

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.

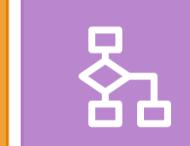


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Unified Identity	Security	Workflows	Semantics
			Structured Data
High Performance	Applications		
		Cloud Computing	Unstructured data
<h2>Platform Building Blocks</h2>			
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VPH-Share - Research Partnerships



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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

VPH-Share provides for the development and sharing of computational processes that are useful as components of larger workflows (and perhaps also as stand-alone entities). This **Application** guide covers the creation of a VPH-Share Application built from a pre-existing service.

- Become familiar with the process of using VPH-Share Applications
- Find an existing Application already available within VPH-Share, note its characteristics
- Start an instance of the Application
- Identify important information required to make use of this now-running Application
- Create a new Application from an existing program (which is provided to you); first, install the program and try it out on your local PC.
- Create the VPH-Share Application...
- Obtain the necessary confidential 'Secure Shell' SSH credentials and uploading them
- Choose the basic 'wrapper' that will be used to encapsulate the Application
- Define the details of the wrapper, including its 'endpoint' (the location where the service will become available)
- Make the Application available to other users.



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Cloud Application Developer

01 Search & Discovery

02 Cloud Application Instantiation

03 Application Deployment

04 Application Endpoints

05 Sharing & Permissions



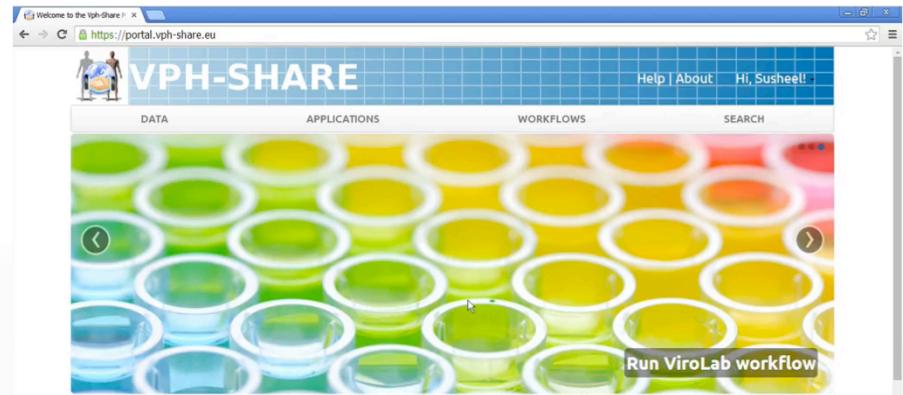
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Cloud Application Developer



Welcome to the Vph-Share

VPH-SHARE

DATA APPLICATIONS WORKFLOWS SEARCH

Run ViroLab workflow

WELCOME TO THE MASTER INTERFACE!

VPH-Share is an online environment for the development, construction and storage of biomedical workflows. It is designed to help researchers, clinicians and software developers share resources - data and tools - to build workflows quickly and easily.

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01 Search & Discovery

- Click **Search** Tab and search for '**Registration**' and filter by '**Applications**' to drill-down the results.
- Choose the '**ANTSSRegister WebService**'

The screenshot shows the VPH-SHARE application search interface. At the top, there is a navigation bar with links for DATA, APPLICATIONS, WORKFLOWS, and SEARCH. The SEARCH tab is active. A search bar contains the text 'Registration'. To the right of the search bar is a button labeled 'Search' with a magnifying glass icon, which is circled in orange. Below the search bar, a message says 'We've found 2 repository results'. Two items are listed: 'ANTSRegister Webservice' and 'GIMIAS Full Configuration'. The 'ANTSRegister Webservice' item is highlighted with a yellow circle and labeled 'b'. On the right side of the search results, there is a sidebar titled 'Filter By' with options for Dataset, Workflow, Application, File, Semantic web service, User, and Institution. Below this is a 'Refine' section with fields for Category, Author, Licence, and Tags.

