

VPH-Share Research Platform

- VPH-Share is a 20-Partner FP7 Integrated Project that is constructing an online, cloud-based environment in which users can share software tools, applications and data, and can develop and execute *in silico* clinical workflows.
- Four Flagship Workflows are included as demonstrators and, in recent months a significant number of additional Use Cases have been added to the project, several of which are already active
- Operational for over 12 months, with new features and content being added continuously.



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Unified Identity	Security	Workflows	Semantics
			Structured Data
High Performance	Applications		
		Cloud Computing	Unstructured data
<h2>Platform Building Blocks</h2>			
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VPH-Share - Research Partnerships



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Slide Objectives:

- Describe our current mix of partners and collaborators

Speaking Points:

Reviewers: Guided Introduction

At the project's second periodic review in April 2013 the Reviewers proposed that, to obtain an enriched appreciation of the system, they might have access to the infrastructure during the two week period prior to the 3rd Periodic Review. This has been arranged, and VPH-Share accounts have been enabled for each reviewer.

VPH-Share, although carefully designed, is none-the-less a complex infrastructure and, as with all such systems, the full benefits emerge after a degree of familiarisation.

To help with this learning process we have prepared a set of illustrated guidance slide-sets that show users how to begin using the system and carry out three common activities.



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For the busy reviewer

In all cases you'll need to see through the Login process. The three activities are then described in separate tutorials, and each requires around 40 minutes to complete. If time doesn't permit this degree of engagement, it may be that an agreement between Reviewers to split the three tasks amongst you may be a possible solution.

If this is palatable, the data-centred activities are probably the least challenging (perhaps 4/10), with the application and workflow development activities being the most challenging (perhaps 7/10)

If you're particularly time-challenged, but would still like to try the system, the Data activity includes as its final step a search exercise to identify semantically-tagged data; this will give a flavour of the system without requiring a large investment of time.



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Summary

The ultimate goal of many VPH-Share users is to employ the Infrastructure to develop complete workflows capable of accepting patient data as inputs and presenting clinically-relevant diagnostic or treatment information as outputs. These workflows are typically assembled from pre-existing Applications that are chained together to interact and provide clinical solutions. This **Workflow** guide covers the creation of such a workflow:

- We start with an incomplete workflow that will be finished by the addition of missing facilities
- The incomplete workflow is opened in the online workflow editor 'Taverna Online', which gives a diagrammatic view of the existing components and their interconnections
- A new service is added, its parameters are entered, and it is connected into the existing workflow
- The resulting workflow is saved with a new name
- We execute the new workflow, providing details of the required source data
- We inspect various details of the running workflow 'instance'
- Finally we share the completed and tested workflow with other users



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Workflow Execution

01 Search & Discovery

02 Workflow Development

03 Taverna Online

04 Workflow Execution

05 Sharing & Permissions



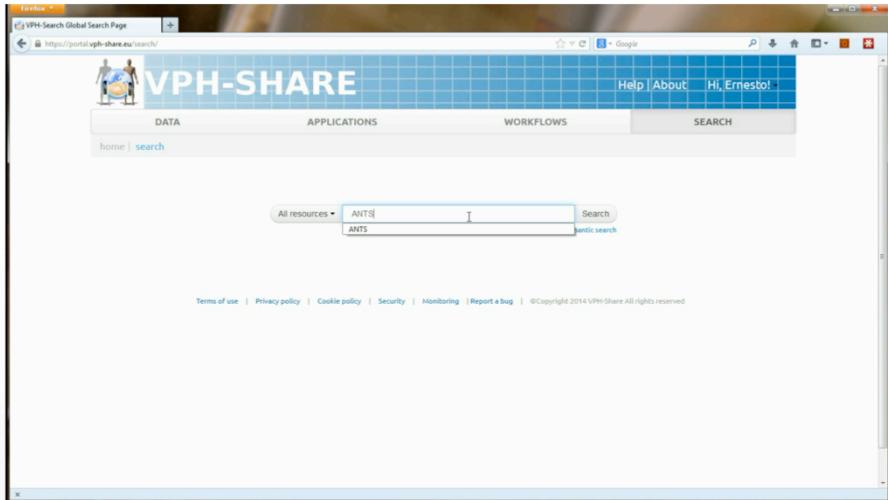
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Video - Workflow Editing & Execution



