



“Grid-enabling” applications using P-GRADE Portal and GEMMLCA

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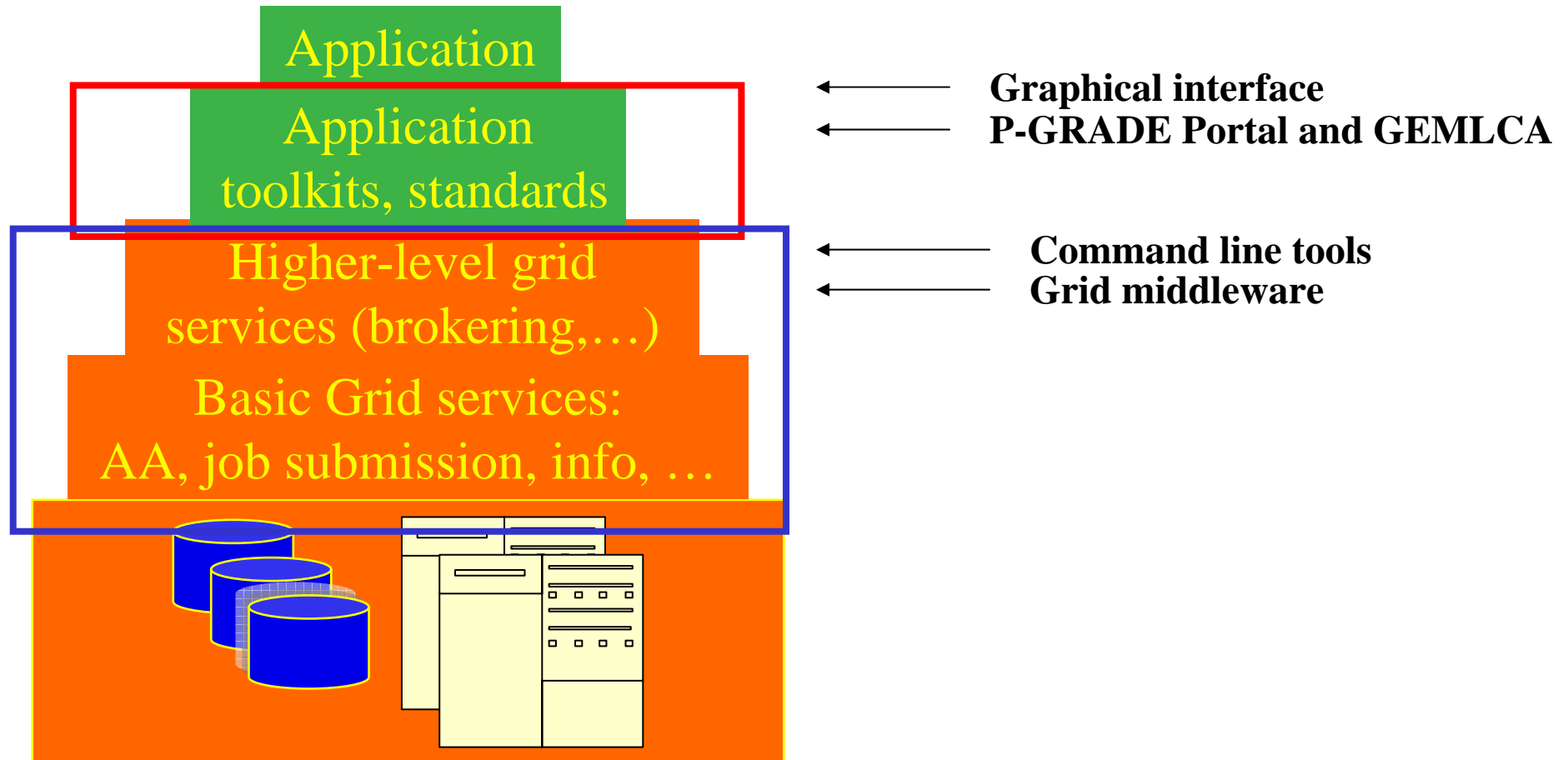
Contents



- Motivation of our work
- P-GRADE Portal in a nutshell
- Demo
- Application development with the Portal
- Application execution with the Portal
- The GEMMLCA-specific P-GRADE Portal
- Demo



Context





Motivation to the P-GRADE Portal



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



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!



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

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

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

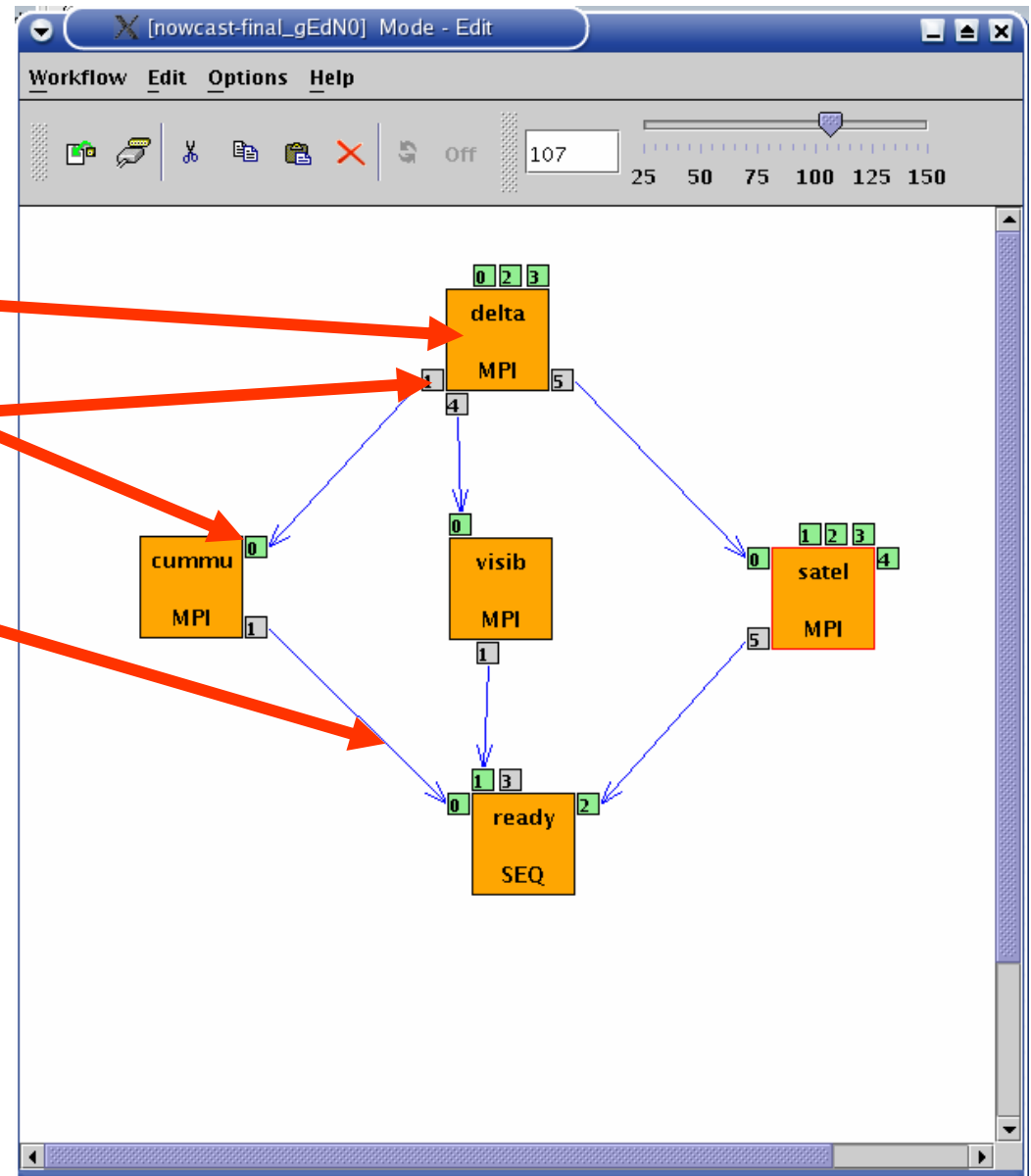
Solves Grid interoperability problem at the workflow level



