



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

Release 1.4

Copyright © 2007 MGH

Table of Contents

<i>About this Guide</i>	<i>iii</i>
<i>Document Version History</i>	<i>iii</i>
<i>Prerequisites</i>	<i>1</i>
Required Software	1
<i>Install/Upgrade</i>	<i>4</i>
Installing or Upgrading the Project Management application	4
Changing Server log level	8
<i>Upgrade</i>	<i>9</i>
Upgrading the Project Management data from Release 1.3 (Typical)	9
Upgrading the from 1.3 when the 1.3 PM Cell and other Cells do not exist on the same server	10
<i>Initial Setup</i>	<i>12</i>
Administration of the i2b2 Project Management application	12
<i>Creating Users</i>	<i>15</i>
User creation in the i2b2 Project (Group) Management application	15
<i>Hive Data</i>	<i>16</i>
Registered Cell	16
<i>Project Data</i>	<i>17</i>
Existing Projects	17
<i>Verify Installation</i>	<i>19</i>
PM Cell Sanity Test via the i2b2Workbench	19
<i>License</i>	<i>23</i>

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/ncbc/>). 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
12/15/2009	1.4	New PM install	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 6 (recommended)

Download JDK 6 Update 16 (jdk-1_6_0_16-linux-i586.bin) from <http://java.sun.com/products/>

a) Install the SDK into a directory of your choice (/opt/java/jdk1.6.0_16, YOUR_JAVA_HOME_DIR)

b. JBoss 4.2.2GA

Download 'jboss-4.2.2.GA.zip', from <http://labs.jboss.com/jbossas/downloads>.

a) Unzip jboss-4.2.2.GA.zip into a directory of your choice (/opt/jboss-4.2.2.GA or YOUR_JBOSS_HOME_DIR)

b) Set JBoss JVM to run with 1GB extended memory.

Edit 'YOUR_JBOSS_HOME_DIR/bin/run.conf' and change the JAVA_OPTS memory settings to that shown below. (-Xms512m, -Xmx1024m)

```
#
# Specify options to pass to the Java VM.
#
if [ "x$JAVA_OPTS" = "x" ]; then
    JAVA_OPTS="-Xms512m -Xmx1024m
-Dsun.rmi.dgc.client.gcInterval=3600000
-Dsun.rmi.dgc.server.gcInterval=3600000"
fi
```

c) If default port 8080 is unavailable (another application is using this port), edit 'YOUR_JBOSS_HOME_DIR/server/default/deploy/jboss-web.deployer/server.xml' file to reconfigure the non-SSL HTTP/1.1 Connector to another port such as 9090

```
<!--Define a non-SSL HTTP/1.1 Connector on port 9090 →  
<Connector port="9090" address="${jboss.bind.address}"  
    maxThreads="250" maxHttpHeaderSize="8192"  
    emptySessionPath="true" protocol="HTTP/1.1"  
    enableLookups="false" redirectPort="8443"  
    acceptCount="100" connectionTimeout="20000"  
    disableUploadTimeout="true" />
```

```
<!--Define an AJP 1.3 Connector on port 9009 →  
<Connector port="9009" address="${jboss.bind.address}"  
    maxThreads="250" maxHttpHeaderSize="8192"  
    protocol="AJP/1.3" emptySessionPath="true"  
    enableLookups="false" redirectPort="8443"/>
```

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 i2b2.war inside
'YOUR_JBOSS_HOME_DIR/server/default/deploy'

b)Unzip axis2.war inside
'YOUR_JBOSS_HOME_DIR/server/default/deploy/i2b2.war' folder.

e. Oracle Express Edition

a) Download Oracle Database 10g Express Edition (Universal) 'oracle 10g EE' 'oracle-xe-univ-10.2.0.1-1.0.i386.rpm' from <http://www.oracle.com/technology/software/products/database/xe/htdocs/102xeinstallsoft.html>

b) Run 'rpm -i oracle-xe-univ-10.2.0.1-1.0.i386.rpm' as root

Run '/etc/init.d/oracle-xe configure' as root to configure the database

Select HTTP and listener ports (use defaults 8080/1521 if they are available)

