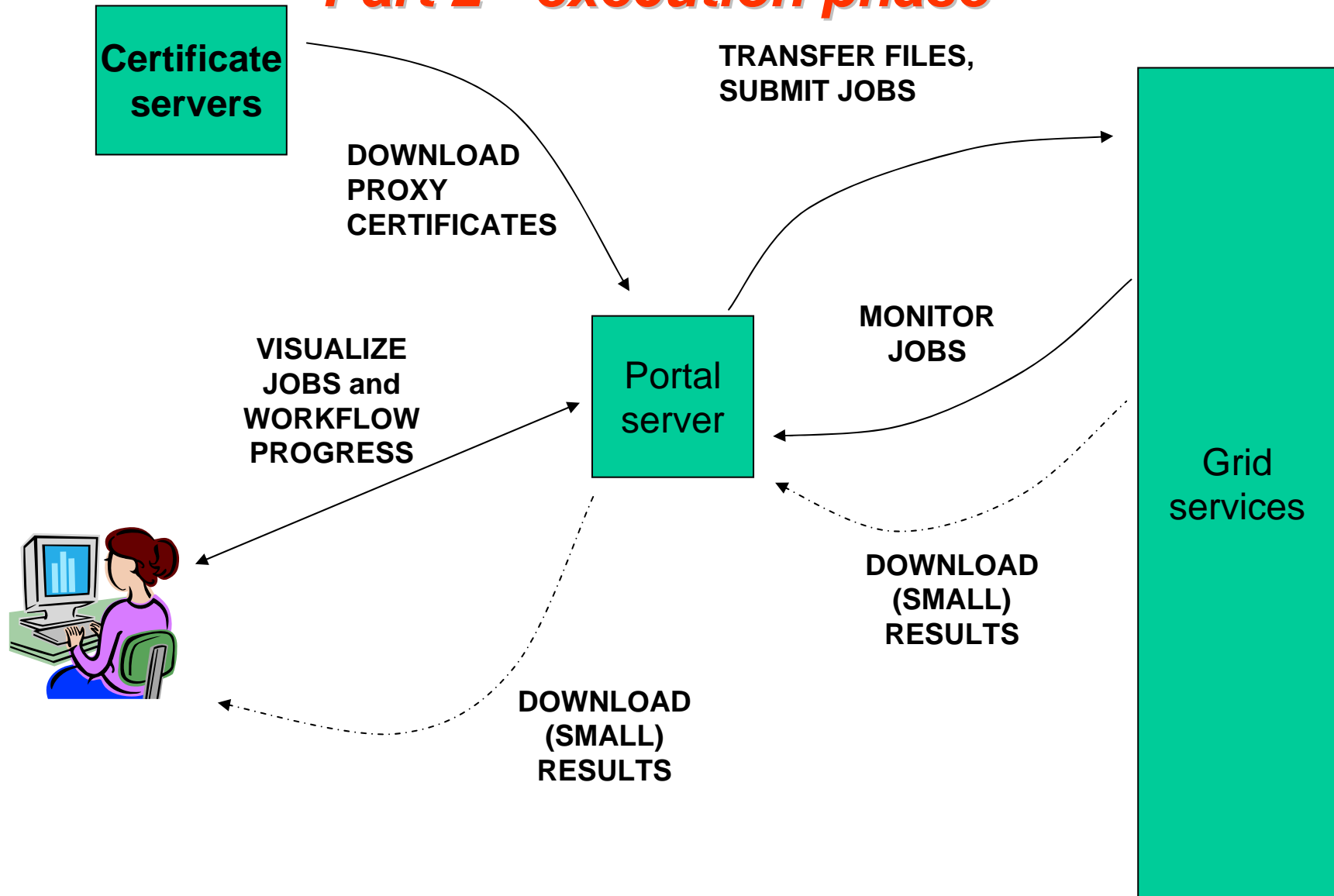
Part 1 - development phase





The typical user scenario

Part 2 - execution phase





User tools in the P-GRADE Portal environment

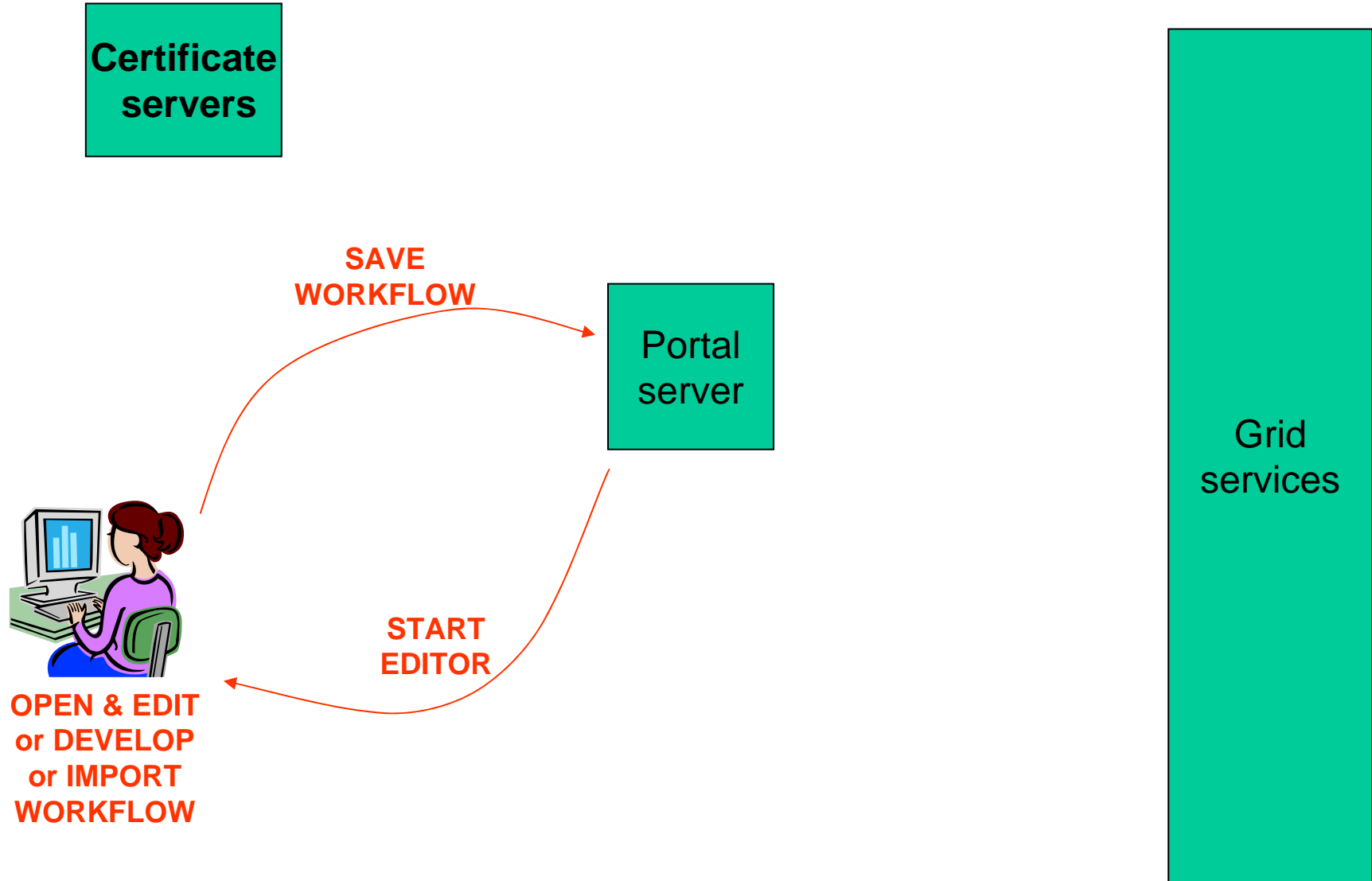
- **Workflow development:**
 - Workflow editor
 - Grid information system browser
- **Workflow execution:**
 - Interface with EGEE and ARC brokers
 - Certificate and proxy manager portlet
 - Built-in GTBroker for Globus Grids
 - Automated file transfer
 - Built-in workflow manager
 - Workflow manager portlet
 - Built-in workflow and job monitoring tools
- **User collaboration:**
 - Workflow repository
 - Workflow import and export





The typical user scenario

Development phase:





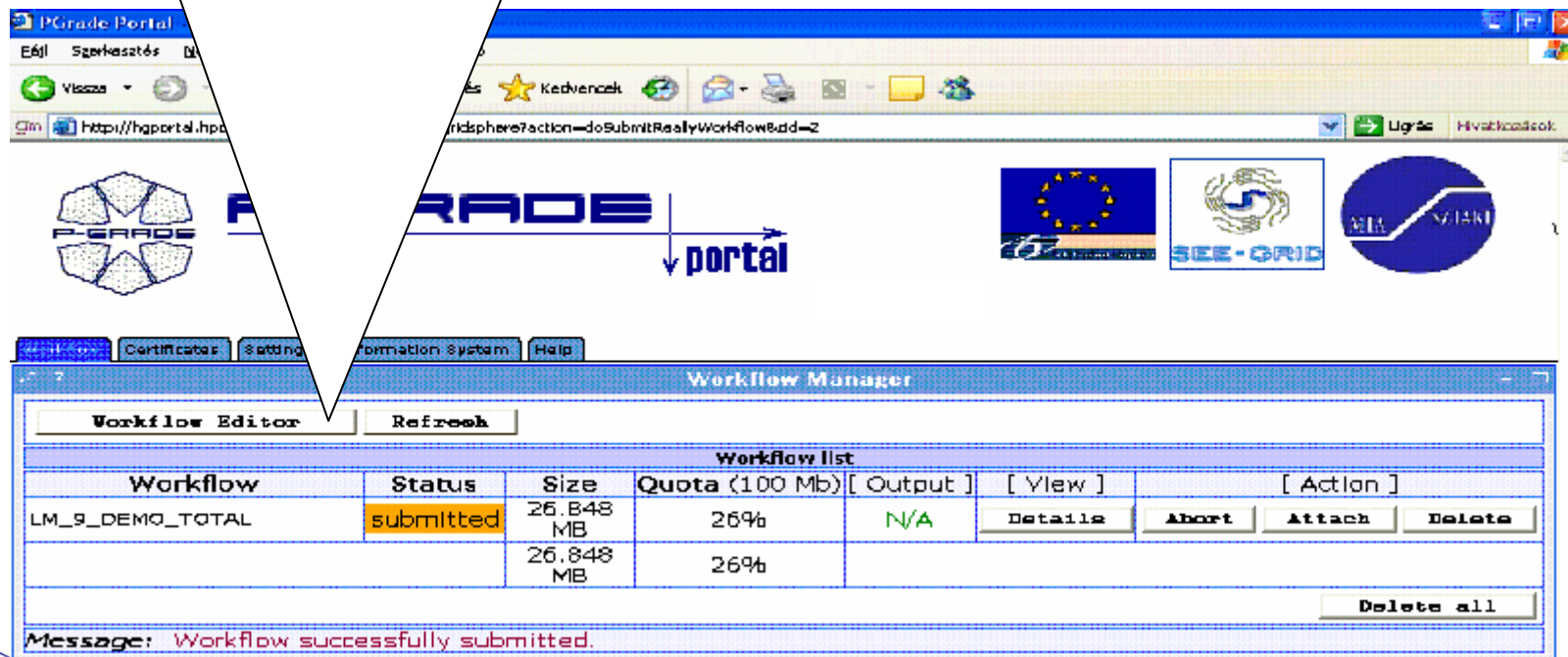
Workflow development

Opening the workflow editor

The editor is a Java Webstart application



download and installation is only one click!



The screenshot shows a web browser window with the URL `http://hgportal.hp.../kdsphere?action=doSubmitReallyWorkflow&id=2`. Below the browser, the Workflow Manager application is displayed. It features a 'Workflow Editor' tab and a 'Refresh' button. The main area contains a 'Workflow list' table with the following data:

Workflow	Status	Size	Quota (100 Mb)	[Output]	[View]	[Action]
LM_9_DEMO_TOTAL	submitted	26.848 MB	269%	N/A	Details	Abort Attach Delete
		26.848 MB	269%			

At the bottom of the application, a message states: **Message: Workflow successfully submitted.**

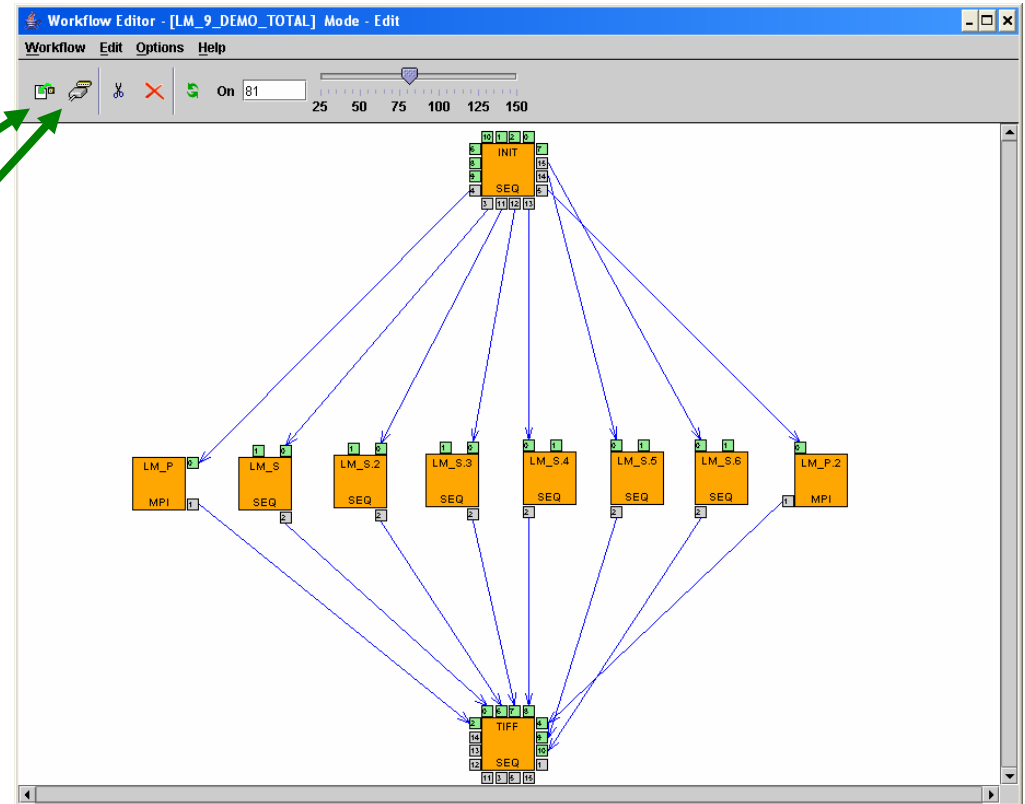




Workflow Editor

Defining the graph

- The aim is to define a DAG of batch jobs:
 - Drag & drop components:**
jobs and ports
 - Define their properties**
 - Connect ports by channels**
(no cycles, no loops, no conditions)





Workflow Editor

Properties of a job

Workflow Editor - [LM_9_DEMO_TOTAL] Mode - Edit

Workflow Edit Options Help

LM_P properties

Name: LM_P

Job Type: SEQ MPI PVM

Job Executable: LM_5.bin
File Browser

Instrument

Process Number: 7

Attributes: -n -m

Grid: SEE-GRID

Monitor:

Resource: n40.hpcc.sztaki.hu:jobmanager-fork
ce01.grid.acad.bg:jobmanager-fork
grid-ce.ii.edu.mk:jobmanager-fork
grid1.irb.hr:jobmanager-fork
grid1.netmode.ece.ntua.gr:jobmanager-fork
n40.hpcc.sztaki.hu:jobmanager-fork
prof.salla6.inima.al:jobmanager-fork

Properties of a job:

- Binary executable
- Type of executable
- Number of required processors
- Command line parameters
- The resource to be used for the execution:
 - Grid/VO
 - (Computing element)



Direct resource selection: Which computing element to use?

I still don't know which resource to use!



The information system portlet queries BDII and GIIS servers

PGrade Portal - Microsoft Internet Explorer

http://hgportal.hpcc.sztaki.hu:7080/gridsphere/gridsphere?action=doCh

Workflow Certificates Settings Information System Help

Grid: SEE-GRID VO: seegrid

Sites

	Computing Element						Storage Element		
	CPU		Job			Space			
	Free	Usage	Running	Waiting	Load	Total	Available	Usage	
	112	80	29%	7	0	0%	226.793 GB	216.34 GB	5%
AEGIS02-RCUB	20	20	0%	0	0	0%	398.466 GB	396.58 GB	0%
BG01-IPP	54	18	67%	4	0	0%	609.554 GB	473.543 GB	22%
BG02-IM	20	16	20%	1	0	0%	131.775 GB	79.957 GB	39%
BG03-IPP-N	3	3	0%	0	0	0%	566.608 GB	566.376 GB	0%
BG04-ACAD	48	32	33%	2	5	71%	554.647 GB	475.767 GB	14%
HR-01-RBI	60	12	80%	4	0	0%	78.317 GB	6.271 GB	92%
MK-01-UKIM_II	28	28	0%	0	0	0%	69.709 GB	69.075 GB	1%
RO-01-ICI	54	24	56%	5	36	88%	849.666 GB	828.387 GB	3%
ROGRID-NIPNE-01	24	24	0%	0	0	0%	862.807 GB	848.676 GB	2%
SZTAKI	4	4	0%	0	0	0%	4.566 GB	2.871 GB	37%
tubitaklg2	35	28	20%	1	0	0%	1.335 TB	1.335 TB	0%

Kész Internet





Automatic resource selection

1. Select a broker Grid/VO for the job (e.g. VOCE or GILDA)
2. (Describe the ranks & requirements of the job in JDL)
3. The portal will use the broker to find the best resource for the job!





