SHIWA Portal tutorial
(Submission service)

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Goals of the tutorials

The aim of this tutorial is ……

Tutorial 1: Creation and execution of a single native workflow

This workflow is composed of a single job, which is a subset of the multi-job workflow that will be discussed later.

This job is a simple shell script named WhatWhichWhereWhen.sh, which returns what the input file contained, which job it is (based on the string passed as an argument), where the job is running and when. This output is then redirected to an output file. For your convenience the code of this shell script is provided below:

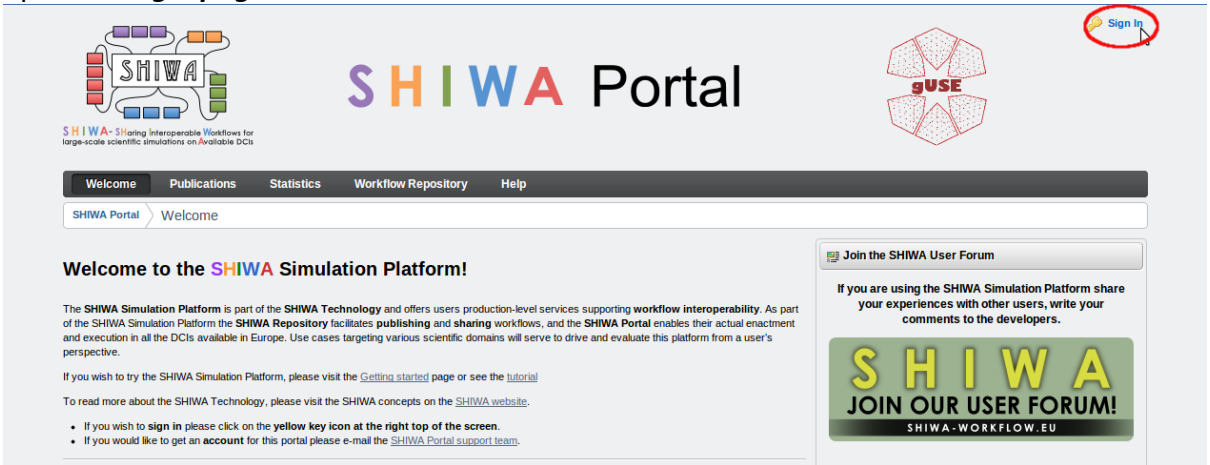
```
#! /bin/bash
/usr/bin/touch INPUT
/bin/echo "String in input file INPUT: " `/bin/cat INPUT`
/bin/echo "This is job: $*"
/bin/echo "Executing on: " `/bin/hostname -f`
/bin/echo "Executing at: " `/bin/date`
/bin/echo " ++++++++++++++++++++++++++++++++++++++ "
/bin/echo
/bin/echo "String in input file INPUT: " `/bin/cat INPUT` > OUTPUT
/bin/echo "This is job: $*" >> OUTPUT
/bin/echo "Executing on: " `/bin/hostname -f` >> OUTPUT
/bin/echo "Executing at: " `/bin/date` >> OUTPUT
/bin/echo " ++++++++++++++++++++++++++++++++++++++ " >> OUTPUT
/bin/echo >> OUTPUT
```

Usage of the Prototype SHIWA 3 Portal

The Prototype SHIWA 3 Portal is available at this address:
https://ssp-test.cpc.wmin.ac.uk/liferay-portal-6.1.0/en
If you own an account, then you can use it to log in. Otherwise, the next subsection will explain how you can create one.

Creation of a portal account

On the ***Welcome page*** of the portal, click on ***Sign In*** located at the top right of the page to open the ***login page***.

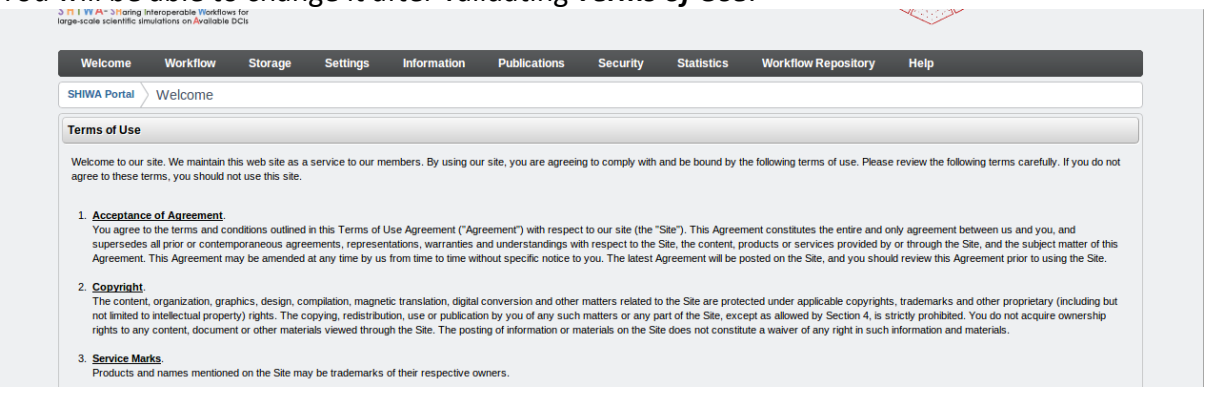


Then, click on ***Create Account*** for accessing to the ***account creation page***.

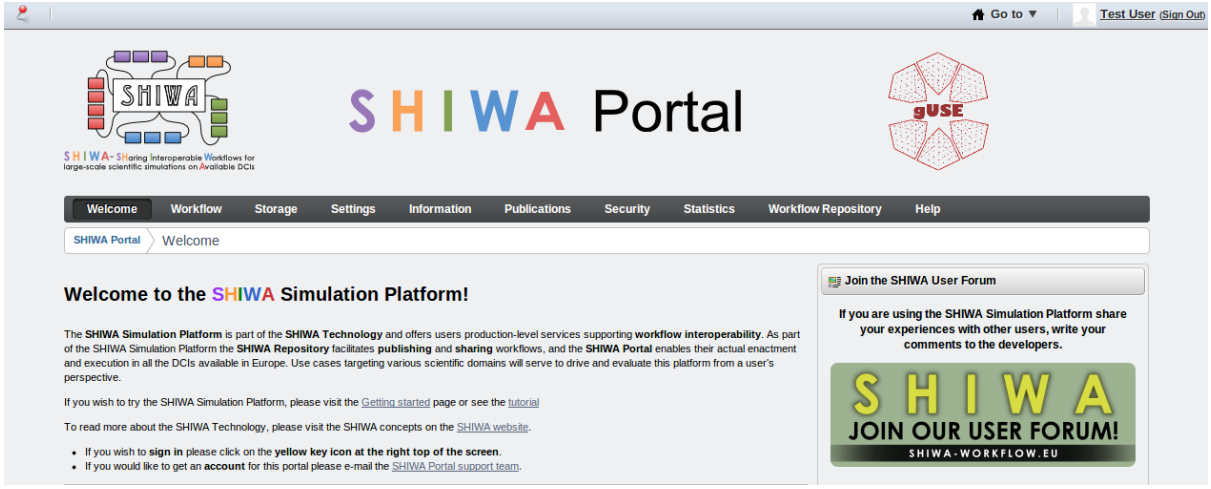
Fill all required field and click on ***Save*** to validate your account.

A default password will be automatically attributed to your account for your first connection and sent to your email address.

You will be able to change it after validating ***Terms of Use***.



Your account is created then, and you can start using the SHIWA Portal as a normal user.



Certificate management

Once you are logged in the SHIWA Portal, you can get a certificate to allow workflow execution on a specific resource.

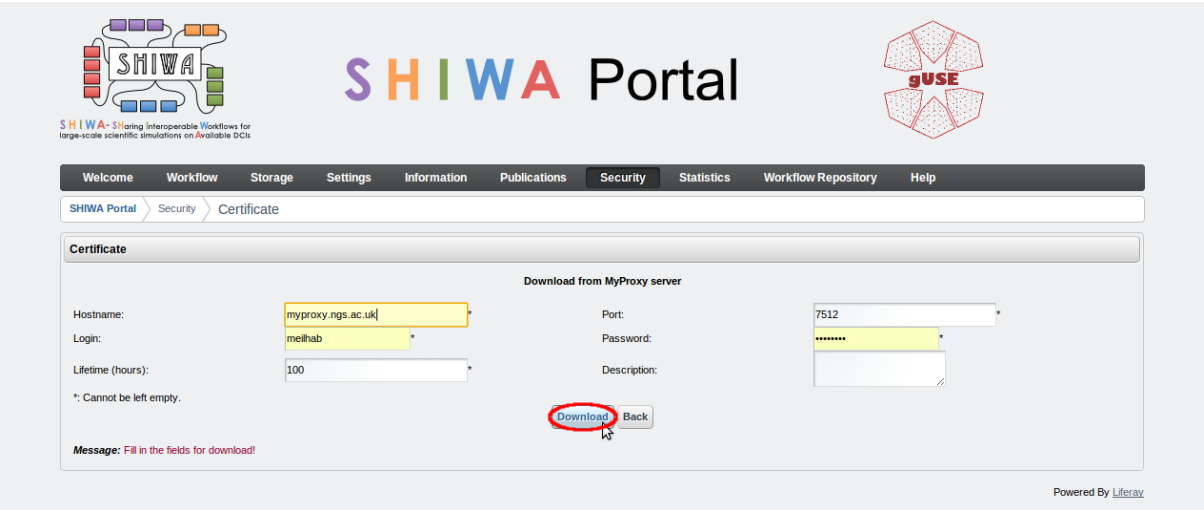
Click on the ***Security -> Certificate tab*** to open the ***Certificate page***.

On the ***Certificate page***, click on the ***Download button*** to open the ***Download certificate page***.

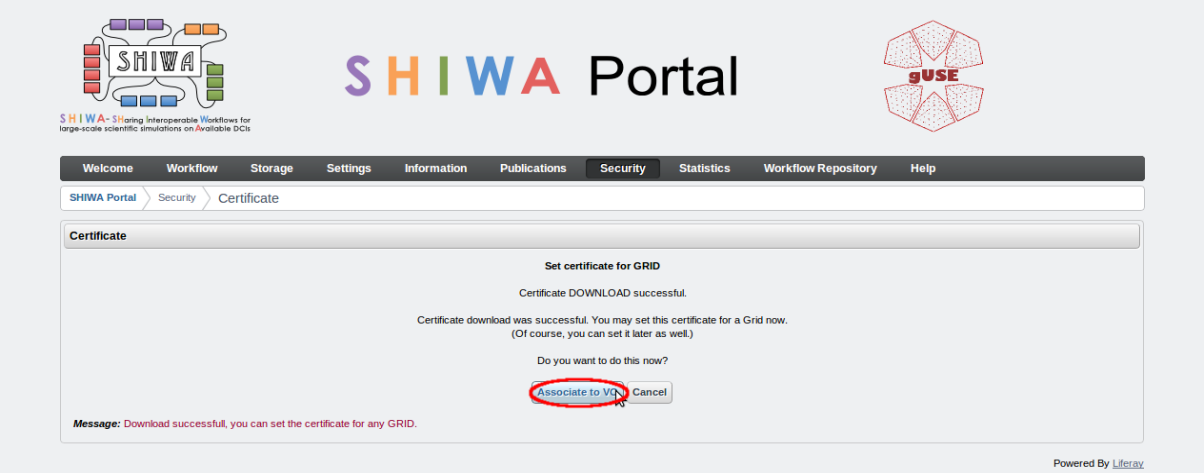
On the ***Download certificate page***, specify the following parameters:

Hostname: myproxy.ngs.ac.uk
Login: your login name associated to your certificate
Password: your password associated to your login name

Click on the ***Download button*** to download your certificate on the SHIWA Portal.

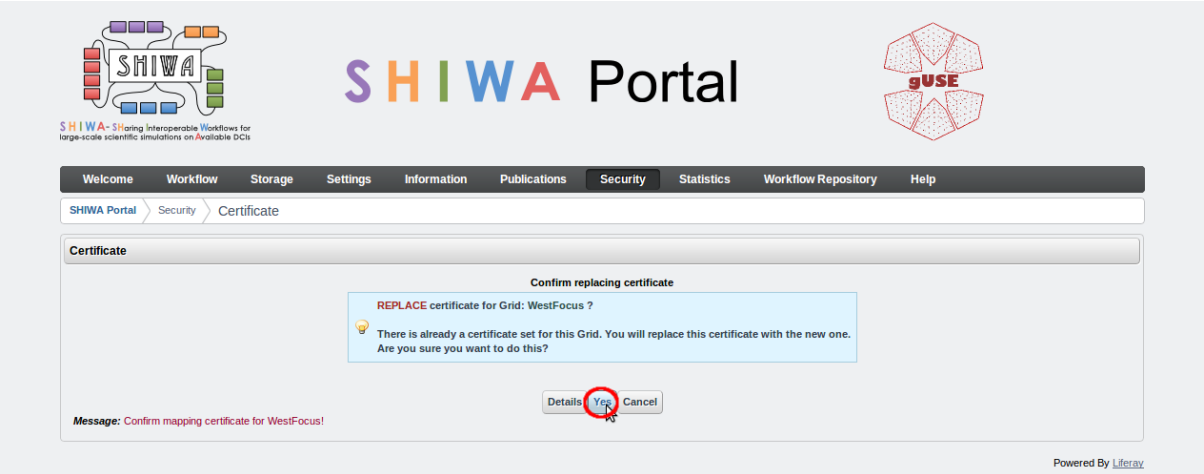


Then, you have to associate the certificate with a Virtual Organization to be able to submit workflows.
By clicking on the ***Associate to VO button***, you open the ***Setting Certificate for Grid page***.

