



UNIVERSITY OF WESTMINSTER



# ***P-GRADE Portal:***

## ***An easy to use graphical interface for Globus and EGEE Grids***



**P-GRADE**



portal





# ***Motivation to the P-GRADE Portal***

- **Fast evolution of Grid middleware technologies and tools:**
  - **GT2, OGSA, GT3 (OGSI), GT4 (WSRF), LCG-2, gLite, ...**
- **Many production Grids are now freely available for e-Scientists**
  - **EGEE** (LCG-2 → gLite), **UK NGS** (GT2),  
**US Open Science Grid** (GT2 → GT4), **NorduGrid** (ARC), ...
- **The same set of services are available everywhere, but implemented in different ways**
  - Computation services, data services, security services, (brokers)

**Let's provide a technology-neutral graphical interface for the most common Grid middleware services!**



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

- **General purpose, workflow-oriented computational Grid portal.** Supports the development and execution of workflow-based Grid applications.
- **Based on standard portlet framework (Gridsphere)**
  - Easy to expand with new portlets (e.g. application-specific portlets)
  - Easy to tailor to community needs
- **Grid services** supported by the portal:

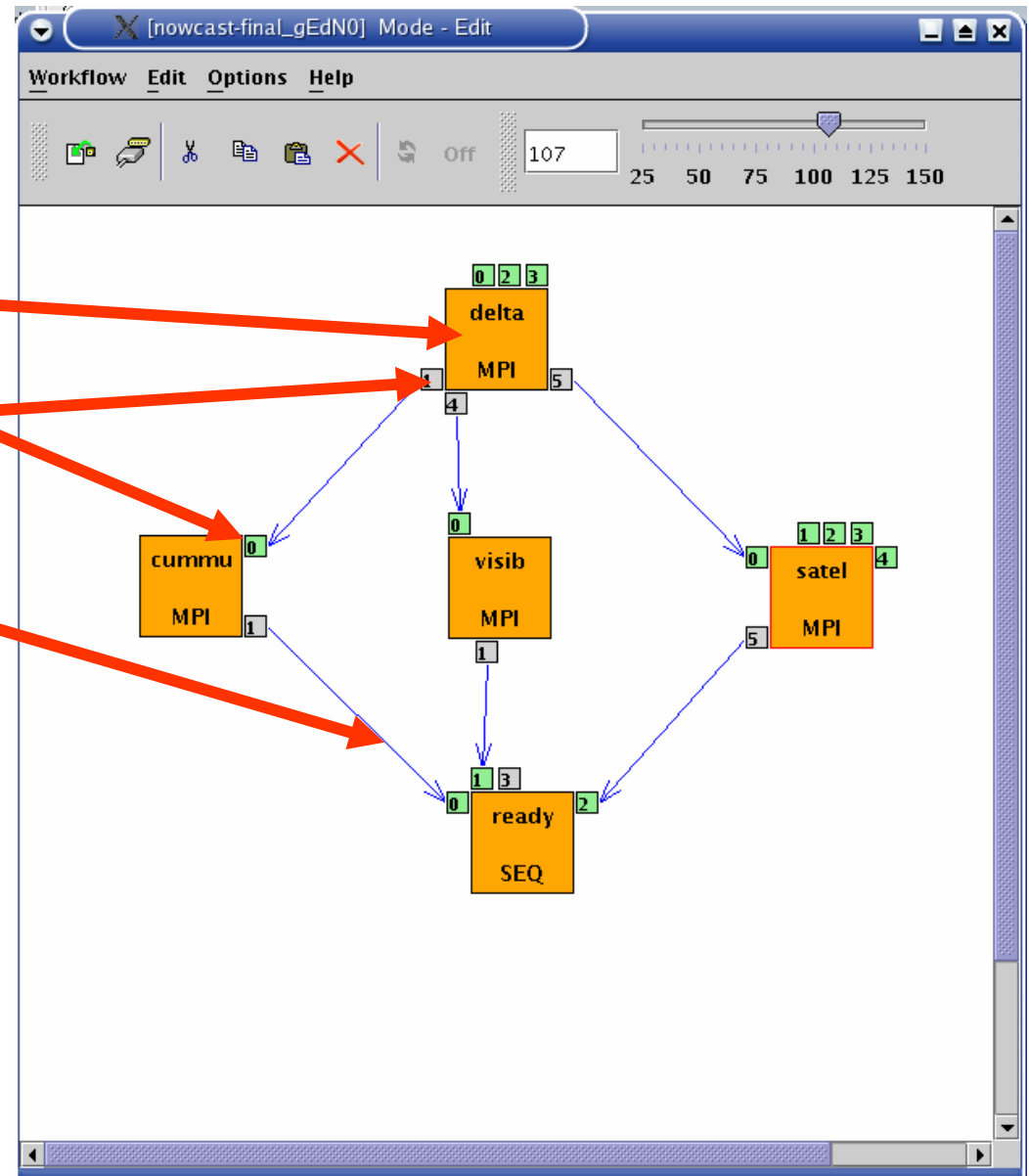
<b>Service</b>	<b>EGEE grids</b>	<b>Globus grids</b>
<b>Job execution</b>	Computing Element	GRAM
<b>File storage</b>	Storage Element	GridFTP server
<b>Certificate management</b>	MyProxy	
<b>Information system</b>	BDII	MDS-2
<b>Brokering</b>	Workload Management System	---
<b>Job monitoring</b>	Mercury	
<b>Workflow &amp; job visualization</b>	PROVE	

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



# What is a P-GRADE Portal workflow?

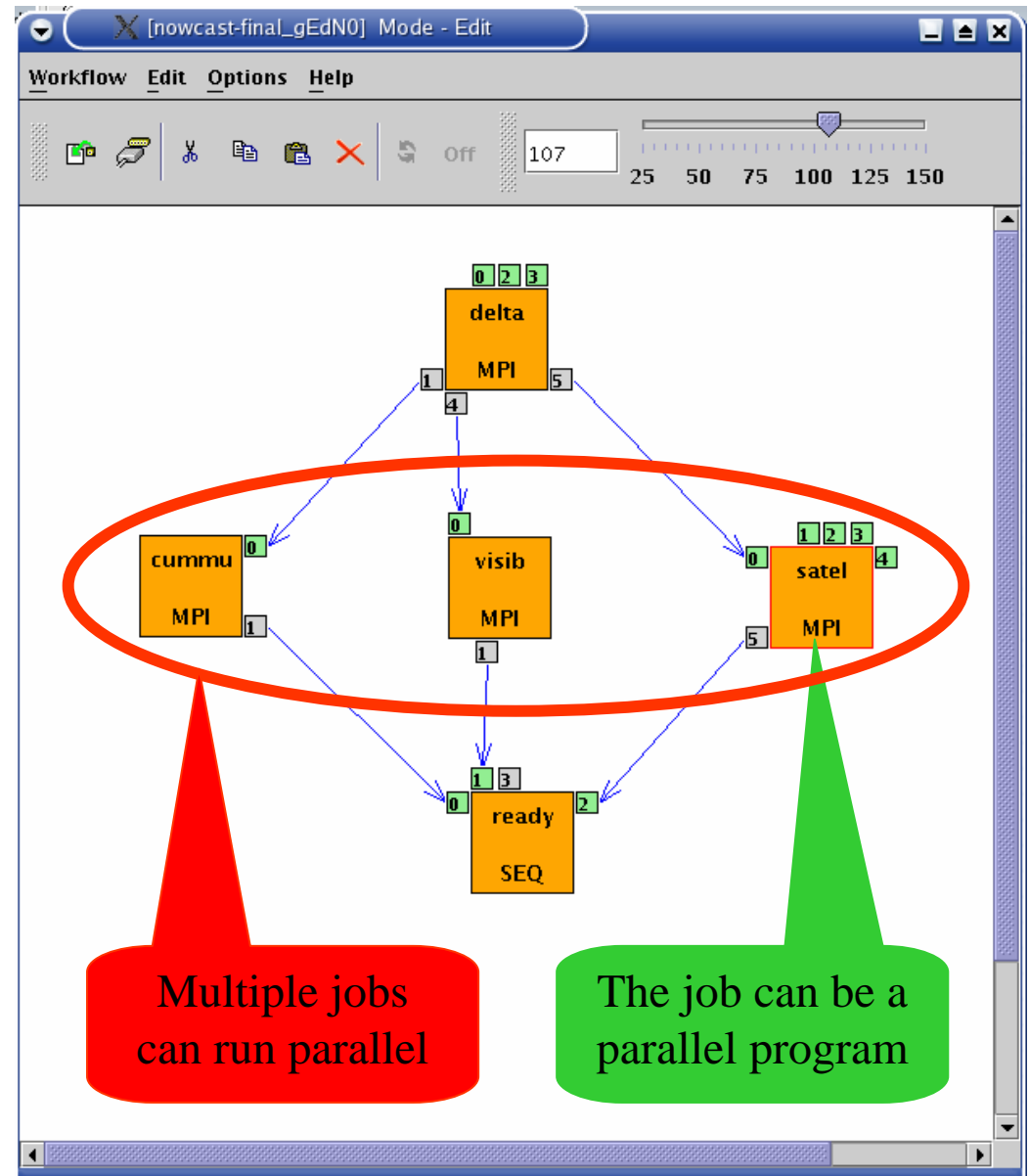
- **a directed acyclic graph where**
  - Nodes represent jobs (batch programs to be executed on a computing element)
  - Ports represent input/output files the jobs expect/produce
  - Arcs represent file transfer operations
- **semantics of the workflow:**
  - A job can be executed if all of its input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





