



SHIWA Portal tutorial

Submission Service version, 21/05/2014

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Goals of the tutorials and definitions

The aim of this tutorial is to introduce the basic features provided by the SHIWA Simulation Platform.

The following features will be covered by the tutorials:

1. Creating, configuring and submitting a WS-PGRADE workflow, consisting of a single native job.
 - Exporting this WS-PGRADE workflow to the SHIWA Repository, and importing it back to the SHIWA Portal.
2. Creating, configuring and submitting a meta-workflow, consisting of both native and non-native workflows.

Native workflows

For the purpose of this tutorial, the term *native workflows* will refer to a standard job in a WS-PGRADE workflow which executes an executable uploaded to the portal during configuration of the WS-PGRADE workflow. In this tutorial the executables used will be a Bash shell script. Native workflows do not make use of any repository.

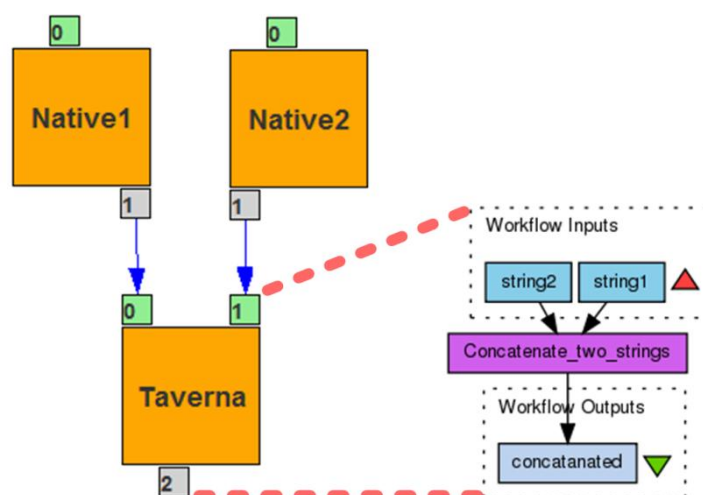
Non-native workflows

For the purpose of this tutorial, the term *non-native workflow* will refer to a job in a WS-PGRADE workflow, which executes a workflow of some workflow engine, is selected from a SHIWA Repository and submitted using the Submission Service.

Meta-workflow

For the purpose of this tutorial, the term *meta-workflow* will refer to a WS-PGRADE workflow which consists of several other workflows. These embedded workflows may be native, non-native or a mixture.

The figure below is of the meta-workflow from the second tutorial. The job *Taverna* is a non-native job, which executes the Taverna 2.4 workflow in the graphic.





Usage of the SHIWA 2 Portal

The Prototype SHIWA 2 Portal is available at this address:

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

If you own an account, then you can use it to log in. Otherwise, the next subsection will explain how you can create one.

i. 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**.

The screenshot shows the SHIWA Portal's welcome page. At the top right, a 'Sign In' button is circled in red. Below the navigation menu, there is a 'Join the SHIWA User Forum' section with a 'Sign In' button also circled in red. The main content area contains a welcome message and a 'Join the SHIWA User Forum' section with a 'Sign In' button circled in red.

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

The screenshot shows the Sign In page. At the bottom left of the form area, a 'Create Account' button is circled in red. The form includes fields for 'Screen Name' (containing 'admin') and 'Password'. There is a 'Remember Me' checkbox and a 'Sign In' button.

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

The screenshot shows the Create Account page. At the bottom left of the form area, a 'Save' button is circled in red. The form includes fields for 'First Name (Required)', 'Middle Name', 'Last Name', 'Screen Name (Required)', and 'Email Address (Required)'. There are also dropdown menus for 'Birthday' and 'Gender', and a 'Text Verification (Required)' field.

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



Sign In [Return to Full Page](#)

Thank you for creating an account. Your password is YALeC64K. Your password has been sent to test.user@whatever.com.

Screen Name

Password

Remember Me

[Create Account](#) [Forgot Password](#)

Powered By [Liferay](#)

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


Terms of Use

Welcome to our site. We maintain this web site as a service to our members. By using our site, you are agreeing to comply with and be bound by the following terms of use. Please review the following terms carefully. If you do not agree to these terms, you should not use this site.


- 1. Acceptance of Agreement.**
You agree to the terms and conditions outlined in this Terms of Use Agreement ("Agreement") with respect to our site (the "Site"). This Agreement constitutes the entire and only agreement between us and you, and supersedes all prior or contemporaneous agreements, representations, warranties and understandings with respect to the Site, the content, products or services provided by or through the Site, and the subject matter of this Agreement. This Agreement may be amended at any time by us from time to time without specific notice to you. The latest Agreement will be posted on the Site, and you should review this Agreement prior to using the Site.
- 2. Copyright.**
The content, organization, graphics, design, compilation, magnetic translation, digital conversion and other matters related to the Site are protected under applicable copyrights, trademarks and other proprietary (including but not limited to intellectual property) rights. The copying, redistribution, use or publication by you of any such matters or any part of the Site, except as allowed by Section 4, is strictly prohibited. You do not acquire ownership rights to any content, document or other materials viewed through the Site. The posting of information or materials on the Site does not constitute a waiver of any right in such information and materials.
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Products and names mentioned on the Site may be trademarks of their respective owners.

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

Go to ▼ Test User (Sign Out)



SHIWA Portal



SHIWA - Sharing Interoperable Workflows for large-scale scientific simulations on Available DCIs

Welcome Workflow Storage Settings Information Publications Security Statistics Workflow Repository Help

SHIWA Portal > Welcome

Welcome to the SHIWA Simulation Platform!

The SHIWA Simulation Platform is part of the SHIWA Technology and offers users production-level services supporting workflow interoperability. As part of the SHIWA Simulation Platform the SHIWA Repository facilitates publishing and sharing workflows, and the SHIWA Portal enables their actual enactment and execution in all the DCIs available in Europe. Use cases targeting various scientific domains will serve to drive and evaluate this platform from a user's perspective.


If you wish to try the SHIWA Simulation Platform, please visit the [Getting started](#) page or see the [tutorial](#).

To read more about the SHIWA Technology, please visit the SHIWA concepts on the [SHIWA website](#).

- If you wish to **sign in** please click on the **yellow key icon** at the **right top of the screen**.
- If you would like to get an **account** for this portal please e-mail the [SHIWA Portal support team](#).

Join the SHIWA User Forum

If you are using the SHIWA Simulation Platform share your experiences with other users, write your comments to the developers.

