



# GEMMLCA / P-GRADE: A workflow-oriented portal and application hosting environment

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[www.portal.p-grade.hu](http://www.portal.p-grade.hu)  
[www.cpc.wmin.ac.uk/gemlca](http://www.cpc.wmin.ac.uk/gemlca)



# 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, TeraGrid (**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 utilise **legacy applications**?
- How can I **collaborate with fellow researchers**?

The GEMMLCA / P-GRADE Portal gives you the answers!



# P-Grade Portal in a nutshell



- **General purpose, workflow-oriented computational Grid portal.** Supports the development and execution of workflow-based Grid applications – **a tool for Grid orchestration**
- Based on **GridSphere-2**
  - Easy to expand with new portlets (e.g. application-specific portlets)
  - Easy to tailor to end-user needs
- Developed by SZTAKI
- **Grid services** supported by the portal:

Service	EGEE grids (LCG/gLite)	Globus 2 grids
Job execution	Computing Element	GRAM
File storage	Storage Element	GridFTP server
Certificate management	MyProxy	
Information system	BDII	MDS-2, MDS-4
Brokering	Workload Management System	(GTbroker)
Job monitoring	Mercury	
Workflow & job visualization	PROVE	

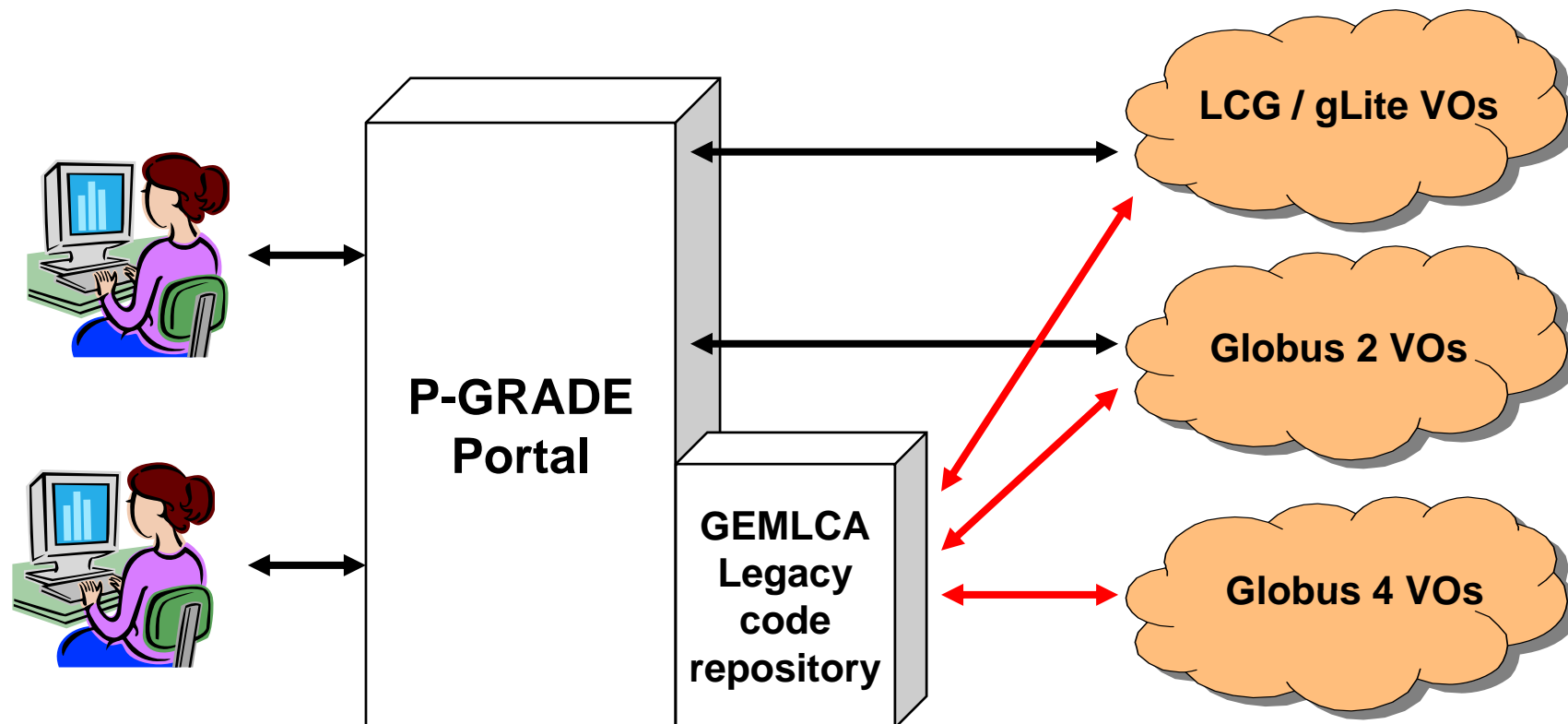
**Solves Grid interoperability problem at the workflow level**



# ***GEMMLCA / P-GRADE Portal in a nutshell***



- **P-GRADE Portal extended with GEMMLCA back-end**
  - **Sharing jobs and legacy codes as workflow components**
  - **GEMMLCA is a grid service implemented by UoW**
- **A step towards collaborative e-Science**
- **Support for Globus 4 grids (besides GT2 and EGEE)**



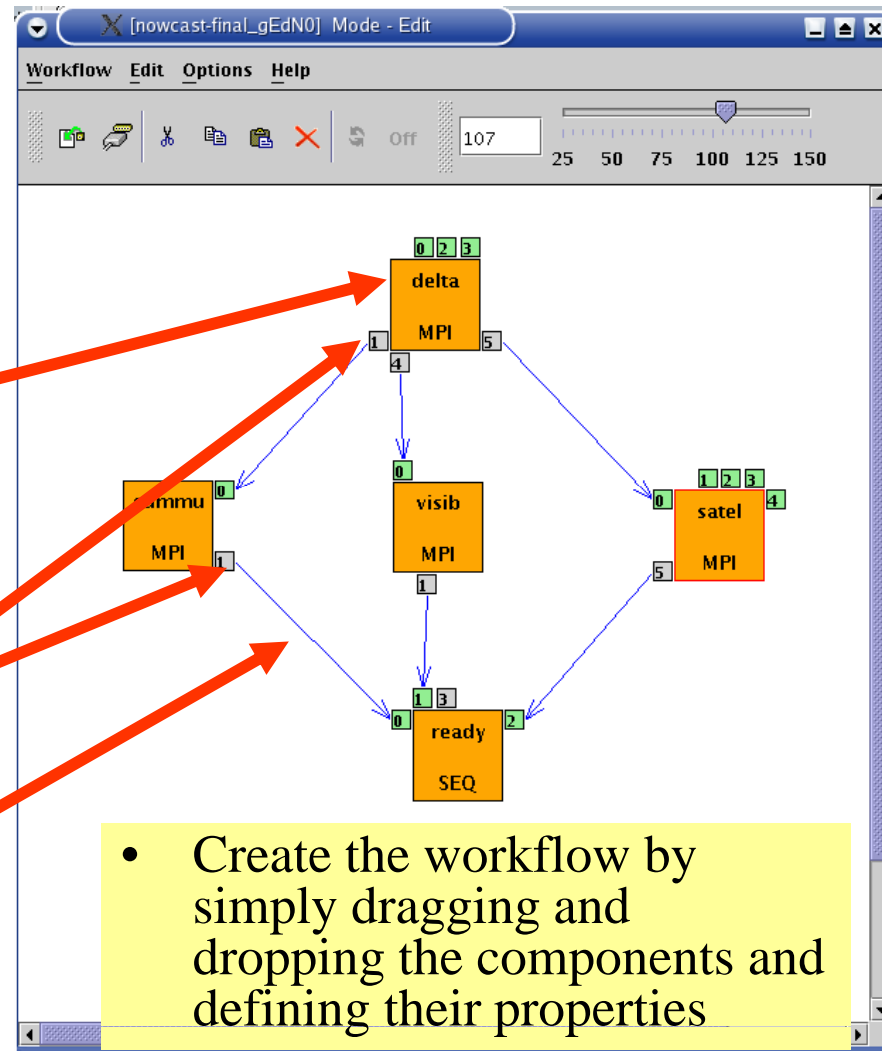


# What is a GEMLCA / P-GRADE Portal workflow?



- A directed acyclic graph where:

- Nodes represent jobs - either sequential or parallel programs
- Ports represent input/output files the jobs expect/produce
- Arcs represent file transfer between the jobs

