

**NATIONAL PRACTITIONER DATA BANK -  
HEALTHCARE INTEGRITY AND PROTECTION  
DATA BANK (NPDB-HIPDB)**

**QUERYING AND REPORTING XML SERVICE (QRXS)  
CLIENT PROGRAM USER GUIDE**

**Version 1.06**

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**DOCUMENT CHANGE HISTORY**

The table below identifies changes incorporated into each baseline of this document.

Date	Version #	Change Description
10/17/2005	1.01	<p>Below is a summary of changes to the Querying and Reporting XML Service (QRXS) User Guide version 1.01. Effective October 17, 2005, this document version 1.01 replaces version 1.0. The changes in this version are indicated below:</p> <ul style="list-style-type: none"> <li>• Updated sample code for obtaining error message text using the Application Programming Interface (API). Sections 5.3.3 and 5.3.4.</li> <li>• Modified and added status codes. See Section 3.3.</li> </ul>
5/8/2006	1.02	<p>Below is a summary of changes to the Querying and Reporting XML Service (QRXS) User Guide version 1.02. Effective May 8, 2006, this document, version 1.02 replaces version 1.01. The changes in this version are indicated below:</p> <ul style="list-style-type: none"> <li>• The Data Banks' Web site is now located at <a href="http://www.npdb-hipdb.hrsa.gov">www.npdb-hipdb.hrsa.gov</a>. The Data Banks are using a .gov domain name to help prevent fraud by showing Data Banks' users that the NPDB-HIPDB Web site is under the Government-run domain. Please update your Internet bookmarks to reference the .gov address for the Data Banks' Web site. NPDB-HIPDB Web site references in this document now refer to the new Web site address.</li> <li>• Due to the NPDB-HIPDB Web site address change, all ITP and QRXS client programs must be upgraded to a new version. Updated client programs are now available on the NPDB-HIPDB Web site. While the current versions of the ITP and Querying and Reporting XML Service (QRXS) client programs will continue to function for a limited time, all ITP and QRXS users must upgrade their client program to the new version no later than September 18, 2006.</li> <li>• Updated the commons-fileupload jar to version 1.1.</li> </ul>
7/31/2006	1.03	<p>Below is a summary of changes to the Querying and Reporting XML Service (QRXS) User Guide version 1.03. Effective July 31, 2006, this document, version 1.03 replaces version 1.02. The changes in this version are indicated below:</p> <ul style="list-style-type: none"> <li>• Updated installation instructions for JRE 1.5 and the QRXS client software. See Sections 2.2 and 2.3.</li> </ul>
1/14/2008	1.04	<p>Below is a summary of changes to the Querying and Reporting XML Service (QRXS) User Guide version 1.04. Effective January 14, 2008, this document, version 1.04 replaces version 1.03. The changes in this version are indicated below:</p> <ul style="list-style-type: none"> <li>• Added new status code -57. See Section 3.3.</li> </ul>

Date	Version #	Change Description
3/31/2008	1.05	<p>Below is a summary of changes to the Querying and Reporting XML Service (QRXS) User Guide version 1.05. Effective March 31, 2008, this document, version 1.05 replaces version 1.04. For transaction submissions prior to March 31, 2008, readers should refer to version 1.04 of the Querying and Reporting XML Service (QRXS) User Guide available at <a href="http://www.npdb-hipdb.hrsa.gov/qrxs.html">www.npdb-hipdb.hrsa.gov/qrxs.html</a>. The changes in this version are indicated below:</p> <ul style="list-style-type: none"> <li>• Added consent to monitoring notice paragraph. See Section 1.1.</li> <li>• Added Section 1.2, User Account Security.</li> <li>• Added Section 1.3, Contact Information.</li> <li>• Updated software requirements. See Section 2.2.</li> <li>• Updated software installation instructions. See Section 2.3.</li> <li>• Clarified the use of the Entity Data Bank Administrator's ID for transactions. See Section 3.2.</li> <li>• Updated and changed the format of the status codes. See Section 3.3.</li> <li>• Updated notes in Section 3.5, Uploading Files.</li> <li>• Updated notes in Section 3.6, Downloading Files.</li> <li>• Added Section 3.8, Password Changes.</li> <li>• Updated Section 5.3, Using the API.</li> </ul>
7/28/2008	1.06	<p>Below is a summary of changes to the Querying and Reporting XML Service (QRXS) User Guide version 1.06. Effective July 28, 2008, this document, version 1.06 replaces version 1.05. For transaction submissions prior to July 28, 2008, readers should refer to version 1.05 of the Querying and Reporting XML Service (QRXS) User Guide available at <a href="http://www.npdb-hipdb.hrsa.gov/qrxs.html">www.npdb-hipdb.hrsa.gov/qrxs.html</a>. The changes in this version are indicated below:</p> <ul style="list-style-type: none"> <li>• Corrected output in the sample download.lst file in section 3.6.</li> <li>• Updated Note 2 in Section 3.8 to indicate that password rejection files are returned immediately.</li> </ul>