VPH-Share provides base application templates and pre-configured applications that can be instantiated by user with authorised permissions for use.



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User Manual (General Search): <http://www.vph-share.eu/content/general-search>

User Manual (Browse Applications): <http://www.vph-share.eu/content/browse-and-search-applications>

01 Search & Discovery

- Click **Search Tab** and search for '**Registration**' and filter by '**Applications**' to drill-down the results.
- Choose the '**ANTSRegister WebService**'
- View metadata and available **soap** endpoint

The screenshot shows the VPH-SHARE application interface. At the top, there are tabs for DATA, APPLICATIONS, WORKFLOWS, and SEARCH. The APPLICATIONS tab is selected, showing a list of applications. One application is highlighted: 'ANTSRegister Webservice'. The details for this application are displayed in a central panel:

- Rating:** ★★★★★ (5 stars)
- Description:** ANTsRegister SOAP Service. Uses Image Registration to register a Fixed_Image to a Moving_Image.
- Created:** May 6, 2014, 2:10 p.m.
- Last update:** May 9, 2014, 8:37 a.m.
- Status:** published
- Annotations:** This resource has not semantic annotations.
- Available endpoints:** soap (highlighted with a yellow circle)

On the right side of the application details panel, there are metadata fields:

- Type: AtomicService
- Views: 6
- Category: None
- Tags

A green 'Start application' button is located at the bottom right of the application details panel.

At the bottom of the page, there is a footer with links: Terms of use, Privacy policy, Cookie policy, Security, Monitoring, Report a bug, and Copyright 2014 VPH-Share All rights reserved.

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User Manual (General Search): <http://www.vph-share.eu/content/general-search>

User Manual (Browse Applications): <http://www.vph-share.eu/content/browse-and-search-applications>

02

Cloud Application Instantiation

a. Click 'Start Application'

The screenshot shows the VPH-SHARE application management interface. At the top, there is a navigation bar with links for DATA, APPLICATIONS, WORKFLOWS, and SEARCH. On the right side of the header, there are links for Help, About, and a user profile (Hi, Susheel). Below the header, the main content area displays a list of applications. One application is highlighted: 'ANTSSRegister Webservice'. The details for this application include:

- Type:** AtomicService
- Views:** 6
- Category:** None
- Tags:** None

Below these details is a green button labeled 'Start application' with a yellow circle containing the letter 'a' to its right.

Under the application details, there is a section for 'Available endpoints':

- SOAP** (link: <https://vph.cyfronet.pl/api/v1/endpoints/1059/descriptor>)

At the bottom of the page, there is a footer with the following information:

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User Manual: https://vph.cyfronet.pl/tutorial/doku.php?id=as_instantiation

02 Cloud Application Instantiation

- a. Click 'Start Application'
- b. Wait for the Application to be instantiated and click blue dropdown box
- c. Developers may access exposed WS/REST Services or via SSH

The screenshot shows the VPH-SHARE application management interface. At the top, there's a navigation bar with links for DATA, APPLICATIONS, WORKFLOWS, and SEARCH, along with a user profile 'Hi, Susheel!'. Below the navigation is a sub-navigation bar with links for home, tools, Applications (which is selected), Workflows, and My Applications.

The main content area displays a table of applications. One row is highlighted for 'ANTSRegister Webservice' with the following details:

Name	IP	Location	Status	Cost	Actions
ANTSRegister Webservice	10.100.8.93	Cyfronet	active	\$0.25	

Below this table, there are sections for 'Web Applications' (empty) and 'WS/REST Services'. Under 'WS/REST Services', there are three entries: 'soap' (with an 'http' icon and a circled 'c'), 'Other services' (empty), and 'ssh' (with the IP address 149.156.10.132:24523).