Workflow Editor

Defining broker jobs

Select a Grid with broker!
(*_BROKER)

Ignore the resource field!

If default JDL is not sufficient
use the built-in JDL editor!





Workflow Editor

Defining ports

The screenshot shows the Workflow Editor interface with a workflow diagram and a dialog box titled "INIT / 10 properties". The workflow diagram consists of several task nodes: "LM_P MPI", "LM_S SEQ", "LM_ SE", and "TIFF SEQ". Blue arrows indicate data flow from the top nodes to the bottom node. The dialog box is open over the "LM_P MPI" node and contains the following fields and options:

- Port name: 10
- Type: In Out
- File type: Local Remote
- File: 2d200.inp
- File storage type: Permanent Volatile

Buttons for "File Browser", "Ok", and "Cancel" are also visible in the dialog.

Type:

input: *the job requires*
output: *the job produces*

File type:

local: *from/to my desktop*
remote: *from/to a storage resource*

File:

location of the file

File storage type:

Permanent: *belongs to the final results of the WF*
Volatile: *used only for inter-job data transfer*



Possible file references

Input file

Output file

Local file

- Client side location:
`c:\experiments\11-04.dat`

- Client side location:
`result.dat`

- LFC logical file name
(LFC file catalog is required – eGrid, Hungrid)
`lfn:/grid/egrid/sipos/11-04.dat`

- LFC logical file name
(LFC file catalog is required – eGrid, Hungrid)
`lfn:/grid/egrid/sipos/11-04_-_result.dat`

- GridFTP address (in Globus Grids):
`gsiftp://myhost.com/11-04.dat`

- GridFTP address (in Globus Grids):
`gsiftp://myhost.com/11-04_-_result.dat`

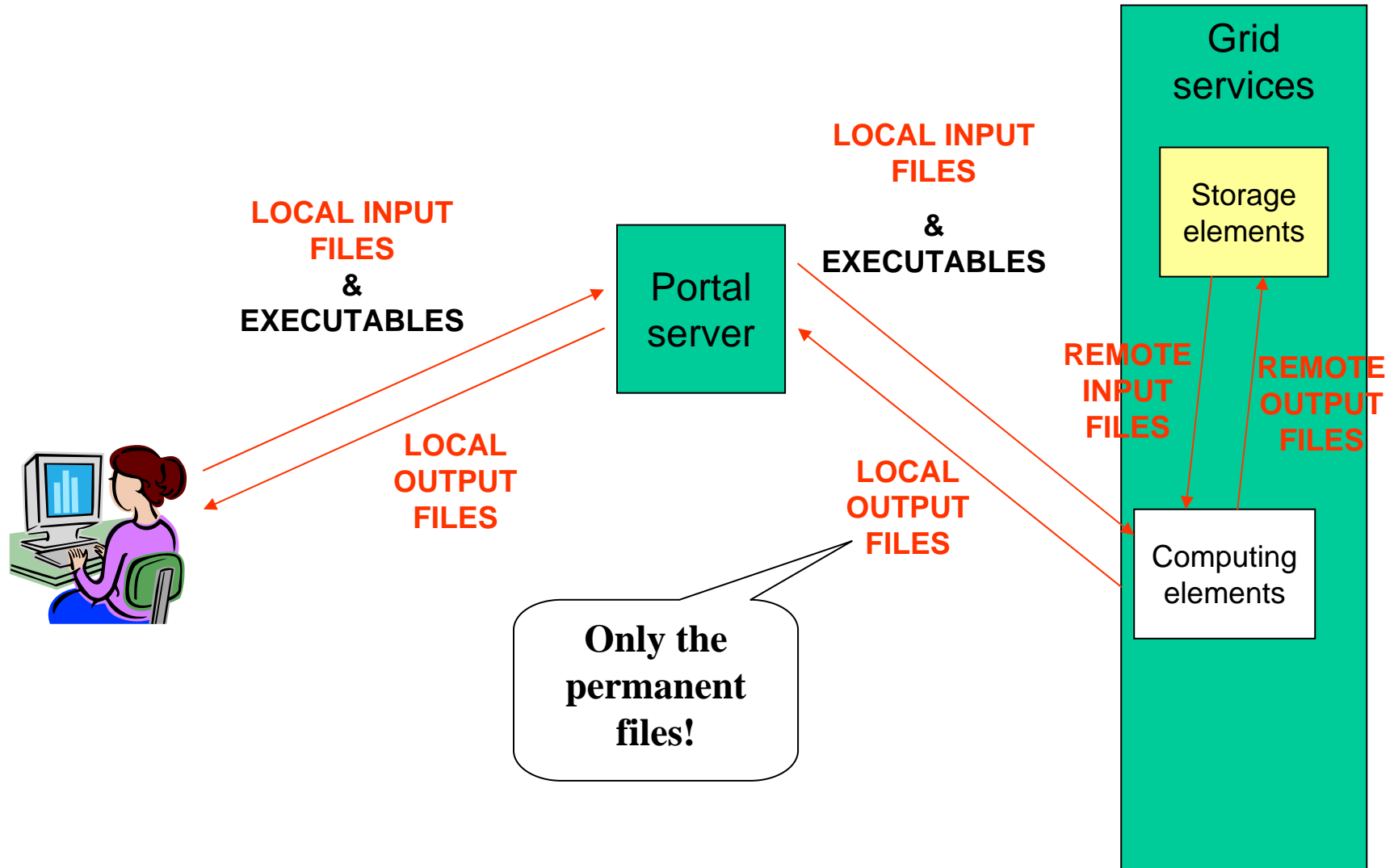
Remote file





Local vs. remote files

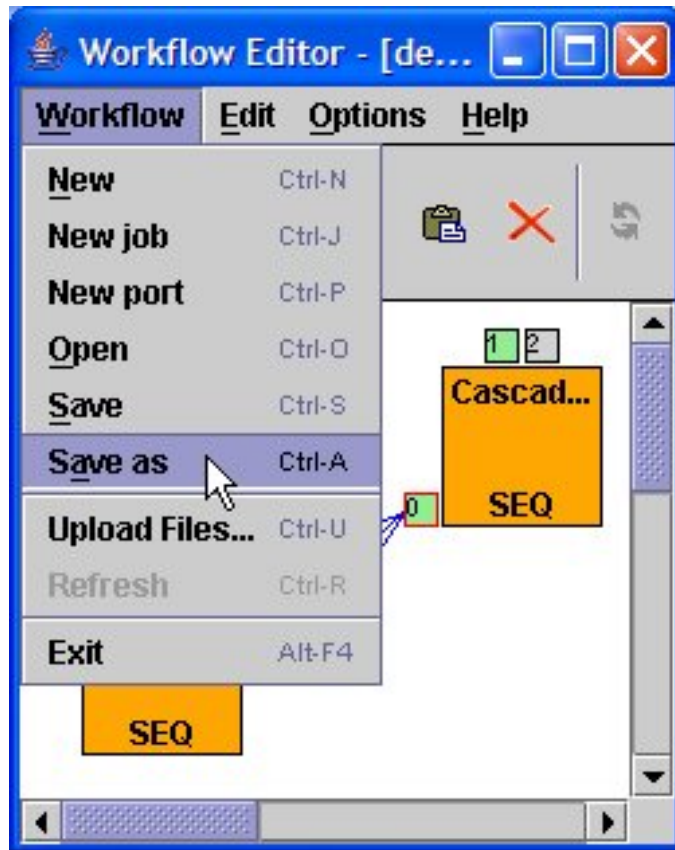
Your jobs can access storage files directly too!





Workflow Editor

Saving the workflow



Workflow is defined!

Let's execute it!





