



Substance Abuse and Mental Health Services Administration (SAMHSA) Behavioral Health Information Technology and Standards (BHITS) Project Consent2Share Version 2 Development Guide

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About this Document

The purpose of this Consent2Share (C2S) Version 2 Development Guide is to provide clear directions to developers to quickly set up their development machines to start focusing on coding for the applications.

The eventual goal is to get a fast, repeatable, and reliable environment set up to quickly start writing code with a few commands or even one command by utilizing infrastructure as code.

Roadmap

This document is divided into several chapters.

Chapter 1—Java Development Environment Setup in the Traditional Way describes steps to set up the Java (Backend) development environment in the traditional way: installing all the tools manually directly on the development machine

Chapter 2—Frontend Development Environment Setup in the Traditional Way describes steps to set up the frontend development environment in the traditional way: installing all the tools manually directly on the development machine

Chapter 3—Using HTTPS for web applications has become standard. It is a good practice to have HTTPS enabled in the development environment as real as possible. This chapter describes configuring SSL for Edge Server of C2S.

Note: Once you complete the first three chapters, you should be able to do development work.

Chapter 4—Install, Configure, and use IntelliJ IDEA to Run/Debug C2S. This chapter reviews how to use IntelliJ IDEA to load C2S projects, write codes, and run/debug source codes.

Chapter 5—Development Environment Setup the Docker Way introduces Docker

Chapter 6—Run and Debug Apps the Docker Way explains how to run and debug C2S the Docker way

Importantly, this development guide is dynamic and will be continually updated over time.

Chapter 1 Java Development Environment Setup in the Traditional Way

Note: Install in the following order.

1.1 Install Java JDK

1.1.1 Install Java JDK

In Consent2Share development, Java 8 is used.

- Go to Oracle JDK download site to download the appropriate JDK for your operating systems. <u>http://www.oracle.com/technetwork/java/javase/downloads/index.html</u>
 * Java SE jdk1.8.0_51 was used when this document was prepared. In the following section, this
 version was used to illustrate the environment setup.
- 2. Install the download Java JDK.

1.1.2 Set JAVA_HOME System Environment Variable and System Path

In order to control where java.exe should be from, do the following for Windows:

- 1. Set variables:
 - System Environment Variable: JAVA_HOME
 - Value: C:\Program Files\Java\jdk1.8.0_51
 - Put **%JAVA_HOME%\bin** in System Path (*at the very beginning of the Path variable value).
- 2. In the command prompt:
 - Run "java -version" to check Java version.
 - Run "where java" to verify the path of java and make sure that java is from the one you specified in JAVA_HOME (Java from JAVA_HOME should appeared as the first item.)

For Mac OSX, follow the below steps to set up the system path:

- 1. Create a file ~/.bash_profile under current user and added follow two lines:
 - export JAVA_HOME=/Library/Java/JavaVirtualMachines/ jdk1.8.0_51.jdk/Contents/Home
 - export PATH=\$PATH:\$ JAVA_HOME /bin
- Next, using the command line to make the change effective: source ~/.bash_profile
- 3. Run "**java -version**" in command line to verify configuration.

1.1.3. Install Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files for JDK/JRE 8

The file can be downloaded from the following link with name *jce_policy-8.zip* <u>http://www.oracle.com/technetwork/java/javase/downloads/jce8-download-2133166.html</u>

- Uncompress and extract the downloaded file. This will create a subdirectory called UnlimitedJCEPolicyJDK8. This directory contains the following files:
 - o README.txt
 - o local_policy.jar Unlimited strength local policy file

- o US_export_policy.jar Unlimited strength US export policy file
- Install the unlimited strength policy JAR files.
 In case you later decide to revert to the original "strong" but limited policy versions, first make a copy of the original JCE policy files (US_export_policy.jar and local_policy.jar). Then replace the strong policy files with the unlimited strength versions extracted in the previous step.
 The standard place for JCE jurisdiction policy JAR files is:
 %JAVA_HOME%\jre\lib\security [Windows]

1.1.4 Upgrade Java JDK

When upgrading to a new version of JDK, make sure to follow the above steps. Remember to reconfigure SDK in IntelliJ IDEA IDE. See instructions in the Install/Configure IntelliJ IDEA section.

1.2 Install Maven

1.2.1 Install

- Download the latest version from <u>https://maven.apache.org/download.cgi</u>
 * Apache-maven-3.3.3 was used when this document was prepared. In the following section, this version is used to illustrate the environment setup.
- 2. Extract the download maven, such as apache-maven-3.3.3-bin.zip, to the *c:\java* folder.

1.2.2 Set M2_HOME System Environment Variable and System Path

For Windows,

- 1. Set M2_HOME system environment variable:
 - Variable: M2_HOME
 - Value: C:\java\apache-maven-3.3.3
- 2. Put **%M2_HOME%\bin** in system environment variable **Path**.
- 3. Run "mvn -version" to verify

For Mac OSX, follow the steps below to set up the system path:

- 1. Create a file ~/.bash_profile under current user (example: =/Users/XXX) and added:
 - export M2_HOME=/Users/XXX/springsource/apache-maven-3.3.3
 - export PATH=\$PATH:\$M2_HOME/bin
- 2. After that, using command line to make the change effective: source ~/.bash_profile
- 3. Run "**mvn -version**" in command line to verify configuration.

1.3 Install Tomcat 8

1.3.1 Install

- 1. Directly download from:
 - <u>https://tomcat.apache.org/download-80.cgi</u> (the Tomcat 8 download site)
 - * Apache-tomcat-8.0.26-windows-x64 was used when this document was prepared.
- 2. Unzip to your local drive e.g. **c:\java** folder.

1.3.2 Configure JVM and Other Options for Tomcat

You can configure JVM and other options for Tomcat.

Go to bin folder of the Tomcat installation and open catlina.bat/catlina.sh based on your operation system to see how you can configure.

By default, Tomcat runs on JVM pointed by the JAVA_HOME environment variable.

1.3.3 Configure User to Operate the "/manager/html" Web Application

Go to the **conf** folder of the Tomcat installation path, open **tomcat-users.xml** file and add the following line inside of tomcat-users element:

<user username="admin" password="admin" roles="manager-gui"/>

1.3.4 Upgrade Tomcat

When upgrading to a new version of Tomcat, make sure to follow the above steps. Remember to reconfigure the Tomcat application server in IntelliJ IDEA IDE. See instructions in the Install IntelliJ IDEA section.

1.4 Install MySql Server and Workbench

1.4.1 Install

- Directly download from <u>http://dev.mysql.com/downloads/mysql/</u>
 ** mysql-installer-community-5.6.27.0.msi was downloaded and installed when this document was prepared.*
- 2. Install MySql.
- 3. Set up username (root) and password (admin) as admin to access local MySql Server.

1.4.2 Set up System Environment Variable and System Path

For Windows,

- 1. Set **MYSQL_HOME** System Environment Variable:
 - Variable: MYSQL_HOME
 - Value: C:\Program Files\MySQL\MySQL Server 5.6
- 2. Append path system variable with **%MYSQL_HOME%\bin**

1.4.3 Setup MYSQL Users and Permissions for Databases Used in Our Projects

By default, C2S applications were given all root permissions. Please revise the permissions based your environments.

Create empty schemas: pcm, phr, patient-user, uaa, npi.

1.4.4 Create Table and Insert Sample Provider Lookup Data in npi Database

- 1. Find the sql script in the following folder <u>https://github.com/bhits/pls-api/blob/master/npi-db-sample/npi-db-sample.sql</u>
- 2. Run the sql script in MySql Workbench, which will create **npi** table in **npi** schema with 10 providers.

1.5 Install Git for Windows

Download and install Git. Git can be downloaded from: <u>https://github.com/msysgit/msysgit/releases/download/Git-1.9.5-preview20141217/Git-1.9.5-preview20141217.exe</u>

* Git-1.9.5-preview20141217.exe was downloaded and installed when this document was prepared.

Note:

- 1. Do not install Git for Window 2.x because it has certain inconveniences, such as there is no longer a system-level gitconfig
- To handle line ending issue, issue the following command: git config --global core.autocrlf true

1.6 Create a Github Account

Once you create a GitHub account, you can access our public Source Code repositories from: https://github.com/bhits/

- 1. Remember to set up a Git global username and email. Otherwise, your commit will not be appropriately credited.
- To setup global username: git config --global user.name "your username" (make sure you enter double '-' before global).
- To setup global email address: git config --global user.email "your email address"
- To verify your username and email set up: git config --global user.name git config --global user.email

1.7 Install Redis

Windows Installation:

1. Download Redis from https://github.com/MSOpenTech/redis/releases/tag/win-2.8.2104 (download the .msi one)



Note: When installing Redis, you may receive the following error message:

This error may arise for the following reasons:

Not full access to the folder: C:\Users\<username>\AppData\Local\Microsoft\Windows\ or C:\Users\<username>\AppData\Local\Temp\

The solution to solve this error is: change the permissions to full access to:

C:\Users\<username>\AppData\Local\Microsoft\Windows\ or C:\Users\<username>\AppData\L ocal\Temp\

1. Make sure that the hidden files and folders are shown in Windows:

1.1. Open the Control Panel in Windows.

1.2. Click on **Folder Options** to open the Folder Options pop-up.

1.3. In the tab View under the section Advanced settings, click Show hidden

files, folders and drives.

1.4. Click OK.

2. Open Windows Explorer and locate the folder mentioned above.

3. Right click on the folder. The Local Properties pop-up window will appear.

4. Select the tab Security.

5. Click Edit and the Permissions for Local pop up window will open.

6. On Group or user names, select the desired user.

7. Ensure that the Allow check box for Full control is activated, if not, activate it.

8. On the Permissions for Local pop up window, click **OK** (if no changes were made) or click **Apply** (if changes were made).

9. On the Local Properties pop up window, click **OK** (if no changes were made) or click **Apply** (if changes were made).

