Informatics for Integrating Biology and the Bedside

i2b2 Installation Guide (Linux)

Data Repository (CRC) Cell

Document Version: *1.6.5*
i2b2 Software Version: *1.6.02*

Table of Contents

DOCUMENT MANAGEMENT

Revision Number	Date	Author	Description of change
1.6.1	07/22/10	Janice Donahoe	Created 1.6 version of document.
1.6.5	09/22/11	Rajesh Kuttan	Max concept count for skipping the temp table property added to crc.properties

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 deploy the i2b2 CRC cell.

1. PREREQUISITES

1.1 Required Software

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

1.1.1 Java JDK

JDK 6.0 is recommended and can be downloaded from the java website: http://java.sun.com/products/

1. Install the SDK into a directory of your choice.

   Example: /opt/java/jdk1.6.0 or *YOUR_JAVA_HOME_DIR*

1.1.2 JBoss 4.2.2GA

Download JBoss (jboss-4.2.2.GA.zip) from the jboss website: http://labs/jboss.com/jbossas/downloads

1. Unzip jboss-4.2.2.GA.zip into a directory of your choice.

   Example: /opt/jboss-4.2.2.GA or *YOUR_JBOSS_HOME_DIR*

2. Set JBoss JVM to run with 1GB of extended memory.

3. Edit '*YOUR_JBOSS_HOME_DIR*/bin/run.conf' and change the JAVA_OPTS memory setting to those shown below. (-Xms512m -X, x1024m)

```
#
# 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"
```

4. If default port 8080 is unavailable because another application is using this port then edit the server.xml file (‘*YOUR_JBOSS_HOME_DIR*/server/default/deploy/jboss-web.deployer/server.xml’) to reconfigure the following two items:

    a. 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” connectionTimout=”20000”
              disableUploadTimeout=”true” />
    ```

    b. The AJP 1.3 Connector to another port such as 9009

    ```
    < ! –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” />
    ```

1.1.3 Apache Ant 1.6.5

Download *Apache Ant version 1.6.5* (apache-ant-1.6.5-bin.zip) from the following Apache website: http://archive.apache.org/dist/ant/binaries/

1. Unzip the file into a directory of your choice.

    Example: /opt/apache-ant-1.6.5 or *YOUR_ANT_HOME_DIR*

1.1.4 Apache Axis2 1.1

Download *Apache Axis2 version 1.1* from the following Apache website: http://ws.apache.org/axis2/download/1_1/download.cgi

Select the download type of WAR (Web Archive) Distribution (axis2.war).

1. Create a folder called **i2b2.war** inside ‘YOUR_JBOSS_HOME_DIR/server/default/deploy’ folder.

2. Unzip axis2.war inside ‘YOUR_JBOSS_HOME_DIR/server/default/deploy/i2b2.war’ folder.

1.1.5 Oracle Express Edition

Download *Oracle Database 10g Express Edition (Universal)* (oracle-xe-univ-10.2.0.1-1.0.i386.rpm) from the following Oracle website: http://www.oracle.com/technology/software/products/database/xe/htdocs/102xelinsoft.html

1. Run *rpm –i oracle-xe-univ-10.2.0.1-1.0.i386.rpm* as root.
    a. Configure the database by running ‘/etc/init.d/oracle-xe configure’ as root
    b. Select HTTP and listener ports (use defaults 8080/1521 if they are available).
    c. Select ‘Y’es to start on boot when asked.

2. Verify Oracle was properly installed.
    a. Open a browser
    b. Enter http://*yourHost*:*yourPort*/apex
    c. You should see an Oracle Database Express Edition login screen.

1.1.6 Update Environment Variables

Be sure to set the JAVA_HOME, JBOSS_HOME, and ANT_HOME variables to the JAVA, JBOSS, and ANT home directories you set up in the previous sections.

Example:

```
# Sample environment variables
JAVA_HOME=/opt/java/jdk1.6.0
JBOSS_HOME=/opt/jboss-4.2.2.GA
ANT_HOME=/opt/apache-ant-1.6.5
PATH=$PATH:$ANT_HOME/bin:$JAVA_HOME/bin
export JAVA_HOME
export JBOSS_HOME
export ANT_HOME
```

1.1.7 Data Installation or Upgrade

Data installation or upgrade has already been performed.

2. INSTALL

2.1 Installing the Data Repository (CRC) Cell

The next few sections outline the CRC installation process.

2.1.1 Download and Extract Source Code

The following outlines the steps to download and extract the core server source code to a target area.

Note: *You can skip this step if the core server source code was downloaded during a previous installation (e.g. PM or ONT).*

Steps:

1. Set up a target source_directory.
2. Extract core server source code into the target source_directory.

2.1.2 Stop Services

In order to install the CRC properly it is important that certain services are **not** running. The services are further defined below.

2.1.2.1 JBOSS

Verify JBOSS is not running.