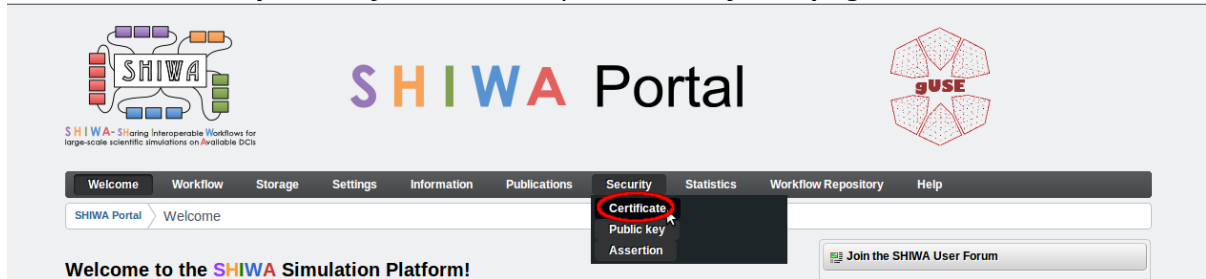




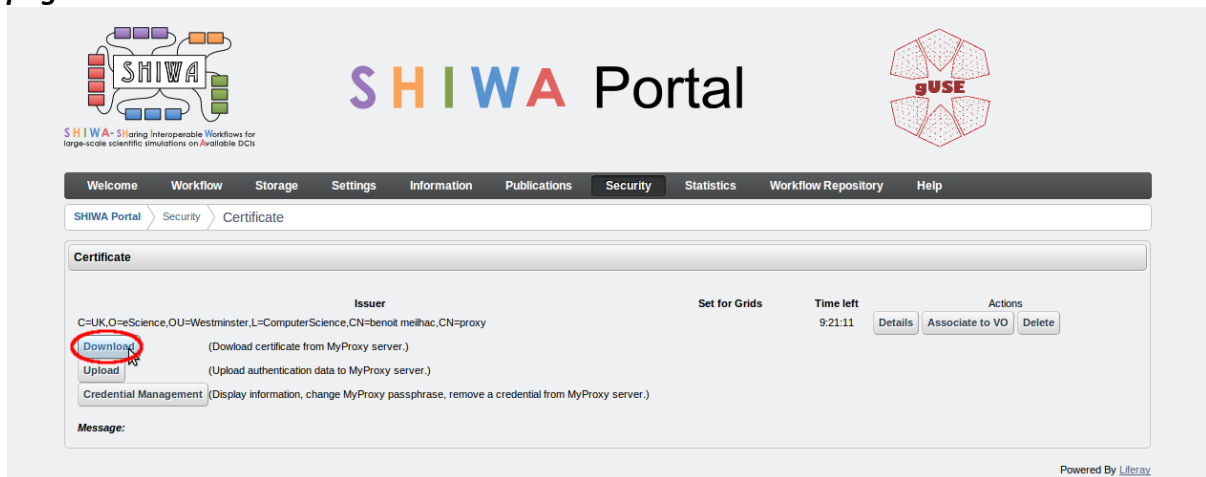
ii. Certificate management

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: **SHIWAtraining2014**
Password: **shiwa12345**

The above credentials are only effective for the duration of the **SHIWA Technology hackathon at EGI Community Forum 2014** event.

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



The screenshot shows the SHIWA Portal interface. At the top, there are logos for SHIWA and GUSE. Below them is a navigation menu with items: Welcome, Workflow, Storage, Settings, Information, Publications, Security, Statistics, Workflow Repository, and Help. The breadcrumb trail is SHIWA Portal > Security > Certificate. The main content area is titled 'Certificate' and contains a form for downloading a certificate from a MyProxy server. The form has fields for Hostname (myproxy.ngs.ac.uk), Login (meilhab), Lifetime (hours) (100), Port (7512), Password (masked with asterisks), and Description. A 'Download' button is circled in red. A message at the bottom says 'Message: Fill in the fields for download!'. The footer indicates 'Powered By Liferay'.

Then, you have to associate the certificate with a *Virtual Organization* in order to be able to submit workflows.

By clicking on the **Associate to VO** button, you open the **Setting Certificate for Grid** page.

The screenshot shows the SHIWA Portal interface. The breadcrumb trail is SHIWA Portal > Security > Certificate. The main content area is titled 'Certificate' and contains a message: 'Set certificate for GRID. Certificate DOWNLOAD successful. Certificate download was successful. You may set this certificate for a Grid now. (Of course, you can set it later as well.) Do you want to do this now?'. There are two buttons: 'Associate to VO' (circled in red) and 'Cancel'. A message at the bottom says 'Message: Download successful, you can set the certificate for any GRID.'. The footer indicates 'Powered By Liferay'.

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

The screenshot shows the SHIWA Portal interface. The breadcrumb trail is SHIWA Portal > Security > Certificate. The main content area is titled 'Certificate' and contains a message: 'Setting certificate for GRID. Certificate details:'. Below the message is a list of certificate details: Downloaded from: myproxy.ngs.ac.uk; Issued by: C=UK,O=eScience,OU=Westminster,L=ComputerScience,CN=benoit meilhab,CN=proxy; Subject: C=UK,O=eScience,OU=Westminster,L=ComputerScience,CN=benoit meilhab,CN=proxy,CN=proxy; Timeleft: 9:59:55; Proxy type: full legacy globus proxy; Strength [bits]: 1024; Description:; Set for Grids: WestFocus. There are two buttons: 'Back' and 'OK' (circled in red). A message at the bottom says 'Message: Map proxy with one of the Grids.'. The footer indicates 'Powered By Liferay'.

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



The screenshot shows the SHIWA Portal interface. At the top, there is a navigation menu with items: Welcome, Workflow, Storage, Settings, Information, Publications, Security, Statistics, Workflow Repository, and Help. Below the menu, the breadcrumb trail is SHIWA Portal > Security > Certificate. The main content area is titled 'Certificate' and displays a confirmation dialog box. The dialog box has the title 'Confirm replacing certificate' and contains the following text: 'REPLACE certificate for Grid: WestFocus ?' followed by a lightbulb icon and 'There is already a certificate set for this Grid. You will replace this certificate with the new one. Are you sure you want to do this?'. At the bottom of the dialog, there are three buttons: 'Details', 'Yes', and 'Cancel'. The 'Yes' button is circled in red. A message at the bottom left of the dialog reads 'Message: Confirm mapping certificate for WestFocus!'. The footer of the page says 'Powered By Liferay'.

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

The screenshot shows the SHIWA Portal interface with the 'Certificate' page. The navigation menu and breadcrumb trail are the same as in the previous screenshot. The main content area displays the details of a certificate. It includes the following information: Issuer: C=UK,O=eScience,OU=Westminster,L=ComputerScience,CN=benoit.melhac,CN=proxy; Set for Grids: WestFocus; Time left: 9:59:36. There are three buttons under the 'Actions' header: 'Details', 'Associate to VO', and 'Delete'. The 'Details' button is circled in red. Below this information, there are three buttons: 'Download' (with subtext '(Download certificate from MyProxy server.)'), 'Upload' (with subtext '(Upload authentication data to MyProxy server.)'), and 'Credential Management' (with subtext '(Display information, change MyProxy passphrase, remove a credential from MyProxy server.)'). A message at the bottom left reads 'Message: Delete successful.'. The footer of the page says 'Powered By Liferay'.

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 “*helloyou*” job will be described. Then the workflow will be exported to the SHIWA Repository, using the export functionality. Finally, the workflow will be imported back from the SHIWA Repository.

The “*helloyou*” job is a simple shell script named [helloyou.sh](#), which returns a greeting including what the input file contained, and the command line argument. This output is then redirected to an output file. For your convenience the code of this shell script is provided below:

```
#!/bin/bash
echo "Hello " `cat input` " , "$* > output
echo " This greeting was generated by a native shell script" >> output
cat output
```

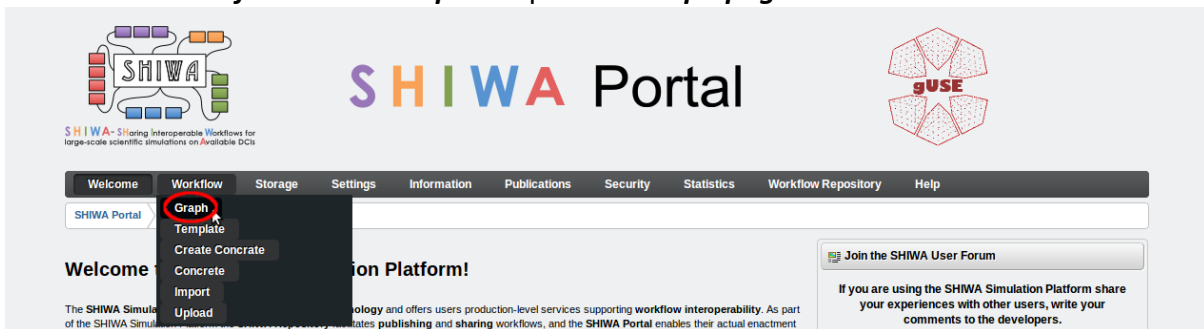
You can download this file from [this link](#)

You are free to use your own bash shell script. To follow this tutorial the script should use a single input file named *input*, and a single output file named *output*.

1.1 Creation and execution of a single native workflow

1.1.1 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.





1.1.2 Creating the abstract workflow

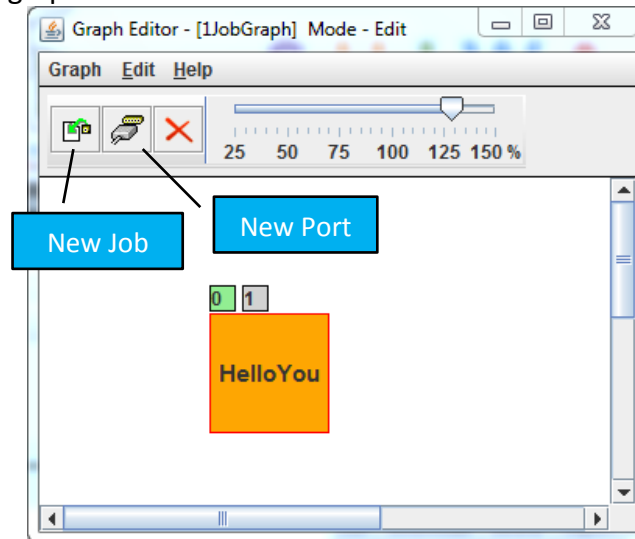
Click on the New Job and New Port buttons to produce the graph below.