- 2. Follow the installation instruction and check the option to put the redis installation folder in system path environment variable
- 3. When you get to the memory limit page check "Set the Max Memory and MaxHeap limits"
- 4. Change the numbers accordingly ("250" for MaxMemory, 375 for MaxHeap)

Redis on Windows Setup	
Memory Limits Select whether to use memory limits or not.	redis
✓ Set the Max Memory and Max Heap limits	
Max Memory (integer values only):	
100 MB	
Max Heap (integer value at least 1.5 times the Max Memory value):	
150 MB	
If invalid or incompatible values are detected, the default values will be used. They can be changed later editing the redis.windows-service.conf file.	
Back Next	Cancel

 Component Services 									- 8 ×
File Action View W									- 8
🗢 🗢 📶 🗇 🎯 📄								(2)	
Corsole Root	Services (Local)	-						Actions	
Services	Redis	Name	Description	Status	Startup Type	Log On As	*	Services (Local)	
Event Viewer (Local) Q. Services (Local)	Contract of the	G,RabbitMQ	Multi-proto	Started	Automatic	Local Syst		More Actions	
A Participation (rocal)	Stop the service	Realtek Audio	For coopera.	Started	Automatic	Local Syst.		PERSONAL PROPERTY AND	
	Restart the service	Q Redis	This service _	Started	Automatic	Network S.,		Actions	
		Remote Acces	Creates a c		Manual	Local Syst		More Actions	
	Description	Remote Acces	Manages di		Manual	Local Syst			
	This service runs the Redis	G Remote Deskt.	Remote De	Started	Manual	Local Syst			
	server	Remote Deskt.	Allows user	Started	Manual	Network S.,			
	10000 C	G Remote Deskt.	Allows the r	Started	Manual	Local Syst			
	G Remote Proce The RPCSS s Started Automatic Network S								
		Remote Proce.	In Windows		Manual	Network S			
		G Remote Regist Enables re Manual Local Servi							
		Q Routing and R_	Offers routi		Disabled	Local Syst			
		G RPC Endpoint	Resolves RP_	Started	Automatic	Network S.,			
		Secondary Lo.,	Enables star		Manual	Local Syst			
		G Secure Socket	Provides su.,		Manual	Local Servi			
		G Security Accou.	. The startup _	Started	Automatic	Local Syst			
		Security Center	The WSCSV_	Started	Automatic [_	Local Servi			
		G Server	Supports fil	Started	Automatic	Local Syst			
		Shell Hardwar.	Provides no	Started	Automatic	Local Syst			
		Smart Card	Manages ac		Manual	Local Sevi.,			
		G Smart Card Re	Allows the s		Manual	Local Syst			
		SMS Agent Ho	Provides ch	Started	Automatic [_	Local Syst			
		G SNMP Trap	Receives tra		Manual	Local Servi	1		
		Software Prot	Enables the		Automatic (_	Network S			
		G SPP Notificati	Provides So.,		Manual	Local Servi			
G. Remote Proce. In Windows Manual Nerwork S. G. Remote Ragist Enables m Manual Local Servit. G. Revore Ragist Enables m Manual Local Servit. G. Revore Rogist Cheres rout Dissolved Local Syst G. Revore Rogist Redoves RP Started Automatic Nerwork S. G. Secondray Los. Enables star Manual Local Servit. G. Secondray Los. The startup Started Automatic Local Servit. G. Secondray Los. The startup Started Automatic Local Servit. G. Secondray Los. The startup Started Automatic Local Servit. G. Secondray Center The WSCSV Started Automatic Local Servit. G. Secondray Center The WSCSV Started Automatic Local Servit. G. Servier South Servit Manual Local Servit. G. Servier Ender Ender Servit Manual Local Servit.									
		A			2000				

5. The service should start automatically. Otherwise, start it manually

6. Right click on the Redis and chose properties go to Recovery tab and configure the failure as below

Redis Properties (Local Computer)	X					
General Log On Recovery Dependencies							
Select the computer's response	if this service fa	ails. Help me set up recoverv					
First failure:	Restart the S	ervice 🔹					
Second failure:	Restart the S	ervice 🔹					
Subsequent failures:	Restart the S	ervice 🔹					
Reset fail count after:	0	days					
Restart service after:	1	minutes					
Enable actions for stops with	errors. Restart Computer Options						
Run program							
Program:							
		Browse					
Command line parameters:							
Append fail count to end of command line (/fail=%1%)							
[ОК	Cancel Apply					

Run the following commands to verify the installation redis-cli --version redis-server --version

1.8 Install Gradle

1.8.1 Install

- Downloaded gradle from <u>https://gradle.org/gradle-download/</u>
 * gradle -2.8-all.zip was used when this document was prepared.
- 2. Extract gradle from gradle-2.8-all.zip to the **c:\java** folder.

1.8.2 Set GRADLE_HOME System Environment Variable and System Path

- 1. Set GRADLE_HOME system environment variable:
 - Variable: GRADLE_HOME
 - Value: C:\java\gradle-2.8 (Based on your directory)
 - Put **%GRADLE_HOME%\bin** in System Path.
- 2. Run "gradle -version" to verify

1.8.3 The Gradle Wrapper

The Gradle Wrapper is the preferred way of starting a Gradle build. The wrapper is a batch script on Windows and a shell script for other operating systems. When you start a Gradle build via the wrapper, Gradle will be automatically downloaded and used to run the build.

Check the wrapper into version control. By distributing the wrapper with your project, anyone can work with it without needing to install Gradle beforehand. Even better, users of the build are guaranteed to use the version of Gradle that the build was designed to work with. Of course, this is also great for continuous integration servers (i.e. servers that regularly build your project) as it requires no configuration on the server.

1.9 Install RabittMQ (Optional)

Installing on Windows: <u>https://www.rabbitmq.com/install-windows.html</u>

- 1. Uninstall previous versions for Erlang Windows Binary File and RabbitMQ.
- 2. Run Erlang Windows Binary File (otp_win64_18.3.exe).
- Install RabbitMQ server: Run rabbitmq-server-3.5.5.exe to set RabbitMQ up and running as a service with default configuration.
 *Please note as of 04/18/2016, the latest rabbitmq-server-3.6.1.exe which is 64 bit rather than

32 bit has some installation issues and doesn't work.

- Enable Management Plugin: Start Menu → RabbitMQ Server → RabbitMQ Command Prompt (sbin dir), then run the following command in the command prompt: rabbitmq-plugins enable rabbitmq_management
- 5. Then stop and start RabbitMQ Service from Start Menu \rightarrow RabbitMQ Server. You should be able to browse <u>http://localhost:15672/</u> and you can use guest/guest to login.

Steps for installing RabbitMQ on Mac:

- 1. Download RabbitMQ for Mac: <u>https://www.rabbitmq.com/releases/rabbitmq-server/v3.1.3/rabbitmq-server-mac-standalone-3.1.3.tar.gz</u>
- 2. Move the downloaded file to the user folder using this command in terminal:

mv ~/Downloads/rabbitmq-server-mac-standalone-3.1.3.tar.gz ~

- Extract the file: tar zxvf ~/rabbitmq-server-mac-standalone-3.1.3.tar.gz
- Change directory to RabbitMQ: cd ~/rabbitmq_server-3.1.3/sbin/
- Install plugins: ./rabbitmq-plugins enable rabbitmq_management
- 6. You can either run the server in normal mode:

./rabbitmq-server In normal mode, you have to keep the terminal open while the server is running. To stop the server, use Ctrl+C.

- 7. Or detached mode:
 ./rabbitmq-server -detached
 In detached mode, the server is running as a background service, you need to use:
 ./rabbitmqctl stop
 - 8. This will stop the server. The server will automatically start when computer restarted.
 - 9. When server started, browse <u>http://localhost:15672/</u> and use guest/guest to login.

1.10 Install Flyway (Optional)

Prerequisites:

- 1. Flyway 3.2.1 and mysql-connector-java-5.1.26-bin.jar.
- 2. download from internet: <u>http://flywaydb.org/getstarted/download.html</u> <u>http://mvnrepository.com/artifact/mysql/mysql-connector-java/5.1.26</u>

Windows Installation:

- 1. Copy and unzip 'flyway-commandline-3.2.1-windows-x64.zip' to your machine
- 2. Set FLYWAY_HOME system environment variable and system path (Optional)
 - Variable: FLYWAY_HOME
 - Value: C:\java\flyway-3.2.1 (Based on your directory)
 - Put **%FLYWAY_HOME%** in System Path.
 - Run flyway -version to check Flyway version.
- 3. Copy mysql-connector-java-5.1.26-bin.jar to flyway-3.2.1\jars
- 4. Go to directory flyway-3.2.1\conf directory and set up configuration
 - flyway.url=jdbc:mysql://localhost:3306/consent2share-bl
 - o flyway.user=username
 - o flyway.password=password
- 5. Go to command prompt by typing "flyway info" command to verify if the flyway works.