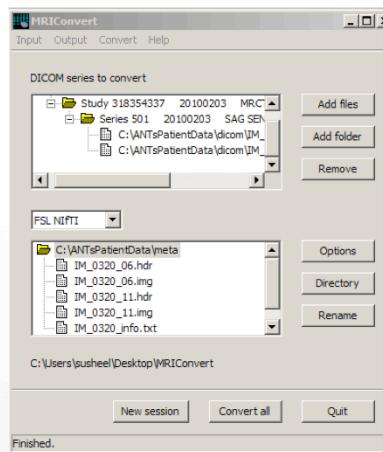
At the bottom of the page, there are links for Terms of use, Privacy policy, Cookie policy, Security, Monitoring, Report a bug, and Copyright 2014 VPH-Share All rights reserved. There's also a logo of a person holding a globe and the text '© VPH-Share 2014'.

Cloud Applications may be instantiated with different (CPU, RAM, HDD) flavours and different pre-configured configurations in developer mode that allows the application to be configured further

User Manual: https://vph.cyfronet.pl/tutorial/doku.php?id=as_instantiation

03 Application Deployment

- a. Double-click '**MRIConvert**' application from ANTsPatientData.zip
- b. Choose '**Add Files**' in **ANTsPatientData > dicom** folder
- c. Choose **MetalImage** and an output directory



We will be using a simple MRI Image converter application that we will be using to demonstrate how a developer of the application may deploy this application within VPH-Share



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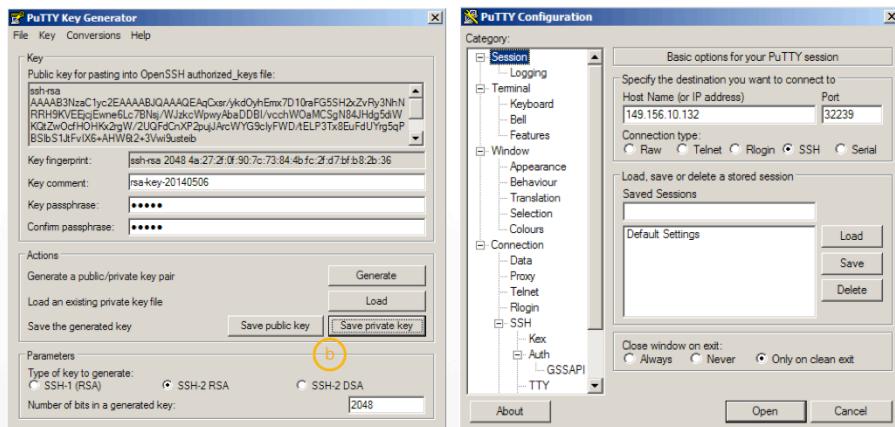
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User Manual: https://vph.cyfronet.pl/tutorial/doku.php?id=as_development

03 Application Deployment

- a. Download and Install **Putty** and **PuttyGen** (Windows)
b. **Use PuttyGen together with Putty** to generate SSH public keys
allow developers low-level access to VPH-Share. To
ensure complete security, the user must generate
these keys locally and upload to VPH-Share.



Developers can obtain deep low-level access to the instantiated Application. For this, user must create an SSH private key and upload their public to VPH-Share



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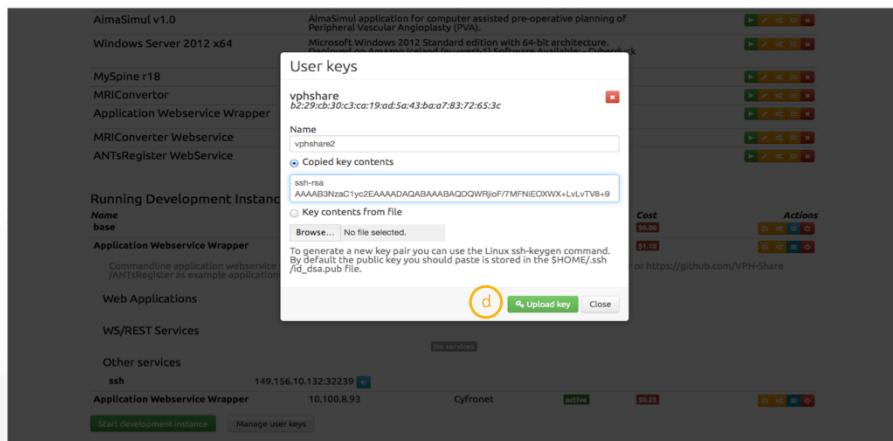
User Manual: https://vph.cyfronet.pl/tutorial/doku.php?id=as_development