Select 'Y'es to start on boot when asked

c) To verify that Oracle was properly installed, open a browser and enter <http://yourHost:yourPort/apex>. You should see an Oracle Database Express Edition login screen.

f. Update your environment variables

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

```
# Sample environment variables
JAVA_HOME=/opt/java/jdk1.5.0_11
ANT_HOME=/opt/apache-ant-1.6.5
JBOSS_HOME=/opt/jboss-4.2.2.GA
PATH=$PATH:$ANT_HOME/bin:$JAVA_HOME/bin
export JBOSS_HOME
export ANT_HOME
export JAVA_HOME
```

2

Install/Upgrade

Installing or Upgrading the Project Management application

The 1.4 i2b2 Project Management cell now runs on the same JBoss platform as the Ontology and Data Repository cells. As a result, all users need to perform the following installation procedures.

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

If this has been downloaded in a previous installation (e.g. ONT or CRC), there is no need to repeat this step.

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

2. Ensure that JBOSS is not running

- a) 'cd \$JBOSS_HOME/bin/'
- b) './shutdown.sh -S'

3. Deploy edu.harvard.i2b2.common

If this has been deployed in a previous installation (e.g. CRC), there is no need to repeat this step.

- a) 'cd source_directory/edu.harvard.i2b2.common'
- b) Edit the build.properties file and set jboss.home and axis2.war.name properties

```
jboss.home=YOUR_JBOSS_HOME_DIR  
axis2.war.name=i2b2.war
```

- c) 'ant clean deploy jboss_pre_deployment_setup'

4. Deploy edu.harvard.i2b2.pm

- a) 'cd source_directory/edu.harvard.i2b2.pm'
- b) Edit the build.properties file and set jboss.home and axis2.war.name properties

```
jboss.home=YOUR_JBOSS_HOME_DIR  
axis2.war.name=i2b2.war
```

- c) Edit etc/jboss/pm-ds.xml and configure your data sources:
PMBootstrapDS points to the location of your PM table.

Data source samples for both sqlserver and oracle are provided in pm-ds.xml. Copy and modify the samples in pm-ds.xml as needed to create the data sources shown below. If using Oracle rename PMBootstrapDS_ORACLE to PMBootstrapDS, else if using SqlServer name PMBootstrapDS_SQLSERVER to PMBootstrapDS.

```
<datasources>  
  <local-tx-datasource>  
    <jndi-name>PMBootstrapDS_ORACLE</jndi-name>  
    <driver-class>oracle.jdbc.driver.OracleDriver  
    </driver-class>  
    <connection-url>jdbc:oracle:thin:@localhost:1521:xe  
    </connection-url>  
    <user-name>i2b2pm</user-name>  
    <password>i2b2pm_password</password>  
  </local-tx-datasource>  
  <local-tx-datasource>  
    <jndi-name>PMBootstrapDS_SQLSERVER</jndi-name>  
    <driver-  
class>com.microsoft.sqlserver.jdbc.SQLServerDriver  
    </driver-class>  
    <connection-  
url>jdbc:sqlserver://localhost:1433</connection-url>  
    <user-name>uname</user-name>  
    <password>pswd</password>  
    <metadata>  
      <type-mapping>MS SQLSERVER2000</type-mapping>  
    </metadata>  
  </local-tx-datasource>  
</datasources>
```

- f) 'ant -f master_build.xml clean build-all deploy'

5. Install the WebClient

- a) Copy the WebClient directory, which is in the root directory of the core server source code to your httpd directory; on Centos Linux this is typically located in /var/www/html.