C:\Users\jiahao.li>flyway	info
21	

Database: jdbc:mysql://localhost:3306/consent2share-bl (MySQL 5.6)

Version	Description	Installed on	State
1.0.0	Database schema	2015-03-24 13:55:02	Future
1.0.1	Address use code lookup data	2015-03-24 13:55:02	
1.0.2	Administrative gender code lookup data	2015-03-24 13:55:02	
1.0.3	Body site code lookup data	2015-03-24 13:55:02	Future
1.0.4	Clinical document section type code lookup data	¦ 2015-03-24 13:55:02	Future
1.0.5	l Clinical document type code lookup data 🔒	: 2015-03-24 13:55:02	Future
1.0.6	Confidentiality code lookup data	2015-03-24 13:55:02	Future
1.0.7	Consent directive type code lookup data	¦ 2015-03-24 13:55:02	
	Country code lookup data	1 2015-03-24 13:55:02	Future
		2015-03-24 13:55:02	
1.0.10	Facility type code lookup data	 2015-03-24 13:55:02	Future
1.0.11	Language ability code lookup data	: 2015-03-24 13:55:02	Future
1.0.12	Language code lookup data	2015-03-24 13:55:02	
1.0.13	Language proficiency code lookup data	2015-03-24 13:55:02	
1.0.14		2015-03-24 13:55:02	
	Marital status code lookup data	2015-03-24 13:55:02	
1.0.16	Medication status code lookup data	2015-03-24 13:55:02	
		2015-03-24 13:55:02	
1.0.18	Privacy law policy code lookup data	2015-03-24 13:55:02	Future
1.0.19		2015-03-24 13:55:02	
	Procedure status code lookup data	2015-03-24 13:55:02	
1.0.21	Product form code lookup data	2015-03-24 13:55:02	
	Provider taxonomy code lookup data	2015-03-24 13:55:02	
1.0.23	Purpose of use code lookup data	2015-03-24 13:55:02	
	Race code lookup data	2015-03-24 13:55:02	
1.0.25	Refrain policy code lookup data	2015-03-24 13:55:02	Future
1.0.26		2015-03-24 13:55:02	
1.0.27	Result interpretation code lookup data		
	Result status code lookup data	2015-03-24 13:55:02 2015-03-24 13:55:02	Future
	Route code lookup data Separativity policy and lookup data	2015-03-24 13:55:02	
	Sensitivity policy code lookup data Social history status code lookup data	2015-03-24 13:55:02	
1.0.31	i Social history status code lookup data I Social history type code lookup data	2015-03-24 13:55:02	
1.0.32	Social history type code lookup data State code lookup data	2015-03-24 13:55:02	
	Target site code lookup data	2015-03-24 13:55:02	
	Telecom use code lookup data	2015-03-24 13:55:02	
	Unit of measure code lookup data	2015-03-24 13:55:02	Future
	Valueset data	2015-03-24 13:55:03	Future
1.1.0		2015-03-24 13:55:03	Future
		2015-03-24 13:55:03	
	Tinvint to BIT 1 changes	2015-03-24 13:55:05	

6. For more, please read: http://flywaydb.org/documentation/commandline/

Linux Installation:

- 1. Create a directory flyway under user: mkdir flyway
- Set Get the latest flyway binaries (refer to <u>http://flywaydb.org/getstarted/download.html</u>). sudo wget https://bintray.com/artifact/download/business/maven/flyway-commandline-3.2.1-linux-x64.tar.gz
- 3. Untar the gz under flyway directory. This will create a flyway-3.2.1 directory under /usr/flyway: sudo tar -zxvf flyway-commandline-3.2.1-linux-x64.tar.gz
- 4. Remove the tar.gz:

rm -rf flyway-commandline-3.2.1-linux-x64.tar.gz

- Create a softlink to the path /usr/flyway/flyway-3.2.1 as /usr/flyway/latest: In -s /usr/flyway/flyway-3.2.1 / usr/flyway/latest
- 6. Create a file called flyway.sh with following contents under /etc/profile.d:

```
#! /bin/sh
```

#! Set FLYWAY_HOME environment variable to point to latest FLYWAY path export FLYWAY_HOME=/usr/flyway/latest export FLYWAY_HOME PATH=\$PATH:\$FLYWAY_HOME export PATH

- 7. Copy 'mysql-connector-java-5.1.26-bin.jar' to flyway-3.2.1\drivers
- 8. Go to directory flyway-3.2.1\conf directory and set up configuration **Note**: following is using local information for sample

- o flyway.url=jdbc:mysql://localhost:3306/ehn2_consent2share-bl
- o flyway.user=username
- o flyway.password=password
- 9. Navigate to /usr/flyway/latest and execute the following

sudo chmod +x flyway

10. Verify flyway installation by executing info command(flyway info)

PuTTY (inactive)	x
sadhanafei@ehn [/etc/profile.d]# flyway info Flyway 3.2.1 by Boxfuse	^
Database: jdbc:mysql://localhost:3306/ehn2_consent2share-pg (MySQL 5.5)	
Version Description Installed on State	
No migrations found	
	Ŧ

1.11 Install Jasypt (Java Simplified Encryption) (Optional)

- 1. <u>Download Jasypt 1.9.2</u> and install it.
- 2. Set up system environment variable:
 - o name: JASYPT_HOME
 - value: C:\java\jasypt-1.9.2 (Based on your directory)
 - And append path system variable with **%JASYPT_HOME%\bin**
- 3. After setting up the system path for Jasypt, you will be able to use all the commands under bin folder to encrypt and decrypt.

1.12 Configure SMTP

SMTP email server should be configured for PCM API, Patient User API and UAA. For PCM and Patient User API the configuration is similar since there are both Spring boot application while for UAA it is a bit different.

For PCM and Patient User API, there are two possibilities:

1. Create OS environment variables for SMTP email server.

Create OS environment variables for the following:

Environment Variables	Values
spring.mail.host	smtp.gmail.com
spring.mail.port	587
spring.mail.username	Consent2share@gmail.com
spring.mail.password	m0vyVUUgfR5u
spring.mail.properties.mail.smtp.ssl.trust	Smtp.gmail.com

2. Pass SMTP email server configuration as Program Arguments in IntelliJ.

See section 4.5.2.1.

For UAA you can configure the SMTP email server in Tomcat. See section 4.5.1.1

1.13 Install and Configure ClamAV in Windows

- 1. <u>Download</u> the Win64 version of ClamAV to your local machine.
- 2. Create the following folders to be used by ClamAV:
 - a. C:\ClamAV-x64
 - b. C:\ClamAV-x64\db
 - c. C:\ClamAV-x64\log
- 3. Run the executable that you just downloaded and remember to specify the installation path to: C:\ClamAV-x64
- 4. Create **clamd.conf** and **freshclam.conf** in the C:\ClamAV-x64 folder with content as below:
 - a) For clamd.conf add this content

TCPAddr 127.0.0.1

TCPSocket 3310

MaxThreads 2

LogTime true

LogFile c:\ClamAV-x64\log\clamd.log

DatabaseDirectory C:\ClamAV-x64\db

b) For freshclam.conf add this content

URL of server where database updates are to be downloaded from
If this option is given multiple times, each will be tried in
the order given until an update is successfully downloaded
#MAKE SYU
DatabaseDirectory "c:/ClamAV-x64/db/"
DatabaseMirror database.clamav.net
Number of times to try each mirror before moving to the next one
MaxAttempts 3
#LogFile c:/ClamAV-x64/log/freshclam.log
NotifyClamd c:/ClamAV-x64/clamd.conf
LogFileMaxSize 20480000
LogTime true
UpdateLogFile c:/ClamAV-x64/log/freshclam.log

- 5) Navigate to the ClamAV installation path C:\ClamAV-x64 and click on C:\ClamAV-x64\freshclam.exe to create the Database.
- 6) Start ClamAV by clicking on C:\ClamAV-x64\clamd.exe.
- 7) To verify installation, run C2S patient portal and in upload a document in Medical Document section. You will get a success message as shown below.

	Work			ortal 🗀 New fold	ler 🖸 TEMP 🧰 Imi	orted (4) Pla	unker Pi ch	rome://net-int	Mailir	ator D Dif	f Checker -	Or 🧑 Jasi	ersoft: Loo	ain 📾 C2S I Ac	tivity Hist	
						chrome://net-int: W Mailinator D Diff Checker - On O Jaspersoft: Login @ C2S Activity ploading medical document								🕈 Logout		
	± Upload					🛱 Uploaded Documents										
	Nam	and Medica	I Document field	is are required.		Document	Type f Episode No			Name CCDA-82			Des	cription		
	Name									and Rem	ove	CCOMIN2				
		Document Name							f Episode Ne	te		CCDA-RT				
									A Downle	ad × Rem	ove					
ents	Descrip															
lon	Episc Medical Choose	Medical Document Type: Episode Summary Note Medical Document Droom File: No file chosen.														
ne 10 🔨	D Preserve lo) 🗐 Disable i	cache E) Offine	Security Audits No throttling ia Font Doc W5	¥ Manifest Other											
0.ms 300	10 ms 4000	ms \$30	0 ms 8000 ms	7000 me	8000 ms 9000 ms	20000 ms	12000-ma	12000 mg	13000 mg	54000 mg	15000-4	18000	17000 m	a 28000 ma	19000-ma	20000 //16
			Status	Тури	Initiator		Size	Time	,	imeline – Start Ti	me	6.00 +	6.00 s	10.00+ 12.00	14001	26.001
			200	shr.	acquiar.(x11442			126.8	22.19 #	-		- 11 A				
			200	100												

Also, if you stop ClamAV by closing the clamd.exe window and try to upload another document, you will get the error message below.