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01

Search & Discovery

- Click Search > Type '**Registration**' > Facet '**Workflow**'
- Click on '**ANTs Registration Workflow Template**'

The screenshot shows the VPH-SHARE search interface. At the top, there's a navigation bar with links for DATA, APPLICATIONS, WORKFLOWS, and SEARCH. Below the navigation is a search bar with the text 'Registration'. To the right of the search bar is a 'Filter By' sidebar with categories like Dataset, Workflow (which is selected), Application, File, Semantic web service, User, and Institution. The main content area displays a list of repository results under the heading 'We've found 5 repository results'. The results include:

- User ANTs Registration Workflow
- ANTs Registration Reference Workflow
- ANTs Registration Workflow Template (circled with a purple circle)

Each result has a brief description below it.

VPH-Share provides pre-configured and template scientific workflows which are annotated with semantic concepts and may use internal and external services



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User Manual: <http://www.vph-share.eu/content/browse-and-search-workflows>

01

Search & Discovery

- a. Click Search > Type '**Registration**' > Facet '**Workflow**'
- b. Click on '**ANTs Registration Workflow**'
- c. View metadata and click '**Edit Taverna Online**'

The screenshot shows the VPH-SHARE interface for managing workflows. At the top, there's a navigation bar with links for DATA, APPLICATIONS, WORKFLOWS, and SEARCH. The current page is 'WORKFLOWS'. Below the navigation, a breadcrumb trail shows 'home | resources | ANTs Registration Workflow Template'. The main content area displays a workflow template titled 'ANTs Registration Workflow Template'. On the left, there's a 'Description' section with a star rating of 1.5 and a detailed description: 'This is an INCOMPLETE workflow, for tutorial purposes. It converts an input DICOM file (the Moving_<u>Image</u>) to Metalmage format, then takes another Metalmage (the Fixed_<u>Image</u>) and uses ANTs Image Registration to register the Fixed_<u>Image</u> to the Moving_<u>Image</u>.' Below this are sections for 'Created', 'Last update', 'Status', 'Format', and 'Annotations'. On the right, there are metadata fields: 'Type: Workflow', 'Views: 16', 'Category: Multidisciplinary', 'Tags: ants, registration', and 'Licence: GPL'. Below these are four green buttons: 'Configure to execute', 'Download workflow file', 'Edit in Taverna Online' (which has a circled 'C' icon), and 'Download input file'. At the bottom of the page, there are links for 'Terms of use', 'Privacy policy', 'Cookie policy', 'Security', 'Monitoring', 'Report a bug', and copyright information: '©Copyright 2014 VPH-Share All rights reserved'.

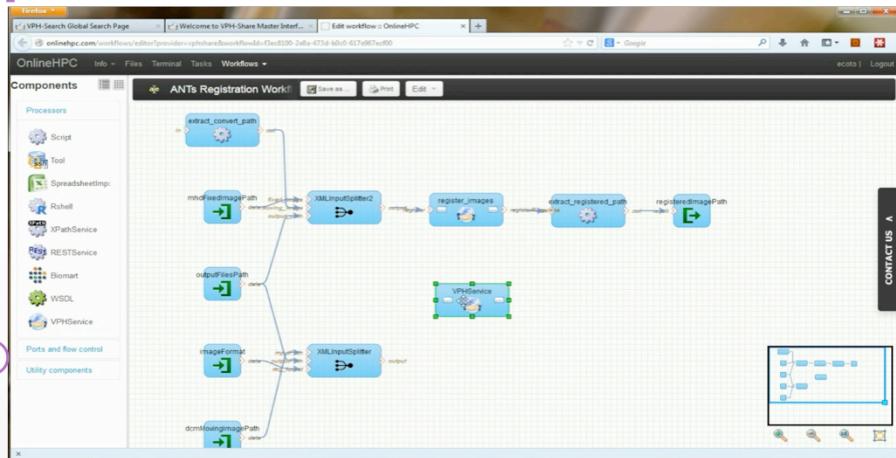
VPH-Share has collaborated with OnlineHPC to provide web-based workflow editing capabilities to users.

