

# Silvia Delgado Olabarriaga

# Introduction to Workflows

## WORKFLOW MANAGEMENT FOR GRID COMPUTING



Prepared by Silvia Delgado Olabarriaga

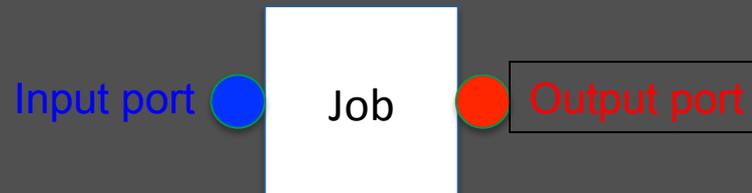
Academic Medical Center of the University of Amsterdam, NL



**SURF SARA**

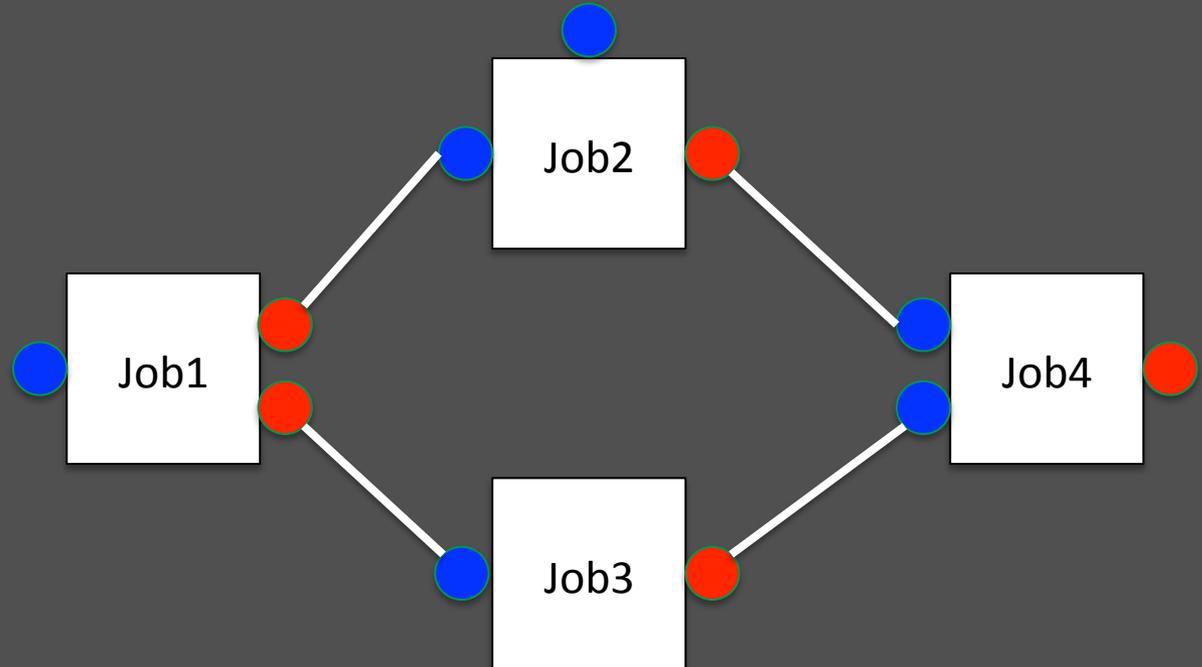
# Basic Grid Workflow Concepts

- ❑ **Components, processes, activities, jobs**
  - Run some program
- ❑ **Inputs, outputs (ports)**
  - Receive or generate some file



