



SCIDIP-ES

SCIENCE DATA INFRASTRUCTURE FOR PRESERVATION - EARTH SCIENCE

D21.5 Preservation Assistant Installation and User Manual

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Abstract:

This document represents the User Manual for the Preservation Assistant developed for the SCIDIP-ES project. The Preservation Assistant helps users generate Representation Information Networks guided by pre-defined templates such as an ontology. This document contains relevant information on how to install, configure, manage and use the Preservation Assistant.

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1 Introduction

1.1 Purpose and Scope

This document describes the installation and configuration process for the Preservation Assistant (PA) as well as an overview of its usage.

1.2 Target Audience

System administrators, application deployers and end-users.

1.3 System Context

The PA is used independently within the SCIDIP-ES e-Infrastructure to support the process of creating and populating the contents of a registry-repository with preservation data. It is used primarily in conjunction with the RepInfo Registry Service component (see [D21.3]).

2 Software Design

2.1 Overview

The PA is a Spring¹ Web MVC application using the Thymeleaf² library for natural templating in the view layer and JPA for ORM between the persistence layer and the model classes. Spring security is utilised to provide a flexible framework for authentication and authorisation.

2.2 Information Model

Figure 1 shows the information model underpinning the PA application.

¹ Spring - <http://spring.io/>

² Thymeleaf - <http://www.thymeleaf.org/>

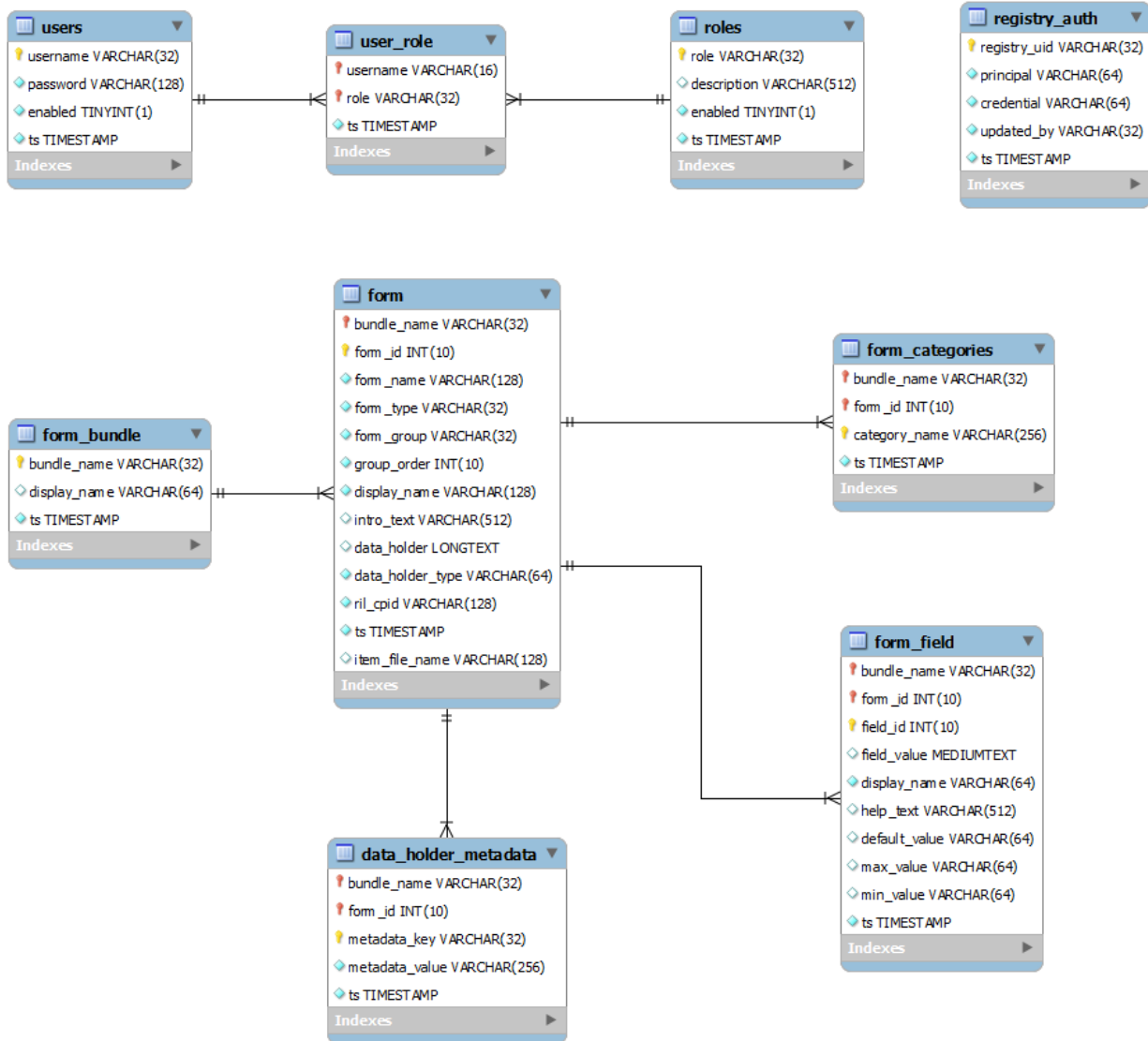


Figure 1: PA information model

3 Installation Guide

3.1 Prerequisites

The installer should have a working knowledge of Java web application deployment to compatible application servers and containers (such as Apache Tomcat³), the MySQL⁴ database server and, if building the latest version of the application form source, the Maven⁵ dependency management and build tool.

3.1.1 Software prerequisites

³ Apache Tomcat - <http://tomcat.apache.org/tomcat-7.0-doc/>

⁴ MySQL database - <http://dev.mysql.com/>

⁵ Apache Maven - <http://maven.apache.org/>

- HTML5-compatible web browser, for optimal user experience (e.g. Google Chrome, Mozilla Firefox)
- Tomcat v6+
- MySQL 5.5+ (for production use)
- HSQLDB⁶ (optional – for development or evaluation purposes only)

3.1.2 Hardware prerequisites

None

3.2 OSS/COTS Installation

N/A

3.3 License Information and Terms of Use

The Preservation Assistant is developed for the SCIDIP-ES project and is licensed under the Apache License, Version 2.0 (the "License"). A copy of the License could be obtained at:

<http://www.apache.org/licenses/LICENSE-2.0>

3.4 Download information

The latest version of the code can be checked out (or exported) from SourceForge using the following connection URL:

<https://svn.code.sf.net/p/digitalpreserve/code/SCIDIP-ES/software/toolkits/preservation-assistant/>

For example,

```
svn export https://svn.code.sf.net/p/digitalpreserve/code/SCIDIP-ES/software/toolkits/preservation-assistant/
```

Pre-built milestone releases can be downloaded from the SCIDIP-ES repository:

<http://nexus.scidip-es.eu/content/repositories/releases/eu/scidipes/toolkits/pa-webapp/>

Select the version you require by directory then download the WAR web archive, e.g.

<http://nexus.scidip-es.eu/content/repositories/releases/eu/scidipes/toolkits/pa-webapp/1.1/pa-webapp-1.1.war>

⁶ HSQLDB - <http://hsqldb.org/>

3.5 Preservation Assistant Installation

3.5.1 Overview

Installation of the PA into a production environment involves three main steps:

- a. Install (deploy) the PA web application and set required system properties
- b. Create the backend database
- c. Update the web application's database connection properties

The PA web application could in theory be deployed to any Servlet 2.5+ compatible container such as GlassFish⁷ or WebLogic⁸; the process of deploying to Apache Tomcat is described in Section 3.5.2. It is the only container that has been used for testing.

The PA requires its own database to manage preservation project data in addition to security data such as users and roles. MySQL should be used in production environments and the installation process is described in section 3.5.3.

3.5.2 Install PA Web Application under Tomcat 7+

1. Configure the following Tomcat system properties:

- a. **pa.sources.path**: a tomcat-writable directory to store PA bundle template files. Template bundle files may be ontologies, for example the PDSC⁹ [Earth Science ontology](#) or any format for which an appropriate PA adaptor exists.
- b. **pa.db-props**: full file path to database connection properties file (optional – defaults to `/[PA_WEBAPP_HOME]/WEB-INF/classes/db/data-access.properties`).

NB: It is advantageous to set this system property to avoid overwriting your connection settings when upgrading the PA webapp.

The standard place to define system properties is in Tomcat's `setenv.bat` (Windows) / `setenv.sh` (Linux) file, found in the `$TOMCAT_HOME/bin` directory. For example, in a linux environment the following entries will set the two PA system properties:

```
CATALINA_OPTS="$CATALINA_OPTS -Dpa.db-props=/app/pa/data-access.properties"  
export CATALINA_OPTS="$CATALINA_OPTS -Dpa.sources.path=/app/pa/pa-sources"
```

2. Deploy the WAR to your running Tomcat server. Assuming the `autoDeploy` option is set to `true` in the server configuration, this simply involves copying the WAR into Tomcat's `webapps` directory; the server will deploy the file into an exploded directory structure.

⁷ Glassfish Server - <https://glassfish.java.net/>

⁸ Oracle Weblogic Server - <http://www.oracle.com/technetwork/middleware/weblogic/overview/index.html>

⁹ Long Term Data Preservation Earth Observation Preserved Data Set Content - http://earth.esa.int/gscb/lt dp/LTDP_PDSC_4.0.pdf

Hint: The name of the WAR file will form the deployed application's context root (i.e. the path on which the application is accessed in a browser) and the deployer may optionally rename the WAR prior to deployment to affect this (e.g. to remove the version number).

3. Depending on your Tomcat server's classloading security configuration, it may be necessary to move the MySQL JDBC connector JAR from the PA's lib directory:

```
$TOMCAT_HOME/webapps/pa-webapp/WEB-INF/lib/mysql-connector-java-5.1.9.jar
```

to:

```
$TOMCAT_HOME/lib
```

If you see errors in the Tomcat log such as “java.lang.ClassNotFoundException: com.mysql.jdbc.Driver” then you should move the JAR as described above.

3.5.3 Install Database

MySQL:

1. Within the deployed application directory find the following file:

```
$WEBAPPS/pa-webapp/WEB-INF/classes/db/mysql/init.sql
```

2. Run init.sql as a user such as root to create the local PA database and user (follow the instructions in the comments at the start of the file). For example:

```
#> mysql -u root -p < init.sql
```

HSQldb (HyperSQL DataBase)

For development and evaluation purposes, the PA can be configured to use either an embedded in-memory or standalone server instance of HSQLDB (a pure Java SQL relational database).

To run HSQLDB in-memory with database re-initialisation on each context reload:

1. Within the deployed application directory find and edit the following file:

```
$WEBAPPS/pa-webapp/src/main/resources/spring/datasource-config.xml
```

Uncomment the following lines, then save the file:

```
<jdbc:initialize-database data-source="dataSource">
  <jdbc:script location="${jdbc.initLocation}" />
  <jdbc:script location="${jdbc.populateLocation}" />
</jdbc:initialize-database>
```

2. Within the deployed application directory find and edit the following file:

```
/pa-webapp/src/main/resources/db/data-access.properties
```

In the HSQLDB section, ensure the following line is uncommented, along with the other HSQLDB properties:

```
jdbc.url=jdbc:hsqldb:mem:pawebapp
```

This ensures the use of an in-memory HSQLDB instance when the app is started.