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

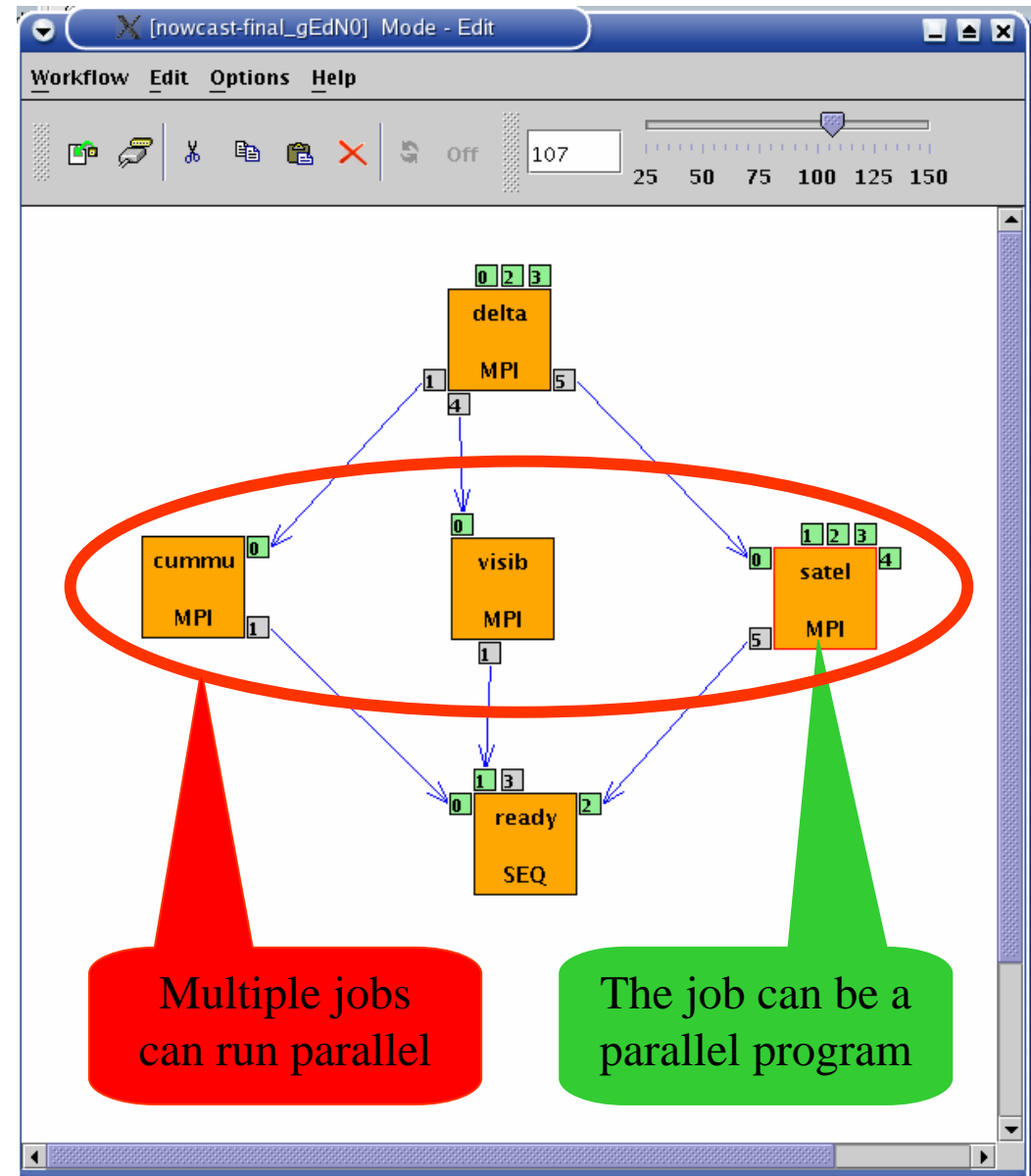




Two levels of parallelism by a workflow

eGEE

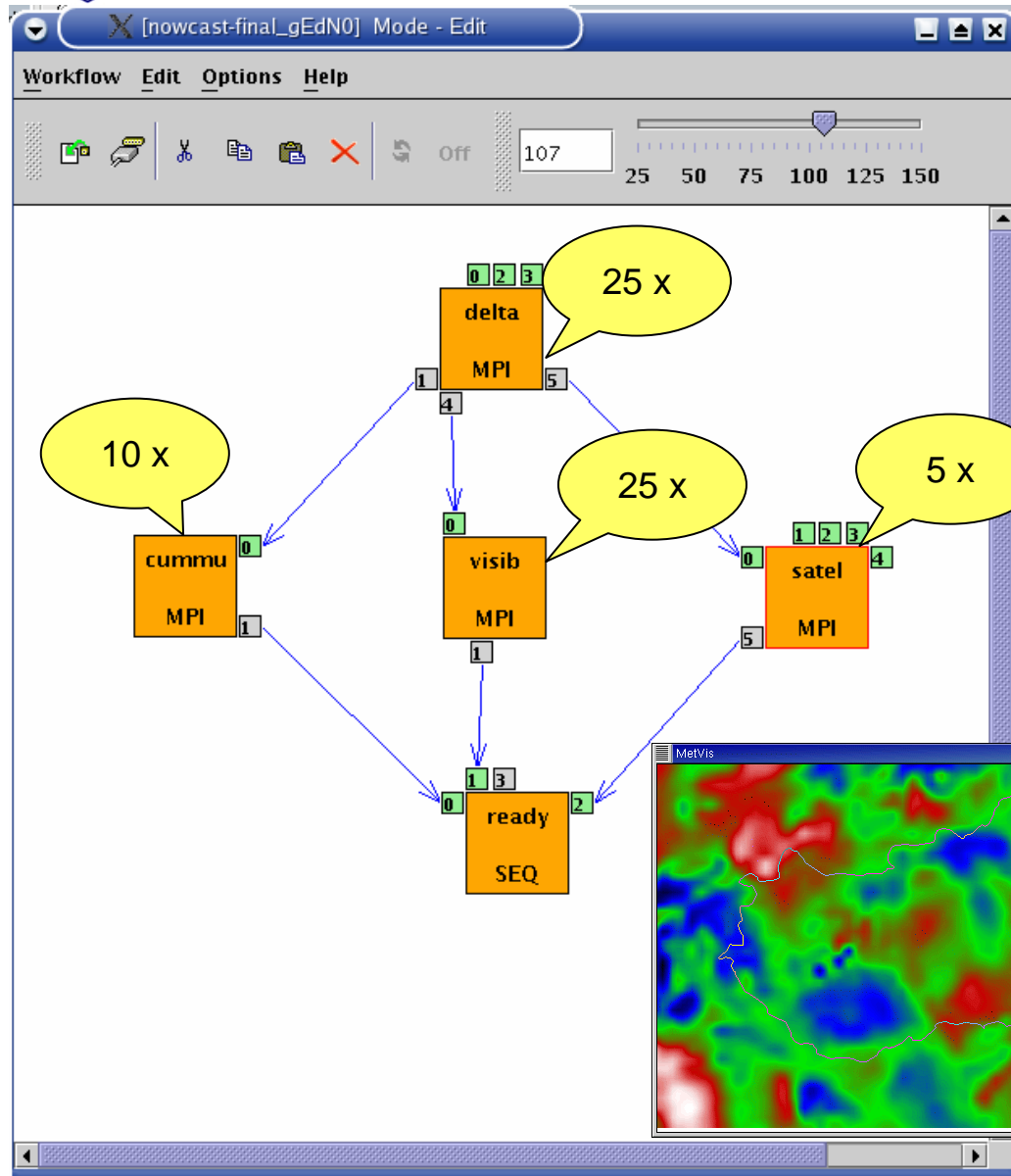
- The workflow concept of the P-GRADE Portal enables the **efficient parallelization of complex problems**
- Semantics of the workflow enables two levels of parallelism:
 - **Parallel execution inside a workflow node**
 - **Parallel execution among workflow nodes**





Ultra-short range weather forecast (Hungarian Meteorology Service)

eGee



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)



Demo

Executing the Corsika job on VOCE
by the P-GRADE Portal



The problem with current portals



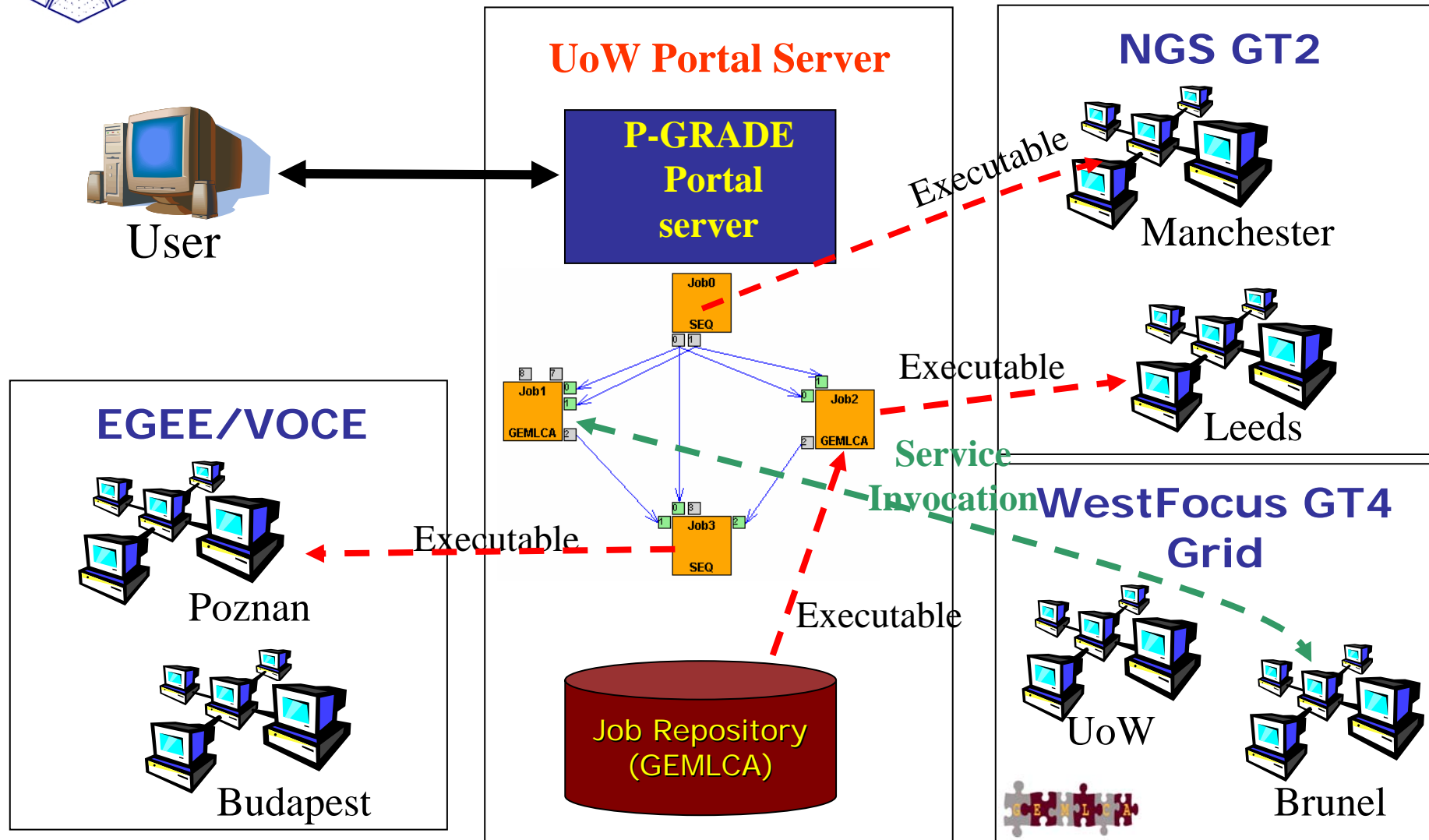
- They are tightly connected and tailored to one particular Grid/VO
- If the user wants to move to another Grid/VO then he/she
 - (has to obtain a certificate from a different CA)
 - has to register for the new Grid/VO
 - has to get an account for its portal
 - has to learn the new environment
 - has to copy the grid files & modify the application
- **P-GRADE Portal v2.1* and above solves the problem:**
 - (has to obtain a certificate from a different CA)
 - Register for the new Grid/VO
 - Map some of the workflow components onto the new Grid/VO