The webclient is pre-configured for a localhost domain of 'i2b2demo'. If you are upgrading from a system with a different domain or want to specify a different domain, edit the file webclient/i2b2_config_data.js accordingly.

```
{ name: "localhost",  
  domain: "yourDomain",  
  debug: true,  
  urlCellPM: "http://localhost:9090/i2b2/rest/PMService/"  
}
```

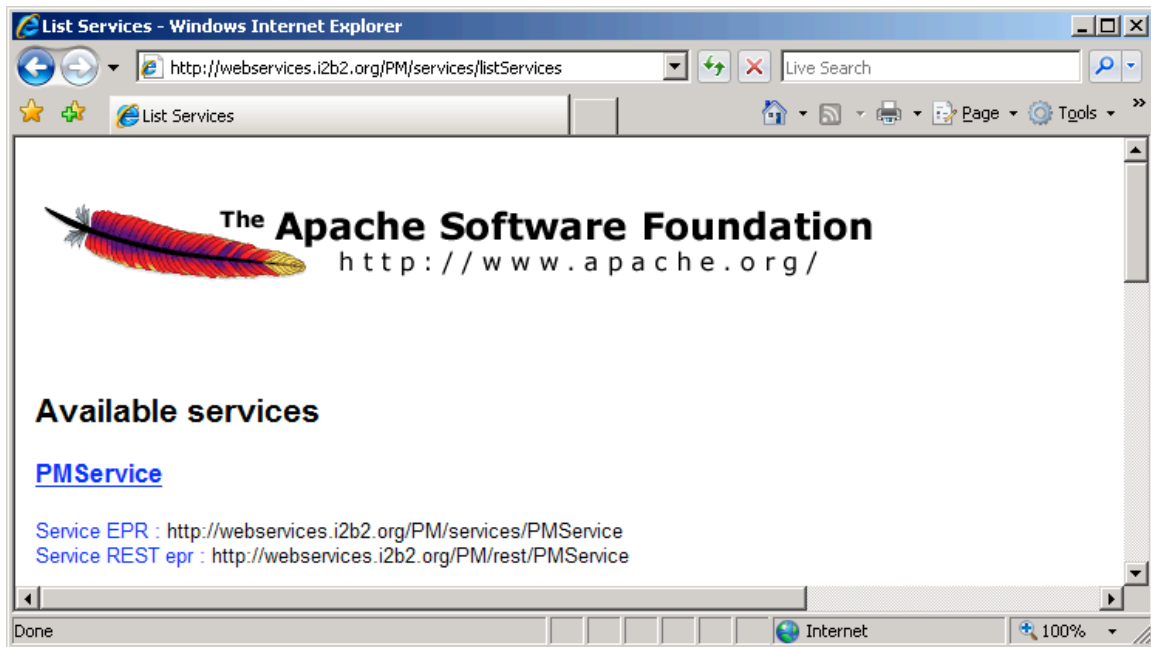
- b) If your httpd server is not running, start it now.

6. Start JBoss

- a) Run '\$JBOSS_HOME/bin/run.sh -b 0.0.0.0 &'

7. Verify webservice is running

- a) Check url 'http://yourHost:9090/i2b2/services/listServices' in a browser. Verify that PMService is listed as active.



8. Configure the PM cell data.

Those users that have previously installed an earlier version of the PM cell should proceed to section 3, Upgrade. Otherwise if you are installing the cell for the first time, proceed to section 4, New Install.

Changing Server log level

By default JBOSS log will be in DEBUG mode, changing it to INFO mode will increase server performance.