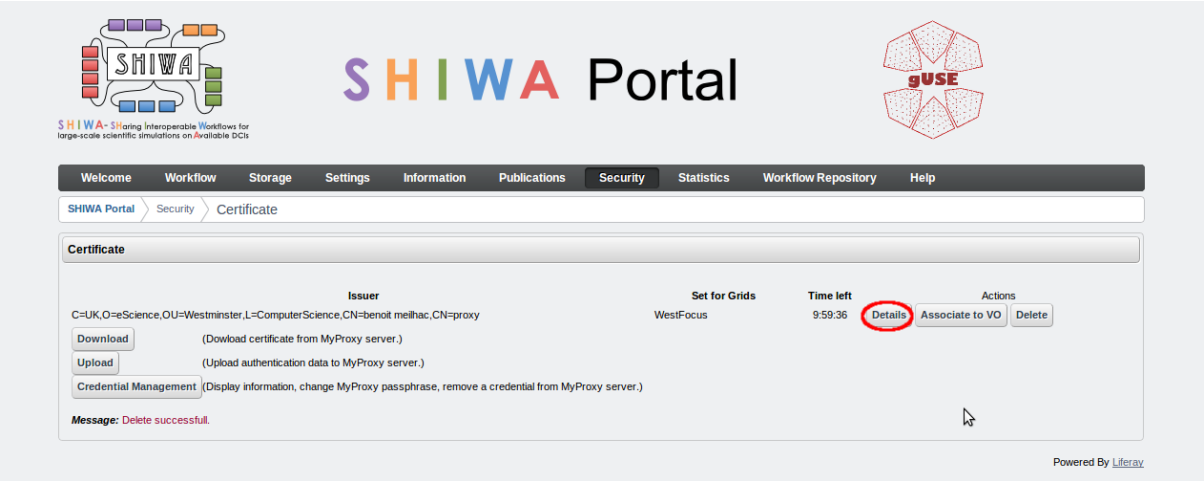


Select *WestFocus* and then click on the OK button to move the ***Confirm certificate page***.

On the ***Confirm certificate page***, click on the ***Yes button*** to finalize the certificate download and association with a Grid.



The portal returns to the ***Certificate page*** where your certificate is displayed and you can check its details by clicking on the ***Details button***.



In order to configure and execute non-native workflows on the SHIWA Portal, you need to associate your certificate with the resource the job will be submitted to.

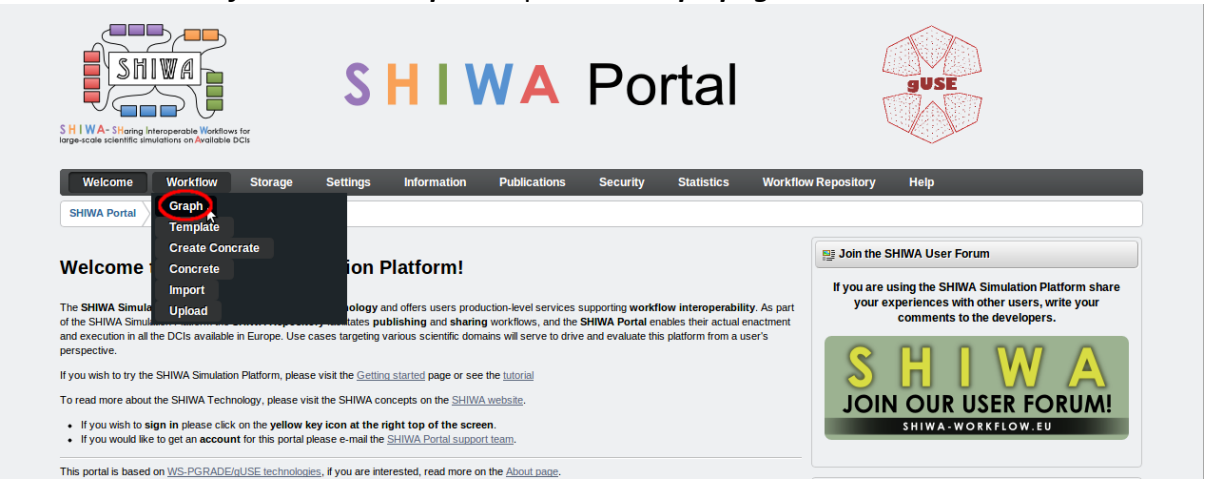
Tutorial 1: Creation and execution of a single native workflow

In this tutorial, the creation, configuration and execution of the "*WhatWhichWhereWhen*" job will be described. Then the export functionality within the SHIWA Repository will be seen. And to finish after the exportation of the workflow, the importation will be discussed.

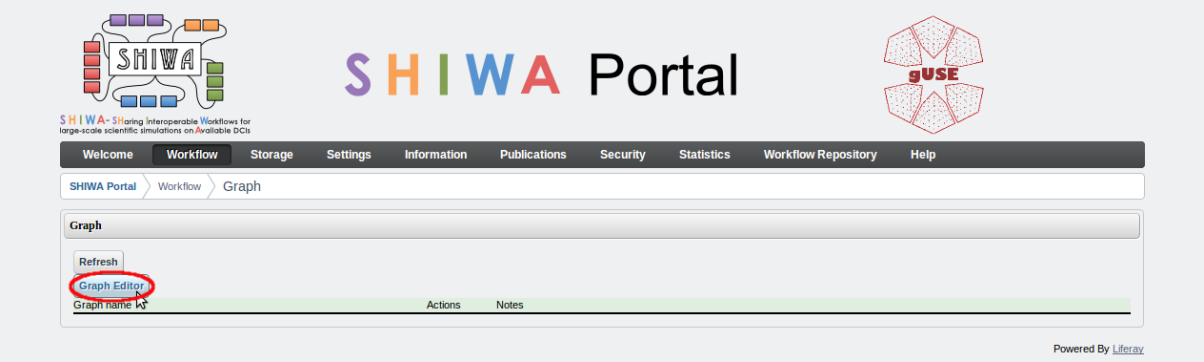
Creation and execution of a single native workflow

Accessing workflow graph editor

Click on the ***Workflow tab -> Graph*** to open the ***Graph page***.



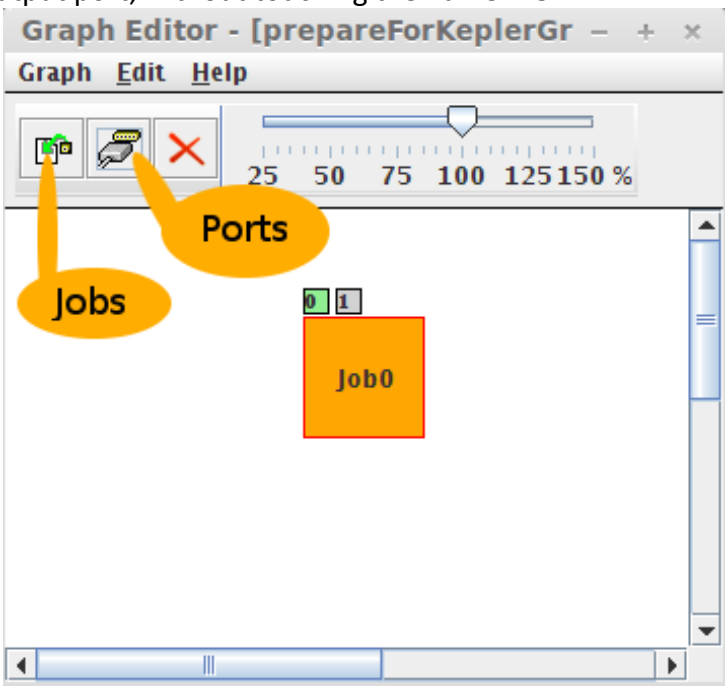
Click on the ***Graph Editor button*** to start the Java Web Start based workflow editor to be able to create the workflow graph.



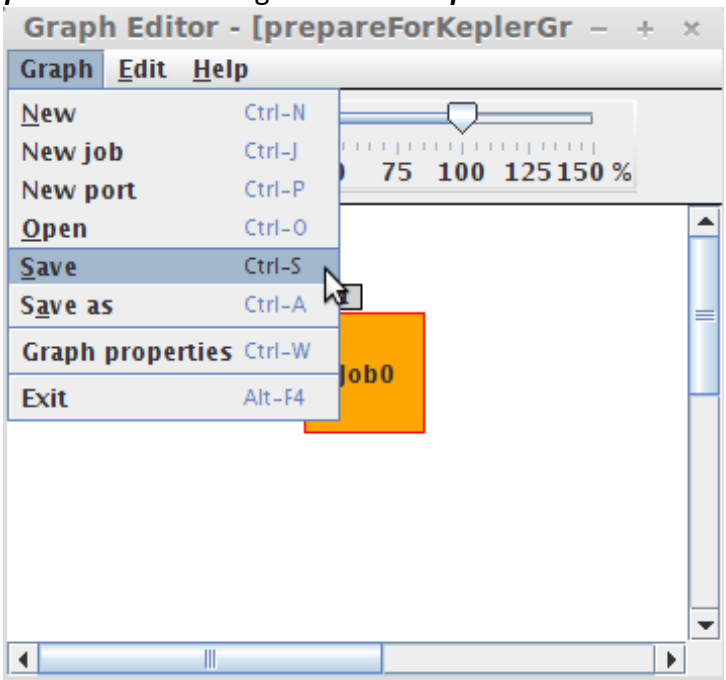
Creating the abstract workflow

Click on the first two icons to specify the workflow job type of its input/output ports.
To specify an output port, double click on the desired port and change the input to output.
Create the following graph:

- 1 job, without touching the name: Job0
  - 1 input port, without touching the name: PORT0
  - 1 output port, without touching the name: PORT1



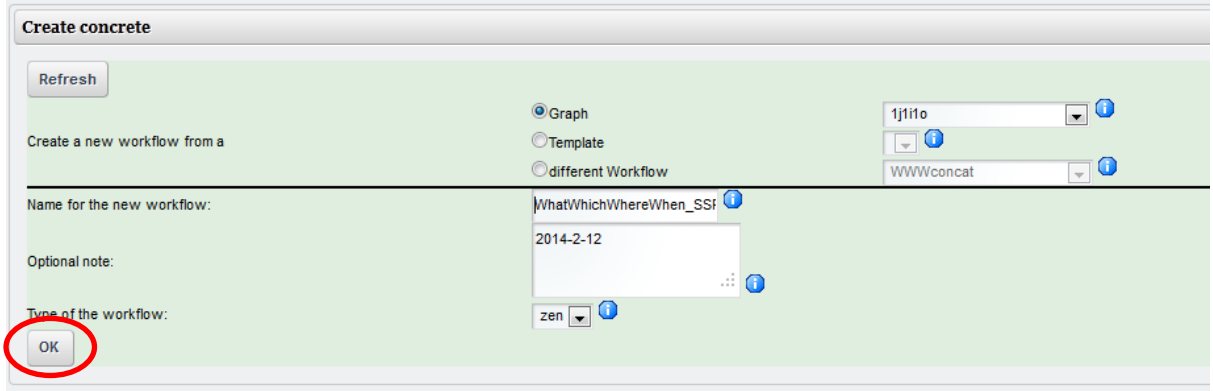
After reproducing the graph corresponding to the "*WhatWhichWhereWhen*" job, save it by clicking on the ***Graph tab*** and selecting the ***Save as option***.



Creating the concrete workflow

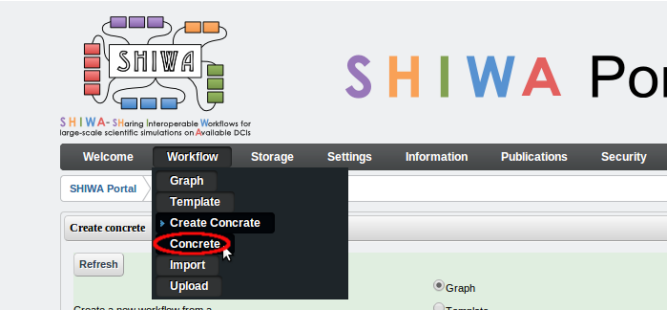
Click on the ***Workflow tab -> Create concrete*** to open the ***Create concrete page***.

Select the previously created graph to be used to create the concrete workflow, define its name and then press the ***OK button***.