* Note: current version is 2.3



Multi-Grid feature: demonstration @ EGEE User Forum

EGEE



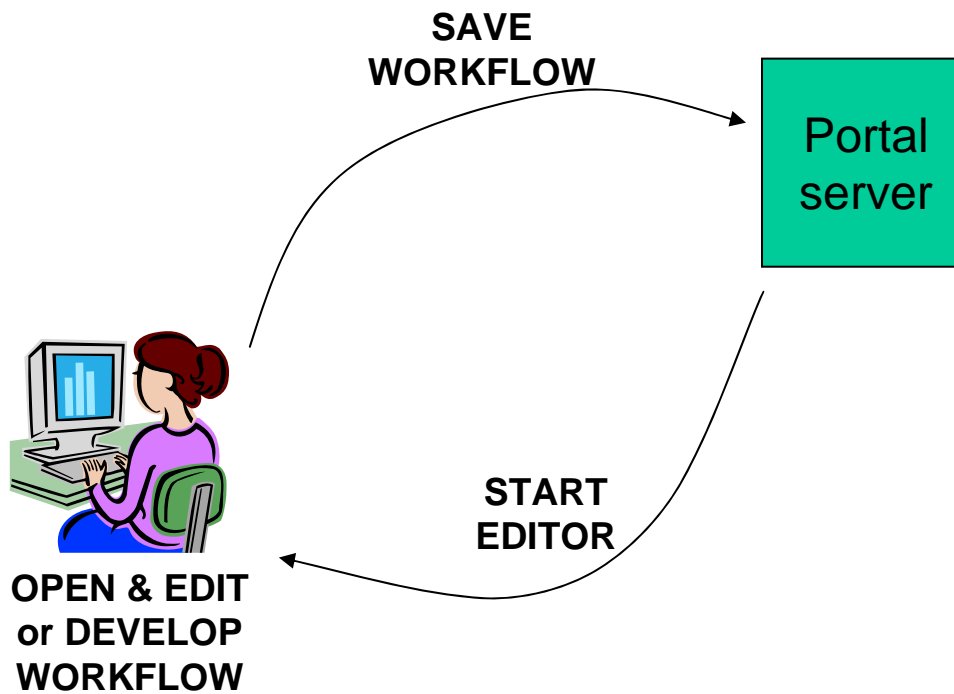


The typical user scenario

Part 1 - development phase

eGEE

Certificate
servers

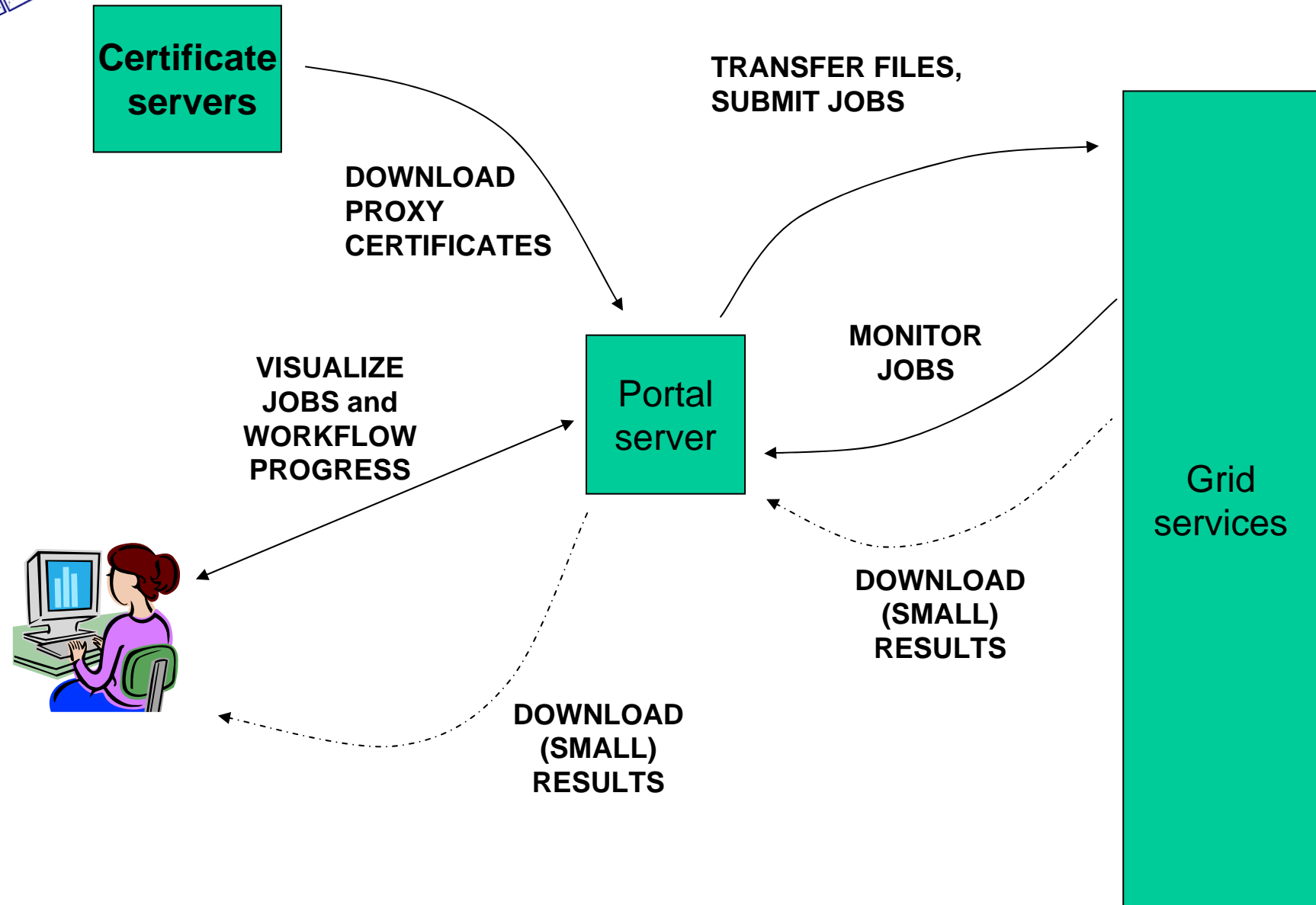


Grid
services



The typical user scenario

Part 2 - execution phase





The typical user scenario

Development phase:

eGEE

Certificate
servers



OPEN & EDIT
or DEVELOP
or IMPORT
WORKFLOW

SAVE
WORKFLOW

Portal
server

START
EDITOR

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 with the P-Grade Portal. The main content area displays the 'Workflow Manager' interface. It includes a 'Workflow Editor' button and a 'Refresh' button. Below these is a table titled 'workflow list' with columns for Workflow, Status, Size, Quota (100 Mb), Output, View, and Action. The table contains one row with the workflow 'LM_9_DEMO_TOTAL' in 'submitted' status, with a size of 26.848 MB and a quota of 269b. The output is 'N/A'. The 'View' column has a 'Details' button, and the 'Action' column has 'Abort', 'Attach', and 'Delete' buttons. A 'Delete all' button is located at the bottom right of the table. A message at the bottom states: 'Message: Workflow successfully submitted.'

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

Message: Workflow successfully submitted.

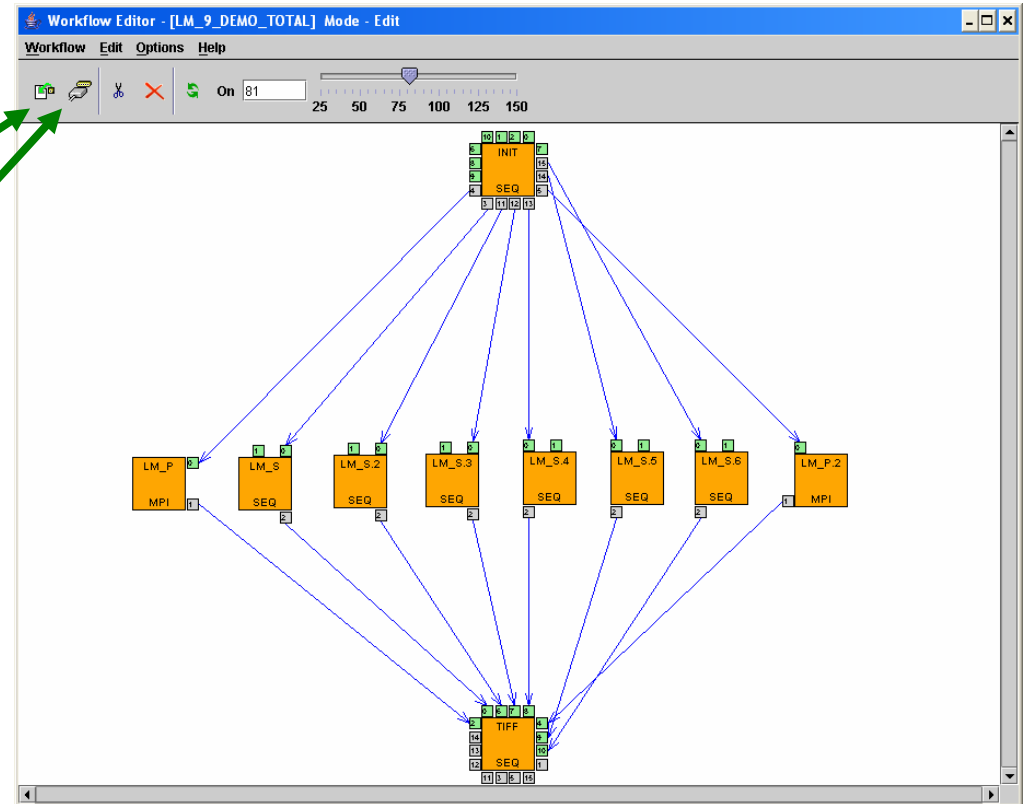


Workflow Editor

Defining the graph



- The aim is to define a DAG of batch jobs:
 1. **Drag & drop components:**
jobs and ports
 2. **Define their properties**
 3. **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 GUIS servers

I don't know which source to use!

The information system portlet queries BDII and GIIS servers

Grid: SEE-GRID VO: seegrid

		Computing Element					Storage Element		
		CPU		Job			Space		
		Free	Usage	Running	Waiting	Load	Total	Available	Usage
	112	80	<div><div></div></div> 29%	7	0	<div><div></div></div> 0%	226.793 GB	216.34 GB	<div><div></div></div> 5%
AEGIS02-RCUB	20	20	<div><div></div></div> 0%	0	0	<div><div></div></div> 0%	398.466 GB	396.58 GB	<div><div></div></div> 0%
BG01-IPP	54	18	<div><div></div></div> 67%	4	0	<div><div></div></div> 0%	609.554 GB	473.543 GB	<div><div></div></div> 22%
BG02-IM	20	16	<div><div></div></div> 20%	1	0	<div><div></div></div> 0%	131.775 GB	79.957 GB	<div><div></div></div> 39%
BG03-IPP-N	3	3	<div><div></div></div> 0%	0	0	<div><div></div></div> 0%	566.608 GB	566.376 GB	<div><div></div></div> 0%
BG04-ACAD	48	32	<div><div></div></div> 33%	2	5	<div><div></div></div> 71%	554.647 GB	475.767 GB	<div><div></div></div> 14%
HR-01-RBI	60	12	<div><div></div></div> 80%	4	0	<div><div></div></div> 0%	78.317 GB	6.271 GB	<div><div></div></div> 92%
MK-01-UKIM_II	28	28	<div><div></div></div> 0%	0	0	<div><div></div></div> 0%	69.709 GB	69.075 GB	<div><div></div></div> 1%
RO-01-ICI	54	24	<div><div></div></div> 56%	5	36	<div><div></div></div> 88%	849.666 GB	828.387 GB	<div><div></div></div> 3%
ROGRID-NIPNE-01	24	24	<div><div></div></div> 0%	0	0	<div><div></div></div> 0%	862.807 GB	848.676 GB	<div><div></div></div> 2%
SZTAKI	4	4	<div><div></div></div> 0%	0	0	<div><div></div></div> 0%	4.566 GB	2.871 GB	<div><div></div></div> 37%
tubitaklog2	35	28	<div><div></div></div> 20%	1	0	<div><div></div></div> 0%	1.335 TB	1.335 TB	<div><div></div></div> 0%



Automatic resource selection eGEE

1. Select a broker Grid/VO for the job
(e.g. 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



Workflow Editor - [default*] Mode - Edit

Workflow Edit Options Help

Off 100 25 50 75 100 125 150

BrokerTest properties

Name: BrokerTest

Job Type: ☒ SEQ ☐ MPI ☐ PVM

Job Executable: D:\A-TEST\Cell.exe

File Browser

☐ Instrument

Process Number:

Attributes:

Grid: HUNGRID_LCG_2_B...