- a) Edit \$JBOSS_HOME /server/default/conf/jboss-log4j.xml file and add the 'Threshold' param.

```
<appender name="FILE"
class="org.jboss.logging.appender.DailyRollingFileAppender">
  <errorHandler
class="org.jboss.logging.util.OnlyOnceErrorHandler"/>
  <param name="File"
value="${jboss.server.home.dir}/log/server.log"/>
  <param name="Append" value="false"/>
  <param name="Threshold" value="INFO"/>
  <!-- Rollover at midnight each day -->
  <param name="DatePattern" value="'.'yyyy-MM-dd"/>

  <layout class="org.apache.log4j.PatternLayout">
    <!-- The default pattern: Date Priority [Category] Message\n -
->
    <param name="ConversionPattern" value="%d %-5p [%c] %m%n"/>

    . . . . .
  </layout>
</appender>
```

To switch back to DEBUG mode, comment out the 'Threshold' param and wait a minute. THERE IS NO NEED TO RESTART JBOSS.

3

Upgrade

Upgrading the Project Management data from Release 1.3 (Typical)

In Release 1.3 the PM data was stored in gridsphere. In this release the PM cell data is stored in Oracle (or SQLServer). The following procedure extracts the PM cell data from gridsphere so it may be imported into the new PM tables.

1. Shutdown the PM 1.3 running on Tomcat

- a. `'cd /opt/apache-tomcat-5.5.26/bin'`
- b. `./shutdown.sh`

2. Go to the default directory in jboss.

- `'cd $JBOSS_HOME/server/default'`

3. Run the data extraction script

The data extraction script takes 4 arguments.

- a) Destination database (SQLSERVER or ORACLE)
- b) Destination sql script (contains extracted PM data)
- c) Location of Release 1.3 Users Database
default:
`YOUR_TOMCAT_HOME_DIR/webapps/gridsphere/WEB-INF/CustomPortal/database`
- d) Location of Release 1.3 i2b2 Database
default: `YOUR_TOMCAT_HOME_DIR/webapps/default/WEB-INF/database`

```
'java -classpath lib/hsqldb.jar:deploy/i2b2.war/WEB-INF/services/ProjectManagement.aar  
edu.harvard.i2b2.pm.upgrade.UpgradeFrom13 ORACLE /tmp/upgrade.sql  
/opt/apache-tomcat-5.5.26/webapps/gridsphere/WEB-INF/CustomPortal/database  
/opt/apache-tomcat-5.5.26/webapps/default/WEB-INF/database'
```

4. Run the upgrade script on your new PM database

The file /tmp/upgrade.sql contains the Cell, User, Global Data, Project and Hive Data that was extracted from the 1.3 gridsphere and upgraded to 1.4. Please review this file and then run it against your newly created 1.4 PM database using your database vendor specific query tool or a third party tool. **All users will default to the data role of DATA_OBFSC and an Administrator will need to assign the proper DATA roles to its users.** The administration role is upgraded from 1.3, but if no users have ADMIN access you will need to add the role 'ADMIN' and 'MANAGER' to a user before you can login to the webclient and access the Admin section.

Upgrading the from 1.3 when the 1.3 PM Cell and other Cells do not exist on the same server

1. Copy the following two files from the default Directory in jboss:
lib/hsqldb.jar
deploy/i2b2.war/WEB-INF/services/ProjectManagement.aar
To a temporary directory on the 1.3 PM server (such as /tmp)

2. Run the upgrade script

The upgrade script takes 4 arguments.

- a) Destination database (SQLSERVER or ORACLE)
- b) Destination sql script (contains extracted PM data)
- c) Location of Users Database
default: YOUR_TOMCAT_HOME_DIR/
webapps/gridsphere/WEB-INF/CustomPortal/database
- d) Location of i2b2 Database
default: YOUR_TOMCAT_HOME_DIR/webapps/default/WEB-INF/database

```
'java -classpath /tmp/hsqldb.jar:/tmp/ProjectManagement.aar  
edu.harvard.i2b2.pm.upgrade.UpgradeFrom13 ORACLE /tmp/upgrade.sql  
/opt/apache-tomcat-5.5.26/webapps/gridsphere/WEB-INF/CustomPortal/database  
/opt/apache-tomcat-5.5.26/webapps/default/WEB-INF/database'
```