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User Manual: <http://www.vph-share.eu/content/browse-and-search-workflows>

02 Workflow Development

a. Drag & Drop 'VPHService' onto workflow



VPH-Share via Taverna Online allows users to import services, workflows and data into their Taverna Online workspace for development and execution.



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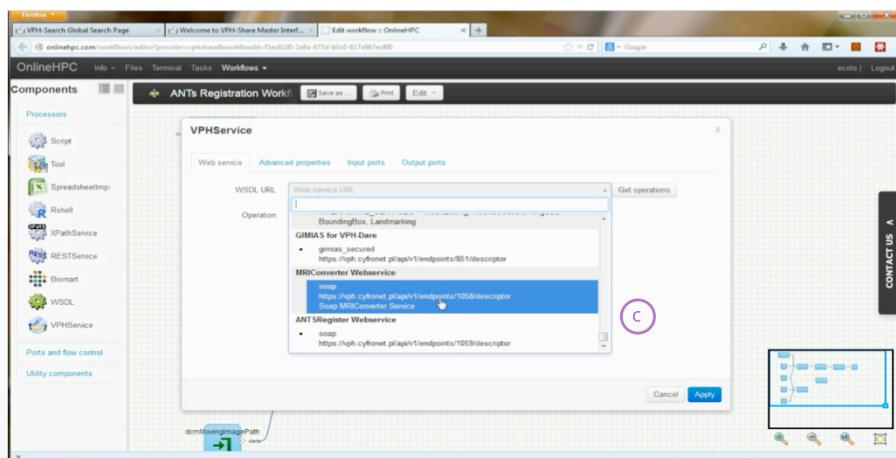
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User manual: <http://www.vph-share.eu/content/workflow-composition-taverna-online>

02 Workflow Development

- a. Drag & Drop '**VPHService**' onto workflow
- b. Double-click **VPHService** to configure the service
- c. Choose **MRIConverter Webservice** and **get operations**
- d. Choose **convert** and click **Apply**



VPH-Share via Taverna Online allows users to import services, workflows and data into their Taverna Online workspace for development and execution.



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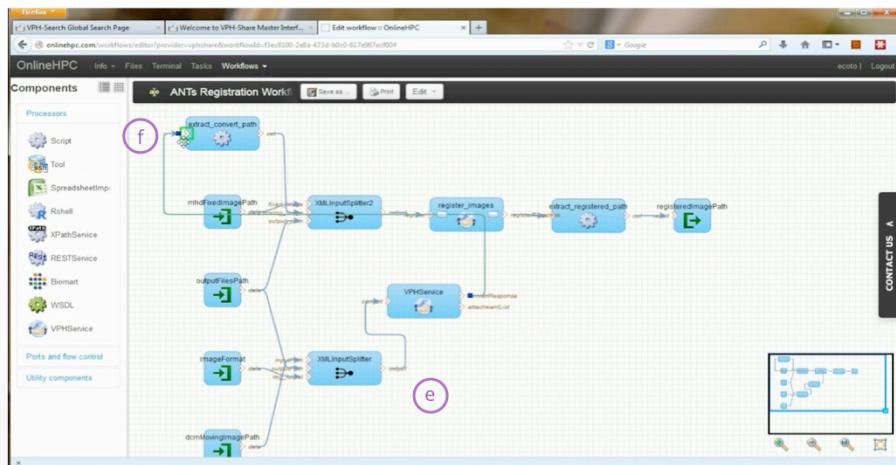
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User manual: <http://www.vph-share.eu/content/workflow-composition-taverna-online>

02 Workflow Development

- e. Connect **XMLInputSplitter** to the **VPHService convert**
- f. Connect **VPHService convertResponse** to **extract_convert_path**



VPH-Share via Taverna Online allows users to import services, workflows and data into their Taverna Online workspace for development and execution.