Monitor: ☐

Resource: grid151.kfki.hu

JDL: JDL Editor...

Ok Cancel

Select a Grid with broker!
(*_BROKER)

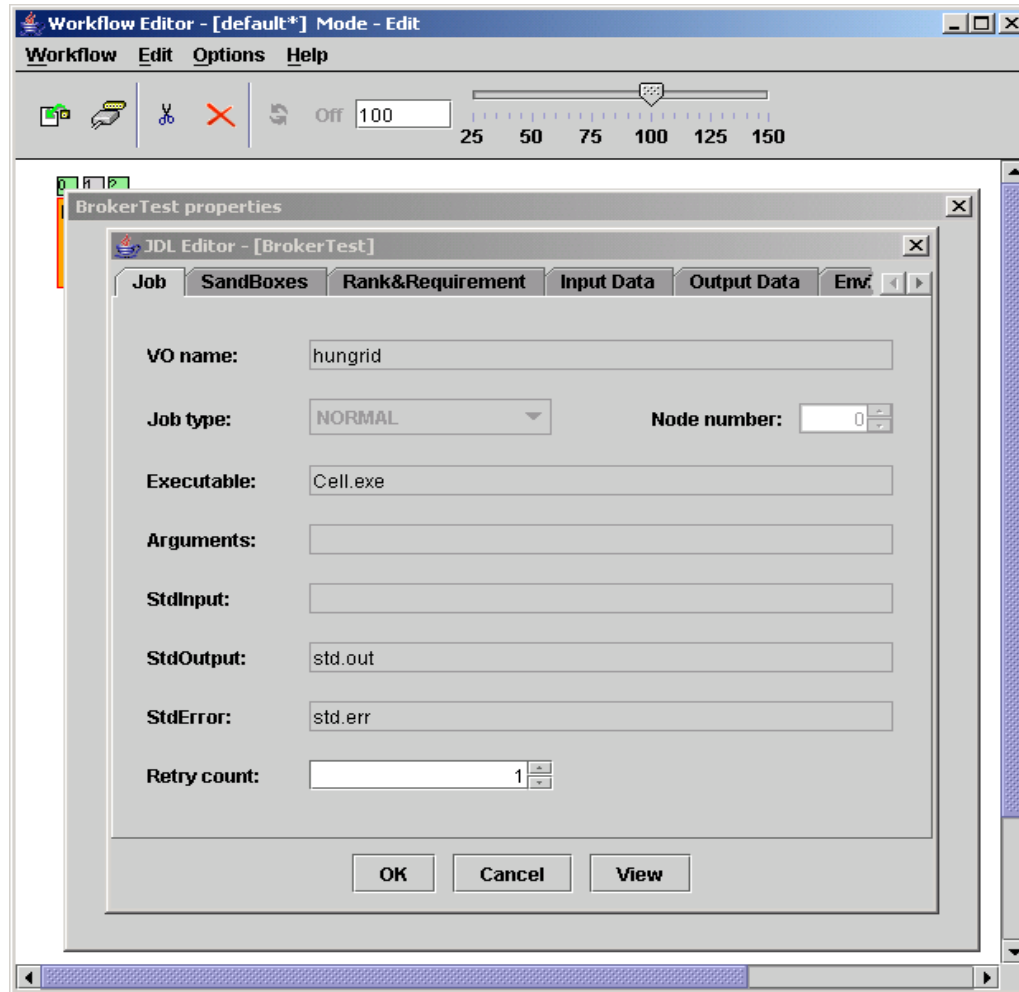
Ignore the resource field!

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



Workflow Editor

Built-in JDL editor

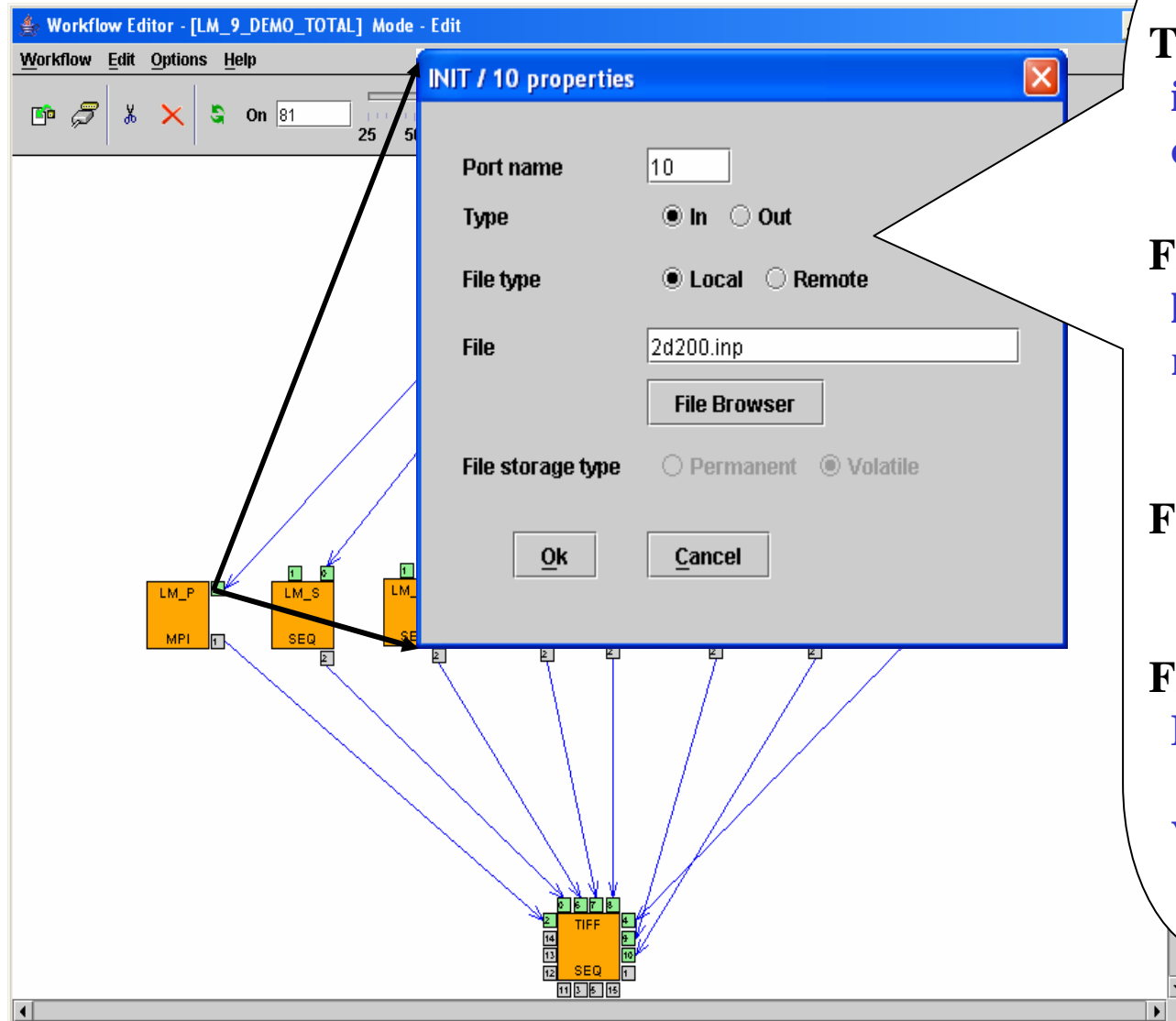


JDL → look at the LCG-2 Users' manual!



Workflow Editor

Defining ports



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 reference values **eGEE**

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](#)