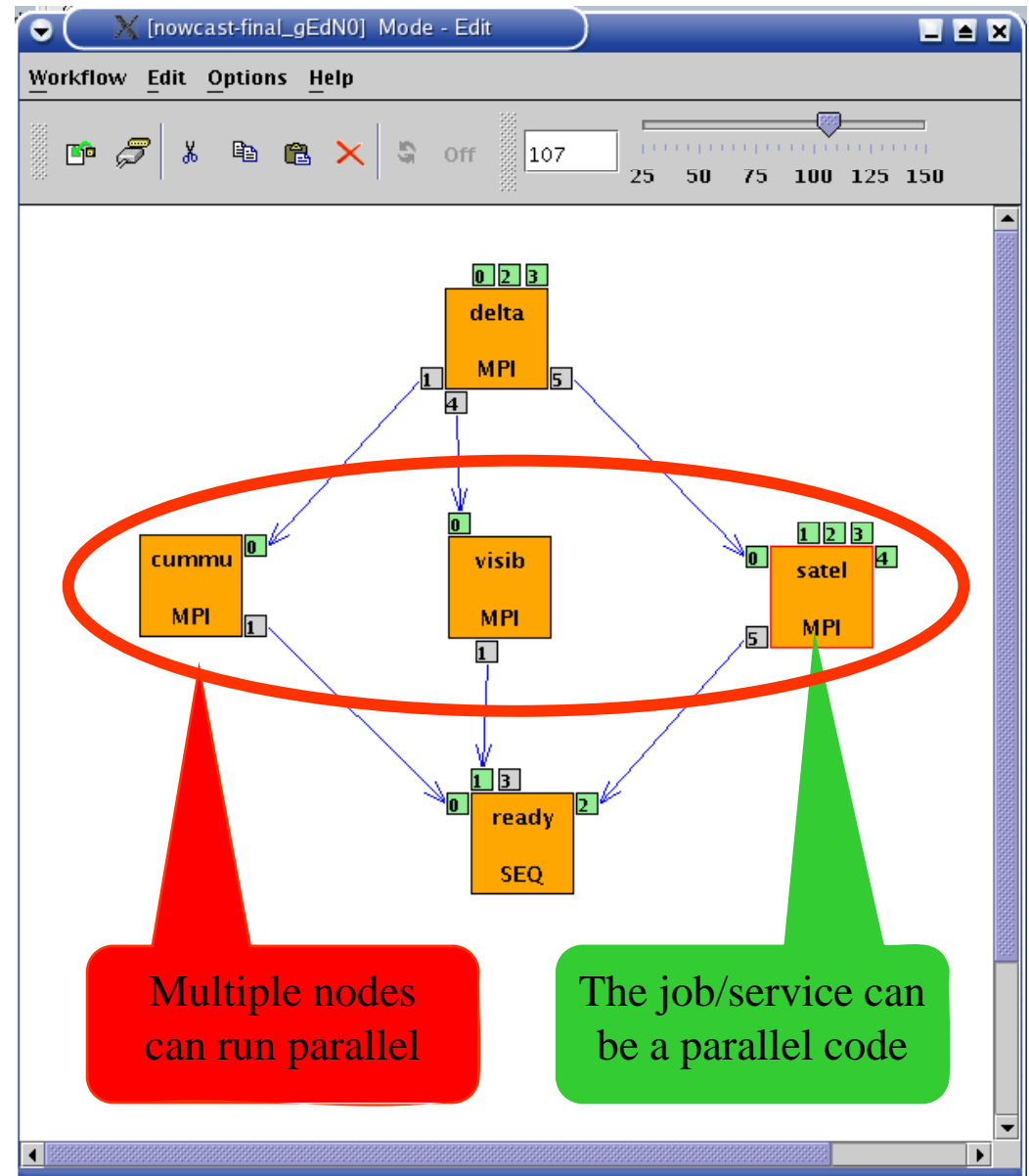




# Two levels of parallelism within a workflow

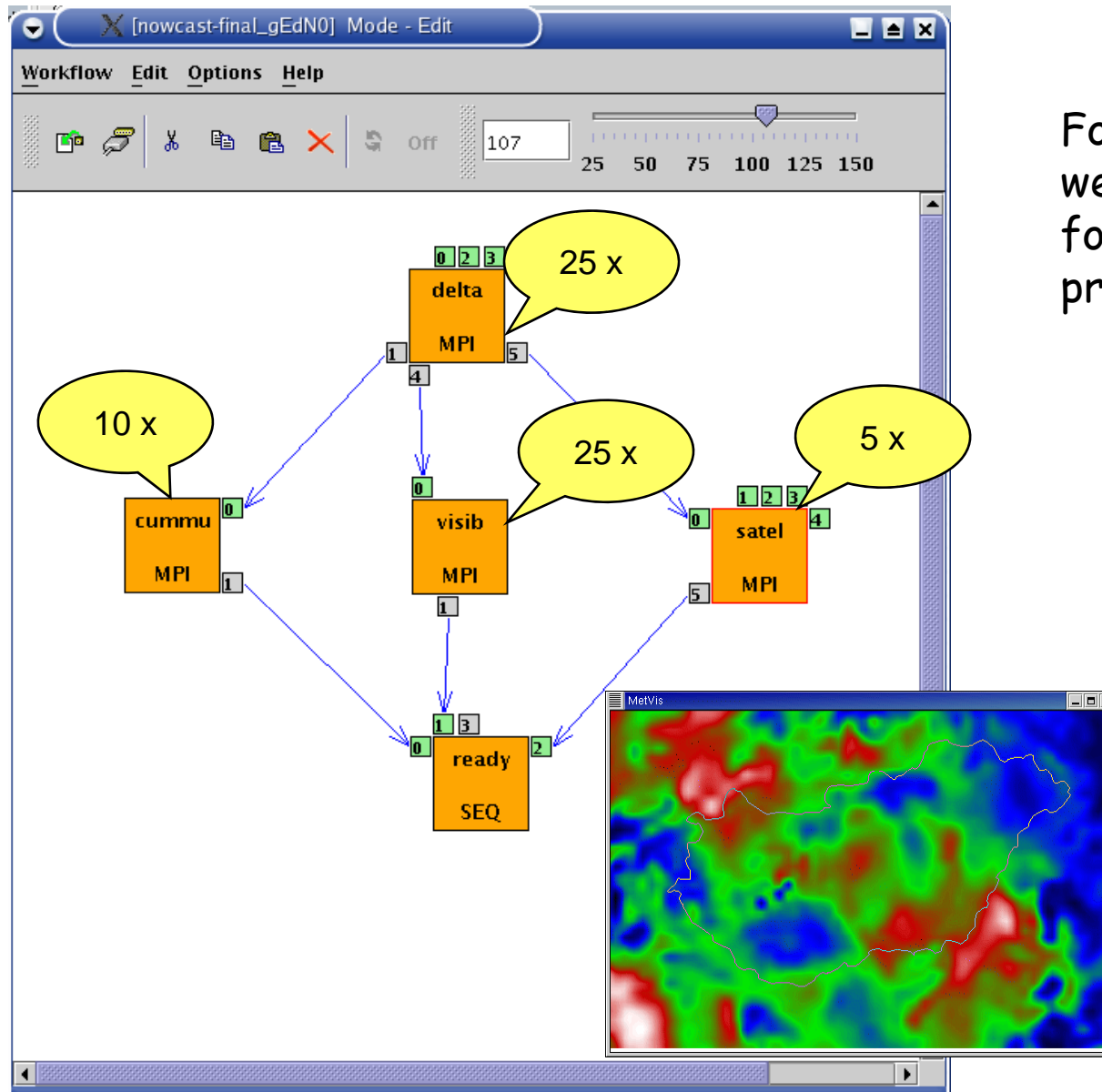


- The workflow concept of the GEMMLCA/ P-GRADE Portal enables the efficient parallelization of complex problems
- Semantics of the workflow enables two levels of parallelism:
  - Parallel execution inside a workflow node
  - Parallel execution among workflow nodes