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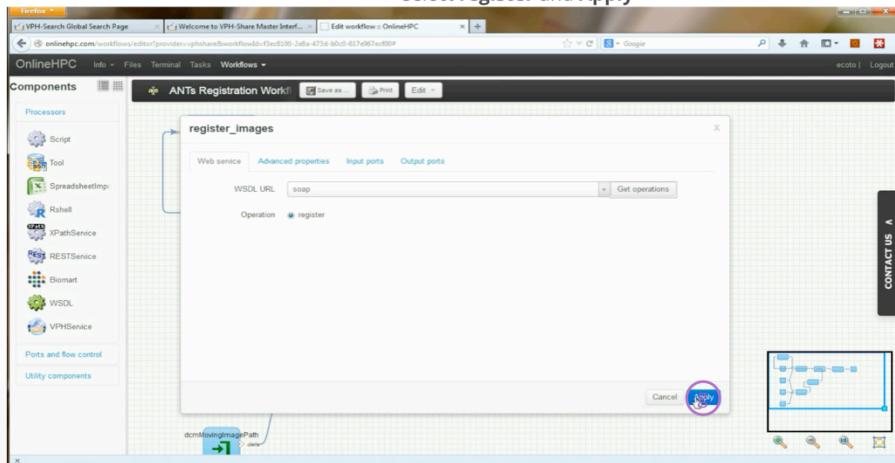
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User manual: <http://www.vph-share.eu/content/workflow-composition-taverna-online>

02 Workflow Development

- e. Connect **XMLInputSplitter** to the **VPHService convert**
- f. Connect **VPHService convertResponse** to **extract_convert_path**
- g. Double-click **register_images** and **get operations** and select **register** and **Apply**



VPH-Share via Taverna Online allows users to import services, workflows and data into their Taverna Online workspace for development and execution.



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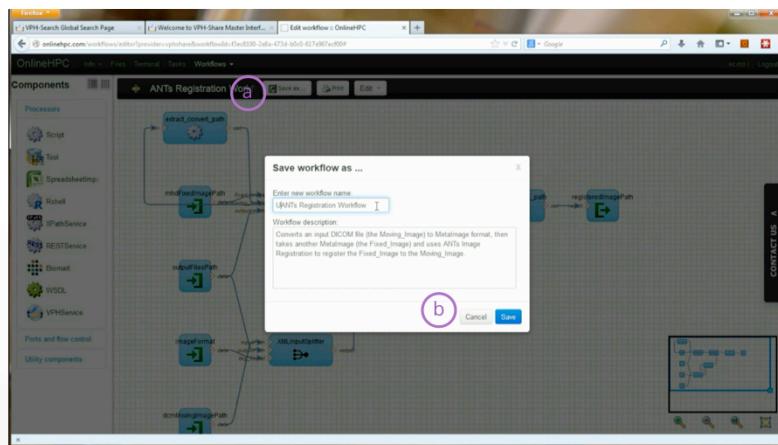
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User manual: <http://www.vph-share.eu/content/workflow-composition-taverna-online>

03 Taverna Online

- a. Click **Save as**
- b. Rename workflow as “**NAME ANTs Registration Workflow**” and click **Save**
- c. Click **Launch**



VPH-Share provides complete integration with Taverna Online as user are able to save and execute their workflows back to VPH-Share



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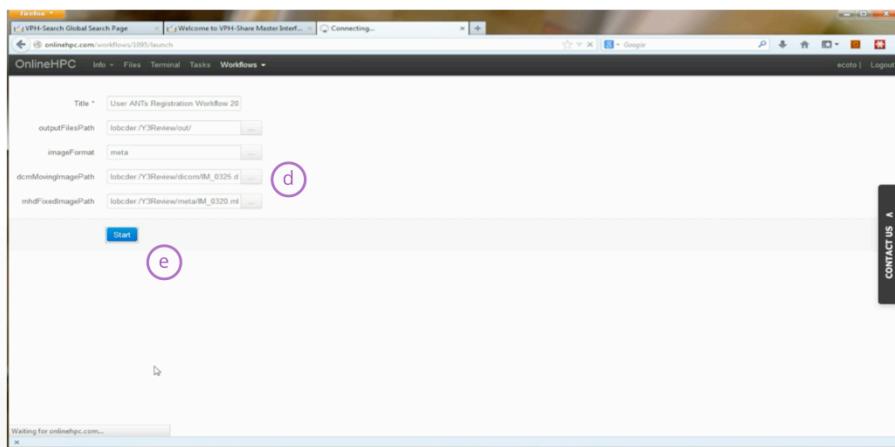
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User manual: <http://www.vph-share.eu/content/workflow-composition-taverna-online>