# Grid Workflows

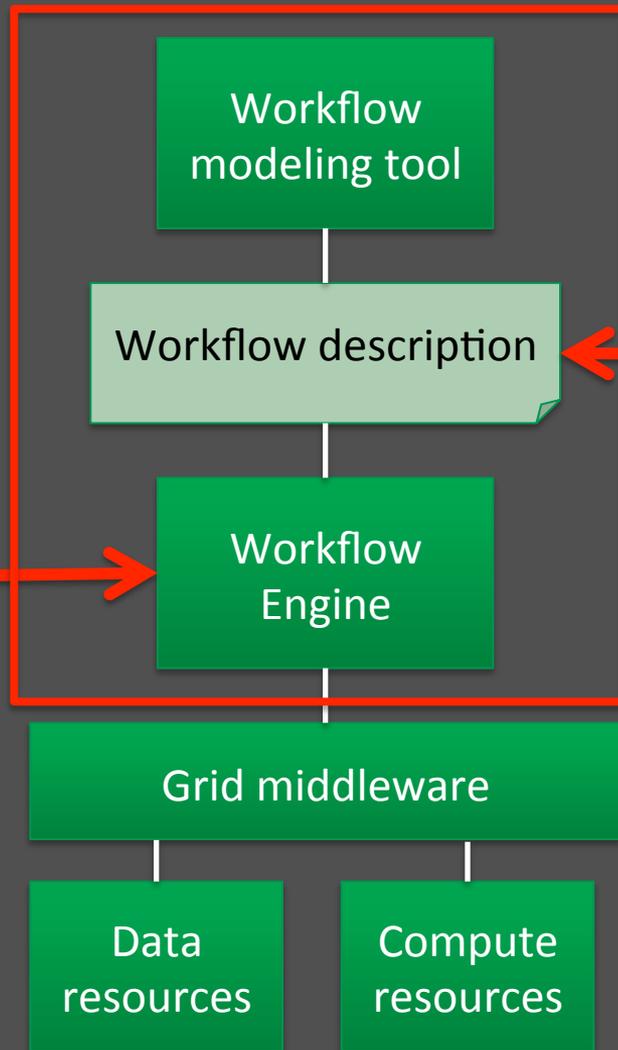
- **Linked jobs**



- **Data passed around**

- **Jobs submitted/started when data is available**

# Grid Workflow Management

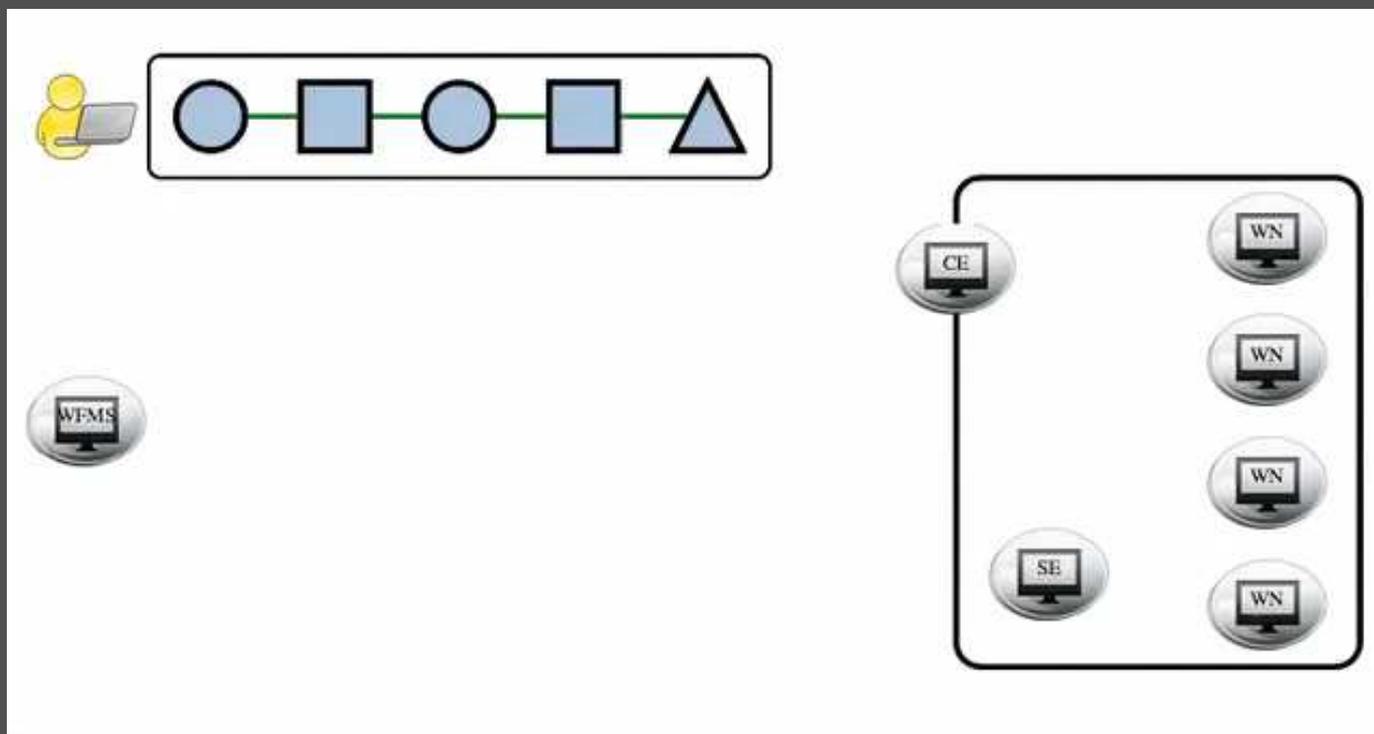


Workflow management system  
WfMS

Jobs (programs, requirements)  
Ports  
Data and control flow

Move data to/from jobs  