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# 1. Introduction

## 1.1 Scope

The National Practitioner Data Bank-Healthcare Integrity and Protection Data Bank (NPDB-HIPDB) provides the Querying and Reporting XML Service (QRXS) to users who wish to send and receive machine-readable responses. These instructions provide details on installing and configuring the QRXS client software.

The QRXS client is a stand-alone program that transmits files containing transaction data to, and receives response files from, the Data Banks. These transactions, can be a query, a report, or a password change request. For security, data is transmitted over a Secure Socket Layer (SSL) connection. This program can be executed as a stand-alone program, or it can be executed under the control of other programs. An Application Programming Interface (API) is also available for additional flexibility when integrating QRXS transactions into existing software systems.

File formats for QRXS submissions and responses are defined in the Interface Control Documents (ICDs) published by the Data Banks, available on-line at [www.npdb-hipdb.hrsa.gov/qrxs.html](http://www.npdb-hipdb.hrsa.gov/qrxs.html).

When using the QRXS, you are accessing a U.S. Government information system. System usage may be monitored, recorded, and subject to audit. Unauthorized use of this system is prohibited and subject to criminal and civil penalties. Use of this system indicates consent to monitoring and recording. Should you have questions concerning your responsibilities, please contact the Customer Service Center immediately as specified in Section 1.3, Contact Information.

## 1.2 User Account Security

### 1.2.1 User Accounts

Each entity has two types of accounts to access the Data Banks, the Entity Data Bank Administrator account and user accounts. The Entity Data Bank Administrator account is used to create and manage the user accounts. User accounts are used to submit transactions and retrieve responses from the Data Banks. The Data Banks have established security policies in order to reduce the risk of unauthorized access to user accounts and protect the confidentiality of practitioner reports.

### 1.2.2 New Entity Registration Passwords

New entities that register with the Data Banks receive registration information via U.S. mail and includes a Data Bank Identification Number (DBID), the Entity Data Bank Administrator account User ID, and a temporary Entity Data Bank Administrator account password. A newly registered entity is required to log in to the IQRS or the QRXS and change the Entity Data Bank Administrator account password within 30 calendar days of the registration verification mailing date. If an entity does not log in to the IQRS or the QRXS within 30 calendar days of the registration verification mailing date, the registration password will expire, the account is automatically locked, and the Entity Data Bank Administrator must contact the Data Banks to reset the password.

### 1.2.3 User Account Password Policies

A user must provide their organization's DBID, their user ID, and user account password each time they access the IQRS or the QRXS. If a valid password is not provided after five consecutive attempts, the user account is locked and the user must contact the Entity Data Bank Administrator to submit a user account password reset request.

Users are required to change their account password **every 90 calendar days**. A password change request can be submitted at any time to change an account's password. Once a password expires, a **30 calendar day** grace login period is available to allow the account password to be changed. Once a password has expired, the NPDB-HIPDB will not accept submissions and access will not be permitted to response files from that account until the account password is successfully changed. Once the grace login period is expired, the account is automatically locked and the user must use the IQRS password reset service or contact the Entity Data Bank Administrator to reset the user's password.

**To ensure the security and privacy of user account passwords when using the QRXS, the response to a password change request transaction can only be downloaded by the same user account that submitted the transaction.**

## 1.2.4 Resetting Passwords

When a user forgets his or her password, or is locked out of the IQRS or the QRXS, the Entity Data Bank Administrator is responsible for providing a new Data Banks-generated temporary password to the user. A Data Banks-generated temporary password is valid for 3 calendar days and must be changed by the user before the user can submit transactions or retrieve response files. Only the Entity Data Bank Administrator can submit and download transactions to reset user passwords using the QRXS. The Entity Data Bank Administrator cannot reset his or her own password. A password change transaction should be submitted instead of a password reset transaction.