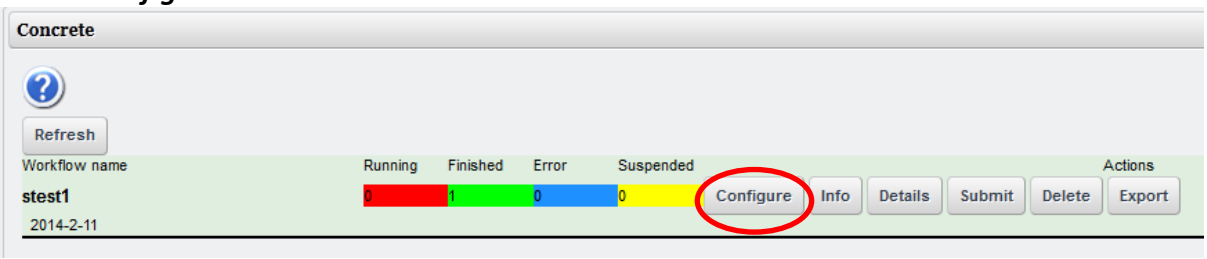


Configuring the concrete workflow

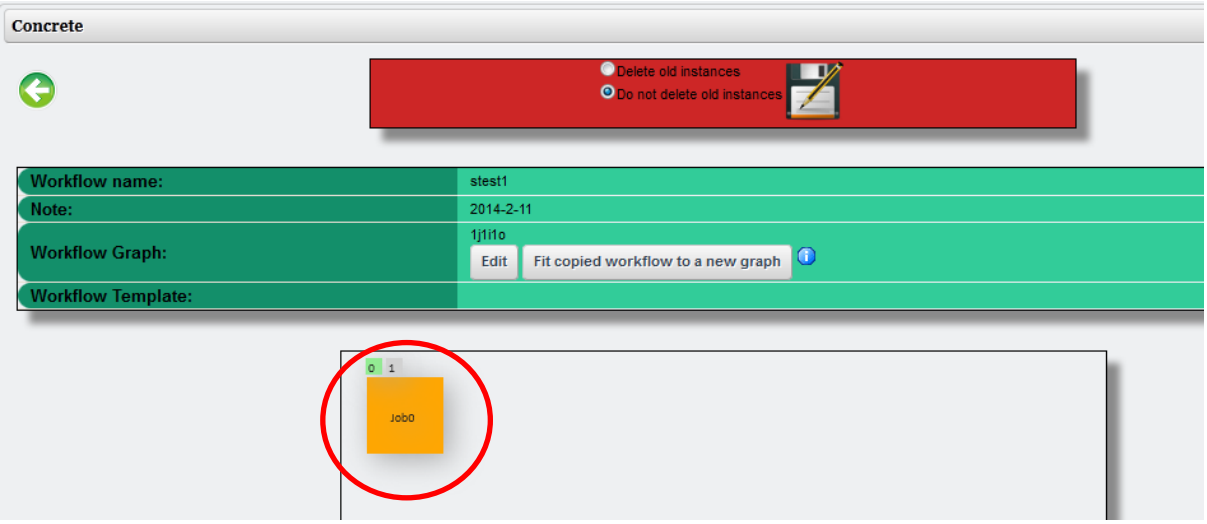
Click on the ***Workflow tab -> Concrete*** to open the ***Concrete page***.



Select the concrete workflow corresponding to the "*WhatWhichWhereWhen*" job by clicking on the ***Configure tab*** of the created workflow.

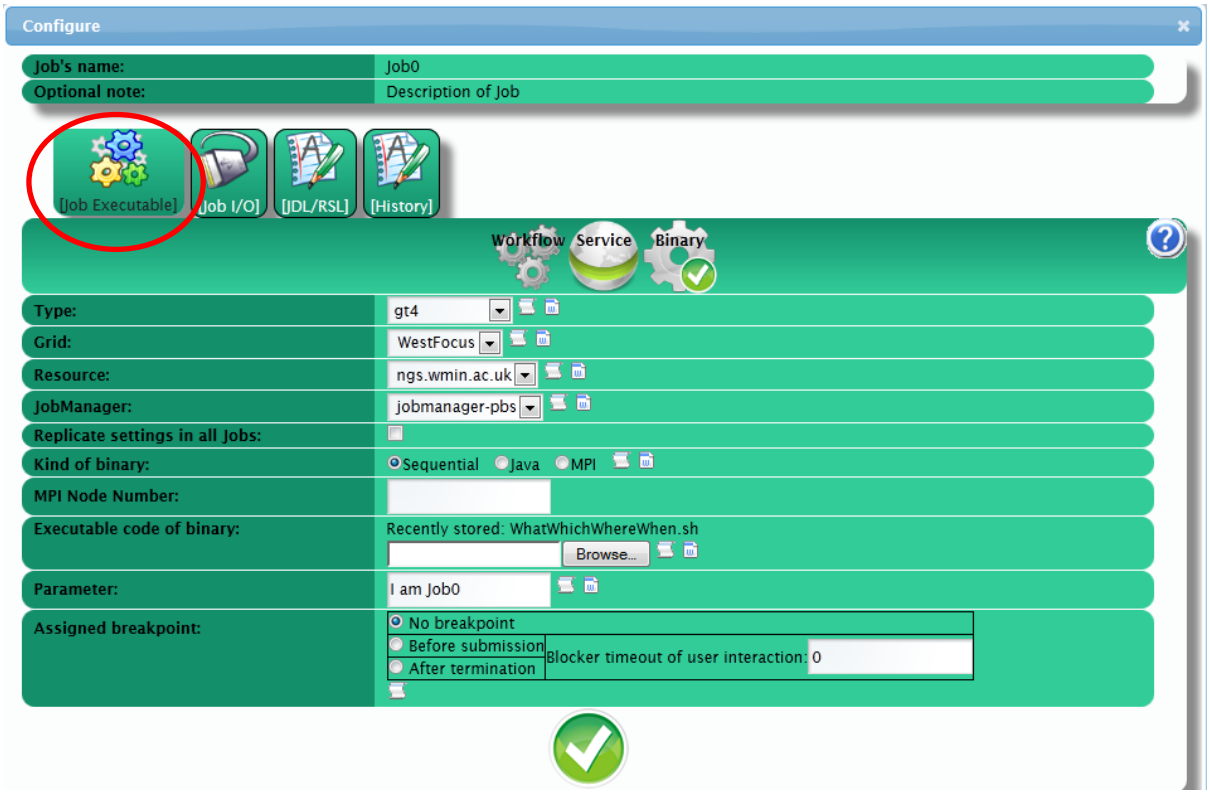


The portal displays the graph of the selected concrete workflow. To configure the workflow job, click on the job on the workflow graph.



Specify both the job binary and input/output files and parameters. To specify job binaries, click on the ***Job Executable tab*** and set the following parameters:

Type:	gt4
Grid:	WestFocus
Resource:	ngs.wmin.ac.uk
JobManager:	jobmanager-pbs
Kind of binary:	Sequential
Executable code of binary:	upload this file named "*WhatWhichWhereWhen.sh*"
Parameters:	I am Job0



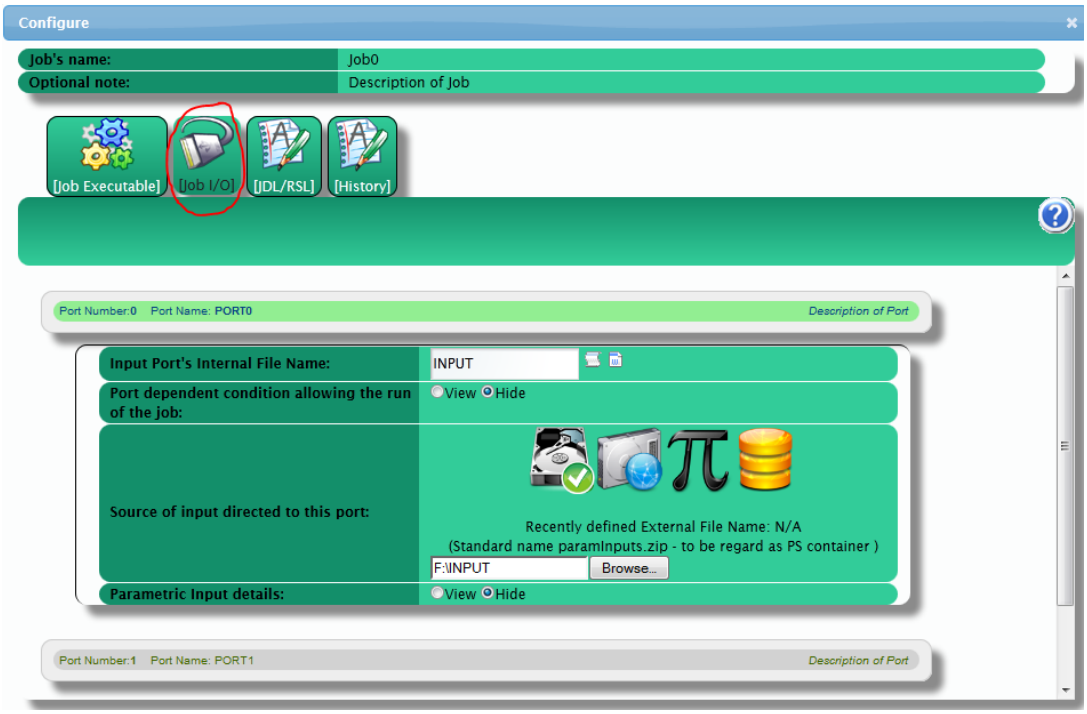
Click on the ***Job I/O tab*** and specify the job input/output files and parameters used by the input/output ports.

Input ports:

Port number	Input Port's Internal File Name	Port dependent condition	Source of input directed to this port	Parametric Input details
Port 0	INPUT	Hide	Upload this file	Hide

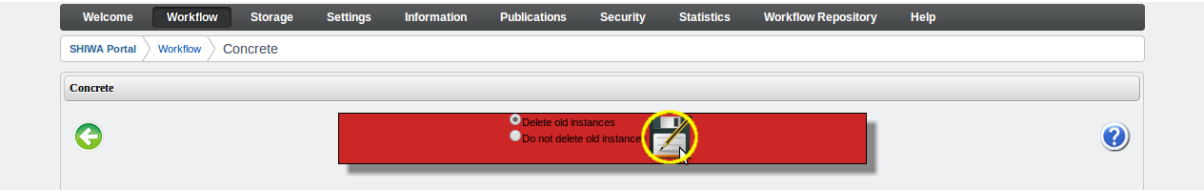
Output ports:

Port number	Output Port's Internal File Name	Base of Output Port's Remote File Name	Storage type	Generator
Port 1	OUTPUT		Permanent	No



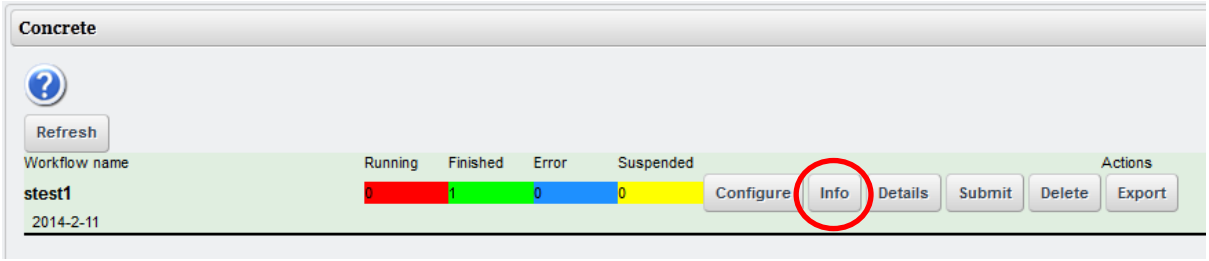
After specifying the job binaries and input/output files and parameters, click on the ***Save button*** at the bottom of the ***Job I/O tab***.

Then click on the ***Save on Server button*** to store details of the concrete workflow.



Verifying the configurations of the concrete workflow

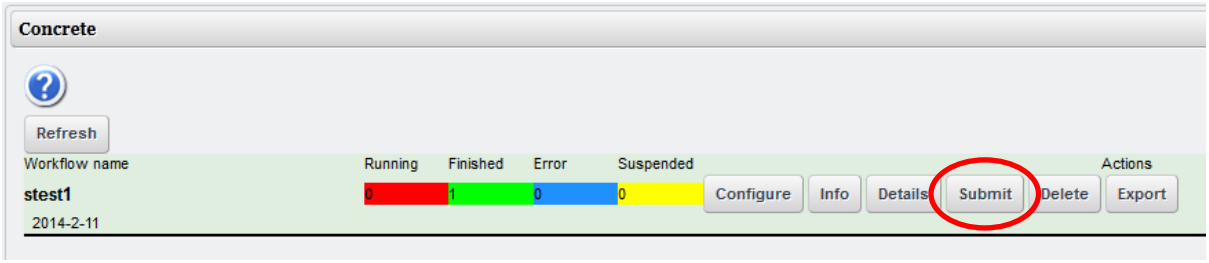
Click on the ***Info button*** of the concrete workflow, to inspect if there are any misconfigurations which the portal has pick-up.