- `./$JBOSS_HOME/bin/shutdown.sh -S`

2.1.3 Deploy edu.harvard.i2b2.common

The following outlines the steps to deploy **edu.harvard.i2b2.common**.

***Note**: You can skip this step if edu.harvard.i2b2.common was deployed during a previous installation (e.g. ONT).*

Steps:

1. cd source_directory/edu.harvard.i2b2.common
2. 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
```

3. Run *ant clean dist deploy jboss_pre_deployment_setup*

2.1.4 Build edu.harvard.i2b2.crc.loader

The following outlines the steps to build **edu.harvard.i2b2.crc.loader**.

***Note**: The source for the uploader service resides in the edu.harvard.i2b2.crc.loader project and uses the CRC's data source setup.*

Steps:

1. cd source_directory/edu.harvard.i2b2.crc.loader
2. 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
```

3. Edit the ***etc/spring/crc_loader_application_directory.properties*** file and specify a location for the application properties directory. This location can be anything you desire but must be a directory path that your Linux user has access permission granted.

```
edu.harvard.i2b2.crc.applicationdir=YOUR_JBOSS_HOME_DIR/server/default/conf/crcloaderapp
```

4. Edit the ***etc/spring/edu.harvard.i2b2.crc.loader.properties*** file and set the *project management properties*.

***Note**: the new location of the PM URL.*

```
edu.harvard.i2b2.crc.loader.ws.pm.url=http://localhost:9090/i2b2/rest/PMService/getServices
# Flag to bypass project management cell
edu.harvard.i2b2.crc.loader.ws.pm.bypass=false
edu.harvard.i2b2.crc.loader.ws.pm.bypass.role=ADMIN
edu.harvard.i2b2.crc.loader.ws.pm.bypass.project=Demo
```

If you are using the **file repository cell** and want to connect the CRC loader to it then set the *FileRepository cell property* setting.

```
# # # # # # # # # # # # # # # # #
# File Management Cell
# # # # # # # # # # # # # # # # #

edu.harvard.i2b2.crc.loader.ws.fr.url=http://localhost:9090/i2b2/services/FRService/
```

5. Edit the ***etc/spring/CRCLoaderApplicationContext.xml***
    a. Specify the *jdbc properties* to locate the CRC_DB_LOOKUP table.

```
<bean id=”LoaderLookupDS” class=”org.apache.commons.dbcp.BasicDataSource”
destroy-method=”close”>
    <property name=”driverClassName” value=”oracle.jdbc.driver.OracleDriver”/>
    <property name=”url” value=”jdbc.oracle:thin:@localhost:1521:xe”/>
    <property name=”username” value=”i2b2hive”/>
    <property name=”password” value+”i2b2hive_pswd”/>
</bean>
```

    b. Update entry in *edu.harvard.i2b2.crc.loader.properties* to reflect the above change.

```
# # # # # # # # # # # # # # # # # #
# Datasource Lookup properties
# # # # # # # # # # # # # # # # # #
edu.harvard.i2b2.crc.loader.ds.lookup.datasource=LoaderLookupDS
edu.harvard.i2b2.crc.loader.ds.lookup.servertype=ORACLE
edu.harvard.i2b2.crc.loader.ds.lookup.schemaname=i2b2hive
```

6. Run *ant -f build.xml clean dist*

***Note**: The 'deploy' target is <u>not</u> used. The loader will be deployed as part of the edu.harvard.i2b2.crc.project.*

2.1.5 Setup edu.harvard.i2b2.crc

The following outlines the steps to setup **edu.harvard.i2b2.crc**.

<u>Steps</u>:

1. cd source_directory/edu.harvard.i2b2.crc
2. Edit the ***build.properties*** file and set *jboss.home*, *axis2.war.name and jboss.jms.persistance* properties accordingly.

```
jboss.home=YOUR_JBOSS_HOME_DIR
axis2.war.name=i2b2.war
#jms persistance could be either oracle or mssql
jboss.jms.persistance=oracle
```

3. Edit the ***etc/spring/crc_application_directory.properties*** file and specify a location for the application properties directory. This location can be anything you desire but must be a directory path that your Linux user has access permission for.

```
    edu.harvard.i2b2.crc.applicationdir=YOUR_JBOSS_HOME_DIR
/server/default/conf/crcapp
```

4. Edit the ***etc/spring/crc.properties*** file and set *project management properties*.

***Note**: the new location of the PM URL.*

```
# # # # # # # # # # # # # # # # # #
# Project Management Cell
# # # # # # # # # # # # # # # # # #
queryprocessor.ws.pm.url=http://localhost:9090/i2b2/rest/PMService/getServices
# Flag to bypass project management cell
queryprocessor.ws.pm.bypass=false
queryprocessor.ws.pm.bypass.role=ADMIN
queryprocessor.ws.pm.bypass.project=Demo
```