NB: To run the PA against a local standalone HSQLDB server, simply change the above property to:

```
jdbc.url=jdbc:hsqldb:hsqldb://localhost/xdb
```

3. Skip to step 2 in section 3.5.4 (restart Tomcat).

3.5.4 Update database connection properties and restart app

1. Assuming you have set system property **pa.db-props** then copy the following file to the defined location and update the relevant section with your DB connection properties:

```
$WEBAPPS/pa-webapp/WEB-INF/classes/db/data-access.properties
```

2. Restart Tomcat, or just the PA application if you have a manager app capable of doing so.
3. Browse to [http://\[servername\]/pa-webapp/](http://[servername]/pa-webapp/) (modify according to the name of the deployed WAR)

3.6 Uninstallation

3.6.1 Uninstall Web Application

Undeploy the PA application from Tomcat, delete the PA WAR file and the exploded directory from the Tomcat's webapps folder. Remove any PA system properties from your container and associated directories and files from the file system.

3.6.2 Uninstall Database

Drop the database from MySQL.

4 User Guide

4.1 Accessing the Preservation Assistant

Access to the PA web application is through a modern web browser such as Chrome or Firefox. If the application were deployed to a standard Tomcat installation running on the localhost, the URL might be:

<http://localhost:8080/pa-webapp/>

You should see the following home page:

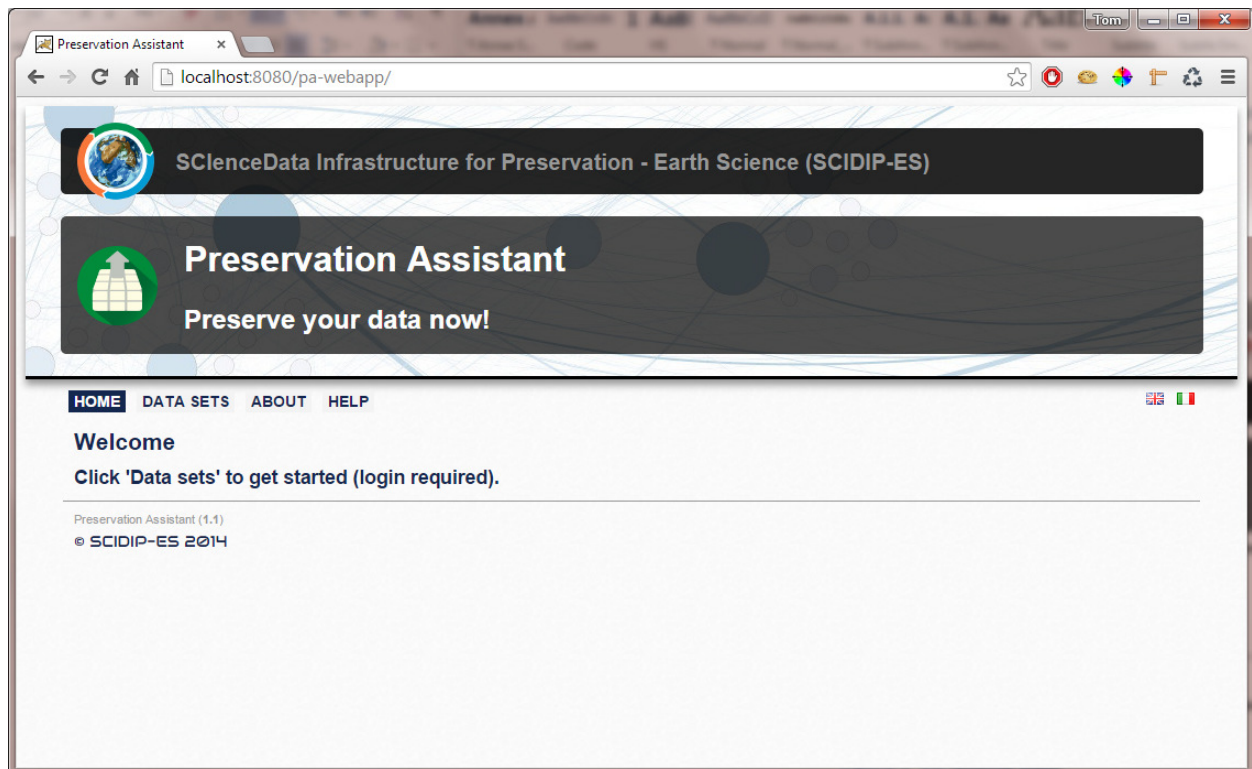


Figure 2: PA landing page

4.2 Login

Click the Data Sets link (see Figure 2). You will be prompted to login. The application has two default users: **admin** and **p3kuser**. The admin user has admin level authorisation and can perform certain tasks which the p3kuser, with normal user access, cannot. The default credentials for these accounts are as follows:

- Admin: adm1n
- p3kuser: pr3s3rv4tr0n

You should now see the Data sets home page:

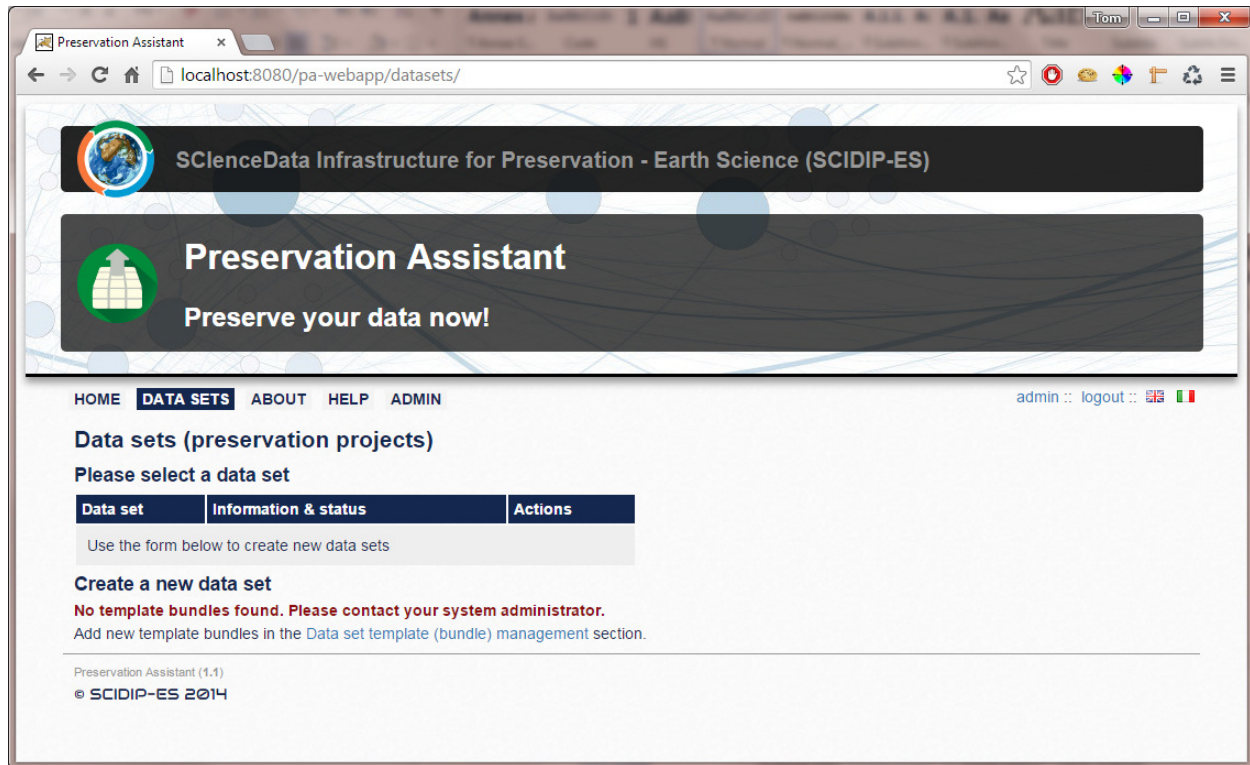


Figure 3: Data sets home page

The creation of new data sets (aka preservation projects) depends on the presence of one or more data set **template bundles**, discussed in section [4.4](#).

4.3 Update User Credentials

The first task, particularly if the application is deployed for production use, should be to change the default passwords of both user accounts. Login as each user with the default credentials then click the user name in the top right corner and follow the on screen instructions to set a new password for each:

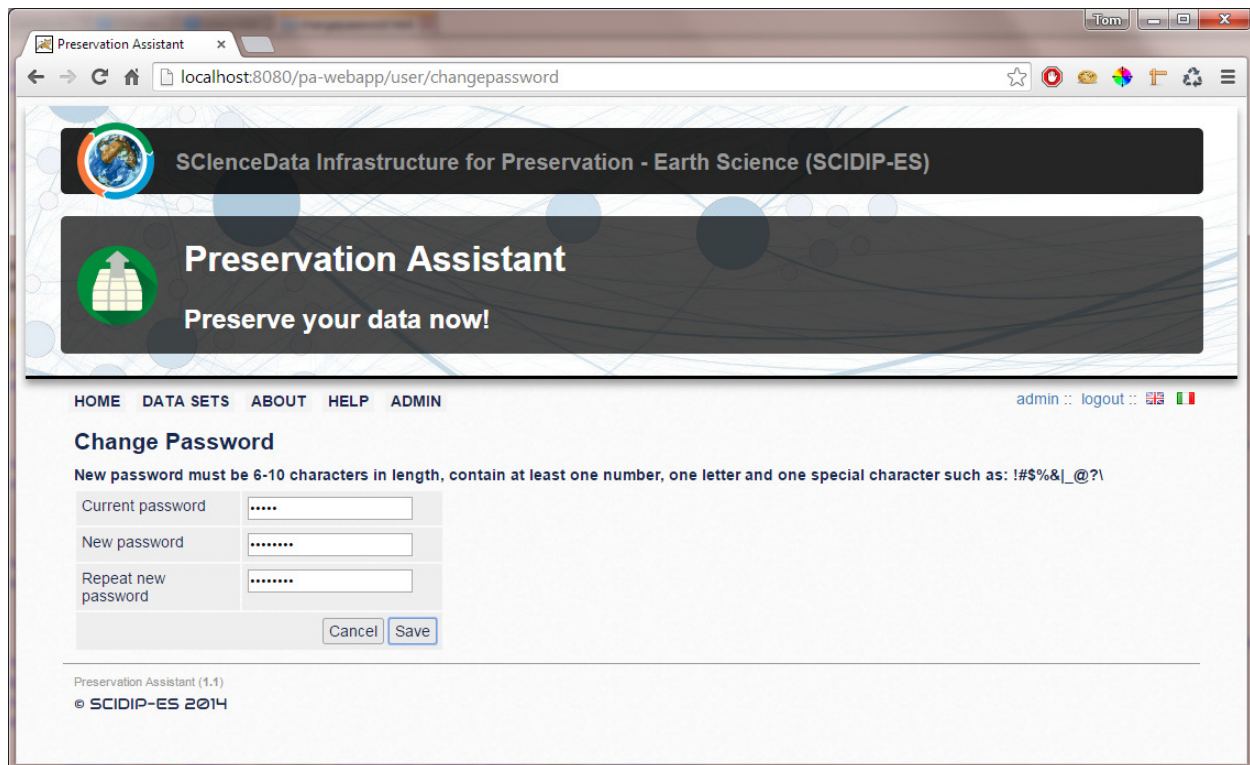


Figure 4 Changing the admin user's password

After changing passwords, click the Data Sets (see Figure 4) link to start using the PA to preserve data.

4.4 Creating new data sets and template bundles

Creating one or more template bundles is a prerequisite to creating a data set (preservation project) in the PA. A template bundle comprises a source file (e.g. an ontology, a JSON file) and an adaptor¹⁰ and is selected when creating a new data set to define the structure of the online forms that will be presented for completion (i.e. provides the user with a guide to the sort of items that should be preserved as part of a data set).

The PA ships with two template bundle adaptors by default:

- The SCIDIP PDSC Earth Science Ontology adaptor. This adaptor is capable of processing ontologies conforming to the same structure as the SCIDIP Earth Science ontology: <http://switchboard.digitalpreserve.info/ontologies/ES.owl>
- A JSON adaptor capable of processing JSON sources based on the serialised form of the Preservation Assistant library module's internal form bundle hierarchy.