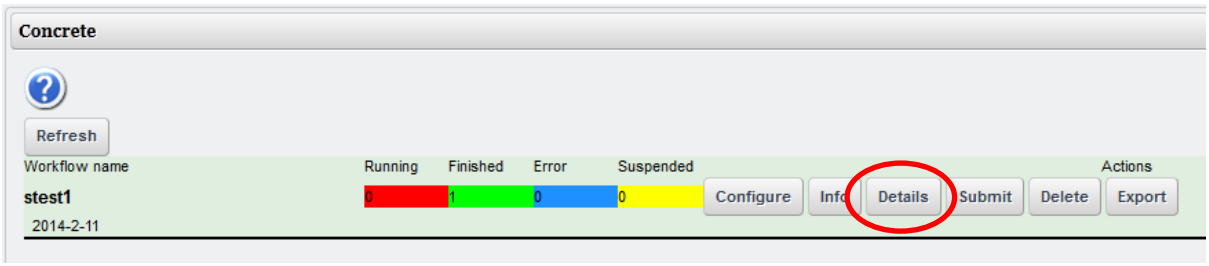
This is not an exhaustive verification of configuration, but does pick-up on common configuration issues.

Running the configured workflow

Click on the ***Submit button*** of the concrete workflow name to submit and execute it.

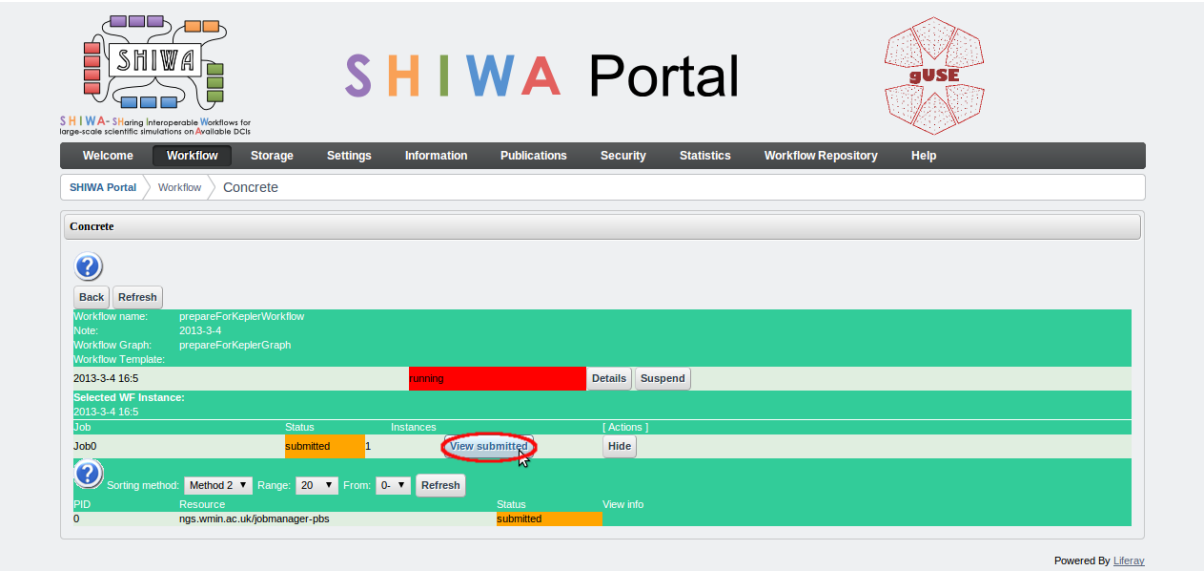


To display the workflow status during the execution, click on the ***Details button***.

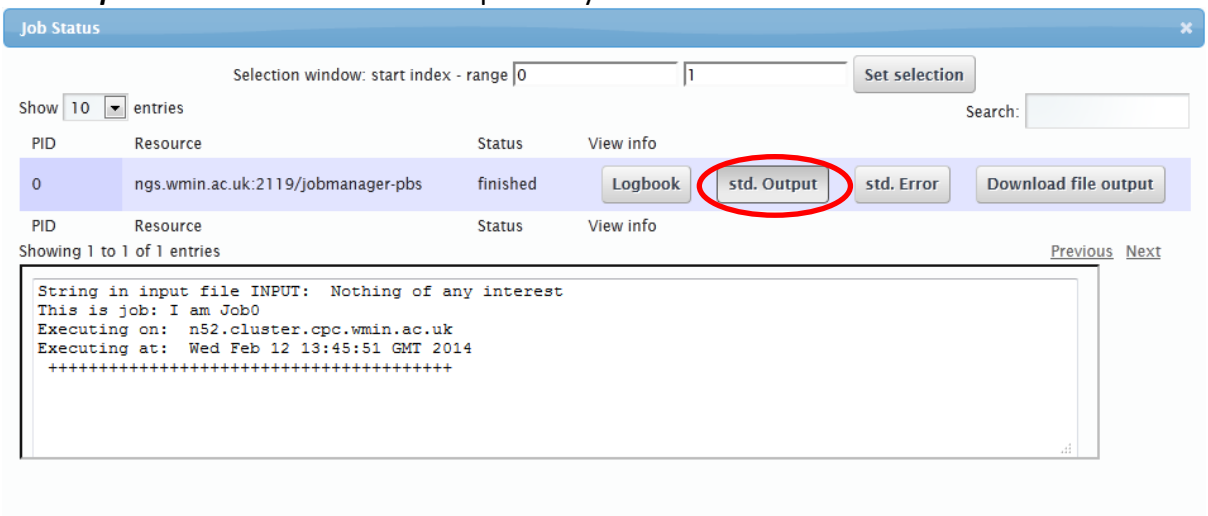


By clicking again on the ***Details button***, the portal displays the execution status of the jobs.

By clicking on the ***View button***, a view of a specific job can be displayed.



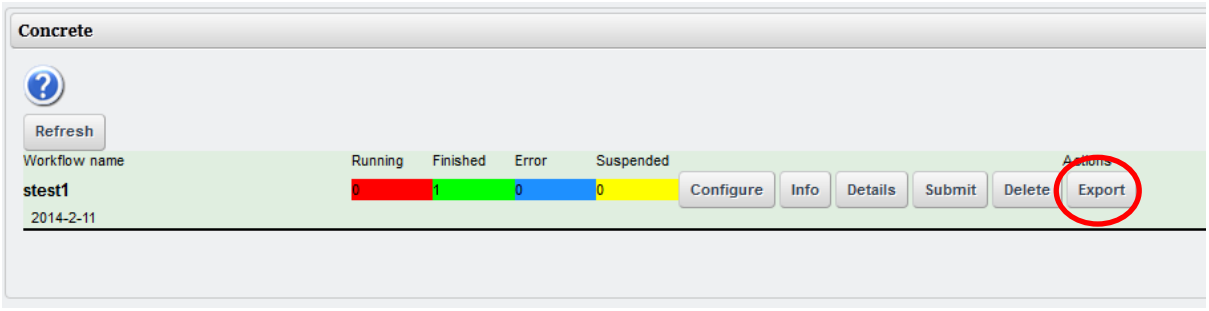
Click on the ***Refresh button*** to update the status.
When the execution of the workflow is successful, the status should be changed to *Finished* and you should be able to see generated output and error messages by clicking the ***std.Output*** and ***std.Error*** buttons respectively.



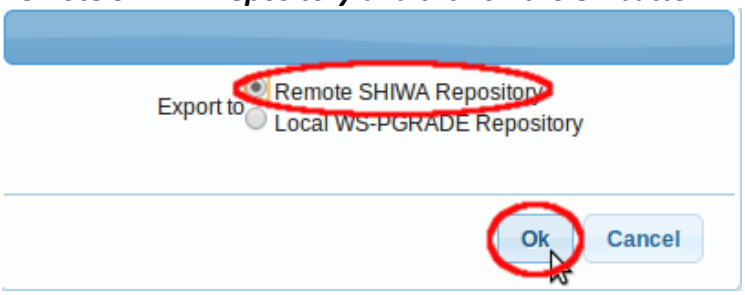
Output files can be downloaded as an archive by clicking on the ***Download file output button***.

Exporting the workflow to the SHIWA Repository

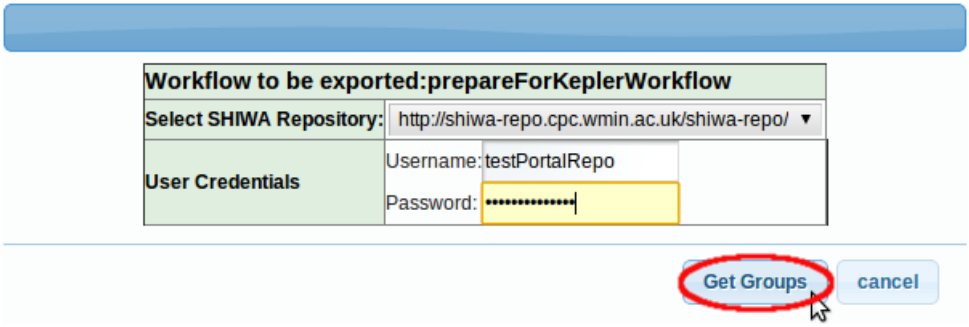
After a successful execution of the "*WhatWhichWhereWhen_SSP*" workflow, you can choose to export it on the SHIWA Repository and share it with the community.
To do that, you have to click on the ***Export button*** of the desired workflow.



It opens a menu where you can choose where to export your workflow. Select the option ***Remote SHIWA Repository*** and click on the ***Ok button***.

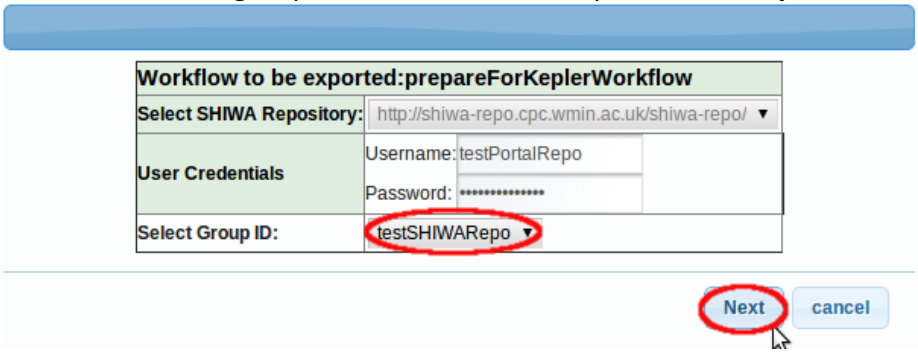


You access to a new menu where you have to select the SHIWA Repository location and enter your SHIWA Repository account credentials. Select http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/ as the repository, your credentials and validate by clicking on the ***Get Groups button***.

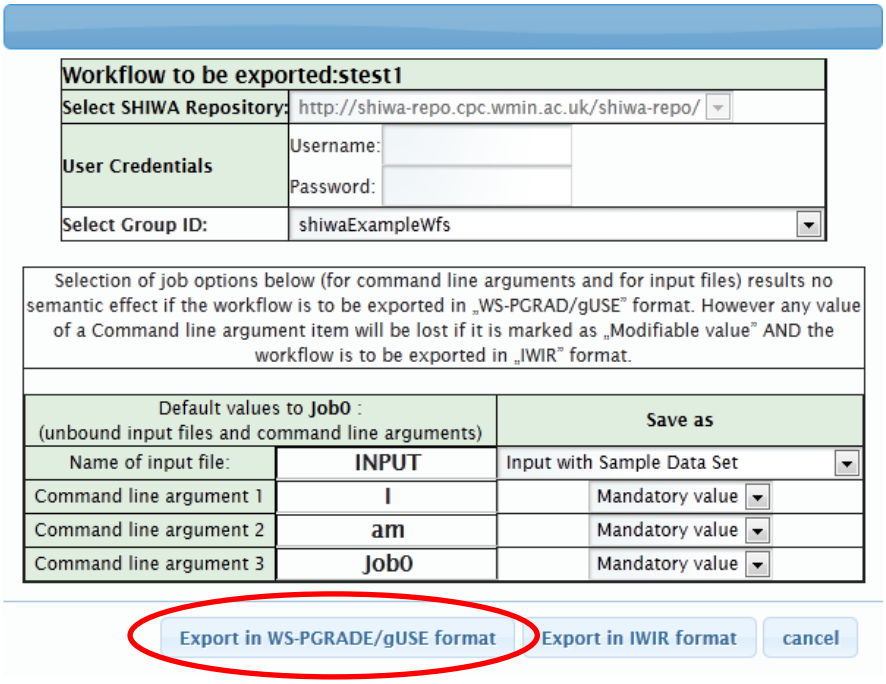


You would get an error message if your credentials are incorrect or if you don't have any group associated to your SHIWA Repository account. In this last case, create one group and add yourself to this group. Then reproduce previous steps to reach this point.