Click on the Job icon to specify the name of job.

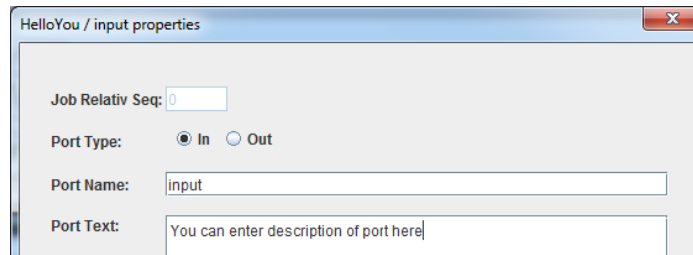
Click on the two Port icons to specify the ports as being input or output, and their details.

To specify an output port, double click on the desired port and change the input to output.

Create the following graph:



- 1 job, there is no need to change the name of this job.
 - 1 input port, change the name of the port to : input
 - 1 output port, change the name of the port to : output

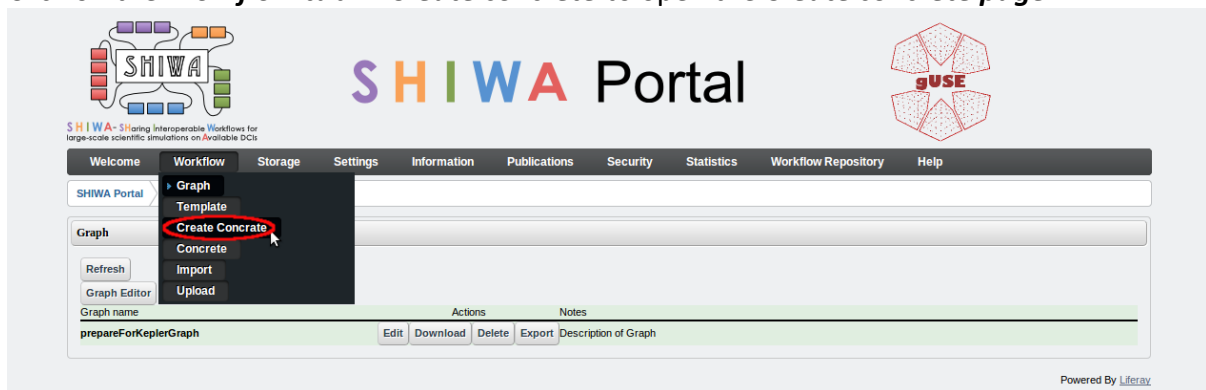


After reproducing the graph corresponding to the “helloyou” job, save it by clicking on the **Graph tab** and selecting the **Save option**.



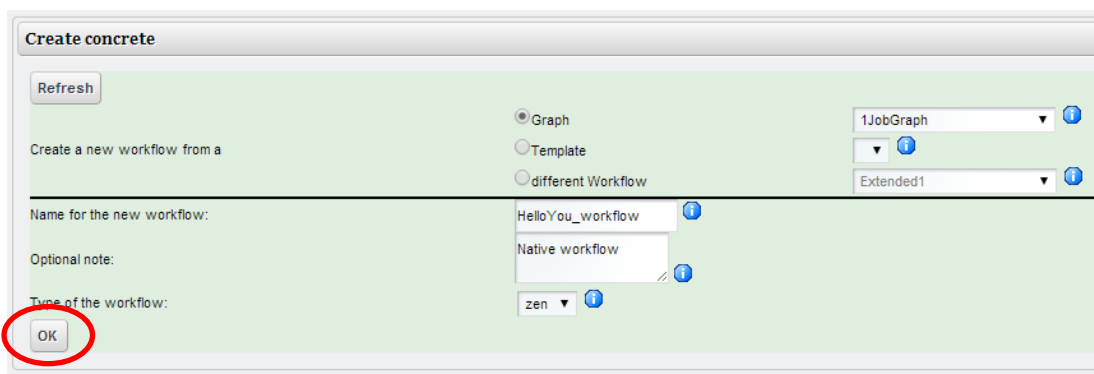
1.1.3 Creating the concrete workflow

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



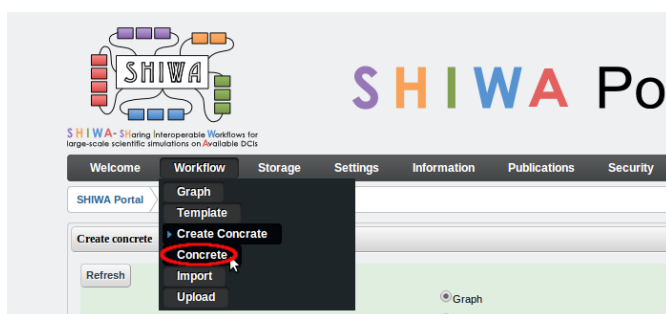
Select the previously created graph to be used to create the concrete workflow, define its name and then press the **OK button**.

Please specify a name unique to yourself, such as *“HelloYou_Peter”*, this will enable exporting to the Repository later, as there is a workflow names on the Repository must be unique.

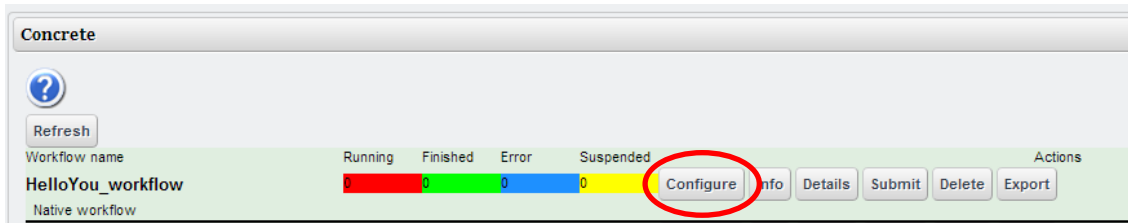


1.1.4 Configuring the concrete workflow

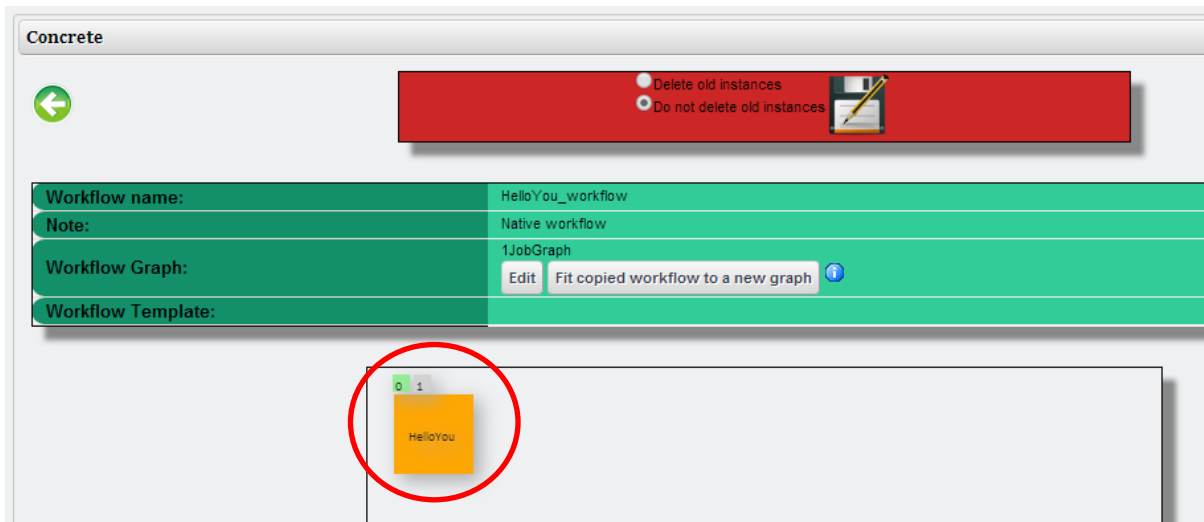
Click on the **Workflow tab** -> **Concrete** to open the **Concrete page**.