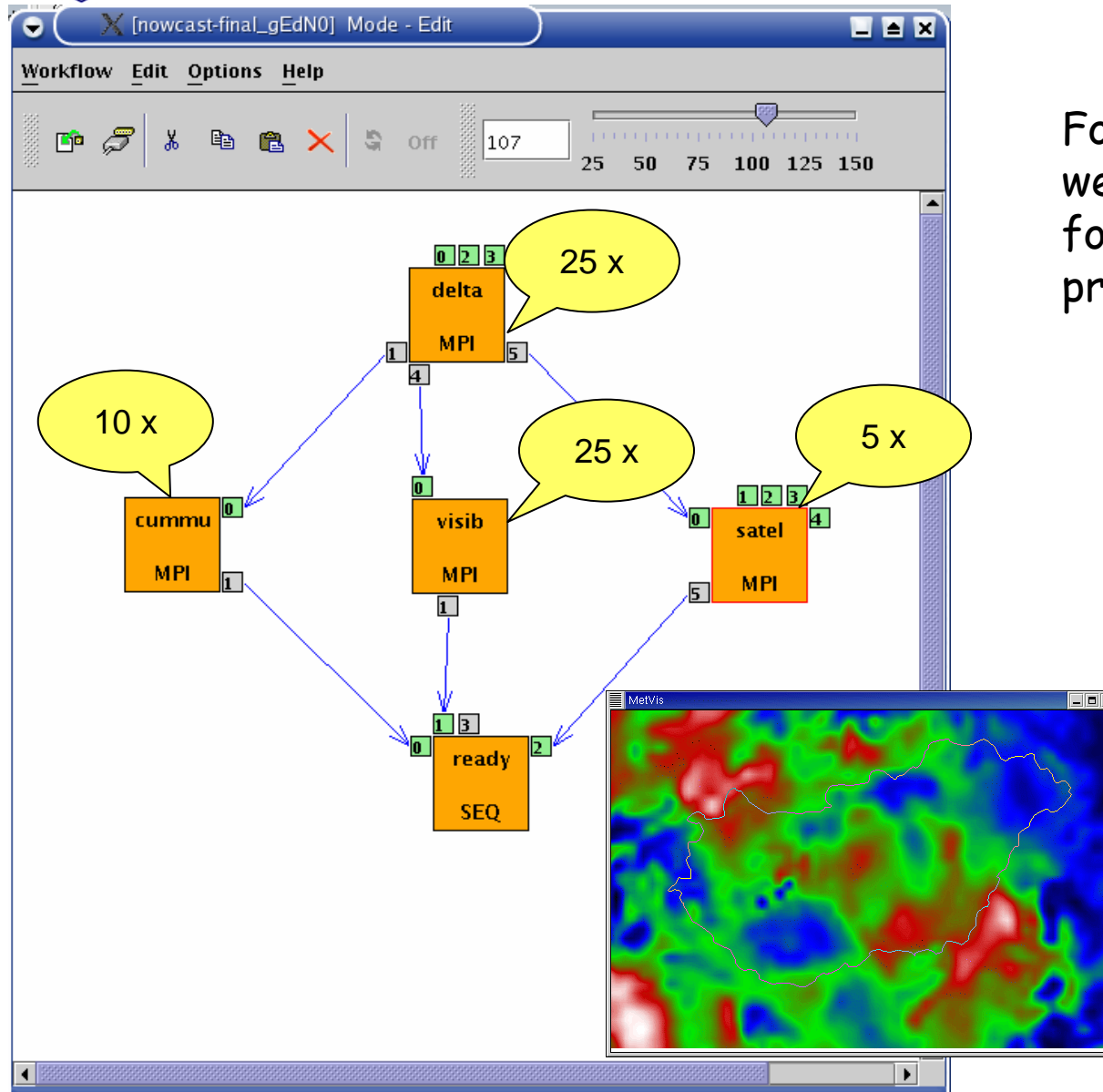
# Two levels of parallelism by a workflow

- The workflow concept of the 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

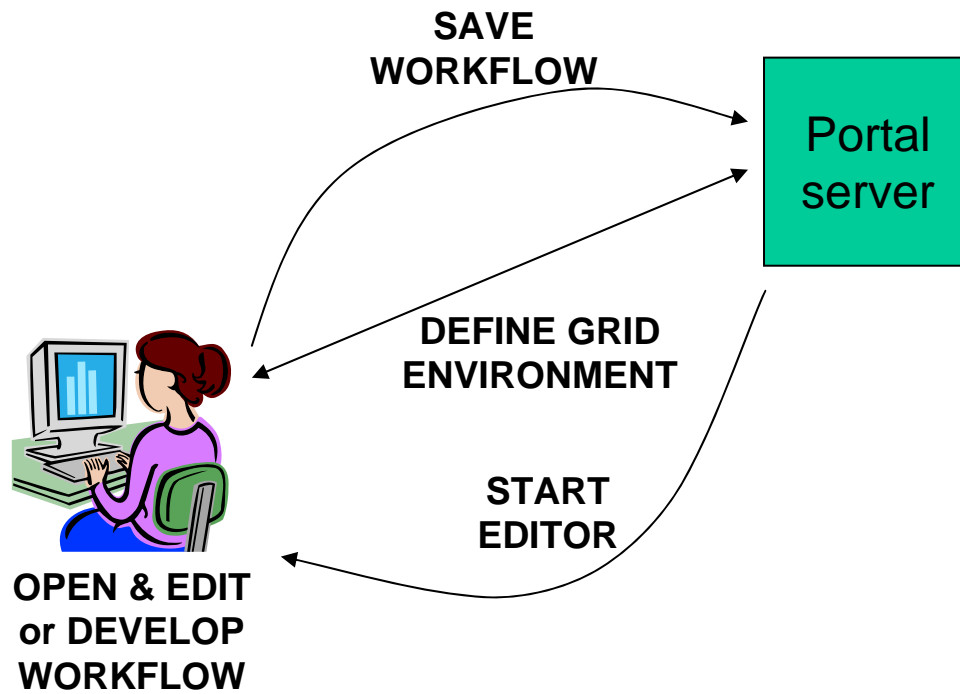
- Requirements:
- Execution time < 10 min
  - High resolution (1km)



# The typical user scenario

## Part 1 - development phase

Certificate servers

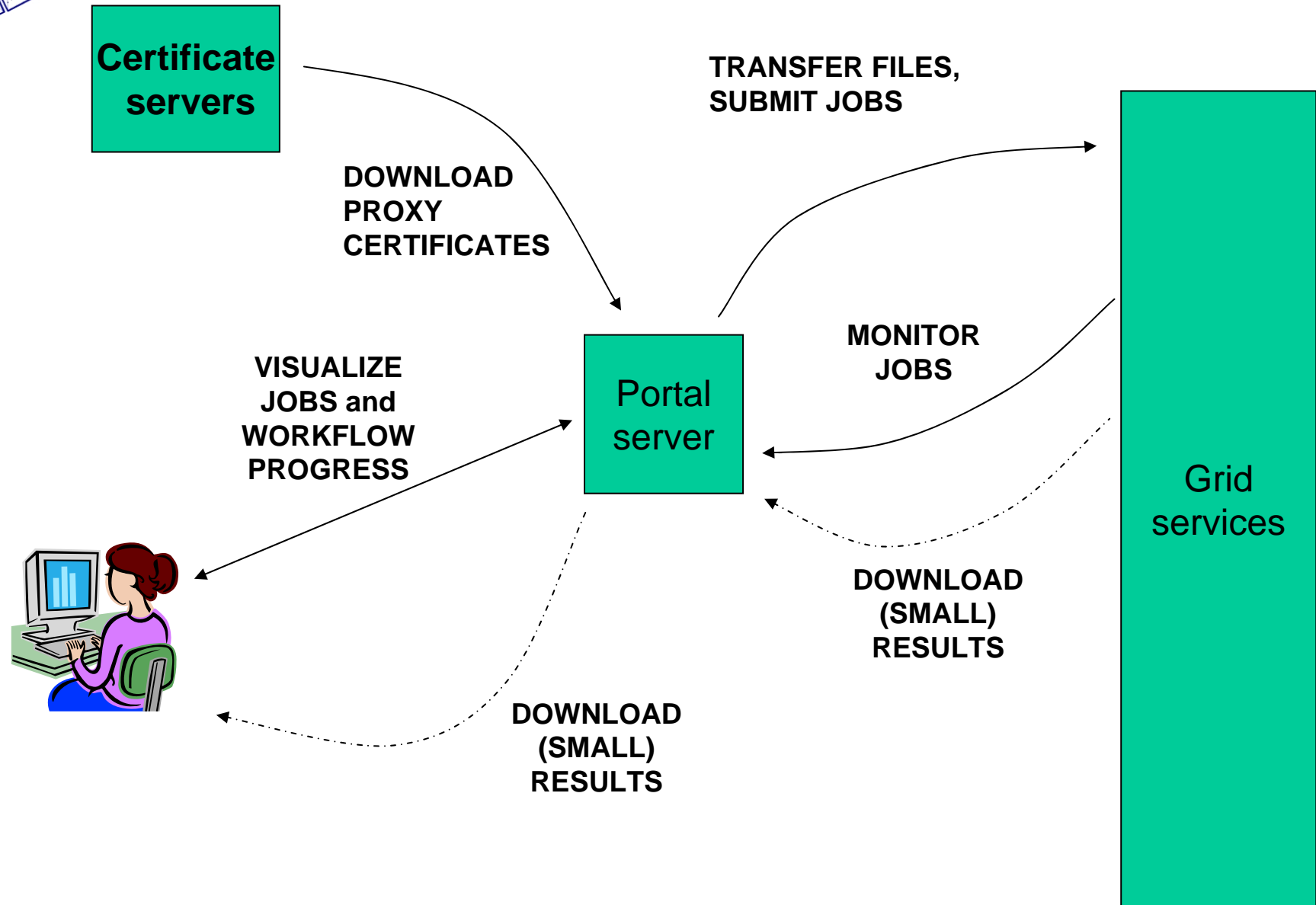


Grid services



# The typical user scenario

## Part 2 - execution phase







## 0. step: login

Portal can be configured to use **http** or **https**

GridSphere  
Home

RELEASE 2.2

P-GRADE

MTA SZTAKI

English

Login

User Name

Password

Remember my login

Login

[Forget your password?](#)

powered by gridsphere



# ***Developing workflows with the P-GRADE Portal***

## **Main steps**

- 1. Open the workflow editor**
- 2. Define workflow**
  - 1. Define graph structure**
  - 2. Define jobs and input/output data**
  - 3. Save workflow**



# Opening the workflow editor

The editor is a Java Webstart application  
**download and installation is only a click!**

The screenshot shows a web browser window displaying the P-Grade portal. The address bar shows a URL starting with 'http://n31'. The page features the P-Grade logo and a 'portal' link. A navigation menu includes 'Welcome', 'Workflow Manager', 'Certificates', 'Settings', 'Information System', and 'Help'. The 'Workflow Manager' section is active, showing a 'Workflow list' table with columns for Workflow, Status, Size, Quota, Output, View, and Action. A 'Workflow Editor' button is visible above the table. A message at the bottom states 'Message: Job list refreshed.'

