

Silvia Delgado Olabarriaga

Introduction to WS-PGRADE

GUSE GRID AND CLOUD SCIENCE GATEWAY FRAMEWORK



Prepared by Silvia Delgado Olabarriaga

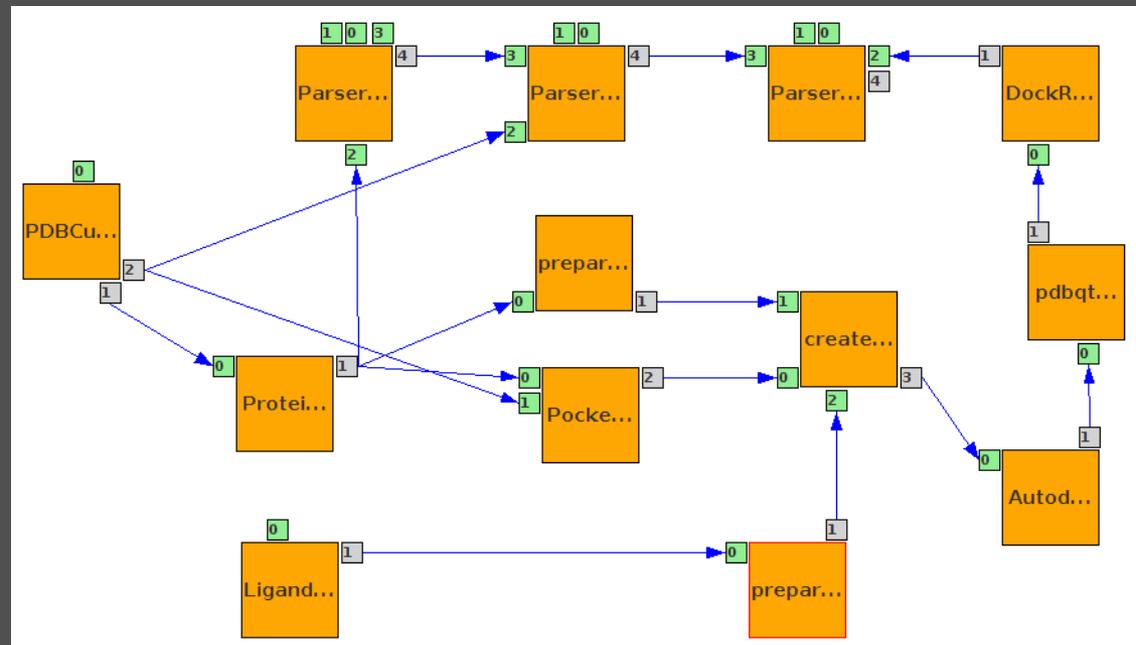
Academic Medical Center of the University of Amsterdam, NL



SURF SARA

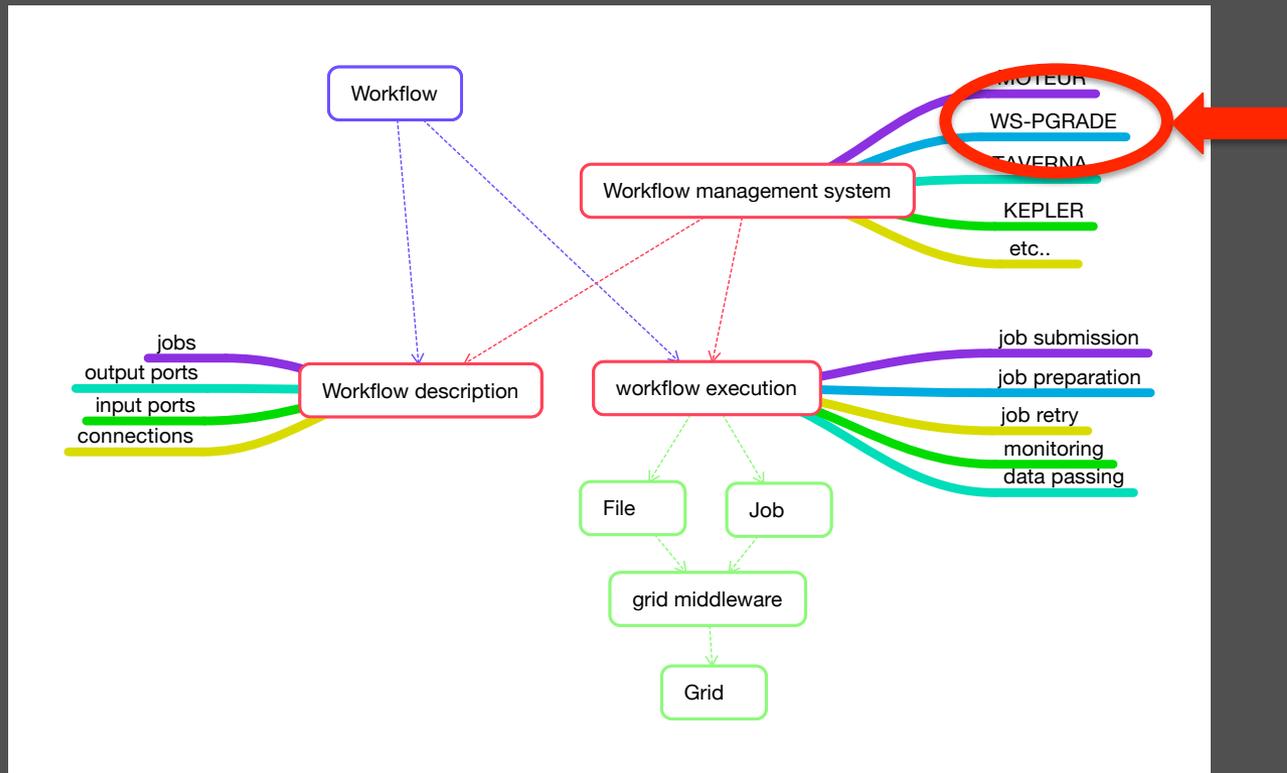
Recap: Workflow is...

