

Network-Specific: ACT to 1.19.2

Depending on your site's current status, not all of these steps will be necessary to follow. For example, you may skip the first major i2b2 section of these instructions if i2b2 1.7.05 is already installed. However, all users should read through and follow the SHRINE 1.19.2 section of the instructions.

The end result is that you will need all of these pieces of software (i2b2, SHRINE, SHRINE Data Steward) installed and upgraded to their indicated version.

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i2b2 1.7.05

If your site has not already upgraded i2b2 to 1.7.05, please do so before upgrading SHRINE. i2b2 1.7.03 has some issues with its query queue that can interfere with more complex queries. If you have already upgraded to i2b2 1.7.05 and confirmed it is working, you may skip this section.

Detailed documentation for upgrading i2b2 is not available on the i2b2 site, however [the general installation documentation on the i2b2 wiki](#) can serve as a base for upgrading.

The following instructions carry the disclaimer that they are not official i2b2 documentation and are not absolutely guaranteed to work. Make sure to keep backups of your current i2b2 installation (which is contained within /opt/jboss-as-7.1.1.Final) before performing the upgrade.

Stop i2b2

Before proceeding, ensure i2b2 is stopped by running the following command:

```
/opt/jboss-as-7.1.1.Final/bin/jboss-cli.sh --connect --command=:shutdown
```

Download i2b2 Files

You will need to download the following from [i2b2's downloads page](#):

- i2b2core-src-1705.zip: <https://www.i2b2.org/software/download.html?d=375>
- i2b2createdb-1705.zip: <https://www.i2b2.org/software/download.html?d=378>
- i2b2webclient-1705.zip: <https://www.i2b2.org/software/download.html?d=377> (not absolutely necessary, mostly useful if you also use i2b2 for non-SHRINE purposes)

Transfer these files to the machine that hosts i2b2, and unzip them there.

Build and Install i2b2 Components

Follow the instructions from the i2b2 wiki for installing the following i2b2 components. The instructions boil down to setting a few variables in .properties files, running several ant builds to compile the i2b2 software components and placing them in their proper destination folders. These components are:

- Core: <https://community.i2b2.org/wiki/display/getstarted/Chapter+4.+i2b2+Server-Common+Install>
- Admin Interface: <https://community.i2b2.org/wiki/display/getstarted/Chapter+6.+i2b2+Administration+Module+Install>
- PM Cell: <https://community.i2b2.org/wiki/display/getstarted/Chapter+5.+Project+Management+%28PM%29+Cell+Install>
- ONT Cell: <https://community.i2b2.org/wiki/display/getstarted/Chapter+9.+Ontology+Management+%28ONT%29+Cell+Install>
- CRC Cell: <https://community.i2b2.org/wiki/display/getstarted/Chapter+10.+Data+Repository+%28CRC%29+Cell+Install>
- WORK Cell: <https://community.i2b2.org/wiki/display/getstarted/Chapter+11.+Workplace+%28WORK%29+Cell+Install>
- FR Cell: <https://community.i2b2.org/wiki/display/getstarted/Chapter+12.+File+Repository+%28FR%29+Cell+Install>
- IM Cell: <https://community.i2b2.org/wiki/display/getstarted/Chapter+13.+Identity+Management+%28IM%29+Cell+Install>
- (optional) i2b2 Webclient: <https://community.i2b2.org/wiki/display/getstarted/Chapter+7.+i2b2+Web+Client+Install>

This should result in the i2b2 webapp under jboss being upgraded to 1.7.05.

Upgrade i2b2 Database

Unzip i2b2createdb-1705.zip, and see the instructions at <https://community.i2b2.org/wiki/display/getstarted/Chapter+3.+Data+Installation> to get started with upgrading the database.

NOTE: do **not** run anything in the edu.harvard.i2b2.data\Release_1-7\NewInstall folder. All work for upgrading must take place in edu.harvard.i2b2.data\Release_1-7\Upgrade.

Similar to the previous set of installations, this boils down to setting variables in .properties files, and then running ant scripts to modify the i2b2 database.