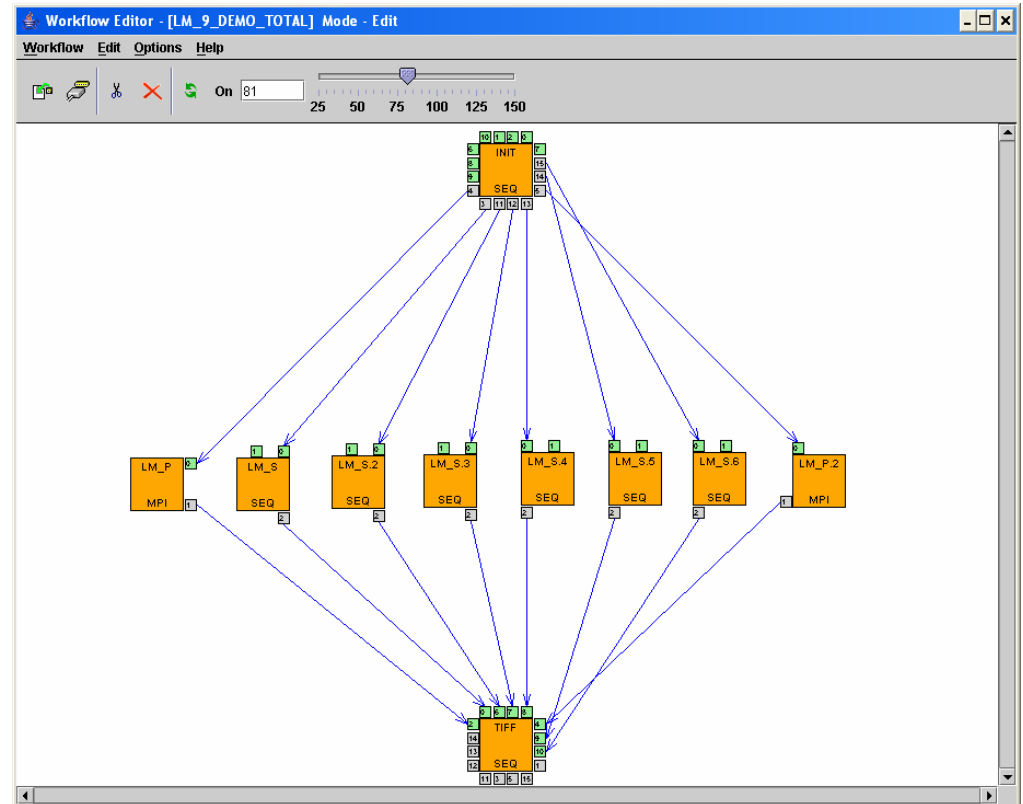
Workflow	Status	Size	Quota (10 Mb)	[ Output ]	[ View ]	[ Action ]
WF1	finished	26 KB	0.26%	<input checked="" type="checkbox"/>	Details	Submit Attach Delete
		26 KB				



# Workflow Editor

Define DAG of batch jobs:

- 1. Drag & drop components:**  
jobs and ports
- 2. Connect ports by channels**  
(no cycles, no loops)
- 3. Define job and port properties**





# Job property window

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 processors)
- Command line parameters
- The resource to be used for the execution:
  - Grid
  - Broker / resource



# Support for manual resource selection: information system browser

The information system portlet can query EGEE and Globus information systems

GridSphere Portal - Microsoft Internet Explorer

Address: http://fn1.hpc.sztaki.hu:8080/gridsphere/gridsphere?cid=90&gs\_mode=view&gs\_state=normal&gs\_action=doChangeGrid

portal

Welcome Workflow Certificates Settings **Information System** Help

MSDSMonitor LCGMonitor

Monitor

Select Grid: EGEE View

Select VO: All View

Grid: EGEE VO: All

Sites

Site Name	Computing Element				Storage Element				
	total	Free	Usage	Running	Waiting	Load	Total	Available	Usage
aegis01-phy	32	10	69%	12	0	0%	106.971 GB	79.263 GB	26%
alberta-lcg2	50	0	100%	0	0	0%	1.221 TB	308.592 GB	75%
beijing-cnic-lcg2-ia64	32	32	0%	0	0	0%	62.87 GB	56.992 GB	9%
beijing-lcg2	8	8	0%	0	0	0%	2 KB	1 KB	50%
belgrid-ucl	12	12	0%	0	0	0%	N/A	N/A	-
bg-inrne	20	20	0%	0	0	0%	37.355 GB	37.299 GB	0%
bg01-ipp	19	1	95%	13	5	28%	N/A	N/A	-
bg02-im	4	4	0%	0	0	0%	32.944 GB	20.169 GB	39%
bg04-acad	11	11	0%	0	0	0%	32.844 GB	27.149 GB	17%
bham-lcg2	132	107	19%	0	0	0%	1.639 TB	1.518 TB	7%
bifi	2	2	0%	0	0	0%	103.52 GB	98.274 GB	5%
bitlabgs	101	99	2%	0	4	100%	417.777 GB	407.123 GB	3%
bristol-pp-lcg	2	2	0%	0	0	0%	174.885 GB	164.261 GB	6%
budapest	95	24	75%	70	0	0%	1.36 TB	1.305 TB	4%



# **Support for manual resource selection: Settings portlet**

- **Here you can define those computing elements that your jobs can **access directly** (*by skipping the broker*)**
- **Two levels:**
  - 1. Define grids** → portal administrator
    - 1. Name** (*e.g. gridats*)
    - 2. Information system** (*e.g. egrid-2.egrid.it*)
  - 2. Define Computing Elements for each grid:**
    - 1. Default list can be set by the portal administrator**
    - 2. Users can customize the list**



# Support for manual resource selection: Settings portlet

List of available grids

The screenshot shows a web browser window displaying the 'settings' portlet. The portlet has tabs for 'Certificates', 'Settings', 'Information System', and 'Help'. The 'Settings' tab is active, showing a table of grid configurations. Below the table, there is a section for 'Default visualization size' with input fields for 'Width' (600) and 'Height' (350), and an 'OK' button. The browser's address bar shows the URL 'http://www.lpds.sztaki.hu/pgportal/'.

Name	Information System				[Actions]
	Type	Host	Port	BaseDn	
GRIDLAB-GRID	MDS2	mds.gridlab.org	2135	mds-vo-name=gridlab,o=grid	Resources
HUNGRID	LCG2	grid152.kfki.hu	2170	mds-vo-name=local,o=grid	Resources
SEE-GRID	LCG2	bdii.phy.bg.ac.yu	2170	mds-vo-name=local,o=grid	Resources
SZTAKI-GRID	MDS2	n0.hpcc.sztaki.hu	2135	mds-vo-name=SzuperGRID,o=Grid	Resources
UK-NGS	LCG2	ngsinfo.grid-support.ac.uk	2135	mds-vo-name=ngsinfo,o=grid	Resources
hungrid_LCG_2_BROKER			N/A		Resources

Default visualization size

Width:

Height:

( Accept values between 150-1000. )





# Support for manual resource selection:

Support for manual resource selection:  
Computing resources of such a grid

The screenshot shows the GridSphere Portal interface in Microsoft Internet Explorer. The page title is "GridSphere Portal - Microsoft Internet Explorer". The address bar shows the URL: [http://hgportal.hpcc.sztaki.hu:9080/gridsphere/gridsphere?cid=77&gs\\_mode=view&gs\\_state=normal&gs\\_...](http://hgportal.hpcc.sztaki.hu:9080/gridsphere/gridsphere?cid=77&gs_mode=view&gs_state=normal&gs_...)

The main content area is titled "settings" and displays "Resources for 'SZTAKI-GRID' GRID". It contains a table with the following data:

URL	Job manager	[Actions]
n0.hpcc.sztaki.hu	jobmanager-condor	Delete
n0.hpcc.sztaki.hu	jobmanager-fork	Delete
n0.hpcc.sztaki.hu	jobmanager-grd	Delete
n0.hpcc.sztaki.hu	jobmanager-sge	Delete
n0.ikpc.iit.bme.hu	jobmanager-fork	Delete
n20.hpcc.sztaki.hu	jobmanager-fork	Delete
n23.hpcc.sztaki.hu	jobmanager-fork	Delete
parsifal.wmin.ac.uk	jobmanager-fork	Delete

Below the table, there are input fields for "URL:" and "Job manager:" with an "Add" button. At the bottom, there are buttons for "Load default", "Load resources from MDS2", and "Back".