Select the concrete workflow corresponding to the *“helloyou”* 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 "helloyou.sh"
Parameters:	-lam Job0




Configure

Job's name: HelloYou
 Optional note: Description of job

Workflow Binary

Type: gt4
 Grid: WestFocus
 Resource: ngs.wmin.ac.uk
 JobManager: jobmanager-pbs
 Replicate settings in all Jobs:
 Kind of binary: Sequential Java MPI
 MPI Node Number:
 Executable code of binary: Local Remote
 Recently stored: C:/fakepath/helloyou.sh
 No file chosen
 Parameter: -lam Job0
 Assigned breakpoint: No breakpoint Before submission After termination
 Blocker timeout of user interaction: 0



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 Internal File Name	Port's	Port dependent condition	Source of input directed to this port	Parametric Input details
Port 0	input		Hide	Use a text file containing your name	Hide

Output ports:

Port number	Output Internal File Name	Port's	Base of Output Remote File Name	Storage type	Generator
Port 1	input			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**.



Configure

Job's name: HelloYou
Optional note: Description of Job

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

Port Number:0 Port Name: input Description of Port

Input Port's Internal File Name: input

Port dependent condition allowing the run of the job: View Hide

Source of input directed to this port: Recently defined External File Name: N/A (Standard name paramInputs.zip - to be regard as PS container)

Choose File string1

Parametric Input details: View Hide

Port Number:1 Port Name: output Description of Port

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

Welcome Workflow Storage Settings Information Publications Security Statistics Workflow Repository Help

SHIWA Portal Workflow Concrete

Concrete

←

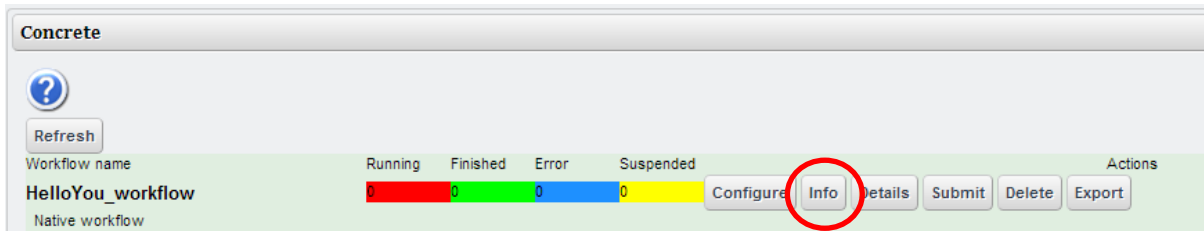
Delete old instances
Do not delete old instances

?



1.1.5 Verifying the configurations of the concrete workflow

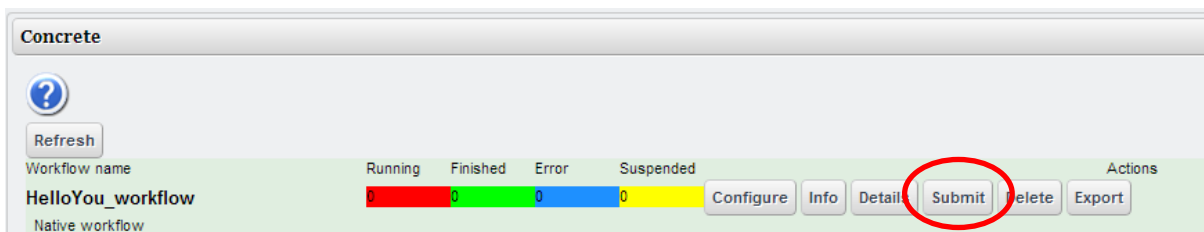
Click on the **Info button** of the concrete workflow, to inspect if there are any misconfigurations.



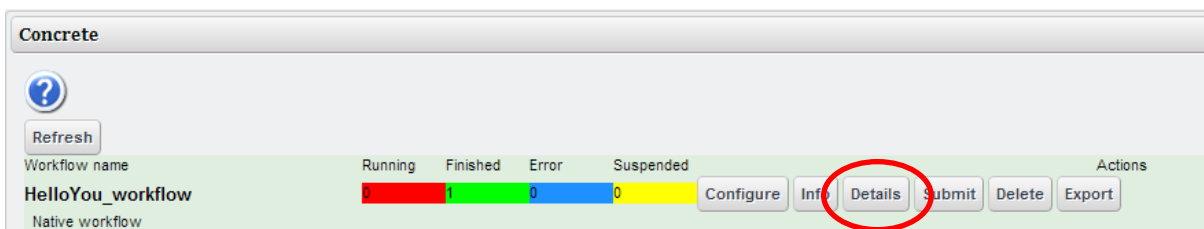
This is not an exhaustive verification of configuration, but does pick-up on common configuration issues.

1.1.6 Running the configured workflow

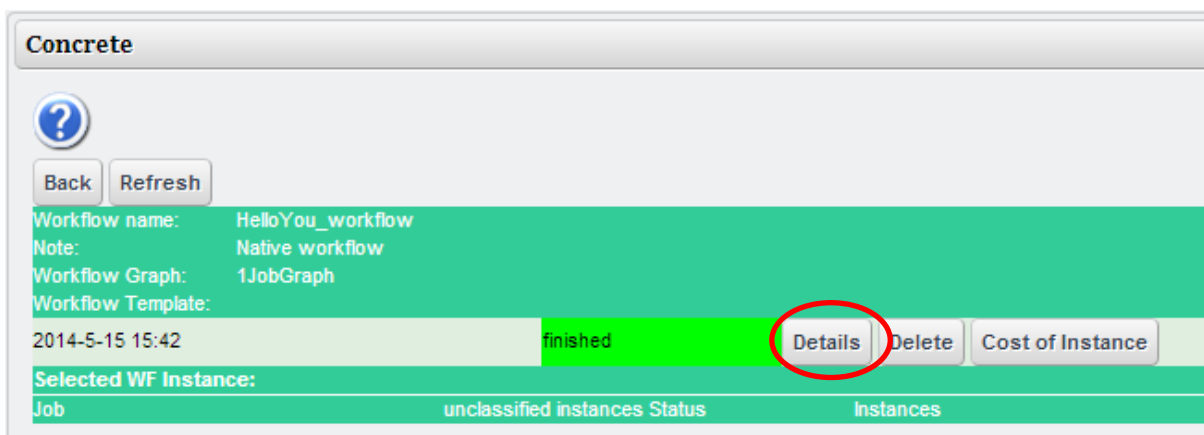
Click on the **Submit button** of the concrete workflow name to submit and execute it.



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.

Concrete

Workflow name: HelloYou_workflow
Note: Native workflow
Workflow Graph: 1JobGraph
Workflow Template:

2014-5-15 15:42 finished Details Delete Cost of Instance

Selected WF Instance:
2014-5-15 15:42

Job	unclassified instances	Status	Instances	[Actions]
HelloYou	0	finished	1	View finished

If the workflow is still running, click on the **Refresh button** to update the status.

When the execution of the workflow is successful, the status will change to *Finished* and you can click the **View finished button** to view the results of the workflow. You are able to see generated output and error messages by clicking the **std.Output** and **std.Error** buttons respectively.

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

Job Status

Selection window: start index - range 0 1 Set selection

Show 10 entries Search:

PID	Resource	Status	View info
0	ngs.wmin.ac.uk:2119/jobmanager-pbs	finished	Logbook std. Output std. Error Download file output

PID Resource Status View info

Showing 1 to 1 of 1 entries Previous Next

```
Hello Noam Zero , -Iam Job0
This greeting was generated by a native shell script
```

1.2 Exporting the workflow to the SHIWA Repository

After a successful execution of the above 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.

Concrete

Refresh

Workflow name: HelloYou_workflow
Native workflow

Running Finished Error Suspended Actions

1 0 0 Configure Info Details Submit Delete Export

An interface is opened, from which you can choose where to export your workflow. Select the option **Remote SHIWA Repository** and click on the **Ok button**.