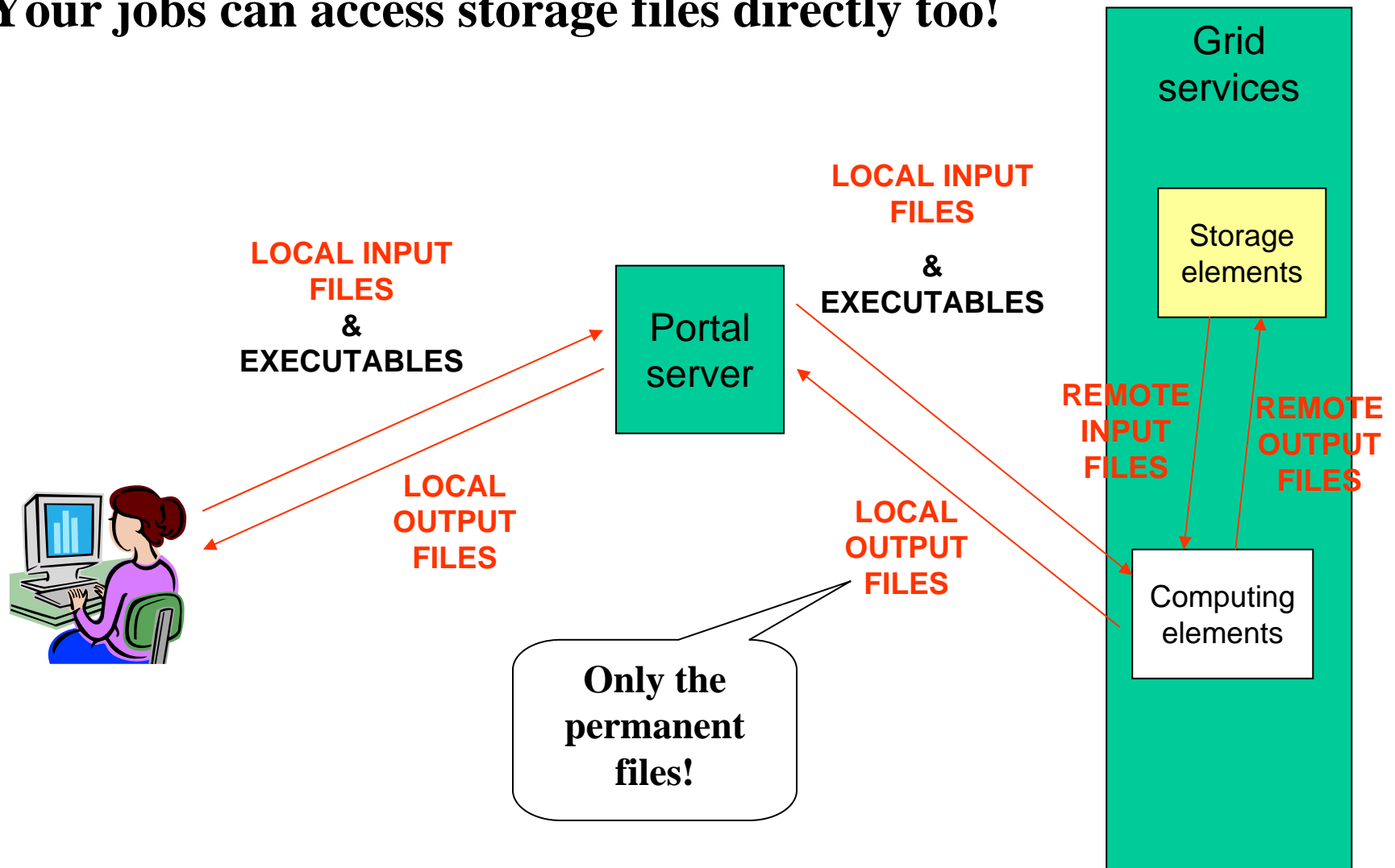
Remote file



Local vs. remote files



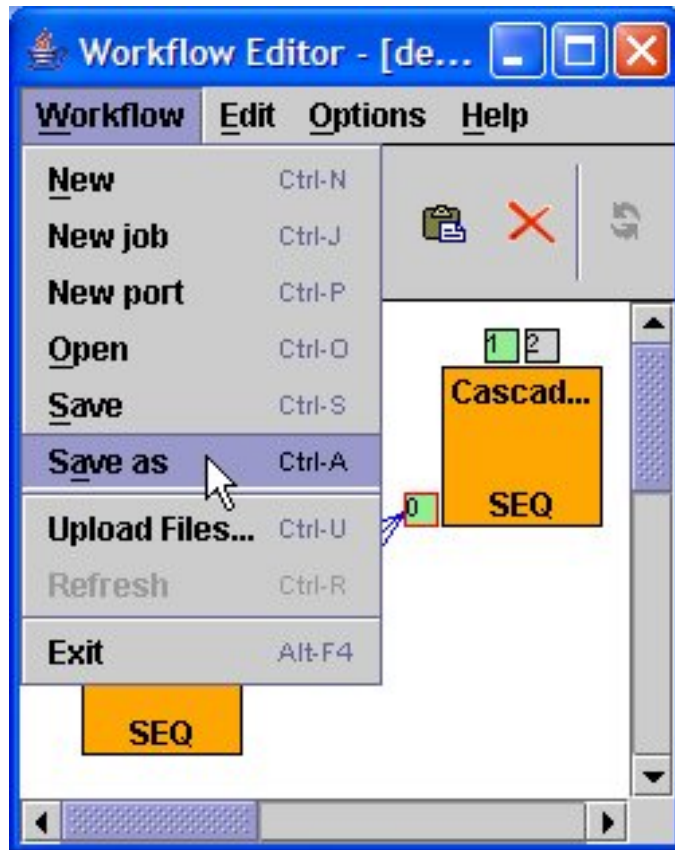
Your jobs can access storage files directly too!





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:

eGEE

Certificate
servers

DOWNLOAD
PROXY
CERTIFICATES

Portal
server

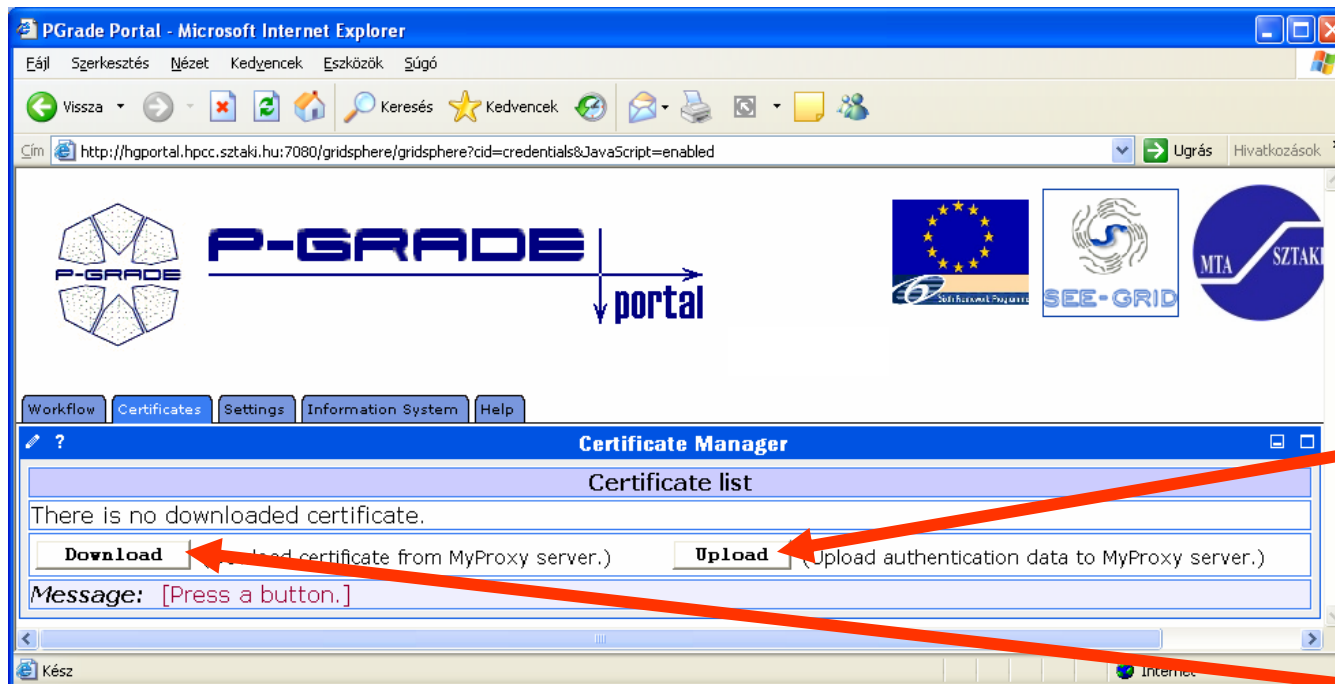
Grid
services





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

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=doGoDownload&cid=5`. The page features the P-Grade logo and a navigation menu with tabs: Workflow, Certificates, Settings, Information System, and Help. The main content area is titled "Certificate Manager" and contains a form for "Download from MyProxy server".

hostname	<input type="text" value="cvs.lpd.sztaki.hu"/>	*	port	<input type="text" value="7512"/>	*
login	<input type="text" value="seecert"/>	*	password	<input type="password" value=""/>	*
lifetime (hours)	<input type="text" value="100"/>	*	description	<input type="text" value=""/>	

*: Cannot be left empty.

Message: Fill in the fields for download!



Certificate Manager

associating the proxy with a grid



PGrade Portal - Microsoft Internet Explorer

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

P-GRADE portal

Workflow Certificates Settings Information System Help

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:

HUNGRID	OK
HUNGRID	
SEE-GRID	
SZTAKI-GRID	

Cancel

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



PGrade Portal - Microsoft Internet Explorer

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

P-Grade portal

Workflow Certificates Settings Information System Help

Certificate Manager

Certificate list			
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.

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

SEE-GRID CEs and SEs

HUNGRID CEs and SEs



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 Editor Refresh

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%			

Delete all

Message: Workflow successfully submitted.



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.idi.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.idi.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

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	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)



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	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.

Kész Internet

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				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.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

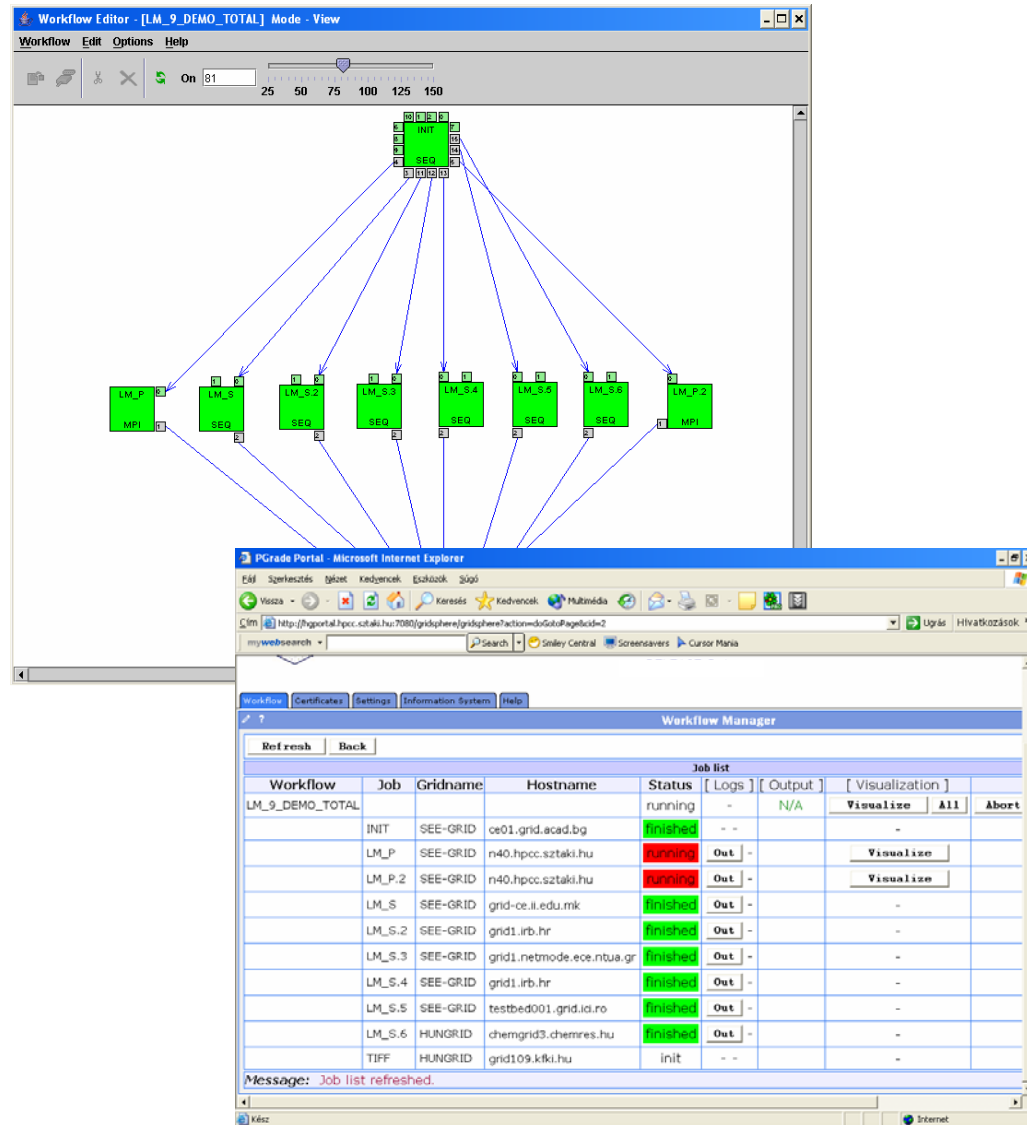
White/Red/Green color means the job is initialised/running/finished



Workflow Execution



What about
data
transfers?