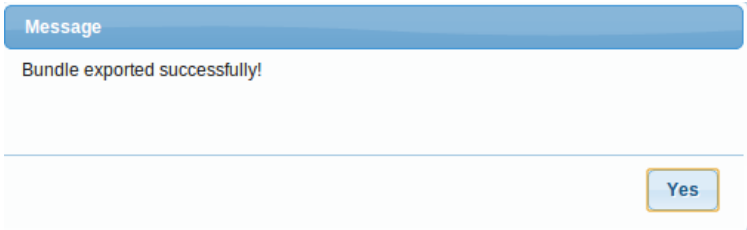
The next step let you see the list of groups you own, select one of them and click on the ***Next button***. The group used for the workshop is: "**shiwaRepoDemo2013**"



You should see the entire workflow configuration now, only one job has to be configured. Configure the job as it is on the following screenshot and click on ***Export in WS-PGRADE/gUSE format button*** to export the workflow in the SHIWA Repository.



A message should appear confirming the good exportation process.

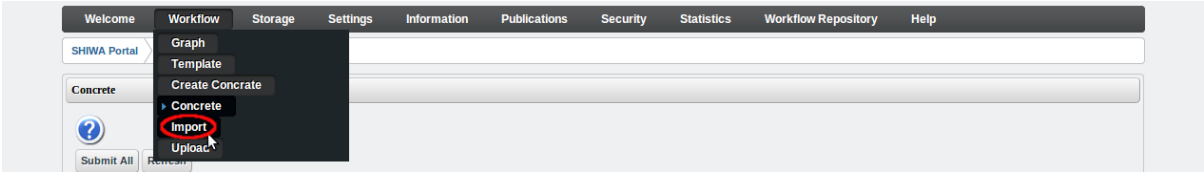


It is to know that the export functionality is working with:

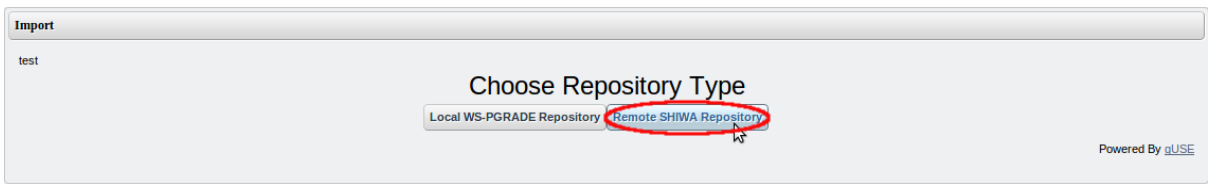
- Single native workflows;
- Single non-native workflows;
- Multi-native workflows;
- Meta-workflows.

Importing and re-submitting the workflow

After the exportation, you have the possibility to import the workflow. Click on the ***Workflow -> Import tab*** to open the ***Import page***.

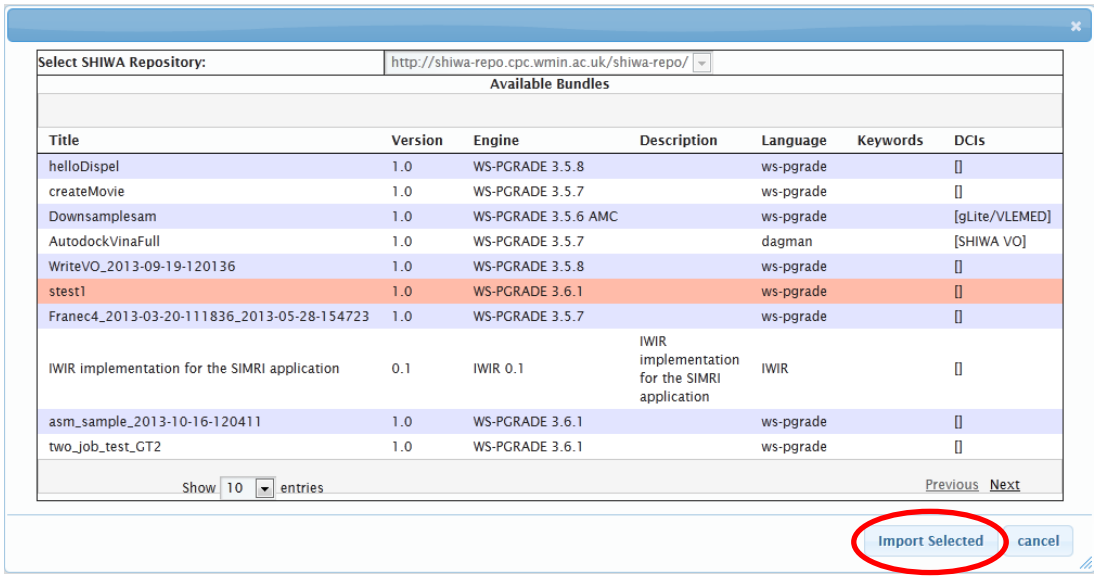


Click on the ***Remote SHIWA Repository button*** to open the menu for importing your workflow.

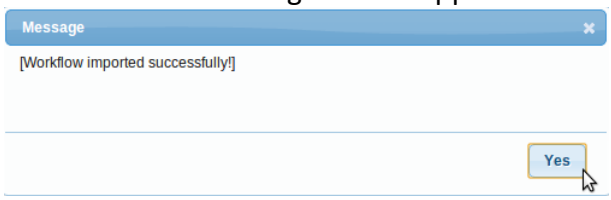


The menu open, select the SHIWA Repository location (http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/) and click on the ***Get Public Bundles button***.

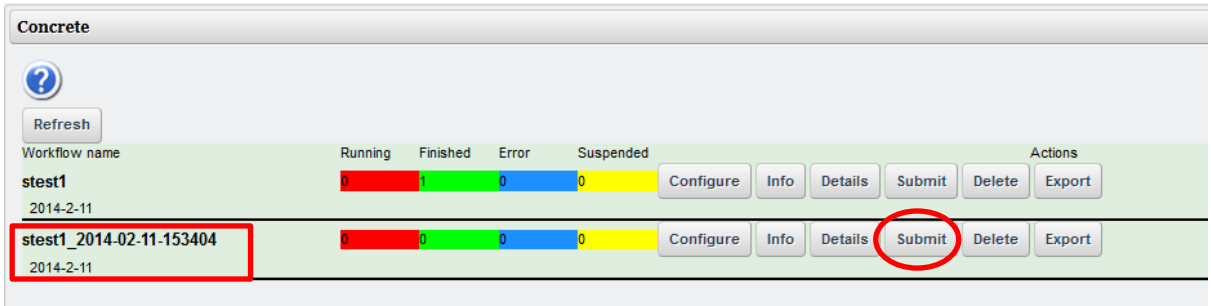
You can see the list of all exported workflows within then SHIWA Repository. Search for the workflow you just exported in the previous subsection, select it and click on the ***Import Selected button***.



A confirmation message should appear to announce the successful importation.



You can now go back the ***Concrete page*** by clicking on the ***Workflow -> Concrete tab***. We should see the new imported workflow. To check if everything went well, click on the ***Submit button*** on the workflow, wait until the end of the execution and check if you get a finished result and not an error.



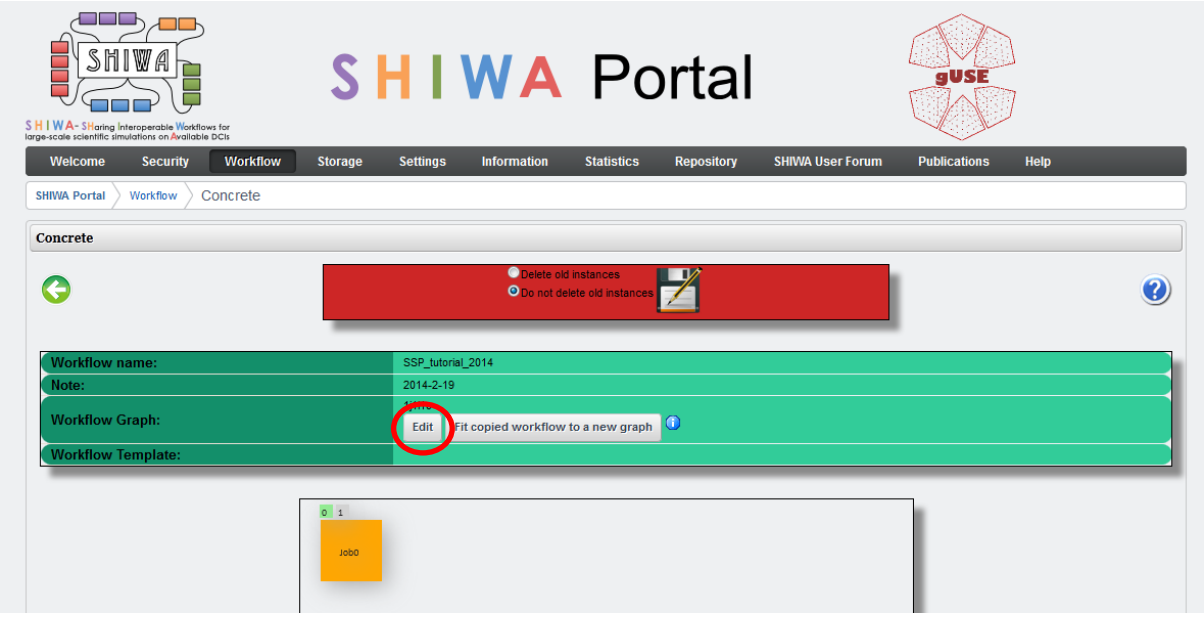
Tutorial 2: Extension of workflow from Tutorial 1 to a meta-workflow including both native and non-native workflows

In this section, you will see how to extend WS-PGRADE workflows and use the selection functionality within the SHIWA Portal and Repository to simplify the configuration of an associated workflow. The workflow in question will be a *"concatenation of strings"* job corresponding to the "*concatTwoStrings*" workflow available in the SHIWA Repository and deployed as Submittable through the Submission Service. Then, once this workflow selected, the creation, configuration and execution of the workflow will be discussed.

Extend graph of workflow

The portal allows developers to extend workflows. As long as the graph is only extended – with the existing jobs neither being removed nor changed - the configurations of existing jobs will persist.

Click on the ***Edit*** button from the workflow configuration interface, to edit the Graph.

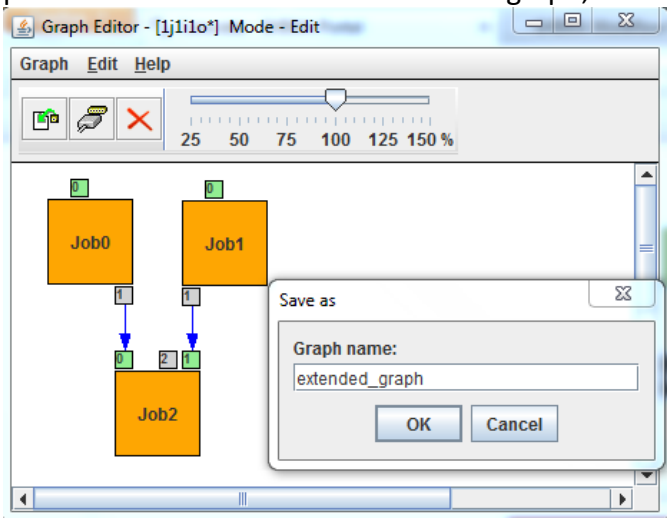


Use the Graph Editor to extend the workflow

Add two jobs to the Graph:

- Job1 should be structure the same as Job0:
  - 1 input port, without touching the name: PORT0
  - 1 output port, without touching the name: PORT1
- Job2 should be structured with two input ports and one output port:
  - 2 input ports, without touching the name: PORT0, PORT1
  - 1 output port, without touching the name: PORT2

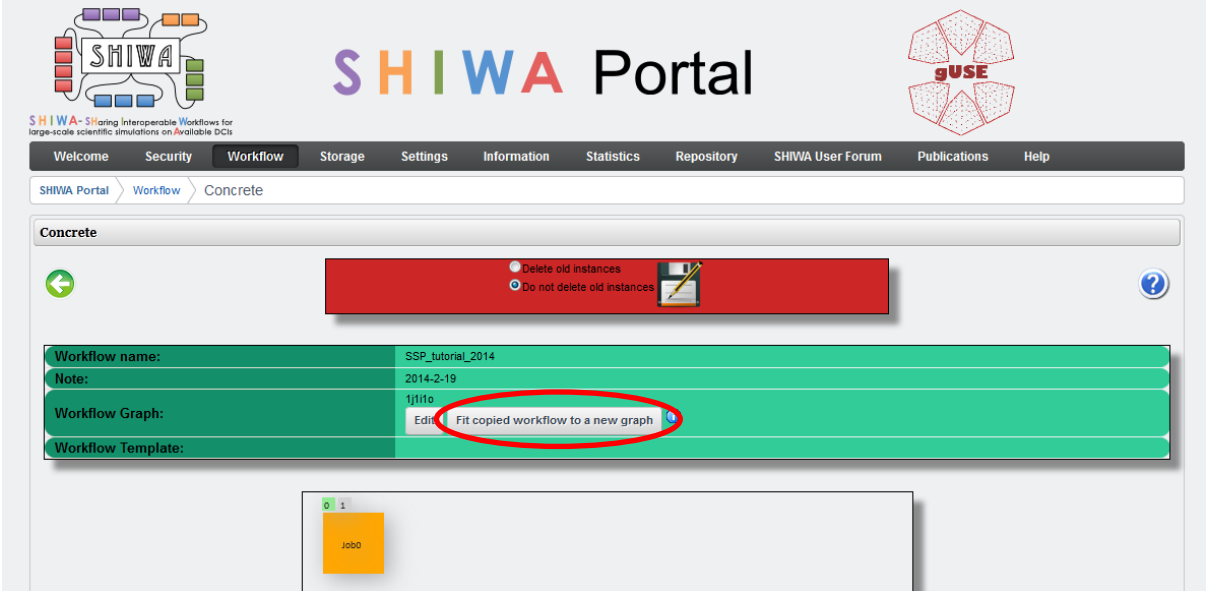
Now connect each of the output (grey) ports of jobs Job0 and Job1 to each of the two input ports of Job2. Then save the extended graph, as a different name.