Export to

Remote SHIWA Repository
 Local WS-PGRADE Repository

Ok Cancel



A new interface is presented, from which 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.

For the *SHIWA Technology hackathon at EGI Community Forum 2014* event, please use user **SHIWAttraining2014**, with password **shiwa12345**. Clicking on the **Get Groups** button and select the only group listed.

Workflow to be exported: HelloYou_workflow
Select SHIWA Repository: <http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/>
User Credentials
Username: SHIWAttraining2014
Password:
Get Groups cancel

The group used for the workshop is: "Training"

Workflow to be exported: HelloYou_workflow
Select SHIWA Repository: <http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/>
User Credentials
Username: SHIWAttraining2014
Password:
Select Group ID: **Training**
Next cancel

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.

Workflow to be exported: HelloYou_workflow
Select SHIWA Repository: <http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/>
User Credentials
Username:
Password:
Select Group ID: Training

Selection of job options below (for command line arguments and for input files) results no semantic effect if the workflow is to be exported in „WS-PGRAD/gUSE“ format. However any value of a Command line argument item will be lost if it is marked as „Modifiable value“ AND the workflow is to be exported in „IWIR“ format.

Default values to HelloYou : (unbound input files and command line arguments)		Save as
Name of input file:	input	Input with Sample Data Set
Command line argument 1	-lam	Mandatory value
Command line argument 2	Job0	Mandatory value

Export in WS-PGRADE/gUSE format Export in IWIR format cancel

A message should appear confirming the successful exportation of the workflow.

Message
Bundle exported successfully!
Yes

The export functionality is known to work with:

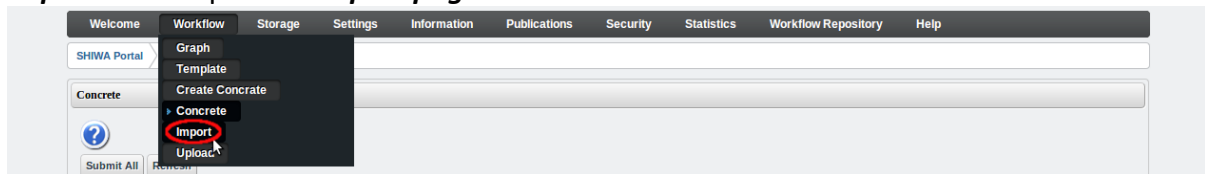
- Single native workflows;
- Single non-native workflows;
- Multi-native workflows;
- Meta-workflows.



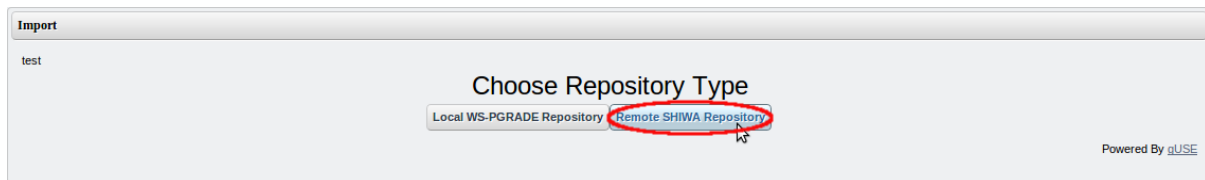
1.3 Importing and re-submitting the workflow

After the exportation, you have the possibility to import the workflow. You would have to set the Implementation in the SHIWA Repository to be publicly visible before it would be importable – this is beyond the scope of this tutorial, although has been included in the video for your information.

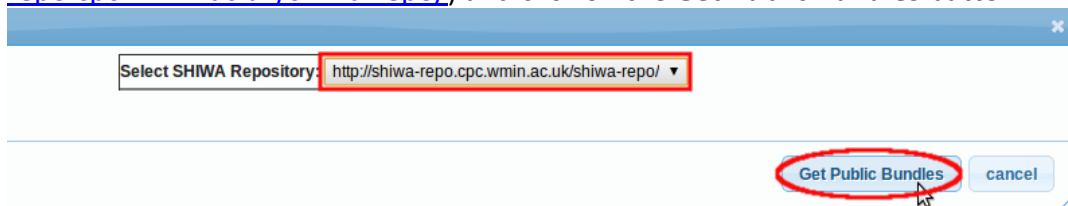
For your convenience, there is already a publicly visible Implementation of this workflow on the Repository. The workflow is named **HelloYou_workflow**. Click on the **Workflow** -> **Import tab** to open the **Import page**.



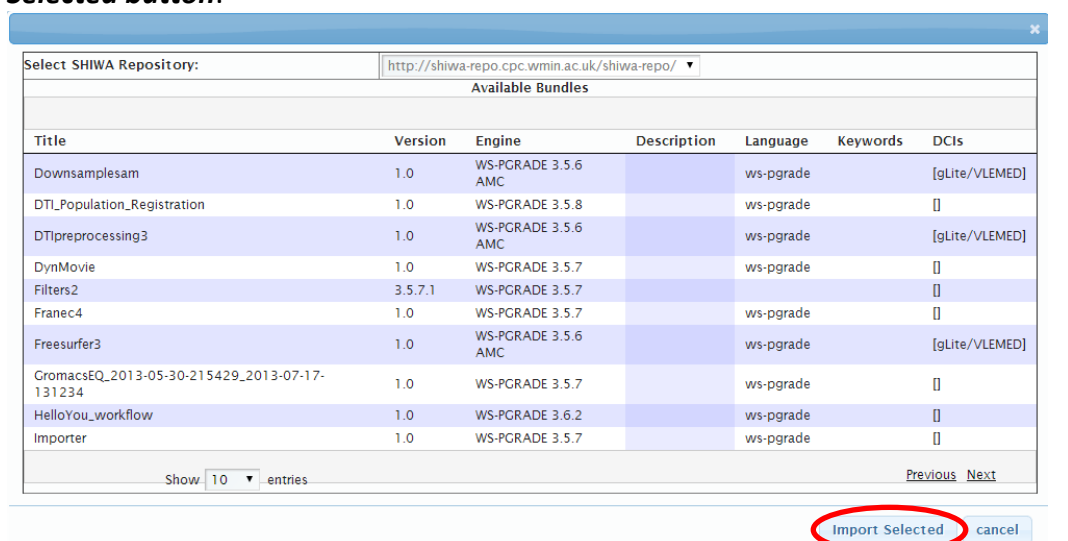
Click on the **Remote SHIWA Repository button** to open the interface for importing your workflow.



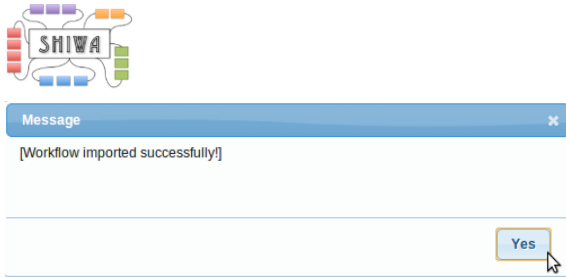
The menu open, select the SHIWA Repository location (<http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/>) and click on the **Get Public Bundles button**.



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**. You should see the new imported workflow – this will be denoted by a time stamp after the name. To check if everything went well, click on the **Submit button** on the newly imported 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.

2.1 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.

The screenshot shows the SHIWA Portal interface. At the top, there is a navigation menu with items: Welcome, Security, Workflow, Storage, Settings, Information, Statistics, Repository, SHIWA User Forum, Publications, and Help. Below the menu is a breadcrumb trail: SHIWA Portal > Workflow > Concrete. The main content area is titled 'Concrete' and contains a table with the following details:

Workflow name:	SSP_tutorial_2014
Note:	2014-2-19
Workflow Graph:	Edit Fit copied workflow to a new graph
Workflow Template:	

Below the table, there is a graph editor area showing a single job node labeled 'Job0'.