5. Edit the **Ontology property settings**; change the hostname and port

```
    # # # # # # # # # # # # # # # # # #
    # Ontology Cell
    # # # # # # # # # # # # # # # # # #
    queryprocessor.ws.ontology.url=http://localhost:9090/i2b2/rest/OntologyService/
getTermInfo
    edu.harvard.i2b2.crc.delegate.ontology.url=http://localhost:9090/i2b2/rest/
OntologyService
```

6. If not already done, create the ***CRC service user account*** in the Project Management cell and assign the roles "*Manager*" and "*Data_AGG*" to the user. The CRC uses this PM user in the calls to the Ontology and PM cells.

```
# # # # # # # # # # # # # # # # # #
# CRC service account properties
# # # # # # # # # # # # # # # # # #
edu.harvard.i2b2.crc.pm.serviceaccount.user=AGG_SERVICE_ACCOUNT
edu.harvard.i2b2.crc.pm.serviceaccount.password=demouser
```

7. Update the **i2b2demodata.*QT_BREAKDOWN_PATH*** table: this table lists the metadata keys (table_cd\fullname) for the gender, race, vital status and age demographic categories in the value column. If you loaded the data supplied in the crcdata package, then no changes are necessary. If you loaded your own metadata then you need to change the entries in the value column to point to the key (table_cd\fullname) for your gender, race, vital status and age demographic categories.

Name	**Value**
PATIENT_GENDER_COUNT_XML	\\i2b2_DEMO\i2b2\Demographics\Gender\
PATIENT_RACE_COUNT_XML	\\i2b2_DEMO\i2b2\Demographics\Race\
PATIENT_VITALSTATUS_COUNT_XML	\\i2b2_DEMO\i2b2\Demographics\Vital Status\
PATIENT_AGE_COUNT_XML	\\i2b2_DEMO\i2b2\Demographics\Age\

8. The following steps tell the CRC, where the “CRC_DB_LOOKUP” table is located.

code_lookup		
PK	**c_domain_id**	**varchar(255)**
PK	**c_project_path**	**varchar(255)**
PK	**c_owner_id**	**varchar(255)**
	c_db_fullschema	**varchar(255)**
	c_db_datasource	**varchar(255)**
	c_db_servertype	**varchar(255)**
	c_db_nicename	**varchar(255)**
	c_db_tooltip	varchar(255)
	c_comment	text
	c_entry_date	datetime
	c_change_date	datetime
	c_status_cd	char(1)

   a. Edit ***etc/spring/CRCApplicationContext.xml***.

```
<bean id="CRCDataSourceLookup" class="org.apache.commons.dbcp.BasicDataSource"
destroy-method="close">
    <property name="driverClassName" value="oracle.jdbc.driver.OracleDriver"/>
    <property name="url" value="jdbc:oracle:thin:@localhost:1521:xe"/>
    <property name="username" value="i2b2hive"/>
    <property name="password" value="i2b2hive_pswd"/>
</bean>
```

b. Update the entry in ***etc/spring/crc.properties*** to reflect the above change.

```
# # # # # # # # # # # # # # # # #
# Datasource Lookup properties
# # # # # # # # # # # # # # # # #
query.processor.ds.lookup.datasource=CRCDataSourceLookup
query.processor.ds.lookup.servertype=ORACLE
query.processor.ds.lookup.schemaname=i2b2hive
```

9. In the ***etc/spring/crc.properties*** file, the ***PDO paging size*** can be adjusted based on the runtime jvm setting.

```
# # # # # # # # # # # # # # # # #
# PDO Paging properties
# # # # # # # # # # # # # # # # #
edu.harvard.i2b2.crc.pdo.paging.observation.size=7500
```

10. In the **etc/spring/crc.properties** file, you can tune the **default max job count** for the Analysis job queue

```
# # # # # # # # # # # # # # # # #
# Analysis Queue properties
# # # # # # # # # # # # # # # # #
edu.harvard.i2b2.crc.analysis.queue.medium.timeoutmills=3000
edu.harvard.i2b2.crc.analysis.queue.medium.maxjobcount=4
edu.harvard.i2b2.crc.analysis.queue.large.timeoutmills=43200000
edu.harvard.i2b2.crc.analysis.queue.large.maxjobcount=1
edu.harvard.i2b2.crc.analysis.queue.medium.jobcheck.timeoutmills=60000
edu.harvard.i2b2.crc.analysis.queue.large.jobcheck.timeoutmills=60000
```

11. If required, you can adjust the ***default query JMS queues timeout*** seconds in the ***etc/spring/crc.properties*** file.

```
# # # # # # # # # # # # # # # # # # # # # # # # #
# Setfinder JMS Queue transaction timeout properties
# # # # # # # # # # # # # # # # # # # # # # # # #
edu.harvard.i2b2.crc.jms.small.timeoutsecs=180
edu.harvard.i2b2.crc.jms.medium.timeoutsecs=14400
edu.harvard.i2b2.crc.jms.large.timeoutsecs=43200
```