Wrap programs as jobs  
Submit jobs  
Monitor  
Retry jobs  
Keep execution records  
(and more..)

# Grid Workflow Management

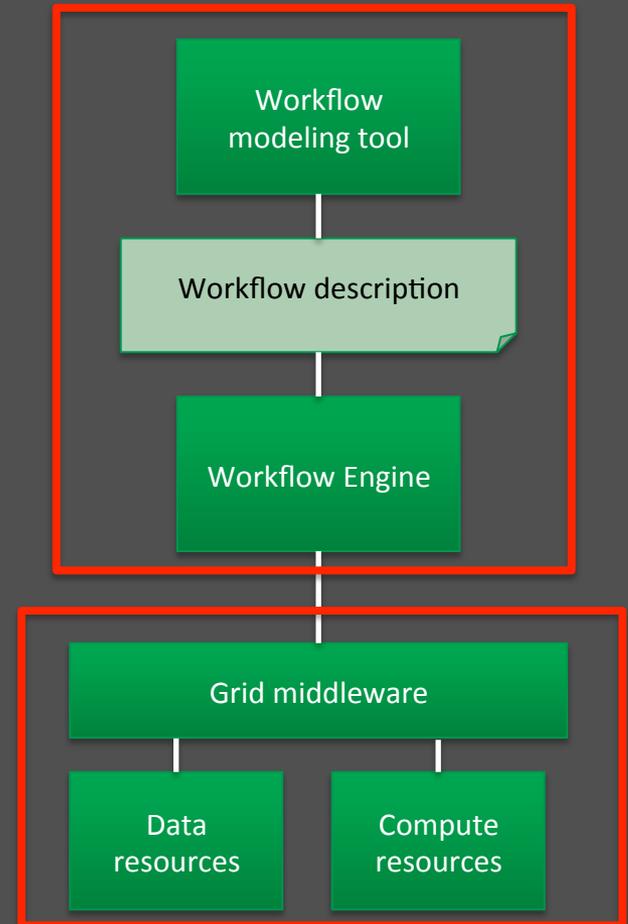


<http://mooc-inst.sara.cloudlet.sara.nl/mooc/wfms.html>



# Recap: WfMS

- ❑ Workflow description
  - ❑ Workflow engine
  - ❑ Workflow system
- 
- ❑ Distributed computing infrastructure