There are three folders under edu.harvard.i2b2.data\Release_1-7\Upgrade:

- Crpdata
- Hivedata
- Metadata

Set db.properties

Ensure the db.properties file within each of these folders matches the database you use, and modify the values to suit your environment. Example values for Oracle, Postgres, and SQL Server can be found at: <https://community.i2b2.org/wiki/display/getstarted/3.4.2+Set+Database+Properties>

Run SQL Scripts

Navigate to the **Crcdata** directory, and invoke the following commands:

```
ant -f data_build.xml upgrade_procedures_release_1-7
ant -f data_build.xml upgrade_table_release_1-7
```

Navigate back up to **Upgrade**, then into **Hivedata**, and then run the following command:

```
ant -f data_build.xml upgrade_hive_tables_release_1-7
```

Navigate back up to **Upgrade**, then into **Metadata**, and then run the following command:

```
ant -f data_build.xml upgrade_metadata_tables_release_1-7
```

Start i2b2

After all this, start i2b2 back up with the following command:

```
/opt/jboss-as-7.1.1.Final/bin/standalone.sh > /dev/null &
```

Check i2b2 is Running

To verify that all i2b2 services are up and running after the upgrade, check the following URL in your browser (substitute "your.i2b2.host" for the address of your i2b2 server):

<http://your.i2b2.host:9090/i2b2/services/listServices>

In case of issues, consult <https://community.i2b2.org/wiki/display/getstarted/Chapter+15.+Troubleshooting+Installation+Errors>

SHRINE 1.19.2 (with SHRINE Data Steward)

These instructions are based on the instructions in the general [Upgrading SHRINE to 1.22.8 \(from 1.20-1.21\)](#) article. You will need to follow all the instructions provided in order to upgrade to SHRINE 1.19.2 and to properly configure the new SHRINE Data Steward. If you have previously installed SHRINE 1.19.1, you will need to follow these instructions. If you have not yet installed the SHRINE Data Steward, you will need to follow these instructions.

Shut Down SHRINE

Before starting the upgrade process, make sure SHRINE's Tomcat is not running. Leaving it running during this process can cause problems. Simply run the following command:

```
$ shrine_shutdown
```

If the above command is not found, try the following instead:

```
$ /opt/shrine/tomcat/bin/shutdown.sh
```

Create Backups

Now that SHRINE is stopped, it is a good idea to back up the current versions of the components we will be upgrading. The exact method for making this backups may vary, but these instructions will place the backups in a folder called `/opt/shrine/upgrade-backups`.

Start by creating a folder to contain these backups:

```
$ mkdir /opt/shrine/upgrade-backups
```

Next, move the current SHRINE webapp to the backup location:

```
$ mv /opt/shrine/tomcat/webapps/shrine /opt/shrine/upgrade-backups/shrine
```

Next, move the SHRINE webclient to that same backup location. Later on, we will be restoring `i2b2_config_data.js` from this backup. If you choose not to make any backups, make sure to at least keep a copy of **`i2b2_config_data.js` and `js-i2b2/cells/SHRINE/cell_config_data.js`**!

```
$ mv /opt/shrine/tomcat/webapps/shrine-webclient /opt/shrine/upgrade-backups/shrine-webclient
```

Upgrade Tomcat

You will need to upgrade Tomcat to version 7. Most older SHRINE installations defaulted to Tomcat 6, which is incompatible with the new Data Steward application. To ease the upgrade process, the SHRINE installer includes a script to detect the presence of Tomcat 6 and upgrade it to Tomcat 7. It will also back up your existing Tomcat installation, just in case.

Before running the upgrade script, make sure the following environment variables are set correctly:

- `SHRINE_HOME`
- `SHRINE_TOMCAT_HOME`
- `SHRINE_PORT`
- `SHRINE_SSL_PORT`
- `KEYSTORE_FILE`
- `KEYSTORE_PASSWORD`

Next, download the upgrade script from the SHRINE installer and run it.

```
$ wget --no-check-certificate https://open.med.harvard.edu/svn/shrine/releases/1.19.2/code/install/i2b2-1.7/shrine/upgrade_tomcat.sh
$ chmod +x upgrade_tomcat.sh
$ ./upgrade_tomcat.sh
```

The script should cleanly replace an existing Tomcat 6 installation with Tomcat 7, generating a new `server.xml` (based on `tomcat7_server.xml`) in the process. If you are already on Tomcat 7 (or newer), the script will exit and do nothing.