3. Run the upgrade script on your new PM database

The file /tmp/upgrade.sql contains the Cell, User, Global Data, Project and Hive Data that was extracted from the 1.3 gridsphere and upgraded to 1.4. Please

review this file and then run it against your newly created 1.4 PM database using your database vendor specific query tool or a third party tool. **All users will default to the data role of DATA_OBFSC and an Administrator will need to assign the proper DATA roles to its users.** The administration role is upgraded from 1.3, but if no users have ADMIN access you will need to add the role 'ADMIN' and 'MANAGER' to a user before you can login to the webclient and access the Admin section.

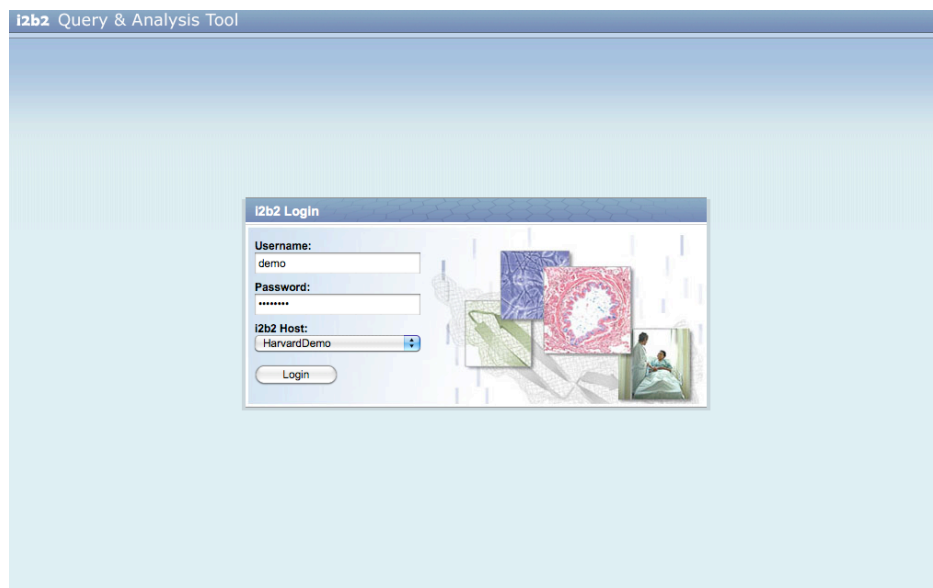
4

Initial Setup

Administration of the i2b2 Project Management application

Go to the site <http://jbossHost/webclient>

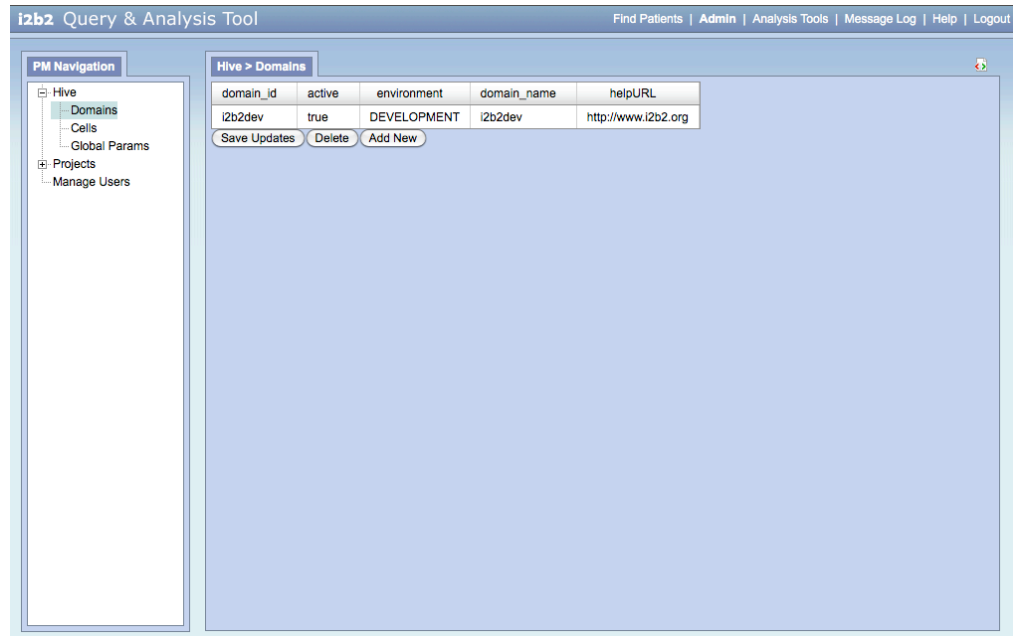
1. You will see a login screen. Log in with a user you know has ADMIN role. For those installing for the first time, use the default ADMIN user of 'i2b2' and password of 'demouser'.



-
2. Once logged on you will be presented with a default setup, select ‘Admin’ from the primary navigation. You should see the following:



3. Click the 'Hive' in the PM Navigation. This is where you can modify the Domains, Cells and Global Params. Click on the Domain to see the Domain Information.

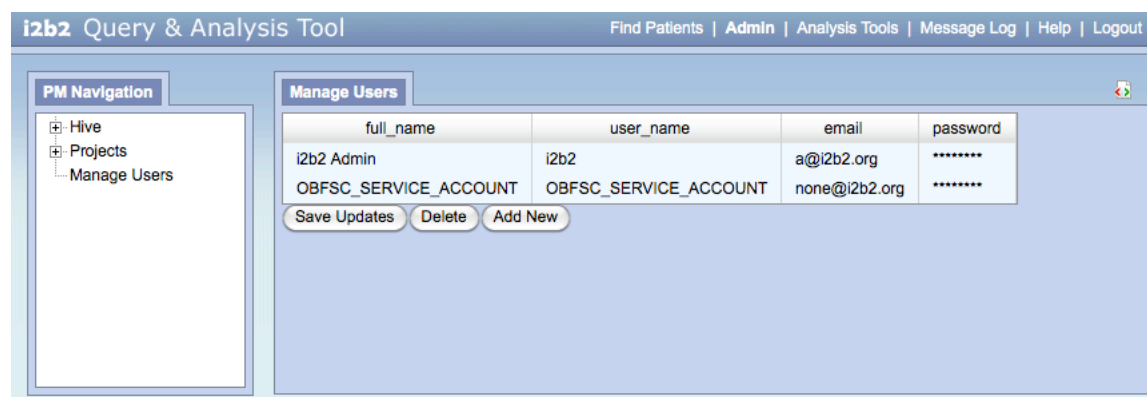


5

Creating Users

User creation in the i2b2 Project (Group) Management application

1. Continuing with the web client, select 'Manage User' from the primary navigation. You should see the following:



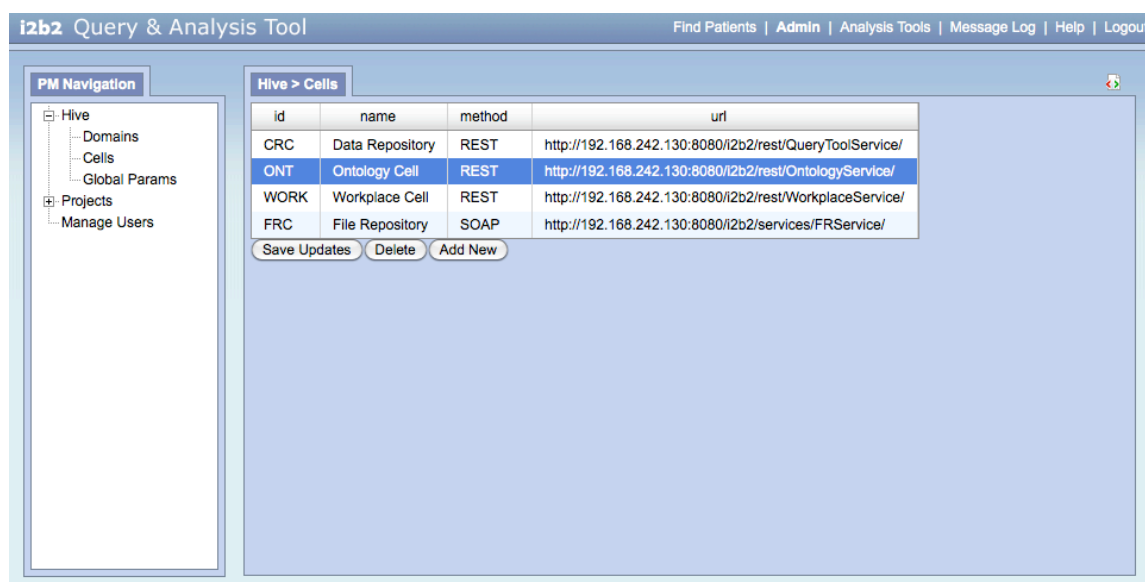
2. Click on the 'Add New' link, and fill in the required fields for the user you wish to add, such as the username, password, email address. Click the 'Save Update' button once you are complete. Repeat the process for as many users you wish to
3. To remove a user from the system, click on the row associated with that user, and click on the 'Delete' button.
4. To add a parameter to the user, select the row that contains the user you wish to add the parameter to and a new table will appear below. Follow the same procedure by select 'Add New' to add a parameter to that user.

6

Hive Data

Registered Cell

1. Continuing with the web client, select 'Hive' from the primary navigation, than 'Cells' from the secondary navigation. You should see the following:



2. Click on the URL column on the row that has the CRC on it. Change the 192.168.242.130 to the IP or domain name that the CRC is installed on. Click the 'Save Update' button once you are complete. Repeat the process for the rest of the cells.
3. To add a new cell, click on the 'Add New' button and fill out the new information for that cell. Click the 'Save Update' button when complete.
4. To add a parameter to the cell, select the row that contains the cell you wish to add the parameter to and a new table will appear below. Follow the same procedure by select 'Add New' to add a parameter to that cell.

7

Project Data

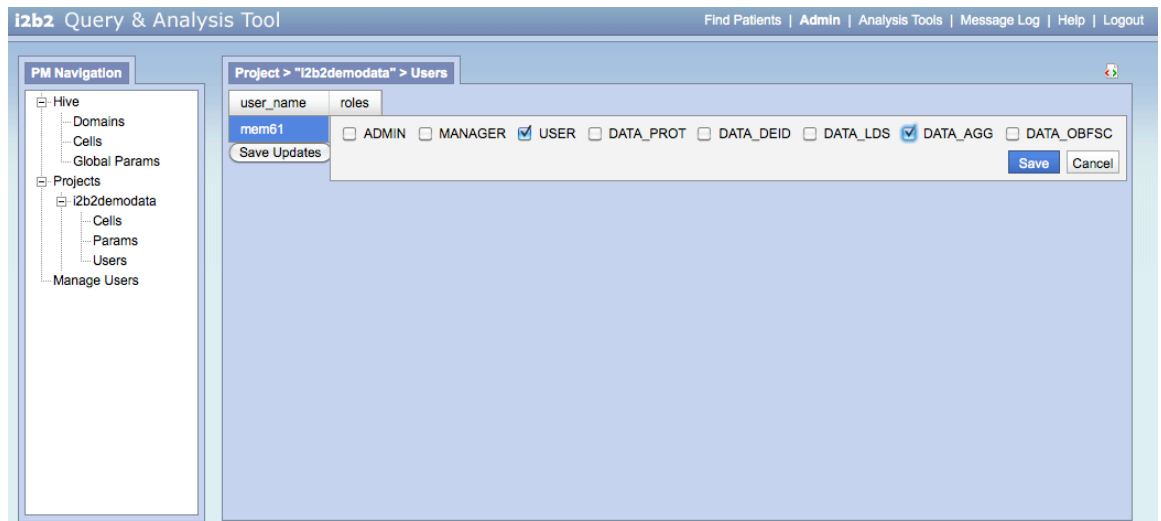
Existing Projects

1. Continuing with the web client, select 'Projects' from the primary navigation, than 'i2b2demodata' from the secondary navigation. This is where you can update the information associated with the project. You should see the following:

The screenshot displays the 'i2b2 Query & Analysis Tool' interface. On the left, the 'PM Navigation' tree shows a hierarchy: 'Hive' (containing 'Domains', 'Cells', 'Global Params'), 'Projects' (containing 'i2b2demodata', 'Cells', 'Params', 'Users'), and 'Manage Users'. The 'i2b2demodata' project is selected. The main area, titled 'Project > "i2b2demodata"', contains a form for project configuration. The form includes fields for 'Project Id' (i2b2demodata), 'Project Name' (i2b2demodata), 'Project Wiki' (www.i2b2.org), 'Project Key' (empty), 'Project Description' (empty text area), and 'Project Path' (/). At the bottom of the form are buttons for 'Delete', 'Save Updates', and 'Cancel'. A message at the top of the form says 'Please select which project configuration screen you want to access.'

2. You can have cells that are associated with only this specific project, by selecting the cells in the third level in the tree. And likewise, there will be parameters associated with that cell.
3. Parameters for this project can be added or deleted by selecting the Params from the tree.
4. The last item in the tree is Users, This item allows you to associate Users to a project. In the table, enter the username that you want to grant permission to and then select the roles. You need to select an Administration Role which is the first three roles and a Data Track which