- ❑ a sequence of connected steps;
- ❑ designed to achieve processing of some sort, such information processing.



Recap: Workflow Management Systems..

- facilitate porting and execution of applications to grid



Goals of this lecture

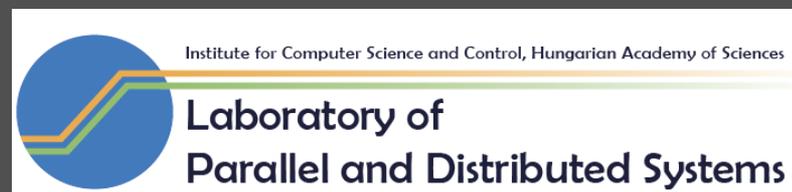
- ❑ Introduce basic components of WS-PGRADE
- ❑ Introduce concepts of workflow description and execution using WS-PGRADE, which are needed for the practical exercises

WS-PGRADE

- ❑ **Web portal for gUse**
 - Workflow composition
 - Workflow execution on grids, clusters and cloud
 - Workflow monitoring
- ❑ **Developed by MTA SZTAKI LPDS, Budapest**
- ❑ **Open source**



<http://www.guse.hu/>



<http://www.lpds.sztaki.hu/>

WS-PGRADE Portals in Use



<http://www.guse.hu/portals/in-use>

WS-PGRADE Components (User view)



Web User Interface



Workflow Editor

Security

Workflow Interpreter

Workflow repository

Files



Job submission Service
Distributed Computer Infrastructure (DCI) bridge

Cluster
pbs

Grid
gLite

Cloud
Amazon

...

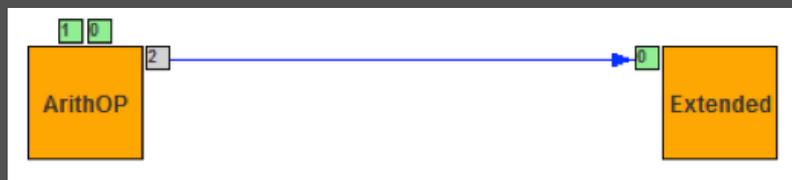
Workflow Concepts

□ Workflows

- Abstract (Graph)
- Concrete

□ Jobs

- Executable
- Type



□ Ports

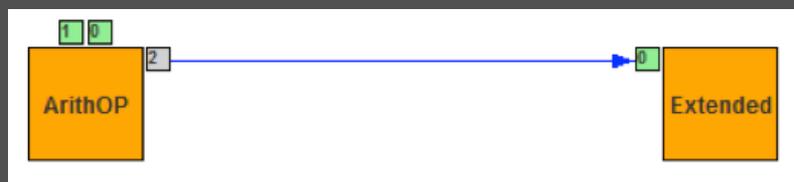
- Input
- Output
- Files

WS-PGRADE Typical Usage

- ❑ **Authenticate with portal**
- ❑ **Create workflow (graph + concrete)**
- ❑ **Configure security (proxy)**
- ❑ **Submit concrete workflow**
- ❑ **Monitor execution (dashboard)**
- ❑ **Get results (files)**
- ❑ **Files are uploaded to the portal, then transported to the infrastructures by WS-PGRADE**

Workflow creation

- ❑ Create abstract workflow (graph)
- ❑ Create concrete workflow (from graph)
- ❑ Configure concrete workflow (jobs executable, type and input data)