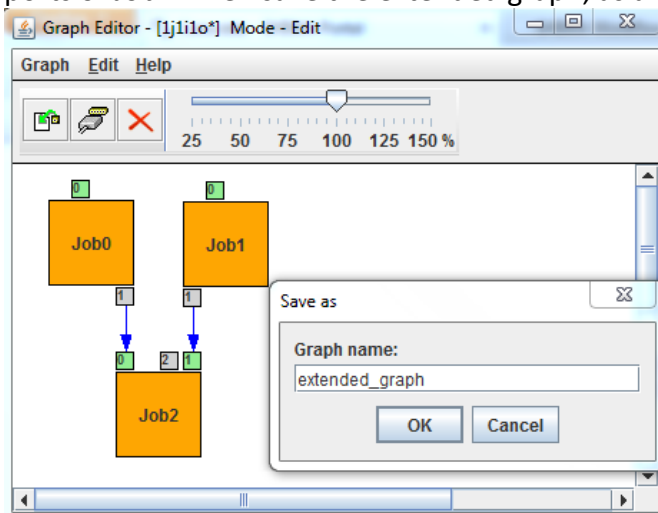
2.2 Use the Graph Editor to extend the workflow

Add two jobs to the Graph:

- Job1 should be structure the same as Job0:
 - 1 input port, change the name of the port to : input
 - 1 output port, change the name of the port to : output
- 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



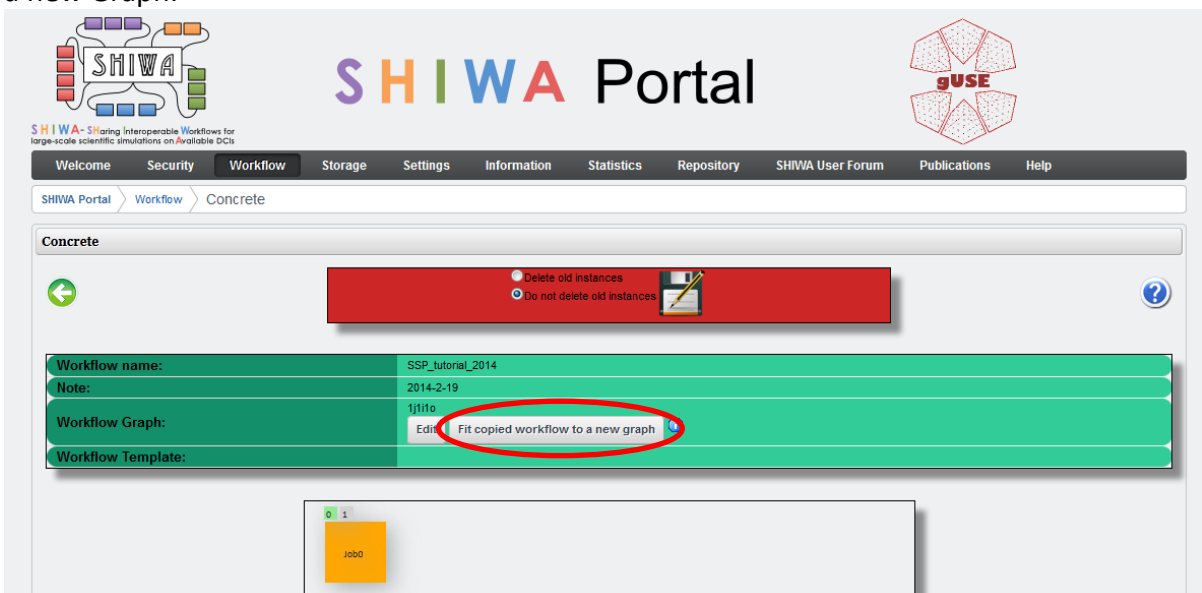
Now connect each of the output (grey) ports of jobs Job0 and Job1 to each of the two input ports of Job2. Then save the extended graph, as a different name.



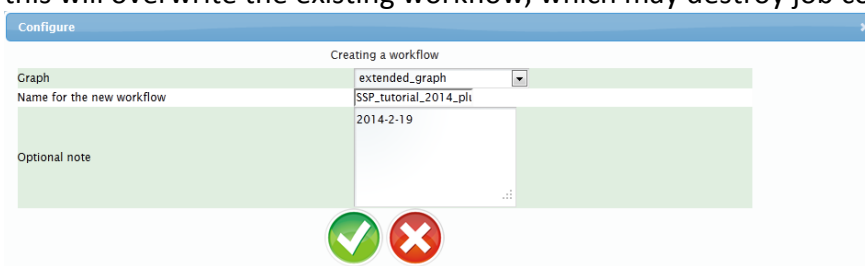
2.3 Copy the workflow and fit to the extended Graph

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.

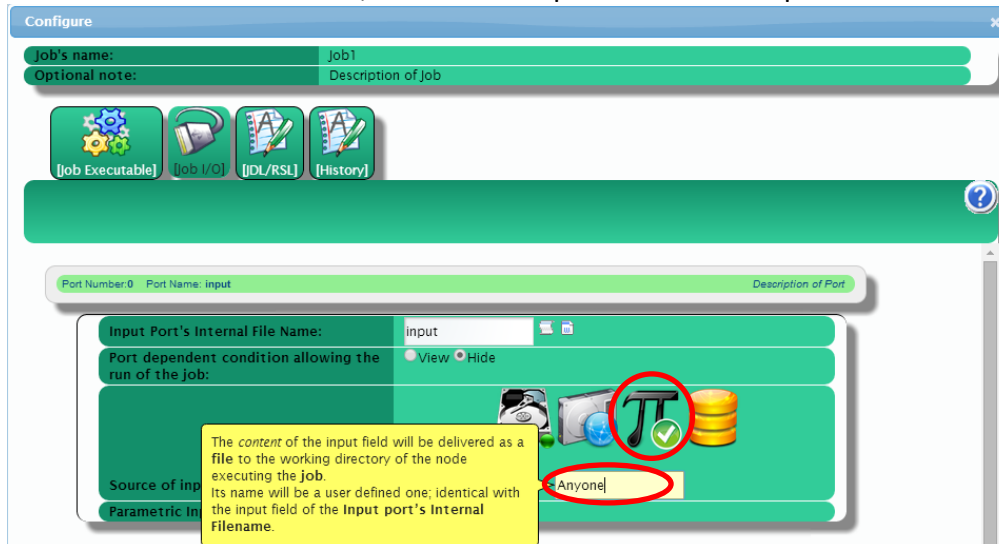




2.4 Configuration of second native job

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

- The string entered in the Parameter box should read “-lam Job1”.
- In the Job I/O tab, for PORT 0, click the π symbol – this will enable you to enter a value in the text box, which will be passed into the input file.

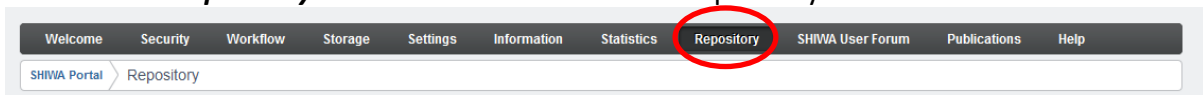


Save the concrete at this stage.

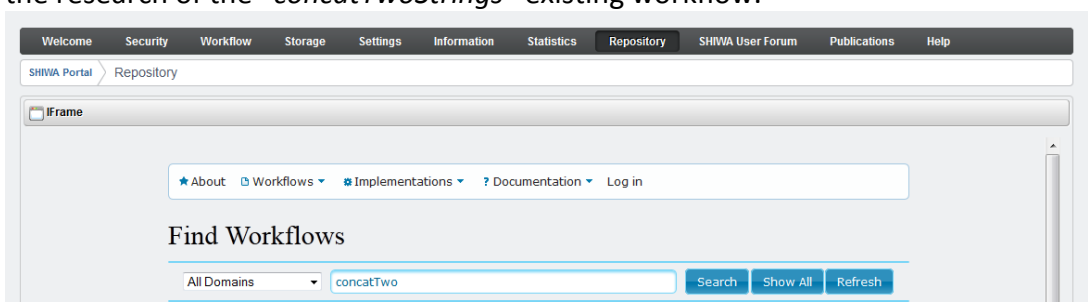
2.5 Browsing the SHIWA Repository and selecting a non-native workflow

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. This information has to be known when you want to include this workflow within a WS-PGRADE workflow, to create a graph with a corresponding job, with the correct number of input and output ports.

To make the selection of the workflow, you have to click on the **blue arrow button**.