12. If required, you can change the default value for the obfuscated user's query lockout parameter in the etc/spring/crc.properties file.

```
# # # # # # # # # # # # # # # # # # # # # # # # #
# CRC Setfinder query lockout parameter
# # # # # # # # # # # # # # # # # # # # # # # # #
#If the count value is -1 don't lockout user, default allows 7 attempt before lockout
edu.harvard.i2b2.crc.lockout.setfinderquery.count=7
edu.harvard.i2b2.crc.lockout.setfinderquery.day=30
# If this property is >0, then user lock out will be counted for query with set size 0
edu.harvard.i2b2.crc.lockout.setfinderquery.zero.count=-1
# obfuscation standard deviation for the set size count. Range -2 to 2
edu.harvard.i2b2.crc.setfinderquery.obfuscation.count.sigma=1.323
# obfuscation standard deviation for the breakdown count. Range -4 to 4
edu.harvard.i2b2.crc.setfinderquery.obfuscation.breakdowncount.sigma=1.6
#if the count is with in this minimum value, then obfuscated value would be 0
edu.harvard.i2b2.crc.setfinderquery.obfuscation.minimum.value=3
```

13. If required, you can change the default maximum number of concepts/items in a query used to determine if the simple setfinder query can be run without using the database temporary table. Change the etc/spring/crc.properties file.

```
# # # # # # # # # # # # # # # # # # # # # # # # #
# CRC setfinder query without using temp table
# # # # # # # # # # # # # # # # # # # # # # # # #
edu.harvard.i2b2.crc.setfinderquery.skiptemptable.maxconcept=40
```

14. Configure JBoss Datasource:

    CRC supports both Oracle and SqlServer. Edit etc/jboss/crc-ds.xml and set the database connection properties. For SqlServer data source, please use the sample provided in the crc-ds.xml.

    The following shows configuring the Oracle data source for two projects.

    If your setup has multiple projects pointing to different data sources, then copy <local-tx-datasource> in ds-xml for each project data source.

```
<jndi-name>QueryToolDemoDS</jndi-name>
<connection-url>jdbc:oracle:thin:@localhost:1521:xe</connection-url>
<driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
<user-name>i2b2demodata</user-name>
<password>i2b2demodata_password</password>
```

    For example, a second project, Demo2, would have this entry:

```
<jndi-name>QueryToolDemo2DS</jndi-name> with connection-url:
<connection-url>jdbc:oracle:thin:@localhost:1521:xe</connection-url>
<driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
<user-name>i2b2demodata2</user-name>
<password>i2b2demodata2_password</password>
```

15. Edit *etc/jboss/crc-jms-ds.xml* and set 'DefaultDS' JMS database connection properties If the data source is SQLserver, then comment the oracle section and uncomment sqlserver data source section.

```
<local-tx-datasource>
    <jndi-name>DefaultDS</jndi-name>
    <connection-url>jdbc:oracle:thin:@localhost:1521:xe</connection-url>
    <driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
    <user-name>i2b2hive_uname</user-name>
    <password>i2b2hive_password</password>
    …
</local-tx-datasource>
```

16. This is an optional step to include query process step timing information in the setfinder query response. The process timing information can be enabled for a project by setting a PM project parameter PM_ENABLE_PROCESS_TIMING.

PM_ENABLE_PROCESS_TIMING=INFO	for basic process timing information
PM_ENABLE_PROCESS_TIMING=DEBUG	for verbose timing information

17. If your numerical observations are not normalized to a single unit_cd in the observation_fact table, you may wish to apply automatic unit conversion to the value constraints in your queries by setting the PM project parameter CRC_ENABLE_UNITCD_CONVERSION.

CRC_ENABLE_UNITCD_CONVERSION=ON	enables unit conversion
CRC_ENABLE_UNITCD_CONVERSION=OFF	disables unit conversion (default setting)

The unit conversion factor is supplied within the ValueMetadata for the concept.

It is recommended that all fact data be normalized prior to entry into the observation_fact table as query performance is optimum when this option is not enabled.

2.1.6 Build and deploy edu.harvard.i2b2.crc and edu.harvard.i2b2.crc.loader

The following outlines the steps to build and deploy **edu.harvard.i2b2.crc** and **edu.harvard.i2b2.crc.loader**.

