Sexually Transmitted Disease Surveillance Project Manual

Course:
CS 6440 – Introduction to Health Informatics

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Git Hub Link:
https://github.gatech.edu/gt-hit-fall2016/Sexually-Transmitted-Disease-Surveillance

Contents

1.0 Introduction:

This Project is to build STD Electronic Case Reporting Exchange that EHR (Electronic Health Record) system and PHA (Public Health Agency) interacts with to send and receive Case Reports electronically.

A number of conditions are required by law to be reported to public health agencies in every state and territory. Frequently, these reportable conditions are transmitted manually (e.g. e-mail, facsimile, paper form), which can be cumbersome, error prone, and often lacking in key demographic elements. CDC's Division of STD Prevention (DSTDP) recently provided guidance for electronic case reporting based on current c-CDA based standard (Technical Guidance for electronic STI case reporting). This project explored a FHIR based application to simplify the process of electronic case reporting.

2.0 System Overview:

2.1 STD Case Report Exchange
STD Case Report Exchange is a Custom application that EHR (Electronic Health Record) system and PHA (Public Health Agency) interacts with.

2.1.1 Receiver Module (Interaction with EHR):

- EHR sends a case report to STDCRX (STD Case Report Exchange Receiver) as a C-CDA document.
- STDCRX populates and sends the FHIR bundle to the United Health Network Public Test FHIR server.
- United Health Network Public Test FHIR server stores the data from the case report in FHIR resources.

2.1.2 Pull Module (Interaction with PHA):
- PHA requests case reports from STDCRX using PHA Tool.
- STDCRX requests relevant FHIR bundles from United Health Network Public Test FHIR server.
- The United Health Network Public Test FHIR server sends the relevant FHIR bundles to STDCRX.
- STDCRX converts the FHIR bundles to C-CDA documents.
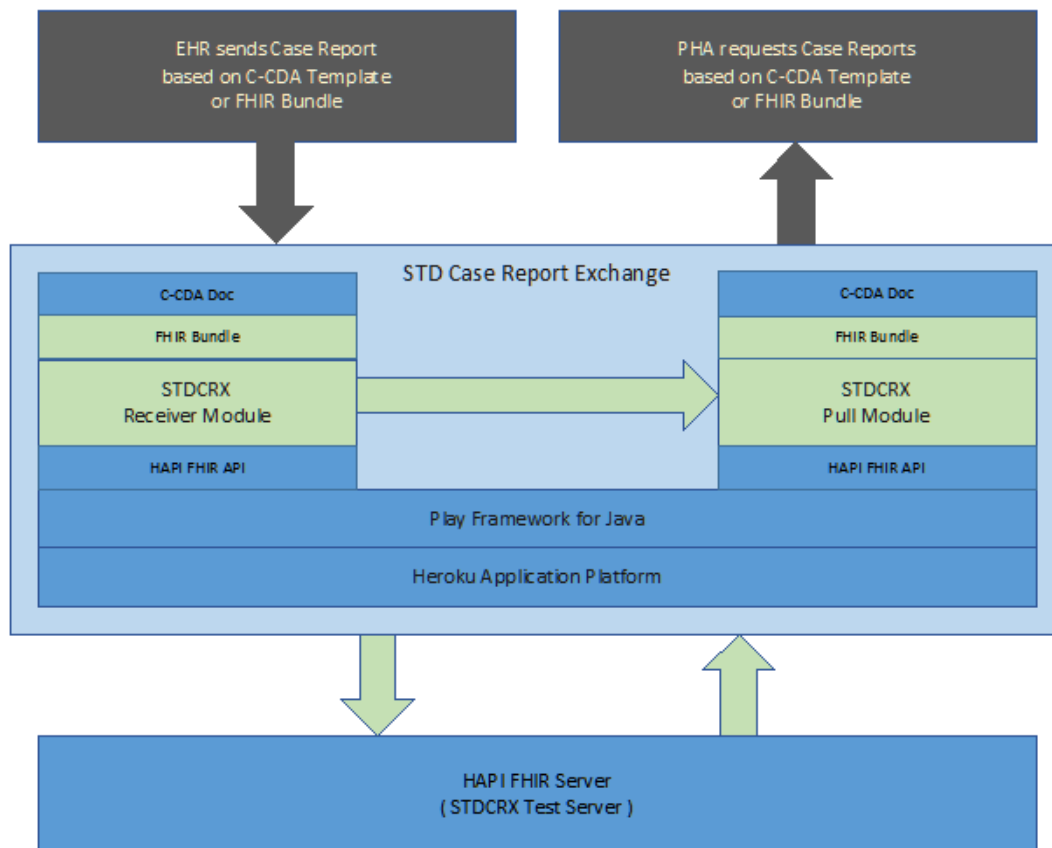- STDCRX sends the C-CCDA documents to the PHA

- The PHA receives the case report(s).

2.2 Sequence Diagram:

The sequence diagram below shows interaction between the EHR, FHIR server and public health agency.
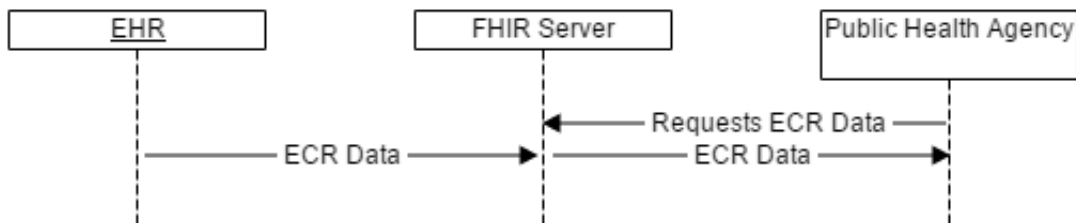
2.3 High Level Architecture:

2.4 Technologies:

2.4.1 STDCRX uses below technologies:
- Java-based server application
- Uses Heroku cloud application platform
- Play Framework – open source web application framework that follows the MVC (model-view-controller) architectural pattern
- HAPI FHIR library is used for interaction with the FHIR server
- GT Github for source control

2.4.2 PHA Tool uses below technologies:
- Web-based SPA (single-page application)
- Logic will be written in JavaScript
- JavaScript libraries used by the application will include but not be limited to the Smart on FHIR JavaScript library and jQuery

3.0 Using Application:

3.1 To Receive data from Pull Module (PHA Interaction):

1. One opens the PHA Tool from: https://stdcrx.herokuapp.com/
2. From there (see image below), the patient information can be sought using a variety of search techniques.