# 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)

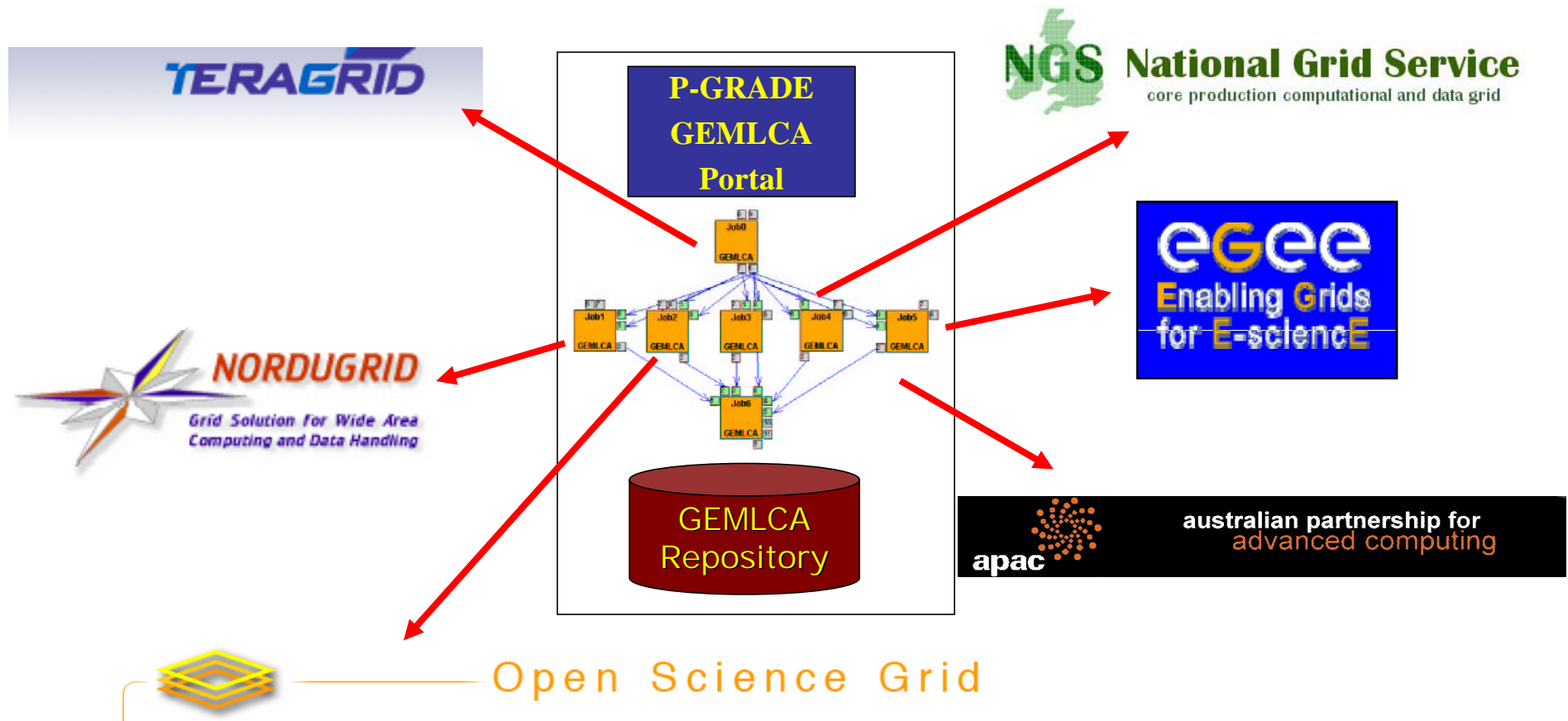




# Workflow-level Grid interoperability: The GIN Resource Testing portal

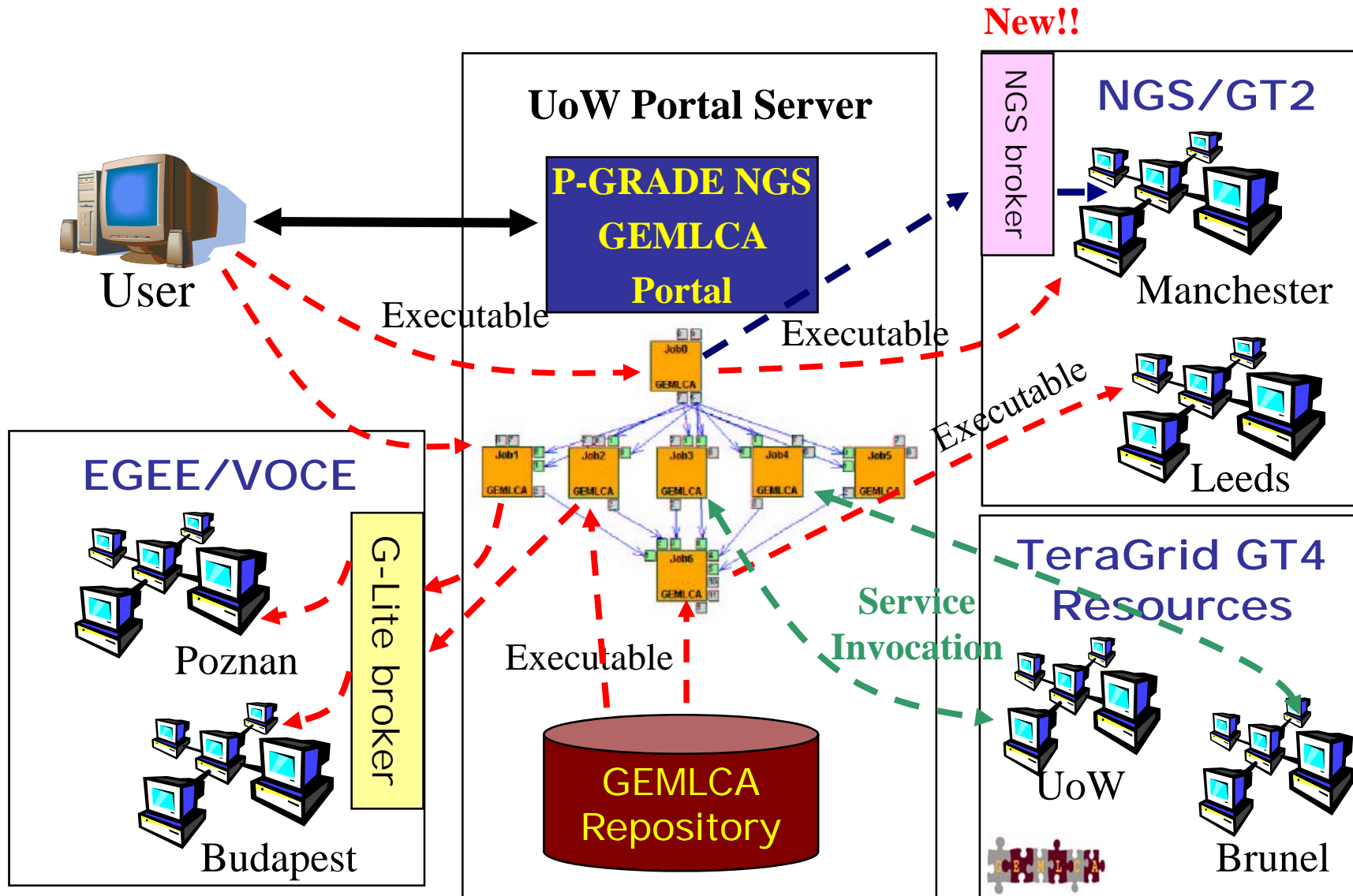


OGF effort to demonstrate workflow level grid interoperability between major production Grids and to monitor OGF GIN VO resources





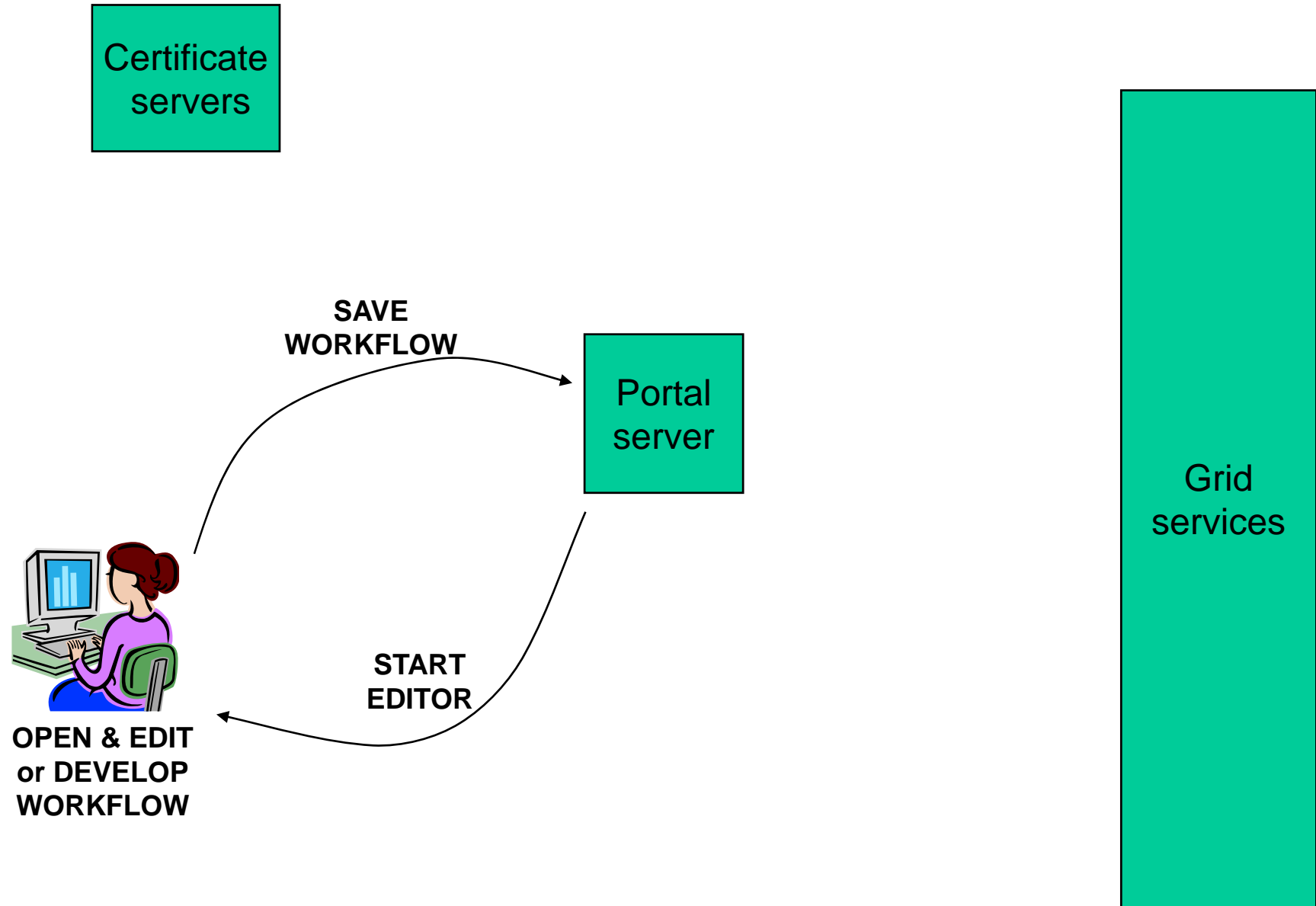
# Workflow level interoperability of Grid systems