Steps:

1. Run *ant -f master_build.xml clean build-all deploy*

Note: *If you are deploying on an existing JBoss instance with CRC 1.3, then please remove the QueryProcessor-EJB.jar from the $JBOSS_HOME/server/default/deploy directory.*

2.1.7 Start Services

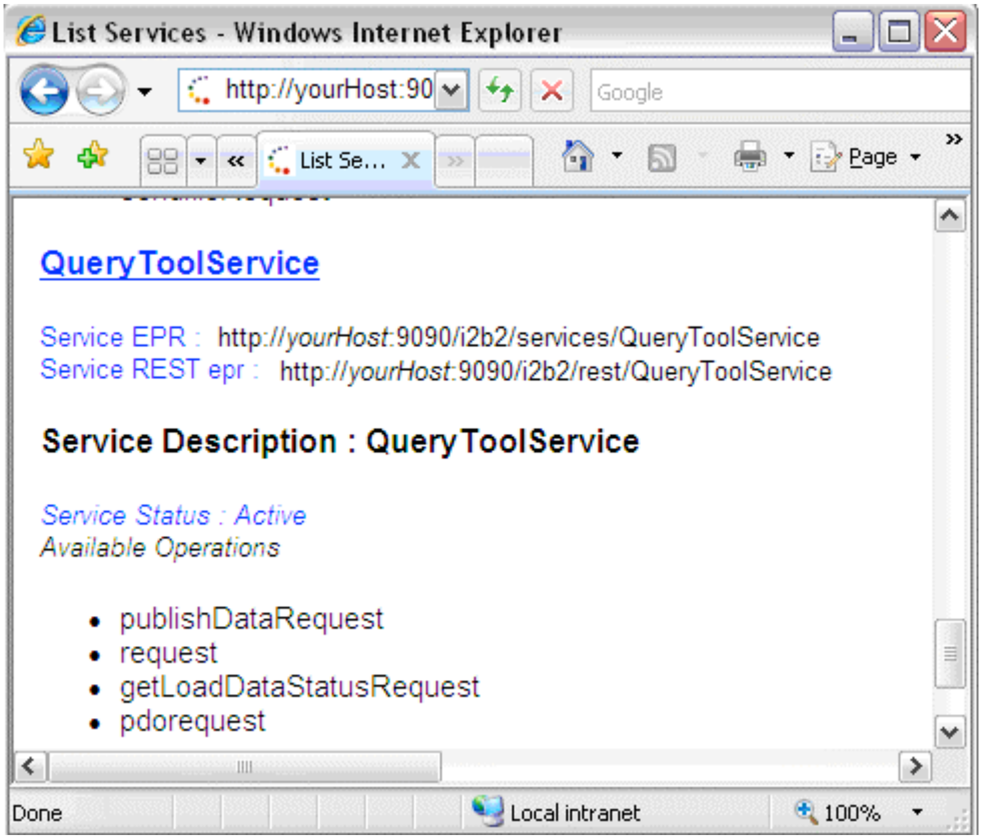
2.1.7.1 START JBOSS

To start JBOSS run the following: *$**JBOSS_HOME**/bin/run.sh -b 0.0.0.0*

2.1.7.2 WEB SERVICE

The following are the steps to take to verify the web service is running.

1. In a browser, check the following URL:
   *http://**yourHost**:9090/i2b2/services/listServices*
2. Verify QueryToolService is listed as active.



QueryToolService

Service EPR : http://*yourHost*:9090/i2b2/services/QueryToolService
Service REST epr : http://*yourHost*:9090/i2b2/rest/QueryToolService