The "Default visualization size" section shows input fields for "Width: 600" and "Height: 350", with an "OK" button and a note: "( Accept values between 150-1000. )".

A message at the bottom states: "Message: Default configuration successfully loaded."

The date "August 24, 2005" is displayed at the bottom of the page.

A red arrow points from the "Delete" button in the table to a "Resources" button in a sidebar on the right.



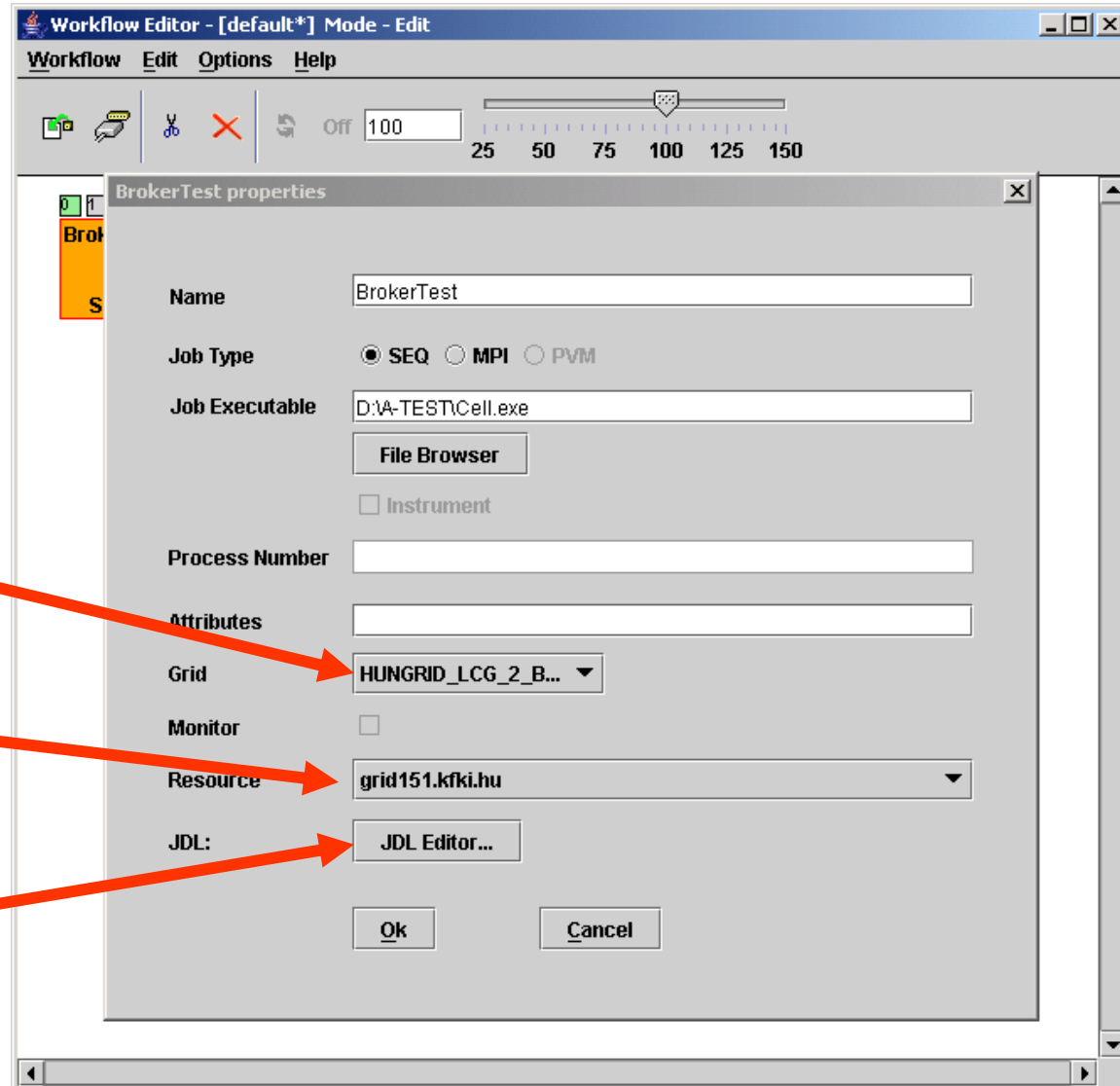
# ***Support for broker-based resource selection***

***(currently not supported by the NGS)***

- 1. Select a broker Grid for the job**
2. (Specify extra ranks & requirements for the job in Job Description Language)
- 3. The broker will find the best resource for your job!**



# Support for broker-based resource selection



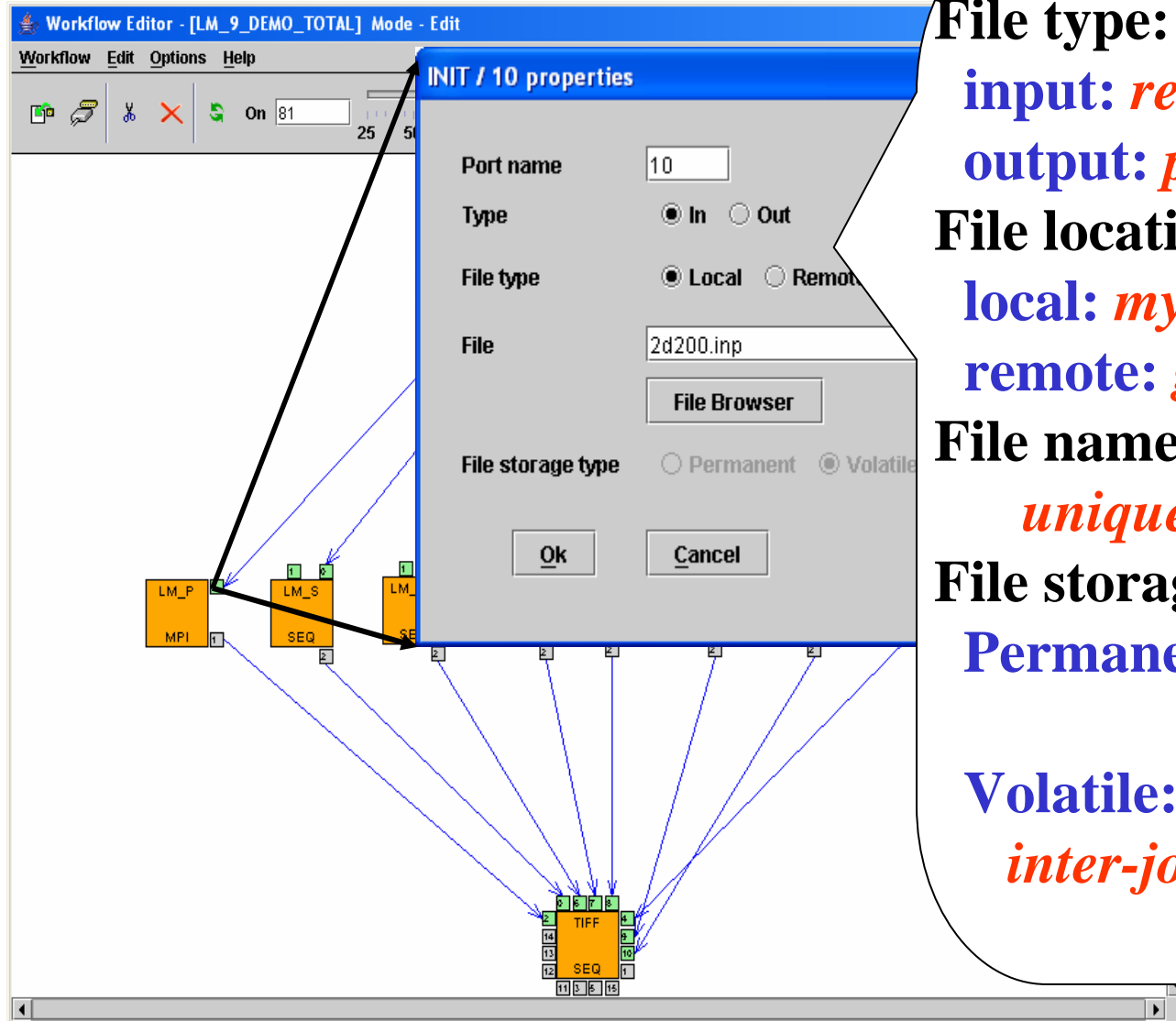
Select a Grid with broker!  
(\*\_BROKER)

Ignore the resource field!

If default is not sufficient  
define ranks & requirements  
using the built-in JDL editor!