If Tomcat fails to start, check `/opt/shrine/tomcat/logs/catalina.out`. An error like this may appear in `catalina.out`, especially if you are using OpenJDK:

```
java.lang.ClassNotFoundException: org.apache.catalina.mbeans.ServerLifecycleListener
```

If this appears, comment out the following line in `/opt/shrine/tomcat/conf/server.xml`:

```
<Listener className="org.apache.catalina.mbeans.GlobalResourcesLifecycleListener"/>
```

Deploy New shrine.war

Next, we will retrieve the new SHRINE webapp from the HMS Sonatype Nexus server at <http://repo.open.med.harvard.edu/nexus/content/groups/public/net/shrine/shrine-war/>. Navigate to the folder for 1.19.2. From there, download the `shrine-war-1.19.2.war` file to the `webapps` directory on the SHRINE server and rename it to `shrine.war`.

For example:

```
$ cd /opt/shrine/tomcat/webapps
$ wget --no-check-certificate http://repo.open.med.harvard.edu/nexus/content/groups/public/net/shrine/shrine-war/1.19.2/shrine-war-1.19.2.war -O shrine.war
```

Deploy New steward.war

Much like shrine.war, the SHRINE Data Steward can be found on the HMS Sonatype Nexus server at <http://repo.open.med.harvard.edu/nexus/content/groups/public/net/shrine/steward/>. Navigate to the folder for 1.19.2. From there, download the steward-1.19.2.war file to the webapps directory on the SHRINE server and rename it to steward.war.

For example:

```
$ cd /opt/shrine/tomcat/webapps
$ wget --no-check-certificate https://repo.open.med.harvard.edu/nexus/content/groups/public/net/shrine/steward/1.19.2/steward-1.19.2.war -O steward.war
```

Deploy New shrine-proxy.war

Like other SHRINE artifacts, the SHRINE proxy can be found on the HMS Sonatype Nexus server at <https://repo.open.med.harvard.edu/nexus/content/groups/public/net/shrine/shrine-proxy/>. Navigate to the folder for 1.19.2. From there, download the shrine-proxy-1.19.2.war to the webapps directory on the SHRINE server and rename it to shrine-proxy.war.

For example:

```
$ cd /opt/shrine/tomcat/webapps
$ wget --no-check-certificate https://repo.open.med.harvard.edu/nexus/content/groups/public/net/shrine/shrine-proxy/1.19.2/shrine-proxy-1.19.2.war -O shrine-proxy.war
```

Deploy New SHRINE Webclient

Unlike shrine.war and steward.war, the SHRINE webclient is retrieved from the releases folder of the HMS Subversion repository at <https://open.med.harvard.edu/svn/shrine/releases/>. The webclient is found at 1.19.2/code/shrine-webclient. Checkout or export this folder to /opt/shrine/tomcat/webapps.

For example:

```
$ cd /opt/shrine/tomcat/webapps
$ svn export https://open.med.harvard.edu/svn/shrine/releases/1.19.2/code/shrine-webclient/
```

Restore Webclient Backups

After this, restore the previous **i2b2_config_data.js** and **cell_config_data.js** files from your backup and place them in the new shrine-webclient folder:

```
$ cp /opt/shrine/upgrade-backups/shrine-webclient/i2b2_config_data.js /opt/shrine/tomcat/webapps/shrine-webclient/i2b2_config_data.js
$ cp /opt/shrine/upgrade-backups/shrine-webclient/js-i2b2/cells/SHRINE/cell_config_data.js /opt/shrine/tomcat/webapps/shrine-webclient/js-i2b2/cells/SHRINE/cell_config_data.js
```

Configure the SHRINE Data Steward

Database - i2b2

The SHRINE Data Steward is typically backed by the i2b2 PM cell used by SHRINE. From the steward application's point of view, all users on the SHRINE project are considered Researchers (except for the Steward and QEP users!). However, there is some additional work that has to be done to the i2b2 user list to accommodate the SHRINE Data Steward.

QEP User

The Steward application requires set of user credentials that the application will use to submit queries through to SHRINE. It is recommended that this be a dedicated system user separate from any other account. Additionally, it will need to have the parameter "qep" defined (name: qep, value: true, type: text), which can be set in the Manage Users section of the i2b2 Admin Panel. Make sure to add this user to the **SHRINE** project in the i2b2 Admin Panel as well.

In shrine.conf, make sure there is a **shrineSteward** block in the **queryEntryPoint** section, and that the **qepUserName** and **qepPassword** properties match the user with the qep parameter.