Executing workflows with the P-GRADE Portal

Main steps

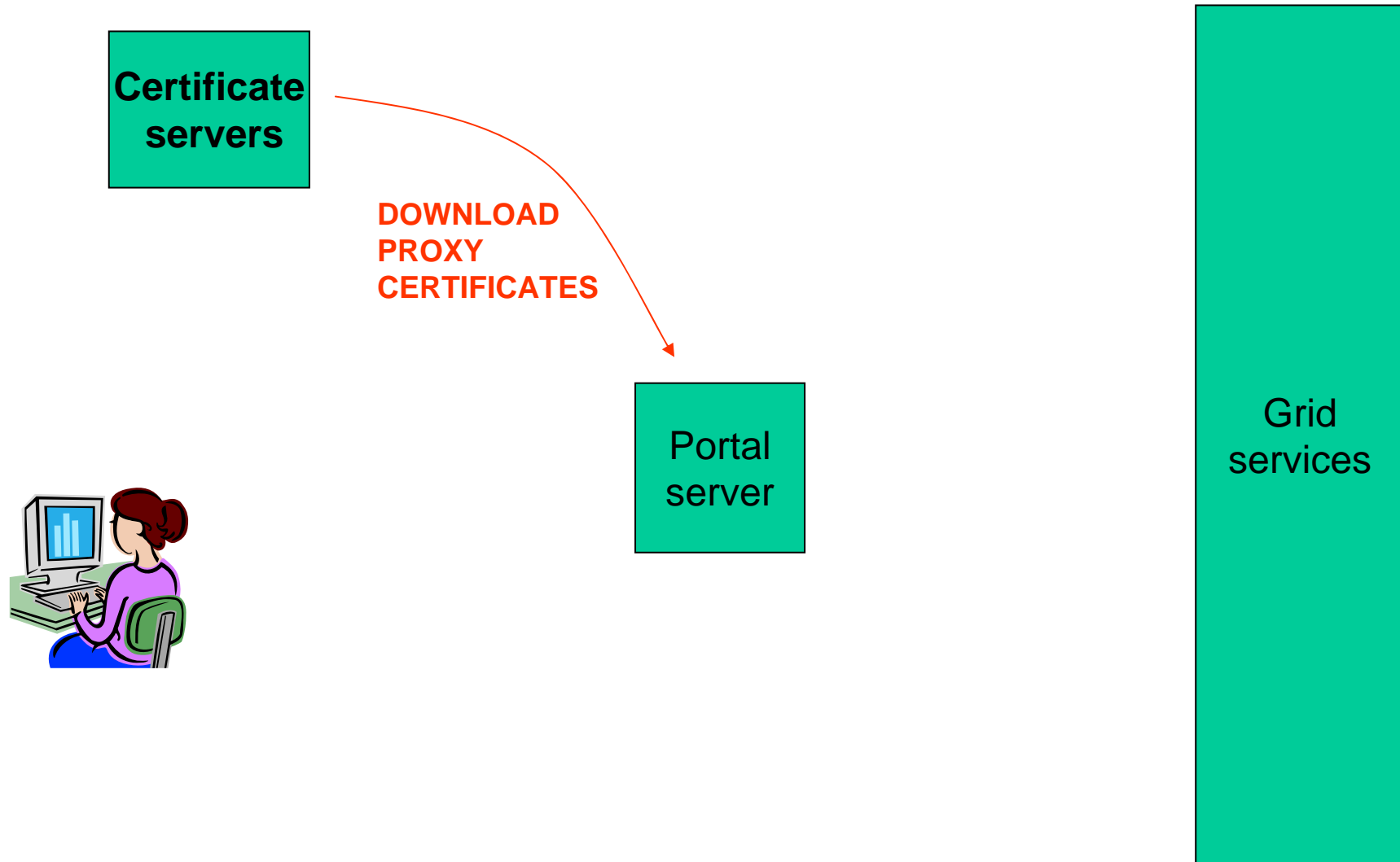
- 1. Download proxies**
- 2. Submit workflow**
- 3. Observe workflow progress**
- 4. If some error occurs correct the graph**
- 5. Download result**





The typical user scenario

Execution phase – step 1:





Certificate Manager

Certificates portlet

- To access GSI-based Grids the portal server application needs proxy certificates
- “Certificates” portlet:
 - to upload X.509 certificates into MyProxy servers
 - to download short-term proxy credentials into the portal server application





Certificate Manager

Downloading a proxy

1. MyProxy server access details:

- Hostname
- Port number
- User name (from upload)
- Password (from upload)

2. Proxy parameters:

- Lifetime
- Comment

Workflow Certificates Settings Information System Help

Certificate Manager

Download from MyProxy server

hostname	cvs.lpds.sztaki.hu *	port	7512 *
login	seecert *	password	***** *
lifetime (hours)	100 *	description	

*: Cannot be left empty.

Download Cancel

Message: Fill in the fields for download!





Certificate Manager

associating the proxy with a grid

Certificate Manager
Setting certificate for GRID

Certificate details	
Downloaded from:	cvs.lpds.sztaki.hu
Issued by:	DC=ORG,DC=SEE-GRID,O=People,O=SZTAKI,CN=Jozsef Patvarczki,CN=proxy
Subject:	DC=ORG,DC=SEE-GRID,O=People,O=SZTAKI,CN=Jozsef Patvarczki,CN=proxy,CN=proxy
Timeleft:	99:56:46
Proxy type:	full legacy globus proxy
Strength [bits]:	512
Description:	

Select GRID

Select from the list:

Message: Map proxy for any of the Grids.

This operation displays the **details of the certificate** and the **list of available Grids** (defined by portal administrator)





Certificate Manager

browsing proxies

Multiple proxies can be available on the portal server at the same time!

The screenshot shows the 'Certificate Manager' interface. At the top, there are logos for P-Grade, SEE-GRID, and SZTAKI. Below the logos is a navigation menu with 'Workflow', 'Certificates', 'Settings', 'Information System', and 'Help'. The main content area is titled 'Certificate Manager' and contains a 'Certificate list' table.

Issuer	Set for Grids	Time left	[Actions]
DC=ORG,DC=SEE-GRID,O=People,O=SZTAKI,CN=Jozsef Patvarczki,CN=proxy	SEE-GRID	99:50:24	<input type="button" value="Details"/> <input type="button" value="Set for Grid"/> <input type="button" value="Delete"/>
C=HU,O=KFKI RMKI CA,OU=SZTAKI,CN=Patvarczki Jozsef,CN=proxy	HUNGRID	99:57:25	<input type="button" value="Details"/> <input type="button" value="Set for Grid"/> <input type="button" value="Delete"/>

Below the table is a 'Refresh' button. At the bottom of the interface, there are 'Download' and 'Upload' buttons. A message at the bottom reads: 'Message: Certificate successfully set for HUNGRID.'



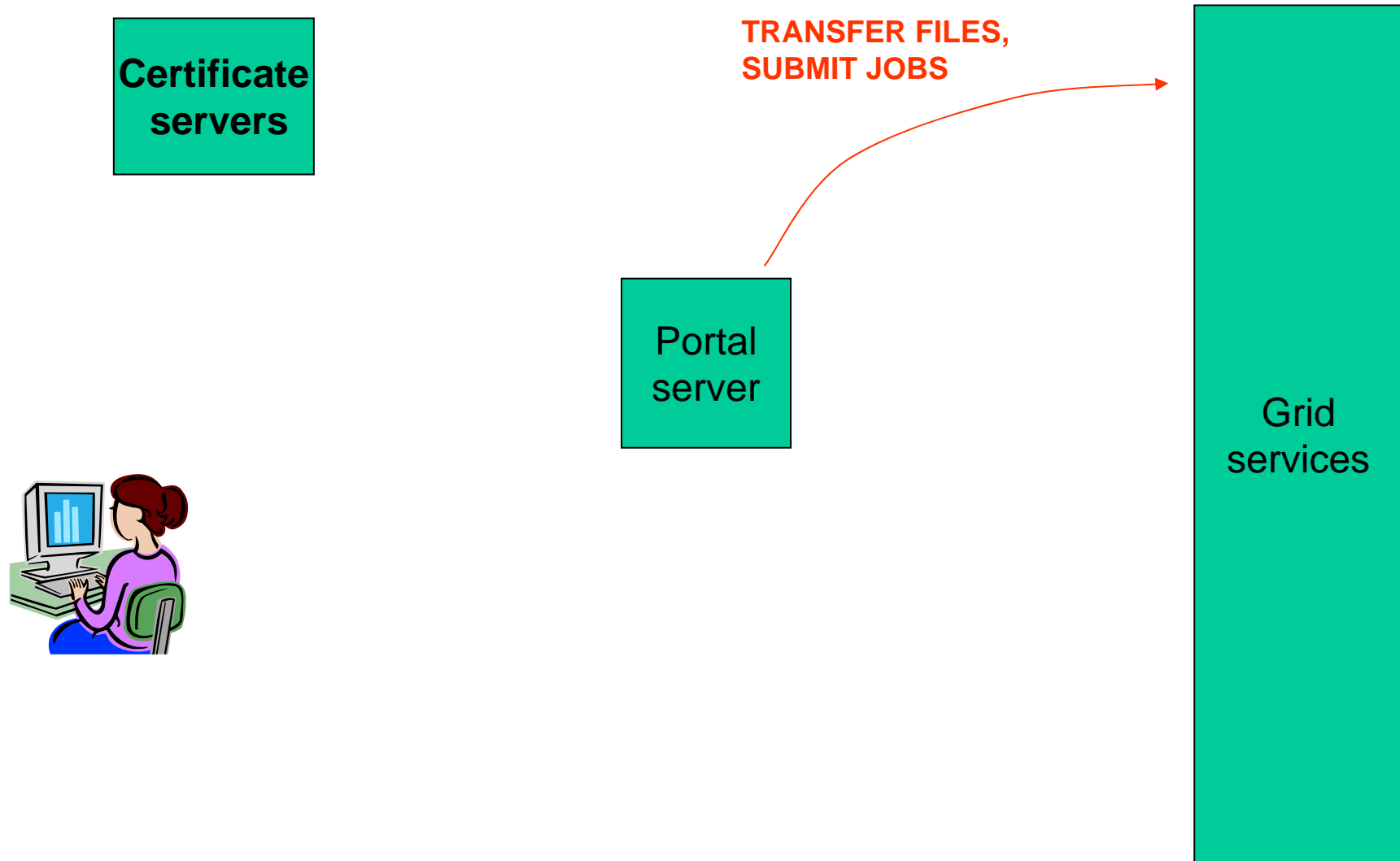
SEE-GRID CEs and SEs

HUNGRID CEs and SEs



The typical user scenario

Execution phase - step 2:





Workflow Management

(workflow portlet)

- The portlet presents the status, size and output of the available workflow in the “**Workflow**” list
- It has a Quota manager to control the users’ storage space on the server
- The portlet also contains the “**Abort**”, “**Attach**”, “**Details**”, “**Delete**” and “**Delete all**” buttons to handle execution of workflows
- The “**Attach**” button opens the workflow in the Workflow Editor
- The “**Details**” button gives an overview about the jobs of the workflow

Workflow Manager

Workflow list

Workflow	Status	Size	Quota (10 Mb)	[Output]	[View]	[Action]
WF1	init	26 KB	0.26%	N/A	Details	Submit Attach Delete
		26 KB				

Delete all

Message: Job list refreshed.