# Example: MOTEUR



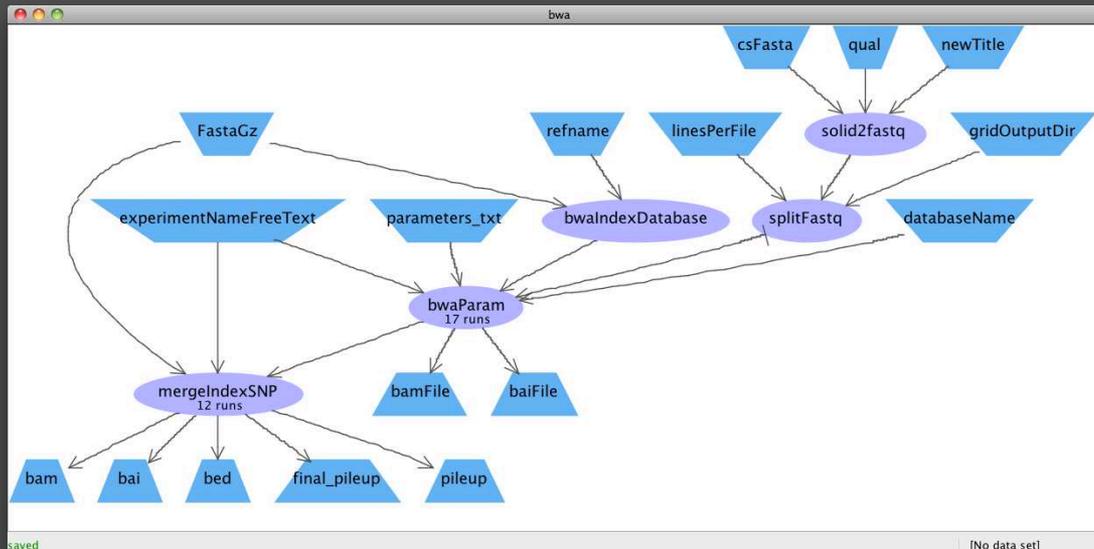
<http://modalis.i3s.unice.fr/moteur2>

## ❑ Components

- Web services, grid jobs, javabeans

## ❑ GWENDIA workflow description language

## ❑ Development workbench and execution server

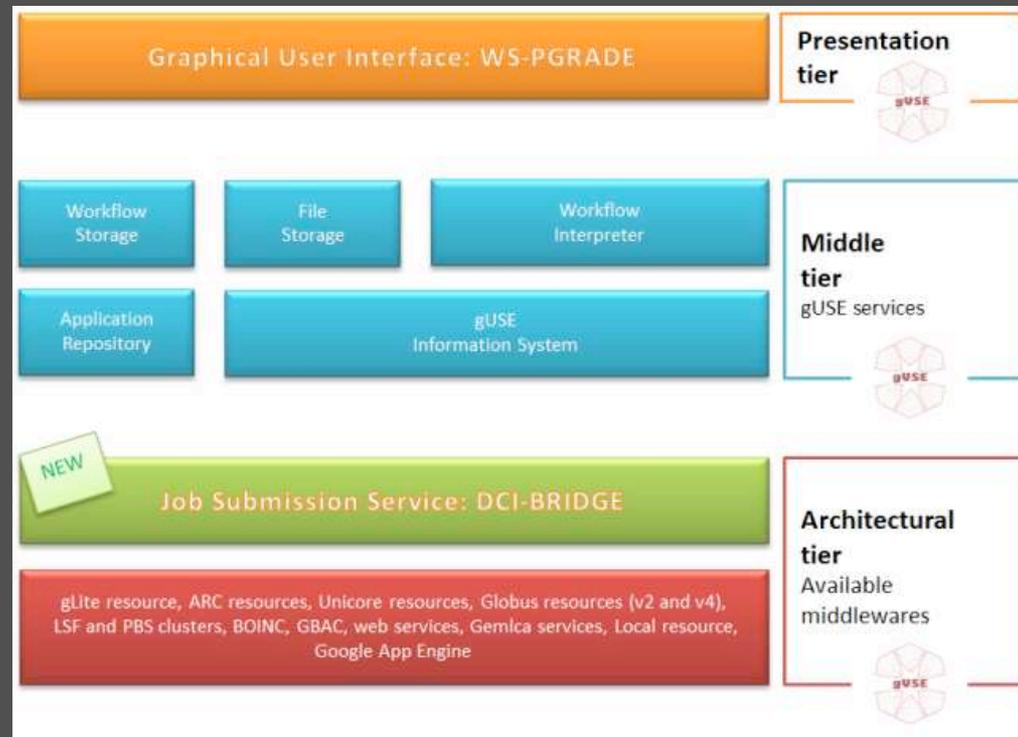


# Example: WS-PGRADE



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

- **Components**
  - Web services, grid jobs, other workflows
- **Web portal**
- **Grid, cluster, cloud**



# There are many WfMS...

| WfMS    | Website (info)  |
|---------|---|
| TAVERNA | <a href="http://www.taverna.org.uk/">http://www.taverna.org.uk/</a>                                   |
| KEPLER  | <a href="https://kepler-project.org/">https://kepler-project.org/</a>                                 |
| GALAXY  | <a href="http://galaxyproject.org/">http://galaxyproject.org/</a>                                     |
| PEGASUS | <a href="http://pegasus.isi.edu/">http://pegasus.isi.edu/</a>   |
| TRIANA  | <a href="http://www.trianacode.org/">http://www.trianacode.org/</a>                                   |
| WINGS   | <a href="http://wings-workflows.org/">http://wings-workflows.org/</a>                                 |
| ASKALON | <a href="http://www.dps.uibk.ac.at/projects/askalon/">http://www.dps.uibk.ac.at/projects/askalon/</a> |
| SWIFT   | <a href="http://www.ci.uchicago.edu/swift/main/">http://www.ci.uchicago.edu/swift/main/</a>           |
| YAWL    | <a href="http://www.yawlfoundation.org/">http://www.yawlfoundation.org/</a>                           |
| WS-VLAM | <a href="http://staff.science.uva.nl/~gvlam/wsvlam/">http://staff.science.uva.nl/~gvlam/wsvlam/</a>   |
| ...     | ...   |

# SHIWA Workflow Repository

Silvia D Olabbarriaga [active]

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## Welcome to the SHIWA Workflow Repository

The FP7 [SHIWA project](#) addresses the challenges of the coarse- and fine-grained workflow interoperability. The project created the SHIWA Simulation Platform which enables users to create and run embedded workflows which incorporate workflows of different workflow systems. The platform consists of the SHIWA Science Gateway and the SHIWA VO. The SHIWA Science Gateway contains the [SHIWA portal](#), the SHIWA Workflow Repository, the SHIWA Proxy Server, the GEMMLCA Service and the GEMMLCA Repository. To find out more about the SHIWA Simulation Platform, and learn about how to get access to execute the workflows deployed in the repository, please go to the [SHIWA wiki page](#).

The SHIWA Workflow Repository manages workflow descriptions, and implementations and configurations of workflows. The repository can be used by the following types of actors:

- **E-scientists:** They can browse and search the repository to find and download workflows. They can use the repository without registration.
- **Workflow developers:** They are the workflow owners who can upload, modify and delete workflows. They should register with the repository.
- **Repository administrator:** The actor who manages the repository.
- **Validator:** This actor tests and validates workflows and implementations created by workflow developers to make sure that the provided workflow and related data is correct and sound.