SSH Keys Generation: On linux, use ssh-keygen See:

https://vph.cyfronet.pl/tutorial/doku.php?id=as_development#registering_developer_credentials

03 Application Deployment

- Download and Install **Putty** and **PuttyGen** (Windows)
- Use **PuttyGen** to generate the SSH private & public keys
- Navigate to **Applications > My Applications > Manage Keys**
- Upload the **public key** to VPH-Share



Developers can obtain low-level access to the instantiated application. For this, the registered user must create an SSH private key and upload their public keys to VPH-Share



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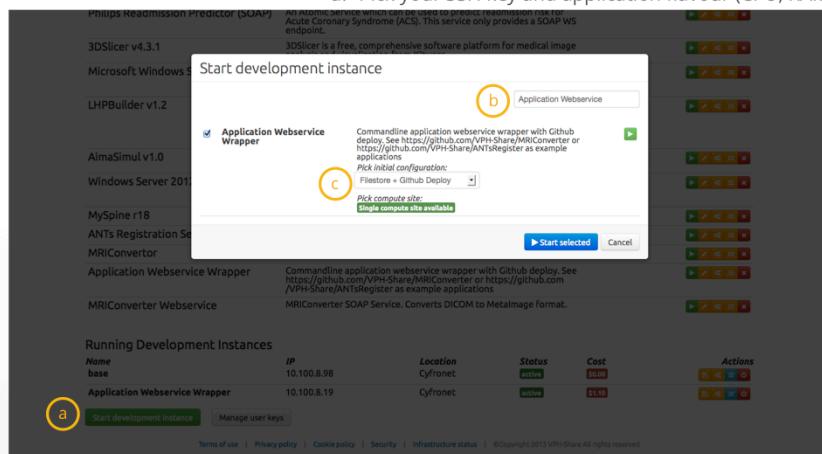
User Manual: https://vph.cyfronet.pl/tutorial/doku.php?id=as_development

SSH Keys Generation: On linux, use `ssh-keygen` See:

https://vph.cyfronet.pl/tutorial/doku.php?id=as_development#registering_developer_credentials

03 Application Deployment

- Click Applications > My Applications > Start Development
- Filter using '**Application Webservice Wrapper**'
- Choose '**Github Deploy**' configuration and set variable to <https://github.com/VPH-Share/MRIConverter>
- Pick your SSH key and application flavour (CPU, RAM)



VPH-Share allows developers to customise application templates and applications with SSH and/or remote desktop access. Configurations can also be used to deploy your application, simply by providing your Github repository in this example.