Workflow Execution

(observation by the workflow portlet)

PGrade Portal - Microsoft Internet Explorer

http://hgportal.hpcc.sztaki.hu:7080/gridsphere/gridsphere?action=doShowWorkflowDetails&cid=2

Workflow Manager

Refresh Back

Workflow	Job	Gridname	Hostname	Status	[Logs]	[Output]	[Visualization]
LM_9_DEMO_TOTAL				submitted	-	N/A	Visualize All Abort
	INIT	SEE-GRID	ce01.grid.acad.bg	init	-	-	-
	LM_P	SEE-GRID	n40.hpcc.sztaki.hu	init	-	-	-
	LM_P.2	SEE-GRID	n40.hpcc.sztaki.hu	init	-	-	-
	LM_S	SEE-GRID	grid-ce.ii.edu.mk	init	-	-	-
	LM_S.2	SEE-GRID	grid1.irb.hr	init	-	-	-
	LM_S.3	SEE-GRID	grid1.netmode.ece.ntua.gr	init	-	-	-
	LM_S.4	SEE-GRID	grid1.irb.hr	init	-	-	-
	LM_S.5	SEE-GRID	testbed001.grid.icl.ro	init	-	-	-
	LM_S.6	HUNGRID	grid109.kfki.hu	init	-	-	-
	TIFF	HUNGRID	grid109.kfki.hu	init	-	-	-

Message: Workflow details successfully displayed.

White/Red/Green color means the job is initial/running/finished state



Workflow Execution

(observation by the workflow portlet)

PGrade Portal - Microsoft Internet Explorer

http://hgportal.hpcc.sztaki.hu:7080/gridsphere/gridsphere?action=doGotoPage&cid=2

Workflow Manager

Refresh Back

Workflow	Job	Gridname	Hostname	Status	[Logs]	[Output]	[Visualization]
LM_9_DEMO_TOTAL				running	-	N/A	Visualize All Abort
	INIT	SEE-GRID	ce01.grid.acad.bg	running	-		-
	LM_P	SEE-GRID	n40.hpcc.sztaki.hu	init	-		-
	LM_P.2	SEE-GRID	n40.hpcc.sztaki.hu	init	-		-
	LM_S	SEE-GRID	grid-ce.ii.edu.mk	init	-		-
	LM_S.2	SEE-GRID	grid1.irb.hr	init	-		-
	LM_S.3	SEE-GRID	grid1.netmode.ece.ntua.gr	init	-		-
	LM_S.4	SEE-GRID	grid1.irb.hr	init	-		-
	LM_S.5	SEE-GRID	testbed001.grid.icl.ro	init	-		-
	LM_S.6	HUNGRID	grid109.kfki.hu	init	-		-
	TIFF	HUNGRID	grid109.kfki.hu	init	-		-

Message: Job list refreshed.



White/Red/Green color means the job is initial/running/finished state

www.portal.p-grade.hu



Workflow Execution

(observation by the workflow portlet)

PGrade Portal - Microsoft Internet Explorer

http://hgportal.hpcc.sztaki.hu:7080/gridsphere/gridsphere?action=doGotoPage&cid=2

Workflow Certificates Settings Information System Help

Workflow Manager

Refresh Back

Job list									
Workflow	Job	Gridname	Hostname	Status	[Logs]	[Output]	[Visualization]		
LM_9_DEMO_TOTAL				running	-	N/A	Visualize	All	Abort
	INIT	SEE-GRID	ce01.grid.acad.bg	finished	-	-	-	-	-
	LM_P	SEE-GRID	n40.hpcc.sztaki.hu	init	-	-	-	-	-
	LM_P.2	SEE-GRID	n40.hpcc.sztaki.hu	init	-	-	-	-	-
	LM_S	SEE-GRID	grid-ce.ii.edu.mk	running	-	-	-	-	-
	LM_S.2	SEE-GRID	grid1.irb.hr	finished	Out	-	-	-	-
	LM_S.3	SEE-GRID	grid1.netmode.ece.ntua.gr	running	Out	-	-	-	-
	LM_S.4	SEE-GRID	grid1.irb.hr	finished	Out	-	-	-	-
	LM_S.5	SEE-GRID	testbed001.grid.ici.ro	running	Out	-	-	-	-
	LM_S.6	HUNGRID	chemgrid3.chemres.hu	finished	Out	-	-	-	-
	TIFF	HUNGRID	grid109.kfki.hu	init	-	-	-	-	-

Message: Job list refreshed.



White/Red/Green color means the job is initial/running/finished state

Workflow Execution

(observation by the workflow portlet)

The screenshot shows the PGrade Portal Workflow Manager interface. At the top, there are navigation tabs: Workflow, Certificates, Settings, Information System, and Help. Below the tabs is a "Job list" table. The table has columns for Workflow, Job, Gridname, Hostname, Status, [Logs], [Output], and [Visualization]. The Status column uses color coding: white for 'init', red for 'running', and green for 'finished'. The table also includes buttons for 'Visualize', 'All', and 'Abort' for each job. A message at the bottom of the table reads: "Message: Job list refreshed."

Workflow	Job	Gridname	Hostname	Status	[Logs]	[Output]	[Visualization]
LM_9_DEMO_TOTAL				running	-	N/A	Visualize All Abort
	INIT	SEE-GRID	ce01.grid.acad.bg	finished	-		-
	LM_P	SEE-GRID	n40.hpcc.sztaki.hu	running	Out	-	Visualize
	LM_P.2	SEE-GRID	n40.hpcc.sztaki.hu	running	Out	-	Visualize
	LM_S	SEE-GRID	grid-ce.ii.edu.mk	finished	Out	-	-
	LM_S.2	SEE-GRID	grid1.irb.hr	finished	Out	-	-
	LM_S.3	SEE-GRID	grid1.netmode.ece.ntua.gr	finished	Out	-	-
	LM_S.4	SEE-GRID	grid1.irb.hr	finished	Out	-	-
	LM_S.5	SEE-GRID	testbed001.grid.ici.ro	finished	Out	-	-
	LM_S.6	HUNGRID	chemgrid3.chemres.hu	finished	Out	-	-
	TIFF	HUNGRID	grid109.kfki.hu	init	-	-	-

Message: Job list refreshed.



White/Red/Green color means the job is initial/running/finished state

Workflow Execution

(observation by the workflow portlet)

The screenshot shows the PGrade Portal Workflow Manager interface. The main content is a table titled "Job list" with the following columns: Workflow, Job, Gridname, Hostname, Status, [Logs], [Output], and [Visualization]. The table contains 10 rows of job data. The "Status" column uses color coding: white for "finished", red for "running", and green for "initialised". The "Output" column shows "Being zipped.." for the first row and "Out" for others. The "Visualization" column has buttons like "Visualize" and "All".

Workflow	Job	Gridname	Hostname	Status	[Logs]	[Output]	[Visualization]
LM_9_DEMO_TOTAL				finished	Err	Being zipped..	Visualize All S
	INIT	SEE-GRID	ce01.grid.acad.bg	finished	-	-	-
	LM_P	SEE-GRID	n40.hpcc.sztaki.hu	finished	Out	-	Visualize
	LM_P.2	SEE-GRID	n40.hpcc.sztaki.hu	finished	Out	-	Visualize
	LM_S	SEE-GRID	grid-ce.il.edu.mk	finished	Out	-	-
	LM_S.2	SEE-GRID	grid1.irb.hr	finished	Out	-	-
	LM_S.3	SEE-GRID	grid1.netmode.ece.ntua.gr	finished	Out	-	-
	LM_S.4	SEE-GRID	grid1.irb.hr	finished	Out	-	-
	LM_S.5	SEE-GRID	testbed001.grid.ici.ro	finished	Out	-	-
	LM_S.6	HUNGRID	chemgrid3.chemres.hu	finished	Out	-	-
	TIFF	HUNGRID	grid109.kfki.hu	finished	Out	-	-

Message: Job list refreshed.