# Defining input/output data for jobs



## File type:

**input:** *required by the job*

**output:** *produced by the job*

## File location:

**local:** *my desktop*

**remote:** *grid storage resource*

## File name:

*unique name of the file*

## File storage type:

**Permanent:** *final result of the WF*

**Volatile:** *only used for inter-job data transfer*



# Possible values for file location

## Input file

## Output file

### Local file

- **Client side location**

`c:\experiments\11-04.dat`

- **Client side location**

`result.dat`

- **Grid Unique Identifier (GUID)**

*(In any EGEE Grid)*

`guid:1fd75fdf-dccc-4603-998b-e17facb0d034`

- **LRS logical file name**

*(In RMC-enabled EGEE Grids)*

`lfn:/sipos_11_04.dat`

- **LFC logical file name**

*(In LFC-enabled EGEE Grids)*

`lfn:/grid/egrid/sipos/11-04.dat`

- **GSIFTP reference**

*(In Globus Grids)*

`gsiftp://lpds.sztaki.hu/sipos/11-04.dat`

- **LRS logical file name**

*(In RMC-enabled EGEE Grids)*

`lfn:/sipos_11_04_-_result.dat`

- **LFC logical file name**

*(In LFC-enabled EGEE Grids)*

`lfn:/grid/egrid/sipos/11-04_-_result.dat`

- **GSIFTP reference**

*(In Globus Grids)*

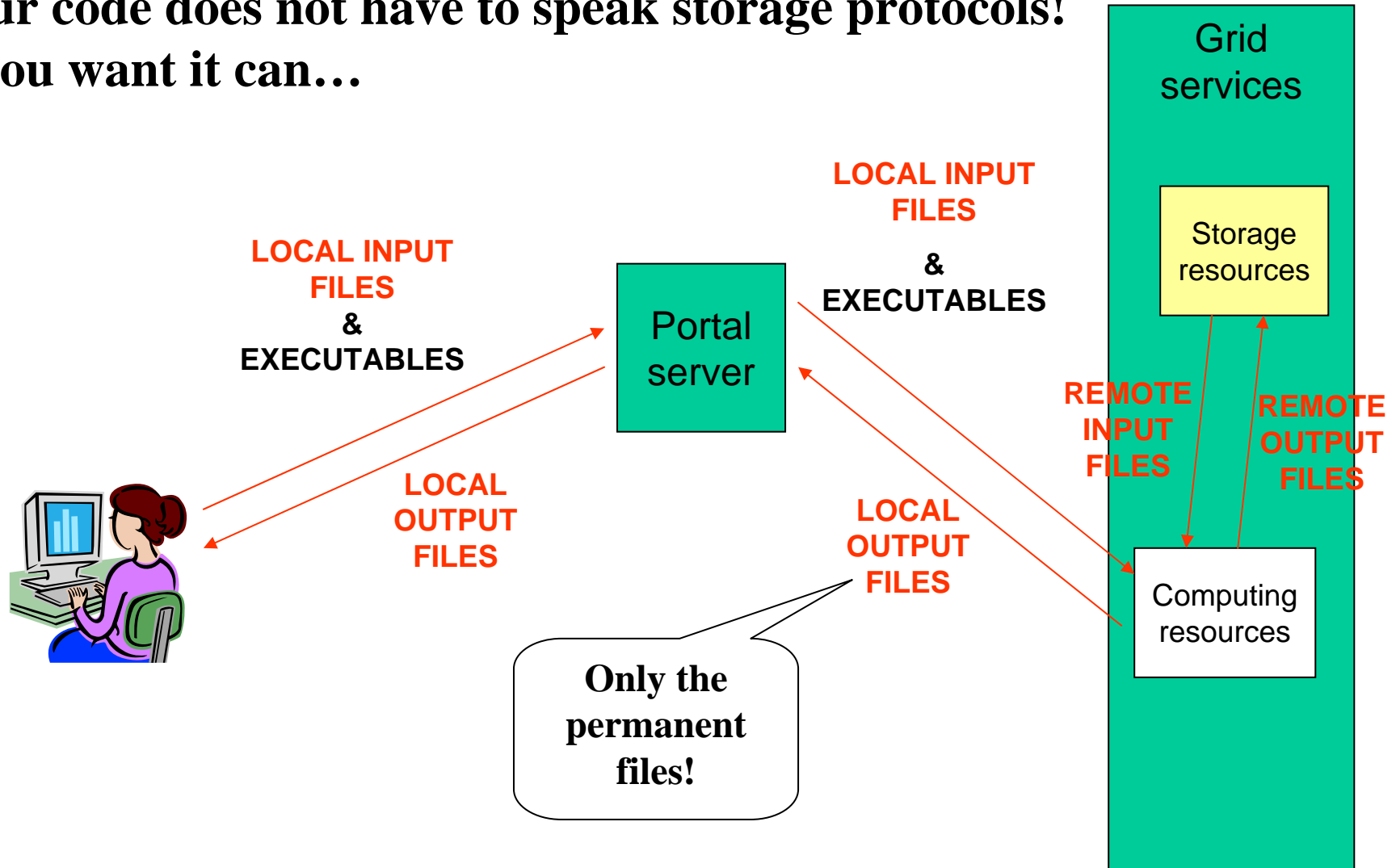
`gsiftp://lpds.sztaki.hu/sipos/11-04_-_result.dat`

### Remote file



# Local vs. remote files

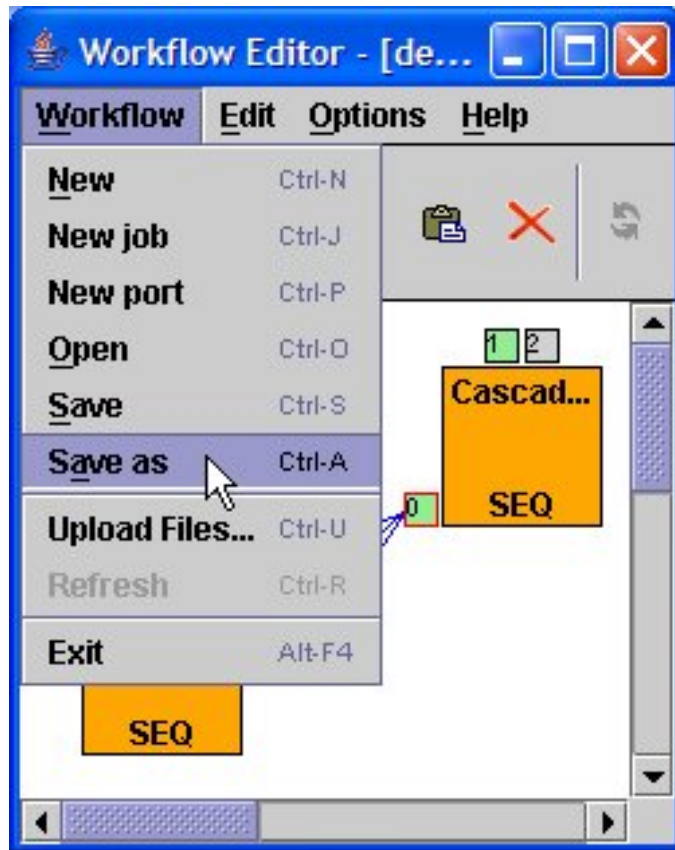
**Your code does not have to speak storage protocols!  
If you want it can...**





# 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 servers

DOWNLOAD  
PROXY  
CERTIFICATES

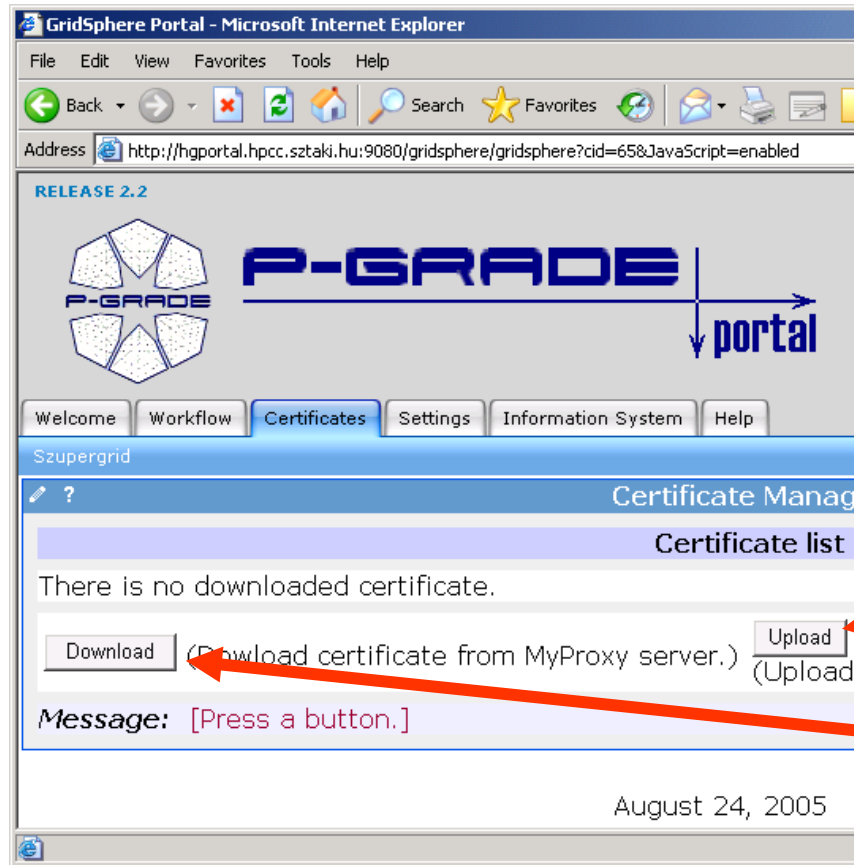
Portal server

Grid services





# Certificate manager 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 portlet

## Downloading a proxy

### 1. MyProxy server access details:

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

### 2. Proxy parameters:

- Lifetime
- Comment

The screenshot shows a Microsoft Internet Explorer browser window displaying the GridSphere Portal. The main content area is titled 'Certificate Manager' and contains a form for downloading a proxy from a MyProxy server. The form fields are as follows:

Download from MyProxy server			
hostname	<input type="text" value="cvs.lpds.sztaki.hu"/>	* port	<input type="text" value="7512"/>
login	<input type="text" value="C123456"/>	password	<input type="password" value="....."/>
lifetime (hours)	<input type="text" value="100"/>	* description	<input type="text"/>

\*: Cannot be left empty.

Buttons: Download, Cancel

Message: Fill in the fields for download!