Service Description : QueryToolService

Service Status : Active
Available Operations

- publishDataRequest
- request
- getLoadDataStatusRequest
- pdorequest

2.2 Changing Server log level

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

1. 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>
```

2. To switch back to DEBUG mode, *comment out* the ‘Threshold’ <param> and wait a minute.

☞ ***Note**: There is no need to restart JBOSS.*

3. VERIFY INSTALLATION

3.1 CRC Cell Sanity Test via the i2b2Workbench

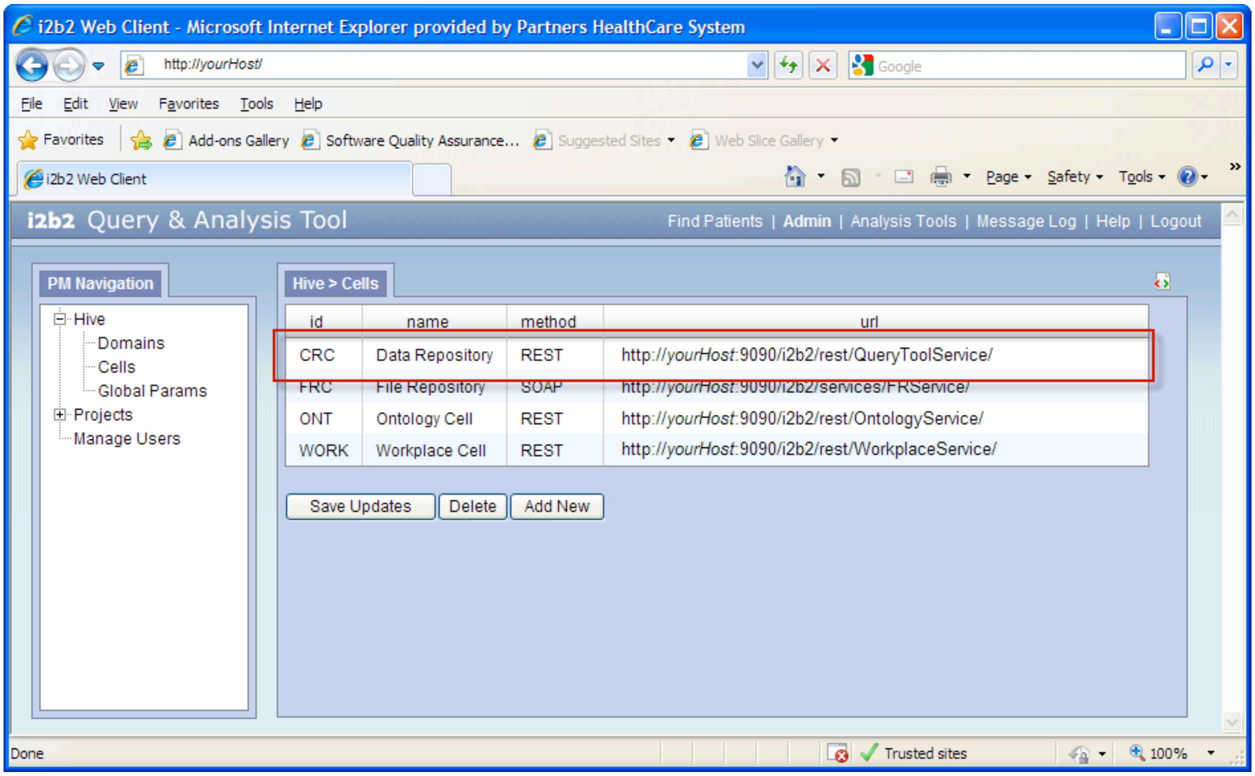
3.1.1 Configure the i2b2Workbench to communicate with your CRC cell.

Cell configuration is addressed in the Project Management (PM) Cell installation and set up. Please refer to this document if the CRC Cell has not yet been configured.

To verify the data, go to the web client site ***http://host/webclient***.

Once logged on, select "*Cells*" under the "*Hive*" primary navigation tab. If the CRC Cell has been configured it will be listed as an existing, registered cell:

- To verify cell data, click on the cell name (CRC).
- To edit the cell data, click on the field you want to edit. Click on "*Save Updates*" to save the changes you have made.

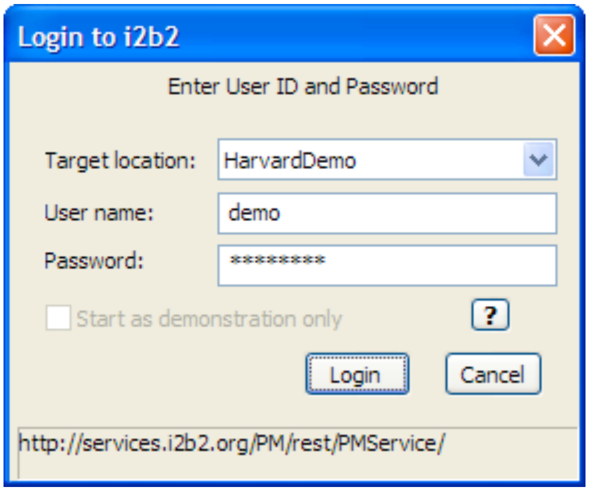

i2b2 Web Client - Microsoft Internet Explorer provided by Partners HealthCare System
http://yourHost/
Google
File Edit View Favorites Tools Help
Favorites
Add-ons Gallery
Software Quality Assurance...
Suggested Sites
Web Slice Gallery
i2b2 Web Client
Page Safety Tools
i2b2 Query & Analysis Tool
Find Patients | Admin | Analysis Tools | Message Log | Help | Logout
PM Navigation
Hive
Domains
Cells
Global Params
Projects
Manage Users
Hive > Cells
Save Updates
Delete
Add New
Done
Trusted sites
100%

id	name	method	url
CRC	Data Repository	REST	http://*yourHost*:9090/i2b2/rest/QueryToolService/
FRC	File Repository	SOAP	http://*yourHost*:9090/i2b2/services/FRService/
