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1	INTRODUCTION	5
2	INSTALLATION AND SETUP.....	5
2.1	REQUIRED SOFTWARE	5
2.2	INSTALLING THE TESTBED	5
2.2.1	A) Downloading and Deploying.....	5
2.2.2	B) Building and Deploying.....	6
3	LOADING THE PROTOTYPE.....	7
4	LOGGING IN	7
5	THE EXPERIMENTER PAGES.....	8
5.1	THE EXPERIMENT WIZARD	8
5.1.1	Stage 1: Define Basic Properties	9
5.1.2	Stage 2: Design Experiment	10
5.1.3	Stage 3: Specify Resources and Outcomes	10
5.1.4	Stage 4: Experiment Approval	11
5.1.5	Stage 5: Experiment Execution.....	12
5.1.6	Stage 6: Evaluate Experiment.....	13
5.2	MY EXPERIMENTS.....	13
5.3	DELETE EXPERIMENT	14
5.4	RELOADING AN EXISTING EXPERIMENT	14
5.5	'READ ONLY' EXPERIMENT STAGES.....	14
5.6	BROWSE EXPERIMENTS	15
5.7	OTHER EXPERIMENTER PAGES.....	15
6	THE READER PAGES.....	16
6.1	THE READER'S VIEW OF THE EXPERIMENT WIZARD.....	16
6.2	OTHER READER PAGES	16
7	THE ADMINISTRATOR PAGES.....	16
8	APPENDIX A: TESTBED FEATURES TO BE DEVELOPED	18
8.1	USER ACCOUNTS:.....	18
8.2	EXPERIMENT STAGE 1: DEFINE BASIC PROPERTIES.....	18
8.2.1	Experiment Formality	18
8.2.2	Experiment Participants	18
8.2.3	Contact Information.....	19
8.2.4	Experiment References.....	19
8.3	EXPERIMENT STAGE 2: DESIGN EXPERIMENT	19
8.3.1	Experiment Type	19
8.3.2	Specify Workflow.....	19
8.3.3	Configure Workflow.....	20
8.4	EXPERIMENT STAGE 3: SPECIFY RESOURCES AND OUTCOMES	20
8.4.1	Resources	20
8.4.2	Specify Outcomes.....	20
8.5	EXPERIMENT STAGE 4: EXPERIMENT APPROVAL.....	20
8.6	EXPERIMENT STAGE 5: RUN EXPERIMENT	20
8.7	EXPERIMENT STAGE 6: EXPERIMENT EVALUATION.....	21
8.8	DATA MANAGEMENT ISSUES.....	21
8.9	ISSUES RELATING TO SERVICES / TOOLS:	22
8.10	LISTS OF EXPERIMENTS	22
8.11	OTHER EXPERIMENT OPTIONS.....	22
8.11.1	Repeat / Reuse / Export Experiment.....	22

8.11.2	<i>Import Experiment</i>	22
8.11.3	<i>Comment on Experiment</i>	23
8.11.4	<i>Selecting Viewer for Data</i>	23
8.11.5	<i>Emulation Experiments</i>	23
8.11.6	<i>Evaluation of Preservation Plans</i>	23
8.11.7	<i>Generate Report</i>	23
8.12	HELP.....	23
8.13	ADMINISTRATOR OPTIONS	23
8.14	BUGS AND OTHER ISSUES THAT NEED FIXED	24
8.15	ALSO TO BE CONSIDERED	24

1 Introduction

This document is a guide to the Planets Testbed Prototype. It highlights what features are available in the prototype and which parts of the system are not yet operational.

2 Installation and Setup

The deployment of the Testbed prototype application is very straightforward and does not require any special configuration or settings for deploying the application. Please make sure you have installed and configured the following required software properly before proceeding with the Testbed setup.

2.1 Required Software

- *Java SDK 1.5*

The installation of Java 1.5 SDK is required on your system. Both the IF Installer 0.1 as well as the Testbed application are tested to work with Java SDK 1.5 only. (recommended version 1.5.0_09-b01).

- *IF Prototype 0.1*

The required software in form of an installer as well as its documentation can be found at: http://gforge.planets-project.eu/gf/project/if_sp/frs/ . If you already have the IF installed on your system you do not need to execute this step.

Once you install the release, you will be able to: create users, register web services, execute web services, browse the data registry, etc.

The Testbed prototype application is built upon the delivered JBoss application server's functionality (mainly) for access, persistency and web application handling.

2.2 Installing the Testbed

It's almost as simple as taking the testbed file and copying it into your JBoss deployment directory. Almost... Depending on your system setup either follow **standard procedure A)** or when experiencing any problems - then follow procedure B).

2.2.1 A) Downloading and Deploying

If you're using Java SDK version 1.5 the installation is quite simple and straightforward.

Step 1: Download the Testbed application file

Go to <http://gforge.planets-project.eu/gf/project/ptb/frs> . When you are logged-in (internal release only downloadable for gforge Testbed members) with your credentials you should be able to see the package "Testbed_release_0_1_internal_20071002".

If you do not have an account please sign up at the GForge project and contact andrew.lindley@researchstudio.at or b.aitken@hatii.arts.gla.ac.uk with the request for being added to the gforge Testbed project.

Download the “**testbed.ear**” file.

Step 2: Start the JBoss server and deploy the Testbed

To see how to use the JBoss application server please follow the IF documentation again. To start up the server go to

<your IF server dir>/server/bin and call run.bat

After the server start up process is completed take the testbed.ear file and copy+paste it into:

<your IF server dir>/server/deploy

When you look at the output window of your application server you should see that the file was found and also got hot-deployed.

Step 3: Enjoy!

<http://localhost:8080/testbed>

2.2.2 B) Building and Deploying

If you experience any errors in the process of deploying the Testbed as for example java version conflicts, deployment or persistency errors, etc. this may result from the fact that the pre-compiled and downloadable “testbed.ear” file is compiled with Java version 1.5.0_09-b01 and although it should be compatible with whatever sub-version of Java 1.5 you’re running it may be necessary to recompile the ear. So in this case please follow procedure B) which is described here.

Step1: Check out the Planets TB SVN

- *SVN Client*

Make sure you’ve got a SVN client installed on your machine. For example Tortoise SVN:
<http://tortoisesvn.tigris.org/>

Please make sure you’ve registered at <http://gforge.planets-project.eu> , received a valid account and got registered within the gforge TB project.

If you do not have an account please sign up at the GForge project and contact andrew.lindley@researchstudio.at or b.aitken@hatii.arts.gla.ac.uk with the request for being added to the gforge Testbed project.

Use your SVN Client to checkout the Testbed’s source code from <http://gforge.planets-project.eu/svn/ptb>

Step3: Create your build.xml file

In the directory

<checkout dir>\ptb\tags\release_0_1_internal_20071002\application\src\main

you’ll find a file called build.xml.template. copy + insert it in the same directory, rename it to build.xml. Open the file and configure the properties’s values **<property name=“jboss.home” value=“”>** **<property name=“junit.lib” value=“”>** according to your local installation

Step2: Building and deploying the testbed.ear file

- *Apache Ant*

Make sure Apache Ant <http://ant.apache.org/> was installed through the “IF Prototype Installer” correctly and is reachable on your command line. You can test this by opening a command line and typing “ant –help”.

Open a command line, change your directory pointer to `<checkout dir>\ptb\trunk\application\src\main` and finally call

“ant deployEar”

You should now be able find a file called “testbed.ear” in the folder `<your IF server dir>/server/deploy`

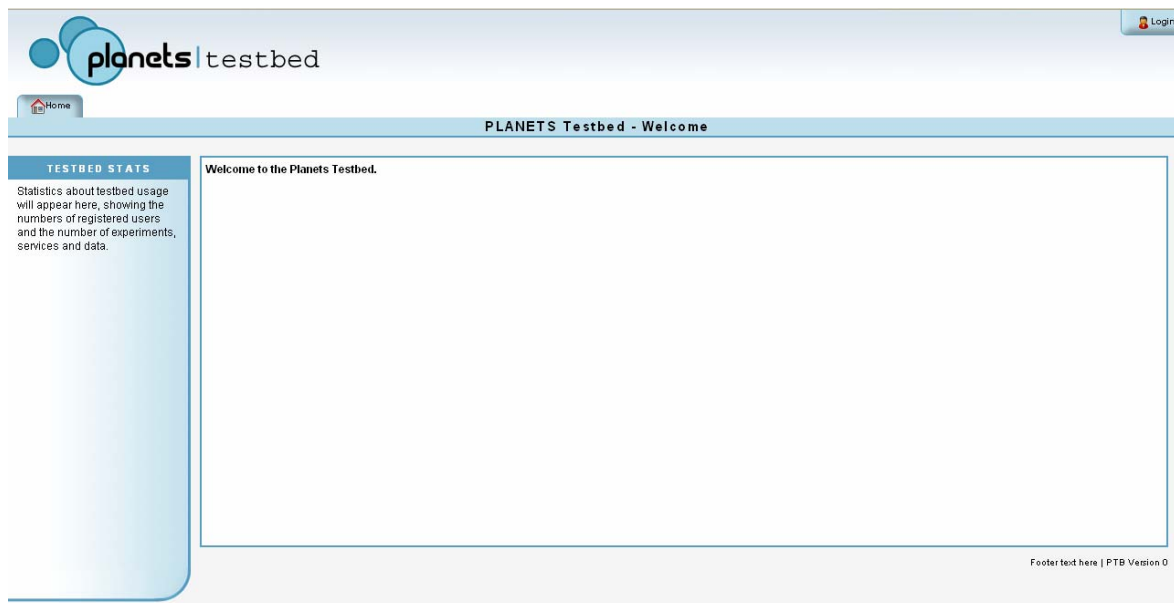
When you look at the output window of your application server you should see that the file was found and also got hot-deployed.

Step 3: Enjoy!

<http://localhost:8080/testbed>

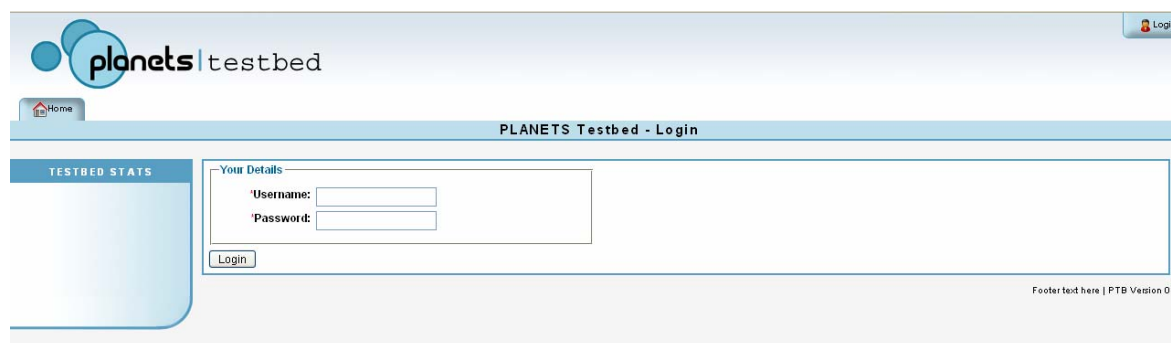
3 Loading the Prototype

Once the IF JBoss server is running and the Testbed EAR file has been deployed you should be able to access the Testbed by entering this URL into your browser: <http://localhost:8080/testbed/>. If all is operational the following screen should be displayed:



4 Logging in

To reach the login screen you should click on the ‘Login’ button in the top right corner of the welcome screen. The following screen should load:



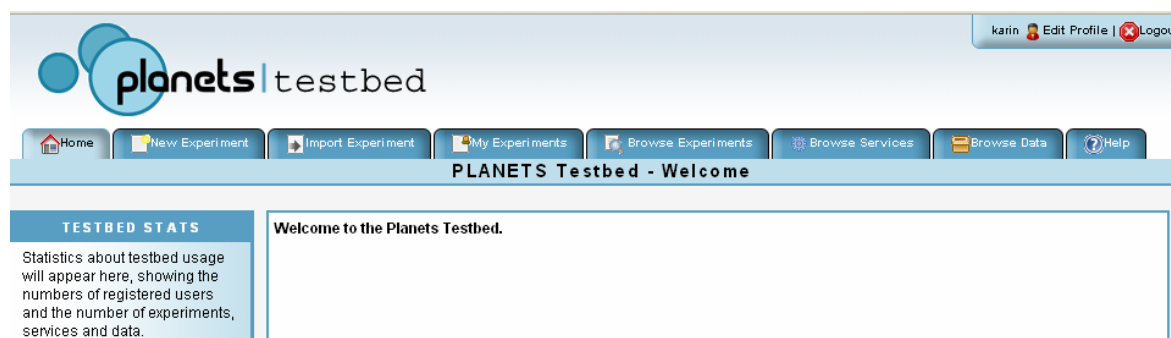
For the prototype the three Testbed user types are fully operational. There are users representing experimenters, readers and administrators. At this stage in the project it has not been possible to provide comprehensive user management options so for the prototype user accounts have been hard coded into the web container. Three user accounts are available, one for each user type.

- To access the experimenter pages enter **karin** as both username and password
- To access the reader pages enter **reader** as both username and password
- To access the administrator pages enter **admin** as both username and password

Note that for the prototype the main focus has been on the pages for the experimenter user type; although pages exist for all of the options that will be available to the three user types some of the pages will be mock-ups and will not be operational. These cases are described below.

5 The Experimenter Pages

Once you have logged in as an experimenter you will see a page with the following tabs:



For the prototype the main focus has been on designing, saving and reloading previously saved experiments and for this reason the pages of the prototype you will spend the most time with are the 'New Experiment', 'My Experiments' and 'Browse Experiments' pages.

5.1 The Experiment Wizard

The six step experiment process can either be accessed for a new experiment or by reloading a previously saved experiment. This section will walk through the six stages for a new experiment.

5.1.1 Stage 1: Define Basic Properties

After logging in as an Experimenter click on the 'New Experiment' tab and stage 1 of the experiment process will load. This stage will allow you to supply the basic properties for your experiment, such as the experiment name, information about the purpose and focus of your experiment, contact information and references, as the following screenshot demonstrates (note that the screenshot only shows part of the form):

The screenshot shows the 'PLANETS Testbed' interface. At the top, there's a navigation bar with links: Home, New Experiment, Import Experiment, My Experiments, Browse Experiments, Browse Services, Browse Data, and Help. Below this is a sub-header 'PLANETS Testbed - New Experiment - 1. Define Basic Properties'. On the left, a sidebar titled 'EXPERIMENT PROGRESS' lists six steps: 1. Define Basic Properties (selected), 2. Design Experiment, 3. Specify Resources & Outcomes, 4. Experiment Approval, 5. Run Experiment, and 6. Evaluate Experiment. The main content area contains a form titled 'General Information' with the following fields: 'Formal Experiment' (checkbox), 'Experiment Name' (text box), 'Summary' (text box), 'Purpose' (text box), 'Focus' (text box), and 'Participants' (text box). Below this is a 'Contact Information' section with fields for 'Contact Name', 'Contact Email', 'Contact Tel', and 'Contact Address'. Each text box has a question mark icon next to it. A note at the top of the form states: 'Create a new experiment using the form below. Once you have supplied the required information and have submitted the form the experiment will be added to your list of experiments as found in the My Experiments section.'

For the prototype all experiments are created as informal experiments, meaning only the experiment name is mandatory. Future releases will allow experimenters to create formal experiments, which require more information to be supplied.

When filling in the form note that the experiment name must be unique in the Testbed system. If you supply a name that already exists you will be asked to choose a different name. The only other constraint on the information supplied in Stage 1 is that the experiment reference in the 'References' section must be a number. This corresponds to the unique identifier that is assigned to experiments when they are created. Future releases will allow experiments to be searched for and attached to the form.

To find out more information about the various input boxes move your mouse over the '?' icon beside a box.

5.1.2 Stage 2: Design Experiment

The second stage is where the experimenter can select workflows and attach data to their experiment. This stage is broken down into three steps. The first allows the selection of the experiment type, the second allows a particular workflow within that type to be selected while the third allows the selected workflow to be configured, including the upload of an input file, as the following screenshot demonstrates:

The screenshot shows the PLANETS Testbed web interface. At the top, there's a header with the PLANETS testbed logo and a user profile for 'karin' with links for 'Edit Profile' and 'Logout'. Below the header is a navigation bar with buttons: Home, New Experiment, Import Experiment, My Experiments, Browse Experiments, Browse Services, Browse Data, and Help. The main content area is titled 'PLANETS Testbed -fhngmghm : Stage 2: Design Experiment'. On the left, there's a sidebar titled 'EXPERIMENT PROGRESS' with a list of steps: 1. Define Basic Properties (checked), 2. Design Experiment (active), 3. Specify Resources & Outcomes, 4. Experiment Approval, 5. Run Experiment, and 6. Evaluate Experiment. The main content area is divided into three steps: Step 1: Select Experiment Type, Step 2: Specify Workflow, and Step 3: Configure Workflow. Step 1 shows a dropdown menu with 'Simple migration' selected and a 'Go' button. Step 2 shows a dropdown menu with 'SimpleMigrationWorkflow2' selected and a 'Go' button. Step 3 shows the configuration for 'SimpleMigrationWorkflow2', including 'Workflow Tool Type: Tiff2Jpeg', 'Output Mime Types: image/jpeg', 'Workflow Services: Service Name: Tiff2Jpeg Action Converter, WSDL', and 'Input Mime Types: image/tiff'. There is a 'Browse...' button for the input file and a 'Save' button at the bottom.

As the IF service registry was not available prior to the release of the Testbed prototype the services listing in Stage 2 are dummy services for test purposes. Two services are available in the prototype for simple characterisation experiments, one purporting to migrate Doc files to OpenOffice XML files, the other purporting to migrate TIFF files to JPEGs. Note that no actual experiments are executed in the prototype as the Testbed is reliant on the IF workflow execution engine to run experiments.

For the prototype it is possible to upload one file for an experiment, uploaded using your browser's file upload capabilities. Click on the 'Browse' button in Step 3 of the process, find a suitable file then press 'Ok' and then to continue to Stage 3 press the 'Save' button.

5.1.3 Stage 3: Specify Resources and Outcomes

Stage three allows the experimenter to select the estimated resources for the experiment and to select the appropriate Benchmark Goals. For the prototype the estimated resources are only represented by two options; more will be added in a future release.

Benchmark goals represent the criteria for evaluating the experiment. Goals selected in Stage 3 will be evaluated in Stage 6. The goals listed in the prototype are Benchmark Goals for a variety of file types; goals for other files types will be made available in future releases and the layout of the goals will be updated to a tree structure.

Stage three has two different buttons at the bottom of it: 'Save' and 'Save and submit for approval'. This is because stage three is the last stage when the experimenter has control over their

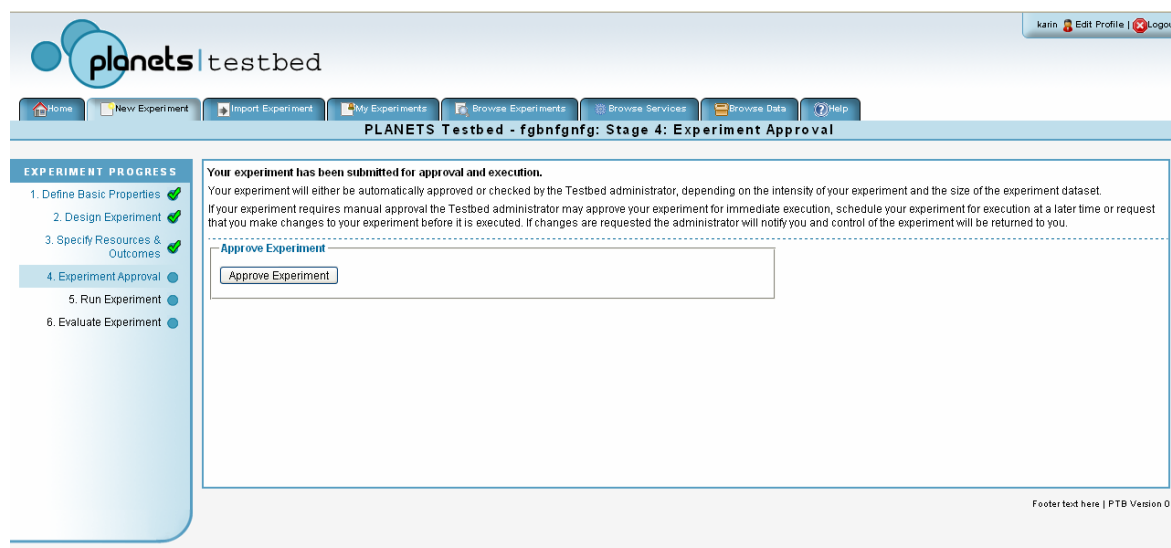
experiment. Up until this point it is possible to return to previous stages to edit information using the 'Experiment Progress' panel down the left-hand side of the screen. Once an experiment has been submitted for approval control of the experimenter is passed to the administrator and the experiment information is fixed. To continue through the experiment process click on the 'Save and submit for approval' button.

The screenshot shows the PLANETS Testbed interface at Stage 3: Specify Resources & Outcomes. The top navigation bar includes links for Home, New Experiment, Import Experiment, My Experiments, Browse Experiments, Browse Services, Browse Data, and Help. The left sidebar shows the Experiment Progress: 1. Define Basic Properties (checked), 2. Design Experiment (checked), 3. Specify Resources & Outcomes (active), 4. Experiment Approval, 5. Run Experiment, and 6. Evaluate Experiment. The main content area is titled 'Supply information about the estimated resources your experiment will require and the objectives you expect your experiment to meet'. It contains two sections: 'Specify Resources' and 'Specify Outcomes'. The 'Specify Resources' section has dropdowns for 'Estimated Output Files' (1-10) and 'Estimated Intensity' (Low), with a note 'Further fields required'. The 'Specify Outcomes' section has a text box for benchmark goals and a table of criteria.

Criteria	Explanation
<input type="checkbox"/> Footer font colour	Identifies the font colour of footers. The font colour of footers. If there are several instances of footers with different values, choose one to focus on. (for first version) "appearance"
<input type="checkbox"/> Header line spacing	Identifies the line spacing of headers. The spacing between two lines of headers. If there are several instances of headers with different values, choose one to focus on. (for first version) "appearance"
<input type="checkbox"/> Machine readability	Indicates which percentage of the characters of the text are machine readable. Define this value with a reference application, e.g. an OCR-application. 0% means nothing readable, 100% means every character readable.
<input type="checkbox"/> Page height	Total height of the page. "appearance"
<input type="checkbox"/> Footer spacing-left	Identifies the space from left of Footer to element at the left. Space from left of footer to element at the left. If there are several instances of footers with different values, choose one to focus on. (for first version) "appearance"
<input type="checkbox"/> Stereo	Describes whether files are opened with one or two sound channels yes for stereo, no for mono.
<input type="checkbox"/> Paragraph spacing-top	Identifies the space from top of paragraph to element above. Space from top of paragraph to element above. If there are several instances of "plain text" with different values, choose one to focus on. (for first version) "appearance"
<input type="checkbox"/> Human readability	Indicates how well the text is readable. Grade how well the text is readable. 1 is very bad, 10 is excellent.
<input type="checkbox"/> Paragraph font colour	Identifies the font colour of plain text. The font colour of plain text. If there are several instances of "plain text" with different values, choose one to focus on. (for first version) "appearance"
<input type="checkbox"/> Header spacing-bottom	Identifies the space from bottom of header to element below. Space from right of header to element below. If there are several instances of headers with different values, choose one to focus on. (for first version) "appearance"
<input type="checkbox"/> Page width	Total width of the page. "appearance"
<input type="checkbox"/> Footer spacing-top	Identifies the space from top of footer to element above. Space from top of footer to element above. If there are several instances of footers with

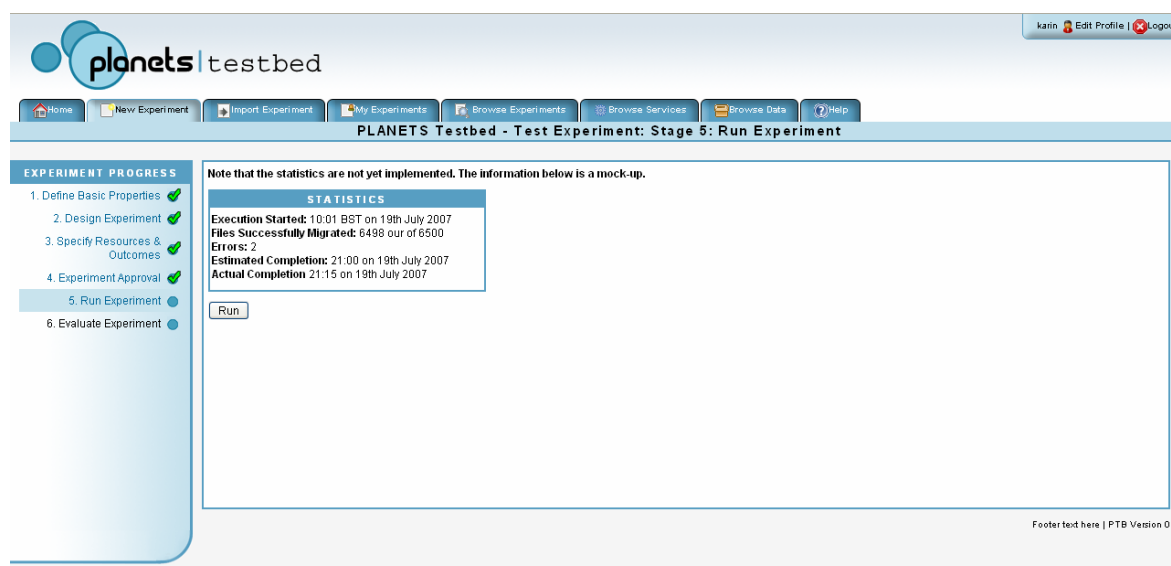
5.1.4 Stage 4: Experiment Approval

This stage in the process is a dummy page in the prototype. In future releases the experiment will either be immediately executed or will require manual approval and execution by the administrator. The prototype allows experimenters to approve their experiments themselves by pressing on a button.



5.1.5 Stage 5: Experiment Execution

As with the previous stage, Stage 5 is a mock-up in the prototype. In future releases this page will provide experimenters with real-time information about their experiment's execution and information about its current status. For the prototype the experimenter is given the option of running the experiment themselves. If you click on the 'Run' button your experiment will be executed. As there is not currently any way of actually executing experiments, in the prototype pressing the 'Run' button calls a dummy invoker that processes your experiment in a similar fashion to the real execution engine and outputs some sample data.



Once the 'Run' button is pressed and the dummy invoker has finished executing stage 5 will reload with a couple of subtle changes: In the experiment progress pane Stage 5 will now have a tick and in the main page there will now be a button labelled 'Proceed to Evaluation'. Click on this button to reach the final stage in the experiment process.

5.1.6 Stage 6: Evaluate Experiment

This stage allows the experimenter to view and download the input and output data for their experiment and to evaluate the Benchmark Goals that they selected during stage three of the experiment process. Future releases will also include a text area where a longer evaluation report can be added but for the prototype the focus of the evaluation is on the Benchmark Goals.

Through this stage you may open both the file you initially uploaded at stage two, and the output file that was created by the dummy invoker during stage five. Note that for the prototype the dummy invoker merely copies the uploaded file to a new directory; no transformation is applied to the file. You will also find a list of the Benchmark Goals you previously selected. As well as displaying the criteria and explanation for each goal, you will also find three input columns. These allow you to rate the success or otherwise of your experiment for each goal and to enter the values found in the input and output files. For example, if the Benchmark Goal 'Page Height' was chosen and your input document had a page height of 30cm and the output document had a page height of 29.8cm you can record these figures in the boxes and decide how you would rate this outcome, as the following screenshot demonstrates.

The screenshot displays the PLANETS Testbed interface for Stage 6: Evaluate Experiment. The top navigation bar includes links for Home, New Experiment, Import Experiment, My Experiments, Browse Experiments, Browse Services, Browse Data, and Help. The main content area is titled 'PLANETS Testbed - Test Experiment Number 5: Stage 6: Evaluate Experiment'. On the left, a sidebar shows the 'EXPERIMENT PROGRESS' steps: 1. Define Basic Properties, 2. Design Experiment, 3. Specify Resources & Outcomes, 4. Experiment Approval, 5. Run Experiment, and 6. Evaluate Experiment (highlighted). The main content area contains a description of the stage, 'Experiment Data' (Input and Output Files), and 'Benchmark Goals'. The 'Benchmark Goals' section includes a table with columns for Criteria, Explanation, Evaluation, Source Value, and Target Value. The table lists several goals such as Header line spacing, Page height, Footer spacing-left, Page margin-top, Page width, and Paragraph indentation. Each goal has a dropdown menu for evaluation (e.g., very good, good, bad, very bad) and input fields for source and target values. A 'Save Evaluation' button is located at the bottom of the table.

Criteria	Explanation	Evaluation	Source Value	Target Value
Header line spacing	Identifies the line spacing of headers. The spacing between two lines of headers. If there are several instances of headers with different values, choose one to focus on. (for first version) "appearance"	very good	0.5	0.5
Page height	Total height of the page. "appearance"	good	30.0	29.8
Footer spacing-left	Identifies the space from left of Footer to element at the left. Space four left of footer to element at the left. If there are several instances of footers with different values, choose one to focus on. (for first version) "appearance"	bad		
Page margin-top	Unused space at the top of the document above the text. "appearance"	very bad		
Page width	Total width of the page. "appearance"	good		
Paragraph indentation	Identifies the space from page margin to left of first line of paragraph. Space four the page margin to the left of the first line of the paragraph. If there are several instances of "plain text" with different values, choose one to focus on. (for first version) "appearance"	very good		

Note that the expected input value types for Benchmark Goals are displayed underneath the boxes; so integers must be whole numbers, floats can be numbers that include decimal places, booleans must be true or false etc. If you supply an incompatible type the Testbed will ask you to supply a valid value.

Once you click on the 'Save Evaluation' button your supplied criteria will be saved in the system and the experiment process is complete.

5.2 My Experiments

Experimenters can access a list of all their experiments by clicking on the 'My Experiments' tab. This loads a page that displays the details for each experiment in a tabular format and allows the experimenter to order the rows by experiment name and experiment type. Click on a column heading to order the data by this column; click on the heading a second time to reverse the ordering. By using this page an experimenter can reload any experiment they have created by

clicking on the experiment name. Experimenters may also delete the experiment from the Testbed by clicking on the 'Delete' link. Experiments in the table are limited to 10 per page, and options for navigating through the pages are presented below the table.

planets testbed

Home New Experiment Import Experiment My Experiments Browse Experiments Browse Services Browse Data Help

PLANETS Testbed - My Experiments

You have 16 experiments listed in the testbed. Experiments 1 to 10 are listed below.

Experiment Name	Type	Start Date	Execution Date	Current Stage	Date Last Updated	Input->Output	Delete
vo brub vobn	simple migration	October 1, 2007 4:11:24 PM		Experiment Setup		0	Delete
Test Two	simple migration	October 1, 2007 2:45:40 PM		Experiment Evaluation		0	Delete
Test Experiment Number 6	simple migration	October 2, 2007 10:21:57 AM		Experiment Evaluation		0	Delete
Test Experiment	simple migration	October 2, 2007 8:54:09 AM		Experiment Evaluation		0	Delete
Test 4	simple migration	October 2, 2007 10:18:29 AM		Experiment Evaluation		0	Delete
Test 3	simple migration	October 1, 2007 2:48:32 PM		Experiment Setup		0	Delete
test		October 1, 2007 4:28:45 PM		Experiment Setup		0	Delete
new monday evening test 2	simple migration	October 1, 2007 4:18:37 PM		Experiment Setup		0	Delete
new monday evening test	simple migration	October 1, 2007 4:15:48 PM		Experiment Evaluation		0	Delete
Monday Test	simple migration	October 1, 2007 2:54:14 PM		Experiment Setup		0	Delete

Footer text here | PTB Version 0

5.3 Delete Experiment

To delete an experiment you should find it in the 'My Experiments' list and click on the 'Delete' link. This will bring up a confirmation screen that asks you if you really want to delete the experiment. Click on the 'Proceed' button to remove your experiment from the prototype, or 'Cancel' to return to the list.

planets testbed

Home New Experiment Import Experiment My Experiments Browse Experiments Browse Services Browse Data Help

PLANETS Testbed - Delete Experiment?

Are you sure you want to delete the experiment named ggnvnt? This will remove all reference to the experiment from the Testbed.

Proceed Cancel

Footer text here | PTB Version 0

5.4 Reloading an existing experiment

To reload an existing experiment find it in the 'My Experiments' page then click on the experiment name. This will reload the experiment wizard at the first stage. You will be able to access any stage you have already completed by clicking on the stage links in the experiment progress pane. You can also continue to fill in information about your experiment or edit existing information.

5.5 'Read only' Experiment Stages

If you have submitted your experiment for approval you will no longer be able to edit any of the information contained in the first three stages of your experiment. You will still be able to view the information but the input boxes will all be set to read only, as the following screenshot demonstrates:

The screenshot shows the PLANETS Testbed interface. At the top, there's a logo and a navigation bar with tabs: Home, New Experiment, Import Experiment, My Experiments, Browse Experiments, Browse Services, Browse Data, and Help. The current page is titled 'PLANETS Testbed - New Experiment - 1. Define Basic Properties'. On the left, an 'EXPERIMENT PROGRESS' sidebar lists six steps: 1. Define Basic Properties (checked), 2. Design Experiment (checked), 3. Specify Resources & Outcomes (checked), 4. Experiment Approval (checked), 5. Run Experiment (not checked), and 6. Evaluate Experiment (not checked). The main content area contains a form for creating a new experiment. It starts with a instruction: 'Create a new experiment using the form below. Once you have supplied the required information and have submitted the form the experiment will be added to your list of experiments as found in the My Experiments section.' The form is divided into two sections: 'General Information' and 'Contact Information'. The 'General Information' section includes a 'Formal Experiment' checkbox, a description of the prototype, an 'Experiment Name' field (filled with 'new monday evening test 2'), a 'Summary' text area (filled with 'summary'), a 'Purpose' text area (filled with 'purpose'), a 'Focus' text area (filled with 'focus'), and a 'Participants' field (filled with 'karin, participant 1, karin, participant 1, ...'). The 'Contact Information' section includes fields for 'Contact Name' (filled with 'cname'), 'Contact Email' (filled with 'cemail'), 'Contact Tel' (filled with 'ctel'), and 'Contact Address' (filled with 'caddress'). Each field has a help icon.

5.6 Browse Experiments

This list of experiments works in a similar manner to the 'My Experiments' list but includes the experiments belonging to all Testbed experimenters. As with the 'My Experiments' page it is possible to change the order of the table by experiment name and type and to load the experiment wizard for any listed experiment.

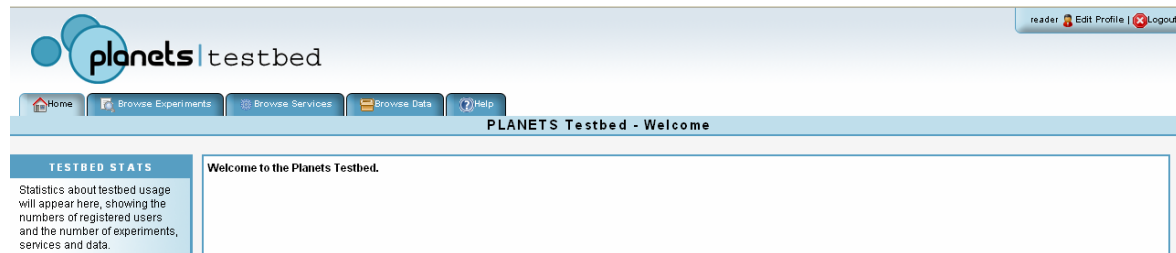
5.7 Other Experimenter Pages

The remaining tabs in the Experimenter interface do not provide any functionality in the prototype Testbed but exist to demonstrate what will be available in future releases. The following tabs fall into this category:

- Import Experiment
- Browse Services
- Browse Data
- Help
- Edit Profile

6 The Reader Pages

Once you have logged in as a Reader a page will load with the following tabs:



The only reader page that has any functionality in the Testbed prototype is the 'Browse Experiments' page. This functions in an identical manner to the Experimenter's view of this page, but for the prototype it will give you an idea of how the experiment wizard will look for readers and experimenters who do not own the experiment that is being viewed.

6.1 The Reader's view of the Experiment Wizard

If you load an experiment using the 'Browse Experiments' page while logged in as a reader you can access the reader's view of the experiment wizard. This view maintains the six-step experiment process but presents the information in paragraphs rather than input boxes. Unfortunately at the time of writing the prototype has a bug which prevents this view from being displayed. This will be addressed in future releases.

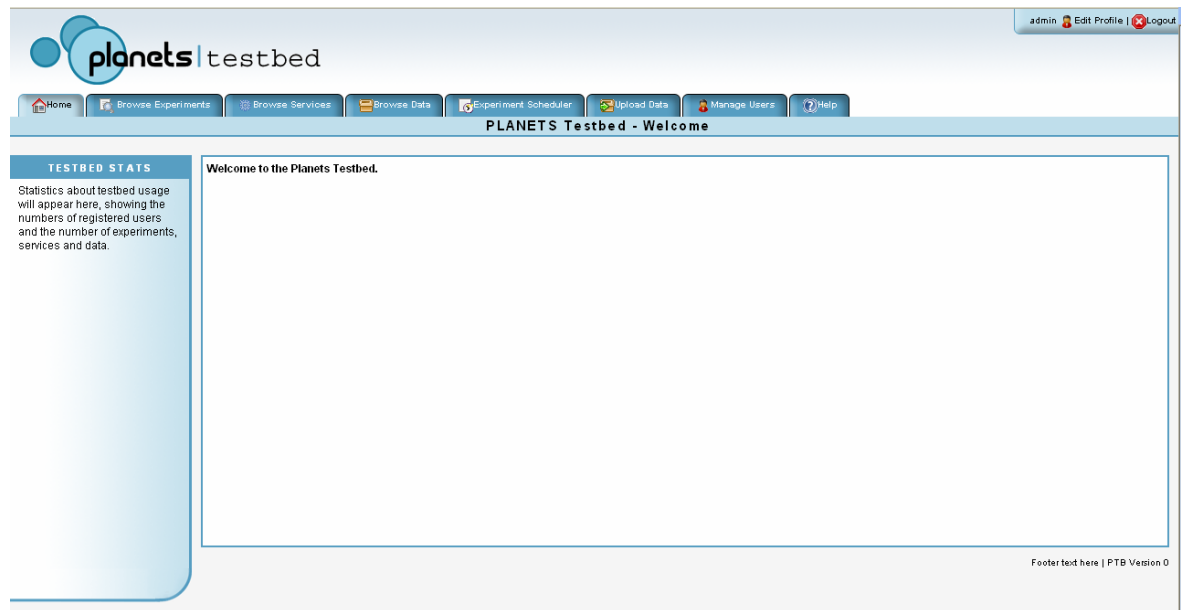
6.2 Other Reader Pages

The other pages available to readers are a reduced set of the tabs that are available to Experimenters. The following pages exist as mock-ups in the prototype:

- Browse Services
- Browse Data
- Help
- Edit Profile

7 The Administrator pages

Once you have logged in as an Administrator a page will load with the following tabs:



For the prototype all administrator functions are mock-ups. There is no administrator functionality at this stage other than access to the 'Browse Experiments' page.

8 Appendix A: Testbed features to be developed

This appendix lists the features of the Testbed that have been specified in the Testbed design documents but have not been implemented in the Testbed Prototype that was released in M16. A significant proportion of these features can only be implemented once the necessary Interoperability Framework (IF) components are made available.

The contents of this appendix formed a starting point for discussions about the next implementation plan at the TB/2 implementation meeting in Glasgow on the 23rd of October 2007. At this meeting the TB participants made a number of design decisions relating to some of the features listed below. Please check the TB/2 wiki page for the most up to date information relating to Testbed development:

http://www.planets-project.eu/private/pages/wiki/index.php/TB/2_Setup_and_Maintenance_of_the_Testbed

8.1 User Accounts:

For the prototype user accounts were hard coded into the JBoss container. This will be replaced with a more flexible approach once the IF single sign-on feature is fully available. At the moment the only user information available to the Testbed is the username so it is not possible to display a person's full name, access their e-mail address, or update their password.

The user account system will be updated to enable access to this sort of user information. This will allow us to implement the 'edit profile' feature to allow users to edit their user details. It will also allow us to develop the administrator pages for managing user accounts. We are currently missing pages for creating user accounts, listing users, editing a user's account (including updating their password and changing their user type) and deleting a user.

8.2 Experiment Stage 1: Define Basic Properties

8.2.1 Experiment Formality

In the prototype the checkbox for selecting whether an experiment is formal or informal is disabled and all experiments are treated as informal. We will add in the option of specifying formal experiments and also provide the additional error checking that this requires (i.e. checking for mandatory fields).

We will also update the lists of experiments to ensure that informal experiments are only viewable by the experimenter who created them.

8.2.2 Experiment Participants

The 'participants' field is currently a textbox. This will be updated to allow the experimenter to search for other registered Testbed users and to add one or more to this box. This would be a

useful place to use AJAX, enabling the experimenter to type in a person's name and have the system display any matching users as the experimenter types.

We should also consider whether listing other Testbed users is sufficient here, or whether we need to give the experimenter the option of entering the names of people who may not be registered users of the Testbed.

8.2.3 Contact Information

In the prototype the contact boxes are blank. We will update this so that the experimenter's recorded contact details are displayed by default. This will require the overhaul of the user details as mentioned in Section 8.1 above.

8.2.4 Experiment References

Currently it is only possible to supply one literature reference and we will add the facility to allow the experimenter to enter as many references as are required. The experiment reference field also needs to be updated to enable the experimenter to search for other experiments that are in the system and to attach one or more to the box. This could be handled using AJAX in a similar manner to the experiment participants mentioned above.

We will also add a reference to an experiment that the current experiment has been based upon. This would be displayed if the experimenter has chosen to re-use or repeat an experiment, a feature which is not currently implemented.

8.3 Experiment Stage 2: Design Experiment

This stage in the experiment process is heavily dependant on tools, workflows and data being made available via the IF. We will discuss what is feasible here and how we should proceed with development. It may be that for future releases the structure of this stage will need to be entirely altered. For example, it may be necessary to allow multiple tools and/or types of tools to be selected as part of once experiment, or we may want to be able to run experiments on a mixture of different file types with different tools being used depending on the type of file that is being processed.

8.3.1 Experiment Type

A greater number of experiment types will be implemented, as currently only the 'Simple migration' experiment is operational.

8.3.2 Specify Workflow

We will include a larger number of workflow types for a variety of tools and experiment types. We may have to include hundreds or thousands of workflows here so a simple select box will not be feasible.

8.3.3 Configure Workflow

We will add an option to allow the Experimenter to change the configuration of the selected tool and workflow here. We will also update the way in which data are attached to the experiment (see Section 8.8 below).

8.4 Experiment Stage 3: Specify Resources and Outcomes

8.4.1 Resources

This section needs further fields. We should also maybe consider if this section is actually needed. It was initially intended that this section would provide the system with some basic information about whether the experiment should be approved automatically or whether the Administrator would need to manually approve the experiment, but it may be that this feature is not going to be implemented.

8.4.2 Specify Outcomes

This section should perhaps be renamed 'Specify Benchmark Goals'. We will update the display of the benchmark goals to make them more readable. Goals will be split into categories and arranged in a tree structure that users can expand or collapse. We will also think of an easier way for users to select / deselect groups of goals. We should also make the goals that are of particular relevance to the experiment's file types be displayed in the most prominent position by default.

We will also consider how to make the goals extensible by experimenters – how to give experimenters the option of uploading new goals and the sorts of error checking we need to include and whether these goals will be made available to all other experimenters.

8.5 Experiment Stage 4: Experiment Approval

At the moment the experimenter is given the option of manually approving their experiment. This will be updated to either make the Administrator approve all experiments or to include some automatic approval algorithm that involves the Administrator in the approval process only if the experiment fails to meet the criteria for automatic approval. The former may be more feasible for the M20 release. Either option will require new pages to be created to allow the administrator to approve experiments or to reject experiments and supply a reason for the rejection. This will also require the sending of notification emails to both the experimenter and the administrator.

Note that if we are to include the automatic approval of experiments based on the current status of the Testbed and the supplied experiment information then we also need to look more closely at developing the 'system monitoring' component that would retrieve real-time information about the underlying system on which the Testbed is running.

8.6 Experiment Stage 5: Run Experiment

As with the previous stage, Stage 5 will be updated to transfer the option of running experiments from the experimenter to the Administrator. This will require several new Administrator features to be implemented, including the experiment scheduler. See Section 8.13 below for further information.

In addition to updating the way in which the initiation of experiment execution begins, we will also consider the actual execution of experiments. For the prototype a dummy invoker was called in place of the actual experiment execution engine. We will integrate the IF execution engine with the Testbed and consider how the Testbed can keep track of the current status of an experiment's execution and can provide up to the minute statistics on the execution for display to the experimenter.

8.7 Experiment Stage 6: Experiment Evaluation

The 'experiment report' will be added to this stage. This will be a large text area where a detailed report can be entered. We will also update the way in which the selected Benchmark Goals are displayed, updating the input type so it is appropriate to the value type (e.g. a Boolean should be displayed as a checkbox).

We could also change the way in which the BG evaluation is handled. Perhaps stars (1-5) would be more useful than 'good / bad' options. The display of the input and output files could also be updated to display an arrow showing the relationship between files.

8.8 Data Management Issues

For the prototype data management is very rudimentary: an experimenter may upload one single file to the Testbed during Stage 2 of the experiment process. Once the file is uploaded it is attached to the experiment and is not tracked in the system in any other way.

The Testbed will be reliant on the IF data repository to provide many of the data management options that the Testbed requires. Further discussion is required to define exactly which options will be feasible and how these may be integrated. The Testbed design documents specify the need for large amounts of files to be uploaded and made available through the Testbed interface. This may include multiple directories and subdirectories and also zip files of data that may be several gigabytes in size. We will look into implementing multiple ways of getting data into the Testbed, including HTTP, FTP, SSH and also the option of the Administrator receiving the data and uploading it into the system locally.

We will also implement facilities for searching and browsing data. This is a feature required by all Testbed users and also more specifically for Experimenters during the data selection stage of the experiment process and by the Administrator who will need to have the option of deleting data from the system.

Another issue that still needs consideration is data protection. What sorts of restrictions are we going to place on the reuse of data and how are we to implement these? How are we going to ensure that intellectual property rights are observed?

Finally, we also need to consider the directory structure we are going to use. The Prototype currently has one folder for input files and another for output files but this is inadequate for future releases. The output files for one experiment may become the input files for another experiment and the uploaded data itself may have its own directory structure. We must also consider the danger of people uploading files or directories that have the same name: should we rename all files when they are uploaded? The prototype currently does so but is this approach correct?

8.9 Issues relating to Services / Tools:

In addition to the issues relating to services that are mentioned above in Section 3 above, there are several issues relating to the browsing of services that still need to be addressed. All user types should be able to browse the available services and view the details that are recorded about each service. As with other lists, we still need to implement listing options such as ordering of columns, and also the navigation between pages of services and the selection of how many services to display per page. An option to search services by certain criteria also needs to be implemented.

We will also consider how services should be added to and removed from the Testbed. Is this something that will automatically be handled by the IF tools registry or will the Administrator need to manually add the services? Or should it be possible for Experimenters to add services to the Testbed themselves?

8.10 Lists of experiments

Further work is required on the lists of experiments. Some columns are not yet displaying any information (such as the date columns), and it is not possible to order the data by certain columns that would be useful (e.g. allowing the data to be ordered by experiment start date or current stage).

The navigation options will also be completed. The look and feel of the 'next' and 'previous' page navigation needs to be improved and we will also implement an option to change the number of experiments that are displayed on each page.

The facility to search experiments also needs to be implemented. Search options may include full free-text searching, searching by selected benchmark goals, by current stage and more.

Finally, the option to 'delete' experiments from the 'my experiments' list will be removed. This feature will only be available to the Administrator.

8.11 Other Experiment Options

8.11.1 Repeat / Reuse / Export Experiment

The options for repeating, reusing and exporting experiments are not yet implemented. These options will be added to the experiment wizard and will be available to all experimenter users, enabling an experimenter to repeat an entire experiment (i.e. running an experiment again, with all settings identical to the previous execution), reuse parts of an experiment (i.e. create a new experiment based on the experiment's settings, with the option of editing these settings), and export an experiment (i.e. the download of the experiment information from the Testbed system to the Experimenter's local PC.)

8.11.2 Import Experiment

This option will allow the Experimenter to load experiment settings from their local PC into the Testbed system and would involve a number of error checks to ensure that the uploaded information is valid. We should consider whether this feature is a priority at this stage.

8.11.3 Comment on Experiment

The option to allow any logged-in user to comment on an experiment is also still to be implemented. We need to consider whether comments should be moderated and how complicated the structure of the comment system should be (e.g. should we allow the nesting of subjects or just allow a flat list of comments).

8.11.4 Selecting Viewer for Data

A feature that was initially considered was making different viewers available for both the input and especially the output data. These would allow files to be viewed in the environment in which they were intended to be viewed, for example a Word 95 file could be viewed in Word 95 on a Windows 95 platform. These options should still be considered, although implementing such functionality may not prove feasible.

8.11.5 Emulation Experiments

How to handle emulation experiments has still not been decided upon and should probably not be addressed until more pressing issues have been resolved.

8.11.6 Evaluation of Preservation Plans

How to handle the evaluation of preservation plans, and how exactly the Testbed and the PP/4 PLATO tool interact with each other has not yet been discussed.

8.11.7 Generate Report

The option to generate a report (perhaps as a PDF?) for an experiment still needs consideration.

8.12 Help

This is a low priority but the creation of detailed help files for every aspect of the system should be implemented at some point.

8.13 Administrator Options

The majority of Administrator options are still to be implemented. The following have been mentioned already in previous sections: User management, Data upload and management, service management, experiment deletion.

In addition to these we still need to add Administrator-specific features to the Experiment wizard, especially the experiment approval and execution stages. These would allow the Administrator to approve or reject an experiment, to supply the reason for a rejection, to initiate the execution of an experiment and to pause or cancel the execution of an experiment that is currently being executed. We should also add features to enable the Administrator to delete user comments from an experiment.

The experiment scheduler will also be implemented. This calendar-based interface will allow the Administrator to see when experiments were executed, which experiments are currently running and provide an option to schedule experiments that are awaiting execution.

8.14 Bugs and other issues that need fixed

- Fix the appearance of ticks in the last two stages of the experiment progress pane.
- Fix BGs so that if you don't supply evaluation before you submit the form it doesn't break.
- Fix apostrophes in experiment names causing errors
- Fix the appearance of the log-in form after a user has logged in
- Fix basic properties Javascript errors
- Add file type upload checks

Bugs can be tracked through the Planets Gforge interface here:

http://gforge.planets-project.eu/gf/project/ptb/tracker/?action=TrackerItemBrowse&tracker_id=47

8.15 Also to be considered

Can we ensuring compatibility between versions of the Testbed? Will this be possible or will it not be possible to carry over the experiments from one version into a newer version?