The typical user scenario

Execution phase – step 3:

eGEE

Certificate
servers

VISUALIZE
JOBS and
WORKFLOW
PROGRESS

Portal
server

MONITOR
JOBS

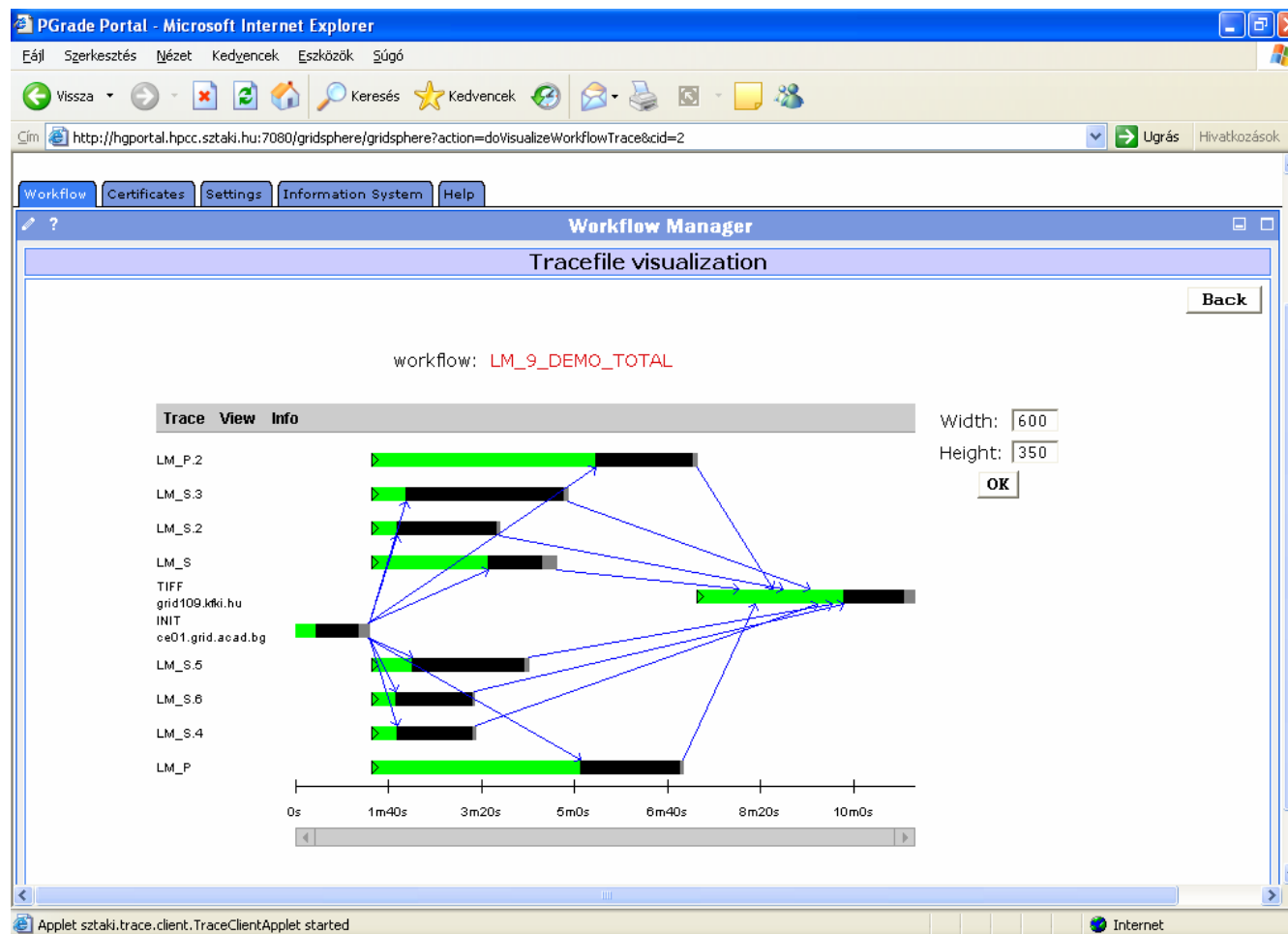
Grid
services





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

eGee



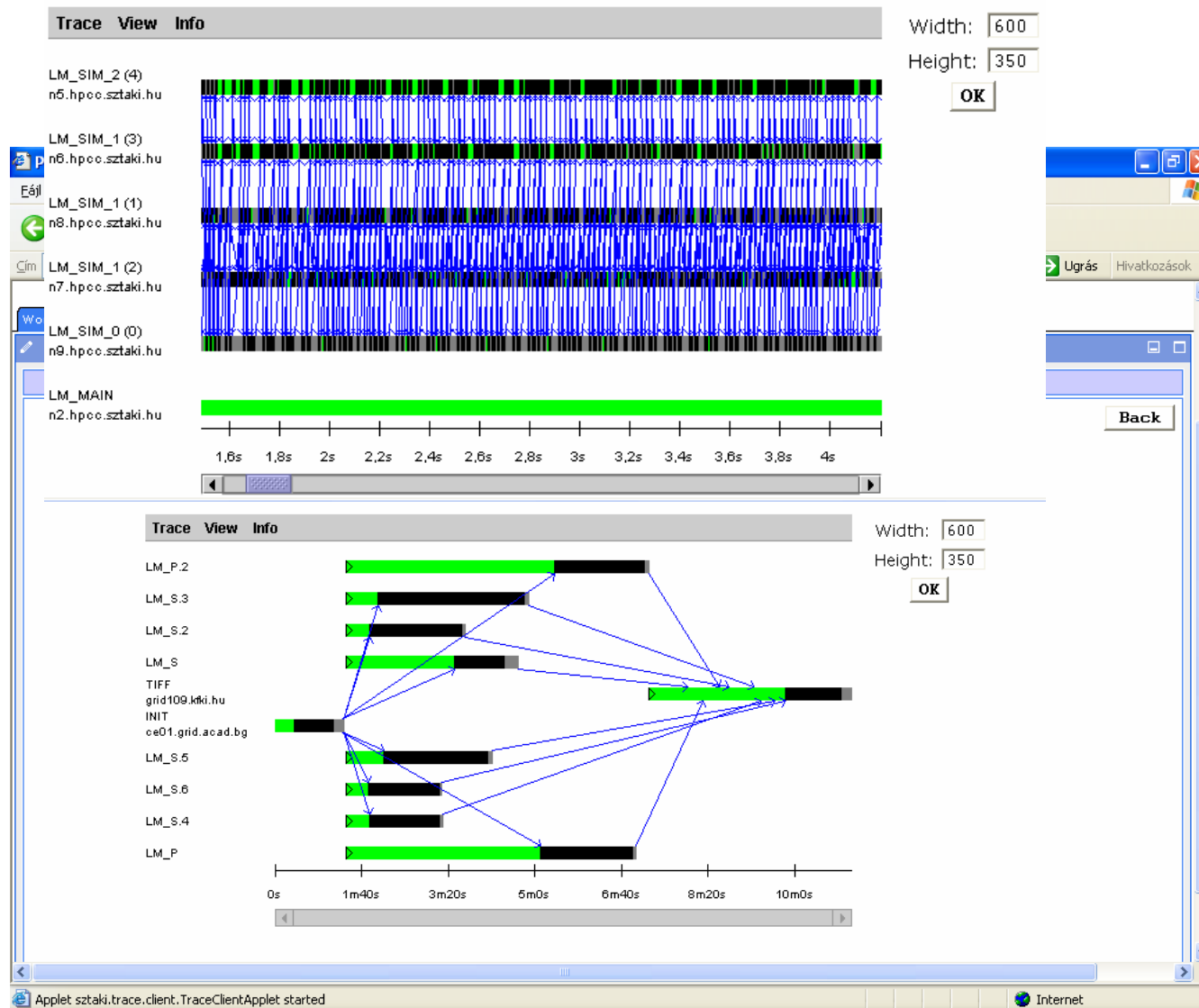
- The portal monitors and visualizes workflow progress



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

eGee

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. eGEE

GridSphere Portal - Microsoft Internet Explorer

Address: http://hgportal.hpcc.sztaki.hu

Workflow

Szupergrid

Refresh Back

Workflow	Job	Gridname	Hostname	Status	Logs	Output	Visualization	Action
demo-RESCUE	Count1	SZTAKI-GRID	n0 .hpcc.sztaki.hu	finished	Out	-	-	Rescue Abort Attach Delete
	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