Steward User

In Steward application deployments that involve topic approval, a trusted human user will have to be given permission to review proposed research topics and approve/reject them. To mark a user as such, add the "DataSteward" parameter (name: DataSteward, value: true, type: text) to that user in the Manage Users section of the i2b2 Admin Panel. Make sure to add this user to the **SHRINE** project in the i2b2 Admin Panel as well.

Note that this user is meant solely to monitor and review, and thus cannot create its own query topics! If you are both a steward and a researcher, you will need to create two separate i2b2 users.

All Other Users (Researchers)

NOTE: The current SHRINE Data Steward webclient transforms usernames to all-lowercase! As such, any i2b2 usernames that use both uppercase and lowercase letters will not be able to use the SHRINE Data Steward properly. Please make sure any users that intend to use SHRINE have a username with all lowercase letters. We apologize for any inconvenience this may cause.

Database - Steward

The SHRINE Data Steward application uses a separate database to store its logging information, similar to how the core SHRINE application keeps its own query log.

This step should be handled by [install-steward-only.sh](#), but instructions to manually perform it can be found below:

1. Create a database (typically stored in MySQL alongside the existing shrine_query_history database, but this is just a suggestion). The installer by default calls it stewardDB.
2. Grant a shrine/steward-specific user full access to this database. The installer by default uses the same credentials as it does for the SHRINE query history database, but you are welcome to (and encouraged to!) change this.
3. Run the appropriate schema script included with the steward application
 - a. For MySQL, this is <https://open.med.harvard.edu/svn/shrine/releases/1.19.2/code/steward/src/main/sql/mysql.ddl>
 - b. For SQL Server, this is <https://open.med.harvard.edu/svn/shrine/releases/1.19.2/code/steward/src/main/sql/sqlserver.ddl>

steward.conf - Application config

1. Start with a sample steward.conf from the installer: <https://open.med.harvard.edu/svn/shrine/releases/1.19.2/code/install/i2b2-1.7/shrine/skel/steward.conf>
 - a. If using the JDBC driver (for example, SQL Server users), make sure slickProfileClassName is set to "scala.slick.driver.JdbcDriver\$" (mind the lowercase "dbc"!)
2. Substitute the following variables with their appropriate value. (see common.rc and shrine.rc for reference, as well as [the listing of configuration variables in the installer](#))
 - a. SHRINE_ADAPTER_I2B2_DOMAIN
 - b. SHRINE_STEWARD_DB_NAME
 - c. I2B2_PM_IP
 - d. KEYSTORE_FILE
 - e. KEYSTORE_PASSWORD
 - f. KEYSTORE_ALIAS
3. Save this file to /opt/shrine/tomcat/lib/steward.conf

Make sure that the keystore{} block in steward.conf **exactly** matches the keystore{} block in shrine.conf!

An important setting in steward.conf which should be manually set by a site administrator is **createTopicsMode**. By default, this is set to "Pending", which means that topic requests submitted in the Data Steward application will have to be manually approved by a user with DataSteward privileges.

The ACT network, however, has not specified requirements for such thorough stewardship, so sites on the ACT network should set **createTopicsMode** to "Approved". In this mode, topic requests must be submitted, but no manual approval is necessary. All topics submitted are automatically approved, and researchers can immediately begin executing queries for that topic.

steward.xml - Tomcat context definition

1. Start with a sample steward.xml from the installer: <https://open.med.harvard.edu/svn/shrine/releases/1.19.2/code/install/i2b2-1.7/shrine/skel/steward.xml>
2. Substitute the following variables with their appropriate value. (see common.rc and shrine.rc for reference, as well as [the listing of configuration variables in the installer](#))
 - a. SHRINE_STEWARD_MYSQL_USER
 - b. SHRINE_STEWARD_MYSQL_PASSWORD
 - c. SHRINE_STEWARD_MYSQL_HOST
 - d. SHRINE_STEWARD_DB_NAME
3. Save this file to /opt/shrine/tomcat/conf/Catalina/localhost/steward.xml

SHRINE Webclient

In webapps/shrine-webclient/js-i2b2/cells/SHRINE/cell_config_data.js, make sure newTopicURL and readApprovedURL are set to something like the following:

```
newTopicURL: "https://your.hostname.here:6443/steward/client/index.html#/topics", /* this URL should be
accessible from the client */
readApprovedURL: "https://your.hostname.here:6443/shrine/rest/i2b2/request" /* this URL should be accessible
from the SHRINE server */
```