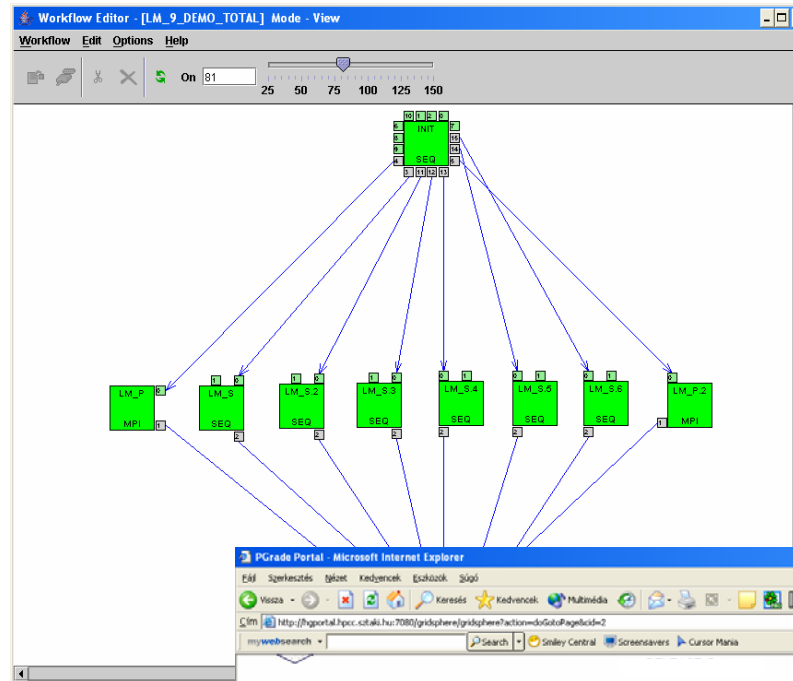


White/Red/Green color means the job is initialised/running/finished



Workflow Execution

What about data transfers?



PGrade Portal - Microsoft Internet Explorer

Workflow Manager

Workflow	Job	Gridname	Hostname	Status	Logs	Output	Visualization
LM_9_DEMO_TOTAL	INIT	SEE-GRID	ce01.grid.acad.bg	finished	-	N/A	Visualize All Abort
	LM_P	SEE-GRID	n40.hpc.sztaki.hu	running	Out	-	Visualize
	LM_P_2	SEE-GRID	n40.hpc.sztaki.hu	running	Out	-	Visualize
	LM_S	SEE-GRID	grid-ce.il.edu.mk	finished	Out	-	-
	LM_S_2	SEE-GRID	grid1.irb.hr	finished	Out	-	-
	LM_S_3	SEE-GRID	grid1.netmode.ece.ntua.gr	finished	Out	-	-
	LM_S_4	SEE-GRID	grid1.irb.hr	finished	Out	-	-
	LM_S_5	SEE-GRID	testbed001.grid.ic.ro	finished	Out	-	-
	LM_S_6	HUNGRID	chemgrid3.chemres.hu	finished	Out	-	-
	TIFF	HUNGRID	grid109.kfki.hu	init	-	-	-

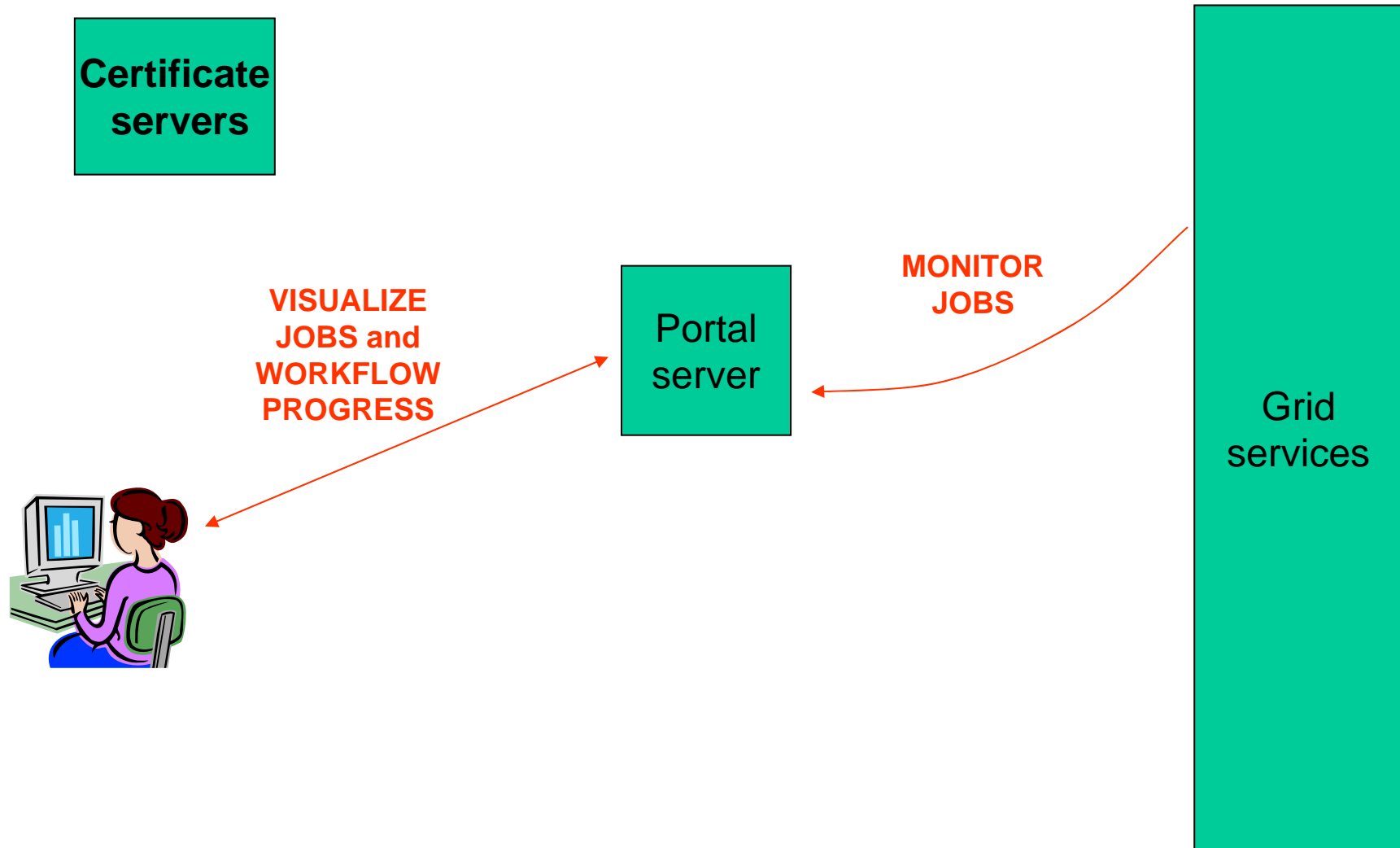
Message: Job list refreshed.