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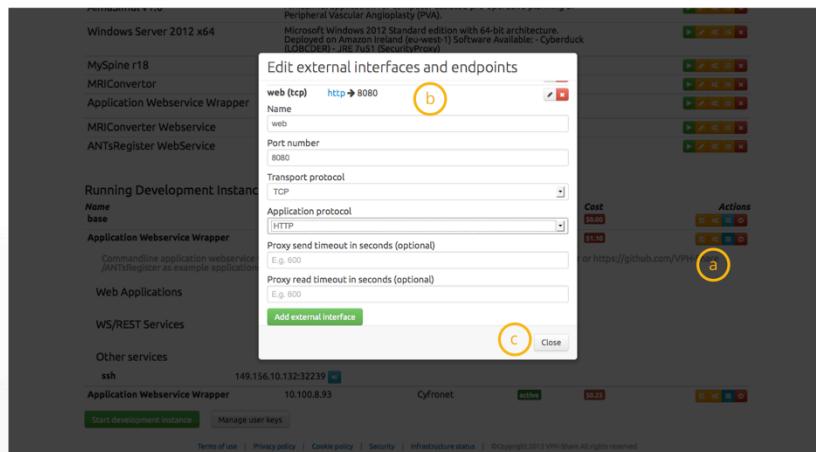
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User Manual: https://vph.cyfronet.pl/tutorial/doku.php?id=as_development

Note: Initial configurations can be used to pass custom data directly to your service instance. Once the service has booted, the initial configuration will be exposed to it under a special URI.

04 Application Endpoints

- Click icon to edit external interfaces
- Add the following as a new external interface
name = 'web', port = '8080', transport_protocol = 'TCP'
application_protocol 'HTTP'
- Click Close



Applications that need to be configured to be available via the web need to expose a transport protocol (TCP, UDP) port that will be automatically be redirected by VPH-Share



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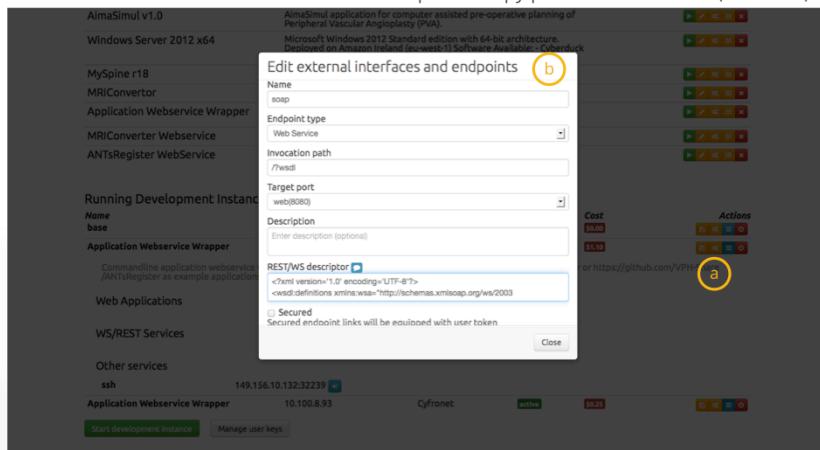
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User Manual: https://vph.cyfronet.pl/tutorial/doku.php?id=as_development

04 Application Endpoints

- Click  icon to edit endpoints
- Add the following as a new endpoint
name='soap', endpoint='webservice', invocation_path='/?wsdl', target_port=web(8080), WS Descriptor -> copy paste the WSDL text (See Note)



Webservices or web applications that expose an endpoint must also be configured to be made available to other users via the internet.