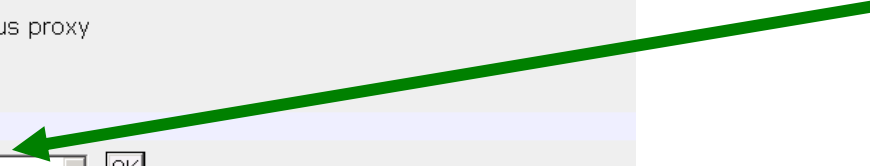
August 24, 2005



# Certificate manager portlet

Associating the proxy with a grid

This operation displays the **details of the certificate** and the **list of available Grids**





# Certificate Manager

*browsing proxies*

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

Refresh

Download (Download certificate from MyProxy server.) Upload (Upload authentication data to MyProxy server.)

Message: Certificate successfully set for HUNGRID.

SEE-GRID resources

HUNGRID resources

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



# The typical user scenario

## Execution phase - step 2:

Certificate servers

TRANSFER FILES,  
SUBMIT JOBS

Portal server

Grid services





# 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				

Message: Job list refreshed.



# 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 the menu is a "Workflow Manager" section with "Refresh" and "Back" buttons. A table titled "Job list" displays 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 table 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)

The screenshot shows the P-Grade Portal interface in Microsoft Internet Explorer. The main content area is titled "Workflow Manager" and contains 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".

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

The screenshot shows a web browser window titled "PGrade Portal - Microsoft Internet Explorer". The address bar shows the URL: `http://hgportal.hpcc.sztaki.hu:7080/gridsphere/gridsphere?action=doGotoPage&cid=2`. The browser toolbar includes navigation buttons (Back, Forward, Stop, Home, Reload), a search bar, and various utility icons. The main content area displays the "Workflow Manager" interface, which includes a navigation menu (Workflow, Certificates, Settings, Information System, Help) and 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'. 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	<input type="button" value="Visualize"/> <input type="button" value="All"/> <input type="button" value="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	<input type="button" value="Out"/>	-	-
	LM_S.3	SEE-GRID	grid1.netmode.ece.ntua.gr	running	<input type="button" value="Out"/>	-	-
	LM_S.4	SEE-GRID	grid1.irb.hr	finished	<input type="button" value="Out"/>	-	-
	LM_S.5	SEE-GRID	testbed001.grid.ici.ro	running	<input type="button" value="Out"/>	-	-
	LM_S.6	HUNGRID	chemgrid3.chemres.hu	finished	<input type="button" value="Out"/>	-	-
	TIFF	HUNGRID	grid109.kfki.hu	init	- -		-

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 Certificates Settings Information System Help

### 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	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)

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

Workflow	Job	Gridname	Hostname	Status	[ Logs ]	[ Output ]	[ Visualization ]	S
							Visualize All	
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	-	-	

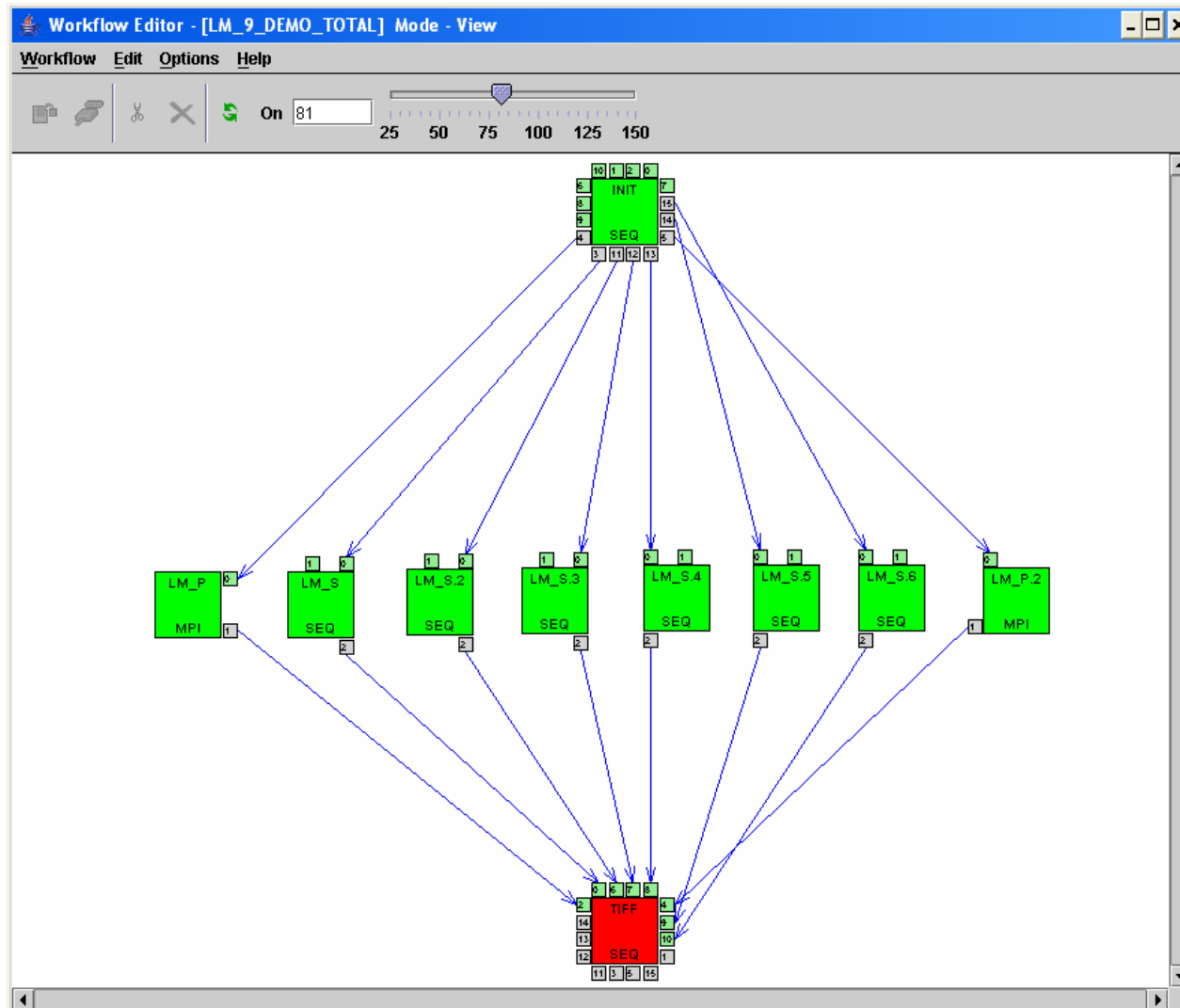
Message: Job list refreshed.

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



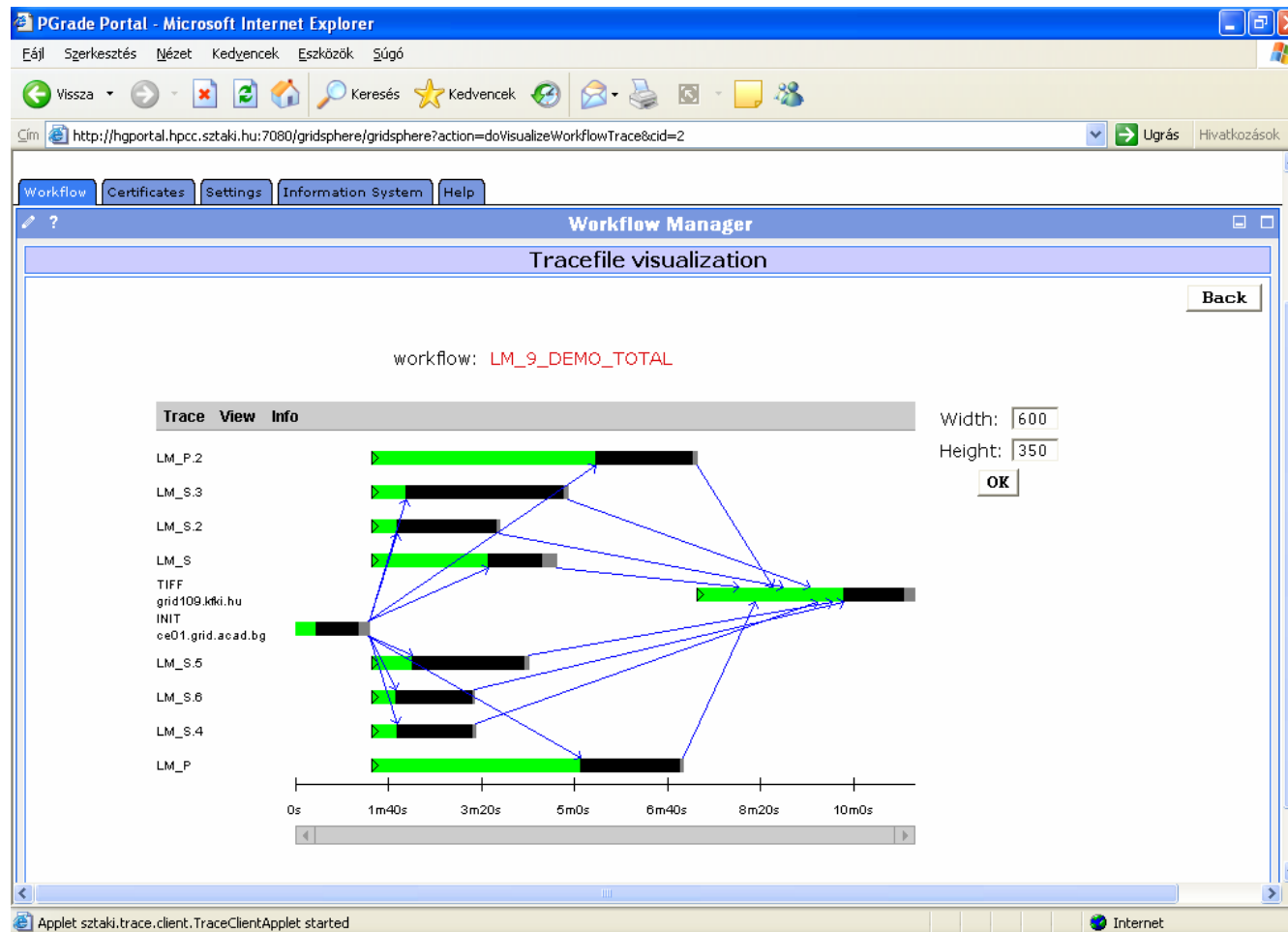
# Workflow Execution

(observation by the workflow editor)





# On-line application monitoring: workflow and job level

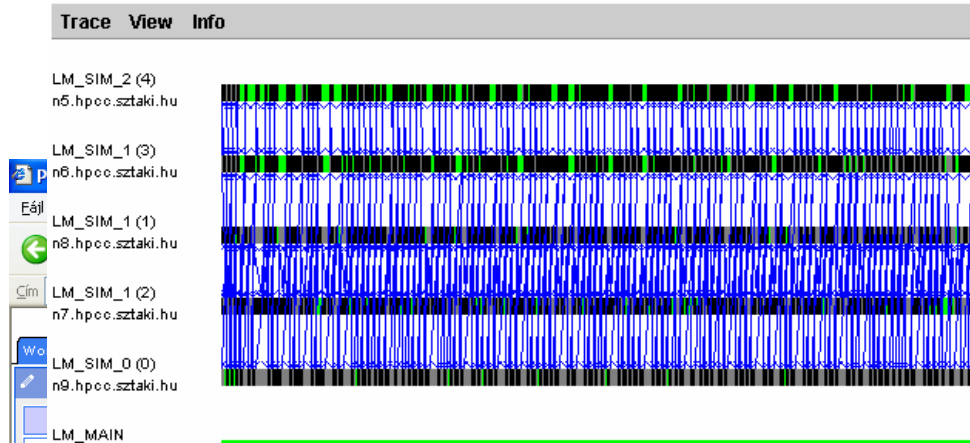


- The portal monitors and visualizes workflow progress



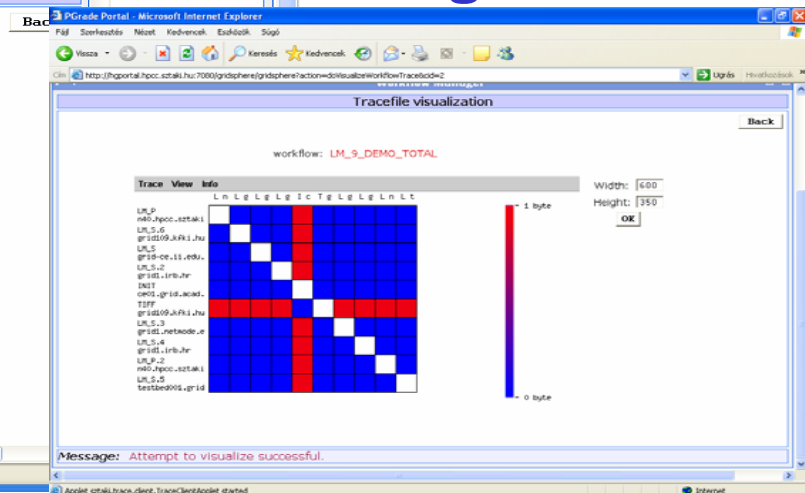
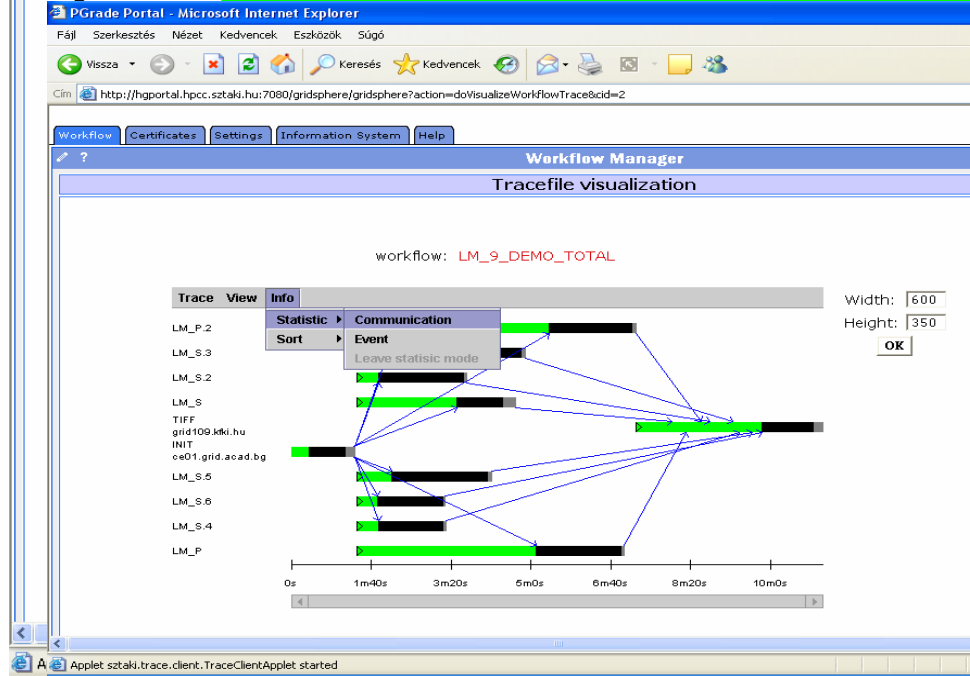
# On-line application monitoring: workflow and job level

workflow / job: LM\_9\_DEMO\_TOTAL / LM\_P



Width: 600  
Height: 350  
OK

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



- Statistical views can also be generated



# Rescuing a failed workflow 1.

**A job failed during workflow execution**

**Read the error log to know why**

Workflow	Job	Gridname	Hostname	Status	Gridname	Hostname	Output	Action	
demo-RESCUE	Count1	SZTAKI-GRID	n0 .hpc.sztaki.hu	finished	Count1	SZTAKI-GRID	n0 .hpc.sztaki.hu	Out	[ Logs ] [ Output ] [ View ] [ Action ]
	Count2	SZTAKI-GRID	n0 .hpc.sztaki.hu	finished	Count2	SZTAKI-GRID	n0 .hpc.sztaki.hu	Out	[ Err ] [ N/A ] [ Visualize ] [ All ] [ Rescue ] [ Abort ] [ Attach ] [ Delete ]
	Count3	HUNGRID	chemgrid3 .chemres.hu	error	Count3	HUNGRID	chemgrid3 .chemres.hu	- Err	
	Count4	SZTAKI-GRID	n0 .hpc.sztaki.hu	submitted	Count4	SZTAKI-GRID	n0 .hpc.sztaki.hu	--	