Create abstract workflow

❑ Workflow->Graph

❑ Graph Editor

❑ Add jobs

❑ Add ports

❑ Edit port type

❑ Edit names

❑ Add description

The screenshot displays the WS-PGRADE Workflow Developers application. The main window is titled "WS-PGRADE Workflow Developers" and has a menu bar with "Graph", "Edit", and "Help". Below the menu bar is a toolbar with icons for adding, deleting, and undoing. A zoom slider is set to 25%. The main workspace shows a graph with a single job named "hello" represented by an orange box. A "hello properties" dialog box is open in the foreground, showing the "Job Name" field set to "hello" and the "Job Text" field containing the description: "takes one string in the input port and puts a 'hello' message in the output port".

amC

Welcome Workflow Storage Settings

AMC e-BioInfra Gateway WS-PGRADE Workflow Developers

Graph

Refresh

Graph Editor

Graph name

| | | |
|-------------------------------------|------|-----|
| TwoJobsCopy | Edit | Dow |
| cesup | Edit | Dow |
| gUseWorkflowGraph_2013-06-27-130223 | Edit | Dow |
| noports | Edit | Dow |

Graph Editor - [default*] Mode - Edit

Graph Edit Help

25 50 75 100 125 150 %

hello

hello properties

Job Name: hello

Job Text: takes one string in the input port and puts a "hello" message in the output port

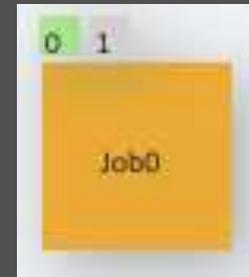
Ok Cancel

Examples

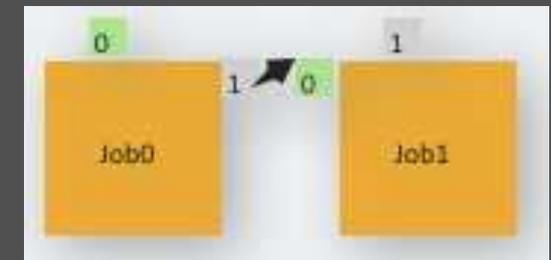
□ No ports



□ One input port, one output port



□ Two jobs connected via one port



Create concrete workflow

❑ Workflow->Create concrete

- From graph (select)
- From different workflow (select)

❑ Add name

Create concrete

Refresh

Create a new workflow from a

Graph
 Template
 different Workflow

one-component-wf
TestSQL
zen

Name for the new workflow: 2013-10-16

Optional note: 2013-10-16

Type of the workflow: zen

OK

Configure concrete workflow

- ❑ Workflow->Concrete
- ❑ Configure

| Concrete | | | | | |
|---|---------|----------|-------|-----------|--|
|  | | | | | |
| <input type="button" value="Refresh"/> | | | | | |
| Workflow name | Running | Finished | Error | Suspended | Actions |
| TestSQL 2013-10-14 | 0 | 1 | 0 | 0 | Configure Info Details Submit Delete Export |
| TwoJobsCopyJava 2013-10-11 | 0 | 0 | 0 | 0 | Configure Info Details Submit Delete Export |
| concrete-cesup 2013-3-1 | 0 | 4 | 1 | 0 | Configure Info Details Submit Delete Export |
| hello-deaf-mute 2013-1-9 | 0 | 7 | 6 | 0 | Configure Info Details Submit Delete Export |

Configure concrete workflow

Job description

- Click on a job to configure it

The screenshot shows the 'Concrete' interface for configuring a workflow. At the top, there is a red bar with two radio buttons: 'Delete old instances' (unselected) and 'Do not delete old instances' (selected). Below this is a table with the following details:

| | |
|--------------------|--|
| Workflow name: | TwoJobsCopyJava |
| Note: | 2013-10-11 |
| Workflow Graph: | TwoJobsCopy Edit Fit copied workflow to a new graph |
| Workflow Template: | -- |

Below the table is a workflow graph with two yellow job nodes, 'Job0' and 'Job1'. 'Job0' is circled in red, and an arrow points from it to 'Job1'. The graph is contained within a white box with a black border.

Configure concrete workflow: Job executable (on local server)

- ❑ Click on **Job Executable**
- ❑ Type: local
- ❑ Kind of binary
 - Sequential (script)
 - Java
- ❑ Choose file (executable)
- ❑ command-line arg
- ❑ 



Configure

Job's name: Job0

Optional note: Description of Job

[Job Executable] [Job I/O] [JDL/RSL] [History]

Workflow Service Binary

Type: local

Grid: dci-bridge host(64bit)

Replicate settings in all Jobs:

Kind of binary: Sequential Java MPI

MPI Node Number:

Executable code of binary: Recently stored: HelloCopyFile.jar

Choose File No file chosen

Parameter: inFile outFile