The screenshot shows a web interface for a workflow named 'concatTwoStrings'. At the top, there is a search bar with 'concatTwo' entered and buttons for 'Search', 'Show All', and 'Refresh'. Below this is a pagination bar showing '(1 of 1)' and a dropdown menu set to '5'. The main content area is titled 'Workflow: concatTwoStrings' and includes a 'Details' link. On the left, the 'Workflow Summary' section lists: Domain: Demo, Subdomain: -, Application: -, Owner: SHIWA Administrator, Group: concatTwoStringsMyExp, Leader: SHIWA Administrator, Status: public, Keywords: Created: 12.02.14 00:00, Modified: 17.02.14 14:47, Description: for tests of TavernaServer This workflow has been downloaded from the myExperiment web site. URL: http://www.myexperiment.org/workflows/3855.html. Below the summary are three expandable sections: 'Inputs (2)', 'Outputs (1)', and 'Data sets (1)'. On the right, the 'Implementation Preview (1)' section shows a workflow diagram with two 'string' input nodes, a 'Concatenate_Two_strings' process node, and a 'concat2str' output node. To the right of the diagram, the following details are listed: Engine: Taverna(2.4), Version: 1.0, Description: for tests of TavernaServer This workflow has been download..., Status: public, Embedding: Not selected. A blue arrow button is visible next to the workflow name in the preview section.

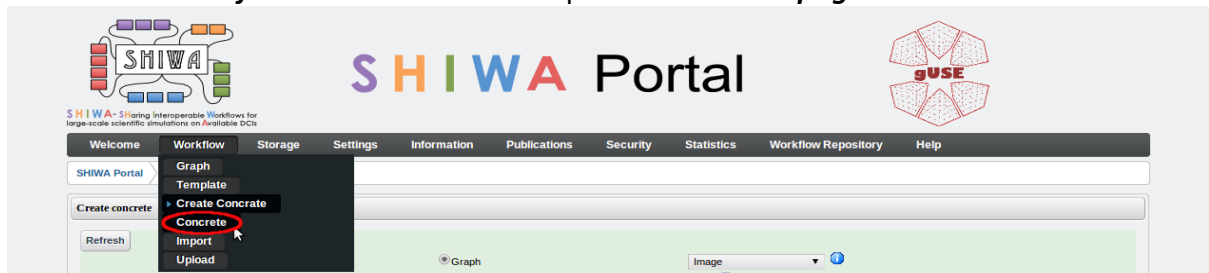
A message is displayed confirming the selection and the button is crossed. The portal and the repository offer the possibility to select as much as implementations as you want.

This screenshot is similar to the previous one, showing the 'Workflow: concatTwoStrings' details. The 'Implementation Preview (1)' section now shows a red circle with a blue checkmark over the blue arrow button, indicating that the implementation has been selected. The details listed are: Engine: Taverna(2.4), Version: 1.0, Description: for tests of TavernaServer This workflow has been download..., Status: public, Embedding: Selected. The workflow diagram and summary information remain the same as in the previous screenshot.

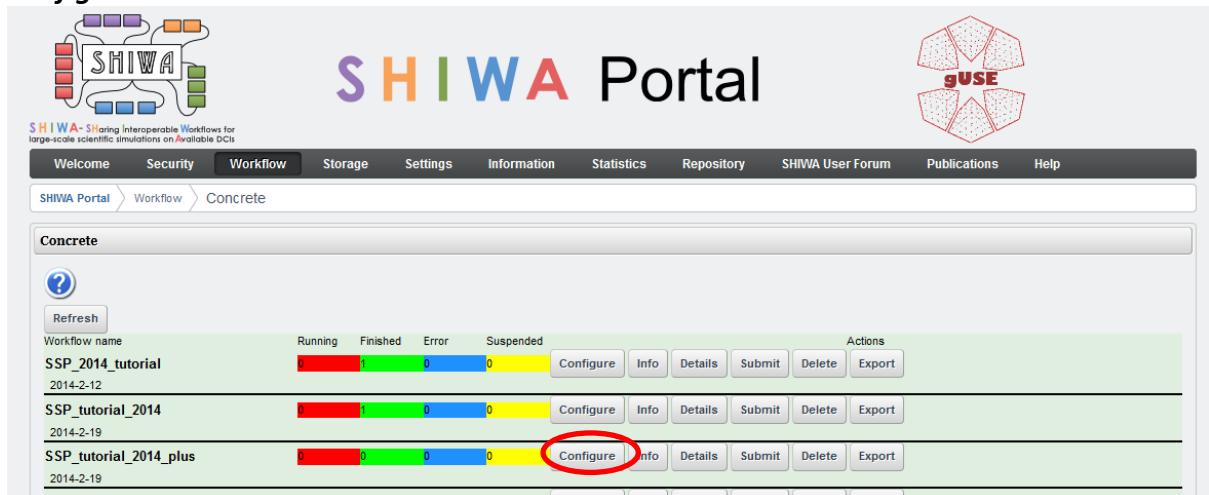


2.5.1 Configuring the non-native job within the concrete workflow

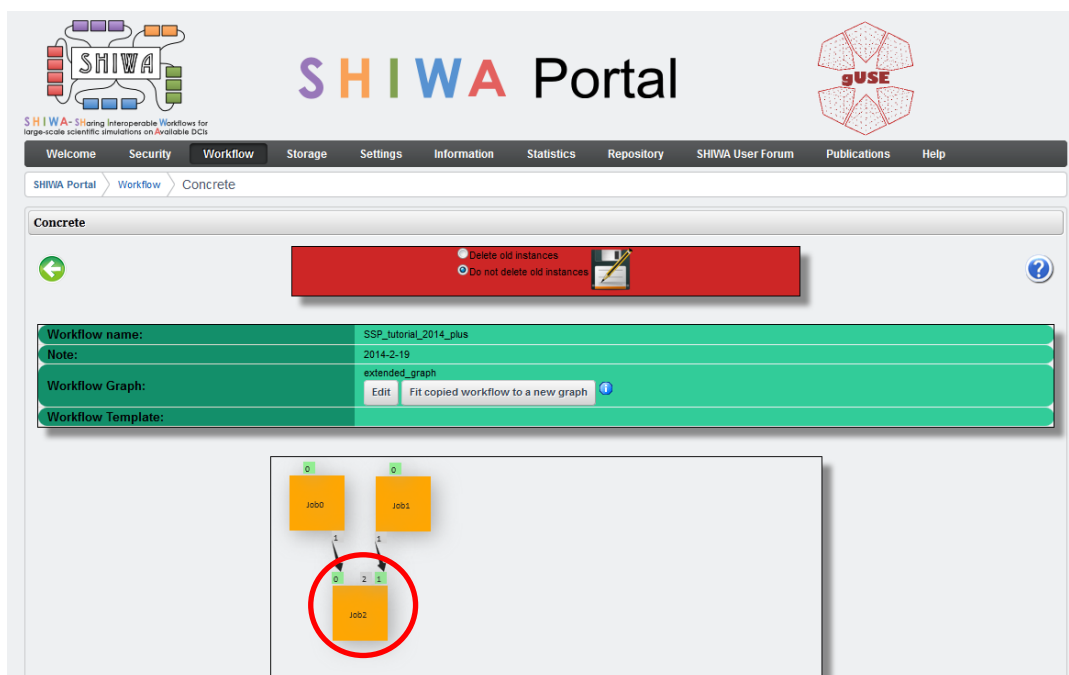
Click on the **Workflow tab** -> **Concrete** to open the **Concrete page**.



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.

Configure

Job's name: Job2
Optional note: Description of Job

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

Workflow Binary

Type: shiwa

SHIWA Submission Service: Submission Service

SHIWA Repository: http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/

Submittable Execution Node (SEN): concatTwoStrings#1.0
Workflows selected in the SHIWA Repository
concatTwoStrings#1.0
Other workflows available
ConcatAndDisplay#1.0
testPython2-4.2#1.0

Resource: ConcatAndDisplay#1.0

Corresponding Resource in Dci Bridge: testPython2-4.2#1.0

SHIWA file parameters:
Eventual other SHIWA parameters::

Do not forget to configure the file associations in the Job Inputs and Outputs tab

Assigned breakpoint: No breakpoint
Before submission
After termination (selected) Blocker timeout of user interaction: 0

Select **WestFocus** from the list of Resources available.