Contraction of the local division of the loc		and the second se	-
Run: E	Ultippication - GP 📲 Distpolication* 📲 TryPolicytophration* 📲 Patentice and Asseption Ultippication* 🖉 Polypication* 🖉 Rehetrise Assertion - GP	eninstall 🚸	-Ø-
1 1	at org.apache.catalina.core.ApplicationFilterchain.doFilter(<u>applicationFilterchain.java1206</u>) [tomcat-embed-core-8.0.30.jar:8.0.30] <2 internal	1 calls>	
1	at org.apache.catalina.core.ApplicationFilterChain.internalBoFilter(<u>hpplicationFilterChain.java:239</u>) [tomcat-embed-core-8.0.30.jar:8.0.30]		
-	at org.spache.catalina.core.ApplicationFilterChain.doFilter(hpplicationFilterChain.jmvs:200) [tomcat-embed-core-8.0.30.jar:8.0.30]		
	at org.springframework.boot.actuate.autoconfigure.MetricsFilter.doFilterInternal(NetricsFilter.java:103) [spring-boot-actuator-1.3.1.%ELEAGE.	jar:1.3.1.RELEASE]	
	<1 internal calls>		
	at org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(hpplicationFilterChain.javar235) [tomcat-embed-core-8.0.30,jar:8.0.30]		
	at org.apache.catalina.core.ApplicationFilterChain.doFilter(<u>ApplicationFilterChain.java:205</u>) [tomcat-embed-core-8.0.30.jar:9.0.30]		
a 💼	at org.apache.catalina.core.StandardWrapperValve.invoke(<u>StandardWrapperValve.javar212</u>) [tomcat-ambed-core-8.0.30.jar:8.0.30]		
	at org.apache.catalina.core.StandardContextValve.invoke(StandardContextValve.java:106) [tomcat-embed-core-8.0.30.jar:8.0.30]		
	at org.apache.catalina.authenticator.AuthenticatorBase.invoXe(AuthenticatorBase.java:502) [tcmcat-embed-core-8.0.30, jar:8.0.30]		
×	at org.apache.catalina.core.StandardHostValve.invoke(StandardHostValve.javas141) [tomcat-embed-core-0.0.30.jar:0.0.30]		
	at org.apache.catalina.valves.ErrorReportValve.invoke(<u>krrorReportValve.invar78</u>) [tcmcat-embed-core-6.0.30, jar:6.0.30]		
£	at org.apachs.catalins.core.standardfrgint%alve.invoke(fizandardfrgintgintyint, javrid) [Cornet=embed-core=5.5.30.jari5.0.30] at org.apachs.catalins.consectro.CoveteAdapte.service(Coverandanter.inv:E2)[Corneat=embed-core=6.0.30,jari5.0.30]		
	at org.spache.catalina.connector.coyotechapter.service (hyprimaniperin javnino) [toncat-mamped-core=0.0.30.jari0.0.30] at org.spache.covote.httpl://Abstractifutpl?processor.process (Abstractifutpl?processor.invalid) [concat-mabed-core=0.0.30.jari0.0.30]		
	at org.spachs.coyote.http://www.tasthtpi/roceasor.process(Antrachitpi/roceasor.artai.org/) [concet-embed-core-0.0.30.jar(0.0.30] at org.spachs.coyote.html/actProtocol/AbstractConcetionInal(ar.process(AbstractForcol.jav(675) [temast-embed-core-0.0.30]		
	at org-spacks.teenst.util.met.NicTelepintFecturererer.dokun (NicTelepint, 1971) [tenst-embed-core-6.0.30] at 0.6.30]		
	at org-spacks.tomat.uti.mst.NichtdpointSocketProcessor.run[Kichtdpoint_jazz1456] [tomat-embed-core-0.0.20, jazt0.sign] <0 internal calls>		
	at org.spache.tesat.uti.threads.rasKhreadSWrappingRunnable.run("arthread izvar() [tomct-embed-core=0.0.10. jart4.0.30]		
	at jaya lang. Thread run (Thread, jaya 745) [net. 8.0.101]		
	an langtan antimi furning furning for the		
	2016-10-27 11:06:37.871 ERROR 7224 (nio-5446-exec-5) c.s.c.p.y.ClinicalDocumencRestController : ClanAV service not available or server aborter	d connection.	
t 4: Ren	📲 DODO 🔞 Java Enterprise 🖷 👷 Version Control 🛋 Spring 📷 Terminal 🗮 🖳 Messages 🖓 Application Servers		Event L
ompilatio	n completed successfully with 6 warnings in 11: 932ms (today 955 AM6	1061 CRUF+ UTF-8+ Git de	1 2

N.B. If you want to use ClamAV running on the server, it suffices to specify the host in the application.yml file of PCM as in the next page.



Chapter 2 Frontend Development Environment Setup the Traditional

Way

2.1 Install Platform - Node.js

Go to <u>https://nodejs.org/</u>, download node.js for your operating system. Along with node.js, npm is installed as well.

Verify the installation by issuing the following commands:

- \$ node --version
- \$ npm --version

2.2 Install grunt globally

First, run the following command: \$ npm install -g grunt-cli

Next, verify the installation by issuing the following command: **\$ grunt --version**

Chapter 3 Enable SSL

The use of HTTPS is commonplace and used by all web application. To get a real HTTPS experience for the local development environment, a SSL certificate, signed by the specific Certificate Authority, need to be generated. The steps of the SSL certificate generation will not be addressed in this guide.

For simplicity in development and testing environments, SSL is **NOT** enabled by default in configurations in Consent2Share components. Please follow the instructions given in particular microservice documentations in Github for enabling SSL if needed to do so in your particular deployment environment.

Also, please be mindful for overriding the target endpoints in the default configurations to use HTTPS for SSL enabled services. This chapter only provides an example to apply SSL in edge-server during the development progress.

* The Edge Server acts as a gatekeeper to the outside world. It keeps unauthorized external requests from passing through.

3.1 Enable SSL While Running as a JAR

 java -jar edge-server-x.x.x-SNAPSHOT.jar --spring.profiles.active=ssl -server.ssl.key-store=/path/to/ssl_keystore.keystore --server.ssl.key-storepassword=strongkeystorepassword

3.1 Enable SSL While Running as a Docker Container

Note: Docker Container will be Introduced in Chapter 5

- docker run -d -v
 "/path/on/dockerhost/ssl_keystore.keystore:/path/to/ssl_keystore.keystore"
 bhits/edge-server:latest --spring.profiles.active=ssl --server.ssl.key store=/path/to/ssl_keystore.keystore --server.ssl.key-store password=strongkeystorepassword
- In a docker-compose.yml, this can be provided as:

```
version: '2'
services:
...
edge-server.c2s.com:
    image: "bhits/edge-server:latest"
    command: ["--spring.profiles.active=ssl","--server.ssl.key-
store=/path/to/ssl_keystore.keystore", "--server.ssl.key-store-
password=strongkeystorepassword"]
    volumes:
        - /path/on/dockerhost/ssl_keystore.keystore:/path/to/ssl_keystore.keystore
...
```

NOTE: As seen in the examples above, /path/to/ssl_keystore.keystore is made available to the container via a volume mounted from the Docker host running this container.

3.3 Override Java CA Certificates Store in Docker Environment

Java has a default CA Certificates Store that allows it to trust well-known certificate authorities. For development and testing purposes, one might want to trust additional self-signed certificates. In order to override the default Java CA Certificates Store in a Docker container, one can mount a

custom cacerts file over the default one in the Docker image as docker run -d -v

"/path/on/dockerhost/to/custom/cacerts:/etc/ssl/certs/java/cacerts" bhits/edgeserver:latest

NOTE: The cacerts references given in the both sides of volume mapping above are files, not directories.

Chapter 4 Install, Configure, and Use IntelliJ IDEA to Run and Debug C2S

4.1 Install

 Download latest IntelliJ IDEA Community or Ultimate from: <u>https://www.jetbrains.com/idea/download</u>.

* The community version is free, but it has a lot of limitations regarding integration and supports, such as Java application server, Sprint support and plugins (NodeJS, AngualrJS, Lombok etc).

* The Ultimate version is not free and requires a license.

* The Ultimate version was used to develop C2S and this chapter is based on the Ultimate version.

 Open IntelliJ IDEA, you will get "Welcome to IntelliJ IDEA" screen. If you are already in a project, click File → Close Project to let IntelliJ reopen the Welcome Screen:



3. Optional: click Register to open "IntelliJ IDEA License Activation" dialogue for you to enter your license information.

4.2 Configure

4.2.1 Configure/Update JDK

Refer to https://www.jetbrains.com/help/idea/2016.1/configuring-global-project-and-module-sdks.html

4.2.1.1 Configure SDKs at the Global (IDE) Level

- Open the Default Project Structure dialog (from Welcome Screen → Configure → Project Defaults → Project Structure, or from File → Other Settings → Default Project Structure).
- 2. In the left-hand pane, under Platform Settings, click SDKs.
- 3. To add a new SDK, click Add and select the desired SDK type.
- 4. In the dialog that opens, select the SDK home directory and click OK.
- 5. As a result, a new SDK is added to IntelliJ IDEA and its settings are shown on the SDK page in the right-hand part of the dialog.
- 6. Optionally, edit the SDK name and contents.
- 7. If necessary, add more SDKs as described above.
- 8. Click OK in the Project Structure dialog.

4.2.1.2 Configure a Project SDK

- 1. Open the Project Structure dialog (e.g. Ctrl+Shift+Alt+S, or from File \rightarrow Project Structure).
- 2. In the left-hand pane, under Project Settings, click Project.
- 3. On the page that opens in the right-hand part of the dialog, select the necessary SDK from the Project SDK list.
- 4. If the desired SDK is not present in the list, click New and select the necessary SDK type. In the dialog that opens, select the SDK home directory and click OK. As a result, a new SDK is added to IntelliJ IDEA as Global Platform Settings and selected as the project SDK.
- 5. To view or edit the SDK name and contents, click Edit. (The SDK page will open.)
- 6. Click OK in the Project Structure dialog.

4.2.1.3 Configure a Module SDK

* If there is no project opened in the IntelliJ, please open a project first to configure the module.

- 1. Open the Project Structure dialog (e.g. Ctrl+Shift+Alt+S, or from File \rightarrow Project Structure).
- 2. In the left-hand pane, under Project Settings, click Modules.
- 3. In the middle pane, select the module of interest.
- 4. In the right-hand part of the dialog, on the Module page, select the Dependencies tab.
- 5. Select the SDK from the Module SDK list. (To select the project SDK, select Project SDK. Note that if you change the project SDK later, the module SDK will change accordingly.)
- 6. If the desired SDK is not present in the list, click New and select the necessary SDK type. In the dialog that opens, select the SDK home directory and click OK. As a result, a new SDK is added to IntelliJ IDEA as Global Platform Settings and selected as the project SDK
- 7. To view or edit the SDK name and contents, click Edit. (The SDK page will open.)
- 8. Click OK in the Project Structure dialog.