To ensure that the current Entity Data Bank Administrator is correctly identified in the Data Banks, he or she must log in to the IQRS and update the administrator's user account by entering the administrator's Name, Title, and Telephone Number in the appropriate fields on the User Account Information screen.

If the Entity's Data Bank Administrator forgets his or her password, or is locked out of the IQRS or the QRXS, the Entity Data Bank Administrator must call the NPDB-HIPDB Customer Service Center to receive a Data Banks-generated temporary password. If the Entity Data Bank Administrator's name is not maintained in the administrator's IQRS user account, the company's certifying official will be required to submit a signed, faxed request for the change on company letterhead. The Customer Service Center will respond by immediately changing the old Entity Data Bank Administrator password and contacting the new Entity Data Bank Administrator with a Data Banks-generated temporary password and instructions for updating the administrator's user account. These temporary passwords (user and administrator) will only be valid for 3 calendar days. The user/administrator should change his or her password immediately; and no grace login period will be permitted.

## 1.2.5 Passwords Restrictions

The Data Banks also prohibit the use of common or easily guessed passwords by applying the following password restrictions:

- Passwords must be from 8 to 14 characters.
- Passwords must have at least one alphabetic and one numeric character.
- Passwords may not be the same as the User ID.
- Passwords may not be the same as any of the last four passwords.
- Passwords may not contain a word found in the dictionary.
- Passwords may not be a common Data Bank word (e.g., NPDB, IQRS).
- Passwords may not be a simplistic or systematic sequence (e.g., abcd1234).

## 1.3 Contact Information

The QRXS is updated periodically by the Data Banks. It is strongly recommended that users join the QRXS Mailing List at [www.npdb-hipdb.hrsa.gov/MailingListReg.html](http://www.npdb-hipdb.hrsa.gov/MailingListReg.html) to receive notice of updates.

The Data Banks make an effort to notify users at least 1 month in advance of an update to code lists. Users should expect code lists to be updated quarterly. Additional updates to the QRXS specifications are required periodically. Users will be notified 6 months in advance of updates to the QRXS specifications that are not backward compatible. If you are already registered for the QRXS Mailing List and would like to be removed, contact the Customer Service Center.

For additional information, visit the NPDB-HIPDB Web site at [www.npdb-hipdb.hrsa.gov/qrxs.html](http://www.npdb-hipdb.hrsa.gov/qrxs.html). If you need assistance, contact NPDB-HIPDB Customer Service Center by e-mail at [npdb-hipdb@sra.com](mailto:npdb-hipdb@sra.com) or by phone at 1-800-767-6732 (TDD 703-802-9395). Information Specialists are available to speak with you weekdays from 8:30 a.m. to 6:00 p.m. (5:30 p.m. on Fridays) Eastern Time. The NPDB-HIPDB Customer Service Center is closed on all Federal holidays.

## 1.4 Conventions

Names of files, URLs, parameters, example Data Bank Identification Numbers (DBIDs), example passwords, or documents are presented in italics.

*http://java.sun.com/*

Data that must be entered into the computer, commands you must enter, contents of files, and contents of directories are presented in a different font (Courier New).

```
java com.npdbhipdb.QRXS send
```

Where the explicit use of upper or lower case letters are necessary due to the system interpreting upper and lower case letters as distinct characters, the text will clearly identify the command as “case sensitive.”

## 2. Installation

### 2.1 System Requirements

1. One of the following supported Microsoft Windows versions: Windows 2000, Windows XP. The software can be expected to run on other platforms that support the required Java Runtime Environment (JRE), but only the supported versions have been tested.
2. Access to the Internet and SSL port (443).

### 2.2 Software Requirements

1. JRE version 1.5.0 or higher.

The JRE can be downloaded from Sun's JRE download page:

*java.sun.com/javase/downloads*

Follow the instructions provided on the Web page to download and install the JRE. If the default installation is followed, the JRE will install to a directory specific to the exact release number. For example, if the release is at version 1.5.0\_06, the default installation will create a directory named *C:\Program Files\Java\1.5.0\_06*.