¹⁰ A template bundle adaptor is an implementation of the following Java interface from the PA library module: `eu.scidipes.toolkits.palibrary.interfaces.PreservationDatasourceProcessor`

4.4.1 Create a new template bundle

1. Logged in as a user with the role 'ADMIN' (see section [TBC]), from the data sets home page (see Figure 3) click the **Data set template (bundle) management** link. You should see the following screen:

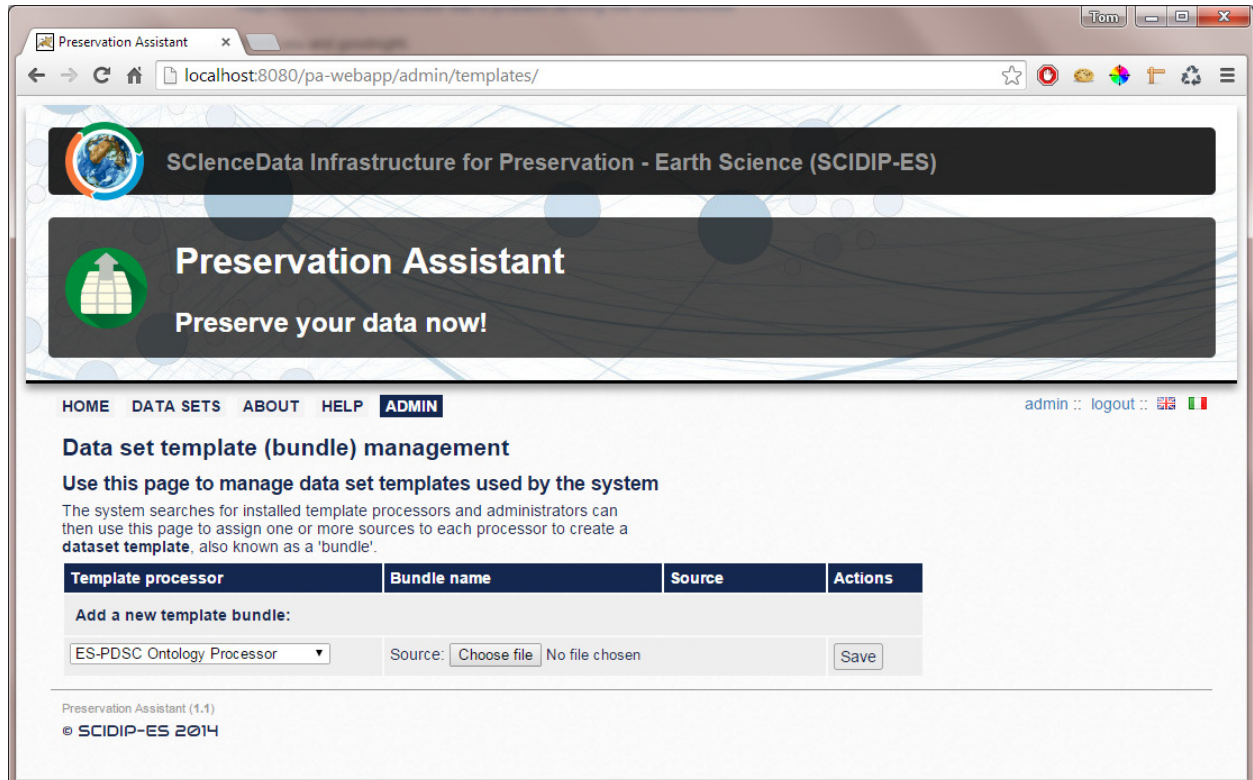


Figure 5: Template bundle management

2. Use the form to select a source template bundle file from your local machine. For this tutorial, we shall use the Earth Science ontology (ES.ow). Click **Save** to upload the file to the PA. This file will be stored in the directory defined in the **pa.sources** system property. You should now see the following:

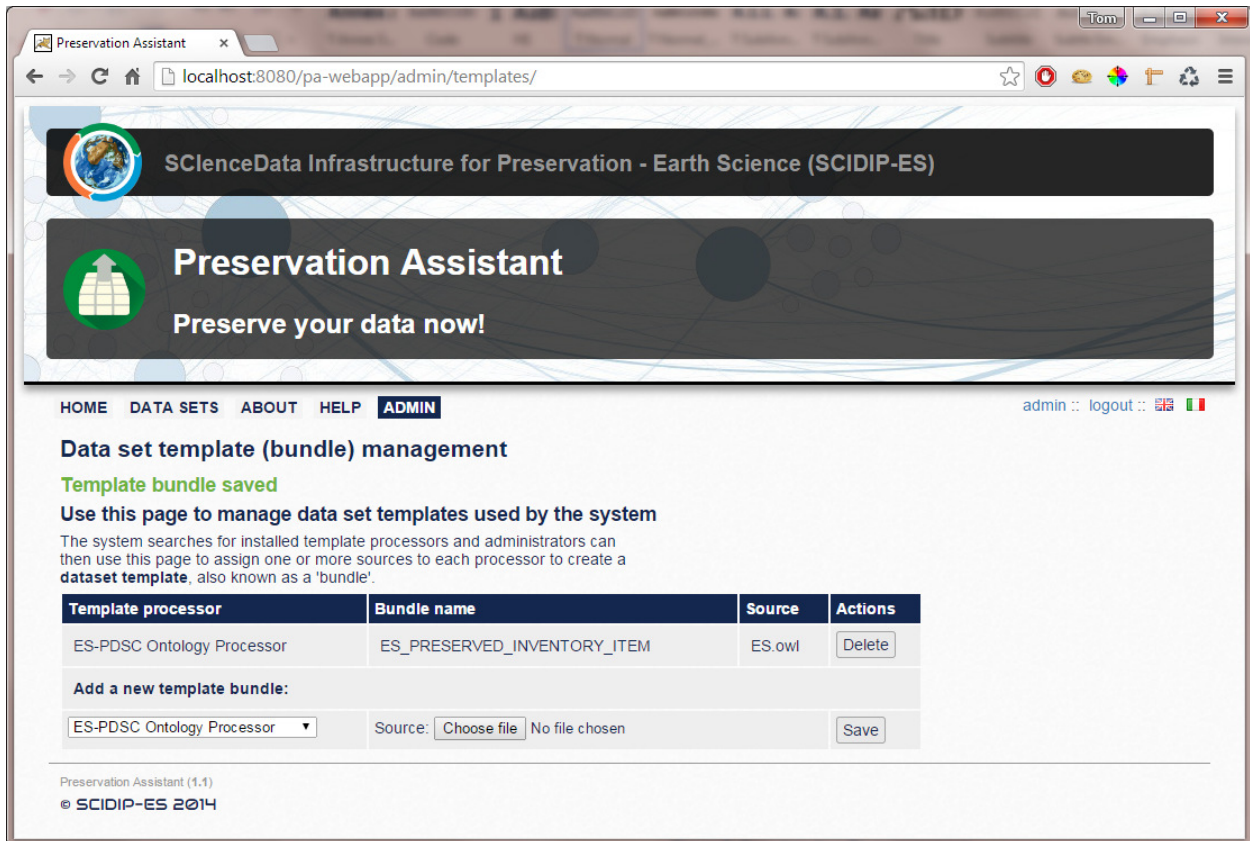


Figure 6: Saved new template bundle

3. Click the **DATA SETS** menu item to return to the data sets home page.

4.4.2 Creating a new project for a Data Set

Now that a template bundle has been created we can use it to create any number of new projects which will contain the ReplInfo Network (RIN) for the specified data set, all based on the same Preservation Data Set Content (PDSC) ontology defined by the bundle. The RIN is made up of individual pieces of Representation Information, such as documents or software modules, which we specify next.

The objective of being able to supply multiple sources for each adaptor is to maximise flexibility; the same ontology class structure may be duplicated but the contents (individual pieces of Representation Information) could be changed.

1. Use the **Create a new project for a data set** form on the data sets home page to add a new data set. If using the ES ontology as the template bundle for the first time, there may be a short delay while the system processes its structure to extract the necessary information. You should now see the following:

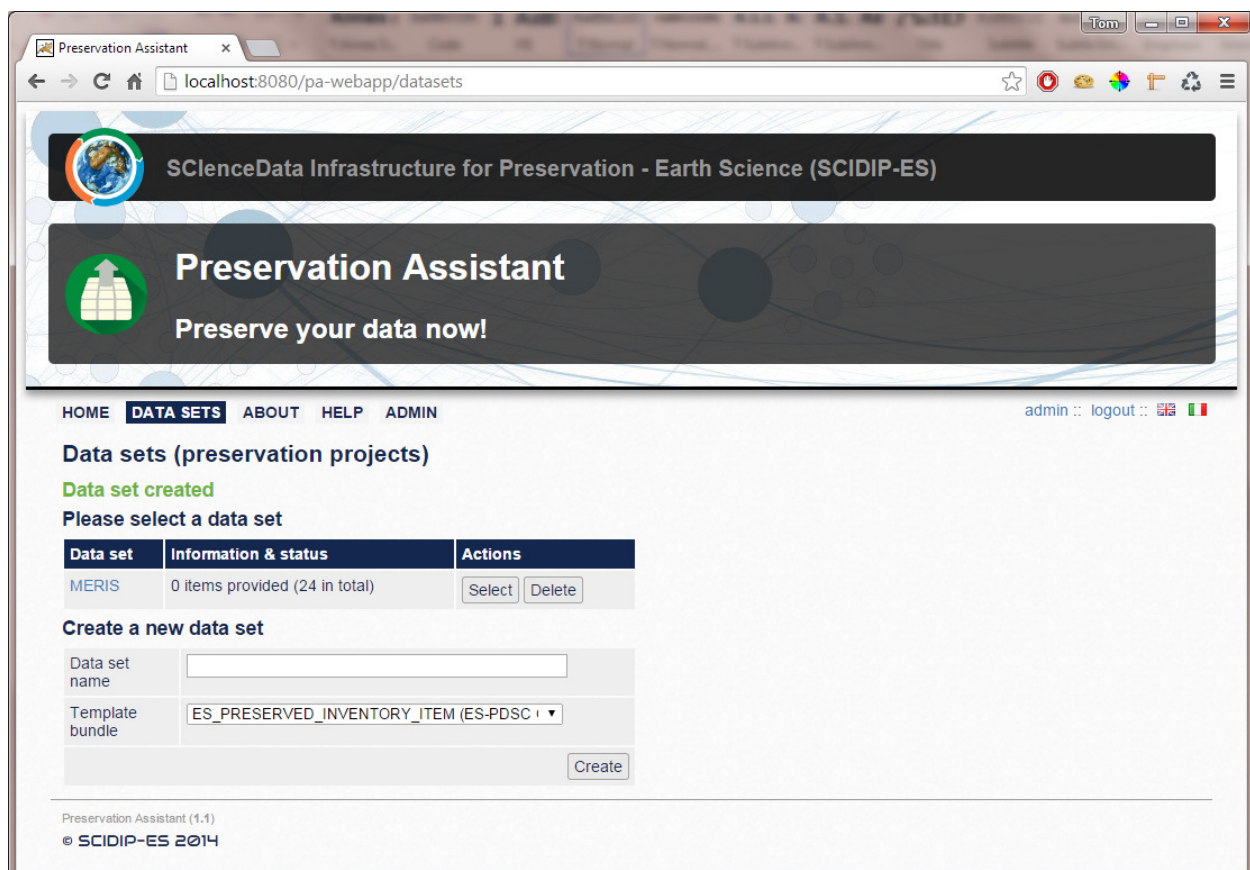


Figure 7: New data set created

2. You can add more data sets using the same, or a different template bundle and one or more users can work on different data sets concurrently. Use the **delete** button to remove a data set at any time. Note that deleting a data set deletes ALL items that have been added to it and is currently non-reversible.
3. Click the name of the new data set or the **Select** button to view the item list. You should see the following:

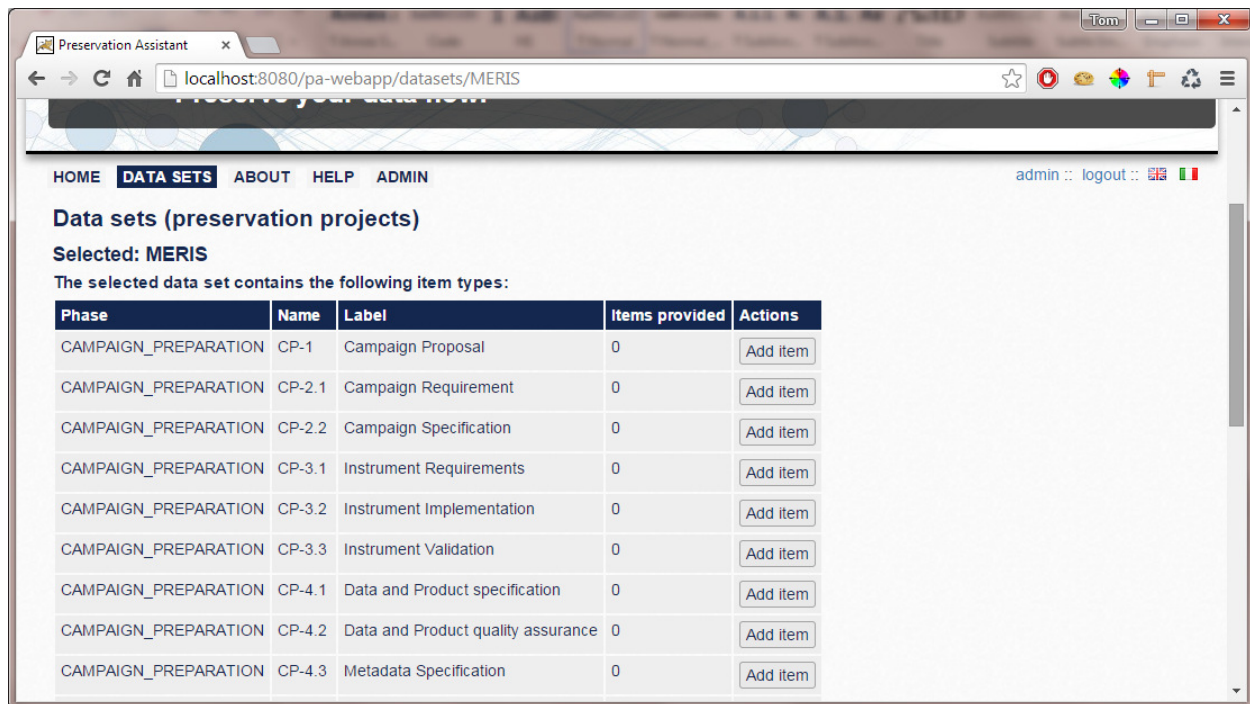


Figure 8: Data set items list

This list represents a set of empty containers to which one or more items (uploaded files or URL pointers) can be added. These are the pieces of Representation Information which the ontology specifies; they are what might be thought about as the first level of the RIN. The lower levels i.e. the ReplInfo for each of these items, are specified later.

4.5 Adding and editing data set items

For each item type within a data set it is possible to add one or more files either by uploading the file itself or providing a URI to locate it on a separate system. It is then possible to group items within a data set together into meaningful sub-groups (e.g. 'MERIS L2 data').

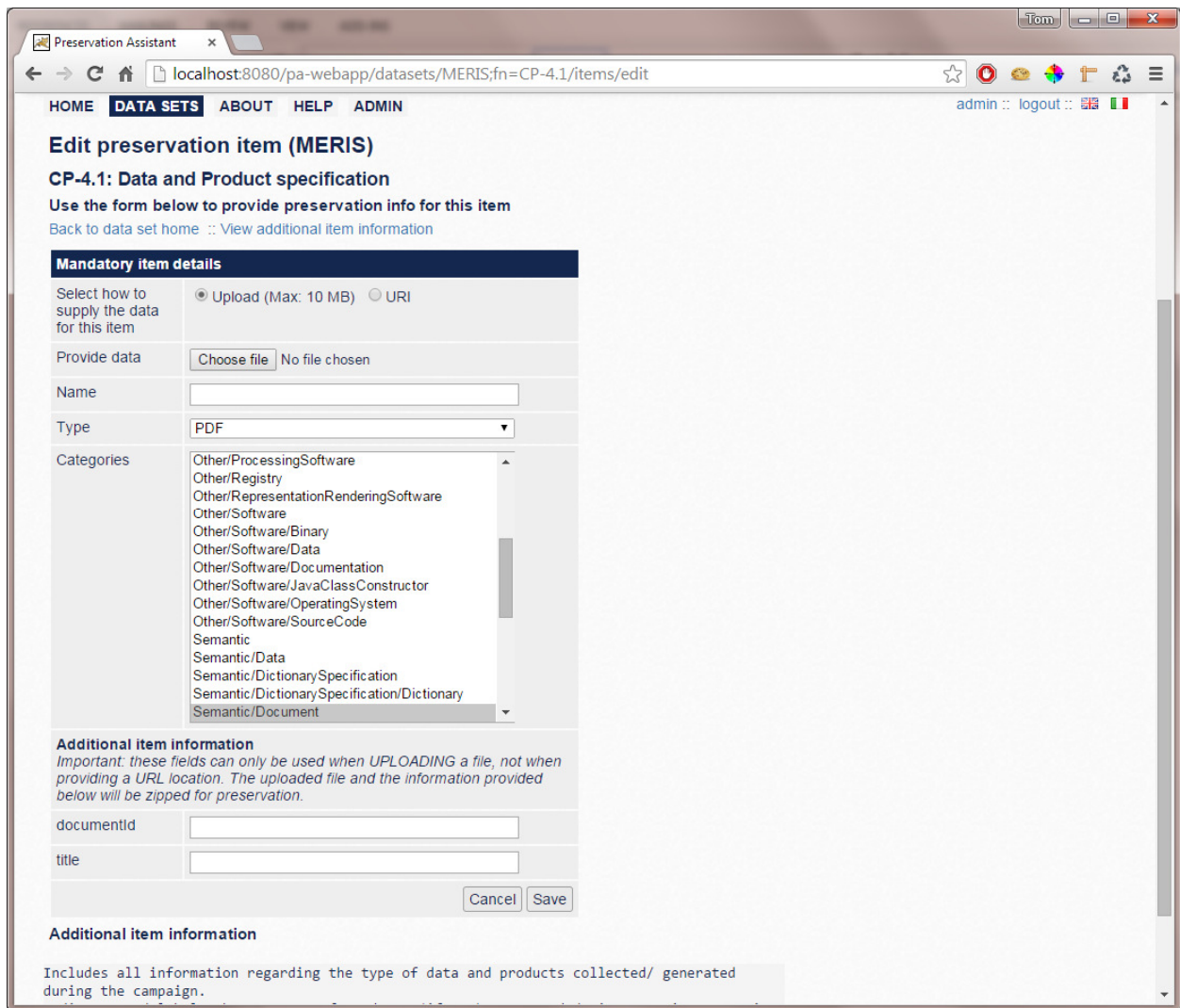
All of the item and subgroup information provided in the PA is preserved to a SCIDIP registry / repository when the data set is preserved.

1. Click **Add item** for the item type you wish to add. The main form for entering preservation item information is displayed. A few important points to consider:
 - a. You can add items to the data set in any order and you can view, update or delete an item at any time.
 - b. Any description information found attached to each item type in the source template bundle is displayed, pre-formatted, below the form for reference.
 - c. Users can **either** upload a file or provide an existing URL location for each item, not both at the same time.
 - d. Each *uploaded* file must be under the limit shown; larger files will be rejected. It is possible for system administrators to configure this limit, by default it is 10MB. Administrators and users should consider that uploaded files are stored in the PA database prior to preservation and that increasing the limit significantly may require

substantially more resource in terms of memory, disk space and bandwidth for the system to work correctly. It is far more efficient to provide existing URL locations of large files.

- e. When specifying a URL locations, the URL is validated as a well formed URI location, but it is not *verified* as pointing to an actual file (this may be a feature of input validation in future releases).
- f. Administrators can edit two fields that normal users cannot: **Type** and **Categories**. The type represents the default expected file format for the item, e.g. PDF and corresponds to a RepInfo Label describing the type, on one or more registries. The system currently does not verify that the uploaded or located file is of the suggested type (though an administrator could change it to match).
- g. Each item provided through the PA is preserved in two parts on a registry: a **manifest** document of a certain type (e.g. PDF) which is a pointer to a digital object via a URL (either the uploaded file in the registry's local repository, or an existing resource on a separate system).

A new empty preservation item form for the **Data and Product Specification** item type from the Earth Science bundle looks like this:



The screenshot shows a web browser window titled 'Preservation Assistant' with the URL 'localhost:8080/pa-webapp/datasets/MERIS;fn=CP-4.1/items/edit'. The page has a navigation menu with 'HOME', 'DATA SETS', 'ABOUT', 'HELP', and 'ADMIN'. The user is logged in as 'admin'. The main content area is titled 'Edit preservation item (MERIS)' and 'CP-4.1: Data and Product specification'. It instructs the user to 'Use the form below to provide preservation info for this item' and provides links to 'Back to data set home' and 'View additional item information'. The form is divided into two main sections: 'Mandatory item details' and 'Additional item information'. The 'Mandatory item details' section includes a radio button to select 'Upload (Max: 10 MB)' or 'URI', a 'Choose file' button, a 'Name' text input, a 'Type' dropdown menu set to 'PDF', and a 'Categories' dropdown menu with a scrollable list of options including 'Other/ProcessingSoftware', 'Other/Registry', 'Other/RepresentationRenderingSoftware', 'Other/Software', 'Other/Software/Binary', 'Other/Software/Data', 'Other/Software/Documentation', 'Other/Software/JavaClassConstructor', 'Other/Software/OperatingSystem', 'Other/Software/SourceCode', 'Semantic', 'Semantic/Data', 'Semantic/DictionarySpecification', 'Semantic/DictionarySpecification/Dictionary', and 'Semantic/Document'. The 'Additional item information' section includes a note: 'Important: these fields can only be used when UPLOADING a file, not when providing a URL location. The uploaded file and the information provided below will be zipped for preservation.' It contains 'documentid' and 'title' text input fields, and 'Cancel' and 'Save' buttons. At the bottom, there is a section titled 'Additional item information' with a description: 'Includes all information regarding the type of data and products collected/ generated during the campaign.'