Done Internet

A job failed during workflow execution

Read the error log to know why

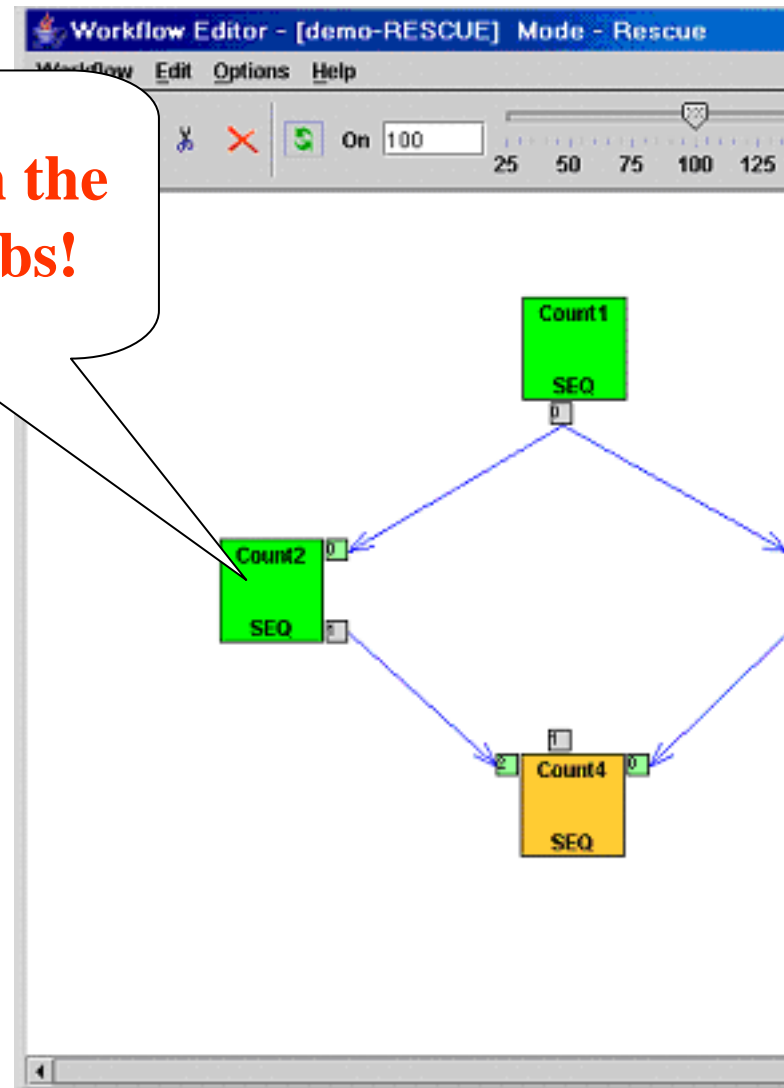


Rescuing a failed workflow 2. EGEE

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

eGEE

Certificate
servers



Portal
server

Grid
services

DOWNLOAD
(SMALL)
RESULTS

DOWNLOAD
(SMALL)
RESULTS



Downloading the results...eGEE

PGrade Portal - Mozilla

File Edit View Go Bookmarks Tools Window Help

http://fn2.hpcc.sztaki.hu:9080/gridsphere/gridsphere?action=doGotoPage&cid=2

Home Bookmarks The Mozilla Or... Latest Builds

P-GRADE portal

Logout

Welcome, Nemeth Csaba

Workflow Credentials Settings Demo Help

Workflow Manager

Refresh Back

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	--			
	visib	n0.hpcc.sztaki.hu	finished	--			

Message: Job list refreshed.

Transferring data from fn2.hpcc.sztaki.hu...

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 Choose...

☒ Save it to disk

☐ Always perform this action when handling files of this type

OK Cancel



Additional 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!**



Workflow/trace export/import eGEE

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 the P-Grade Workflow Manager interface. The table lists three workflows: WF1, WF12, and WF12Sz. Each workflow has a 'Download' button and a 'set init' button. The 'Delete' button is only visible for WF12Sz. The 'Trace' and 'Output' columns show '--' for WF1 and WF12, and '--' and '337 Byte' for WF12Sz. The 'Size' column shows '27 276 Byte' for WF1, '77 964 Byte' for WF12, and '95 528 Byte' for WF12Sz. The 'All' column shows '27 276 Byte' for WF1, '77 964 Byte' for WF12, and '95 865 Byte' for WF12Sz. The 'Delete' button is located in the 'All' column for WF12Sz.

Workflow	Size	Action	Trace	Output	All
WF1	27 276 Byte	Download set init	--		27 276 Byte
WF12	77 964 Byte	Download set init	--		77 964 Byte
WF12Sz	95 528 Byte	Download set init	--	337 Byte	95 865 Byte



References



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





The GEMLCA-specific version of the P-GRADE Portal



University of Westminster

MTA SZTAKI





GEMLCA P-GRADE Portal Motivation 1.



- Support legacy applications by the P-GRADE Portal:
 - Code from the past, maintained because it works
 - Often supports business critical functions
 - Complex dependencies, licence and/or hardware restrictions → cannot be dynamically migrated





Publish legacy applications as application services



Web



Des

Workflow Certificates Settings Demo Help GEMMLCA Administration Tools Macroscopic Visualiser

Resource Selector Legacy Code Information Descriptor Creator

GEMMLCA Legacy Code Interface Descriptor composer

Legacy code Environment Paramaters:

maximumProcessors	1
executable	LINUX/mkdir
minimumProcessors	1
maximumJob	11
jobManager	Fork
id	mkdir
description	Unix mkdir program

Set Parameters

List of legacy code Arguments:

name	file	order	fixed	inputOutput	mandatory	regexp
------	------	-------	-------	-------------	-----------	--------

New argument entry form:

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

Add Argument

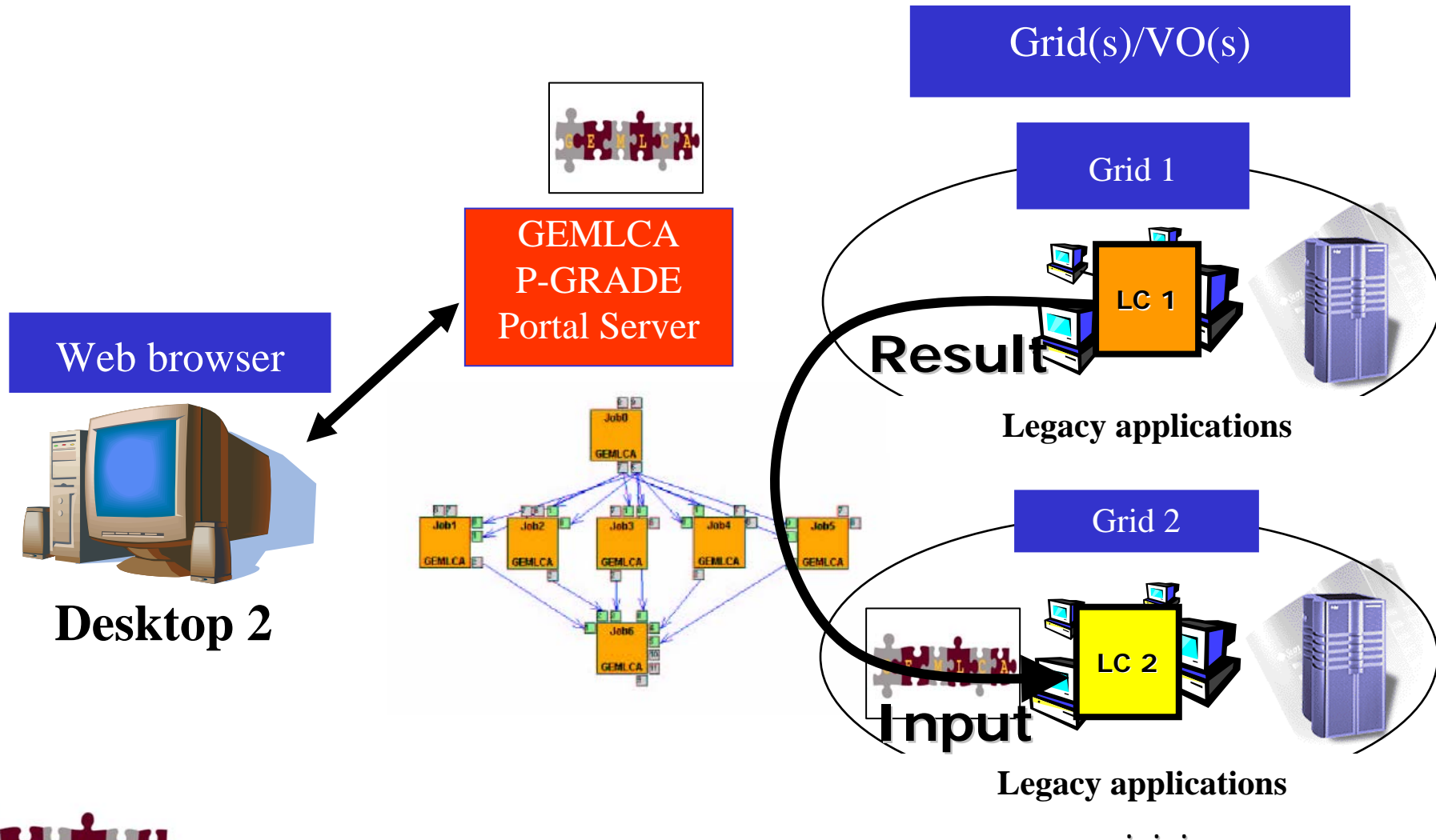
"GEMMLCA Administration Tool" portlet





Integrate legacy application services into your workflow

eGEE

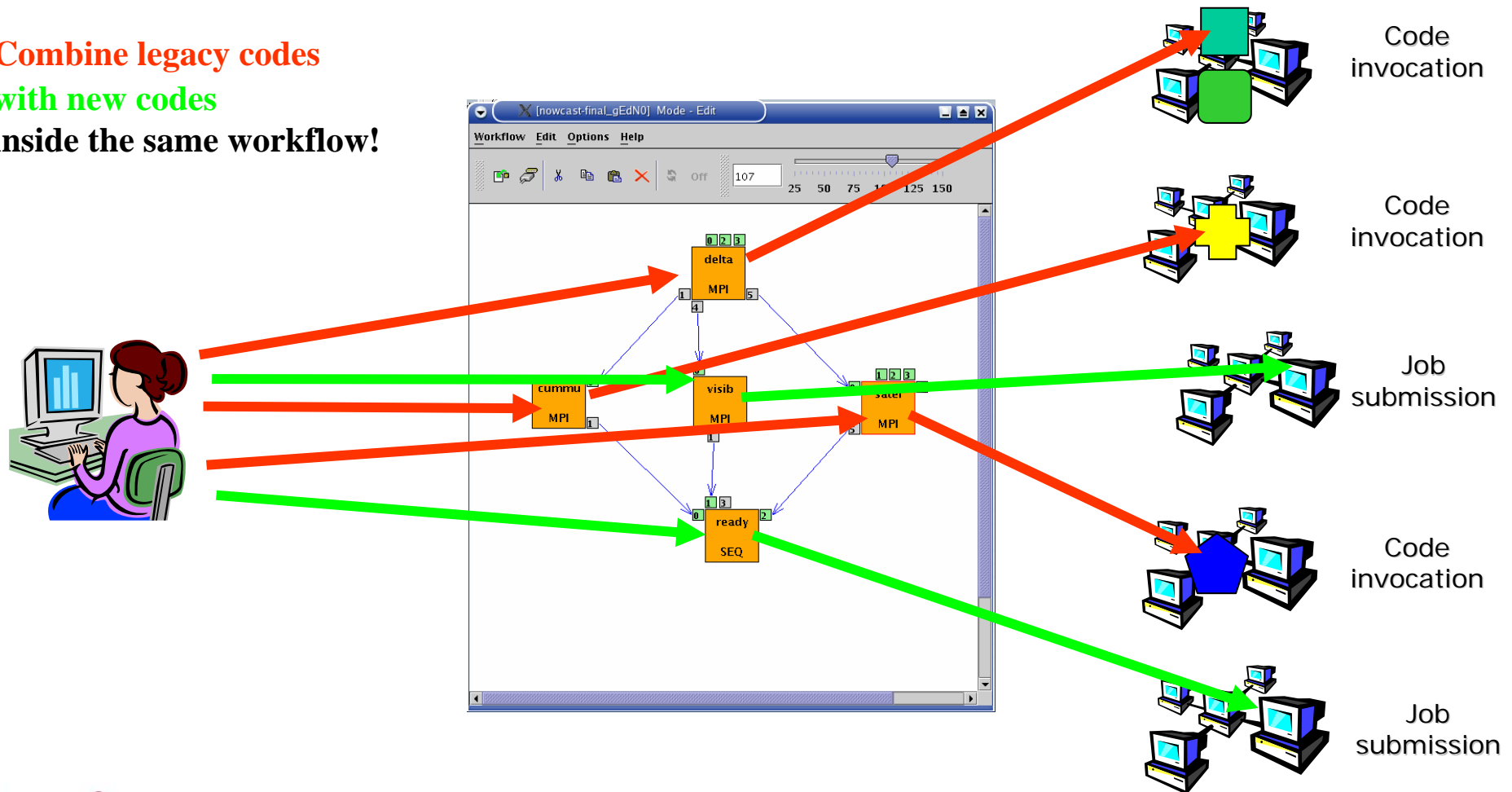




Combining legacy and non-legacy applications



Combine legacy codes
with new codes
inside the same workflow!