ONT	Ontology Cell	REST	http://*yourHost*:9090/i2b2/rest/OntologyService/
WORK	Workplace Cell	REST	http://*yourHost*:9090/i2b2/rest/WorkplaceService/

3.1.2 Launch the i2b2Workbench

The following outlines the steps to log into the i2b2 Workbench.

1. Go to the location (folder) in which the i2b2 Workbench was installed.
2. Double click on **i2b2Workbench.exe**.
3. The **Login dialog box** will open.



Login to i2b2

Enter User ID and Password

Target location: HarvardDemo

User name: demo

Password: ********

☐ Start as demonstration only

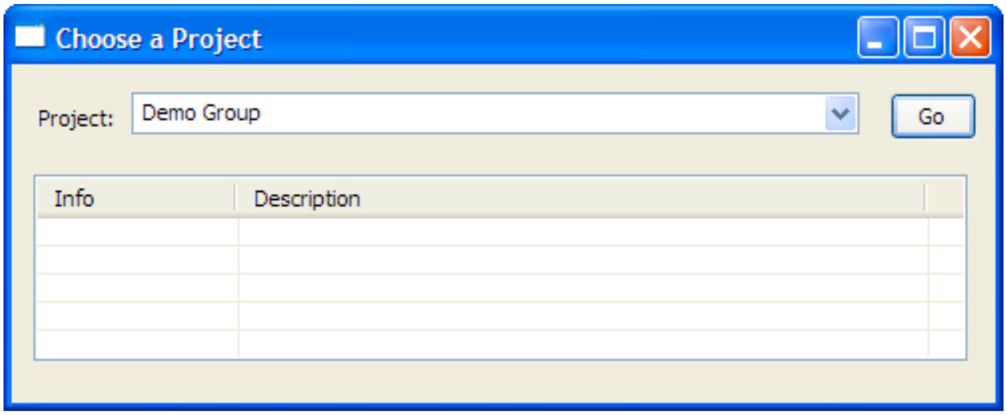
http://services.i2b2.org/PM/rest/PMService/

4. Select your **target location** (YourSite)
5. Enter you **User name** (ID) and **Password**. (demo/demouser)
6. The *URL at the bottom of the login screen* should be the address of your PM cell. If it isn't then edit the *i2b2Workbench.properties* file to point to the correct location of your PM cell.

   i2b2.1=**YourSite**,REST,http://*jbossHost*:port/i2b2/rest/PMService/

7. The **Choose a Project** dialog box will open.

Note: *the project dialog box will only appear if you have access to multiple projects. If you only have access to one project you will be brought to the Welcome page.*

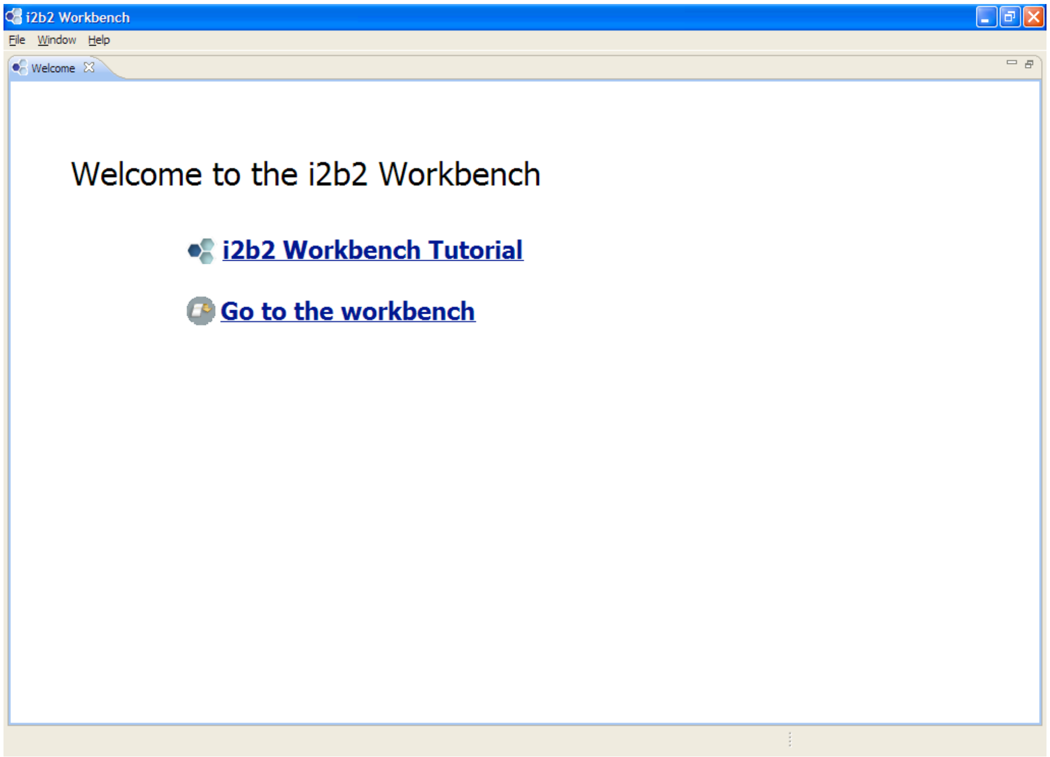


Project: Demo Group

8. Select the project you want to log into.

9. The **Welcome** page will open.

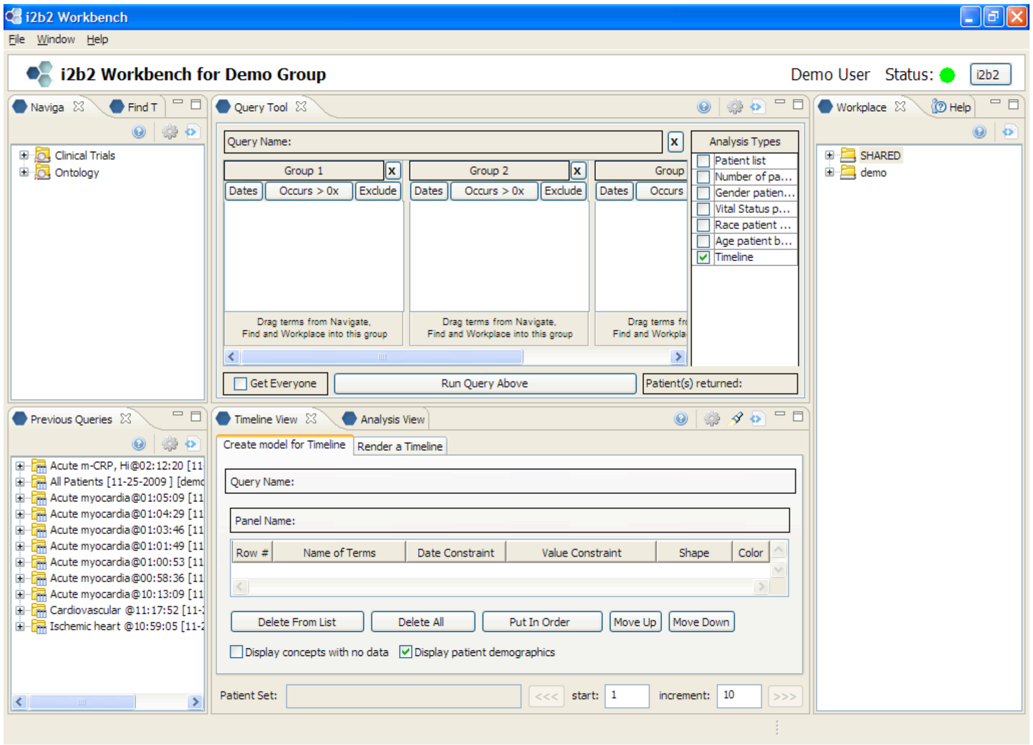
Note: *the welcome page will open the first time you login. All subsequent logins will bring you directly to the desktop. You can access the welcome page anytime by selecting it from the Help menu on the toolbar.*



Welcome to the i2b2 Workbench

10. Click on Go to the workbench.

11. The **desktop** of the i2b2 Workbench will open.



3.1.3 Possible problems

One of the following error messages may appear in view window.

1. CRC cell is unavailable