4.2.2 Configure Maven

4.2.2.1 Configure Maven at the Global (IDE) level

 Open the Default Settings dialog (from Welcome Screen → Configure → Project Defaults → Settings, or from File → Other Settings → Default Settings).

- 2. In the left-hand pane, under Build, Execution, Deployment \rightarrow Build Tools, click Maven.
- 3. In the right-hand pane, set Maven home directory to the Maven directory, which is the parent folder of bin folder.
- 4. Click OK in the Default Settings dialog.

4.2.2.2 Configure Maven for a Project

- 1. Open the Settings dialog (from File \rightarrow Settings).
- 2. In the left-hand pane, under Build, Execution, Deployment \rightarrow Build Tools, click Maven.
- 3. In the right-hand pane, set Maven home directory to the Maven directory, which is the parent folder of bin folder.
- 4. Click OK in the Settings dialog.

4.2.3 Set Up Tomcat

* Since Intellij Community version does not offer Java application server integration, this section only works for the Intellij Ultimate version.

- From Welcome Screen, click Configure → Settings, open Settings dialog. Alternatively, after opening your project, open the Settings dialog from File → Settings. Both ways achieve results, but the first way is better.
- 2. In the left-hand pane, under Build, Execution, Deployment, click Application Servers.
- 3. Click the green "+" in the middle pane to set up Tomcat. Note to give a meaningful name for the application server e.g. Tomcat 8.0.27.

🛄 Default Settings	8
	Build, Execution, Deployment > Application Servers
Appearance & Behavior	+ - <u>N</u> ame: Tomcat 8.0.27
Кеутар	Tomcat 8.0.27 Tomcat <u>H</u> ome: C:\java\apache-tomcat-8.0.27
▶ Editor	Tomcat Version: 8.0.27
Plugins	Tomcat base directory: C:\java\apache-tomcat-8.0.27
Version Control	
Build, Execution, Deployment	Libraries
► Build Tools 🖷	+ + + + -
► Compiler 🔹	▼ ↓ ⁿ¹ ₀₁ Classes
Debugger	C:\java\apache-tomcat-8.0.27\lib\jsp-api.jar
► Deployment 🐵	C:\java\apache-tomcat-8.0.27\lib\servlet-api.jar
Arquillian Containers 🐵	
Application Servers	
Clouds	
Coverage 🗈	
Required Plugins 🐵	
Languages & Frameworks	
	OK Cancel Apply Help

4.2.4 Configure Git (Optional)

 From the Welcome screen, Open Default Settings dialog. Version Control → Git. Make sure that Path to Git executable is correct and accept the default configurations. Note: DO NOT check Control repositories synchronously.

- 2. Selecting this configuration means that the Synchronous branch control is enabled. If you have several Git roots in the project, they all are checked out at the same branch.
- 3. For this project, at least at this stage, we want to control branches for each project module (Microservice) in different roots separately.
- 4. Once you have loaded a project with several modules source controlled by Git, to let IntelliJ IDEA know the root of every Git repository, select each module in the Project tool window, then click VCS → Enable Version Control Integration...., in the Enable Version Control Integration Dialog, select Git in the drop down, click OK. Alternatively, you can open Settings dialogue by clicking File → Settings..., in the left-hand pane, select Version Control, in the right pane you can add/remove/edit VCS Directory Mapping.

4.2.5 Configure Github (Optional)

- 1. From the Welcome screen, Open the Default Settings dialog. Version Control \rightarrow Github. Select and enter the followings in the right-pane.
 - o Host: github.com
 - o Auth Type: Password
 - Login: your-user-name
 - Password: your-password

4.2.6 Configure for Frontend Development

4.2.6.1 Install NodeJS Plugin

Note: only Intellij Ultimate version supports this plugin.

- 1. In the Welcome Screen, click Configure --> Settings --> Plugins --> Browse repositories... --> type node.js to find NodeJS plugin --> Install plugin.
- 2. Then you will be able to using Run --> Edit Configuration.... to open Run/Debug Configurations and configure to run Node.JS.

4.2.6.2 Install Karma Plugin

Note: only Intellij Ultimate version supports this plugin.

In the Welcome Screen, click Configure --> Settings --> Plugins --> Install JetBrains plugin... --> type karma to find Karma plugin --> click the green "Install Plugin" button to install.

4.2.6.3 Install AngularJS Plugin

Note: only Intellij Ultimate version supports this plugin.

In the Welcome Screen, click Configure --> Settings --> Plugins --> Install JetBrains plugin... --> type angular to find AngularJS plugin --> click the green "Install Plugin" button to install.

4.2.6.4 Install John Papa's Angular File Templates and Live Templates

- 1. Download John Papa's Angular File templates and Live Templates settings jar archive for WebStorm from http://jpapa.me/ngstormtmpl, which is names as fileTemplateSettings.jar.
- 2. Copy fileTemplateSettings.jar to your local computer.
- 3. Export and backup your local setting first, go to File --> Export Settings..., save the jar to your backup folder. And it is a good idea to source control this jar file.
- 4. Import John Papa's fileTemplateSettings.jar, go to File --> Import Settings... and browse to the file fileTemplateSettings.jar to import it.

5. Once the John Papa's settings are imported, you will see in the Angular related file templates in the New menu. e.g. go to File --> New, you will see serval Angular related file templates.

4.3 Install Lombok Plugin

Lombok is a framework that generates boilerplate code in an annotation-driven fashion and it has been utilized in several C2S services. The projects will successfully build if the Lombok is on classpath (as a Maven dependency), however one needs to also install a plugin to IDE to prevent IDE based errors.

For Intellij Plugin Installation:

- 1. Go to: File > Settings > Plugins
- 2. Search for "Lombok" to see if it is already installed or not
- 3. If it is already installed, no additional steps are required. If it is not installed, click "Search in repositories" link.
- 4. Select "Lombok Plugin" and click "Install" button. Potentially, you might need to restart the IDE after installation.
- 5. See <u>https://projectlombok.org/</u> for details including documentation and support for other IDEs.

4.4 Open Multiple Projects in the Same Window

If your system include multiple projects, it is very convenient to open these projects in the same window for easy development.

There are several ways to do so. You can randomly open one project, which is treated as a host project, and add other projects as modules for this host project. Alternatively, you can create an empty project as a host project to host other projects as modules. The latter method is better.

For our project, we assume that the following folder structure is used:

ganize • Include i	n library . Share with . New fold	late .				U. • 🚺
Favorites	Name	Date modified	Туре	Size		
Desktop						
Downloads	admin-portal-ui common-libraries	10/20/2016 11:46 10/20/2016 11:23				
Recent Places	config-server	10/20/2016 11:23				
Common	contig-server consent2share					
Pluralsight	consent2share-project	10/20/2016 11:23 10/21/2016 11:09				
shruti.rao		10/20/2016 12:03 -				
AppData	L context-handler					
Papada	A discovery-server	10/20/2016 12:03 -				
Libraries	document-validator document-validator	10/20/2016 12:03				
Documents						
Music	L edge-server	10/20/2016 12:04				
Pictures	👗 iexhub	10/20/2016 11:24				
Videos	k iexhub-fork	10/20/2016 2:52 PM				
- videos	L patient-portal-ui	10/20/2016 12:04				
Computer	🌲 patient-user-api	10/20/2016 12:04				
System (C:)	🗼 pcm-api	10/20/2016 12:04 _				
P Department (H:)	📕 pep-api	10/20/2016 12:05 -				
Department (H:) BHITS (E)	👃 phr-api	10/20/2016 12:05 _				
Profestion (E)	👢 pis-api	10/20/2016 12:05				
and the second second	k registration-api	10/20/2016 12:05 _				
Network	L try-policy-api	10/20/2016 12:05 _				
	🗼 uaa	10/26/2016 1:20 PM	File folder			

4.4.1 Create an Empty Project to House Other Projects as Modules

- 1. In your C:\ drive, create a new folder: intellij-workspaces
- 2. Inside this folder, create another empty folder: c2s-ws
- 3. Open IntelliJ
- From Welcome Screen click "Create New Project" or File → New Project to Open New Project dialog.
- 5. In the left-hand pane, select Empty Project, then click Next button.
- 6. Give the name of the project something like mysystem-intellij-projects, then click Finish button to open Project Structure dialog.
- In your intellij-workspaces folder, at the SAME level as the c2s-ws folder, clone ~/subrepo-management using the SSH option from github.
- Double click on the main.bat script in the intellij-workspaces\subrepo-management folder.
 *NOTE:
 - The main.bat script is customizable, see the GitHub page for instructions
 - When it prompts you for "Select the operating system type on this computer:", make your selection.
 - Next, select "Clone" or "Pull latest from GitHub..." operation. Select "Clone" option if you're setting up the project for the very first time.
 - When it prompts you to use HTTPS or SSH, make your selection.
 - It will give you a list of projects to download. Select the ones you need and then hit 0 on your keyboard to finish.
 - This will clone all the selected projects into the intellij-workspaces\c2s-ws folder you created earlier.
- 9. Now you have to manually import all of the projects we just pulled using: File -> New -> Module from Existing Sources.
- 10. When using the Import Module, make sure that you select the right folder that contains project related files like pom.xml, build.gradle and so on. The module project may not contain project related files other than source code. If so, select the folder that contains all the source code.
- 11. Once a folder is selected and click OK button to open Import Module dialog, choose CORRECT option here based on the module project folder that you selected.
- 12. In the following sub-sections, we will show several examples to import modules.

There are several ways to manage project modules:

- You can use File → Project Structure... to open Project Structure dialog to manage project Modules.
- If the project is Maven project, you can use View → Tools Windows → Maven Projects to open Maven Projects tool windows to add Maven Projects as Modules.
- File → New → Module ... to add new project Module from scratch.
 File → New → Module from Existing Sources... to add new project Module from existing sources.