**Message:** Workflow details successfully displayed.

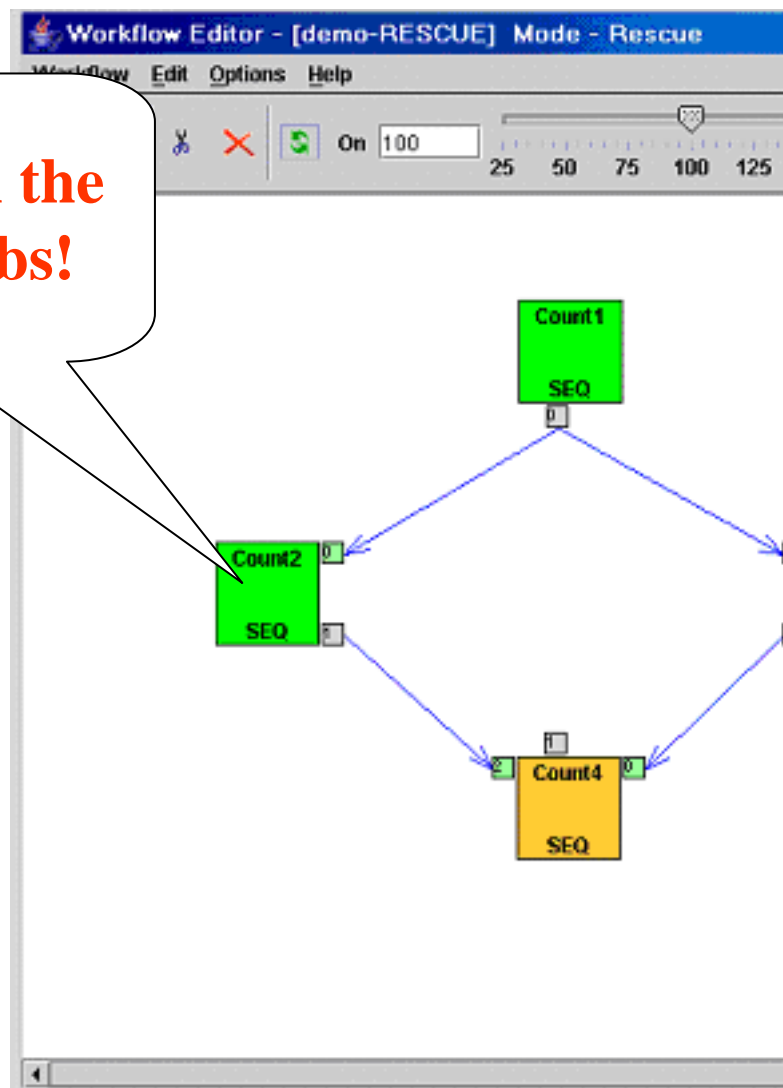
July 29, 2005





# Rescuing a failed workflow 2.

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



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

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



# The typical user scenario

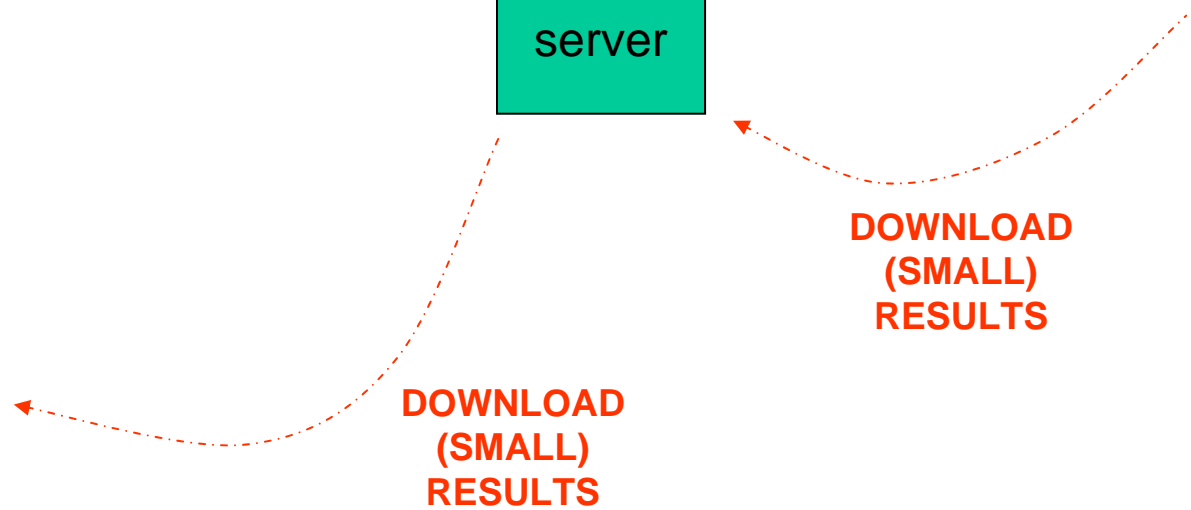
## Execution phase – step 5

Certificate servers



Portal server

Grid services





# Downloading the results...

The screenshot shows the GridSphere Portal interface in Microsoft Internet Explorer. The main content area displays a 'Workflow Manager' with a 'Job list' table. The table has columns for Workflow, Job, Gridname, Hostname, Status, Logs, Output, Visualization, and Action. Two jobs are listed, both with a status of 'finished'. A red arrow points from the 'Output' column of the second job to a file download dialog box titled 'Opening nowcast\_final\_g.zip'. The dialog box contains the following text: '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'. Below this text are three radio button options: 'Open it with the default application', 'Open it with' (with a text input field and a 'Choose...' button), and 'Save it to disk' (which is selected). There is also a checkbox for 'Always perform this action when handling files of this type' and 'OK' and 'Cancel' buttons at the bottom.

Workflow	Job	Gridname	Hostname	Status	[ Logs ]	[ Output ]	[ Visualization ]	[ Action ]			
WF1				finished	-	✓	Visualize	All	Submit	Attach	Delete
	Cascade1	SZTAKI-GRID	n0.hpcc.sztaki.hu	finished	Out	-	-				
	Cascade1.2	SZTAKI-GRID	n0.hpcc.sztaki.hu	finished	Out	-	-				

- Download small files in a single ZIP file

- Keep large files in the Grid for future analysis!



## ***Extra features***

- **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!**



# References

- **P-GRADE Portal service is available for**
  - **UK National Grid Service** (with GEMLCA support)
  - **SEE-GRID infrastructure**
  - **HUNGRID VO of EGEE**
  - **Central European VO of EGEE**
  - **GILDA: Training VO of EGEE**
- **Under preparation for**
  - **US Open Science Grid, Economy-Grid, Swiss BioGrid, Bio and Biomed EGEE VOs**
- **P-GRADE portal can be installed for any public/private EGEE or Globus Grid/VO**

**Please contact us!**





# How to get access?

- Take a look at [www.lpds.sztaki.hu/pgportal](http://www.lpds.sztaki.hu/pgportal)  
(manuals, training events, client & server requirements, installation procedure, etc.)
- **Visit or request a training event!** (pgportal@sztaki.hu)
  - Lectures, demos, hands-on tutorials, application development support
- **Get an account for one of its production installations:**
  - **NGS portal – University of Westminster** } [www.cpc.wmin.ac.uk/gngsportal](http://www.cpc.wmin.ac.uk/gngsportal)
  - VOCE portal - SZTAKI
  - SEEGRID portal – SZTAKI
  - HUNGrid portal – SZTAKI } [www.lpds.sztaki.hu/pgportal](http://www.lpds.sztaki.hu/pgportal)
- **If you are the administrator of a Grid/VO then contact SZTAKI to get your own P-GRADE Portal!**
- **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*)**



## ***Conclusion:*** ***Easy-to-use, technology-neutral*** ***Grid portal for e-Scientists***

- **The P-Grade Portal hides differences of Grids**
  - **Globus X – LCG2 – gLite Grid interoperability**
  - **Transparent switching between Grid technologies**
- **Graphical tools for application development, execution and monitoring**
  - **Sequential & parallel components can be integrated into large Grid applications**
  - **Manual or broker based resource allocation**
- **Your code does not have to contain grid specific calls**
- **Support for collaborative research**
  - **Share workflows**
- **Built by standard portlet API**
  - **customizable to specific application areas and user groups**



**Learn once, use everywhere**  
**Develop once, execute anywhere**

***Thank you!***

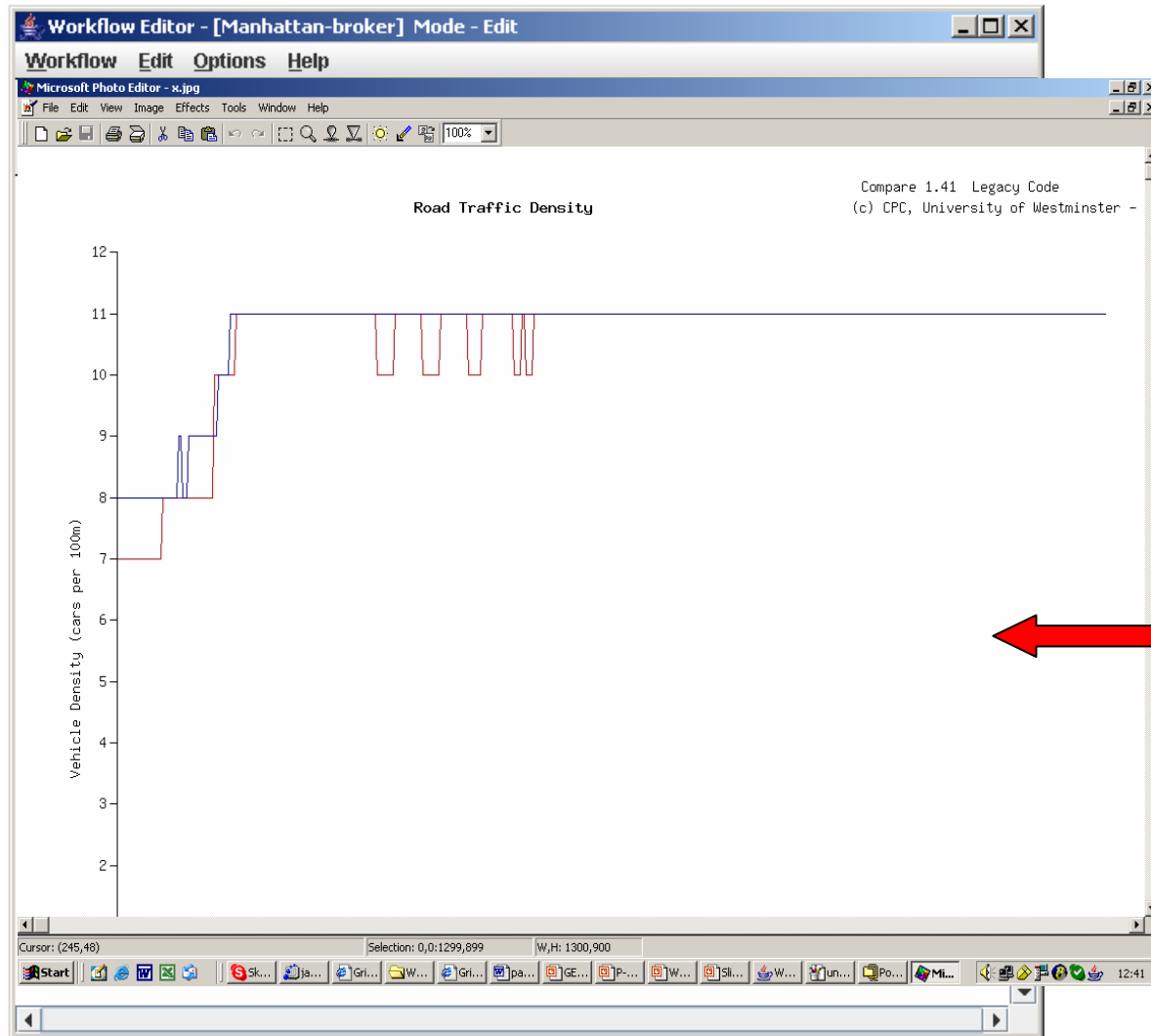
**[www.lpds.sztaki.hu/pgportal](http://www.lpds.sztaki.hu/pgportal)**  
**[pgportal@lpds.sztaki.hu](mailto:pgportal@lpds.sztaki.hu)**





# Live Demonstration I.

## Workflow to analyse road traffic



Manhattan road network generator

Traffic simulators

Analyser