# The typical user scenario

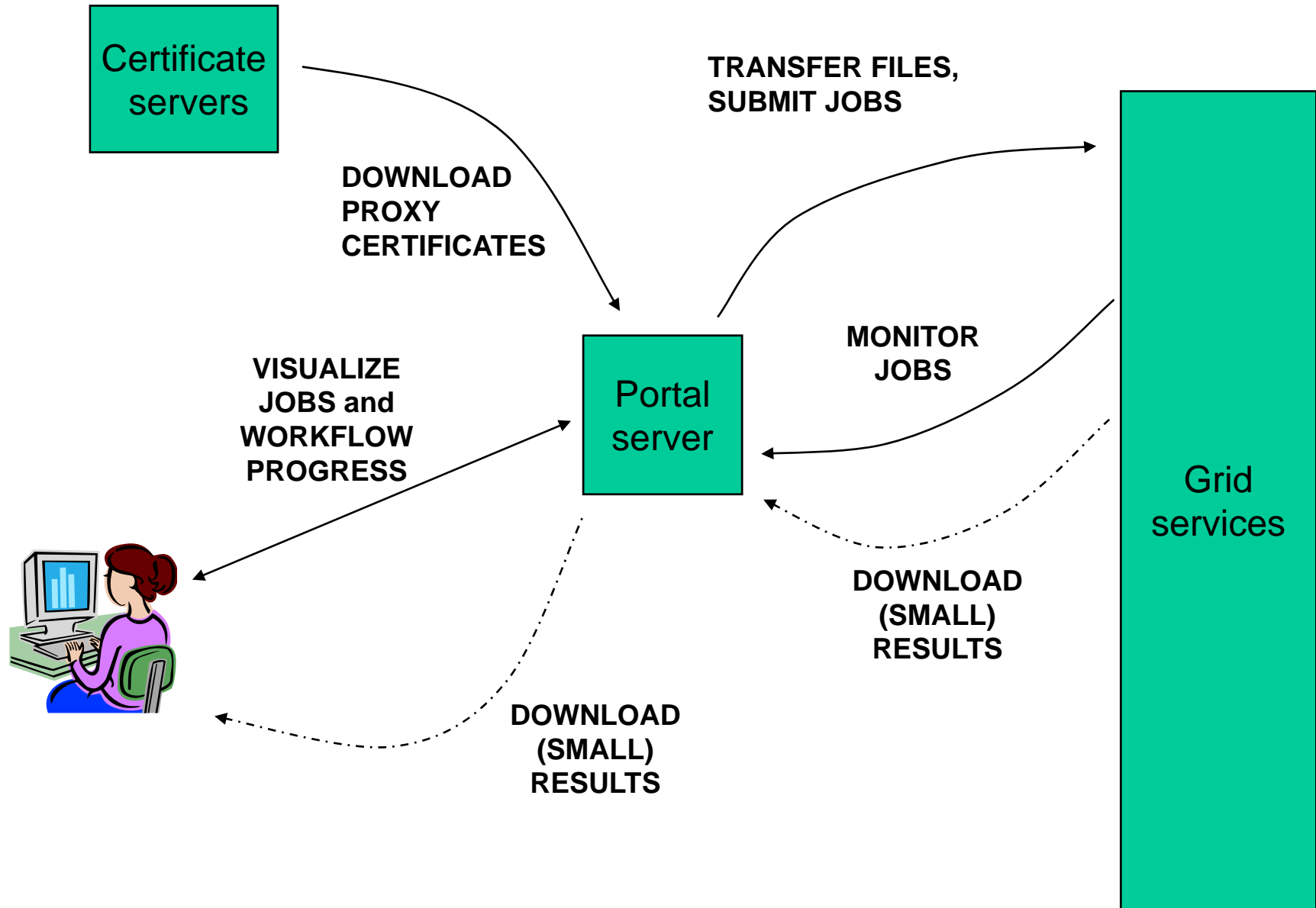
## Part 1 - development phase





# The typical user scenario

## Part 2 - execution phase



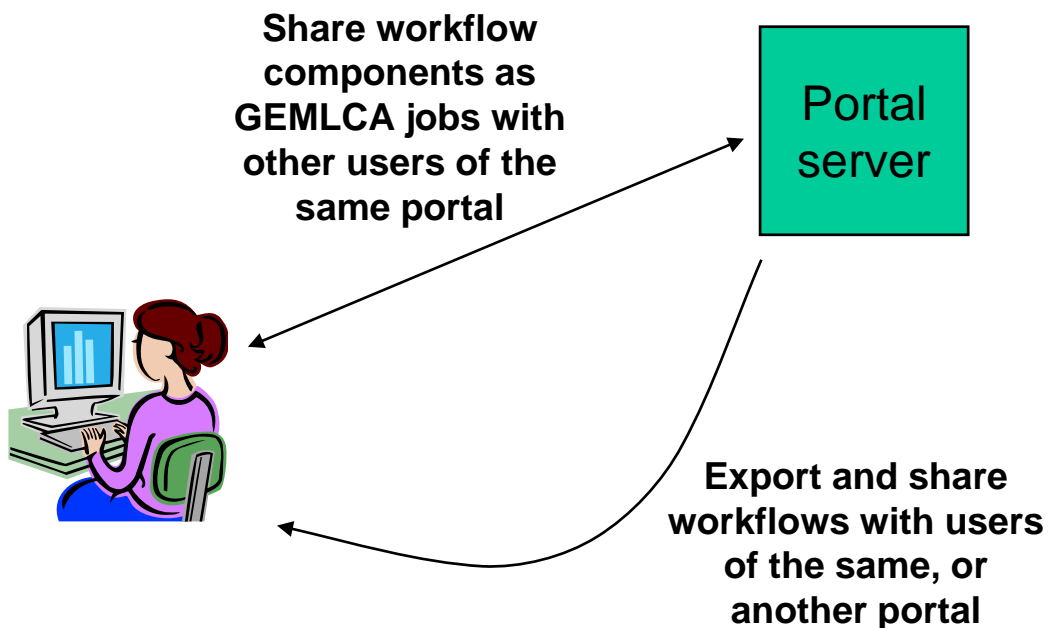


# The typical user scenario

## Part 3 - collaborative phase



Certificate servers



Grid services



# 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 displaying the P-Grade Portal. The main content area features the 'Workflow Manager' application. The 'Workflow Editor' tab is active, and a 'Workflow list' table is visible. The table contains the following data:

Workflow	Status	Size	Quota (100 Mb)	[ Output ]	[ View ]	[ Action ]
LM_9_DEMO_TOTAL	submitted	26.848 MB	26%	N/A	Details	Abort Attach Delete
		26.848 MB	26%			

At the bottom of the interface, a message box displays: **Message:** Workflow successfully submitted.



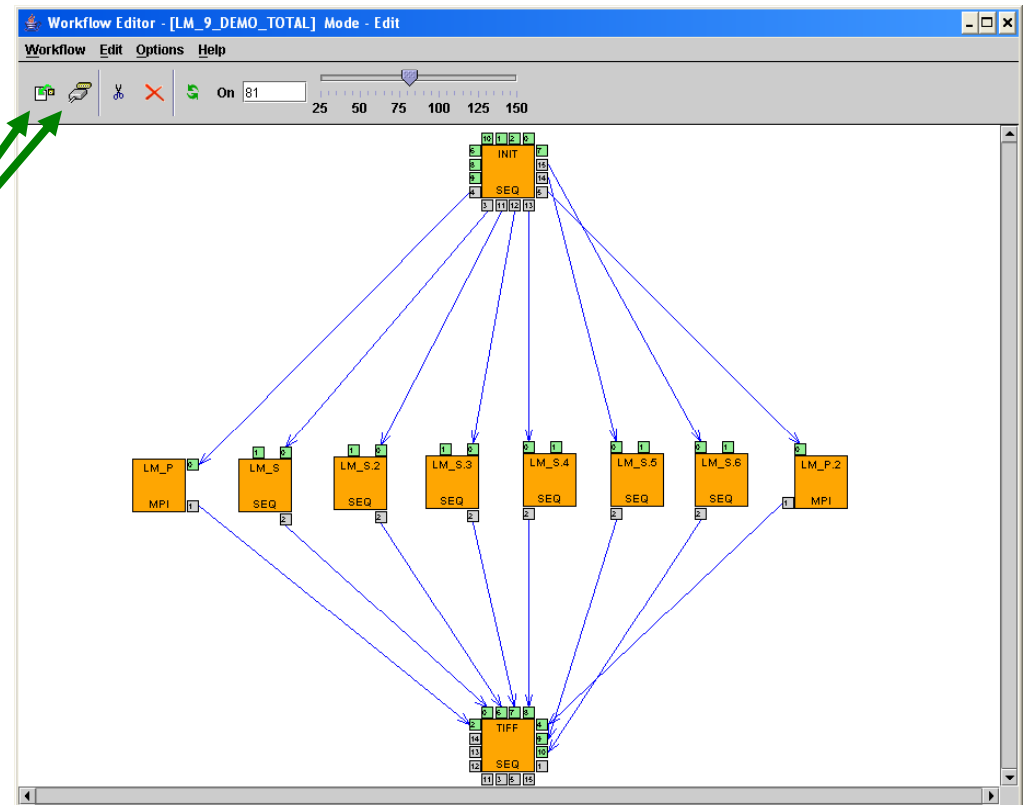
# Workflow Editor

## Defining the graph



- The aim is to define a DAG of jobs and services (GEMMLCA jobs):

- Drag & drop components:** nodes and ports
- Define their properties**
- Connect ports by channels** (no cycles, no loops, no conditions)





# Workflow Editor

## Properties of a job component



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:

- Type of executable
- Client side location of binary
- Number of required processors
- Command line parameters
- The resource to be used for the execution:
  - Grid (VO)
  - Resource / broker





# Workflow Editor



## Properties of a GEMMLCA service component

Workflow Editor - [LM\_9\_DEMO\_TOTAL] Mode - Edit

Workflow Edit Options Help

**Job0 properties**

Name: Job0

Job Type: GEMMLCA

Grid: Westfocus

Resource: http://gn6.cluster.cpc.wmin.ac.uk:8082/wsrf/service...

Legacy Code: manhattan - Manhattan generator (Fork)

Parameters

Parameter ...	Mandatory	Type	Mode	Val	
rows	No	Command...	Input	10	
columns	No	Command...	Input	10	null
unit width	No	Command...	Input	150	null
unit height	No	Command...	Input	150	null
columns o...	No	Command...	Input	2	null
rows of pa...	No	Command...	Input	2	null
net file	No	File	Output	file.net	null

LM\_P  
MPI

Ok Cancel

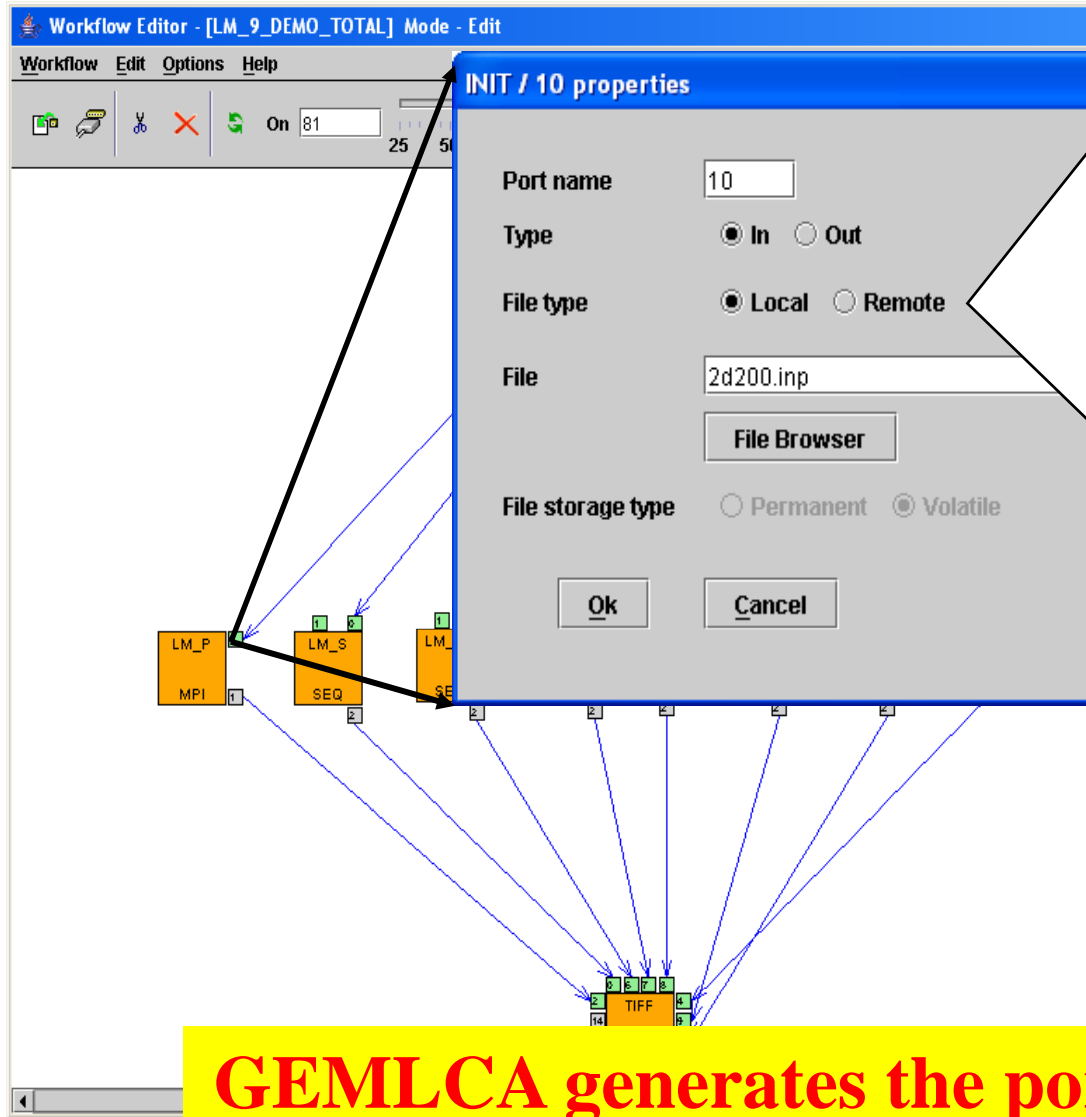
### Properties of a GEMMLCA service:

- The location of the service:
  - Grid (VO)
  - Resource / broker
- Code available for that resource
- Actual parameter values



# Workflow Editor

Defining job / service input-output data



## File properties

### Type:

**input:** *the component requires*  
**output:** *the component produces*

### File type:

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

### File:

*location of the file*

### File storage type (for outputs only):

**Permanent:** *final result*  
**Volatile:** *used only for inter-component data transfer*

**GEMMLCA generates the ports automatically**



# 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 – EGEE VOs)  
`lfn:/grid/egrid/sipos/11-04.dat`

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

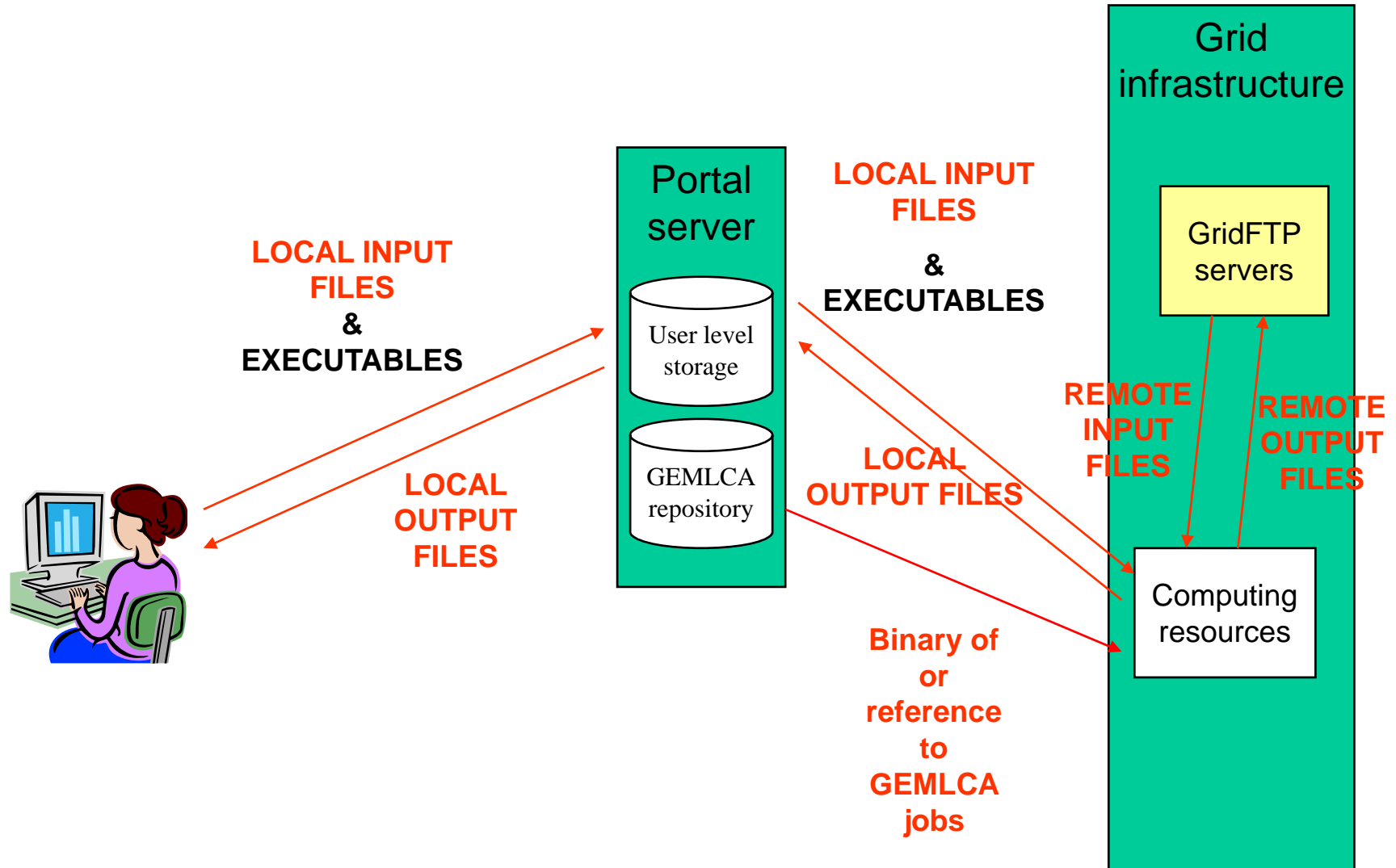
- GridFTP address (in Globus Grids):  
`gsiftp://somengshost.ac.uk/mydir/11-04.dat`

- GridFTP address (in Globus Grids):  
`gsiftp://somengshost.ac.uk/mydir/result.dat`

### Remote file

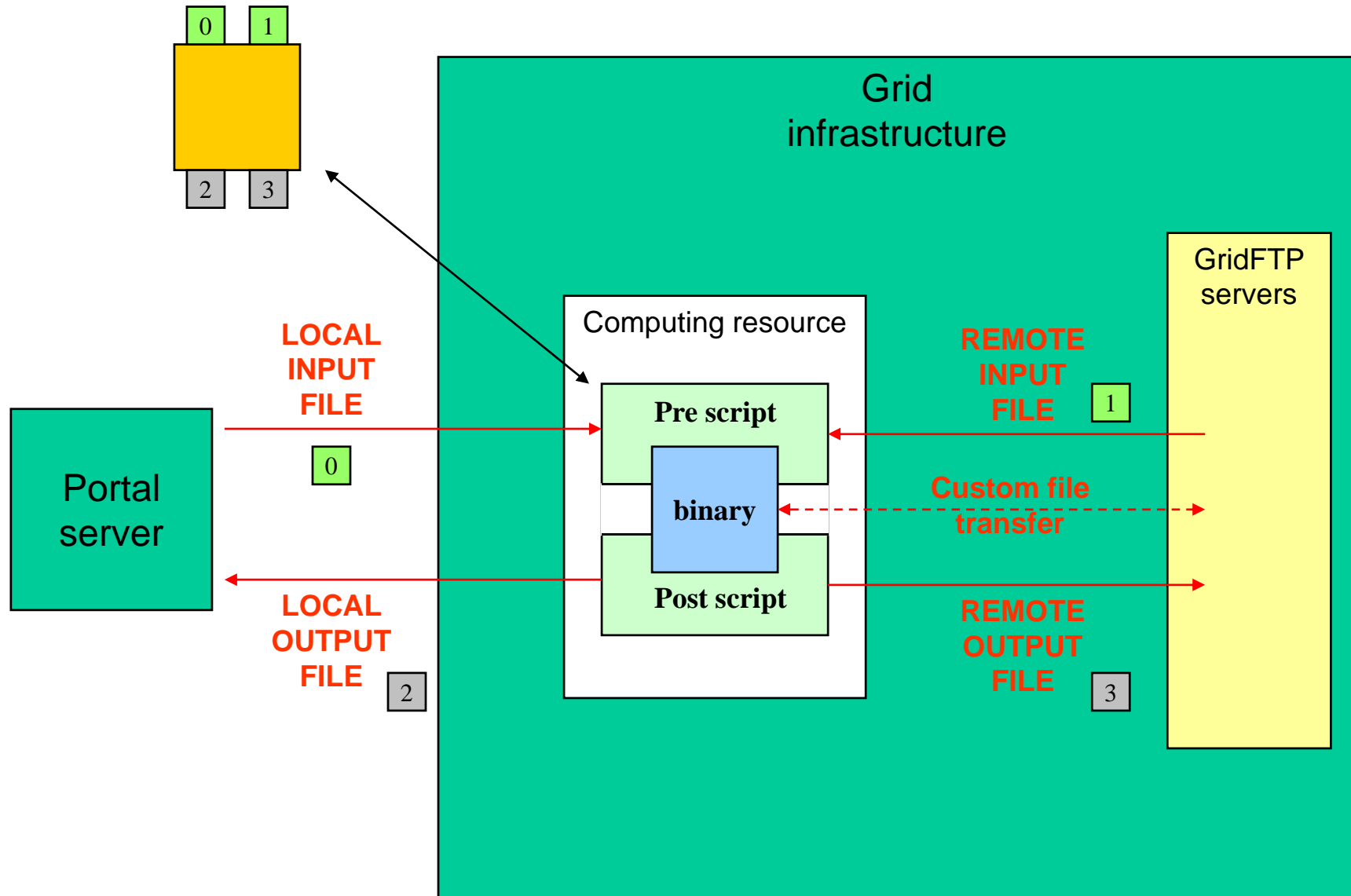


# Workflow level file transfer





# Job / service level file transfer





# Browsing computing resources by the information system portlet



PGrade Portal - Microsoft Internet Explorer

http://hgportal.hpcc.sztaki.hu:7080/gridsphere/gridsphere?action=doChangeVO&cid=15

Workflow Certificates Settings Information System Help

MDS Monitor LOG Monitor

Monitor

Select Grid: SEE-GRID View

Select VO: seegrid View

Grid: SEE-GRID VO: seegrid

Site Name	Computing Element						Storage Element		
	CPU			Job			Space		
	Total	Free	Usage	Running	Waiting	Load	Total	Available	Usage
AEGIS01-PHY-SCL	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%
	20	16	20%	1	0	0%	131.775 GB	79.957 GB	39%
	3	3	0%	0	0	0%	566.608 GB	566.376 GB	0%
	48	32	33%	2	5	71%	554.647 GB	475.767 GB	14%
	60	12	80%	4	0	0%	78.317 GB	6.271 GB	92%
	28	28	0%	0	0	0%	69.709 GB	69.075 GB	1%
	54	24	56%	5	36	88%	849.666 GB	828.387 GB	3%
-01	24	24	0%	0	0	0%	862.807 GB	848.676 GB	2%
	4	4	0%	0	0	0%	4.566 GB	2.871 GB	37%
	35	28	20%	1	0	0%	1.335 TB	1.335 TB	0%

**Graphical interface for  
GIIS and  
BDII servers**



# GMT – GEMLCA Monitoring Toolkit



- to test resource availability
- implementation is based on MDS4
- probes are implemented as scripts and their outputs are displayed in a monitoring portlet
- Runs on the NGS and GIN portals

GridSphere Portal - Microsoft Internet Explorer

RELEASE 2.4

University of Westminster

GridSphere | **GT4/GEMLCA Monitor** | GIN VO Information

GT4/GEMLCA Monitor

ServiceGroup Overview

This page provides a brief overview of Web Services and/or WS-Resources that are members of a WS-ServiceGroup.