4.4.2 Import admin-portal-ui Server Maven Project

Use File \rightarrow New \rightarrow Module from Existing Sources... to open "Select File or Directory to Import" dialog:

Select File or Directory to Import	X
Select Intellij IDEA module file (*.iml), directory with existing sources , Eclipse project (project) or classpath (.classpath) file, Maven project file (pom.xml), Bnd/Bndtools project (project /bnd.bnd), Flash Builder project file (.project, *.fxp, *.fxpl), Gradle build script (*.gradle).	
	Hide path
C:\intellij-workspaces\c2s-ws\admin-portal-ui\server	Ľ
 C:\ Intel intellij-workspaces c2s-ws admin-portal-ui build-scripts client docs 	
V Server	
 .mvn src admin-portal-ui-server.iml admin-portal-ui.iml mvnw mvnw.cmd pom.xml 	
Drag and drop a file into the space above to quickly locate it in the tree OK Cancel	Help

Locate **admin-portal-ui server** folder in the dialog, click OK to open the Import Module dialog.

Import Module	X
O Create module from <u>e</u> xisting sources	
Import module from external <u>m</u> odel	
Eclipse Fx Flash Builder	
💽 Gradle	
11 Maven	
Previous Next Canc	el Help

Since the admin-portal-ui server is a Maven project, in the dialog, select "Import module from external model", then select Maven and click Next. Review settings in the following steps, click the Next buttons, and finally, click the Finish button to finish the dialog.

4.4.3 Import admin-portal-ui Client Project

Use File \rightarrow New \rightarrow Module from Existing Sources... to open "Select File or Directory to Import" dialog:

Select File or Directory to Import
Select Intellij IDEA module file (*.iml), directory with existing sources , Eclipse project (.project) or classpath (.classpath) file, Maven project file (pom.xml), Bnd/Bndtools project (project /bnd.bnd), Flash Builder project file (.project, *.fxp, *.fxpl), Gradle build script (*.gradle).
🗌 📼 🖬 🕞 🔀 🗙 💋 🏾 🗰 Hide path
C:\intellij-workspaces\mhc-ws\admin-portal-ui\client
🔻 🗖 admin-portal-ui
idea
 build-scripts client
▶ □ app
Tassets
🕨 🗖 karma
► 🗖 less
protractor
Jshintrc
bower.json
i build.config.js
is gruntfile.js
h index.html
view package.json
Drag and drop a file into the space above to quickly locate it in the tree
OK Cancel Help

Locate admin-portal-ui client folder in the dialog, click OK to open "Import Module" dialog.



Since there are no project-related files for this client project, select "Create module from existing sources," click the Next button, review the settings, and then click the Finish button.

Locate the newly added module in Project tool window:

	client	\rangle					
ť	P P	roject	🛅 Packages	🥼 Project Files	•	⊕ ≑ ✿-	
<u>1</u> : Project	v 🖬	client	: C:\intellij-work	<pre>cspaces\mhc-ws\a</pre>	dmin-porta	l-ui∖client	
_	►	🗖 ap	pp				
G	►	🗖 as	sets				
e	►	🗖 ka	irma				
Ē	►	🗖 les	ss				
📢 <u>7</u> : Structure	►	🖿 pr	otractor				
~~i		.b	owerrc				
¥		JS .js	hintrc				
		Join Po	ower.json				
		📑 bu	uild.config.js				
		🔓 cli	ient.iml				
		📑 gr	untfile.js				
		🗈 in	dex.html				
		Join pa	ackage.json				

Right click to open context menu and select Open Module Settings to open this Module's settings dialog (Project Structure dialog). In the right-hand pane, change the name from **client** to **admin-portal-ui-client** and then click OK button to close the dialog.

*Note: when you import pp-ui client, you need rename the name of the module as well. Rename the module name for this project to patient-portal-ui-client.

*Note: For our project, the following structure is showed in IntelliJ, when projects served as modules are hosted by the project like **c2s-intellij-projects**.

U o	ons	sent2share-project - [C:\intellij-workspaces\c2s-ws\consent2share-project] - [cloudfoundry-identity-					
<u>F</u> ile	E	<u>dit V</u> iew <u>N</u> avigate <u>C</u> ode Analy <u>z</u> e <u>R</u> efactor <u>B</u> uild R <u>u</u> n <u>T</u> ools VC <u>S W</u> indow <u>H</u> elp					
Þ	l,	🗄 💋 🛩 → 😹 🖺 📬 🔍 🔍 💠 → 👫 🚮 PPUIApplication-QB -> 🔶					
D	cli	ient					
ಕ	Ð	📮 Project 👻 👘 🕸 - 🖿					
<u>1</u> : Project	►	C:\intellij-workspaces\c2s-ws\admin-portal-ui\client					
ä,	►	C:\intellij-workspaces\c2s-ws\patient-portal-ui\client					
	►	C:\intellij-workspaces\c2s-ws\common-libraries\common-libraries					
e	►	C:\intellij-workspaces\c2s-ws\context-handler\context-handler					
Structure	►	🔄 discovery-server C:\intellij-workspaces\c2s-ws\discovery-server\discovery-server					
Z: Stri	►	document-validator C:\intellij-workspaces\c2s-ws\document-validator\document-validator					
	►	🗖 dss C:\intellij-workspaces\c2s-ws\dss-api\dss					
	►	adge-server C:\intellij-workspaces\c2s-ws\edge-server\edge-server					
	►	iexhub C:\intellij-workspaces\c2s-ws\iexhub-fork\iexhub					
	►	🔁 patient-user C:\intellij-workspaces\c2s-ws\patient-user-api\patient-user					
	▶.	C:\intellij-workspaces\c2s-ws\pcm-api\pcm					
	•	pep C:\intellij-workspaces\c2s-ws\pep-api\pep					
	•	phr C:\intellij-workspaces\c2s-ws\phr-api\phr					
	•	pls C:\intellij-workspaces\c2s-ws\pls-api\pls					
	registration [patient-registration] C:\intellij-workspaces\c2s-ws\registration-api\registration						
	•	server [admin-portal-ui] C:\intellij-workspaces\c2s-ws\admin-portal-ui\server					
	•	server [pp-ui] C:\intellij-workspaces\c2s-ws\patient-portal-ui\server					
	•	tryPolicy [try-policy] C:\intellij-workspaces\c2s-ws\try-policy-api\tryPolicy					
		uaa [cloudfoundry-identity-parent] C:\intellij-workspaces\c2s-ws\uaa					
	▶.	External Libraries					

U Settings			23
Q	Version Control @ For current project		
Appearance & Behavior	Directory	VCS	+
Кеутар	C:\intellij-workspaces\mhc-ws\admin-portal-ui	Git	_
▶ Editor	C:\intellij-workspaces\mhc-ws\common-libraries	Git	
Plugins	C:\intellij-workspaces\mhc-ws\discovery-server	Git	
Version Control	C:\intellij-workspaces\mhc-ws\document-validator	Git	
Build, Execution, Deployment	C:\intellij-workspaces\mhc-ws\dss-api	Git	
Languages & Frameworks	C:\intellij-workspaces\mhc-ws\mhc-intellij-projects	Git	
▶ Tools	C:\intellij-workspaces\mhc-ws\mhc-runner	Git	
Other Settings	C:\intellij-workspaces\mhc-ws\patient-portal-ui	Git	
	C:\intellij-workspaces\mhc-ws\try-policy-api	Git	
	Unregistered roots:		
	C:\intellij-workspaces\mhc-ws\edge-server	Git	
	 < Project> - Content roots of all modules, all immediate descendants of project base directory contents ✓ Limit history to: 1,000 rows Show directories with changed descendants Store on shelf base revision texts for files under DVCS File texts bigger than 500K are not stored Show changed in last 31 days Filter Update Project information by scope Manage Scopes Commit message right margin (columns): 72 day Wrap when 	directory, and .idea	margin
	OK	Apply	Help

4.4.4 Add Unregistered Roots for New Modules Under Git Source Control

Select the folder path under Unregistered roots and then click +.

Once the roots are registered, IntelliJ IDEA then can be used to manage these Git repositories.

4.5 Run/Debug Source Code the Traditional Way

*Note: Since the Intellij Community version does not support Sprint Boot and Tomcat server integration, this section only works for the Intellij Ultimate version.

When you import Spring Boot project, a Run/Debug configuration is automatically generated.

For UAA, PLS, Document Validator and IExHub project, you need configure Run/Debug configuration to use Tomcat Server.

*Note: Only import IExHub as a Maven project. Don't import SysLog4j. Also IExHub by default runs in test mode. So you have TestMode=true in the IExHub properties file. To run in non-test mode, you have to set TestMode to false and configure IExHub accordingly.

4.5.1 Run/Debug Configuration with Tomcat

Click Run \rightarrow Edit Configurations... to pen Run/Debug Configurations dialog.

Click +, Select Tomcat Server then Local:

Run/Debug Configurations	
+ - 🗈 🌮 ♠ ↓ 🗖 ↓ੈ	
Add New Configuration	Press the + button to create a new Tomcat Server Run Configuration based on default settings
Kotlin	
Kotlin (JavaScript - experimental)	a
Kotlin script	
🏶 Maven	
🔟 💷 Mocha	
▶ Multirun	
🔞 Node.js	
🖓 Node.js Remote Debug	
🕼 Nodeunit	
npm .	
NW.js	
Remote	
nt Spring Boot	
👮 Spy-js	
💼 🚔 Spy-js for Node.js	
NG TestNG	
No TestNG Test Discovery	
🥂 Tomcat Server 🔹 🕨	Add New 'Tomcat Server' Configuration
👯 XSLT	🕺 Local
29 items more (irrelevant)	📈 Remote

Click the OK button.

Here is an example configuration to run/debug UAA & PLS & Document Validator & IExHub:

NOTE: If using HTTPS, set up HTTPS port as 8443.