Make the following change in webapps/shrine-webclient/i2b2_config_data.js:

```
isSHRINE: true
```

The above may already be present in i2b2_config_data.js, but commented out. (there may be a /* on the previous line, as well as a */ or // on the "isSHRINE" line) If so, uncomment it. If **isSHRINE** is not already present, add it to the main entry in **lstDomains**.

shrine.conf Changes

SHRINE Data Steward Integration

In order to make SHRINE aware of the steward, you will need to change the `authorizationType` value and add the following `shrineSteward` block to the `queryEntryPoint` block of `shrine.conf`:

```
queryEntryPoint {
  ...

  authorizationType = "shrine-steward"

  shrineSteward {
    qepUserName = "qep" // name of user the steward will submit queries as
    qepPassword = "qep-password"
    stewardBaseUrl = "https://your.hostname.here:6443" // typically hostname+port of Tomcat server running
    steward.war
  }
  ...
}
```

The `qepUserName` and `qepPassword` properties should match the set of credentials used for the QEP user defined earlier.

Lockout Threshold for ACT

In the `adapter` block of `shrine.conf`, change `adapterLockoutAttemptsThreshold` to 3:

```
adapter {
  ...
  adapterLockoutAttemptsThreshold = 3
  ...
}
```

Start SHRINE

The only thing left to do at this point is start SHRINE back up. Simply do the following:

```
$ shrine_startup
```

If the above command is not found, try the following instead:

```
$ /opt/shrine/tomcat/bin/startup.sh
```

Verify SHRINE Upgrade

After starting SHRINE up, verify that the upgrade was properly deployed by checking the SHRINE Happy module. The exact address you will need to go to depends on your configuration, but the general format looks like the following:

```
https://your.shrine.host:6443/shrine/rest/happy/version
```

It may take a few seconds for the page to load, but after it does load, verify that the value for `<shrineVersion>` matches the version that was just deployed. If it is still displaying an old version, repeat steps 1 and 4 to redeploy the `shrine.war` file and start SHRINE again. Example output from this report for SHRINE 1.19.2 can be seen below:

```
<versionInfo>
  <shrineVersion>1.19.2</shrineVersion>
  <ontologyVersion>UNKNOWN</ontologyVersion>
  <adapterMappingsVersion>Unknown</adapterMappingsVersion>
  <scmRevision>(not available)</scmRevision>
  <scmBranch>UNKNOWN_BRANCH</scmBranch>
  <buildDate>2015-06-30 18:03:57</buildDate>
</versionInfo>
```

Creating a Query Topic

Upon logging in to the SHRINE webclient for the first time after installation of the SHRINE Data Steward, the user should see a new dropdown list and button at the bottom of the query construction panel. This is where a user sets which query topic will be associated with their query when it enters the SHRINE system. If no topic is selected, then query execution will fail.

Initially, a user will not have any approved query topics, so they must first click on the "**Request New Topic**" button, which will take them to the SHRINE Data Steward webclient. Log in using the same set of credentials used to log in to the SHRINE webclient, and request a new topic from there. On this network, all query topics are automatically approved. After creating a query topic, log out and back in to the SHRINE webclient, and the recently-created topic should be available in the dropdown list at the bottom of the query construction panel.

SHRINE operation continues as normal from this point onward.

Verify SHRINE Data Steward Query Logging

After creating a query topic and logging back in to the SHRINE webclient, try selecting a topic and executing a query. The query should come back with a list of sites and patient counts (or issues) as usual. After this, verify that the SHRINE Data Steward is also logging these queries.

Check the SHRINE Data Steward client (either click on Request New Topic or go to <https://your.host.here:6443/steward/client/>), log in with the user you ran the query as, and then check the Query History section of the client. If you need help navigating the application, check the Help file in the upper right (also available at <https://your.host.here:6443/steward/client/src/assets/img/SHRINE-Data-Steward-Help.pdf>)

The recently-executed query should show up in that list, with the same query name that was entered in the SHRINE webclient. If it does not show up, verify that your configuration settings for both the SHRINE Data Steward as well as SHRINE itself match the values suggested in this documentation.