This WS-ServiceGroup has 54 direct entries, 54 in whole hierarchy.

Resource Type	ID	Information	
gmtgemcalistcodes	161.74.12.24	GTT Probe "gmtgemcalistcodes" for https://161.74.12.24:9000/wsrf/services/grid-compute.cpc.wmin.ac.uk	<a href="#">detail</a>
GEMLCA	161.74.83.51	GEMLCA resource test for https://161.74.83.51:3104/wsrf/services/tg-grid.uc.teragrid.org	<a href="#">detail</a>
GEMLCA	161.74.83.51	GEMLCA resource test for https://161.74.83.51:3107/wsrf/services/tg-login1.sdsc.teragrid.org	<a href="#">detail</a>
GEMLCA	161.74.83.51	GEMLCA resource test for https://161.74.83.51:3101/wsrf/services/gm6.cluster.cpc.wmin.ac.uk	<a href="#">detail</a>
GEMLCA	161.74.83.51	GEMLCA resource test for https://161.74.83.51:3106/wsrf/services/maverick.tacc.utexas.edu	<a href="#">detail</a>
GEMLCA	161.74.83.51	GEMLCA resource test for https://161.74.83.51:3103/wsrf/services/grid-hg.ncsa.teragrid.org	<a href="#">detail</a>
GEMLCA	161.74.83.51	GEMLCA resource test for https://161.74.83.51:3100/wsrf/services/node40.cluster.cpc.wmin.ac.uk	<a href="#">detail</a>
GEMLCA	161.74.83.51	GEMLCA resource test for https://161.74.83.51:3105/wsrf/services/th1.uits.iupui.edu	<a href="#">detail</a>
gmtgridftptest	antaeus.hpcc.ttu.edu	GTT Probe "gmtgridftptest" for gsiftp://antaeus.hpcc.ttu.edu:2811	<a href="#">detail</a>
gmtprewsgramtest	antaeus.hpcc.ttu.edu	GTT Probe "gmtprewsgramtest" for gram://antaeus.hpcc.ttu.edu:2119/jobmanager-fork	<a href="#">detail</a>
gmtgridftptest	ariane.doc.ic.ac.uk	GTT Probe "gmtgridftptest" for gsiftp://ariane.doc.ic.ac.uk:55101	<a href="#">detail</a>
gmtwsgramtest	ariane.doc.ic.ac.uk	GTT Probe "gmtwsgramtest" for https://ariane.doc.ic.ac.uk:55100/wsrf/services/ManagedJobFactoryService	<a href="#">detail</a>
gmtgridftptest	ariane.doc.ic.ac.uk	GTT Probe "gmtgridftptest" for gsiftp://ariane.doc.ic.ac.uk:55001	<a href="#">detail</a>
gmtprewsgramtest	ariane.doc.ic.ac.uk	GTT Probe "gmtprewsgramtest" for gram://ariane.doc.ic.ac.uk:55000/jobmanager-fork	<a href="#">detail</a>
gmtprewsgramtest	atlas.iu.edu	GTT Probe "gmtprewsgramtest" for gram://atlas.iu.edu:2119/jobmanager-pbs	<a href="#">detail</a>
gmtgridftptest	atlas.iu.edu	GTT Probe "gmtgridftptest" for gsiftp://atlas.iu.edu:2811	<a href="#">detail</a>
gmtgridftptest	cmsdsk00.hep.ph.ic.ac.uk	GTT Probe "gmtgridftptest" for gsiftp://cmsdsk00.hep.ph.ic.ac.uk:2811	<a href="#">detail</a>
gmtgridftptest	fermid1.fnal.gov	GTT Probe "gmtgridftptest" for gsiftp://fermid1.fnal.gov:2811	<a href="#">detail</a>
gmtprewsgramtest	fermid1.fnal.gov	GTT Probe "gmtprewsgramtest" for gram://fermid1.fnal.gov:2119/jobmanager-condor	<a href="#">detail</a>
gmtgridftptest	grid-compute.cpc.wmin.ac.uk	GTT Probe "gmtgridftptest" for gsiftp://grid-compute.cpc.wmin.ac.uk:2811	<a href="#">detail</a>
gmtprewsgramtest	grid-compute.cpc.wmin.ac.uk	GTT Probe "gmtprewsgramtest" for gram://grid-compute.cpc.wmin.ac.uk:2119/jobmanager-condor	<a href="#">detail</a>



# *Executing workflows*

## **Main steps**

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





# 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



PGrade Portal - Microsoft Internet Explorer

http://hgportal.hpcc.sztaki.hu:7080/gridsphere/gridsphere?action=doGoDownload&cid=5

P-Grade portal

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!

### 1. MyProxy server access details:

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

### 2. Proxy parameters:

- Lifetime
- Comment

### 3. Grid association



# Certificate Manager

Multi-grid → Multi-proxy



The screenshot shows the 'Certificate Manager' interface within the P-Grade Portal. It features a 'Certificate list' table with columns for Issuer, Set for Grids, Time left, and Actions. Two certificates are listed: one for SEE-GRID and one for HUNGRID. Below the table are buttons for 'Download' and 'Upload', and a message indicating a successful action for HUNGRID.

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	Details Set for Grid Delete
C=HU,O=KFKI RMKI CA,OU=SZTAKI,CN=Patvarczki Jozsef,CN=proxy	HUNGRID	99:57:25	Details Set for Grid Delete

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

SEE-GRID CEs and SEs

HUNGRID CEs and SEs



# 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

The screenshot shows a Microsoft Internet Explorer browser window displaying the P-Grade Portal. The address bar shows the URL: <http://hgportal.hpcc.sztekl.hu:7080/gridsphere/gridsphere?action=doSubmitReallyWorkflow&add=2>. The page features the P-Grade logo and the text "P-Grade portal" with a downward arrow. There are also logos for the European Union, SEE-GRID, and VIKI. Below the logos, there are navigation tabs: "Certificates", "Settings", "Information System", and "Help". The main content area is titled "Workflow Manager" and contains a "Workflow Editor" button and a "Refresh" button. A table titled "Workflow list" displays the following data:

Workflow	Status	Size	Quota (100 Mb)	[ Output ]	[ View ]	[ Action ]
LM_9_DEMO_TOTAL	submitted	26.848 MB	26%	N/A	Details	Abort Attach Delete
		26.848 MB	26%			

At the bottom of the table, there is a "Delete all" button. A message at the bottom of the page reads: "Message: Workflow successfully submitted."



# Workflow Execution

(observation by the workflow portlet)



The screenshot shows a web browser window titled "PGrade Portal - Microsoft Internet Explorer". The address bar displays the URL: `http://hgportal.hpcc.sztaki.hu:7080/gridsphere/gridsphere?action=doShowWorkflowDetails&cid=2`. The page features a navigation menu with "Workflow", "Certificates", "Settings", "Information System", and "Help". Below this is the "Workflow Manager" section, which includes "Refresh" and "Back" buttons. A "Job list" table is displayed with the following data:

Workflow	Job	Gridname	Hostname	Status	[ Logs ]	[ Output ]	[ Visualization ]
LM_9_DEMO_TOTAL				submitted	-	N/A	<input type="button" value="Visualize"/> <input type="button" value="All"/> <input type="button" value="Abor"/>
	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	-	-	-

A message at the bottom of the page reads: "Message: Workflow details successfully displayed."

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



# Workflow Execution

(observation by the workflow portlet)



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



# Workflow Execution

(observation by the workflow portlet)



PGrade Portal - Microsoft Internet Explorer

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	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	SEE-GRID	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)



PGrade Portal - Microsoft Internet Explorer

Workflow Certificates Settings Information System Help

### Workflow Manager

Refresh Back

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



PGrade Portal - Microsoft Internet Explorer

Workflow Certificates Settings Information System Help

### Workflow Manager

Refresh Back

Workflow	Job	Gridname	Hostname	Status	Job list			S
					[ Logs ]	[ Output ]	[ Visualization ]	
LM_9_DEMO_TOTAL				finished	Err	Being zipped..	Visualize All	
	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.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	finished	Out	-	-	

Message: Job list refreshed.