3. Name search areas search with both "Name starts with" and exact match capabilities. For example "John" in First name field will give the results for first name John and "Jo" will give first names starting with Jo. The more complete the name, the less chances for multiple results.

4. Other criteria for searching are by filtering by Date Range and by Facility Id. At least one of the following fields must have something entered: first name, last name, or facility id. If none of those fields have text entered than an error appears and the request does not proceed.

5. Once the criterion is entered, the "Get Report" button needs to be pressed to retrieve search results.
6. This queries for Patient and the Patient list appears on the Right hand side of the Page (see the image above searching for John Stinn).
7. Clicking on one of the Patient names from the search results brings up a new window with the CCDA document for that patient (see the image below for an example window).
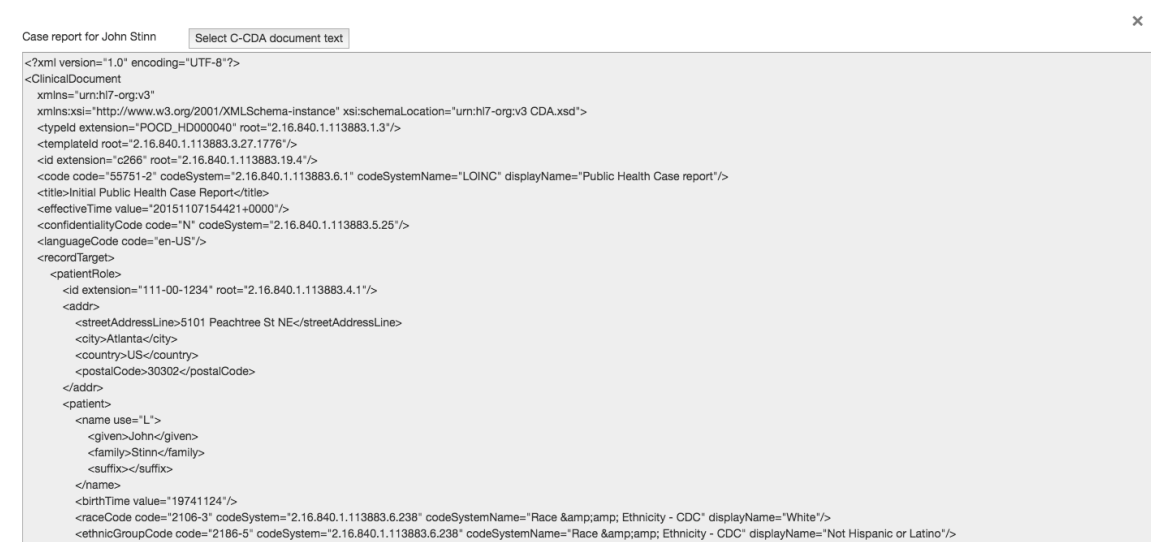
3.2 To send Data to Receiver Module (EHR Interaction):

1. Use URL https://stdcrx.herokuapp.com/report/send to open the page shown below.
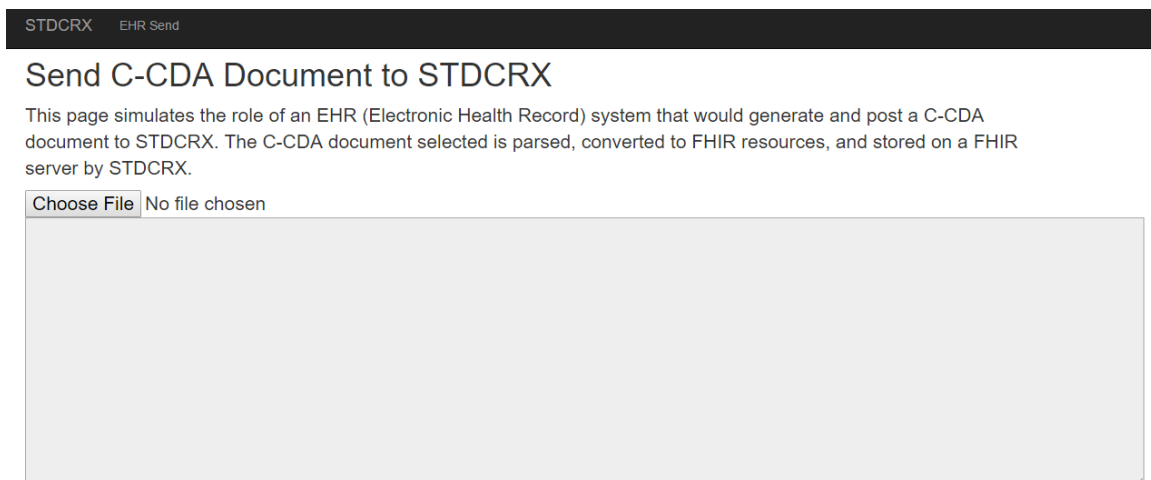
2. Select CCDA Document using "Choose File" button as shown below.

3. Click on "Send File" to send message to receiver module.