Figure 9: Adding a new data set item

2. Enter the details of the item as required. For non-admin users this simply involves uploading a file or providing a URL location, and optionally specifying any additional item information in the fields displayed (file upload only). Non admin users see a simplified version of the form which does not allow them to change the file type or category selection.
3. Click **Save** to persist the item information to the PA database. The screen should now look something like this:

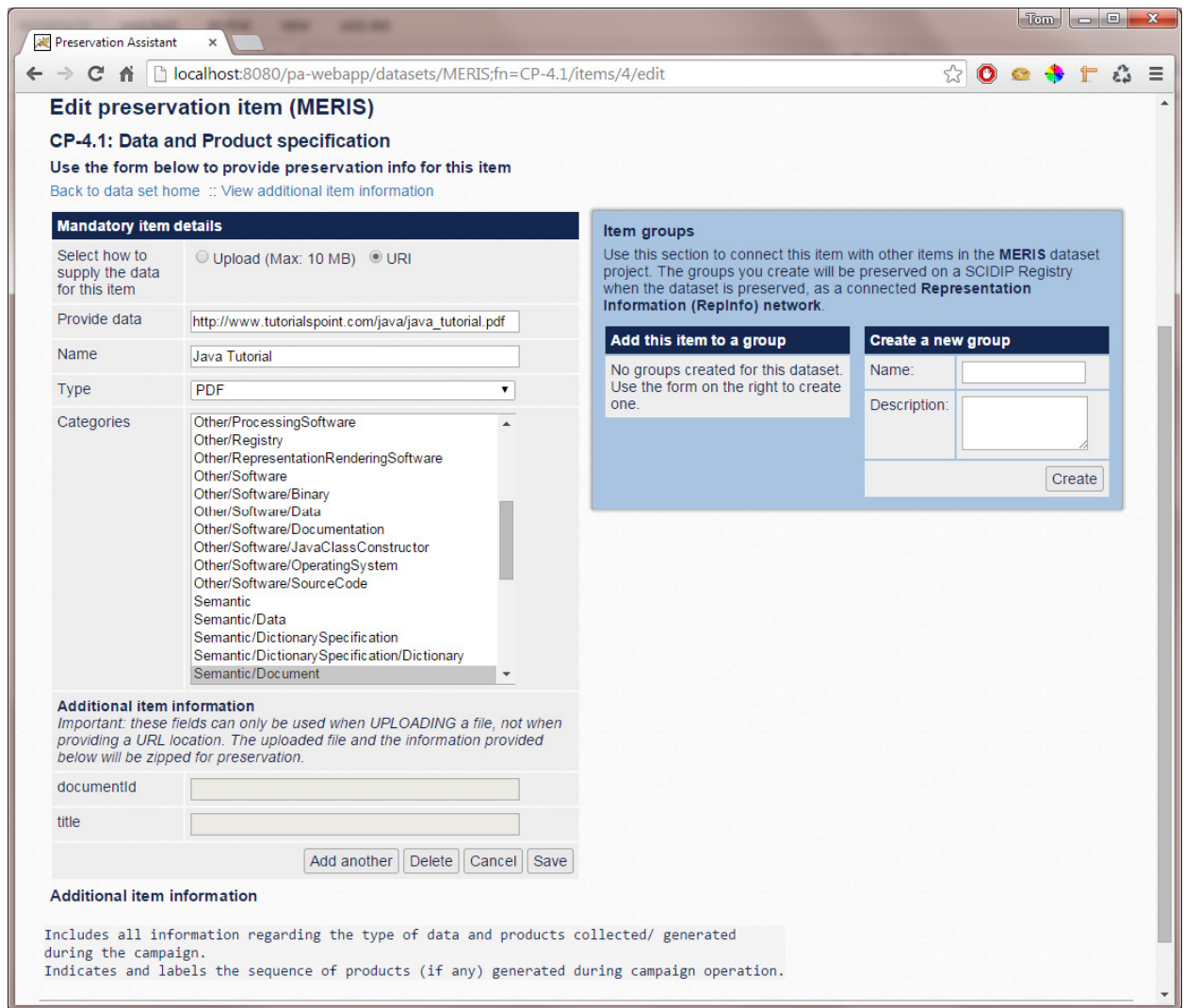


Figure 10: Saved data set item

Because the item has been saved in the PA, the features allowing it to be linked to other items in the data set via a subgroup are now displayed in the **Item groups** section on the right.

4. The user can click **Add another** to add another file of the same item type (e.g. a second or third 'Data and Product Specification' item) or use the **Cancel** button or navigation links above the form to return to the data set home page or enter another part of the system.

4.6 Linking items together within a data set

Remaining within the edit item screen having added a second item to the 'MERIS' test data set, we can now create a group to link the two items together. When the data set is preserved, this grouping will be transformed into a **Representation Information Label (RIL)** on the selected SCIDIP registry, thus creating a connected ReplInfo network (albeit a small, rather meaningless one in this case).

1. Create a new group using the form displayed in the **Item groups** section. The system will then display a new section listing the other items from this data set the group contains. As none have been added to the new group it is currently empty:

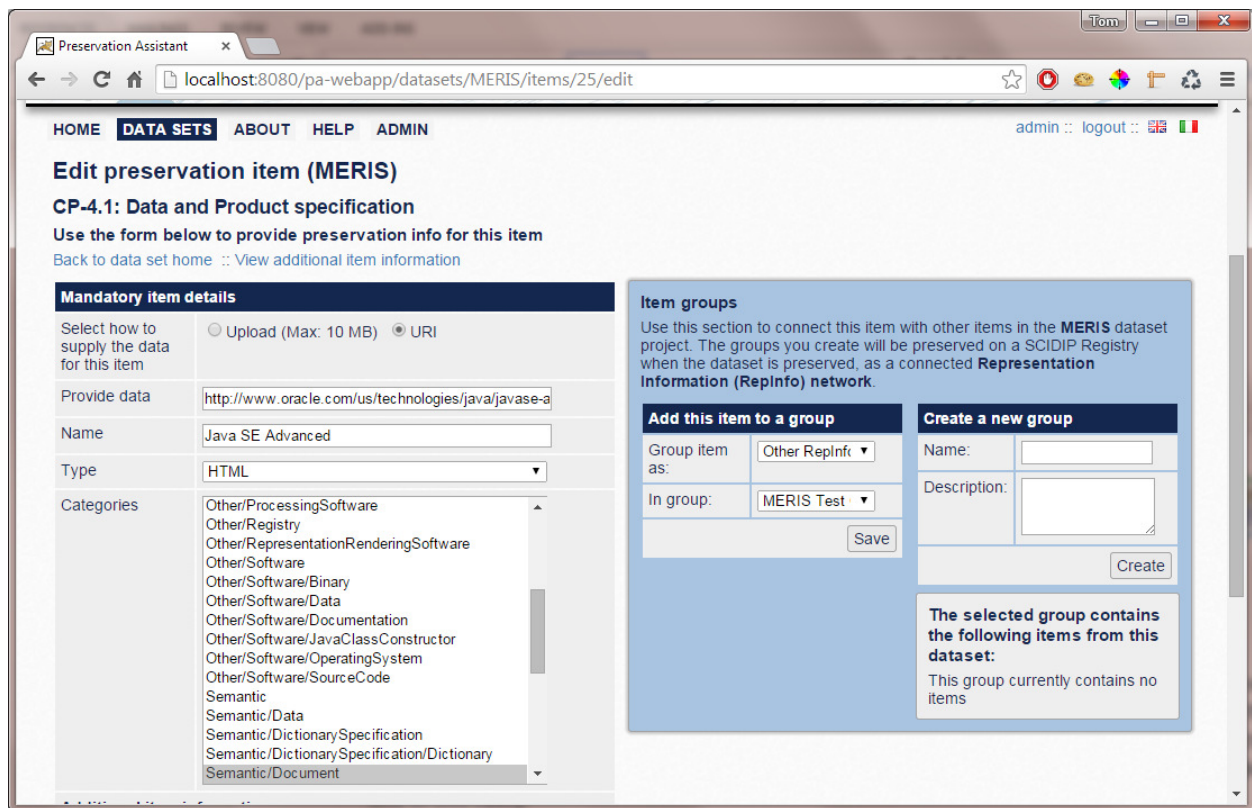


Figure 11: Adding a new item group

2. Now add the current item to the group using the **Add this item to a group** form. Select whether the item should be included in the group as Structural, Semantic or Other ReplInfo. The screen should now look something like:

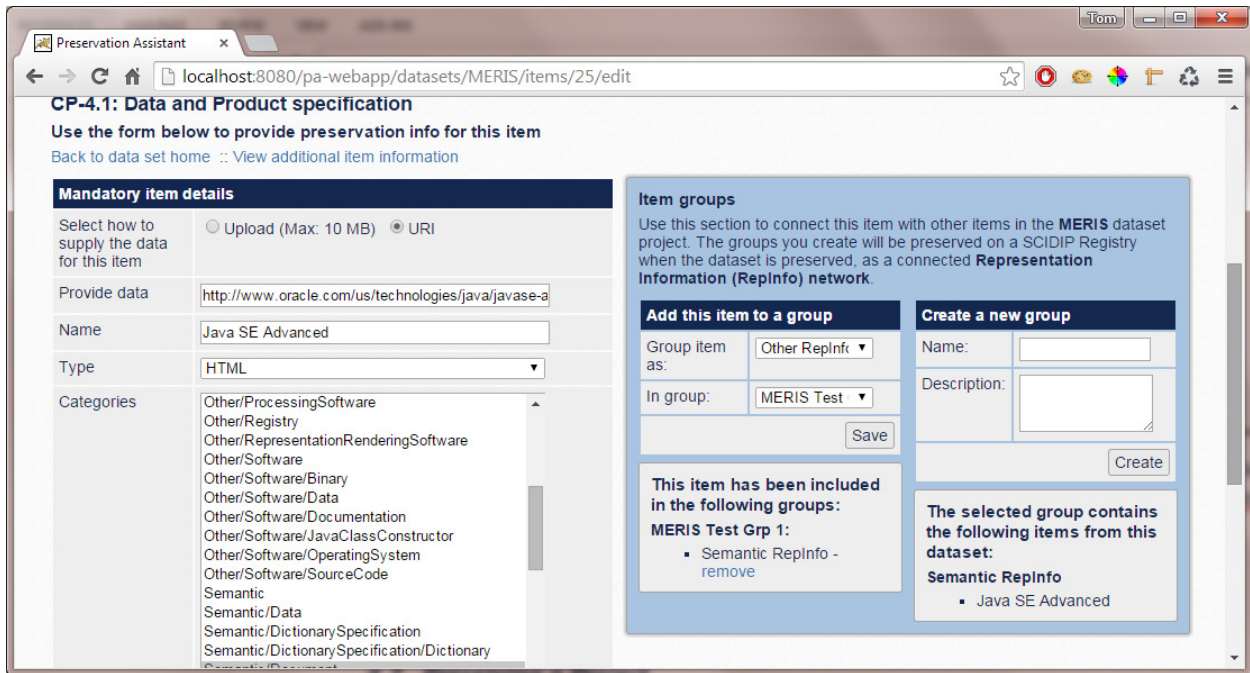


Figure 12: Adding first item to a group

- Now click **Back to data set home** then the **Edit Items** link next to the item type 'Data and Product specification' and you should see the first item you added, which you can link to the second item by adding it to the same group. Your screen should now look something like:

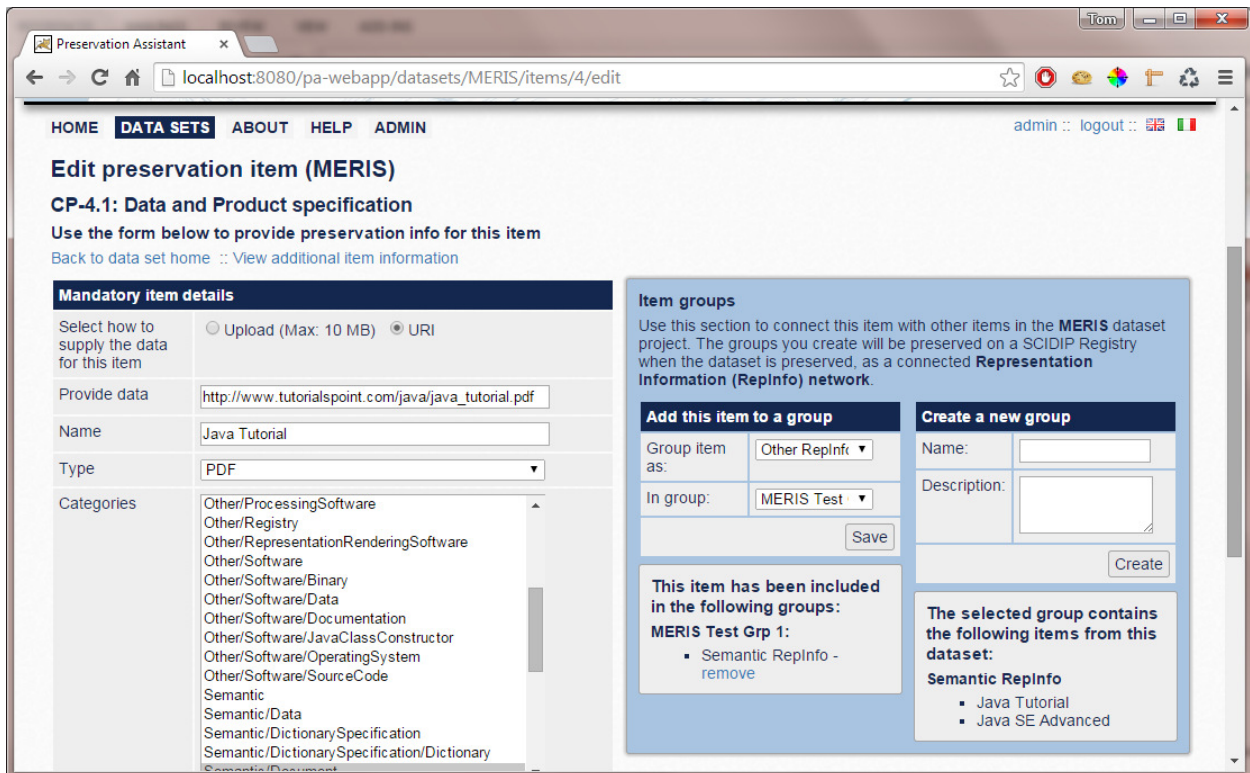
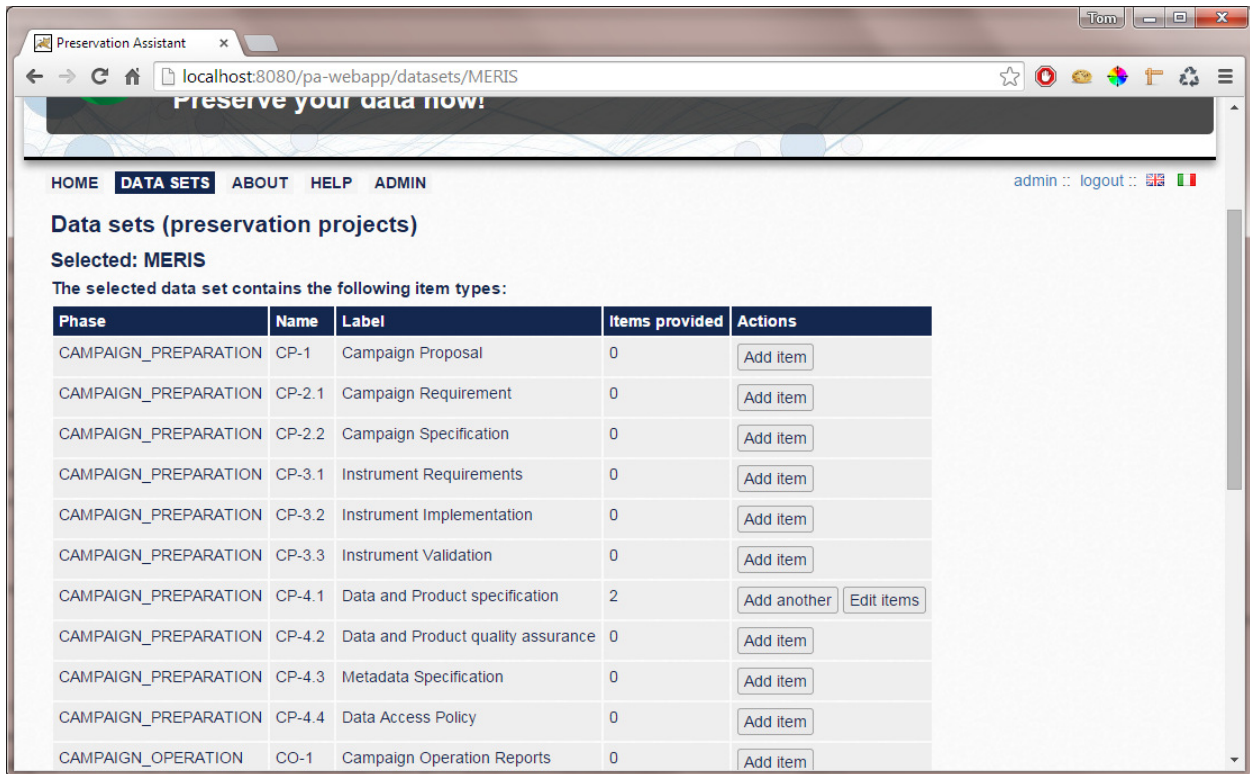


Figure 13: Adding a second item to a group

Whenever you are editing a data set item you can always see a) which groups the item has been added to and b) which other items are in the currently selected group (from the **In group** drop-down menu). This way groups can quickly and easily be created and modified. Use the **remove** link next to an item-group entry to remove the current item from a group.

Back on the item list page for this data set you should now see updated status information for the number of items provided for each type, with the option to add another or edit the existing items:



The screenshot shows a web browser window titled 'Preservation Assistant' with the URL 'localhost:8080/pa-webapp/datasets/MERIS'. The page header includes navigation links: HOME, DATA SETS, ABOUT, HELP, ADMIN. The user is logged in as 'admin' and the language is set to Italian. The main content area is titled 'Data sets (preservation projects)' and 'Selected: MERIS'. Below this, it states 'The selected data set contains the following item types:' followed by a table.

Phase	Name	Label	Items provided	Actions
CAMPAIGN_PREPARATION	CP-1	Campaign Proposal	0	Add item
CAMPAIGN_PREPARATION	CP-2.1	Campaign Requirement	0	Add item
CAMPAIGN_PREPARATION	CP-2.2	Campaign Specification	0	Add item
CAMPAIGN_PREPARATION	CP-3.1	Instrument Requirements	0	Add item
CAMPAIGN_PREPARATION	CP-3.2	Instrument Implementation	0	Add item
CAMPAIGN_PREPARATION	CP-3.3	Instrument Validation	0	Add item
CAMPAIGN_PREPARATION	CP-4.1	Data and Product specification	2	Add another Edit items
CAMPAIGN_PREPARATION	CP-4.2	Data and Product quality assurance	0	Add item
CAMPAIGN_PREPARATION	CP-4.3	Metadata Specification	0	Add item
CAMPAIGN_PREPARATION	CP-4.4	Data Access Policy	0	Add item
CAMPAIGN_OPERATION	CO-1	Campaign Operation Reports	0	Add item

Figure 14: Updated data set item list

4.7 Preserving a data set project

Once all files in a data set have been provided to the PA and linked together via the requisite groups, the entire set can be preserved to a registry-repository. The system does not enforce the number of items that must be specified prior to preservation, but the **Preserve** button on the data sets home page will not be displayed until at least one item has been provided.

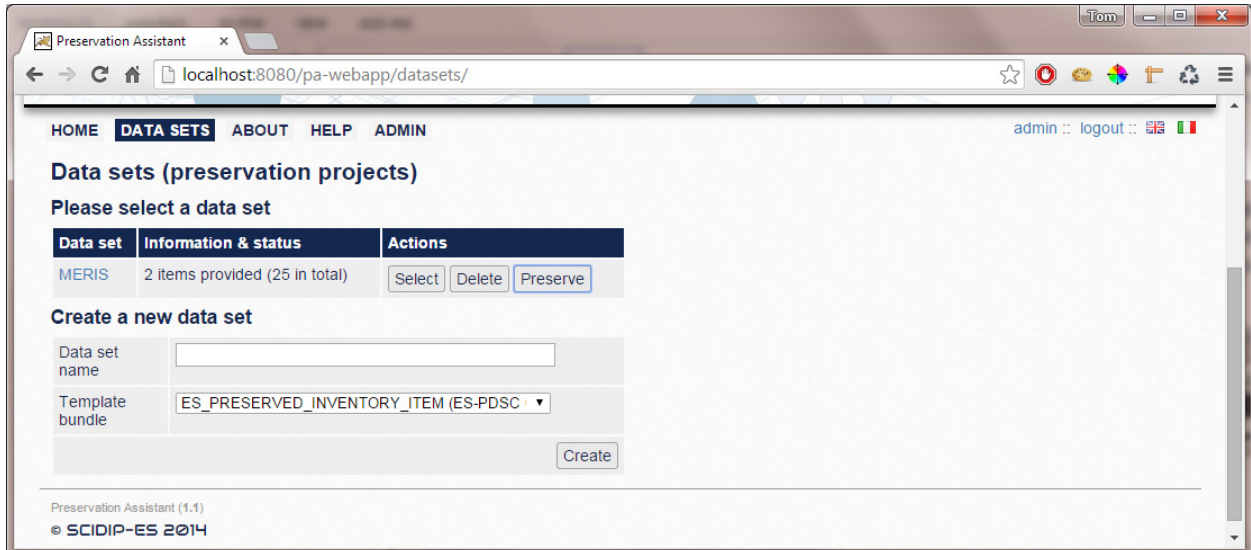


Figure 15: Data sets home page (ready to preserve)

To start a preservation job for this data set:

1. From the Data Sets page click the **Preserve** button for the data set you wish to preserve.
2. In the **Preserve data set** page, select a registry and add credentials as required for write-access by clicking the **add now** link (the system stores credentials provided for registries and checks access when the selection is changed):

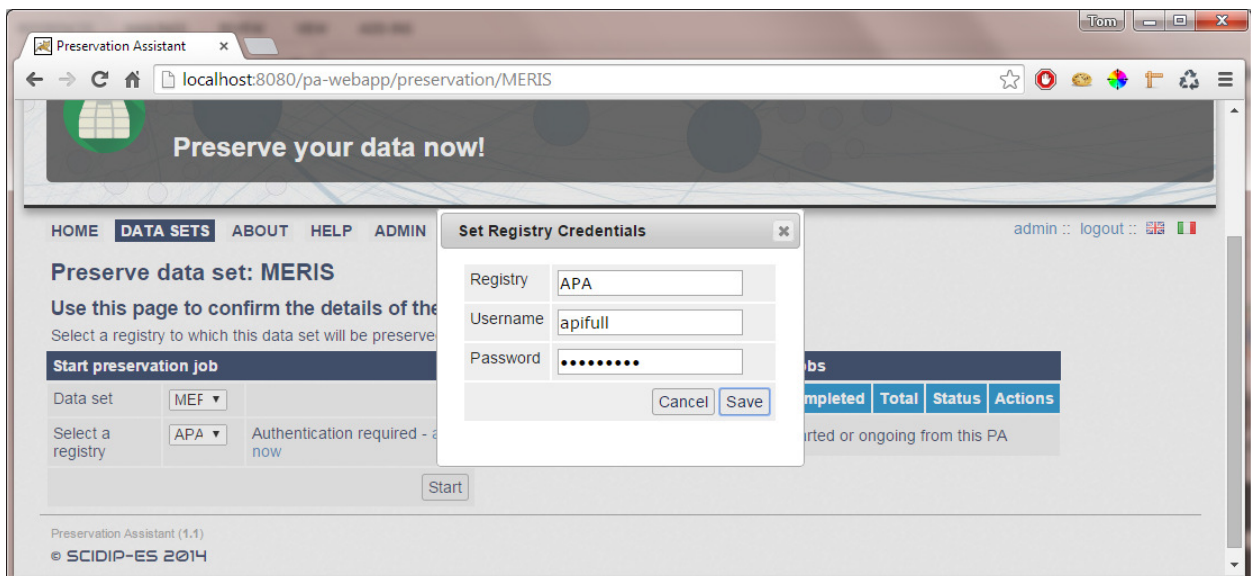


Figure 16: Adding registry credentials

- Click the **Start** button to begin the preservation process. Because a preservation job may take some time, the system creates a new background task for each job. All preservation jobs started from a PA instance can be monitored on this screen at any time to check their progress. Your screen should now look something like:

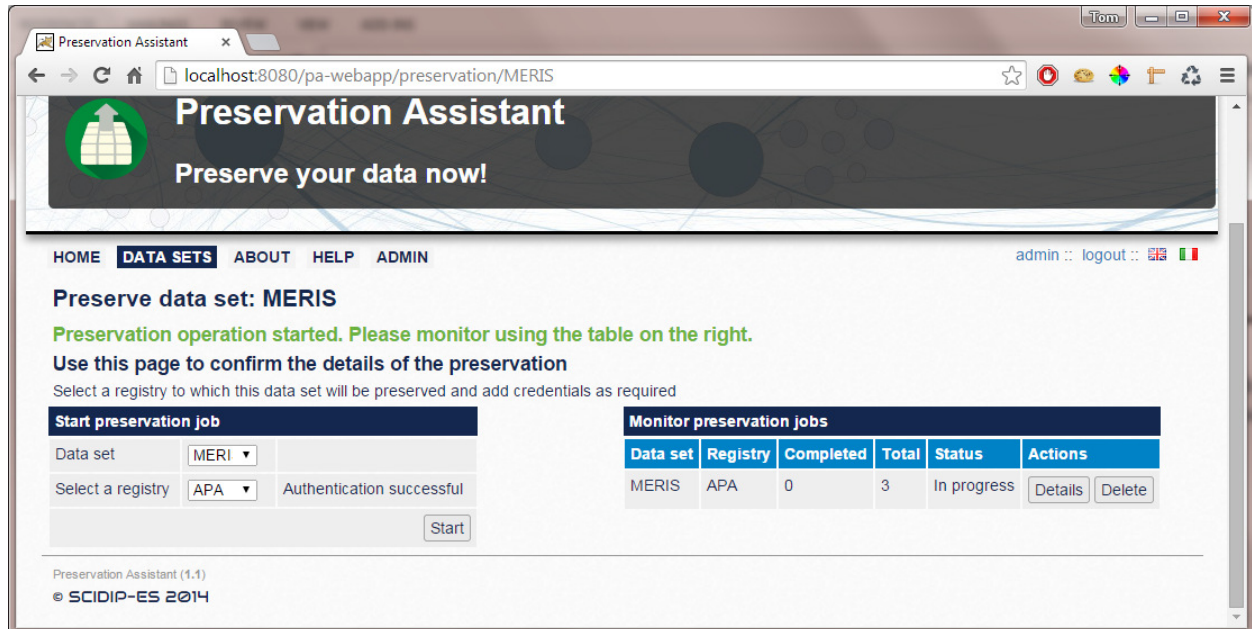


Figure 17: Starting a preservation job

- Click the **Details** button to view the progress details of each job. This will open a dialog which displays a table containing a row for each item being preserved, with its name, type, current status (in progress, complete, error etc.) and, if the item preservation completes successfully, the preservation details:

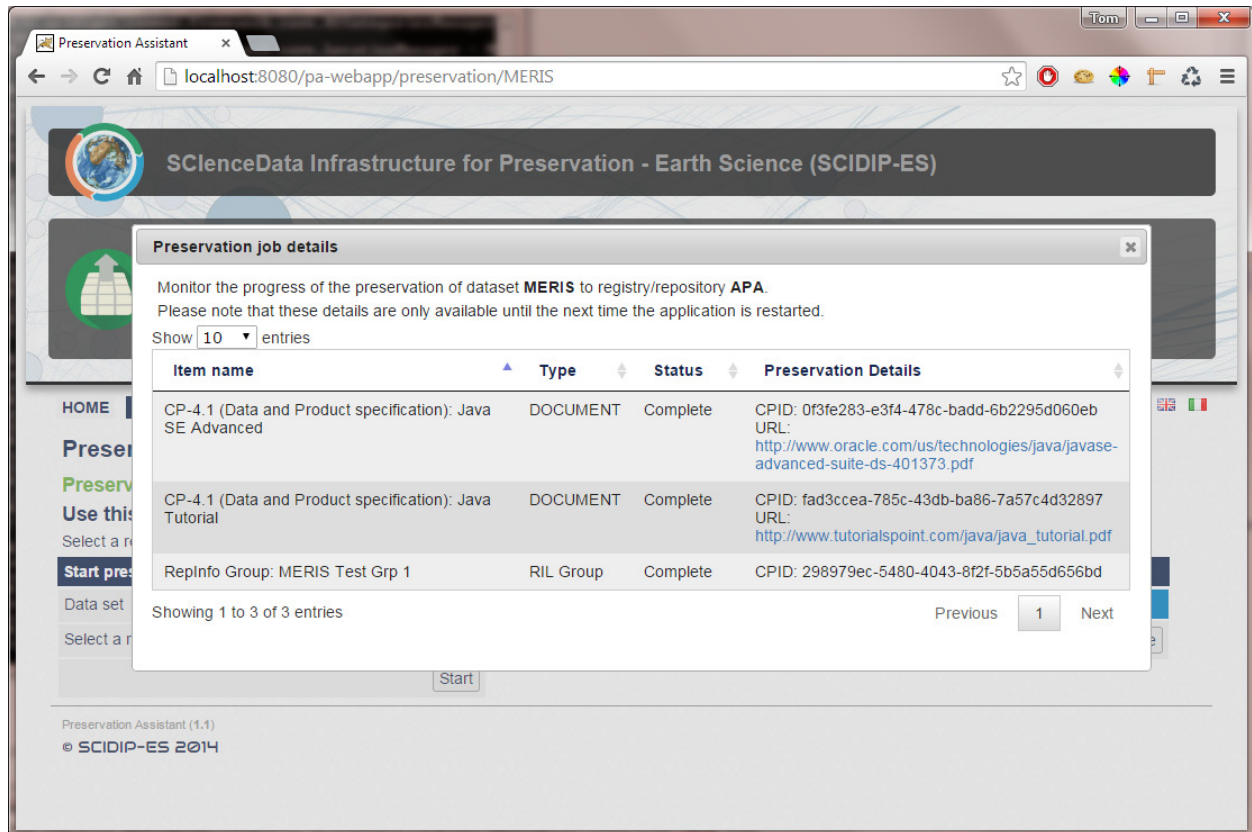


Figure 18: Preservation job details dialog

- This table refreshes automatically every 5 seconds. For long-running preservation jobs it is useful to be able to periodically check on progress; it is not necessary to remain logged in to the system or to remain on the preserve data set page.
- When the job has completed the status of the job should change to **Complete**:

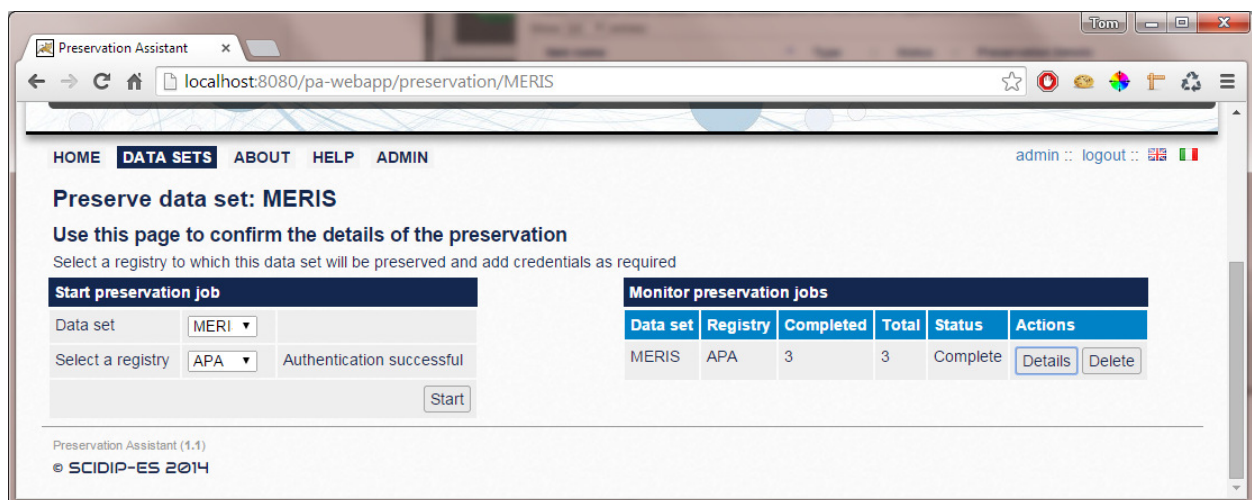
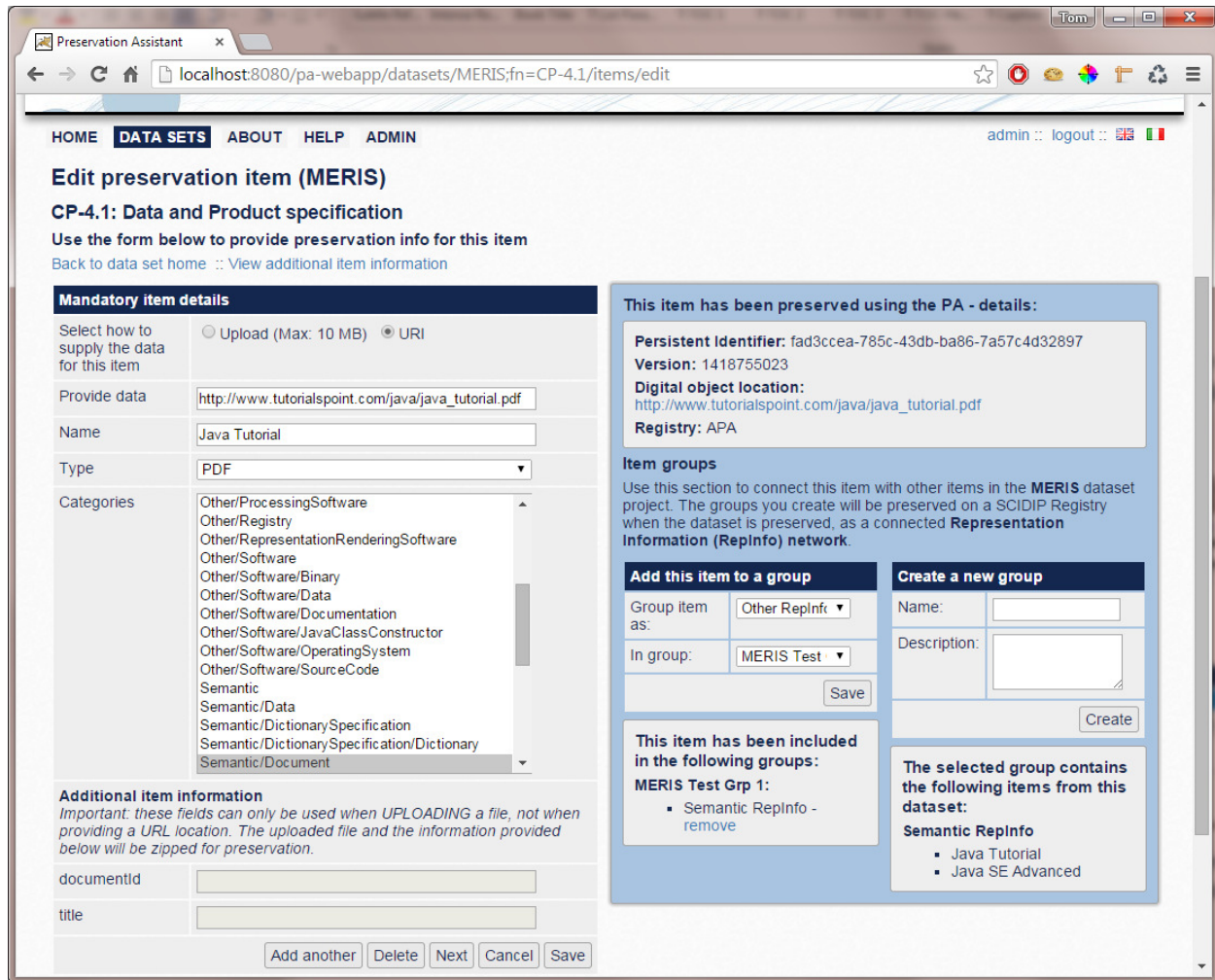


Figure 19: Preservation job completed

- As each item is preserved as part of the job, the essential details of its preservation is recorded on the local PA database record. This can be seen by returning to view/edit one of the items, as shown below:



The screenshot shows a web browser window with the URL `localhost:8080/pa-webapp/datasets/MERIS;fn=CP-4.1/items/edit`. The page title is "Edit preservation item (MERIS)" and the subtitle is "CP-4.1: Data and Product specification". The user is logged in as "admin".

Mandatory item details

- Select how to supply the data for this item: Upload (Max: 10 MB) URI
- Provide data:
- Name:
- Type:
- Categories: A list of categories including "Other/ProcessingSoftware", "Other/Registry", "Other/RepresentationRenderingSoftware", "Other/Software", "Other/Software/Binary", "Other/Software/Data", "Other/Software/Documentation", "Other/Software/JavaClassConstructor", "Other/Software/OperatingSystem", "Other/Software/SourceCode", "Semantic", "Semantic/Data", "Semantic/DictionarySpecification", "Semantic/DictionarySpecification/Dictionary", and "Semantic/Document".

Additional item information

Important: these fields can only be used when UPLOADING a file, not when providing a URL location. The uploaded file and the information provided below will be zipped for preservation.

documentId:

title:

Buttons: Add another, Delete, Next, Cancel, Save

This item has been preserved using the PA - details:

- Persistent Identifier: fad3ccea-785c-43db-ba86-7a57c4d32897
- Version: 1418755023
- Digital object location: http://www.tutorialspoint.com/java/java_tutorial.pdf
- Registry: APA

Item groups

Use this section to connect this item with other items in the MERIS dataset project. The groups you create will be preserved on a SCIDIP Registry when the dataset is preserved, as a connected Representation Information (ReplInfo) network.

Add this item to a group

- Group item as:
- In group:
- Save

Create a new group

- Name:
- Description:
- Create

This item has been included in the following groups:

- MERIS Test Grp 1:
 - Semantic ReplInfo - remove

The selected group contains the following items from this dataset:

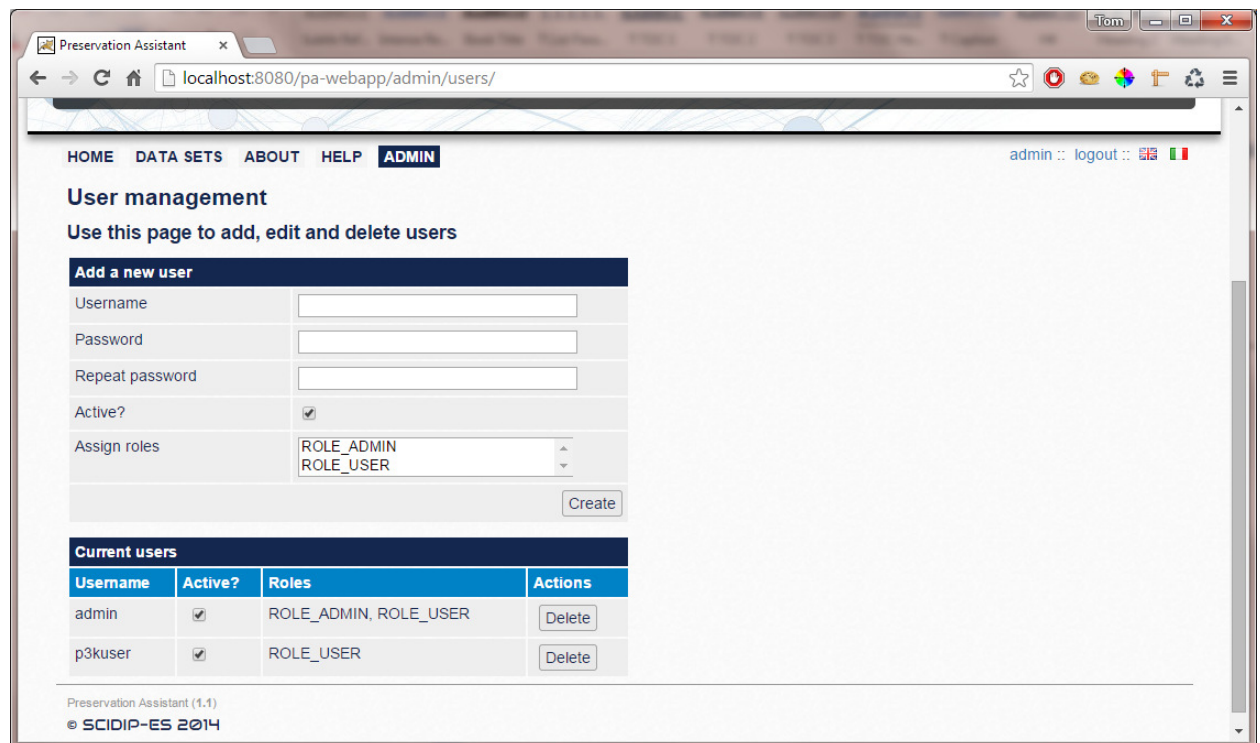
- Semantic ReplInfo
 - Java Tutorial
 - Java SE Advanced

Figure 20: Viewing item preservation details

4.8 User management

The PA provides features for adding, disabling / enabling and deleting users from the system. In situations where the system is installed within a large organization where there may be multiple data sets to preserve and a group of staff assigned to work on the PA, this could be especially useful. This feature is only available to users with the ADMIN role.

1. To manage users, login with an administrator account, e.g. **admin**, click the **ADMIN** main navigation link and then **User Management**. The following screen is displayed:



Preservation Assistant (1.1)
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Figure 21: User management

2. Use the top form to add a new user and the **Current Users** form to activate / deactivate or delete existing users. Deactivating a user means they will no longer be able to login, however the account remains in the system.

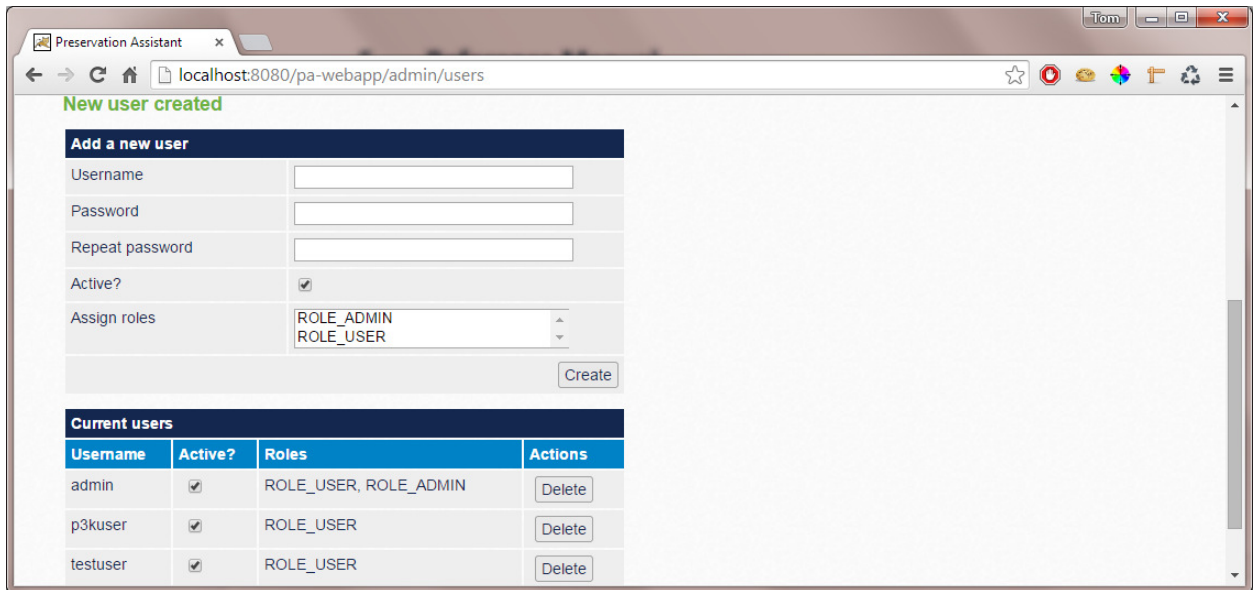


Figure 22: New user added

- Deactivate an existing user by unchecking the corresponding **Active** checkbox in the **Current users** row. The change is immediately saved and a message briefly displayed:

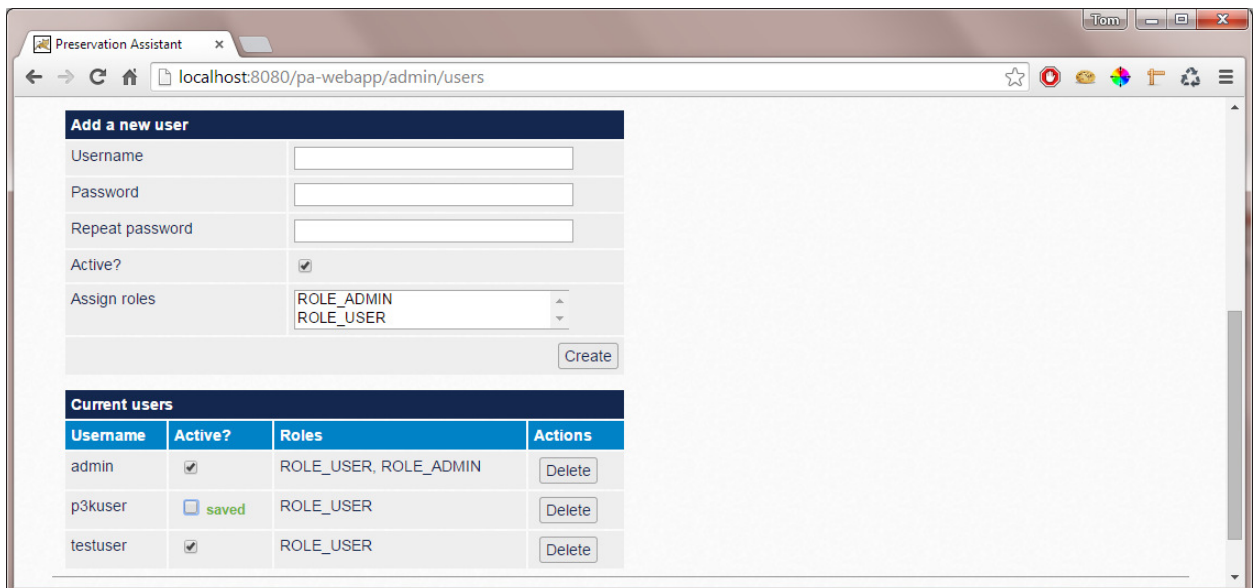


Figure 23: Deactivating a user

The **p3kuser** will no longer be able to login to the system.

5 Reference Manual

5.1 Keyboard shortcuts

None

5.2 Command-line commands

None

5.3 Public APIs

None

6 Troubleshooting Common Issues

NA

Annex A. References

[D21.3] Generic Services and Toolkits Installation and Deployment Manual (including design and specification)

Annex B. Figures and Tables

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B.2. List of Tables

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Annex C. Terminology

ACRONYM	DESCRIPTION
OAIS	Open Archival Information System
RepInfo	Representation Information
RIL	Representation Information Label
RIN	Representation Information Network
RIT	SCIDIP-ES RepInfo Toolkit