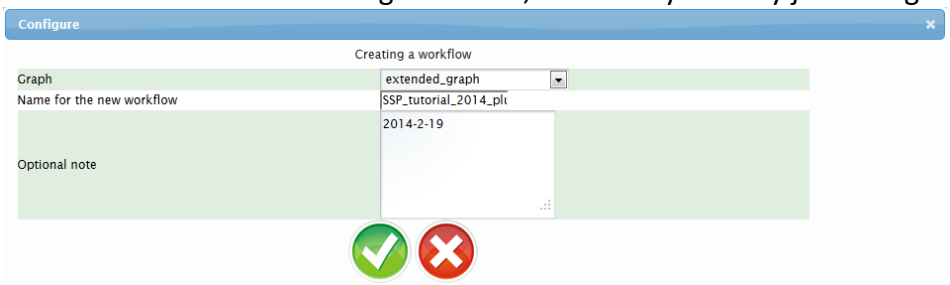
Copy the workflow and fit to the extended Graph

The portal will allow users copy the workflow and attempt to fit the copied workflow to a new Graph.

Click on the ***Fit copied workflow to a new graph*** to attempt to fit the configured concrete to a new Graph.



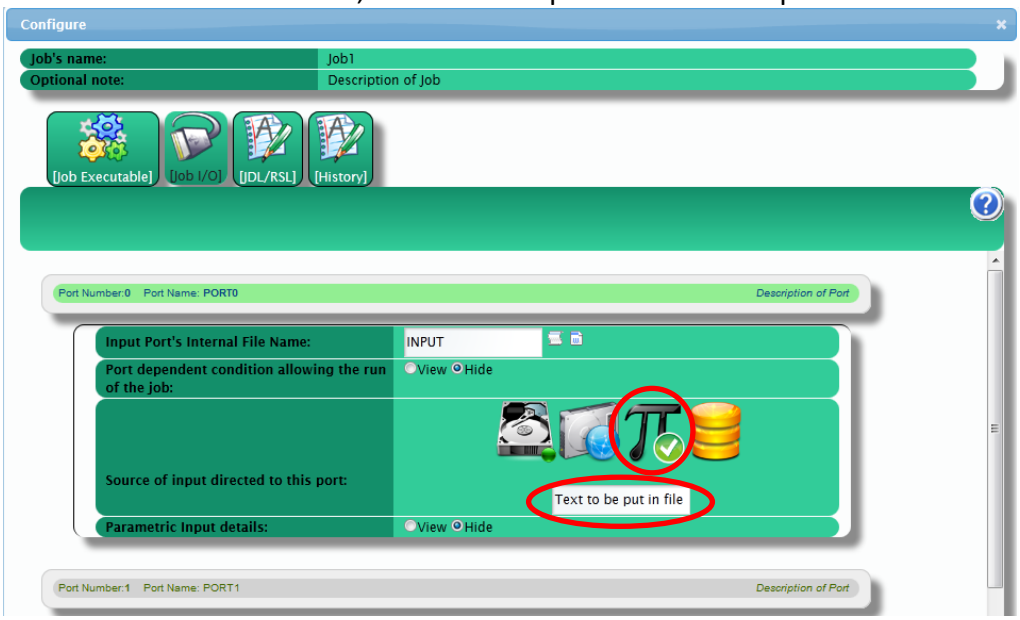
Now select the new graph. Make sure you specify a name for the new workflow – failure to this will overwrite the existing workflow, which may destroy job configurations.



Configuration of second Job1

Job1 should be configured in the same was as Job0 was configured in the previous tutorial. The only differences should be:

- The string entered in the Parameter box should read “I am Job1”.
- In the Job I/O tab, for PORT0, click the π symbol – this will enable you enter in a value in the text box, which will be passed into the input file.

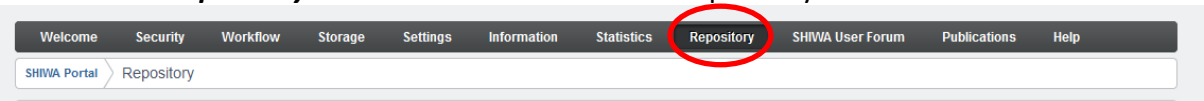


Save the concrete at this stage.

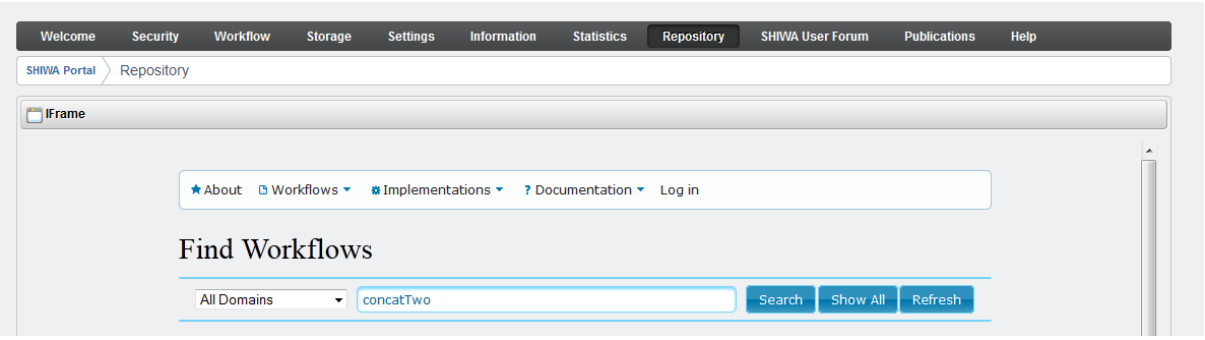
Browsing the SHIWA Repository and selecting a non-native workflow

A new feature of the portal allows the selection of non-native workflow deployed as Submittable through the Submission Service through the SHIWA Repository tab. If an implementation exists within the SHIWA Repository and is deployed as Submittable through the Submission Service, you can select it and easily access to it during the configuration of the workflow as it will be explained in the next part of this tutorial.

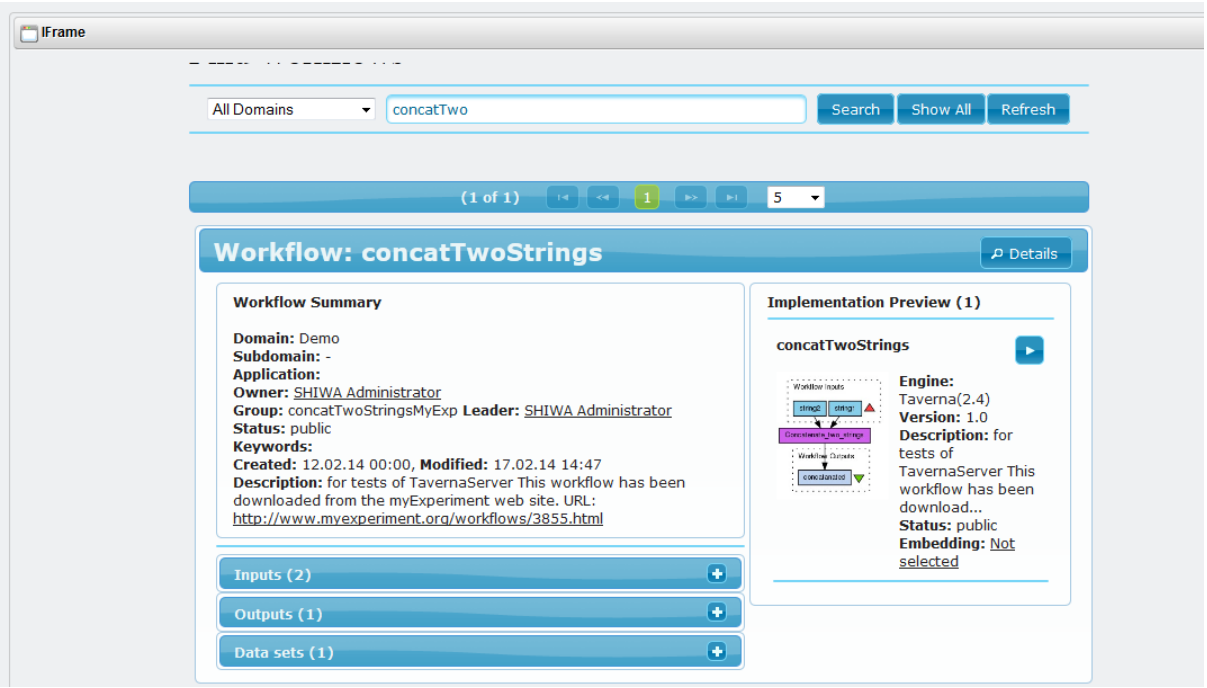
Click on the ***Repository tab*** to access to the SHIWA Repository embedded website.



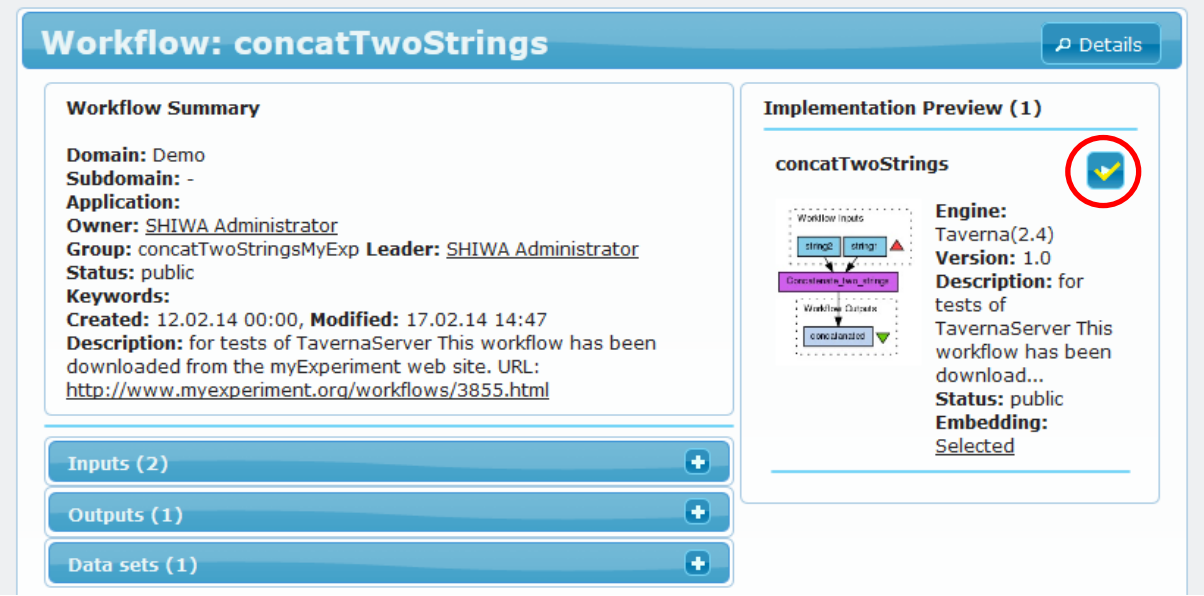
Then, in the ***Find Workflows field***, enter “*concat*” and click on the ***Search button*** to launch the research of the “*concatTwoStrings*” existing workflow.



A short description of the workflow and its implementation appear. This workflow is composed of two inputs and one output. These information have to be known when you want to create a graph and the workflow corresponding job.
To make the selection of the workflow, you have to click on the ***blue arrow button***.