D % 1 + D 1: >> Multirun	
	Name URA 00 PLS & Document Validator & Exhlub
►► MHC Multirun	Server Deployment Logs Code Coverage Startup/Connection
ଶ୍ଚି Spring Boot ଝି Tomcat Server	Application server: Tomcat 8.0.27
AUAA	Open browser
RUAA & PLS WUAA & PLS & Document Validator	🗋 After launch 😨 Default 🗾 🔄 🗋 with JavaScript debugger
ALUAA & PLS & Document Validator & IExHub	http://localhost:8080/
P Defaults	YM options:
	On 'Update' action: Restart server 🔽 🗹 Show glulog
	On frame deactivation: Do nothing
	RE: Default (1.8.0,77 · project SDK) Tomast Server Settings
	HTTP port: 0080 Deploy applications configured in Tornect insta
	HTTPs port Preserve sessions across restarts and redeploys
	JMX port: 1099
	AlP port
	▼ Before launch: Make, Build Artifacts (A), Activate tool window
	Perfore saunce: Mask build Arthracts (4), Activities tool Window + - ≠ + ↓
	4% Make
	80, Build & artifacts
	Show this page 🖬 Activate tool window
	OK Cancel Apply H
Dahua Caafaunatiana	The second se
un/Debug Configurations	
• 🗕 🗊 🛠 🛧 📮 🐙	Name: UAA & PLS & Doc-Validator & IExHub
Multirun	
Spring Boot	Server Deployment Logs Code Coverage Startup/Connection
,	
Tomcat Server	Deploy at the server startup
	Deploy at the server startup
KUAA & PLS & Doc-Validator &	.IExHub cloudfoundry-identity-uaa-3.4.1-01.war + Application context: /iexhub
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub III cloudfoundry-identity-uaa-3.4.1-01.war + Application context: /iexhub
減UAA & PLS & Doc-Validator & べUAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war % pls-web:war exploded % document-validator-ccda-r1:war exploded % document-validator-ccda-r2:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war % pls-web:war exploded % document-validator-ccda-r1:war exploded % document-validator-ccda-r2:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
REAL AND A WEAR A COC-Validator & REAL AND A COLORY	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
REAL AND A WEAR A COC-Validator & REAL AND A COLORY	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
REAL AND A WEAR A COC-Validator & REAL AND A COLORY	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war + Application context: /iexhub B pls-webxvar exploded + - + - + B ocument-validator-ccda-r1:war exploded + - + + + Main context: /iexhub + - + + + + B ocument-validator-ccda-r1:war exploded +
REAL AND A WEAR A COC-Validator & REAL AND A COLORY	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war + Application context: /iexhub B pls-webxvar exploded + - + - + B ocument-validator-ccda-r1:war exploded + - + + + Main context: /iexhub + - + + + + B ocument-validator-ccda-r1:war exploded +
₩UAA & PLS & Doc-Validator & ₩UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
₩UAA & PLS & Doc-Validator & ₩UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-webxvar exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-web:war exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-web:war exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
縦UAA & PLS & Doc-Validator & ※UAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-web:war exploded document-validator-ccda-r1:war exploded c iexhub:war exploded i iexhub:war exploded
減UAA & PLS & Doc-Validator & べUAA Only	IExHub II cloudfoundry-identity-uaa-3.4.1-01.war b pls-web:war exploded document-validator-ccda-r1:war exploded i document-validator-ccda-r2:war exploded i iexhub:war exploded
Real only & PLS & Doc-Validator & Real only	IExHub I cloudfoundry-identity-uaa-3.4.1-01.war Pis-web:war exploded document-validator-ccda-r1:war exploded document-validator-ccda-r2:war exploded iexhub:war exploded iexhub:war exploded
Real only & PLS & Doc-Validator & Real only	.IExHub I cloudfoundry-identity-uaa-3.4.1-01.war + Application context: /iexhub S pls-web:war exploded + + + Application context: /iexhub * i i i i i i i i i i i i i i i i i i i
Revealed a series with the series of the ser	ItexHub ItexHub Application context: //iexhub ItexHub Itexhub Itexhub
	JExHub I cloudfoundry-identity-uaa-3.4.1-01.war + Application context: /iexhub Pis-web:war exploded + Gocument-validator-ccda-r1:war exploded + Texhubwar exploded + Fiexhubwar exploded
Revealed a series with the series of the ser	ItexHub ItexHub Application context: /iexhub ItexHub ItexHub ItexHub

Please note that in the deployment tab:

1. You can Deploy War or Exploded War. Exploded War may have some advantages for quick deployment upon file changes.

Cancel Apply Help

 For the Application context: uaa: /uaa pls: /pls **document-validator**: There are two artifacts, set them as: /documentValidator/r2 and /documentValidator/r1 **lexhub:** /iexhub

Append the following configuration to the file of "catalina.properties" under the directory of tomcat. For instant, C:\java\apache-tomcat-8.0.27\conf
 C2S_KEY=9HPcr8z634
 C2S_PROPS=C:\\intellij-workspaces\\c2s-ws
 AUTO_SCAN=true
 SCAN_PERIOD=30 seconds
 UAA_CONFIG_PATH=C:\\intellij-workspaces\\c2s-ws\\uaa\\config-template
 Note: the path of above configuration is based on your directory.

4.5.1.1 UAA Configuration for SMTP Email Server

To configure SMTP email server for UAA, add the following key-value pair in the "catalina.properties" files in Tomcat: UAA_SMTP_HOST=smtp.gmail.com UAA_SMTP_PORT=587 UAA_SMTP_USER=consent2share@gmail.com UAA_SMTP_PASSWORD=m0vyVUUgfR5u

4.5.2 Use Multirun Plugin to Run C2S

- Multirun Plugin allows you to run multiple run configurations at once: group multiple run configurations and start them in a single click. Not only can application and test run configurations be grouped, but other Multirun configurations can be organized into single run configuration.
- 2. Install the Multirun Plugin:
 - From Welcome screen → Configure → Settings, open Default Settings, Plugins
 - Or from Welcome screen \rightarrow Configure \rightarrow Plugins, open Plugins Dialogue File \rightarrow Settings. In the left-hand pane, select Plugins to install Multirun plugin
- 3. Use cases:
 - o Start batch of tests for multiple modules or applications
 - Start multiple applications, like multiple servers or backend + web application
- 4. Usage:
 - Run -> Edit Configurations...
 - Find and add a new Multirun configuration, such as **Run All C2S**
 - You may add other run configurations to the Multirun configuration
 - Pick options you like

Here is an example a Run/Debug Configurations for C2S:

Run/Debug Configurations	×				
+ — 🖺 🌮 ∔ 🖿 ↓ª	Name: All C2S Share Single instance only				
V Multirun	Choose configurations to run:				
All C2S	+ - + +				
 Spring Boot Tomcat Server P Defaults 	 Run 'DiscoveryServerApplication' Run 'EdgeServerApplication' Run 'EdgeServerApplication' Run 'AdminUIApplication-QB' Run 'PPUIApplication-QB' Run 'ContextHandlerApplication' Run 'DssApplication' Run 'DssApplication' Run 'DssApplication' Start configurations one by one with delay 0 s Mark the tab of failed configuration 				
	Close tab of successfully completed configuration (and leave only tabs of failed configurations)				
	Re-use tab to run configuration (except the tab of failed configurations)				
	<u>B</u> efore launch: Activate tool window				
	$+ - \nearrow + +$				
	There are no tasks to run before launch				
	Show this page 🗹 Activate tool window				
	OK Cancel Apply Help				

4.5.2.1 Run PCM and Patient User API with SMTP Email Server Configuration in Program Argument

If you have not setup SMTP email server configuration as explained in **section 1.12**, you can pass these configuration as program argument in Intellij as below.

Run/Debug Configurations		No. of Concession, Name			And in case of the local division of the loc
+ - 🗅 🌳 🛊 🞍 🖬 🔱	Name: PatientUserApiApplication				🔲 Share 🚿 Single instance
Multirun G Spring Boot	Configuration Code Coverage Logs				
AdminUIApplication-QR AdminUIApplication-FR					
ContextHandlerApplication					
ේ EdgeServerApplication ලේ DSsApplication දේ PPUIApplication-QR දේ PPUIApplication-FR					
PatientUserApiApplication		patient-user			
SteintConsentManagementApplication SepApplication PhrApplication					
୍ରତ୍ତି PatientRegistrationApplication କ୍ଷ୍ୱି TryPolicyApplication କ୍ଷ୍ୱି AdminUApplication					
PPUIApplication Zomcat Server					
► ♀ Defaults	Enabled	Name			alue
4.5.3 Develop C2S Portal UI Projects

When you work on Spring Boot UI project, in order to quick build and run by using Grunt build or watch, you need configure Run/Debug configuration as following:

1. Use case one: Quick to Build and Run UI Project

Use grunt watch or dev/qa build + spring boot run. You can use grunt watch or run grunt dev/qa build whenever you make changes in UI project and then restart related sprint boot run Usage:

- Run -> Edit Configurations...
- Find and edit PPUIApplication configuration
- Navigate to 'Before launch' configuration
- Add Run Maven Goal configuration
- Add compile -PskipGrunt in Command line
 Note: You must make sure the working directory point to related UI maven server project

Here is an example a Run/Debug Configurations for C2S:

Ľ	R	un/Debug Configurations				X
	+	- 🗈 🛠 🕇 🔸 🖿 🐙	Name: PPUIApplication-Q	uick Run	Single instanc	e only
	Ŧ	Multirun	Configuration Code Cove	erage Logs		
		MII C2S	Main class:	gov.samhsa.c2s.ppui.PPUIApplication		[]
		PatientConsentManagementApplica AdminUIApplication-FB	<u>V</u> M options:			
		AdminUIApplication-QB	Program arguments:			
		ContextHandlerApplication	Working directory:			
		DiscoveryServerApplication Monopole Son Application	Environment variables:			
		EdgeServerApplication PepApplication	Use classpath of module:	D a pp-ui		
		PhrApplication PatientUserApiApplication	JRE:	Default (1.8 - SDK of 'pp-ui' module)	· · · · · · · · · · · · · · · · · · ·	
		PPUIApplication-FB PPUIApplication-Quick Run	Spring Boot Settings			
		PatientRegistrationApplication	Enable <u>d</u> ebug output	Hide <u>B</u> anner		
	•	TryPolicyApplication Tomcat Server	Active Profiles:			
	•	Province Server	Override parameters			
			Enabled	Name	Value	+
				No parameters		>>
			Before launch: Maven Goal	Make Activate tool window		
		\sim	+ - / + +			
			Maxim Maven Goal 'ppui: c ↓ Make	ompile -PskipGrunt'		
				Activate tool window		

Select Maven Goal	JAL Database 1.2 - 100 of the of modern	X
Working <u>directory</u>	/intellij-workspaces/c2s-ws/patient-portal-ui/server	🖬
Command line co	ompile -PskipGrunt	
	ок	Cancel

2. Use case two: Full Build and Run UI Project

For a Spring Boot UI project, a Run/Debug configuration is automatically generated, but it does not pick up client resources.