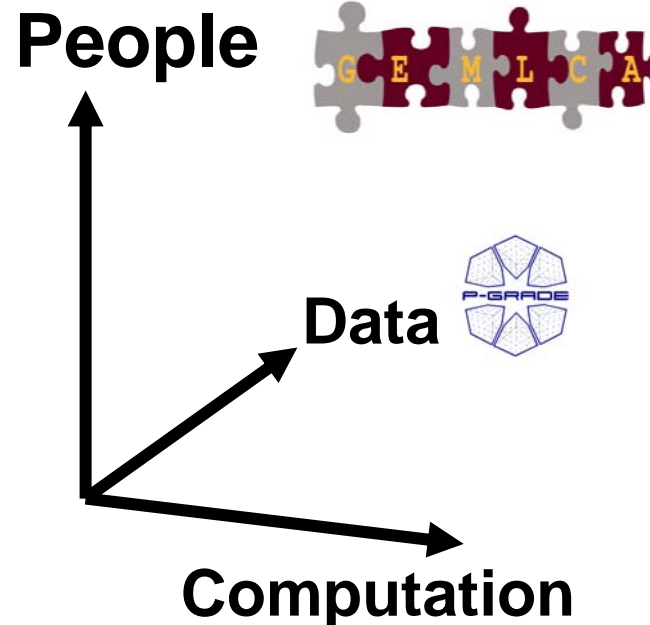




GEMMLCA P-GRADE Portal Motivation 2.



- Foster the user's collaboration:
 - Enable the sharing of jobs with other users by a high-level interface





Sharing jobs with other GEMLCA portal users



GridSphere Portal - Microsoft Internet Explorer

Fájl Szerkesztés Nézet Kedvencek Eszközök Súgó

Vissza Keresés Kedvencek

Cím http://westfocus.cpc.wmin.ac.uk:8080/gridsphere/gridsphere?cid=24&gs_mode=view&gs_state=normal&gs_action=doGotoPage

RELEASE 2.2

University of Westminster P-Grade WestFocus ICT Network gridalliance

Workflow Certificates Settings Information System GEMLCA Administration Tool Help

Szupergrid

Workflow Manager

Refresh Back

Workflow	Job	Gridname	Hostname	Status	[Logs]	[Output]	[Visualiza	[Action]
Traffic_simulator				submitted	-	N/A	Visualize	Abort Attach Delete
	Job0	Westfocus	http://grids.brunel.ac.uk:8082/wsrf/services/uk/ac/wmin/cpc/gemlca/frontend	finished	Out	-	-	Create a LC from this Job...
	Job1	EGEE	ares02.cyf-kr.edu.pl	finished	Out	Err	-	Create a LC from this Job...
	Job2	EGEE	ares02.cyf-kr.edu.pl	finished	Out	Err	-	
	Job3	NGS	http://westfocus.cpc.wmin.ac.uk:58087/wsrf/services/grid-data.man.ac.uk	submitted	Out	-	-	

Message: Job list refreshed.

New button for successfully executed jobs: create a legacy code service from this jobs





Sharing jobs with other GEMLCA portal users



Workflow Certificates Settings Demo Help GEMLCA Administration Tools Macroscopic Visualiser

Resource Selector Legacy Code Information Descriptor Creator

GEMLCA LCID Administration Portlet

GEMLCA Legacy Code Interface Descriptor composer

Legacy code Environment Parameters:

maximumProcessors	<input type="text" value="1"/>
executable	<input type="text" value="LINUX/mkdir"/>
minimumProcessors	<input type="text" value="1"/>
maximumJob	<input type="text" value="11"/>
jobManager	<input type="text" value="Fork"/>
id	<input type="text" value="mkdir"/>
description	<input type="text" value="Unix mkdir program"/>

List of legacy code Arguments:

name	file	order	fixed	inputOutput	mandatory	regex	friendlyName	commandline	initialValue
------	------	-------	-------	-------------	-----------	-------	--------------	-------------	--------------

New argument entry form:

name	<input type="text" value="-p"/>
file	<input type="text" value="No"/>
order	<input type="text" value="0"/>
fixed	<input type="text" value="No"/>
inputOutput	<input type="text" value="Input"/>
mandatory	<input type="text" value="No"/>
regex	<input type="text"/>
friendlyName	<input type="text" value="Folder to be created"/>
commandline	<input type="text" value="Yes"/>
initialValue	<input type="text"/>

Put job into Portal
level repository

GEMLCA
P-GRADE
Portal
server

Job
Repository





References



- **GEMMLCA-specific P-GRADE portal is available as service for:**
 - UK National Grid Service



- **In testing phase for**
 - EGEE middleware ~ 1 month



Conclusion: **Technology-neutral portal for e-Scientists**



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



Further information...



- Take a look at **www.lpds.szteki.hu/pgportal**
(*manuals, slide shows, installation procedure, etc.*)
- **Visit or request a training event!**
(list of event is on P-GRADE Portal homepage)
 - Lectures, demos, hands-on tutorials, application development support
- **Get an account for one of its production installations:**
 - VOCE portal - SZTAKI
 - SEEGRID portal – SZTAKI
 - HUNGrid portal – SZTAKI
 - NGS portal – University of Westminster
- **Install your own portal:** If you are the administrator of a Grid/VO SZTAKI is pleased to help you install a portal for your community!



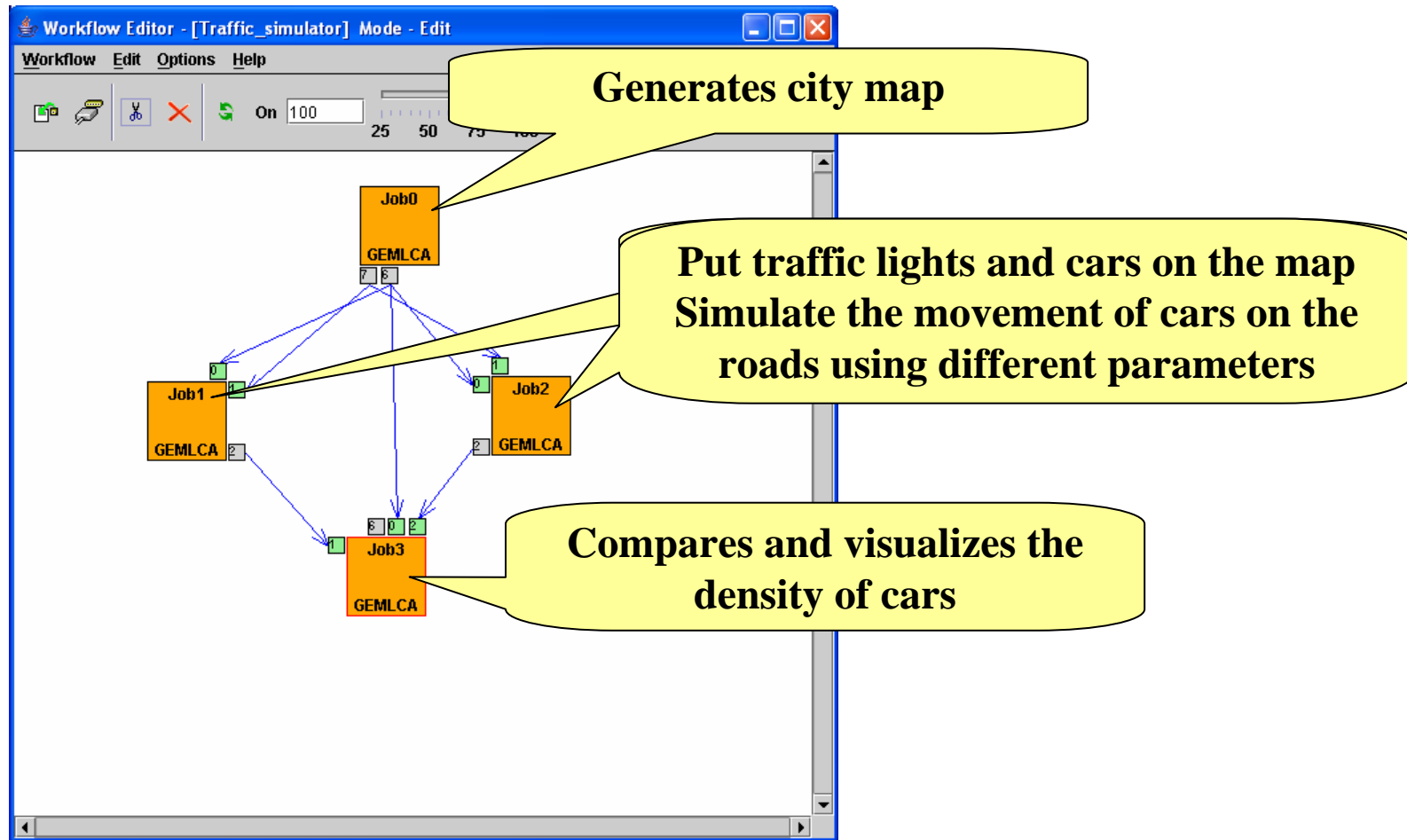
Demo



1. A three-grid workflow (GT2, GT4, LCG-2)
2. P-GRADE Portal on EGEE Grids:
 1. Job execution by broker + JDL
 2. LFC catalogs
 1. Remote output files
 2. Remote input files
3. Developing and executing a traffic simulator and analyzer workflow on the UK NGS with GEMLCA
in 5 minutes!



Traffic simulation application





Latest news!

eGee

- **P-GRADE Portal tutorial in Paris**

22-23, June

See details on P-GRADE Portal homepage!

- **Joint Regional CE EGEE and SEE-GRID
Summer School on Grid Application Support**

3-8 July, Budapest, SZTAKI

www.egee.hu/grid06



Learn once, use everywhere
Develop once, execute anywhere

Thank you!

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