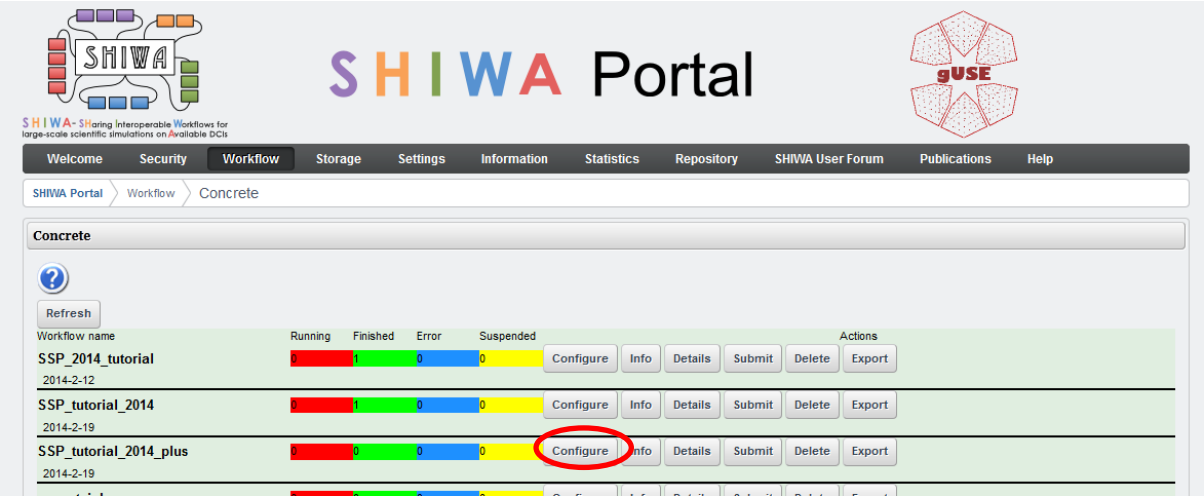
A message is displayed confirming the selection and the button is crossed. The portal and the repository offer the possibility to select as much as implementations as you want.



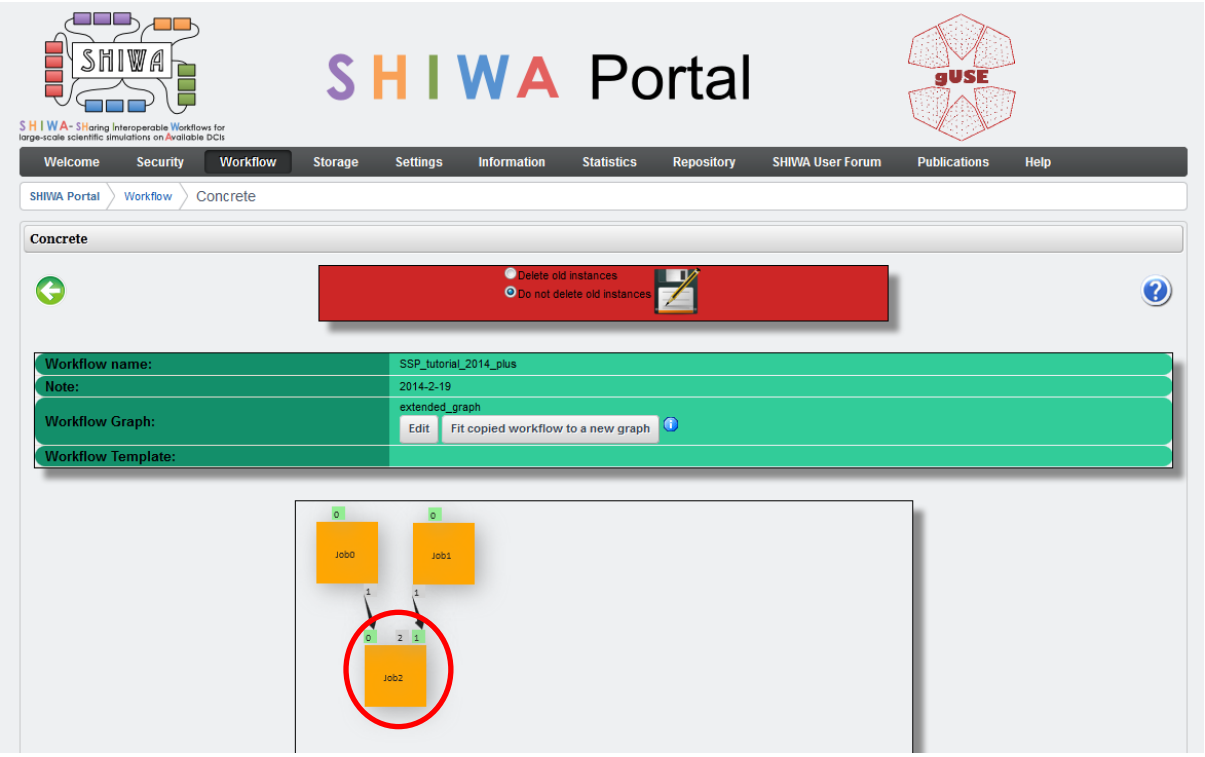
Configuring the non-native job within the concrete workflow

Click on the ***Workflow tab -> Concrete*** to open the ***Concrete page***.

Select the concrete workflow corresponding to the extended workflow by clicking on the ***Configure tab***.

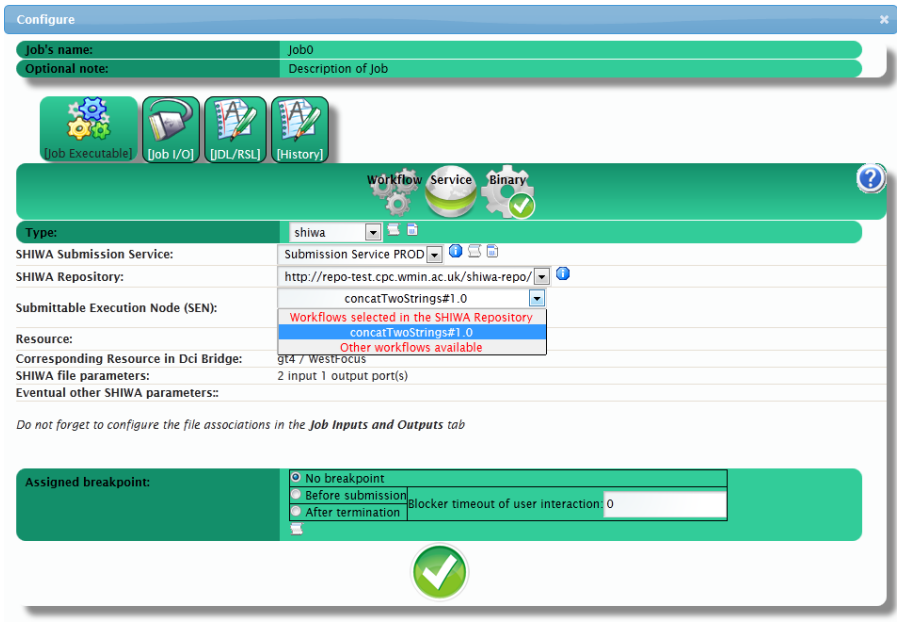


The portal displays the graph of the selected concrete workflow. To configure the workflow job, click on the Job2 on the workflow graph.

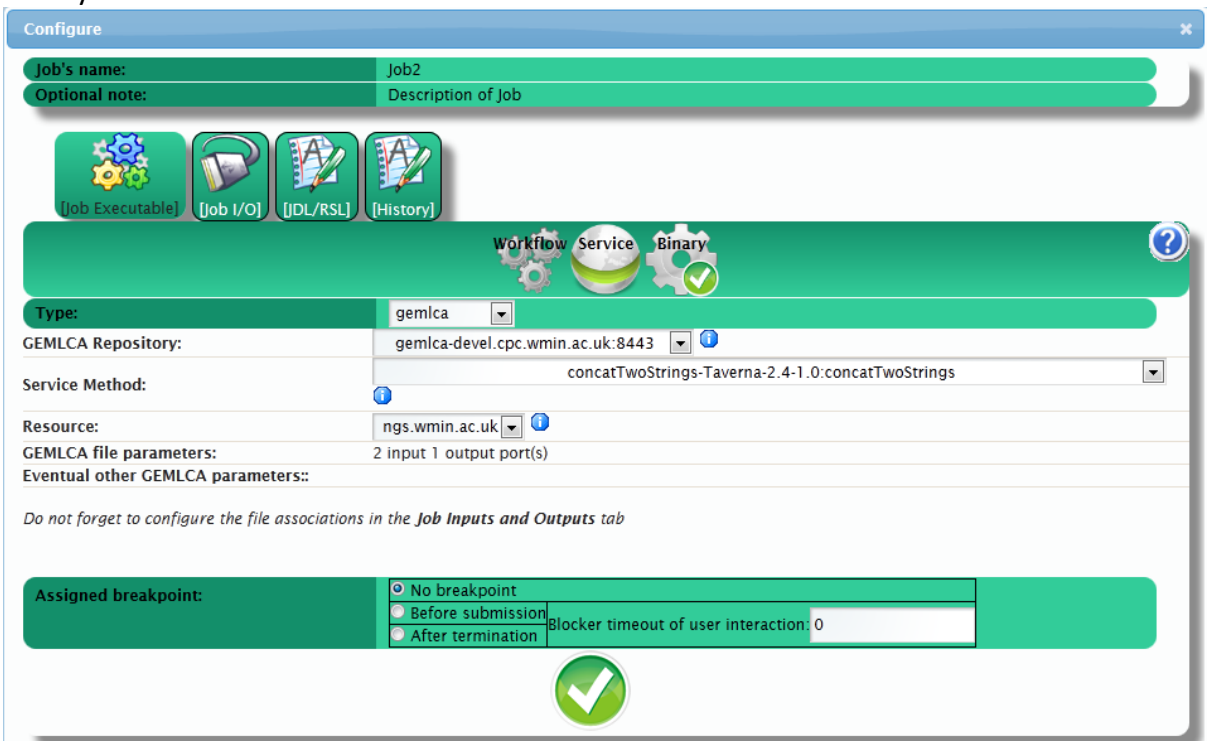


Specify both the job binary and input/output files and parameters. To specify job binaries, click on the ***Job Executable tab***. The job executable configuration is done in two steps.

The first step is to select the corresponding workflow implementation from the SHIWA Repository for the job. Select "*shiwa*" as **Type** of the Job Executable tab. Select the **SHIWA Submission Service** "*to complete*". Select the **SHIWA Repository** is "*http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo*". Then select the **Submittable Execution None (SEN)** "*to complete*". You can see that the list is divided into two parts, the first part being workflows selected within the SHIWA Repository. The "*concatTwoStrings*" workflow should appear in this first part of the list.



Click the green tick at the bottom of the interface, to save the configurations at this stage. Then you should see this screen.



Click on the ***Job I/O tab*** and specify the job input/output files and parameters used by the input/output ports.

Input ports:

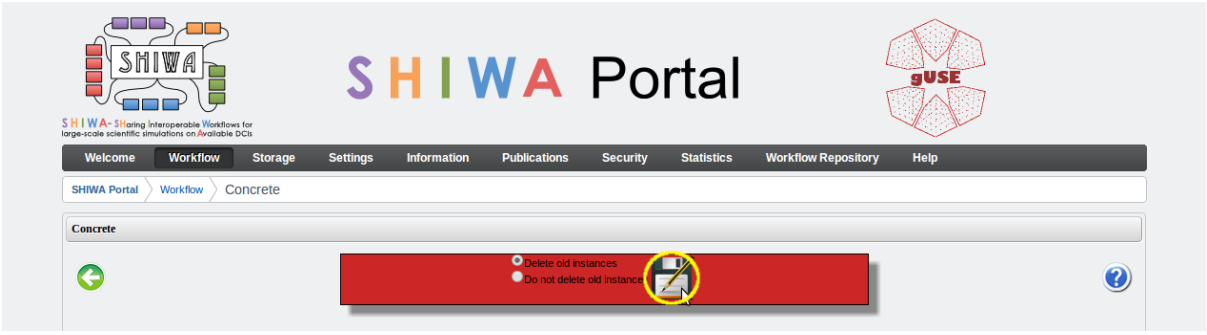
Port number	Internal File Name(SHIWA)	Port dependent condition allowing the job to run:	Parametric Input details:
0	string1	Hide	Hide
1	string2	Hide	Hide

Output ports:

Port number	Internal File Name(SHIWA)	Storage type:	Generator:
2	concatenated	Permanent	No

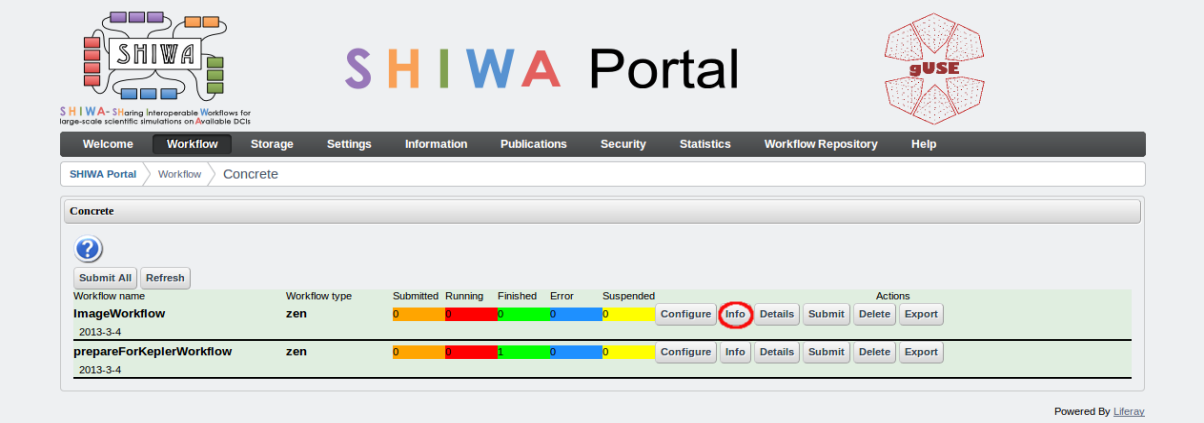
Do not forget to click the greet tick to save the configurations.