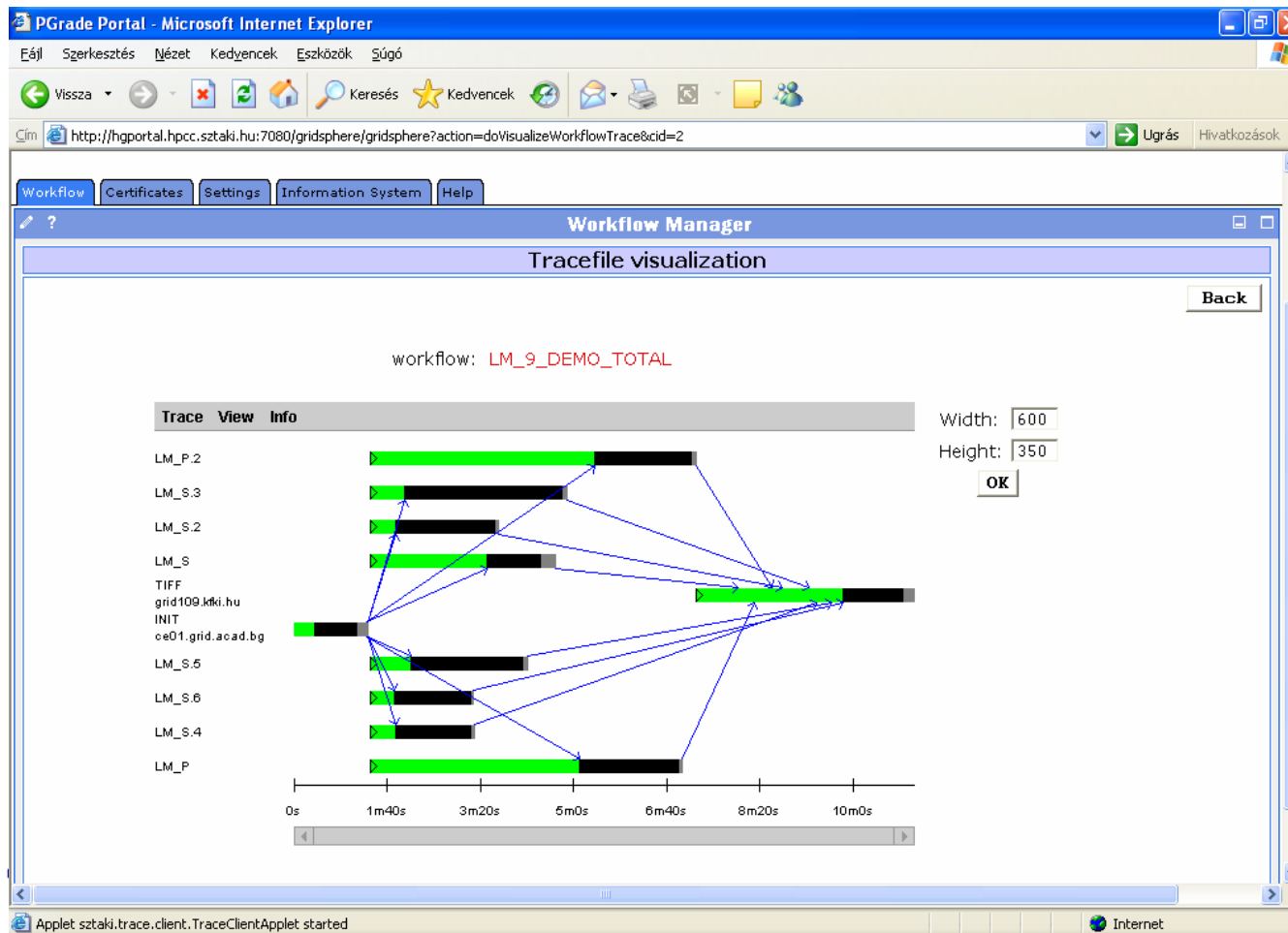
The typical user scenario

Execution phase – step 3:





On-Line Monitoring both at the workflow and job levels *(workflow portlet)*

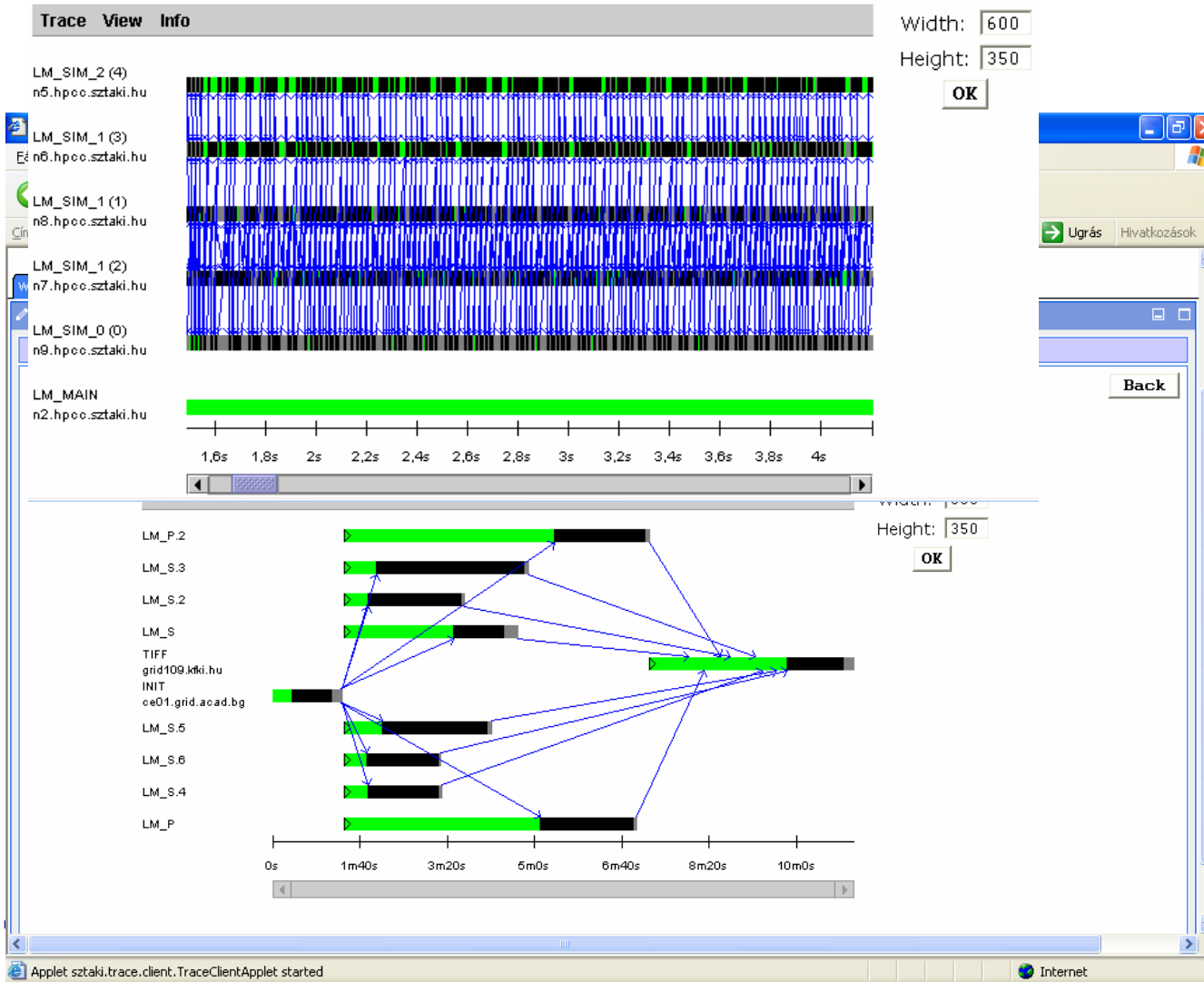


- The portal monitors and visualizes workflow progress



On-Line Monitoring both at the workflow and job levels *(workflow portlet)*

workflow / job: LM_9_DEMO_TOTAL / LM_P



- The portal monitors and visualizes parallel jobs (if they are prepared for Mercury monitor)



Rescuing a failed workflow 1.

A job failed during workflow execution

Read the error log to know why

Workflow	Job	Gridname	Hostname	Status	Grid	Output	View	Action
demo-RESCUE	Count1	SZTAKI-GRID	n0 .hpc.sztaki.hu	finished	Out	-	-	-
	Count2	SZTAKI-GRID	n0 .hpc.sztaki.hu	finished	Out	-	-	-
	Count3	HUNGRID	chemgrid3 .chemres.hu	error	- Err	-	-	-
	Count4	SZTAKI-GRID	n0 .hpc.sztaki.hu	submitted	--	-	-	-

Message: Workflow details successfully displayed.

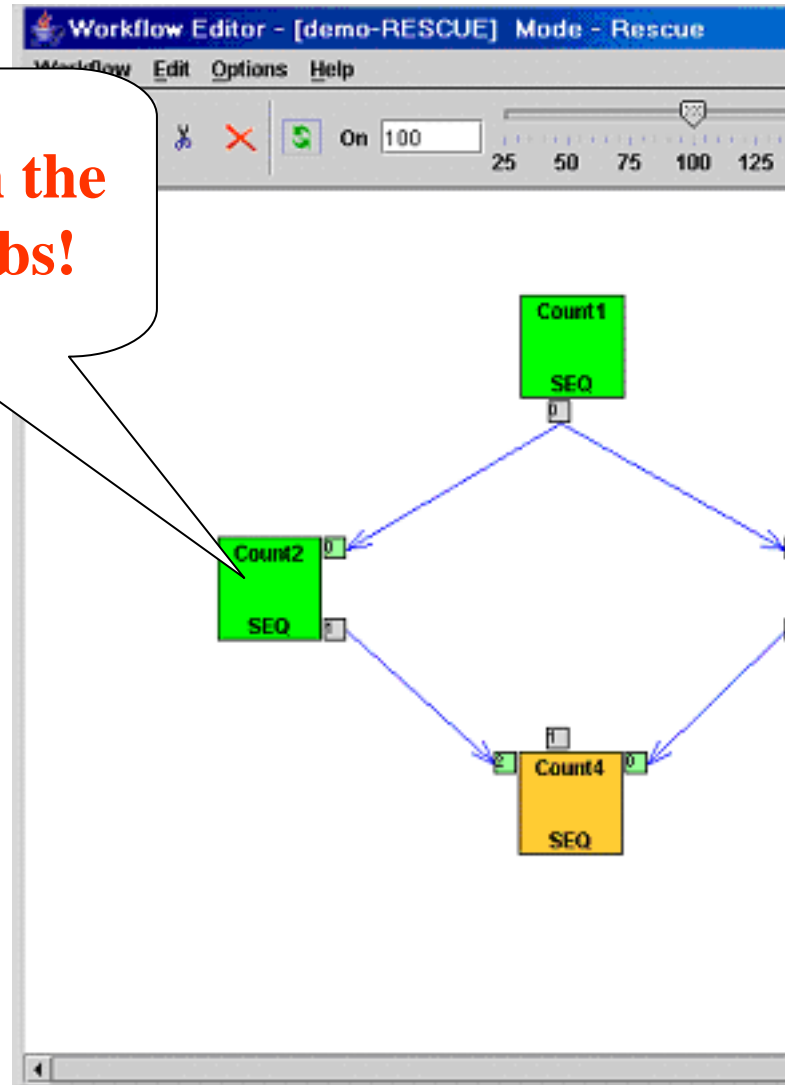
July 29, 2005





Rescuing a failed workflow 2.