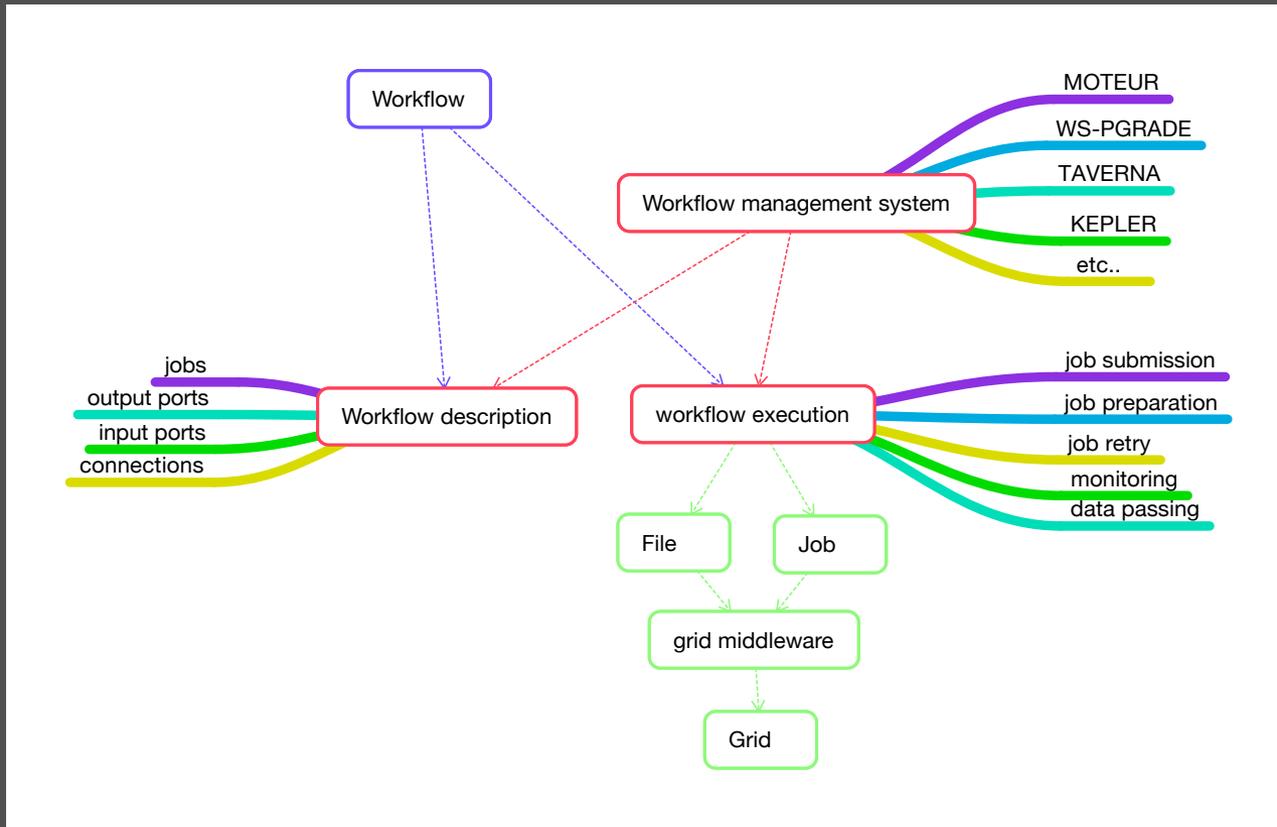
Version: 3.0.1

<http://shiwa-workflow.eu/>

<http://repo.shiwa-workflow.eu/>

# Wrap-up

- Workflow management systems can facilitate porting and execution of applications to grid infrastructures



# Acknowledgements



SCientific gateway Based User Support  
<http://www.sci-bus.eu/>



Building an European Research community  
through interoperable WorkFLOWS and Data  
<http://www.erflow.eu/>



e-infrastructure



# Thanks!