03 Taverna Online

- d. Fill input parameters with:
outputFilesPath: Pick **home > NAME > demo > out**
imageFormat: **meta**
dcmMovingImagePath: Pick **home > NAME > demo > dicom > IM_0325.dcm**
dcmFixedImagePath: Pick **home > NAME > demo > dicom > IM_0320.dcm**

e. Click **Start**



Users are able to configure their workflows with parameters and by selecting input files from VPH-Share



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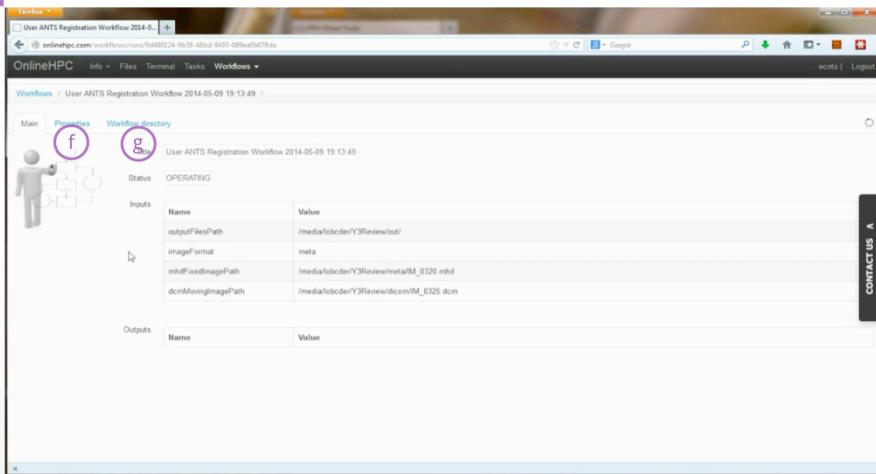
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User manual: <http://www.vph-share.eu/content/workflow-execution-taverna-online>

03 Taverna Online

- f. Click on **Properties** to view the workflow properties
- g. Click on **Workflow directory** to view



Workflows can also be executed from within Taverna Online



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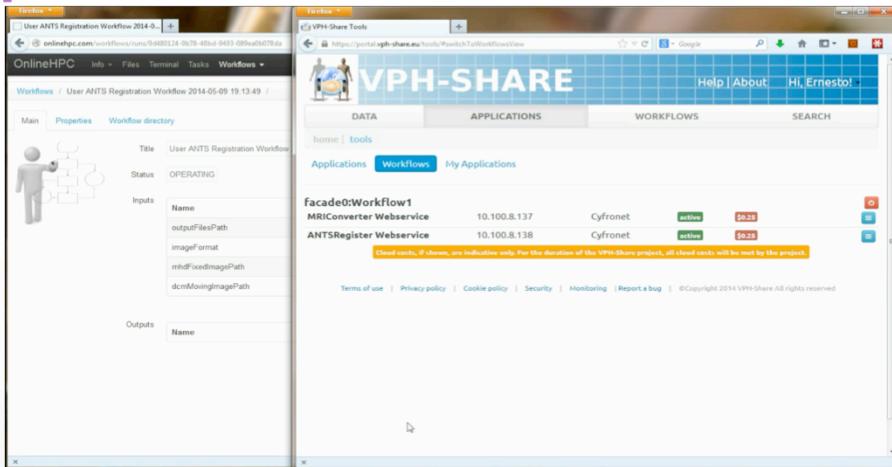
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User manual: <http://www.vph-share.eu/content/workflow-execution-taverna-online>

04 Workflow Execution

- a. Navigate to **Applications > Workflows**
- b. View Applications automatically started by the workflow. **MRIConverter** and **ANTSRegister**