2. The *QRXS-v1\_04.zip* distribution available at *www.npdb-hipdb.hrsa.gov/qrxs.html*.

The following files are provided in the zip file:

*commons-codec-1.3.jar*  
*commons-fileupload-1.1.jar*  
*commons-httpclient-2.0.jar*  
*commons-logging.jar*  
*QRXS-Javadoc-Files-v1\_03.zip*  
*QRXS-Readme.txt*  
*qrxs-v1\_04.jar*  
*qrxs.properties*

### 2.3 Software Installation

1. Install the JRE. Instructions are provided at Sun's JRE download page, referenced above.
2. Create a working directory for running the client. For example:

```
mkdir c:\QRXS
```

3. Install the JAR files from the *QRXS-v1\_04.zip* distribution. Copy the .jar files (*qrxs-v1\_04.jar*, *commons-codec-1.3.jar*, *commons-fileupload-1.1.jar*, *commons-httpclient-2.0.jar*, and *commons-logging.jar*) to the JRE's library extension directory. For example (using the default JRE installation directory):

```
c:\Program Files\Java\1.5.0_06\lib\ext
```

4. Install the initialization file. Copy the file *qrxs.properties* to the directory from which the QRXS client executes (your working directory, e.g., *c:\QRXS*).

**Note:** Previous versions of QRXS-related files should be removed before installing newer versions in order to ensure the latest files are used.

## 3. Client Configuration and Execution

### 3.1 Executing the QRXS Client

The client is controlled via command-line parameters. The following are the only supported commands:

```
java com.npdbhipdb.QRXS send (for sending submission files) or
java com.npdbhipdb.QRXS receive (for receiving response files) or
java com.npdbhipdb.QRXS encode <password> (for encoding a password in the initialization file)
```

**Note:** The program name and the command-line parameter values are case sensitive.

### 3.2 Preparing the Initialization File

On startup, the *qrxs.properties* file is read for initialization information. The *qrxs.properties* file resides in the working directory as described in Section 2.3, Software Installation, Step 4. A sample *qrxs.properties* file is provided in the zip file. All the required properties in the initialization file must be complete and valid. If the information is missing or invalid, the program terminates. Users may configure their own *qrxs.properties* files to reflect their desired download directory location, upload/download list file locations, and to specify use of a proxy server.

Certain characters may be interpreted as instructions by the user's operating system or by the QRXS client. For this reason, the *qrxs.properties* file must be written in such a way that each character is interpreted literally, and not as an instruction. In order to accomplish this, characters that may be interpreted as instructions must be escaped; i.e., a backslash (“\”) character is placed in front of the character that may be interpreted as an instruction.

The following is a sample *qrxs.properties* file:

```
DBID=123400000000123
Password=UuhUh5owKFEeue
UserID=myuserid
DownloadDir=c:\\QRXS\\download
UploadListFile=upload.lst
DownloadListFile=download.lst
```

Notes:

1. The properties are case sensitive.
2. The password is encoded and **must be set using the client's encode command**. Instructions on setting the password are in Section 3.7, Encoding the Password.
3. The backslash character itself must be escaped, because in this case it must be interpreted literally; this is the reason for the two backslashes in the directory values.
4. The properties within the file may appear in any order.

The following properties are allowed. Users must enter any properties that they do not wish to use the default values for:

Properties	Descriptions
DBID*	The Data Bank Identification Number (DBID).
UserID*	The User ID of a user registered with the Data Banks. Do not use the Entity Data Bank Administrator's ID except for password-related transactions.**
Password*	The encoded Data Bank password (also known as the IQRS password).
DownloadDir*	Directory to hold the downloaded QRXS response files .
UploadListFile	Name of the file containing one or more names of QRXS submission files; defaults to <i>upload.lst</i> .
DownloadListFile	File containing names of the QRXS response files downloaded; defaults to <i>download.lst</i> .
LogFile	Name of the file containing error messages; defaults to <i>qrxs.log</i> .
ProxyHostName	Name of the proxy host (usually an IP Address). Only required when using a proxy server (see Section 4.4, Proxy Server for more information).
ProxyPort	Port number of the proxy server. Only required when using a proxy server (see Section 4.4, Proxy Server for more information).
<p>* Required property.  ** For detailed information on maintaining User IDs and passwords refer to <a href="http://www.npdb-hipdb.hrsa.gov/iqrs.html">www.npdb-hipdb.hrsa.gov/iqrs.html</a>.</p> <p>For <i>UploadListFile</i>, <i>DownloadDir</i>, <i>LogFile</i>, and <i>DownloadListFile</i>, acceptable values of the properties include the file name only, or a path name and the file name. If the value is the file name only, then the file is assumed to be located in the working directory.</p>	

### 3.3 Status Codes

The QRXS client provides status in three ways. First, an exit code containing the status code value is always returned; second, a file called *qrxsstat.dat*, which contains the status code, is created in the program's working directory; and third, unsuccessful status codes and corresponding messages are appended to a log file located in the program's working directory. A status code of "C00" indicates that the transaction was successful, and any other status code indicates that the transaction failed.

The following status codes are returned:

Status Code	Description
C00	Success, no errors.
C01	Error on NPDB-HIPDB server, reattempt transfer.
C02	Authentication failed; invalid DBID, UserID, or Password.*
C03	Password expired for DBID and UserID.*
C04	No filenames specified for upload.
C05	Error sending files to server, reattempt transfer.
C06	Client sent an invalid request.
C07	Inactive DBID.
C08	Maximum upload file size exceeded; reduce file size and reattempt transfer.
C09	All uploaded files are invalid.
C10	Unable to communicate with NPDB-HIPDB server, reattempt transfer.
C12	Database error on NPDB-HIPDB server, reattempt transfer.
C13	Not all of the files were processed successfully.

Status Code	Description
C16	The DBID for your organization must be renewed before you can access the Data Banks' services. The NPDB-HIPDB requires all registered entities to periodically renew their registration information. Re-registration enables the NPDB-HIPDB to maintain accurate entity contact information and provides the entity with the opportunity to review the legal requirements and verify their compliance for participation with NPDB-HIPDB. The certifying official for your organization must review the NPDB-HIPDB statutory authorities, available at <a href="http://www.npdb-hipdb.hrsa.gov/legislation.html">http://www.npdb-hipdb.hrsa.gov/legislation.html</a> , as part of the renewal process. Once the statutory authorities have been reviewed, complete the on-line registration renewal form by logging in to the IQRS and selecting Renew Registration on the registration confirmation screen. The completed form must be signed and mailed to the NPDB-HIPDB for processing. If your organization has already mailed the registration renewal to the Data Banks, it will be processed within 1 business day of its receipt by the NPDB-HIPDB. Data Bank Correspondence will be sent once the Data Banks have successfully processed your registration renewal form. If necessary, you may complete a new form by selecting Renew Registration below. If you need further assistance, please contact the NPDB-HIPDB Customer Service Center at 1-800-767-6732.
C17	The DBID for your organization must be renewed before you can access the Data Banks' services. The NPDB-HIPDB requires all registered entities to periodically renew their registration information. Re-registration enables the NPDB-HIPDB to maintain accurate entity contact information and provides the entity with the opportunity to review the legal requirements and verify their compliance for participation with NPDB-HIPDB. The certifying official for your organization must review the NPDB-HIPDB statutory authorities, available at <a href="http://www.npdb-hipdb.hrsa.gov/legislation.html">http://www.npdb-hipdb.hrsa.gov/legislation.html</a> , as part of the renewal process. Contact the Entity Data Bank Administrator of your organization so they can renew the registration. If you need further assistance, please contact the NPDB-HIPDB Customer Service Center at 1-800-767-6732.
C21	Client error, refer to log file for more information.
C22	Usage error, check command-line parameter.
C23	Error in reading Initialization file <i>qrxs.properties</i> , check that <i>qrxs.properties</i> file is in working directory.
C24	Unable to open program log file, check that disk space is available.
C30	Error validating property in <i>qrxs.properties</i> , a property is missing or value is invalid.
C31	Error validating <i>UploadListFile</i> , upload file missing or a file listed in the upload file does not exist.
C32	Error validating <i>DownloadDir</i> , directory does not exist.
C40	Error opening connection to NPDB-HIPDB server, check Internet connection and reattempt transfer.
C43	Error during client startup.**
C54	Error downloading response files, reattempt transfer.
C56	Error getting the list of response files downloaded, reattempt transfer.
C57	Your password has expired. You may login to the IQRS to reset your password or contact your Entity Data Bank Administrator or the NPDB-HIPDB Customer Service Center.***
C58	Your account has been locked out. Contact your Entity Data Bank Administrator to reset the password. If you are using an Entity Data Bank Administrator account, contact the NPDB-HIPDB Customer Service Center to reset the password.
C59	Your account has been locked out. The number of invalid login attempts has exceeded the allowable login limit. Contact your Entity Data Bank Administrator to reset the password. If you are using an Entity Data Bank Administrator account, contact the NPDB-HIPDB Customer Service Center to reset the password.
C60	Your password must be changed before other transactions can be submitted.
C64	No more than one password change transaction can be listed in the upload file at any time. Modify the upload file to include only one password change transaction, reattempt transfer.
	<p>* For detailed information on maintaining User IDs and passwords refer to <a href="http://www.npdb-hipdb.hrsa.gov/iqrs.html">www.npdb-hipdb.hrsa.gov/iqrs.html</a>.</p> <p>** Either two instances of the client program are running or one instance of the program was terminated prematurely. If it is the latter, remove the <i>qrxslock</i> file from the program's working directory and try again.</p> <p>*** Under specific circumstances the IQRS password reset service is available to obtain a new password. Log in to the IQRS with your expired password to begin. You must have an e-mail address stored in your user account to use this service. You may also contact your Entity Data Bank Administrator to reset the password. If you are using an Entity Data Bank Administrator account, you may also use the IQRS password reset service or contact the NPDB-HIPDB Customer Service Center to reset the password.</p>

### 3.4 QRXS Status File

The *qrxsstat.dat* file contains the final status of the QRXS client execution. This file is created in the working directory immediately upon program completion. The file contains two lines. The first line indicates the overall status of “Done” or “Not Done.” The second line contains a status code of “C00” or another status code indicating failure (see Section 3.3, Status Codes, for error codes that may be returned).

Sample *qrxsstat.dat* file for a successful execution:

```
Overall status      = Done
StatusCode=C00
```

Sample *qrxsstat.dat* file for an unsuccessful execution:

```
Overall status      = Not Done
StatusCode=C22
```

### 3.5 Uploading Files

The upload file contains the names (including the full or relative path) of the submission files that are sent to the Data Bank(s). The name of the upload file must be specified in the *qrxs.properties* file using the *UploadListFile* property. If it is not specified, it defaults to *upload.lst*.

A sample upload file with four submission files to upload, using a full path:

```
c:\QRXS\upload\0000001.xml
c:\QRXS\upload\0000002.xml
c:\QRXS\upload\0000004.xml
c:\QRXS\upload\0000005.xml
```

A sample upload file with three submission files to upload, using a relative path:

```
upload\file0001.xml
upload\file0002.xml
upload\file0003.xml
```

Notes:

1. In the upload file, the backslash is not escaped.
2. A file name can contain a relative or full path as noted above. Each set of files above is specified differently, but all the files are located in *c:\QRXS\upload*, and the working directory is *c:\QRXS*.
3. A submission file listed in the upload file may be a report, a query, or a password change transaction. No more than one password change transaction can be included at any time.
4. Submission files must not exceed 3 MB.

### 3.6 Downloading Files

Response files are stored in the download directory after being successfully downloaded from the Data Bank(s). The names of the files are in the following format: #####.xml (i.e., a unique 20-digit ID number with the ‘xml’ extension).

The download list file contains the names of downloaded files. The name of the download list file must be specified in the *qrxs.properties* file with the *DownloadListFile* property. If it is not specified, it defaults to *download.lst*.



### 3.8 Password Changes

As explained in Section 1.2.3, *User Account Password Policies*, a valid password is required to submit transactions to and download responses from the Data Banks. This includes password change request transactions. To successfully change your password, a password change request must be submitted using your current password. Status code "C00" indicates that the password change request transaction was successful. Any other status code indicates an error.

Notes:

1. If status code "C00" is indicated after submitting a password change request transaction, the password for the specified DBID/user ID was changed successfully. The new password must be encoded into the `qrxs.properties` file in order to download the password change response, submit additional transactions, and download responses. For that process, follow the instructions specified in Section 3.7, *Encoding the Password*.
2. If status code "C00" is not indicated after submitting a password change request transaction, the password change request for the specified DBID/user ID was unsuccessful. The password rejection file will be returned immediately and stored as specified in the `download.lst` file. Refer to the Password Change XML Transaction specifications for rejection codes.
3. No more than one password change transaction can be included in the upload file at any time.
4. It is recommended when submitting a password change transaction that you do not submit any other transactions until the password change has been successfully processed and the response file downloaded.
5. A response to a password change request transaction can only be downloaded by the same user account that submitted the transaction.
6. Only the Entity Data Bank Administrator can submit and download transactions to reset user passwords using the QRXS.
7. The Entity Data Bank Administrator cannot reset his or her own password. A password change transaction should be submitted instead of a password reset transaction.
8. After a password is reset for a user or Entity Data Bank Administrator, the system-generated password must be changed by submitting a password change transaction before other transactions can be submitted by that user or Entity Data Bank Administrator.

## 4. Sample Configuration and Execution

The following sections guide you through a sample configuration and execution of the QRXS client. This is only a sample configuration and may be changed if desired.

### 4.1 Configuration

The client is installed in the directory *c:\QRXS* for entity DBID *123400000000123*, *UserID BobJones*, and password *myPassw0rd*. The initialization file is configured with the download directory *c:\QRXS\download*, upload file *updlist.fil*, download list file *qrxsresp.fil*, and log file *qrxserrors.fil*. The submission files for upload are located in *c:\QRXS\upload*. The user creates the new directories:

```
cd QRXS
mkdir download
mkdir upload
```

The following is a listing of files in directory *c:\QRXS*:

```
qrxs.properties
<DIR> download
<DIR> upload
```

The working directory is *c:\QRXS*. Encode the password by executing the following command:

```
java com.npdbhipdb.QRXS encode myPassw0rd
```

The following is a printout of the *qrxs.properties* initialization file (the order of properties may vary; this is normal):

```
UploadListFile=updlist.fil
Password=2MhEB2Fsue1I7eqJLDyI
DownloadDir=download
DBID=123400000000123
UserID=BobJones
DownloadListFile=qrxsresp.fil
LogFile=qrxserrors.fil
```

### 4.2 Uploading Submission Files

The submission files must first be uploaded to the Data Bank(s). Submission files *0000001.xml*, *0000002.xml*, *0000003.xml*, and *0000004.xml* are placed in the upload directory *c:\QRXS\upload*. The upload file, *updlist.fil*, is placed in the working directory *c:\QRXS*. The following is a printout of *updlist.fil*:

```
c:\QRXS\upload\0000001.xml
c:\QRXS\upload\0000002.xml
c:\QRXS\upload\0000003.xml
c:\QRXS\upload\0000004.xml
```

Execute the following command, either from the command prompt or from a user application, to upload files to the Data Bank(s). This command is case sensitive and must be executed exactly as shown here:

```
java com.npdbhipdb.QRXS send
```

After execution of this command, the submission files are uploaded to the Data Bank(s) successfully. **The submission may generate some immediate responses**, depending on the processing required to handle the submissions. The number of responses received will be displayed:

```
QRXS Sending...
Received 2 response(s)
Status Code: C00
```



## 5. Application Programming Interface

### 5.1 Overview

The QRXS Application Programming Interface (API) is a Java-based library that provides the capability to interface with the QRXS. The API provides the same capabilities available in the QRXS client program. In fact, the QRXS client is built on top of the API. Javadocs for the QRXS API can be found on-line at [www.npdb-hipdb.hrsa.gov/qrxs.html](http://www.npdb-hipdb.hrsa.gov/qrxs.html).

### 5.2 When to use the API

The provided client program is appropriate for most users. The API may be beneficial for users who wish to integrate their QRXS interaction into existing Java software. Submitting files and examining responses and error codes can be done programmatically, eliminating the need to write code to parse the text results that are generated by the client program.

### 5.3 Using the API

Install the libraries as described in Section 2.3, Software Installation. The QRXS API is in the `com.npdhhipdb` package. Import the package to make the API visible to the Java application.

```
import com.npdhhipdb.*;
```

#### 5.3.1 Configuration

The QRXS Configuration class contains the properties needed to communicate with the QRXS. An instance of the Configuration is created and the object is passed to the `send()` or `receive()` method. A Configuration instance can be created using an existing initialization file (Section 3.2, Preparing the Initialization File), or by providing the property values directly during instantiation.

##### 5.3.1.1 Using a File

A Configuration object can be created using the same properties file format (Section 3.2, Preparing the Initialization File) used for the client application. The **password must be encoded** in the file using the client's `encode` command (Section 3.7, Encoding the Password) or the API `encode()` method (Section 5.3.2, Encoding). Exceptions can be thrown if a required property is not defined or if the file cannot be opened.

```
final String configFilename = "qrxs.properties";

// create an instance of QRXS
QRXS qrxsClient = new QRXS();
QRXS.Configuration config;

try
{
    // create Configuration using the properties file
    config = qrxsClient.new Configuration(configFilename);
}
catch (QRXS.Configuration.InvalidConfigurationException e)
{
    // configuration property missing
    System.out.println("Error: " + e.getCode());
}
catch (QRXSException e)
{
    // problem encountered opening the file
    System.out.println("Error: " + e.getCode());
}
```

### 5.3.1.2 Using Parameters

A Configuration object can be created by specifying the required properties as parameters to the constructor. With this method there is no need to perform the password encoding required when using a file. An exception can be thrown if a property value is invalid.

```

final String entityDBID = "123456787654321";
final String userID    = "myusername";
final String password  = "myPassw0rd";
final String downloadDir = "C:/QRXS/download";
QRXS.Configuration config;

// create an instance of QRXS
QRXS qrxsClient = new QRXS();

try
{
    // create Configuration using the required values
    config = qrxsClient.new Configuration(entityDBID, userID, password,
                                         downloadDir);
}
catch (QRXS.Configuration.InvalidConfigurationException e)
{
    // configuration property invalid
    System.out.println("Error: " + e.getCode());
}

```

### 5.3.2 Encoding

Encoding is used to write an encrypted password to a configuration properties file. The file will be re-written with the password value encoded. The ordering of the properties in the file may be changed by the encoding process. The password in a configuration file **must be encoded** before sending and receiving or authentication will fail.

```

final String password  = "myPassw0rd";
final String configFile = "qrxs.properties";
String status;

// create an instance of QRXS client
QRXS qrxsClient = new QRXS();

try
{
    status = qrxsClient.encode(configFilename, password);
    System.out.println("QRXS status: " + status);
}
catch (QRXSException e)
{
    // unable to read/write the configuration file
    System.out.println("Error: " + e.getCode());
}

```

### 5.3.3 Sending

The send process involves establishing the connection to the QRXS, uploading the specified submission files, and receiving responses.

```
// create Lists to hold submissions and responses
List responseFileNames = new ArrayList();
List submissionFileNames = new ArrayList();
List errorFiles = new ArrayList();
String status;

// populate the list of file(s) to upload
submissionFileNames.add("C:/QRXS/upload/000000001.xml");
// add the remaining files
try
{
    // send the files
    status = qrxsClient.send(config, submissionFileNames,
                            responseFileNames, errorFiles);
    System.out.println("QRXS status: " + status);
}
catch (QRXSException e)
{
    System.out.println("Error Code: " + e.getCode());
    System.out.println("Error Message: " + e.getMessage());
}
```

Files returned in the response are stored to the location specified in the Configuration object. The responseFileNames List contains the names of the response files. Sent files that could not be processed are listed with the accompanying error code in a list of ErrorFile objects. Each ErrorFile object also contains one or more error messages giving a textual description of the error.

```
Iterator fileIter = errorFiles.iterator();

while (fileIter.hasNext())
{
    QRXS.ErrorFile err = (QRXS.ErrorFile) fileIter.next();
    System.out.println("File " + err.getFilename() + ", " + err.getCode());

    String errorMessages[] = err.getErrorMessages();
    for (int i=0; i<errorMessages.length; i++)
    {
        System.out.println("Error Message: " +
                           MessageFormat.format(errorMessages[i], new String[]
                                                  {err.getFilename()}));
    }
}
```

### 5.3.4 Receiving

The receive process establishes the connection to the QRXS and downloads any response files that have completed processing by the Data Banks.

```
// create List to hold responses
List responseFileNames = new ArrayList();
String status;

try
{
    status = qrxsClient.receive(config, responseFileNames);
    System.out.println("QRXS status: " + status);
}
catch (QRXSException e)
{
    System.out.println("Error Code: " + e.getCode());
    System.out.println("Error Message: " + e.getMessage());
}
```

Files returned in the response are stored to the location specified in the Configuration object. The responseFileNames List contains the names of the response files.