Installation Guide

ELR Translator Tool for Mirth

Version: 1.1

Prepared by:
Science Applications International Corporation

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REVISION HISTORY

VERSION #	IMPLEMENTER	DATE	EXPLANATION
1.0	Paul DeJong	02-04-2012	Initial Deployment – ELR Translator Tool for Mirth
1.1	Soumya Koonapureddy	02-21-2012	JBoss configuration section

TABLE OF CONTENTS

1. Introduction

The ELR Translator Tool for Mirth Installation Guide will assist with the installation, configuration, and upgrade of the ELR Translator Tool for Mirth product.

This Guide provides instructions to correctly install and configure the ELR Tool to translator between HL7 2.3.1 and 2.5.1 ORU R01 messages. This tool is based on the Public Health Information eXchange (PHIX) open source tool developed by the Centers for Disease Control and Prevention (CDC).

2. Installation Requirements

2.1 Compatible Platforms

This product has been tested on the following platforms with the following characteristics:

- Operating Systems for the Application:
    - Windows XP Professional Version 2002 Service Pack 3
    - Windows Server 2008 Standard Edition Service Pack 2
- Databases:
    - Database: PostgreSQL version 9.0.1
- Application Servers:
    - JBoss version 5.1.0.GA
- Java:
    - Java version 1.6.0_29 - Java(TM) Development Kit (JDK)
- Integration Engine:
    - Mirth Connect 2.1.1

2.2 Resource Requirements

- Processor: Intel Pentium Dual-Core CPU 2 GHz +
- Memory (RAM): 2.00 GB minimum
- System type: 32-bit (x86) or 64-bit (x64) Intel architecture

3. Distribution

The software required for a complete ELR Translator Tool for Mirth installation consists of a .zip file plus a number of third-party downloads.

ELR_1_0_0_0.zip: contains most of the software and configuration files required for running the ELR Translator Tool for Mirth.

The following sections of this document describe the necessary ELR Tool components and third-party dependencies that make up an ELR Translator Tool for Mrith installation. They should be installed in the order listed in this document by a user with Administrator privileges. When a download is necessary, version numbers and download URLs are provided.

For each item, a specific installation location is suggested. While it is possible to use other locations, using the suggested locations will greatly reduce the amount of configuration required to install and deploy the product.

4. Java

Java is the virtual machine environment required by several of the PHIX components. The version currently used is JDK 1.6.0_29 (Java 1.6.0_18 was also tested). Please download the entire JDK, not just the JRE.

4.1 **Download**

Obtain the software from:
http://www.oracle.com/technetwork/java/javase/downloads/index.html

Version:

JDK 1.6.0_29 for 32-bit Windows (64-bit may also work, but was not verified. The 32-bit version will work on a 64-bit architecture)

Full filename:
jdk-6u29-windows-i586.exe

4.2 **Installation**

Execute the jdk-6u29-windows-i586.exe installation file. Install Java to this custom directory:
c:\ jdk1.6.0_29

When prompted, allow the JRE portion of the JDK to be installed in the default location within "Program Files".

Set the JAVA_HOME system environment variable to c:\jdk1.6.0_29 .

Modify the PATH system environment variable by appending c:\jdk1.6.0_29\bin .

4.3 **Verification**

Open a new Windows Command Prompt. Run the following command and verify that the output matches the following:

```
C:\Users\Dejonpa>java -version
java version "1.6.0_29"
Java(TM) SE Runtime Environment (build 1.6.0_29-b11)
Java HotSpot(TM) Client VM (build 20.4-b02, mixed mode, sharing)
```

5. PostgreSQL

The PostgreSQL 9 RDBMS is required for the following PHIX services that the ELR Translator Tool for Mirth makes use of: ComponentRoutingService, StructuralValidationService.

5.1 **Download**

Obtain the software from:

http://www.enterprisedb.com/products-services-training/pgdownload#windows

Version:

Version 9.0.5-1 binary for 32-bit Windows (x86)

or

Version 9.0.5-1 binary for 64-bit Windows (x64)

Full filename:

postgresql-9.0.5-1-windows.exe

or

postgresql-9.0.5-1-windows-x64.exe

5.2 **Installation**

Execute the downloaded file. Install PostgreSQL to this custom directory:

C:\PostgreSQL\9.0

Install the data directory to:

C:\PostgreSQL\9.0\data

During installation, set the "postgres" admin user password to "hub4cdc" when prompted; alternatively, set the "postgres" admin user password to another password, then update the value of the "password" property inside the database.properties file inside both of the PHIX web service war files (See PHIX Services. By default, these services are installed to C:\jboss-5.1.0.GA\server\default\deploy\ComponentRoutingService.war, StructuralValidationService.war). Accept the default PostgreSQL port of 5432. Do not choose the option to install "Stack Builder" when prompted.

5.3 **Restore hub database**

Locate the hub_elr.backup file located inside the db\ directory within the **ELR_1_0_0_0.zip** file and extract it to a temporary directory. Start the pgAdmin III utility that was installed as part of

the PostgreSQL installation. In the left-hand navigation area, right-click on "PostgreSQL 9.0" under "Servers (1)" and select "Connect'. Enter your "postgres" admin user password ("hub4cdc", or whatever password you selected above). Right-click on the "Databases" item in the tree, and select "New database…" from the menu. Name the database "hub" (*NOT "hub_elr" !),* leave the options set to their defaults, and click the "ok" button. Right-click on the "hub" icon now located under "Databases" in the tree, and select "Restore…" Enter the path to the extracted hub.backup file and click the "ok" button. Click the "done" button and exit pgAdmin III.

5.4 **Verification**

Inside pgAdmin III, inside the left-side navigation pane, you should see the hub database listed. If you drill into hub → Schemas → public → Tables, you should see four tables listed.

6. JBoss

JBoss is a Java Application Server that is used to host two PHIX web services that provide functionality to the ELR Translator Tool: ComponentRoutingService and StructuralValidationService.

6.1   Download

Download JBoss 5.1 AS from the following location:

http://www.jboss.org/jbossas/downloads/

Click on the "download" link next to the 5.1.0 version (release date 2009-05-23) and follow the directions.

6.2   Installation

Install JBoss to the following directory: c:\jboss-5.1.0.GA.   JBoss is configured to use port 8080. If a different port is desired, you will have to update all the web service invocations from within the PHIX Mirth Connect channels (see Mirth Connect section). You will also need to update the following file inside JBoss:

C:\jboss-5.1.0.GA\server\default\deploy\jbossweb.sar\server.xml

On the 12th line, change the port="8080" entry to the desired port, and restart jboss if it is already running.
.

6.3   Configuration

You may or may not encounter the following error later when you try to run the messages through the ELR Translator (Section 9.2).

"javax.xml.ws.WebServiceException: No Content-type in the header!"

In order to avoid this error, the following libraries (found in JBOSS_HOME /common/lib) have to be copied to the endorsed folder (JBOSS_HOME/lib/endorsed).

jbossws-native-jaxrpc.jar
jbossws-native-jaxws.jar
jbossws-native-jaxws-ext.jar
jbossws-native-saaj.jar

If the JBOSS is already running, it needs to be restarted now.

6.4 **Running**

JBoss can be started by executing C:\jboss-5.1.0.GA\bin\run.bat. Alternatively, JBoss be installed as a service from within an administrative Windows Command Prompt by running "C:\jboss-5.1.0.GA\bin\service.bat install". This will set the display name of the service to "JBoss Application Server 5.1". It is recommended that JBoss be installed as a service with Startup Type set to "Automatic" within non-development environments. Once installed as a service, JBoss can be started via the Windows Service Manager, or will start automatically after reboot if Startup Type is set to "Automatic".

6.5 **Verification**

Correct installation and deployment of JBoss can be verified by accessing this URL after starting JBoss:

http://localhost:8080

You should see a verification page that JBoss is running.

7. PHIX Services

The PHIX Services are a pair of web services that are hosted on the JBoss application server.

7.1 **Installation**

Locate the services\ subdirectory inside the ELR_1_0_0_0.zip file. Within this directory, locate the two .war files: ComponentRoutingService.war and StructuralValidationService.war. Extract these two files to the following directory: C:\jboss-5.1.0.GA\server\default\deploy. You will need to restart the JBoss server if it is already running in order for the deployments to complete.

7.2 **Running**

Running the services is accomplished in the same way as described in the JBoss : Running section.

7.3 **Verification**

Correct installation and deployment of the PHIX Services can be verified by accessing this URL after starting JBoss:

http://localhost:8080/jbossws/services

You should also see these services listed: ComponentRoutingService, StructuralValidationService.

8.   Mirth Connect

Mirth Connect is a healthcare integration engine that is the backbone of the ELR Translator Tool for Mirth. It receives HL7 ORU messages from the file system, consumes the various web services that constitute the PHIX functionality, performs the ELR translation between 2.3.1 and 2.5.1, produces any appropriate response to the message, and archives the results. The version of Mirth Connect currently used with the Tool is 2.1.1.

8.1   **Download**

Obtain the software from:
http://www.mirthcorp.com/community/downloads

Version:
Mirth Connect 2.1.1 for 32-bit Windows. The 64-bit version may also work, but was not tested.

Full filename:
mirthconnect-2.1.1.5490.b781-windows.exe

8.2   **Installation**

Execute the mirthconnect-2.1.1.5490.b781-windows.exe installation file. Install Mirth Connect to this custom directory:
C:\MirthConnect2

When prompted during installation, replace the default port values with these settings:
Administrator launcher port: 9080
Administrator port: 9443
Server JMX Port: 1199

Choose the option to install Mirth as a service. Select the defaults for the remaining prompts and complete the installation. If you launch Mirth Connect, you will be prompted to register with Mirth Corporation. Once you are finished, please exit and stop the Mirth Connect service if it is running, as you will altering the Mirth Connect configuration in the next step.

Next, locate the demo\ directory within the ELR_1_0_0_0.zip file. This directory contains a subdirectory named phixdata\. Extract the phixdata\ directory to C:\. This will create a directory named C:\phixdata.

Locate the mirth_channels\ directory within the ELR_1_0_0_0.zip file and extract this directory along with all subdirectories to a temporary directory.

8.3 Configuration

8.3.1 Change Mirth Connect log level

Edit the log4j.properties file located in the C:\MirthConnect2\conf directory. Change all eight default log levels listed in the "Mirth Connect channel logging" section from DEBUG to INFO.

8.3.2 Restore Channels

Now start the Mirth service, either through the Windows Service Manager, or by going to the "Mirth Connect" program group and selecting "Mirth Connect Server." Next, start the "Mirth Connect Server Manager" under the "Mirth Connect" program group. This will display the Mirth "M" logo in the system tray. Right-click on this icon and select "Start Mirth" if it is not greyed-out. Then right-click again and select "Launch Administrator". The default username and password are both "admin". The password can now be changed by selecting the "Users" option on the left-side menu.

Click on the "Channels" option on the left-side menu. Under "Channel Tasks", select the "Import Channel" option. Browse to the mirth_channels\ directory inside the temporary directory you created in the Installation section above, and select the "02_ELR_PHIX.xml" file and click "Open". If you are warned that this channel was created with an earlier version of Mirth, and do you wish to convert the file, select "Yes". Once the channel information is populated, select "Save Changes" under the "Channel Tasks" group. Repeat this task for each the 02_ ELR_PHIX _FILE_READER.xml channel.

8.3.3 Enable and Deploy channels

Click on the "Channels" option under the "Mirth Connect" group. For both of the PHIX channels just imported, highlight the channel, right-click, and select "Enable". Then right-click, and select "Deploy."

8.4 Verification

At this point, you can only verify that the channels deployed correctly. Select the "Dashboard" option from the top-left Mirth navigation pane. You should see both channels with Status set to "Started".

You will verify the rest of the functionality when executing the demonstration scenarios in the [Running the Demonstration section](#).

9. Running the Demonstration

9.1 **Verification**

Start all services described in this document. Select the "TEST_251_DatatypesAndNotes_26Jan2012.txt" message located inside c:\phixdata\elr src msgs. Place the message in C:\phixdata\HL7_IN .

9.2 **Expected logging output**

Open the Mirth Connect dashboard and verify that you see logging output, and that the message processing statistics at the top are incremented. The error counts should remain 0.

Next, open up the message event log file located at C:\phixdata\logs\phix_events.log. The most recent entry at the bottom should look similar to the following output. Ensure especially that no errors are listed at the bottom.

```
--------------------------------------------------------------------------
Date: 02/04/2012 14:44:12
Message DateTime: 20110511192054-0400
Message Control ID: 201105024
HL7 version: 2.5.1  Type: ORU  Event: R01
Sending Facility ID: Lab1,  Receiving Facility ID: DOH1
Incoming Filename: 1328384651753_IN.txt  Transformed Filename:
1328384651753_XFORMED.txt

Site Configuration:
  hubInstanceName: PHIX 1
  hubHost: koonapureddy.us.saic.com
  hubInstanceEmailFromAddr: administrator@koonapureddy.us.saic.com
  hubInstanceWebSvcHost: koonapureddy.us.saic.com:8081

Msg Configuration:
  structural validation: true
  vocabTranslation: false
  codeValidation: false
  subscription: false
  anonymization: false
  addSFTSegment: true
  addSPMSegment: false
  translateToVersion: 2.3.1
  vocabTranslationMSSProfile:
  codeValidationMSSProfile:
  sendingFacilityDirectEmailAddress: hub@koonapureddy@us.saic.com
```

```
sendingFacilityNotificationEmail: koonapureddy@saic.com
sendingFacilityErrorNotificationEmail: koonapureddy.us.saic.com
sendingFacilityWebSvcHost: koonapureddy.us.saic.com:8081
sendingFacilityXportType: MIRTH WS
sendingFacilityHubHost: koonapureddy.us.saic.com
receivingFacilityDirectEmailAddress: hub@koonapureddy@us.saic.com
receivingFacilityWebSvcHost: koonapureddy.us.saic.com:8081
receivingFacilityXportType: MIRTH WS
receivingFacilityHubHost: koonapureddy.us.saic.com

Services:
  Component Routing Service: CALLED
  Dynamic Msg Routing: BYPASSED
  Structural Validation Service: CALLED
  Vocabulary Translation Service: BYPASSED
  Code Validation Service: BYPASSED
  Subscription Service: BYPASSED
  Linker/Anonymizer Service: BYPASSED
  ACK Message: BYPASSED
  Outgoing Message: BYPASSED
  PHIX Connector Service: BYPASSED
  Notifiable Condition Email Alert: BYPASSED

Errors:
```

9.3   Translated file

If no errors occurred, the translated output file will be placed in
C:\phixdata\HL7_TRANSFORMED. It will be named the same as the original file, but with
"XFORMED_" prepended to the filename. You can open the file with a text editor or HL7 tool
to verify that it contains the expected format.