Taverna Online executed workflows automatically starts Applications within VPH-Share for processing by the workflow



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User manual: <http://www.vph-share.eu/content/workflow-execution-taverna-online>

04 Workflow Execution

- a. Navigate to **Applications > Workflows**
- b. View Applications automatically started by the workflow. **MRIConverter** and **ANTSRegister**
- c. On completion, navigate to FileStore and your home directory to view the converted files.

o	dicom	owned by susheel	modified 06 May 2014		
o	meta	owned by ecoto	modified 08 May 2014		
o	out	owned by ecoto	modified 08 May 2014		
	IM_0320_IM_0325.nii	owned by ecoto	modified 09 May 2014	2097504 bytes	
	IM_0320_IM_03250GenericAffine.mat	owned by ecoto	modified 09 May 2014	137 bytes	
	IM_0320_IM_03251InverseWarp.nii.gz	owned by ecoto	modified 09 May 2014	9881 bytes	
	IM_0320_IM_03251Warp.nii.gz	owned by ecoto	modified 09 May 2014	9881 bytes	
	IM_0325.mhd	owned by ecoto	modified 09 May 2014	365 bytes	
	IM_0325.raw	owned by ecoto	modified 09 May 2014	524288 bytes	
	IM_0325_Info.txt	owned by ecoto	modified 09 May 2014	779 bytes	

VPH-Share allows



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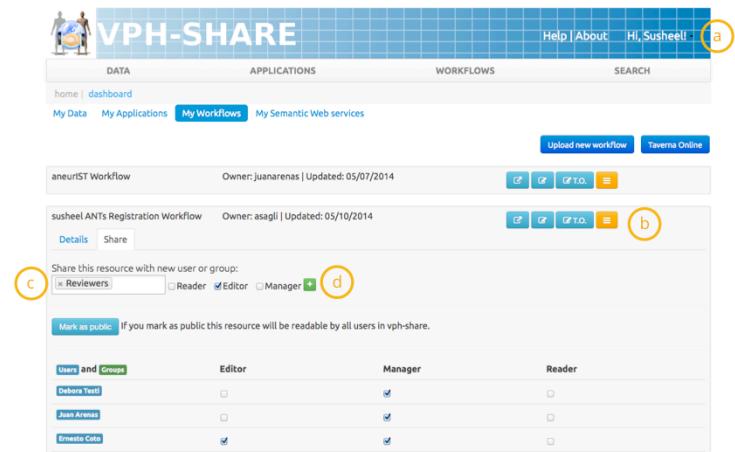
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User manual: <http://www.vph-share.eu/content/workflow-execution-taverna-online>

05 Sharing & Permissions

- a. Click on your NAME > Dashboard > My Workflows
- b. Select your Application >  > Share Tab
- c. Search for individual or Group
- d. Choose permission 'Editor' and click the plus sign



The screenshot shows the VPH-SHARE interface. At the top, there's a navigation bar with 'DATA', 'APPLICATIONS', 'WORKFLOWS', 'SEARCH', 'Help', 'About', and a 'Hi, Susheel!' greeting. Below the bar, the 'My Workflows' tab is selected. A list of workflows is shown, with the first one, 'aneurIST Workflow', having its details visible. The 'Details' tab is active, showing the owner as 'juanarenas' and the last update as '05/07/2014'. Below the details, there's a 'Share' section where 'Reviews' is selected. A 'Mark as public' link is present. At the bottom, a table lists users and groups with checkboxes for 'Editor', 'Manager', and 'Reader' permissions.

Users and Groups	Editor	Manager	Reader
Debora Testi	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Juan Arenas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ernesto Cola	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

VPH-Share allows fine-grained permissions on all resources. Sharing may be performed on individuals and/or groups according to the needs of the resource



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User manual: <http://www.vph-share.eu/content/grant-permissions>

GLOSSARY

- API – Application Programming Interface
- Workflow – A sequence of steps configured to be performed by passing data or control signals



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Sheffield Teaching Hospitals NHS

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Excellence as standard



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Slide Objectives:

Speaking Points:

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