Configure

Job's name: Job2
Optional note: Description of Job

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

Workflow Binary

Type: shiwa

SHIWA Submission Service: Submission Service

SHIWA Repository: http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/

Submittable Execution Node (SEN): concatTwoStrings#1.0

Resource: WestFocus

Corresponding Resource in Dci Bridge: gt4 / WestFocus

SHIWA file parameters: 2 input 1 output port(s)

Eventual other SHIWA parameters::

Do not forget to configure the file associations in the Job Inputs and Outputs tab

Assigned breakpoint: No breakpoint
Before submission
After termination (selected) Blocker timeout of user interaction: 0



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

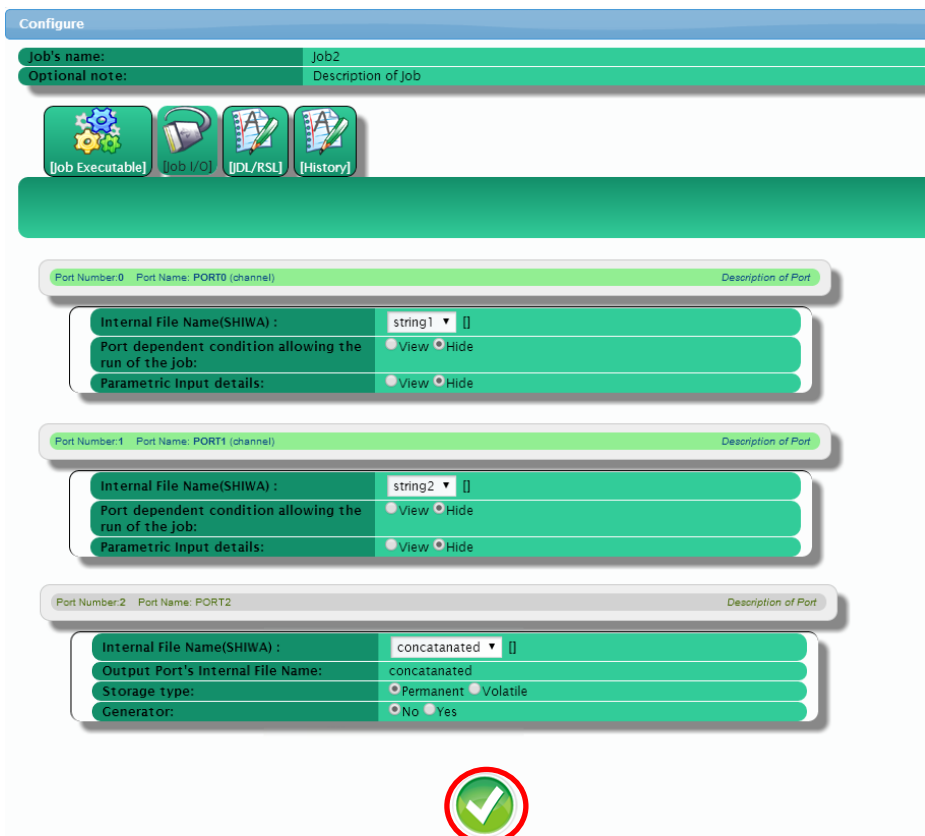
Click on the **Job I/O tab** and specify the job input/output files and parameters used by the input/output ports.

Input ports:

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

Output ports:

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



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

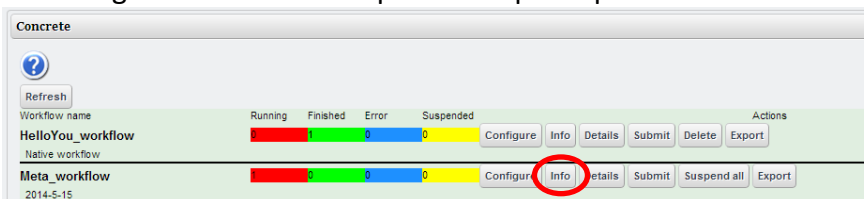
After specifying the job binaries and input/output files and parameters, click on the **Save button** at the bottom of the **Job I/O tab**.

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



2.6 Verifying the configurations of the concrete workflow

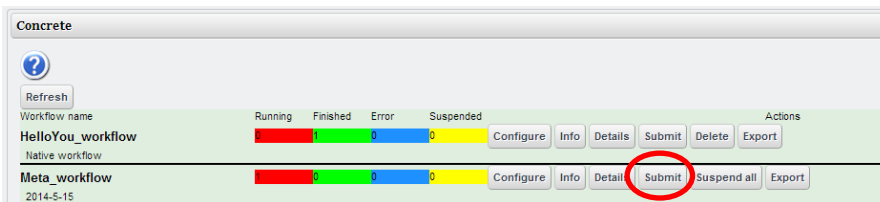
Click on the **Info button** of the concrete workflow, to inspect if there are any misconfigurations which the portal has pick-up.



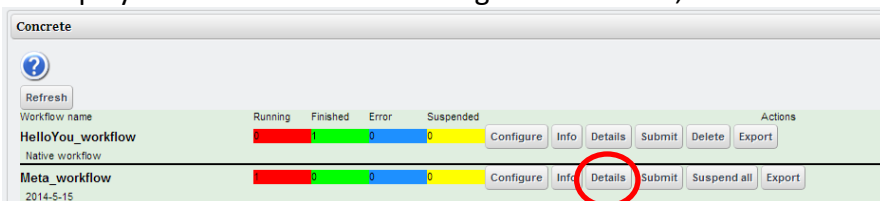
This is not an exhaustive verification of configuration, but does pick-up on common configuration issues.

2.7 Running the configured workflow

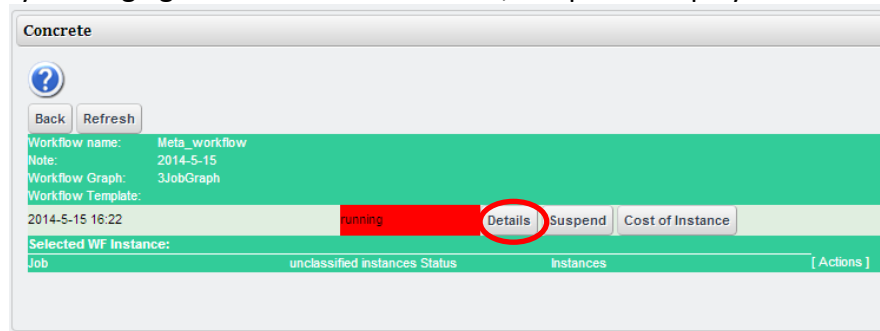
Click on the **Submit button** of the concrete workflow name to submit and execute it.



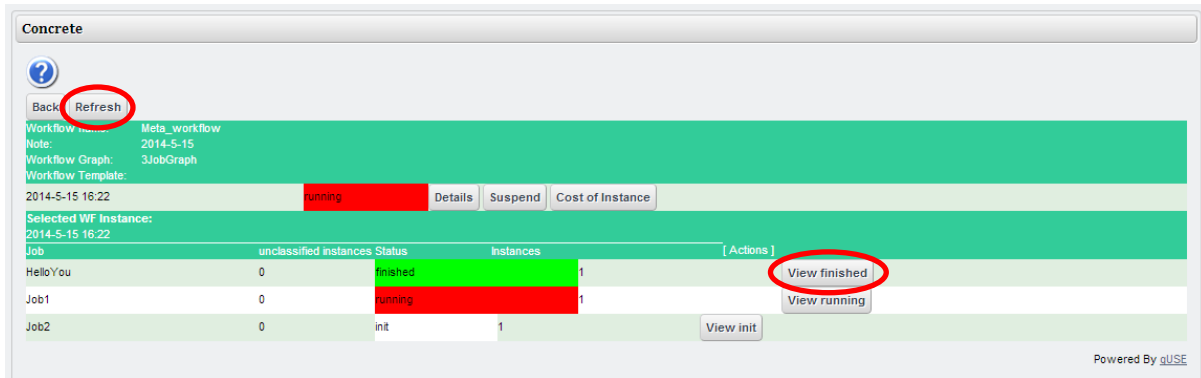
To display the workflow status during the execution, click on the **Details button**.



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.

2.8 Retrieving results of the workflow

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.