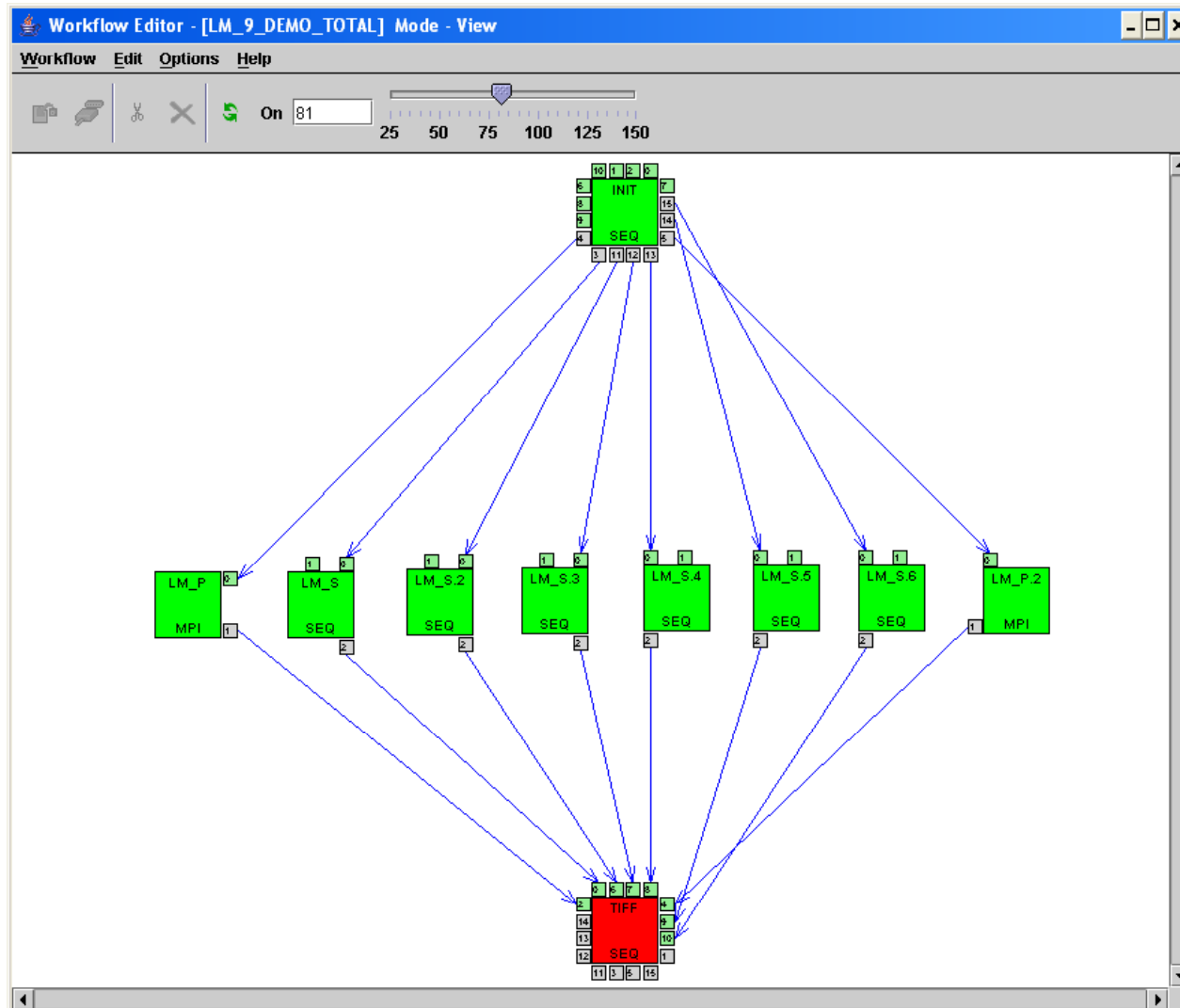
Kész Internet

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



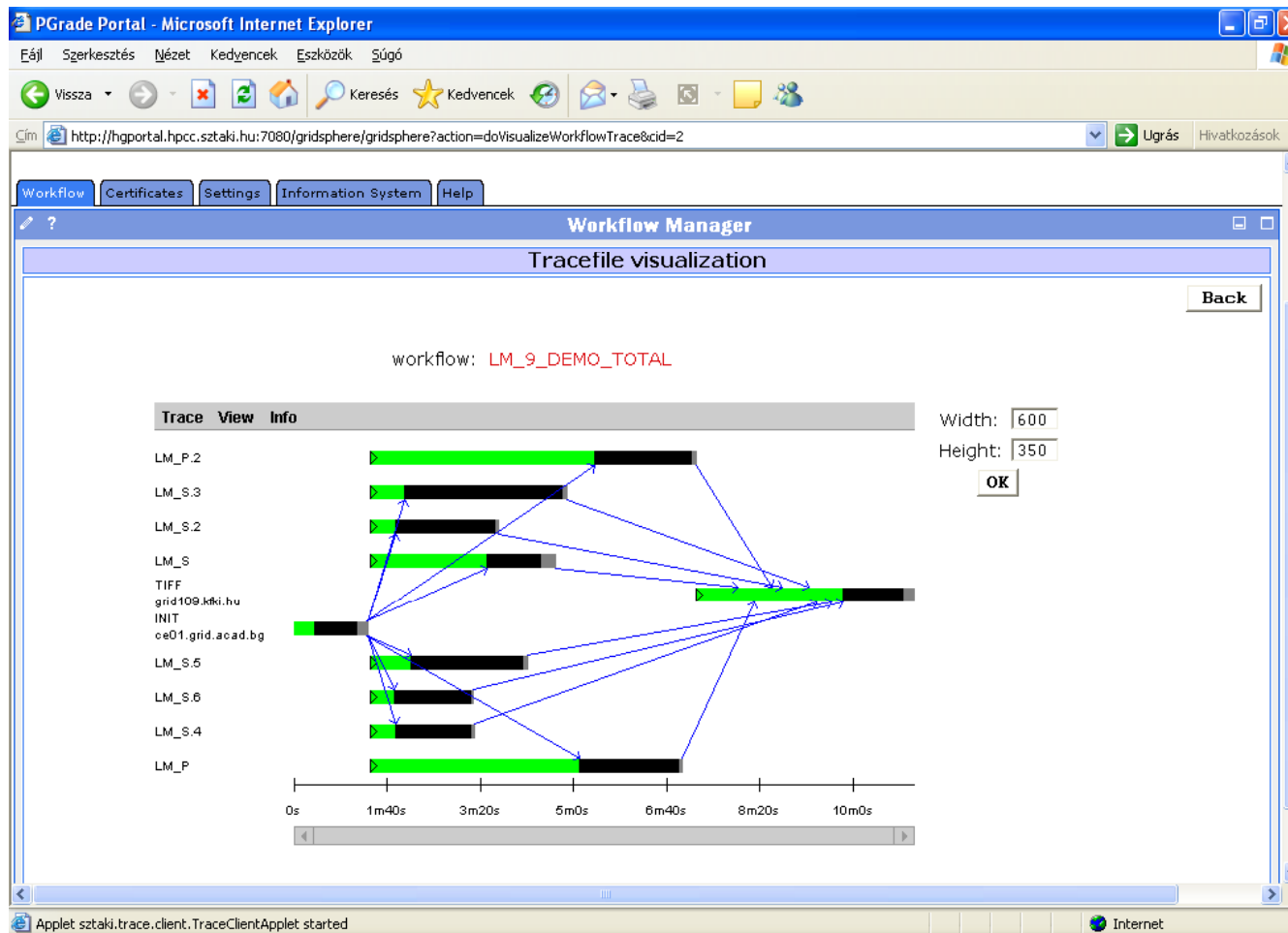
# Workflow Execution

(observation by the workflow editor)





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



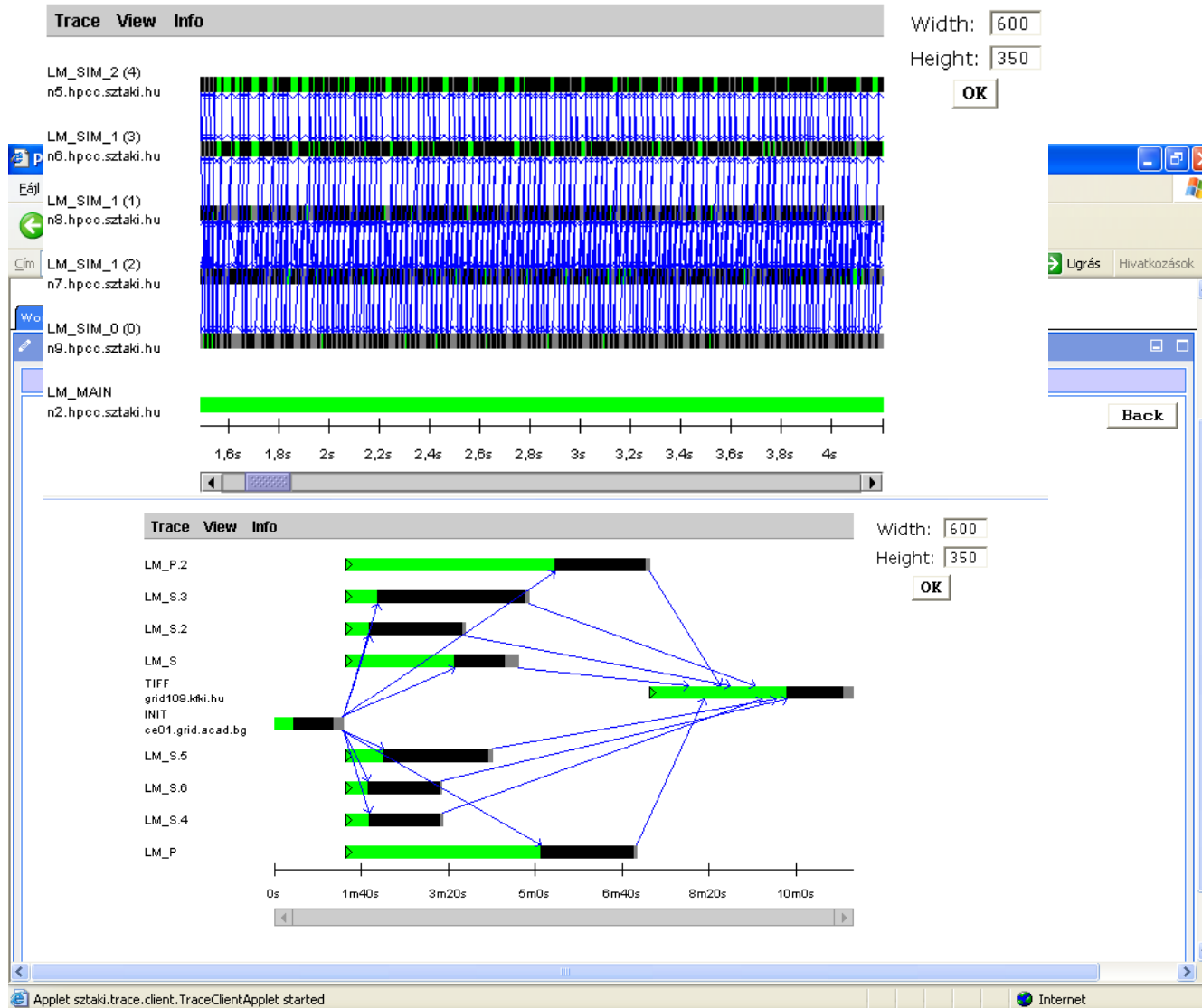
- The portal monitors and visualizes workflow progress



# 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	Action
demo-RESCUE	Count1	SZTAKI-GRID	n0 .hpcc.sztaki.hu	finished	Out -
	Count2	SZTAKI-GRID	n0 .hpcc.sztaki.hu	finished	Out -
	Count3	HUNGRID	chemgrid3 .chemres.hu	error	- Err
	Count4	SZTAKI-GRID	n0 .hpcc.sztaki.hu	submitted	--

Message: Workflow details successfully displayed.