   The possible cause for this error message may be one of the following:

   - CRC cell address in the PM webclient is incorrect.

   a. See the section labeled "*Configure the i2b2Workbench to communicate with your CRC Cell*" (section 3.1.1) to verify the CRC cell address is correct.

- CRC cell may be down. Follow these steps to check the status of the CRC cell.
   a. In a browser, check the url http://**yourHost**:9090/i2b2/services/listServices
   b. Verify that *QueryToolService* is listed as active.

2. Remote server is unavailable

   The possible cause for this error message may be one of the following:

   - Server may be down. Follow these steps to check the status of the server.
      a. In a browser, check the url http://**yourHost**:9090/i2b2/services/listServices
      b. Verify that *QueryToolService* is listed as active.

3. PM service is not responding

   The Project Management Cell is down or its address was not configured properly in the following sections:

   a. *Section*: Build edu.harvard.i2b2.crc.loader (section 2.1.4)
      Step 4: Edit the *etc/spring/edu.harvard.i2b2.crc.loader.properties* file

   b. *Section*: Setup edu.harvard.i2b2.crc (section 2.1.5)
      Step 4: Edit the etc/spring/crc.properties file

4. Database error

   The possible cause for this error message may be one of the following:

   - Problem connecting to the database.
   - Verify configuration parameters in the following sections:
      a. *Section*: Build edu.harvard.i2b2.crc.loader (section 2.1.4)

Step 5: Edit the *etc/spring/CRCLoaderApplicationContext.xml*

b. <u>*Section*</u>: Setup edu.harvard.i2b2.crc (section 2.1.5)
   Step 8a: Edit *etc/spring/CRCApplicationContext.xml*
   Step 8b: Update the entry in *etc/spring/crc.properties*
   Step 13: Configure Jboss Datasource
   Step 14: Edit *etc/jboss/crc-jms-ds.xml*

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.