is the remaining roles. In the example below, User and Data_Agg was selected. The user mem61 will inherit Data_Obfsc automatically.



7

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://webservices.i2b2.org/i2b2/rest/
PMSERVICE/
#I2b2.2=YourSite,REST,http://JbossHost:JbossPort/i2b2/rest/PMS
ervice/
```

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://webservices.i2b2.org/i2b2/rest/PMSERVICE/
#I2b2.2	YourSite	REST	http://host:port/i2b2/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.

Upgrade: Users who upgraded from 1.3 to 1.4, will need to modify the i2b2Workbench.properties file because the PM port and in the URL (axis2 -> i2b2) has changed.

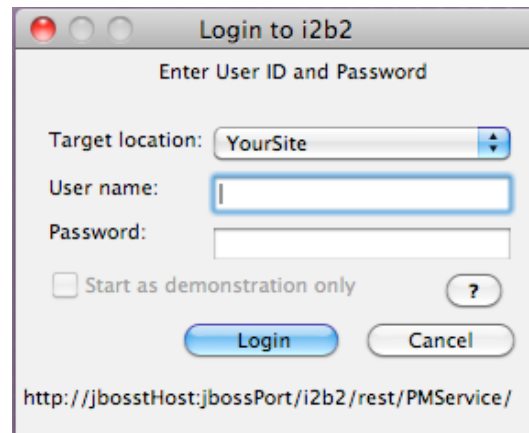
Caveats: The Identifier should have the same prefix as the application name. (“I2b2.x”) The label is just a meaningful description of the target PM cell. Supported

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.



Target location: YourSite

User name:

Password:

☐ Start as demonstration only ?

Login Cancel

http://jbossHost:jbossPort/i2b2/rest/PMService/

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://JBossHost:JBossPort/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 the webclient
 - 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://JBossHost:JBossPort/i2b2/rest/PMSe  
rvice/
```

- 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.
- i. webclient is not running.
Is your httpd server running?

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.