Don't touch the finished jobs!



Map the failed job onto a different CE or download a new proxy for it.

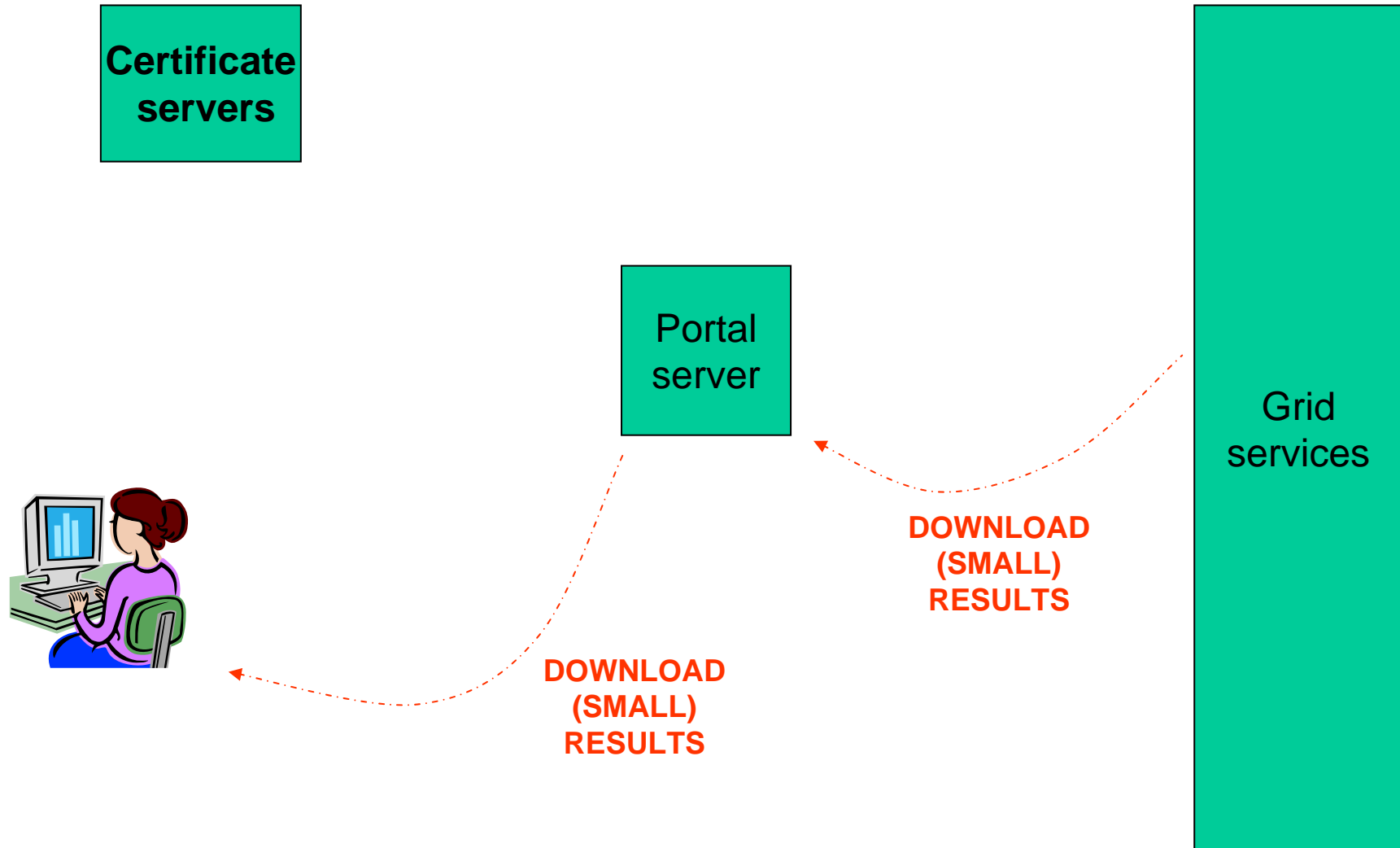
The execution can continue from the point of failure!





The typical user scenario

Execution phase – step 5





Downloading the results...

The screenshot shows the P-Grade Portal interface in a Mozilla browser window. The main content area is titled "Workflow Manager" and contains a "Job list" table. A red arrow points from the "Visualize" button in the table to a "Opening nowcast_final_g.zip" dialog box. The dialog box asks what to do with the file and has "Save it to disk" selected.

Workflow	Job	Hostname	Status	[Logs]	[Output]	[Visualization]	[Action]
nowcast-final-g_SGE			finished		<input checked="" type="checkbox"/>	Visualize All	Subm Attach Delete
	cummu	n0.hpcc.sztaki.hu	finished	--		Visualize	
	delta	n0.hpcc.sztaki.hu	finished	--		Visualize	
	ready	n0.hpcc.sztaki.hu	finished	--			
	satel	n0.hpcc.sztaki.hu	finished	--			
	visib	n0.hpcc.sztaki.hu	finished	--			

Opening nowcast_final_g.zip

The file "nowcast_final_g.zip" is of type application/x-zip-compressed, and Mozilla does not know how to handle this file type. This file is located at:
e:\pri\mc04

What should Mozilla do with this file?

- Open it with the default application
- Open it with - Save it to disk
- Always perform this action when handling files of this type

OK Cancel





User collaboration

- **Workflows and traces** can be exported from the portal server onto your client machine
- **Workflows and traces** can be imported into the Portal



- **Share your workflows or results with other researchers!**
- **Migrate your application from one portal into another!**





Workflow/trace export/import

To export a workflow from the portal onto your machine

To delete every unnecessary files of the workflow

To delete trace/output of the workflow (if any)

The screenshot shows a web browser window displaying a portal interface. At the top right, there is a user profile for 'Gabor Hermann' with a 'Logout' link. The main content area features a table of workflow items. The table has columns for workflow name, size, and actions. Three callout boxes are overlaid on the table:

- The first callout points to the 'Download' button for workflow 'WF1'.
- The second callout points to the 'Delete' button for workflow 'WF12Sz'.
- The third callout points to the 'set init' button for workflow 'WF12Sz'.

Workflow	Size	Trace	Output	Action
WF1	27 276 Byte			Download, set init
WF12	77 964 Byte	--		Download, set init
WF12Sz	95 528 Byte	--	337 Byte	Download, set init, Delete



References

- **Already available for**
 - **UK NGS**
 - **GILDA: EGEE training infrastructure**
 - SEE-GRID infrastructure
 - HUNGRID infrastructure
 - VOCE: Central European VO of EGEE
 - Swiss BioGrid
 - OGF GIN VO
- **Under preparation for**
 - Economy Grid
 - Turkish Grid
 - BioInfoGrid
 - US Open Science Grid
 - US TeraGrid
- **P-GRADE portal can be installed by the system administrator of any EGEE/Globus/ARC Grid/VO → Please contact us!**





How to learn the P-GRADE portal?

- Visit the <http://www.portal.p-grade.hu>
 - *Manuals, tutorials*
 - *Installation procedure*
 - *Self-guided hands-on exercise for the GILDA P-GRADE Portal*
- **Visit or request a training event** (event list on Portal homepage)
 - Lectures, demos, hands-on tutorials, application developer courses
- **Get an account for one of the production portals:**
 - **NGS portal – University of Westminster**
 - GILDA portal - SZTAKI
 - VOCE portal - SZTAKI
 - SEEGRID portal – SZTAKI
 - HunGrid portal – SZTAKI
 - Swiss Biogrid – Swiss Centre of Supercomputing
- **If you are the administrator of a Grid/VO then contact SZTAKI to get your own P-GRADE Portal installation**
- If you know the administrator of a P-GRADE Portal you can ask him/her to give access to your Grid through his/her portal installation! (Multi-Grid portal)





Conclusions: E-scientists' concerns are resolved!

- The P-GRADE Portal hides the complexity and differences of Grids
 - **Globus X – LCG2 – gLite - ARC Grid interoperability at the workflow level**
 - **Switching between Grid technologies is transparent to the end-user**
 - Various components can be integrated into large Grid applications
 - Sequential codes
 - MPI codes
 - Legacy codes (with the GEMMLCA-specific P-GRADE Portal)
- **Your code does not have to include grid specific commands**
- Graphical tools for application development, execution and monitoring
- **Support for collaborative team work**
 - **Sharing workflows**
 - **Sharing jobs (with the GEMMLCA-specific P-GRADE Portal)**
- Built by standard portlet API → customizable to specific application areas, user groups





Learn once, use everywhere
Develop once, execute anywhere

Thank you!

www.portal.p-grade.hu
pgportal@lpds.sztaki.hu