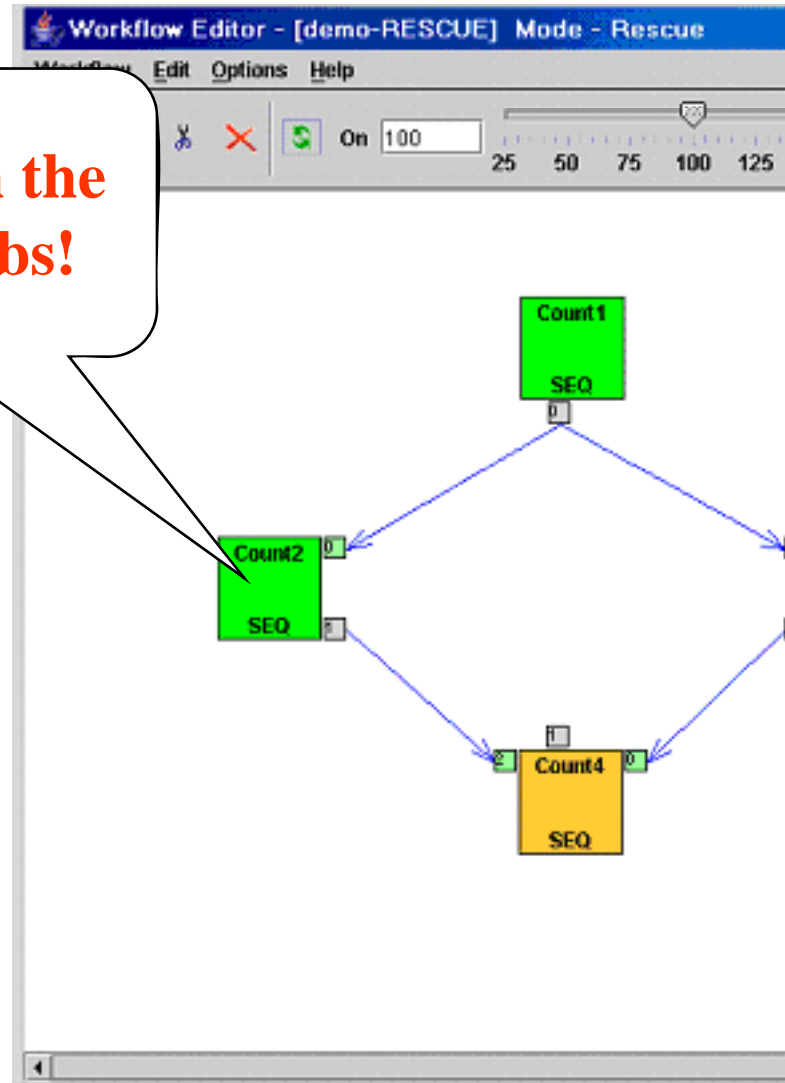
July 29, 2005



# Rescuing a failed workflow 2.



**Don't touch the finished jobs!**



**Map the failed job onto a different resource or download a new proxy for it**

**The execution can continue from the point of failure**



# Downloading the results...



The screenshot shows the P-Grade Portal web interface in a Mozilla browser window. The page title is "PGrade Portal - Mozilla" and the URL is "http://fn2.hpcc.sztaki.hu:9080/gridsphere/gridsphere?action=doGotoPage&cid=2". The page features the P-Grade logo and a "portal" link. A "Logout" link is visible in the top right corner. Below the navigation menu, the "Workflow Manager" section displays a "Job list" table. The table has columns for Workflow, Job, Hostname, Status, Logs, Output, Visualization, and Action. The "Status" column for all jobs is highlighted in green and labeled "finished". A "Message" box at the bottom of the table indicates "Job list refreshed."

Workflow	Job	Hostname	Status	[ Logs ]	[ Output ]	[ Visualization ]	[ Action ]
nowcast-final-g_SGE			finished		✓	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	--		Visualize	
	satel	n0.hpcc.sztaki.hu	finished	--		Visualize	
	visib	n0.hpcc.sztaki.hu	finished	--		Visualize	

**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



# Putting a successfully finished job into the GEMLCA repository



Workflow Certificates Settings Demo Help GEMLCA Administration Tools Macroscopic Visualiser

Resource Selector Legacy Code Information Descriptor Creator

GEMLCA LCID Administration Port

GEMLCA Legacy Code Interface Descriptor

Legacy code Environment Parameters:

maximumProcessors

executable

minimumProcessors

maximumJob

jobManager

id

description

List of legacy code Arguments:

name	file	order	fixed	inputOutput	mandatory	regexp	friendlyName	commandline
-p	No	0	No	Input	No		Folder to be created	Yes

New argument entry form:

name

file

order

fixed

inputOutput

mandatory

regexp

friendlyName

commandline

initialValue

## Mkdir Legacy Code exposed as a Grid Service

**Folder** : ../.gemlca/legacycodes/mkdir

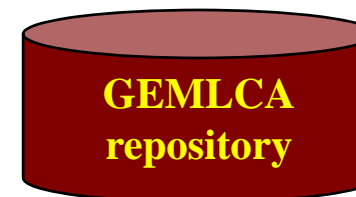
**Content** : i) mkdir binary or link ii) config.xml

## Legacy Code Interface Description File: config.xml

```

<?xml version="1.0"?>
<!DOCTYPE GLCEnvironment "gemlcaconfig.dtd">
<GLCEnvironment
  id="mkdir" executable="LINUX/mkdir" jobManager="Fork"
  maximumJob="11" minimumProcessors="1"
  maximumProcessors="1" universe="PVM"
>
<Description>Unix mkdir program</Description>
<GLCParameters>
  <Parameter name="-p" friendlyName="Folder to be created"
    fixed="No" inputOutput="Input" order="0"
    mandatory="No" fileCommandline="Commandline">
    <initialValue> </initialValue>
  </Parameter>
</GLCParameters>
</GLCEnvironment>

```







# GEMLCA / P-GRADE on the UK NGS: NGS P-GRADE GEMLCA Portal



- portal website:  
<https://gngs-portal.cpc.wmin.ac.uk:8080/gridsphere/gridsphere>
- Interface for NGS GT2 sites
- Interface for GT4 Westminster site
- Interface for EGEE GILDA sites
- Connected to the NGS and the GILDA Resource Brokers

NGS P-GRADE GEMLCA portal

Information page

GridSphere | GT4/GEMLCA Monitor

Home

Welcome to NGS P-GRADE Portal!

This Portal provides access to the UK National Grid Service. It is a workflow-oriented Grid portal that enables the creation, execution and monitoring of computational workflows in Grid environments through user-friendly graphical Web interfaces.

To get an account for this Portal and find further information and tutorials please visit <http://www.cpc.wmin.ac.uk/ngsportal/241/>.

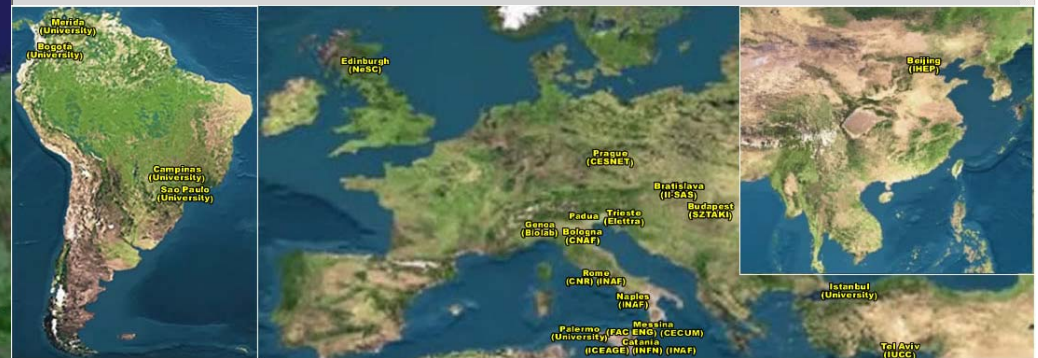
If you need any assistance please e-mail to the support team: [noam@cpc.wmin.ac.uk](mailto:noam@cpc.wmin.ac.uk)

This portal works under an academic license and hence:  
*"you can use this portal under the condition that you only perform non-commercial research and education activities. By using your account on this portal you hereby warrant that you understand that contravention of this clause may result in a liability arising for historic, current and future license payments under the terms of the prevailing commercial license that was in effect during the time period of the contravention. If you are in any doubt please contact [portalreq@ipds.szaki.hu](mailto:portalreq@ipds.szaki.hu)."*

This portal is based on P-GRADE Grid Portal technology, which was developed by the Laboratory of Parallel and Distributed Systems at MTÁ-SZTAKI, Hungary. The P-GRADE Portal is a workflow-oriented Grid portal that enables the creation, execution and monitoring of computational workflows in Grid environments through high-level, graphical Web interfaces. The P-GRADE Portal serves various Grid Communities in research and industry.

This site is built with P-GRADE Portal version 2.4.1 software. This Portal has been tested with Mozilla 1.6, Netscape (4.x, 6 and higher) and Internet Explorer (5 or 6 - but may behave strangely with IE7) with JRE 1.4.2\_x and 1.5.0\_06 Java plug in. Using other versions of Web browsers or Java Virtual Machines may lead to visualization problems.

The portal has been continuously developed and hence any feed-back, comment advice, request concerning the portal features is highly appreciated. Please, send your comments to [noam@cpc.wmin.ac.uk](mailto:noam@cpc.wmin.ac.uk)





## *Other P-GRADE Portal installations*



- P-GRADE Portal service is available for
  - SEE-GRID infrastructure
  - Central European VO of EGEE
  - GILDA: Training VO of EGEE
  - US Open Science Grid, TeraGrid
  - Economy-Grid, Swiss BioGrid, Bio and Biomed EGEE VOs, BioInfoGrid, BalticGrid
  - **OGF GIN (also connected to NGS)**





***Thank you for your  
attention!***

***Hands-on session with the P-  
GRADE/GEMMLCA portal will now  
follow.***