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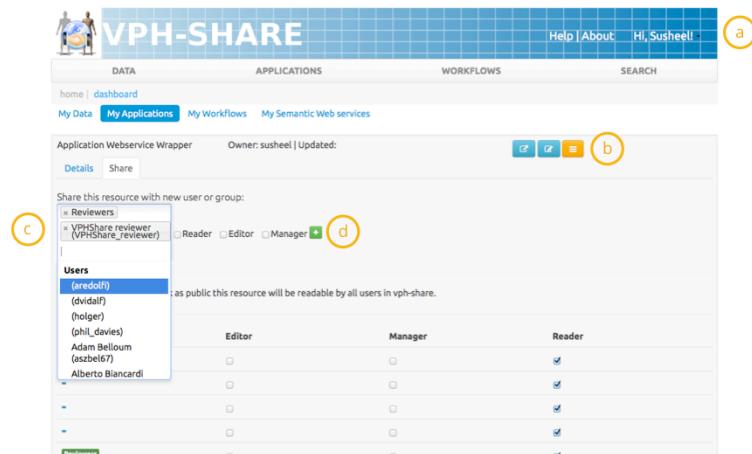
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User Manual: https://vph.cyfronet.pl/tutorial/doku.php?id=as_development
REST/WS Descriptor:

```
<?xml version='1.0' encoding='UTF-8'?>
<wsdl:definitions name="MRIConverter" targetNamespace="mri"
  xmlns:plink="http://schemas.xmlsoap.org/ws/2003/05/partner-link/"
  xmlns:s1="MRIConverter" xmlns:s12enc="http://www.w3.org/2003/05/soap-
  encoding/" xmlns:s12env="http://www.w3.org/2003/05/soap-envelope/"
  xmlns:senc="http://schemas.xmlsoap.org/soap/encoding/" xmlns:senv="http://
  schemas.xmlsoap.org/soap/envelope/" xmlns:soap="http://schemas.xmlsoap.org/
  wsdl/soap/" xmlns:tns="mri" xmlns:wsa="http://schemas.xmlsoap.org/ws/2003/03/
  addressing" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns:xop="http://
  www.w3.org/2004/08/xop/include" xmlns:xs="http://www.w3.org/2001/
  XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <wsdl:types>
    <xsd:schema elementFormDefault="qualified" targetNamespace="mri">
      <xsd:import namespace="MRIConverter"/>
      <xsd:import namespace="http://www.w3.org/2001/XMLSchema"/>
      <xsd:complexType name="convert">
        <xsd:sequence>
          <xsd:element minOccurs="0" name="img_format" nillable="true"
            type="xsd:string"/>
```

05 Sharing & Permissions

- a. Click on your NAME > Dashboard > My Applications
- 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 application's sharing interface. At the top, there's a header with the logo and the text 'VPH-SHARE'. Below it is a navigation bar with tabs for DATA, APPLICATIONS, WORKFLOWS, and SEARCH. The APPLICATIONS tab is selected, showing a list of applications: 'My Data', 'My Applications' (which is highlighted in blue), 'My Workflows', and 'My Semantic Web services'. Under 'My Applications', it says 'Application Webservice Wrapper' and 'Owner: susheel | Updated:'. There are four buttons below this: 'Details', 'Share' (which is circled 'a'), and three others. A dropdown menu is open over the 'Share' button, showing 'Share this resource with new user or group:' followed by a list of users and groups. One item in the list is circled 'c'. The list includes '(redolfi)' (selected), '(davidl)', '(holger)', '(phil_davies)', 'Adam Balogun', '(aszelofit)', and 'Alberto Biancardi'. To the right of the dropdown is a table with columns for 'Editor', 'Manager', and 'Reader'. The 'Manager' column has a checked checkbox next to '(redolfi)'. Below the table, there's a note: 'as public this resource will be readable by all users in vph-share.' At the bottom left is a copyright notice: '© VPH-Share 2014'. At the bottom right are links: 'Period 3 Review, 23-May-14', 'Email support@vph-share.eu', and the page number '21'.

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 owner.

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

https://vph.cyfronet.pl/tutorial/doku.php?id=as_development#sharing_your_service_with_other_users

GLOSSARY

- API – Application Programming Interface
- Webservice – A method of communication between two electronic addresses on the Internet. Typically between a client and a server
- SOAP – Type of webservice communication protocol
- REST – Type of webservice communication protocol
- SSH – Secure Shell. Method of access to a remote server
- Metalmage – Type of image format specification
- WSDL – SOAP webservice definition language



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VPH-Share Consortium Partners



The
University
Of
Sheffield.



Sheffield Teaching Hospitals NHS

NHS Foundation Trust

Excellence as standard



UNIVERSITY OF AMSTERDAM



Slide Objectives:

Speaking Points:

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Slide Objectives:

Speaking Points: