



**Project (Group) Management
Installation Guide (Linux)**

Version 1.3

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About this Guide

Informatics for Integrating Biology and the Bedside (i2b2) is one of the sponsored initiatives of the NIH Roadmap National Centers for Biomedical Computing (<http://www.bisti.nih.gov/nbc/>). One of the goals of i2b2 is to provide clinical investigators broadly with the software tools necessary to collect and manage project-related clinical research data in the genomics age as a cohesive entity—a software suite to construct and manage the modern clinical research chart. This guide with the provided source code will help you to understand how to install i2b2 cells.

Document Version History

| Date | Revision | Description | Author(s) |
|-------------|-----------------|------------------------------|-------------------------------|
| 11/01/2007 | 1.0 | Version 1.0 | Mike Mendis, Lori Phillips |
| 11/27/2007 | 1.01 | Update permission on scripts | Lori Phillips |
| 10/8/2007 | 1.3 | Added domain info | Mike Mendis |
| | | | |
| | | | |
| | | | |

1

Prerequisites

Required Software

If you installed the prerequisite software from the Hive Installation Guide you may skip this section.

a. Java JDK

JDK 5.0 (recommended)

Download JDK 5.0 Update 11 (jdk-1_5_0_11-linux-i586.bin) from <http://java.sun.com/products/archive/>

a) Install the SDK into a directory of your choice (/opt/java/jdk1.5.0_11 or YOUR_JAVA_HOME_DIR)

b. Apache Tomcat 5.5 + JDK 1.4 Compatibility Package

The PM cell runs under tomcat. Download following 2 files from <http://archive.apache.org/dist/tomcat/tomcat-5/v5.5.23/bin/>

1. apache-tomcat-5.5.23-compat.zip
2. apache-tomcat-5.5.23.zip

a) Unzip into a directory of your choice (/opt/apache-tomcat-5.5.23 or YOUR_TOMCAT_HOME_DIR)

b) If default port 8080 is unavailable (another application is using this port), edit 'YOUR_TOMCAT_HOME_DIR/conf/server.xml' file to reconfigure the non-SSL HTTP/1.1 Connector to another port such as 7070 and the AJP 1.3 connector to another port such as 7009

```
<!-- Define a non-SSL HTTP/1.1 Connector on port 7070 →  
<Connector port="7070" maxHttpHeaderSize="8192"  
    maxThreads="150" minSpareThreads="25" maxSpareThreads="75"  
    enableLookups="false" redirectPort="8443" acceptCount="100"  
    connectionTimeout="20000" disableUploadTimeout="true" />
```

```
<!-- Define an AJP 1.3 Connector on port 7009  
<Connector port="7009"  
    enableLookups="false" redirectPort="8443"  
    protocol="AJP/1.3"/>
```

c) You may also need to update the run permission of the tomcat startup scripts.

```
'chmod 775 YOUR_TOMCAT_HOME_DIR/bin/*.sh'
```

c. Apache Ant 1.6.5

Download 'Apache Ant version 1.6.5' (apache-ant-1.6.5-bin.zip) from <http://archive.apache.org/dist/ant/binaries/>

a) Unzip into a directory of your choice (/opt/apache-ant-1.6.5 or YOUR_ANT_HOME_DIR)

d. Apache Axis2 1.1

Download 'Apache Axis2 version 1.1', from http://ws.apache.org/axis2/download/1_1/download.cgi and select the download type WAR (Web Archive) Distribution.(axis2.war)

a) Create folder axis2 inside 'YOUR_TOMCAT_HOME_DIR/webapps'

b) Unzip axis2.war inside 'YOUR_TOMCAT_HOME_DIR/webapps/axis2' folder.

e. Update your environment variables

Be sure to set the JAVA_HOME, ANT_HOME and CATALINA_HOME variables to the JAVA, ANT and Tomcat home directories you set up in steps a-c respectively. Examples are shown below.

```
# Sample environment variables
JAVA_HOME=/usr/java/jdk1.5.0_11
ANT_HOME=/opt/apache-ant-1.6.5
CATALINA_HOME=/opt/apache-tomcat-5.5.23
PATH=$PATH:$ANT_HOME/bin:$JAVA_HOME/bin
export JBOSS_HOME
export CATALINA_HOME
export JAVA_HOME
```

2

Install

Installing the Project Management application

1. Download and extract core server source code into a target area.

- a) Set up a target source_directory.
- b) Extract core server source code to the target source_directory

2. Ensure that Tomcat is not running

- a) '\$CATALINA_HOME/bin/catalina.sh stop'

3. Deploy from edu.harvard.i2b2.pm

Make sure that you have a active internet connection, because when the hibernate build scripts runs it verifies that the XML file are valid against a schema on hibernate.org

- a) 'cd source_directory/edu.harvard.i2b2.pm'
- b) Edit the build.properties file and set tomcat.home property.

```
tomcat.home=YOUR_TOMCAT_HOME_DIR
```

- c) ant -f master_build.xml build-all
Agree to the Gridsphere license

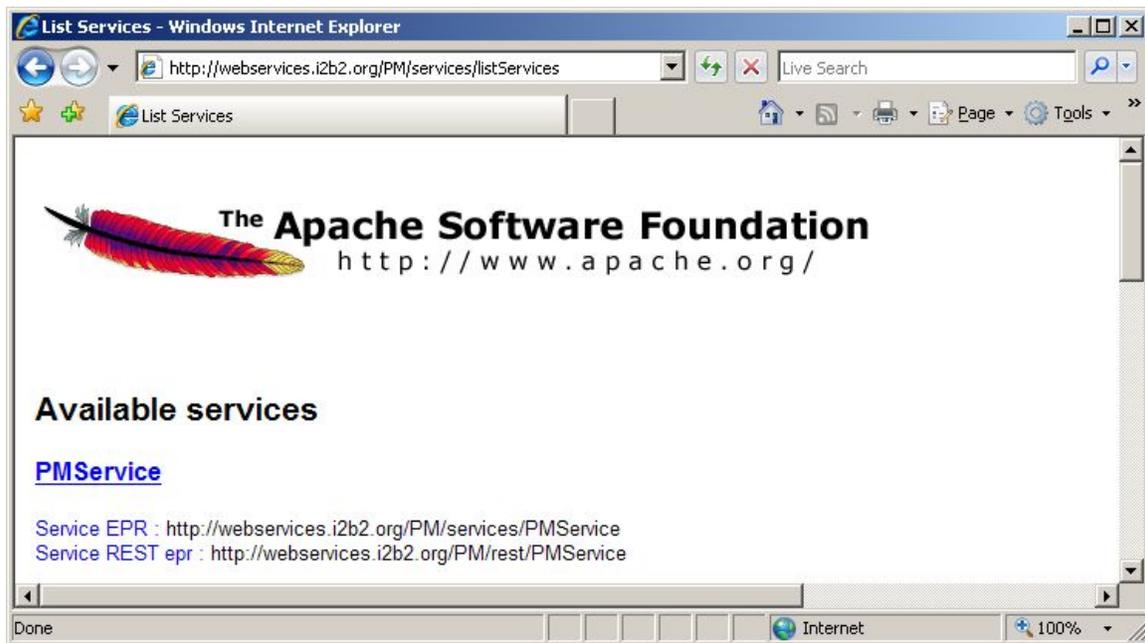
4. Start Tomcat

- a) './CATALINA_HOME/bin/catalina.sh start

5. Verify web service is running

a) Check url 'http://yourTomcatHost:7070/axis2/services/listServices' in a browser. Verify that PMService is listed as active.

(Port will be the non-SSL HTTP/1.1 Connector configured during your Tomcat installation.)



Changing Server log level

a) Edit \$CATALINA_HOME/conf/logging.properties to indicate 'INFO' or 'DEBUG'. Logs appear in \$CATALINA_HOME/logs/catalina.out

```
#####  
# Facility specific properties.  
# Provides extra control for each logger.  
#####  
  
org.apache.catalina.core.ContainerBase.[Catalina].[localhost].level =  
INFO
```

3

Initial Setup

Initial Setup of the i2b2 Project (Group) Management application

Go to the site <http://tomcatHost:tomcatPort/gridsphere>

1. You will see a setup screen which requires some initial information, fill in all the fields. This will create the default Administrator account, used to configure and setup the hive, when you are complete click the 'Save' button.

i2b2 Group Management - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address <http://localhost:8080/gridsphere/gridsphere> Go Links

i2b2 A National Center for Biomedical Computing English

Informatics for Integrating Biology & the Bedside

i2b2 Hive

Setup

GridSphere Setup

Create Portal Administrator

After submission, you will be able to login using the provided user name and password

User Name:

Full Name:

Email Address:

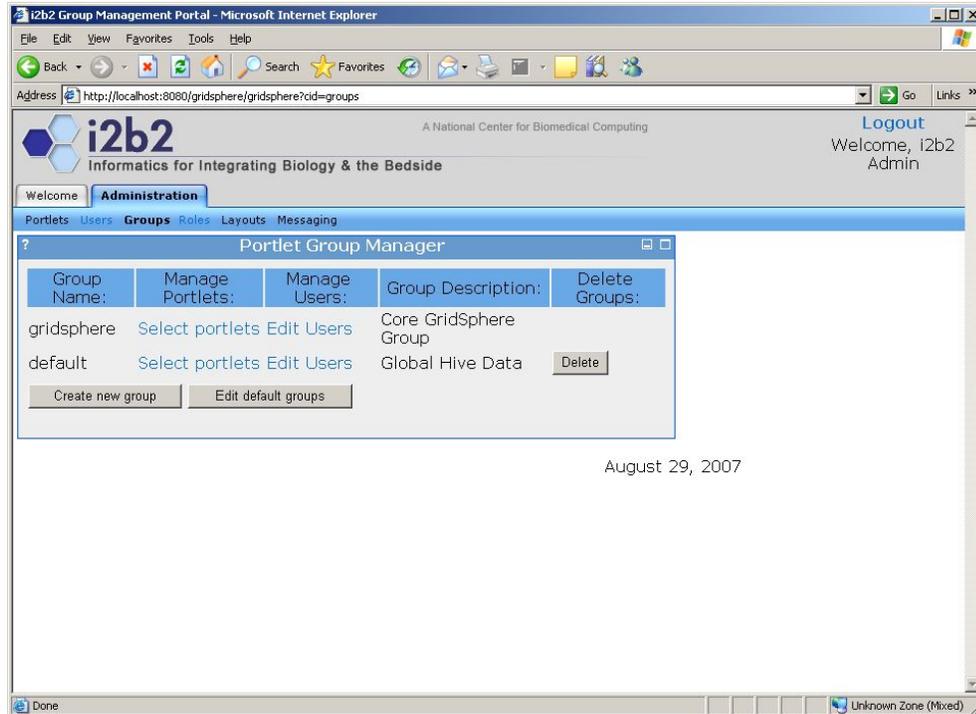
Organization:

Password:

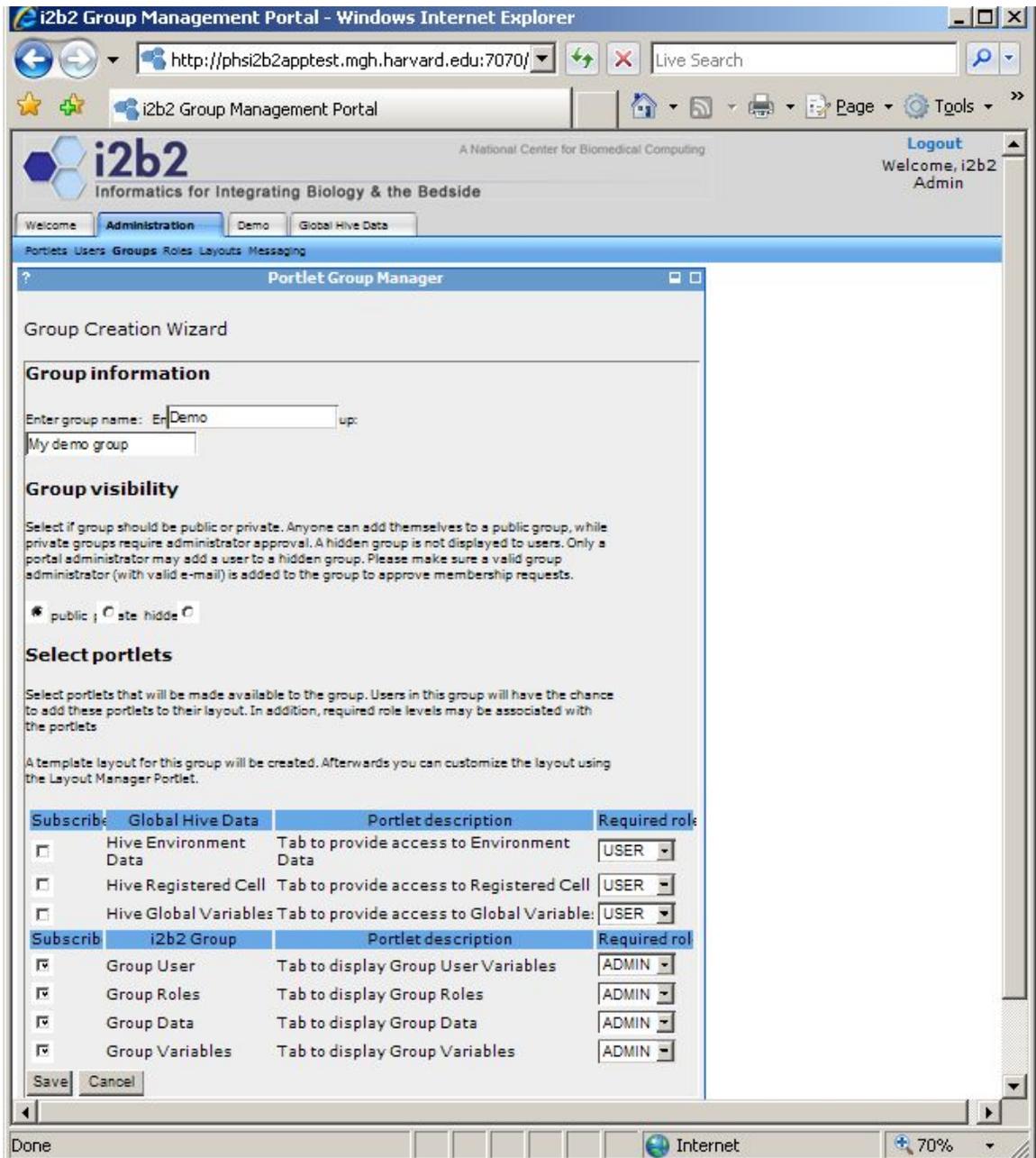
Confirm password:

Done Unknown Zone (Mixed)

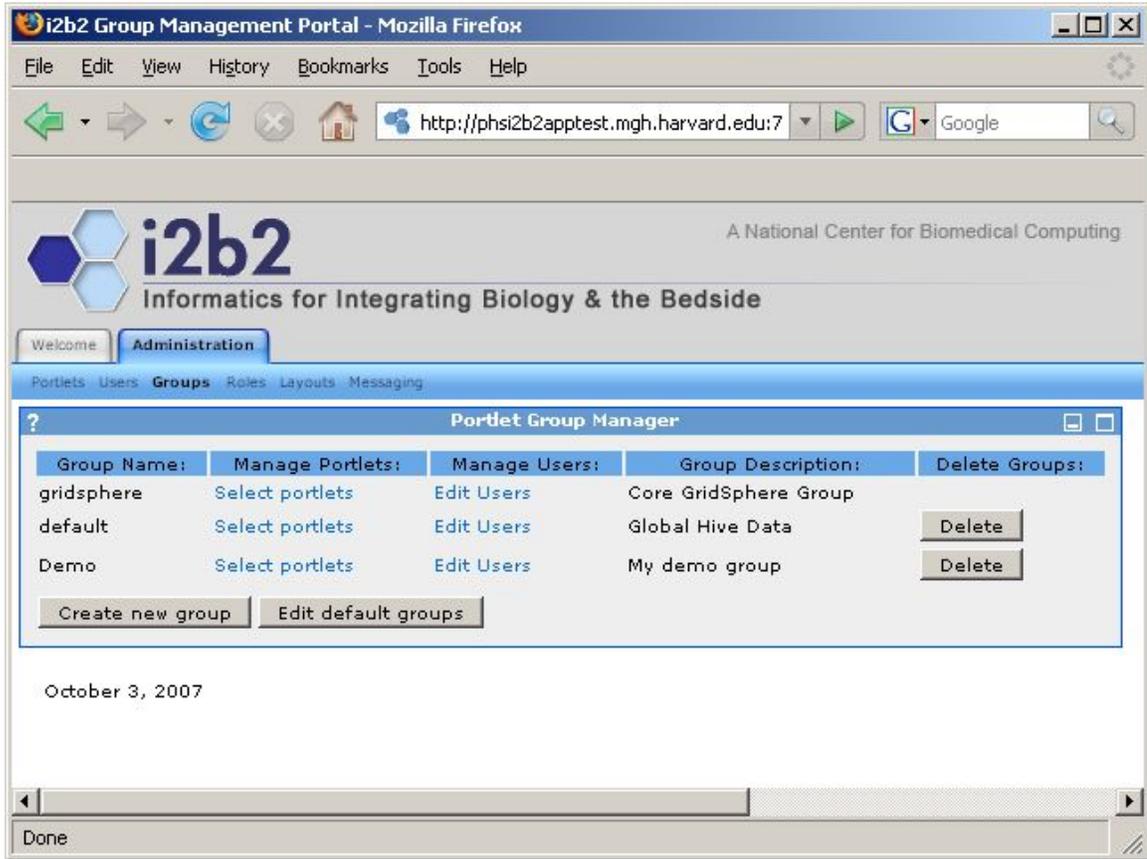
- Once logged on you will be presented with a default hive setup, select the 'Administration' from the primary navigation and 'Groups' from the secondary navigation. You should see the following:



- Click the 'Create new group' button, and enter an initial name for your group and a description for this group. Make sure that you click on Group Role, Group Data, and Group Variables. Also change the required role from User to Admin and set the group visibility to 'hidden'. This will prevent users from being able to modify the hive configuration.



4. You should be presented with a screen listing your groups



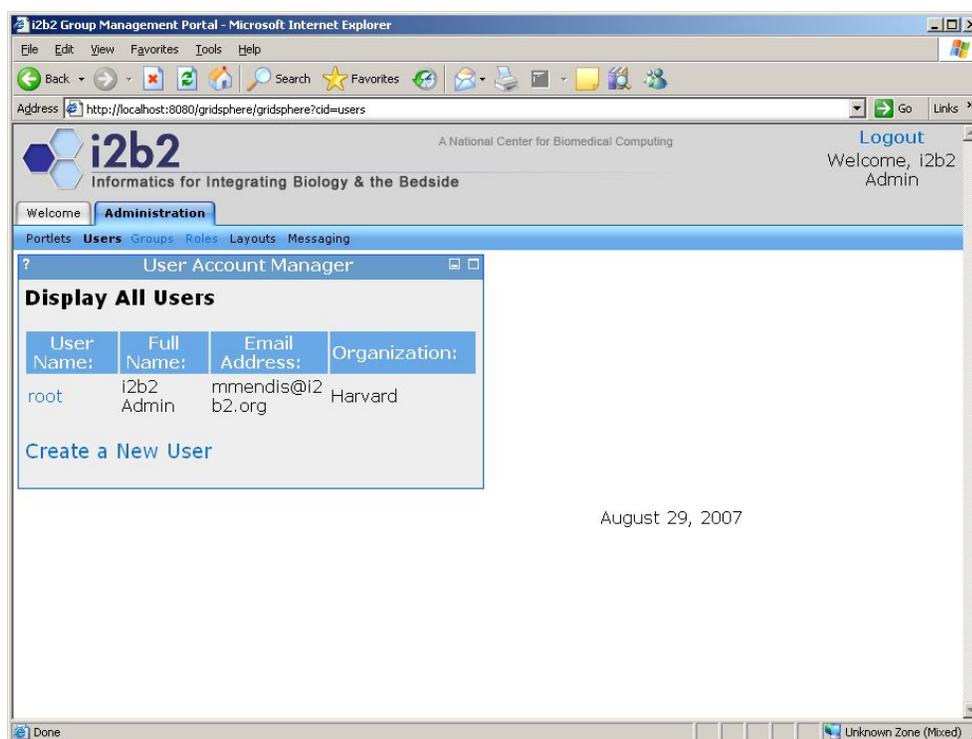
Continue with the remaining sections of this document and do not skip any sections or pages.

4

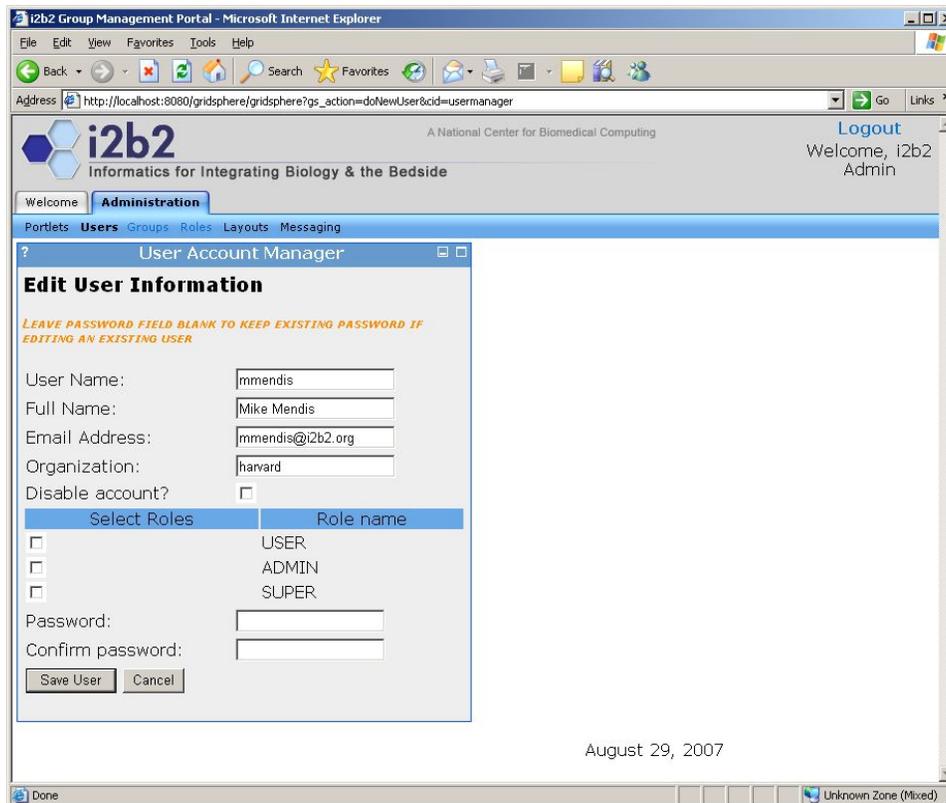
Creating Users

User creation in the i2b2 Project (Group) Management application

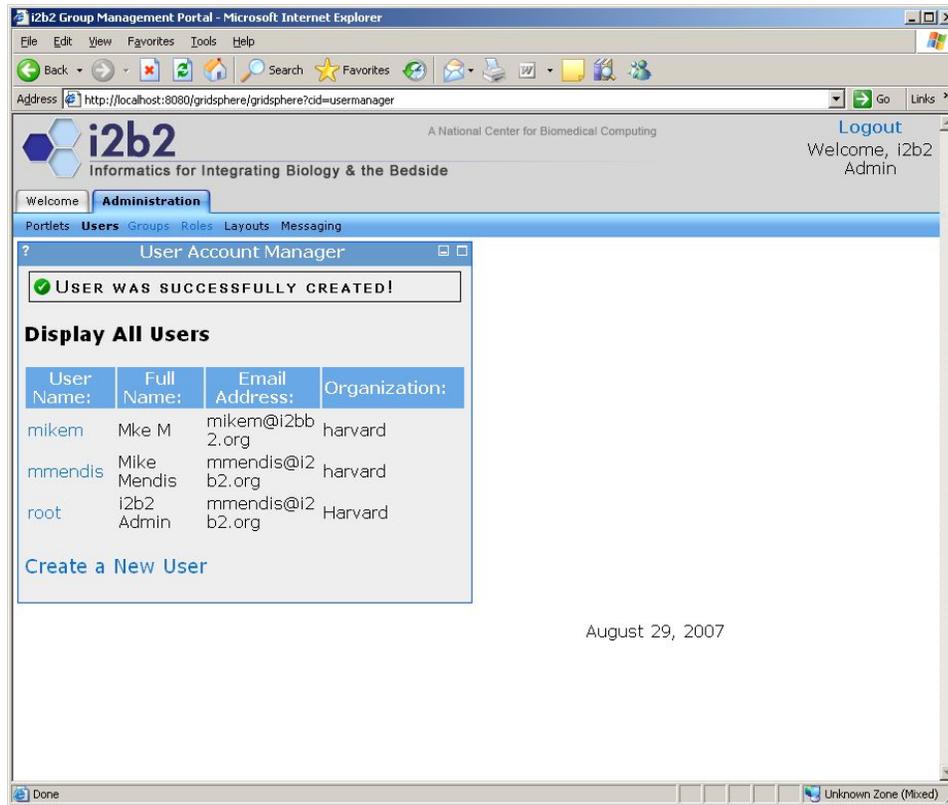
1. Continuing with Gridsphere, select 'Administration' from the primary navigation and 'Users' from the secondary navigation. You should see the following:



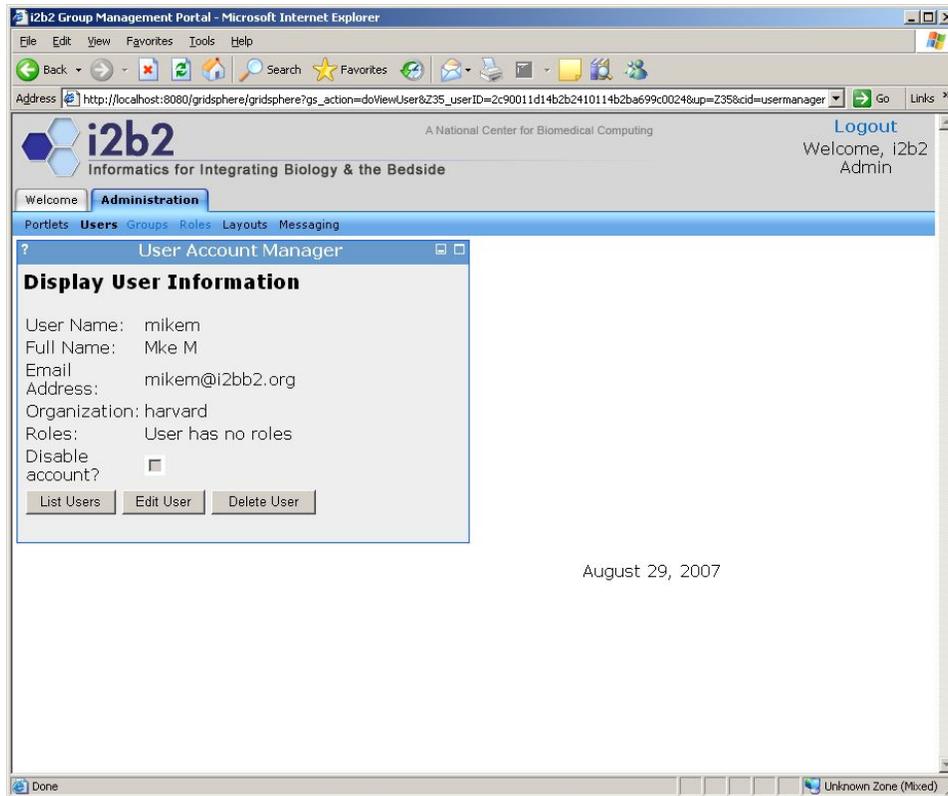
2. Click on the 'Create a New User' link, and fill in the required fields for the user you wish to add, such as the username, password, email address. If you wish this user to have the ability to administrator the hive, then select the 'ADMIN' checkbox. Click the 'Save' button once you are complete. Repeat the process for as many users you wish to add.



3. To remove a user from the system, click on the link associated with that user, in this case lets delete 'mikem'



Next click on the ‘Delete User’ button and the user will be removed from the system. You can also edit the user by clicking on the ‘Edit User’ button.

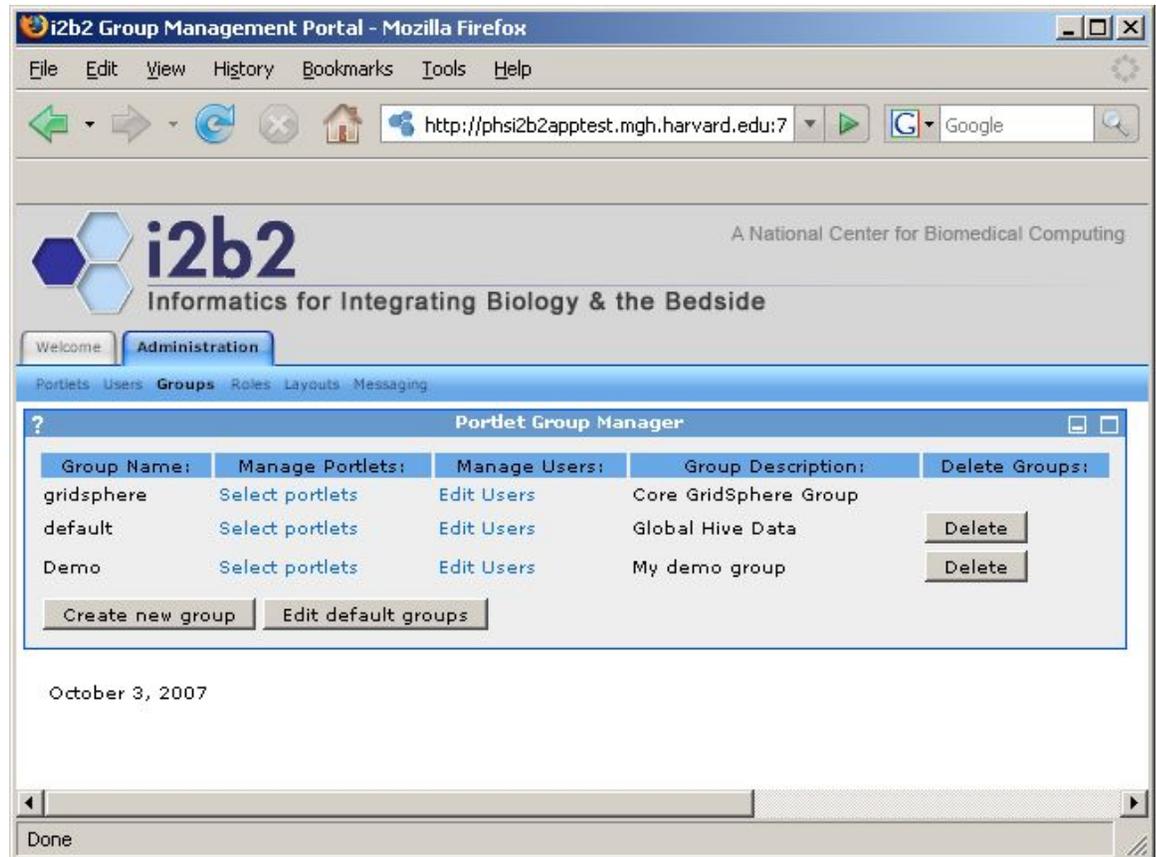


- Once the users have been created they will need to be associated with the specific groups in the hive. The application is designed to allow for wide variety of configurations, such as if you have two groups: demo and project A and three users, Bill, Sandy, and Amy. You can mix and match the users, roles and groups to fit your needs. Such as:

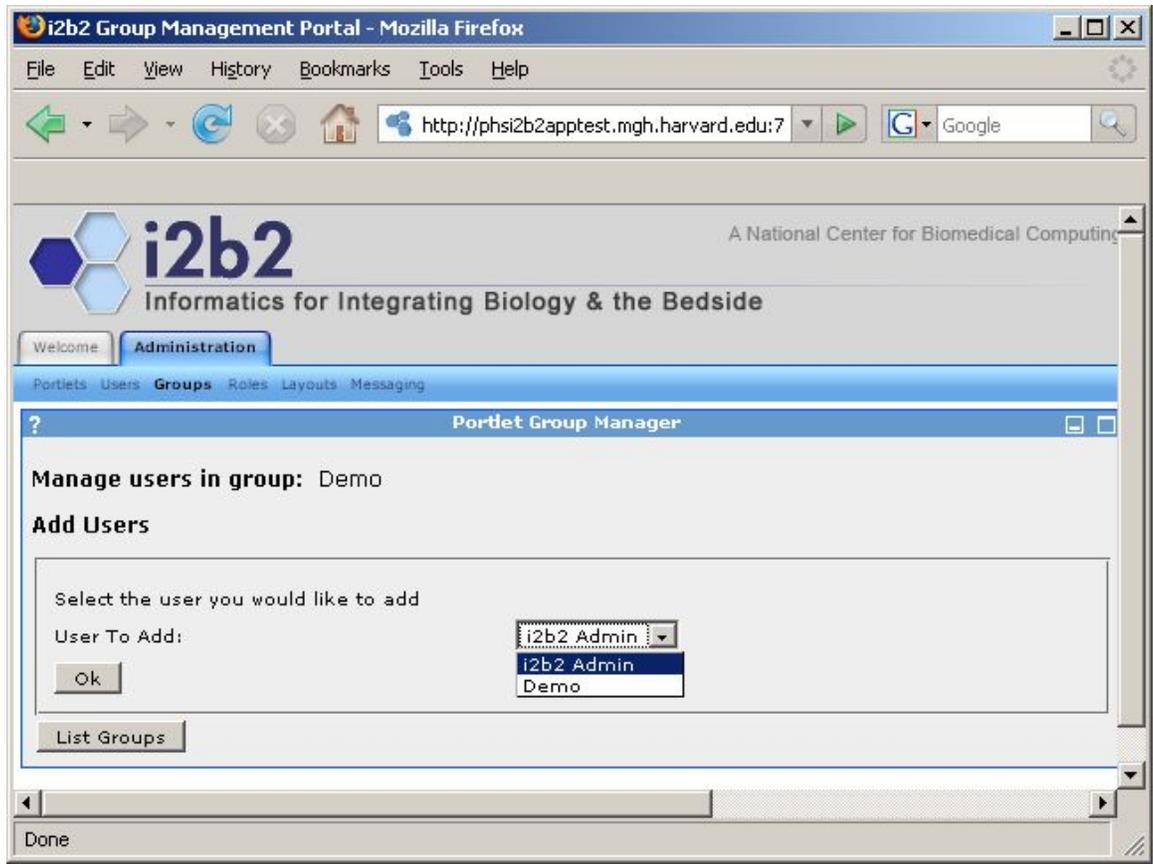
| Group | User | Role |
|-----------|-------|---------------------------------------|
| Demo | Bill | User |
| Demo | Sandy | User, Administrator |
| Demo | Amy | User, Protected Access |
| Project A | Sandy | User, Administrator, Protected Access |
| Project A | Amy | User, Protected Access |

Click on the ‘Groups’ in the secondary navigation and you will be presented with a screen displaying the list of groups in the hive.

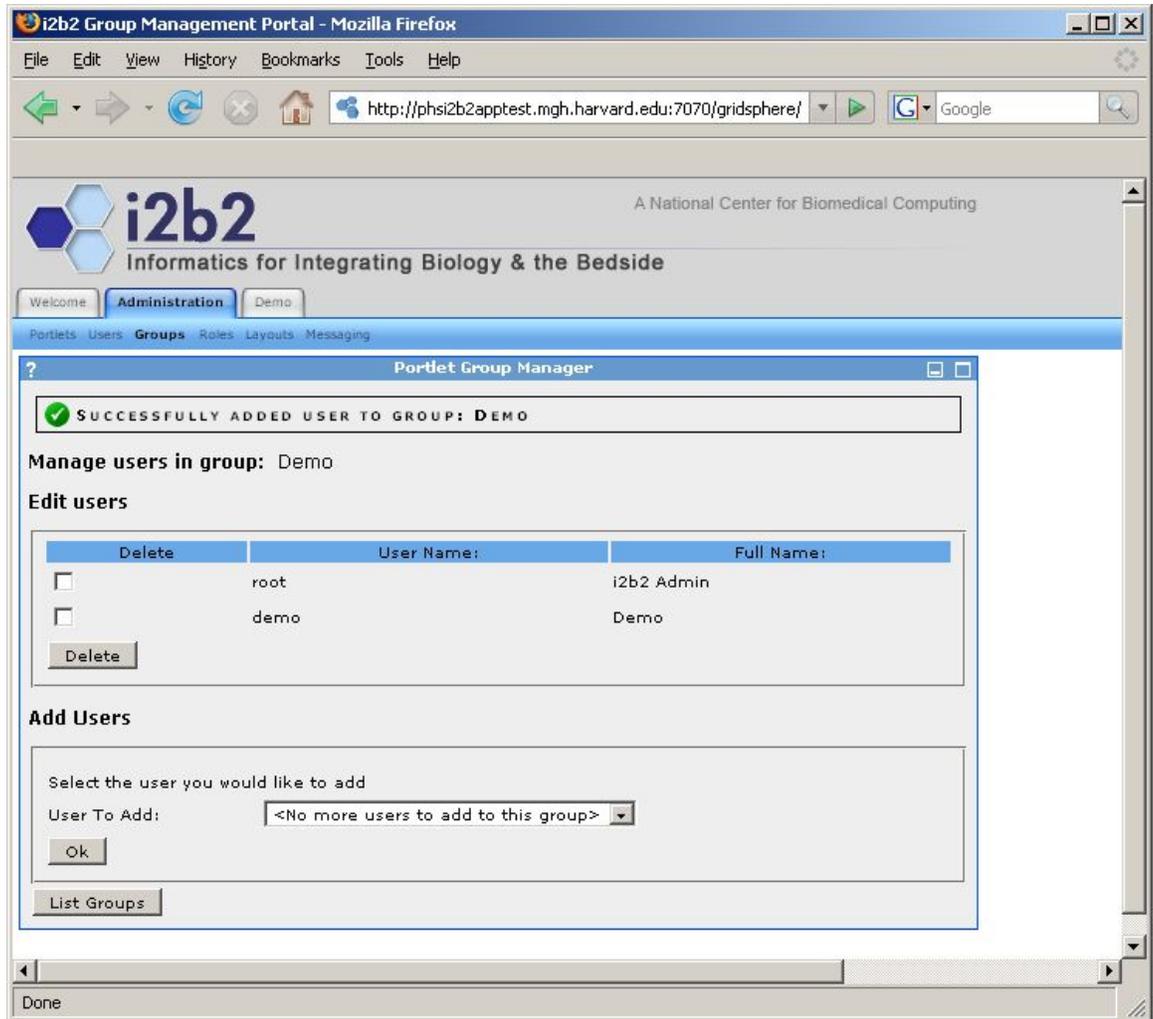
- **gridsphere** is the core group which is used by the portal to allow users access to the web interface
- **default** is the Global Hive which contains the hive specific information, global variables, cell location, and environment data.
- **Demo** is the group we created earlier that contains information relevant to this group, users and there roles, and variables for the group.



5. Click on the ‘Edit Users’ associated with the Demo group. When you associate a user with a group on this screen, that user will be allowed to see the tab in the portal web browser and will also have access to that group in applications like the i2b2workbench. In the next screen let’s associate users i2b2 Admin and Demo with the Demo group. Since the user Demo does not have a role of Admin, only the user i2b2 Admin will be allowed to modify the hive.



Once you have added the users you should see a screen similar to the following:



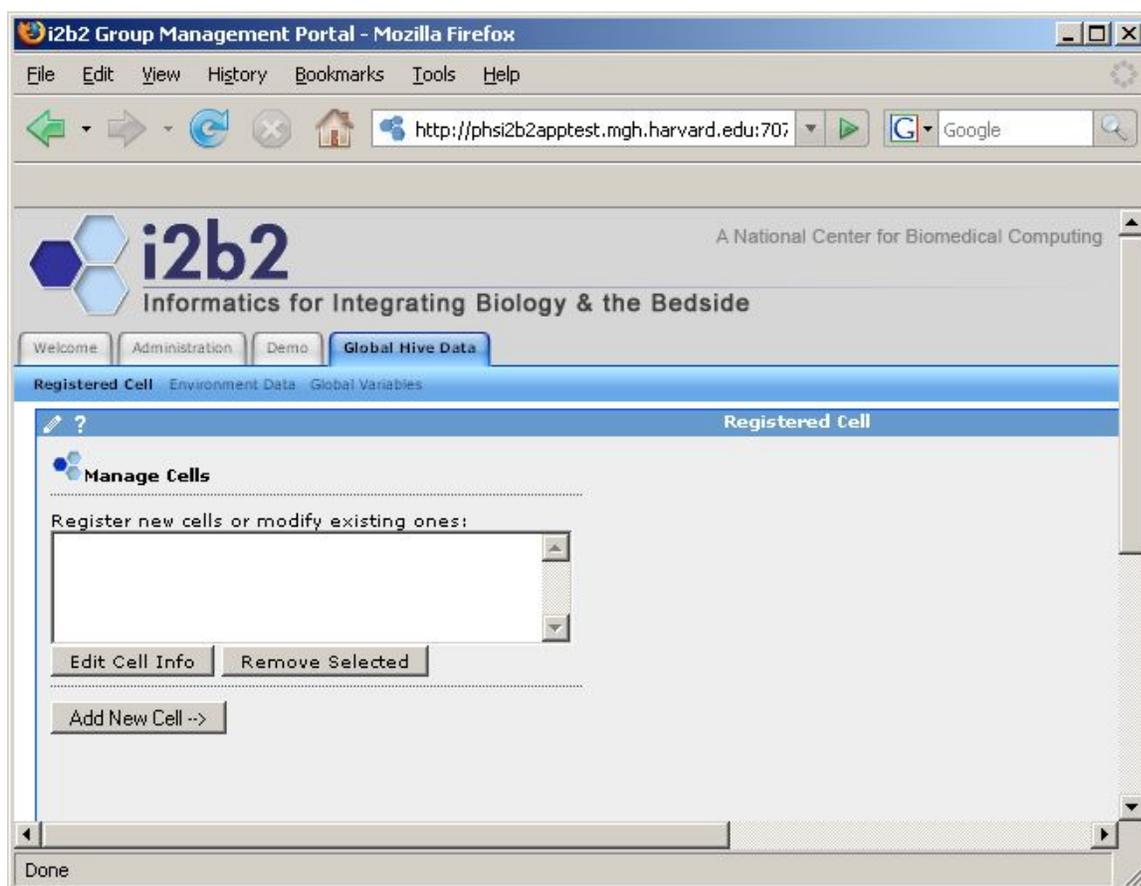
Click on the 'List Groups' button and add the current Admin user to the 'default' group. Once you have completed that a tab labeled 'Global Hive Data' should appear.

5

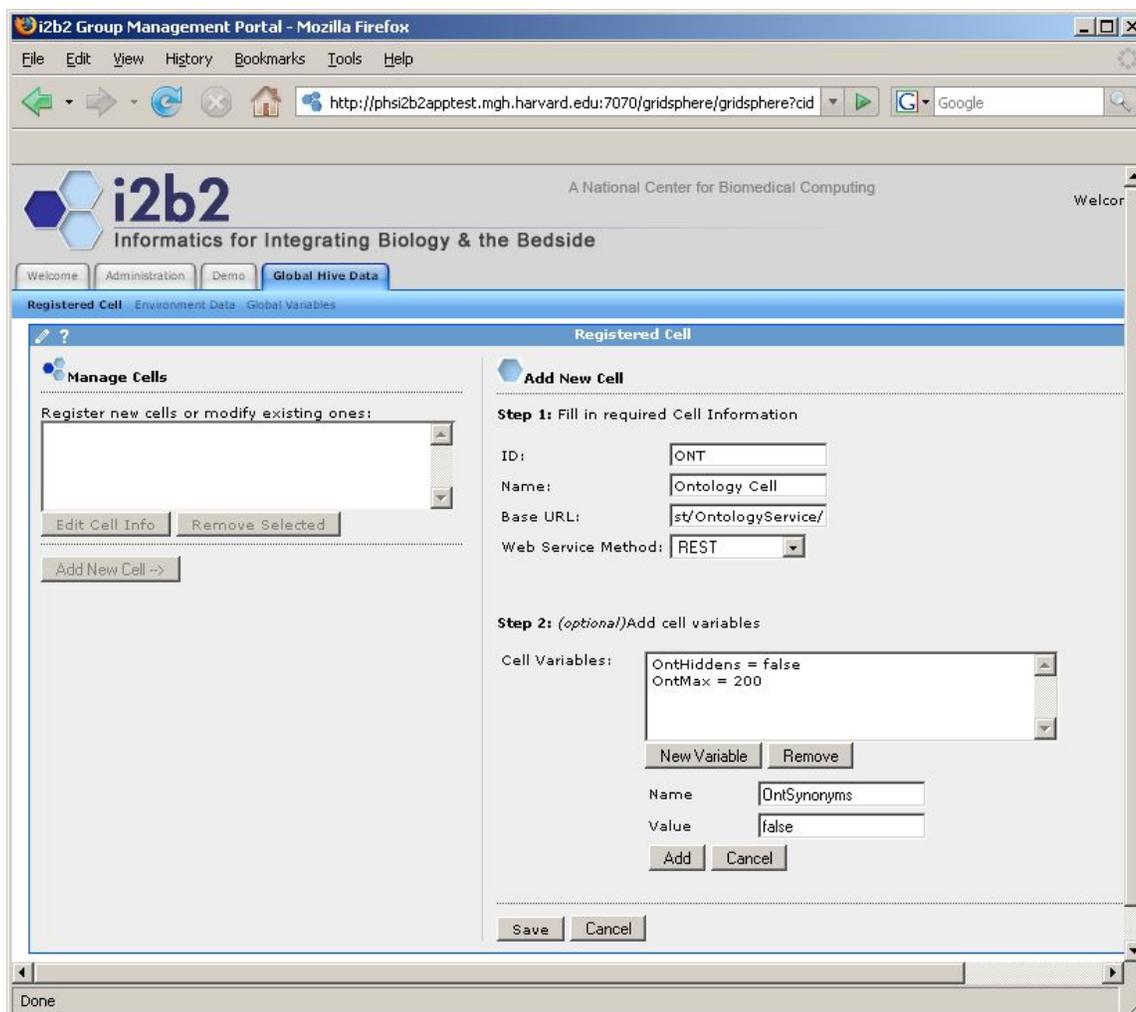
Global Hive Data

Registered Cell

1. Continuing with Gridsphere, select 'Global Hive Data' from the primary navigation. You should see the following:



2. This is where cells can be added, removed and edited within the hive. Click on the 'Add New Cell' button and fill out new information for a cell, and any variables needed for that cell. Here is an example of the Ontology Cell.

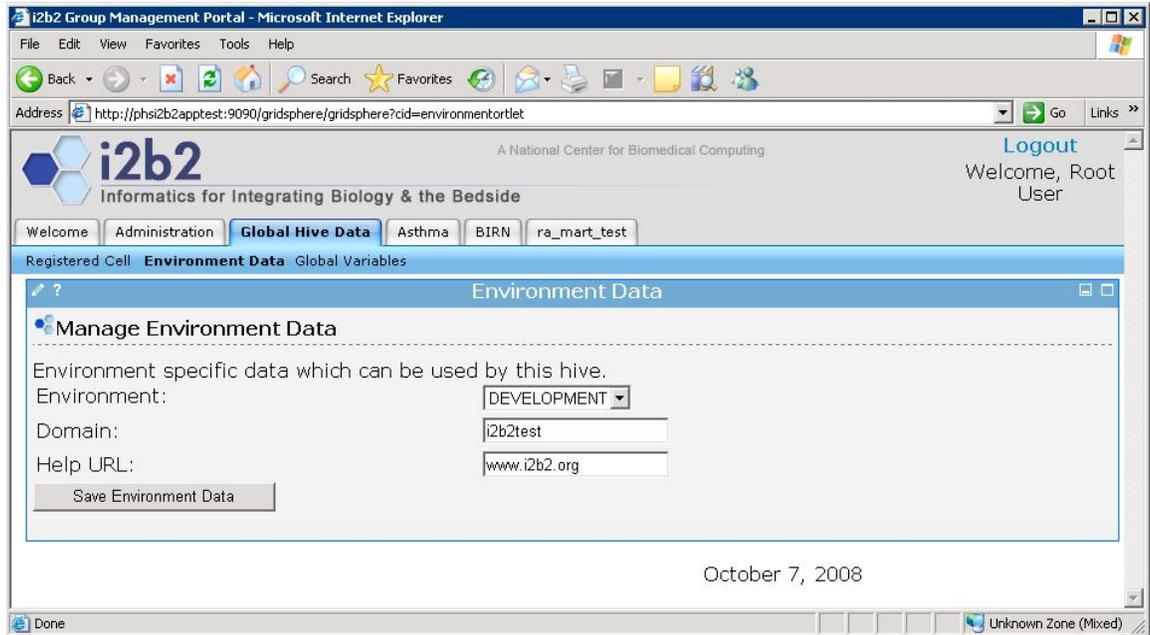


Click on 'Save' to add the cell to the hive. Repeat the process for the rest of the cells. The core cells contain the following; replace the *host* with the hostname and port associated with the location of the cell.

| ID | Name | Base URL | Variables |
|------|-----------------|----------------------------------------------|-----------------------------------------------------------|
| CRC | Data Repository | http://host:port/i2b2/rest/QueryToolService/ | |
| ONT | Ontology Cell | http://host:port/i2b2/rest/OntologyService/ | OntMax = 200 OntHiddens = false OntSynonyms = false |
| WORK | Workplace Cell | http://host:port/i2b2/rest/WorkplaceService/ | |
| FRC | File Repository | http://host:port/i2b2/services/FRService/ | PathSeparator = / DestDir = /opt/FRC |
| PFT | PFT Cell | http://host:port/axis2/rest/PFTService/ | |

Environment Data

1. Continuing with Gridsphere, select ‘Global Hive Data’ from the primary navigation, and ‘Environment Data’ as the secondary navigation. You should see the following:

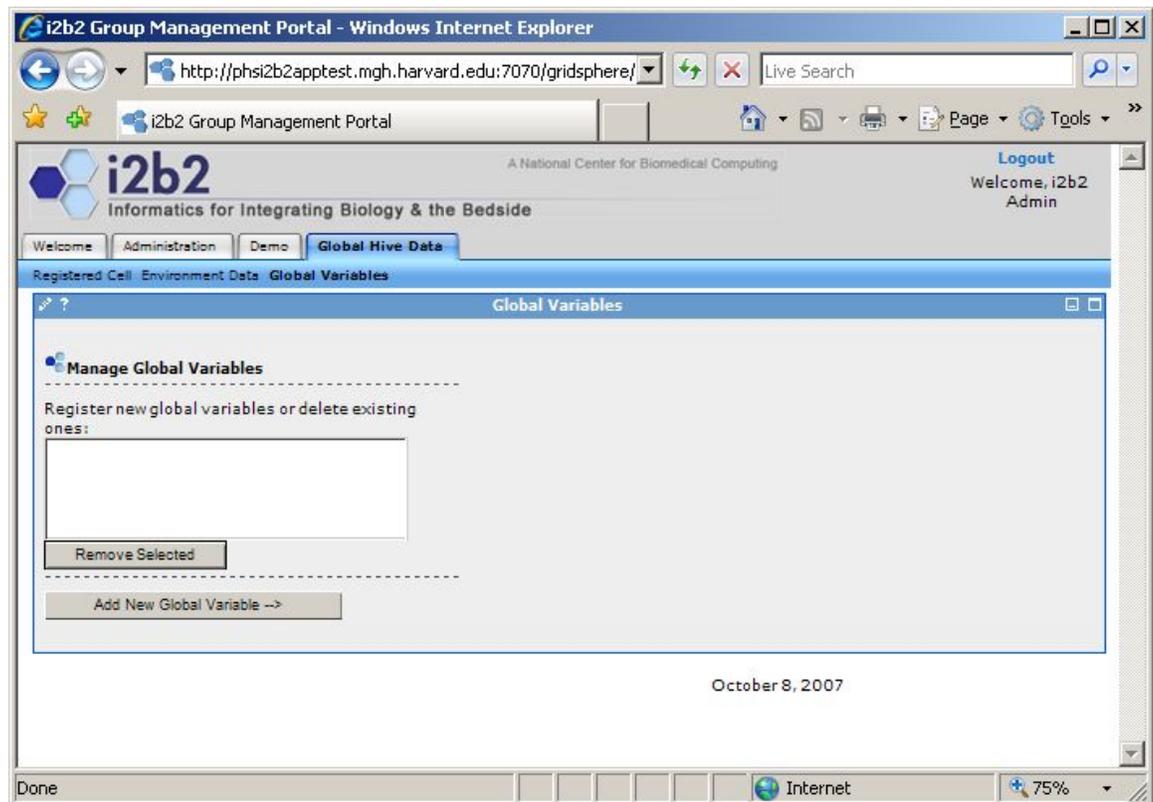


2. The three options are to specify the environment you wish the hive and the application accessing the cells within the hive to run in. The i2b2workbench will display a gray status bar when the development environment is selected; a white status bar represents the production environment. The Domain is the domain of the Hive, it needs to be the same as the first column in the i2b2workbench.properties file. In the vmware image it is set to ‘demo’. The Help URL is used also within the i2b2workbench to specify a location for the ‘help url’ button. The site www.i2b2.org may be used as a default help URL or it may be left blank.

Global Variables

Global variables are name value pairs which can be used by any of the cells, but is not specific to any individual cell, such as database connections.

1. Continuing with Gridsphere, select 'Global Hive Data' from the primary navigation, and 'Global Variables' as the secondary navigation. You should see the following:



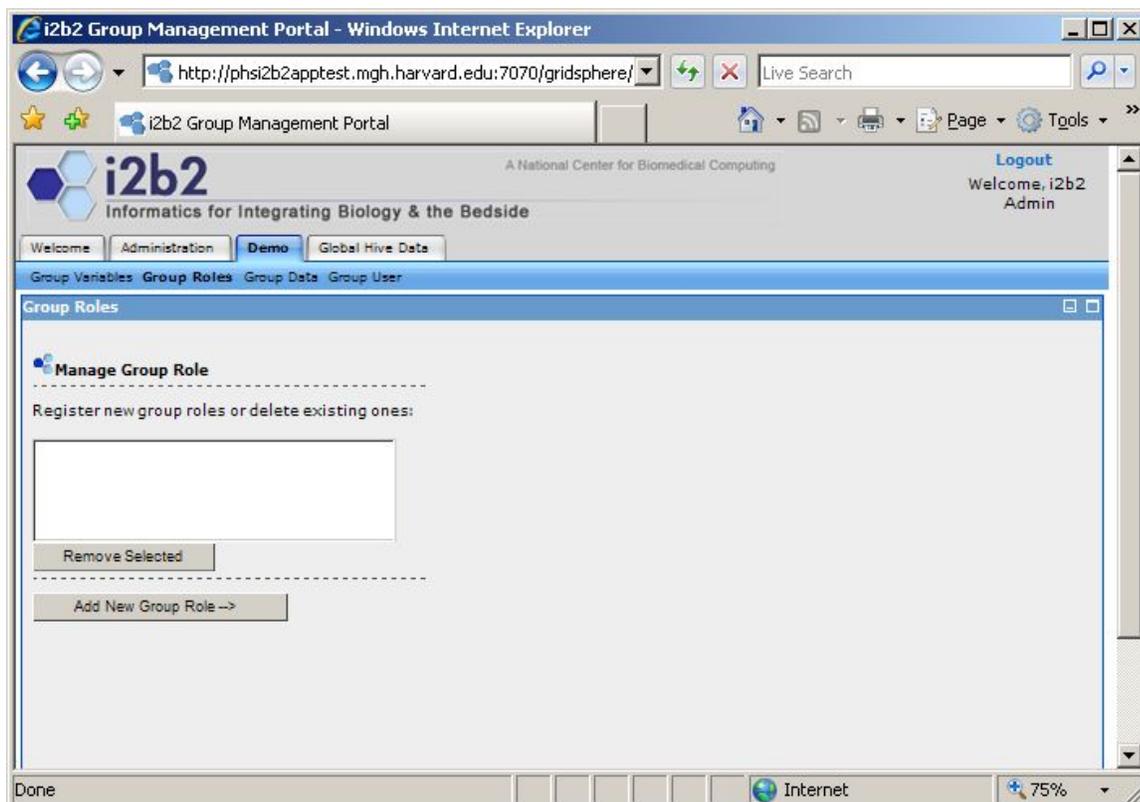
2. This is a similar design as the registered cell tab, in which you click on 'Add New Global Variable' and you will be presented with a screen on the right for the name and value for the variable. Existing variables can be removed by selecting them in the list and clicking on the 'Remove Selected' button.

6

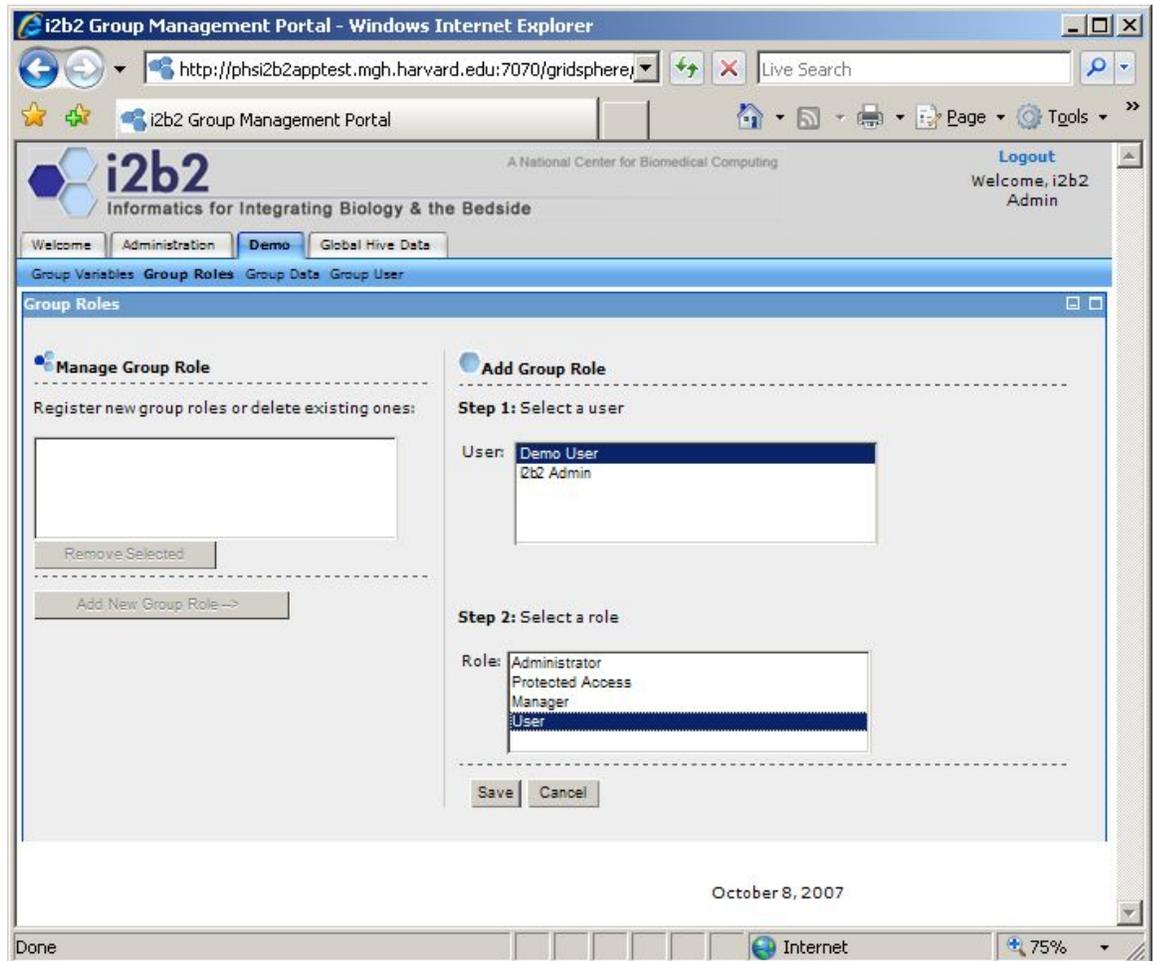
Group Data

Group Role

1. Continuing with Gridsphere, select the 'Demo' tab, or the name of the group you created from the primary navigation. Then select 'Group Roles' from the secondary navigation. You should see the following:

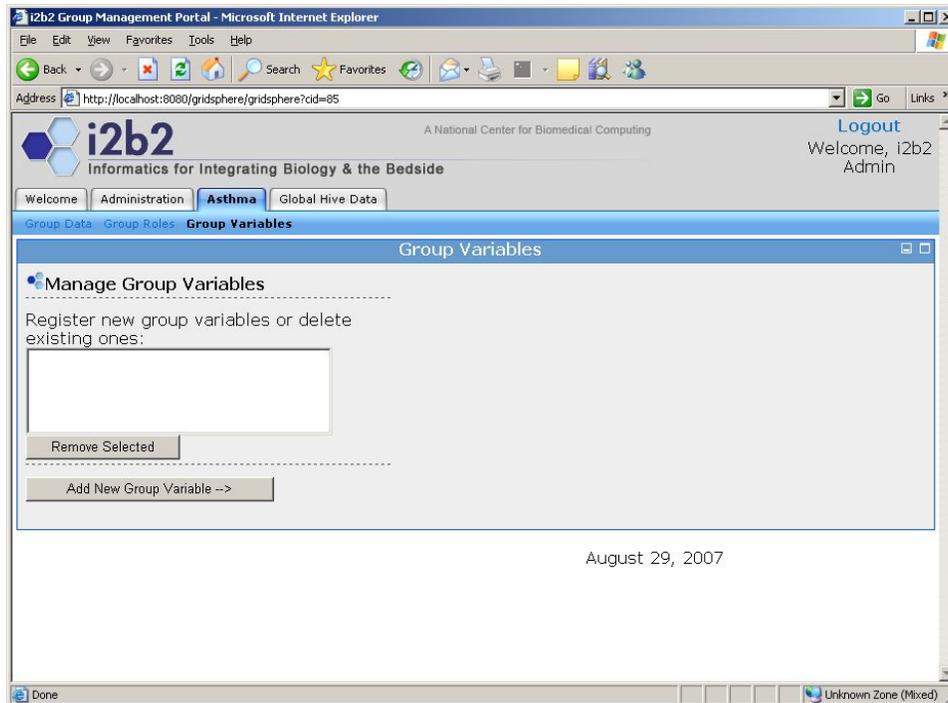


- This is where you can associate various users to the group roles, clicking the 'Add New Group Role' button will display a screen to the right where you can select a user and a role. If you wish to associate a user with multiple roles, then you will need to associate the user to one role and click the 'save' button and repeat the process again for the second role. The system is designed with four roles: Administrator, Protected Access, Manager and User. These roles are different from the roles within the portal, in that these roles are the roles used by the i2b2workbench and hive cells. The following screen show adding Demo User to the User role.



Group Variables

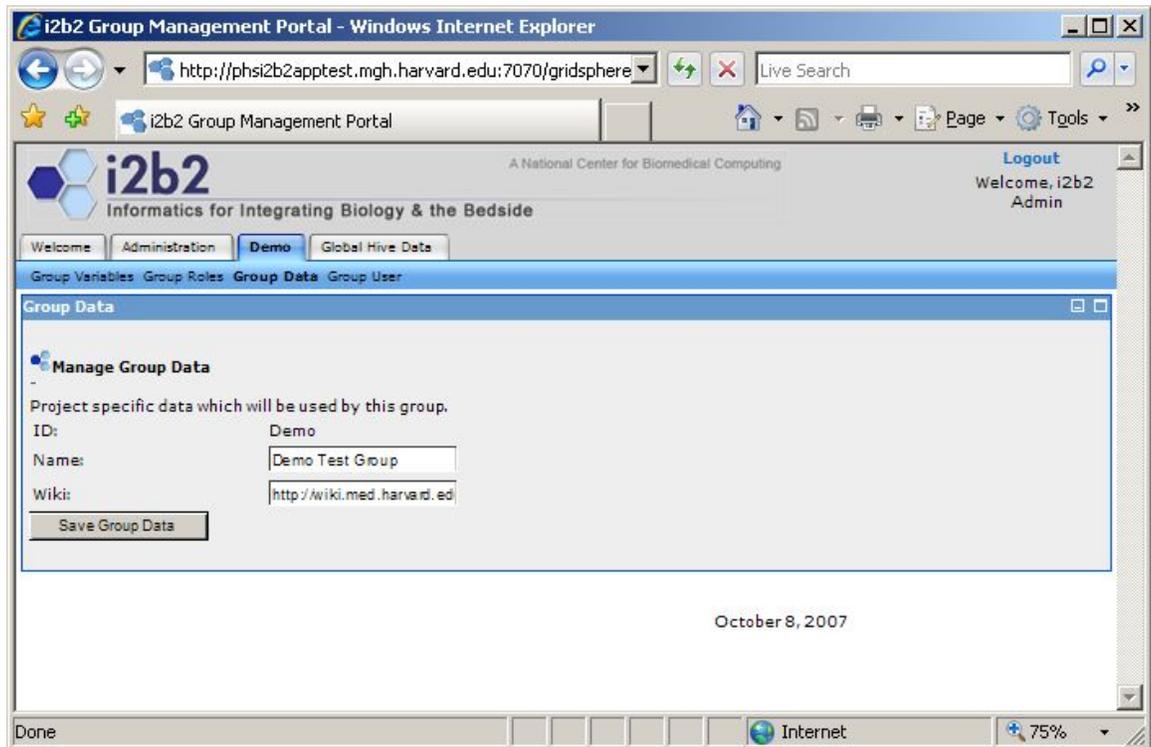
1. Continuing with Gridsphere, select the 'Demo' tab or the name of the group you created from the primary navigation, and 'Group Variables' as the secondary navigation. You should see the following:



2. Group variables are similar to Global Variables in the Hive Data, except they are specific to the current group.

Group Data

1. Continuing with Gridsphere, select 'Demo' or the name of the group you created from the primary navigation, and 'Group Data' as the secondary navigation. You should see the following:



2. Group data is specific to the current group, and contains the name of the group and wiki, which can be seen in the i2b2workbench status bar. The wiki name may be left blank.

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Verify Installation

PM Cell Sanity Test via the i2b2Workbench

1. Configure the i2b2Workbench to communicate with your PM cell.

The i2b2Workbench may be configured via the i2b2Workbench.properties file. This file is found in the top level directory of the binary package (see file /i2b2Workbench/i2b2Workbench.properties). Sample contents of this file are shown below:

```
writeTimelineFile=yes
applicationName=i2b2
messageversion=1.1
I2b2.1=HarvardDemo,REST,http://services.i2b2.org/PM/rest/PMService/
#I2b2.2=YourSite,REST,http://tomcatHost:tomcatPort/axis2/rest/PMService/
```

The last lines in this file provide the location of the target PM cells. Its structure is as follows:

| Identifier | Label | Protocol | URL |
|------------|-------------|----------|---------------------------------------------|
| I2b2.1 | HarvardDemo | REST | http://services.i2b2.org/PM/rest/PMService/ |
| #I2b2.2 | YourSite | REST | http://host:port/axis2/rest/PMService/ |

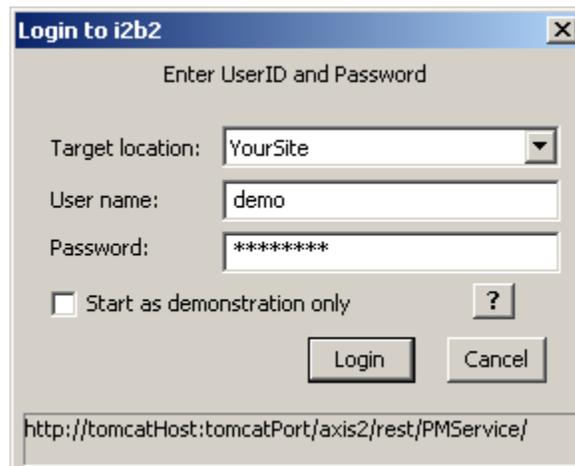
To set up the system to point to your target PM cell, remove the comment tag ('#') in the I2b2.2 identifier, provide a meaningful label and configure the URL for the location of your PM cell.

Caveats: The Identifier should have the same prefix as the application name. ("I2b2.x") The label is just a meaningful description of the target PM cell. Supported communication protocols are 'REST'. The sample PM cell provided in our delivery uses the 'REST' protocol. The URL points to the location of the target PM cell.

2. Launch the i2b2Workbench (double-click on i2b2Workbench.exe)

Login to i2b2:

- a. Select your target location (YourSite)
- b. Enter a valid username and password that you set up in gridsphere (demo/demouser)
- c. The URL at the bottom of the login screen should be the address of your PM cell. If not, return to the i2b2Workbench.properties file and repeat step 1 of this section to reconfigure your PM cell address.



If all is configured properly, you will be greeted with the i2b2Workbench.

3. Possible problems

- a. Error message: Project Management Cell is unavailable for login
Possible causes:
 - The PM cell URL in the i2b2Workbench.properties file is incorrect.
 - The PM cell is not running
In a browser, check the site
<http://tomcatHost:tomcatPort/axis2/services/listServices>
The PMSERVICE should be listed as active.
- b. Error message: Supplied password does not match user password or Username does not exist
 - Verify that the user exists in gridsphere
 - Verify that the correct password was entered

-
- c. ‘Your site’ target location label does not appear or No target locations appear.
Revisit the i2b2Workbench.properties file.
- Verify that the ‘#’ symbol was removed from the start of the line pointing to your target location.
 - Verify that all parameters are listed and are correct.
 - Verify that applicationName matches prefix of target identifier.
(e.g. i2b2, I2b2.x)

```
I2b2.2=YourSite,REST,http://tomcatHost:tomcatPort/axis2/rest/PMService/
```

- d. Error message: “applicationName is missing from properties file”
Revisit the i2b2Workbench.properties file.
- Verify that applicationName property has been entered and is correct.
 - It should match the prefix of the target identifiers.
- e. Error message: “PM Target location not specified properly”
Revisit the i2b2Workbench.properties file.
- Verify that the PM target location parameters have proper number of elements and that the information is correct.
- f. Error message: “No PM Target locations were provided that have prefix of ‘appName’”
Revisit the i2b2Workbench.properties file.
- Verify that the PM target location identifiers have the same prefix as the application name. (e.g ‘i2b2’, ‘I2b2.x’)
- g. Error message: “PM Cell’s getVersion operation is not responding”
Revisit the i2b2Workbench.properties file.
- Verify that the PM target location URL is correct and valid.
 - If PM target location URL is valid; check that it supports the getVersion operation. If not, this PM cell does not support messaging version 1.1 and should not be used with this version of the i2b2Workbench.
- h. Error message: “messageversion property is missing from properties file”
Revisit the i2b2Workbench.properties file.
- Verify that ‘messageversion’ property has been entered and is correct.

8

License

The i2b2 source code is licensed under the i2b2 Software License Software. This includes but not limited to all code in the `edu.harvard.mgh.i2b2.*` package namespace.