After specifying the job binaries and input/output files and parameters, click on the ***Save button*** at the bottom of the ***Job I/O tab***.
Then click on the ***Save on Server button*** to store details of the concrete workflow.



Verifying the configurations of the concrete workflow

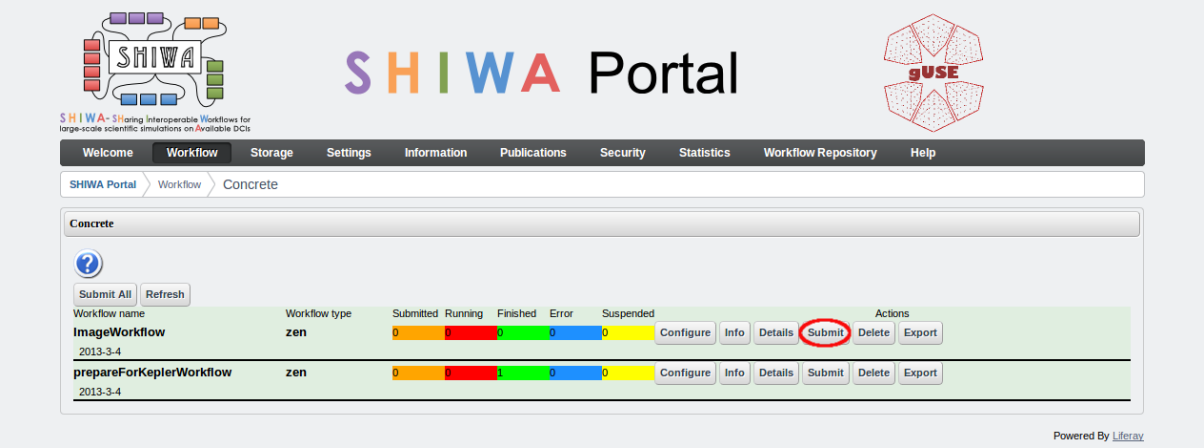
Click on the ***Info button*** of the concrete workflow, to inspect if there are any misconfigurations which the portal has pick-up.



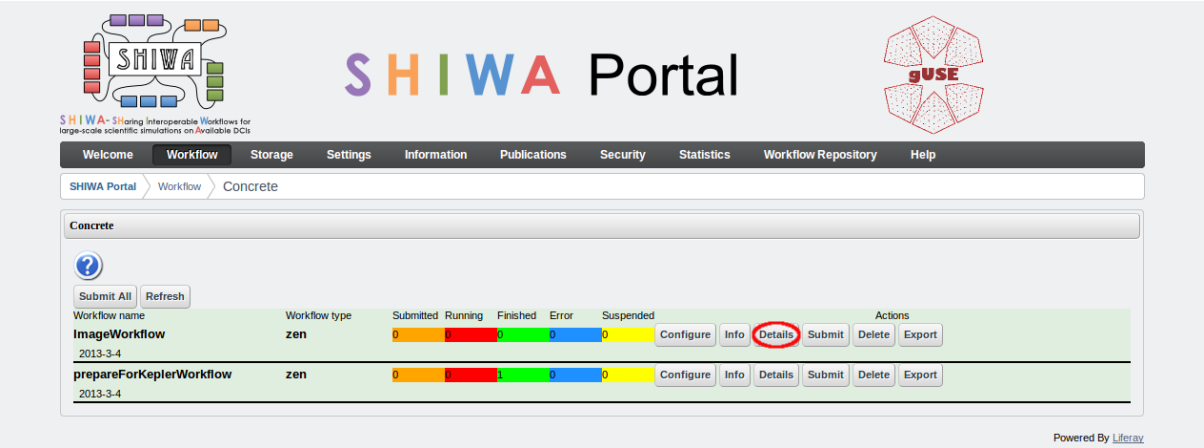
This is not an exhaustive verification of configuration, but does pick-up on common configuration issues.

Running the configured workflow

Click on the ***Submit button*** of the concrete workflow name to submit and execute it.

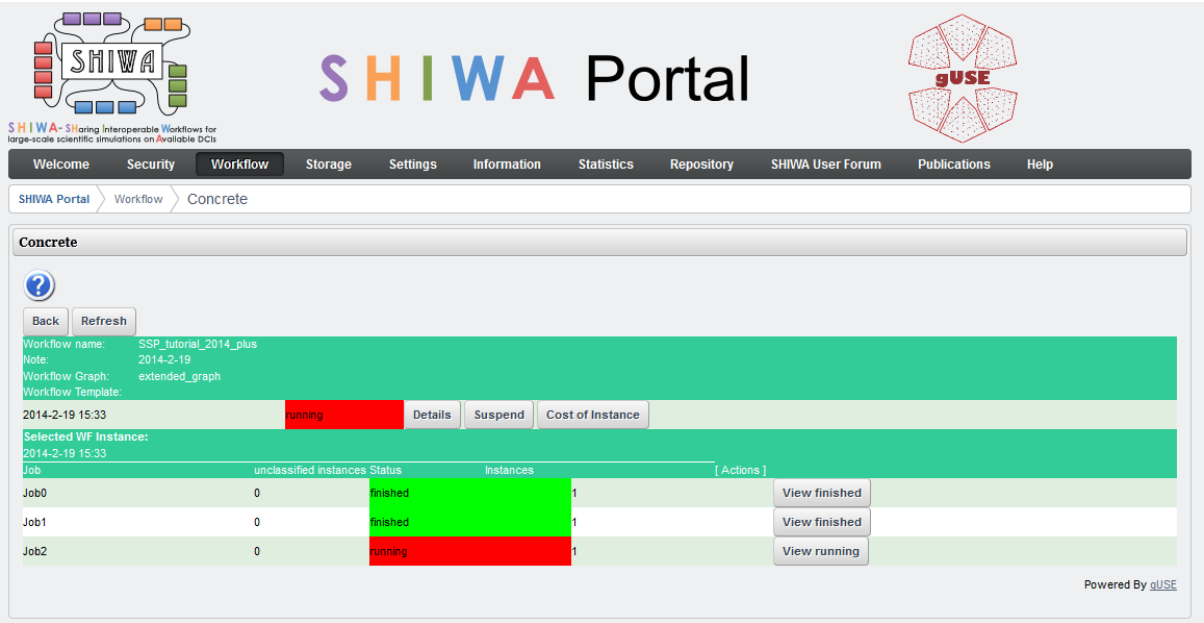


To display the workflow status during the execution, click on the ***Details button***.

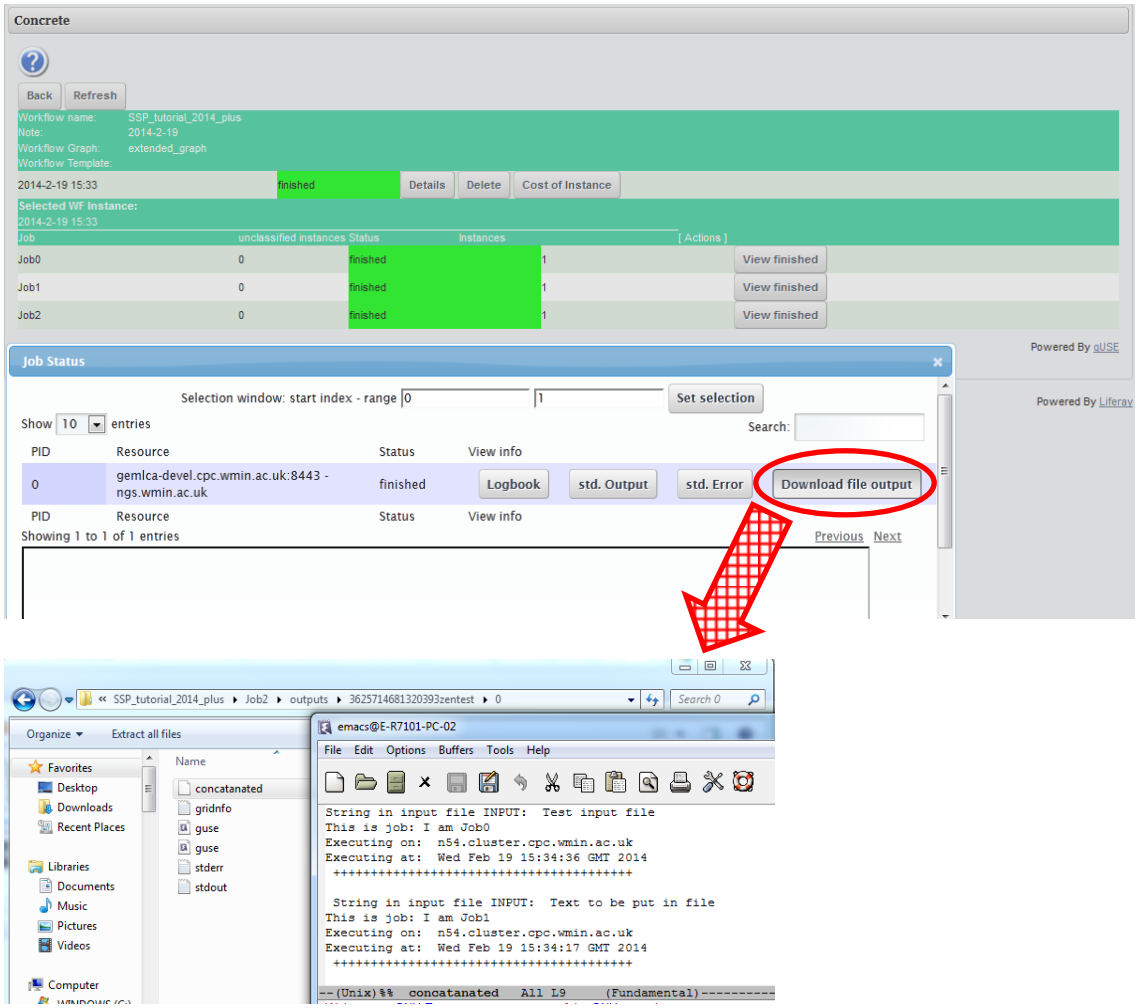


By clicking again on the ***Details button***, the portal displays the execution status of the jobs.

By clicking on the respective ***View button***, a view of a specific job can be displayed.



Click on the ***Refresh button*** to update the status.
When the execution of the workflow is successful, the status should be changed to *Finished* and you should be able to see generated output and error messages. Output files can be downloaded as an archive by clicking on the ***Download file output button***.


Concrete
Back
Refresh
Workflow name: SSP_tutorial_2014_plus
Note: 2014-2-19
Workflow Graph: extended_graph
Workflow Template:
2014-2-19 15:33
finished
Details
Delete
Cost of Instance
Selected WF Instance:
2014-2-19 15:33
Job
unclassified instances
Status
Instances
[Actions]
Job0
Job1
Job2
View finished
Powered By gUSE
Powered By Liferay
Job Status
Selection window: start index - range
Set selection
Show 10 entries
Search:
PID
Resource
Status
View info
0
gemlca-devel.cpc.wmin.ac.uk:8443 - ngs.wmin.ac.uk
Logbook
std. Output
std. Error
Download file output
Showing 1 to 1 of 1 entries
Previous
Next

SSP_tutorial_2014_plus
Job2
outputs
3625714681320393zentest
0
Search 0
Organize
Extract all files
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Computer
Name
concatanated
gridnfo
guse
guse
stderr
stdout
emacs@E-R7101-PC-02
File Edit Options Buffers Tools Help
String in input file INPUT: Test input file
This is job: I am Job0
Executing on: n54.cluster.cpc.wmin.ac.uk
Executing at: Wed Feb 19 15:34:36 GMT 2014
String in input file INPUT: Text to be put in file
This is job: I am Job1
Executing on: n54.cluster.cpc.wmin.ac.uk
Executing at: Wed Feb 19 15:34:17 GMT 2014
--(Unix)%% concatanated All L9 (Fundamental)----------