Usage:

- Run -> Edit Configurations...
- Find and edit PPUIApplication configuration
- o Navigate to 'Before launch' configuration
- Add Run Maven Goal configuration
- Add clean install in Command line

Note: You must make sure the working directory point to related UI maven server project

Here is an example a Run/Debug Configurations for C2S:

Run/Debug Configurations	And Annual Annua							
+ - 🗅 🌳 🛊 🖿 😂 🤇	Name: PPUIApplication -	Full Build And Run Share	Single instance only					
 Multirun Spring Boot 	Configuration Logs							
BiscoveryServerApplication	Main class;	gov.samhsa.bhits.ppui.PPUIApplication	(
Model and the second	VM options:		8					
PatientUserApplication			1					
PatientConsentManagementApplica PhrApplication	Working directory:		··· 🛛					
PhrApplication Control Control Control Control Control Control Control								
TryPolicyApplication	Use classpath of module:	Ca pp-ui						
AdminUIApplication BPPUIApplication - Quick Run								
PPUIApplication - Full Build And Rur								
Z Tomcat Server P Defaults	Spring Boot Settings							
	Enable <u>d</u> ebug output	Hide Banner						
1								
	Enabled	Name Value						
	• Before launch: Maven Goal,							
(+ - / + +							
	Run Maven Goal 'ppu: (lean install'						
	- it make							
		OK Cancel	Apply Help					
		Cancer						

Select Maven Goa			X
Working <u>d</u> irectory <u>C</u> ommand line	C:/intellij-workspaces/mhc-ws/patient-portal-ui/server clean install	>	
		ОК	Cancel

Note: Perform the same steps for admin-portal-ui

***Final Remark:

1. Build *common-libraries* first. Several projects in C2S have common-libraries as their dependencies. In order to build these projects successfully, go to common-libraries repository's releases page, download the corresponding releases source code, and build and deploy the artifacts in your local Maven directory or in your own Maven repository.

2. The <u>MDHT</u> dependencies (org.mdht.dependencies:org) is required by the module of *document-validator*, but MDHT cannot be found in Maven central repository. It can be downloaded from Consent2Share document-validator repository's releases page or build from the source code at <u>https://github.com/siteadmin/referenceccdavalidator</u>. After get the artifacts, deploy the artifacts in your local Maven directory or in your own maven repository.

4.6 Configure and Deploy Logback

- 1. Clone the repo: <u>https://github.com/FEISystems/logback-audit</u> to where your C2S_PROPS variable in your catalina.properties point to
- 2. Create a database called `audit`
- 3. Run this script after selecting this schema: <u>https://github.com/FEISystems/logback-audit/blob/master/audit-db/audit_tables-2014-04-07T102006.sql</u>
- 4. Add these variables in the catalina.properties:
 - a. audit.datasource.url=jdbc:mysql://localhost:3306/audit?autoReconnect=true
 - b. audit.datasource.username=root
 - c. audit.datasource.password=admin
 - d. audit.listen.port=9630
- 5. To build the war:
 - a. Navigate to the root of the cloned project in the terminal and run the following commands:

For Windows

mvnw.cmd clean install & cd audit-server-generator\logback-audit-server & ..\..\mvnw.cmd clean install & cd ..\..

For *nix systems

mvnw clean install; cd audit-server-generator/logback-audit-server/; ../../mvnw clean install; cd ../..

Deploy the logback-audit-server war (located in /path/to/ logback-audit/audit-server-generator/logback-audit-server/target/ logback-audit-server-0.6.1-SNAPSHOT.war) to Tomcat in Intellij as external war and run it. Choose any contextpath. To deploy in Tomcat see section
 4.5.1. To verify that it is running, check that the logs are being generated in /java/C2S_LOGS/logback-audit.

4.7 Deploy and Configure Guvnor

- 1. Clone the <u>Guvnor</u> repository from GitHub to your local machine.
- 2. Open IntelliJ and deploy Guvnor war (located in the root of the repository you just cloned) in Tomcat in Intellij as in **section 4.5.1**. Set the context path to **guvnor**.



- 3. Start Tomcat and make sure that Guvnor is deployed and running properly.
- 4. Open a browser and navigate to the Guvnor UI in http://localhost:8080/guvnor

		Notices and Ear Od
Browse	First	
B dinbox	E Name search	
∎ ∲ Assets	Enter the name or part of a name. Alternatively	use the caregories to browse.
	Q	
	Find items with a name matching:	
	Include archived assets in results.	
	Case sensitive:	
	Search	
	E Test search	
	Search for:	Welcome to Gavnor 🗶
	Include archived assets in results:	This looks like a brand new repository.
	Search	Would you like to install a sample repository? Yes, please instal samples. No thanks
	E Atvibute search	Two, preise moai samples inclinants
	Created by:	
	Format	
	Subject	
	Type: External link	
	External link	
	Description	
	Last modified by:	
	Checkin comment:	
Hnowledge Bases	Date created After:	/ Before: /
MOA	Last modified After:	9 Before: 0
Package snapshots	Search	
Administration		Close all fame

When ask to install sample repository click on "No Thanks" button in the dialog.

5. To import the rules, go to the bottom of the left navigation panel, click on **Administration** and then **Import Export** and **Choose File** button to select the **repository_export.xml** in the root of the cloned repository in 1) above.

← → C ☆ () localhost:8080	10/guvnor/org.drools.guvnor.Guvnor/Guvnor.jsp?#ManagerPlace:MANAGER=3	☆ 🥹	0	
🔢 Apps 🛃 BHITS Portfolio Team	🖸 c2s 🖚 C2S Patient 🏟 C2S Admin 🕠 Github - FEi Systems 🌓 bootlint 🤹 bhitsDevelopment 📙 bhits 📒 angular 📒 bhits local 📒 bhits remote 📒 Angu	ılar2 💤 Unanet		» Other bookmarks
9 Drools				Welcome: admin [Sign Out author *
Browse	Find Import Export			
Knowledge Bases	Import/Export			
∛QA				
Package snapshots				
Administration	Choose File repository_export.xml Import			
Gategory				
Status	Export			
Archive				
Devent Log				
🐉 User permission				
Import Export				
Repository Configuration				
(1) About				

6. Click on import. This will import the repository and the system will show you a dialog as below when successful.

	🖸 c2s 🎲 C2S Patient 🎲 C2S Admin 🎧 Github	FE localhost:8080 says: Rules repository imported successfully. Browser will now refresh to show the new content.	bhits remote	Angular2	J~ Unanet		_	Other bookma kome admin <u>ISka</u> autho
∲ Browse ∰Knowledge Bases ∛QA ∲Package snapshots	Find Import Export Import/Export	Prevent this page from creating additional dialogs.						
Administration Category 'd' Status Active Category 'd' Status Active Category Category	Choose File Trepository_export sml	Importing repository, please wait, as this could take some time						

7. At the bottom of the left navigation, if you click on **QA**, **Test Scenarios in packages** and then **AnnotationRules** to the screen below where you can see all the rules.

Apps 🔣 BHITS Portfolio Team	les en col	raudit up CO	1 Admin	Conside - Les Systems D poots	in DratsDeve	opment 🔤 prints 🛃 angu	an in many loca	a sinus remote	Anguiat2	y* unable			Other boo	
() Drools												Wei	come admin au	athor
Browse	Find	AnnotationRul	es §	Scenarios for AnnotationRules	Analysis for Ann	otationRules								
Knowledge Bases	Ť	Run all sc		cage:AnnotationRules										
AnnotationRules	Refresh	ist Open selec	ted Op	pen selected to single tab Archive s	selected									
M Analysis		Format	Valid	Name	Status	Last modified	Open							
H AnnotationRules	0	3	*	ETH Sensitive Category Test	Draft	2016 Oct 20 15:14:58	Open							
	10	B	•	GDIS Sensitive Category Test	Draft	2016 Oct 20 15:16:49	Open							
		B	-	HIV Sensitive Category Test	Draft	2016 Oct 20 15:19:53	Open							
	10	B		PSY Sensitive Category Test	Draft	2016 Oct 20 15:20:21	Open							
	0	2		SDV Sensitive Category Test	Draft	2016 Oct 20 15:20:49	Open							
		B		SEX Sensitive Category Test	Draft	2016 Oct 20 15:21:17	Open							
			*	SICKLE Sensitive Category Te	st Draft	2016 Oct 20 15:22:33	Open							
		B	~	STD Sensitive Category Test	Draft	2016 Oct 20 15:21:43	Open							
		1-9 of 9 💌	• н н	TBOO Sensitive Category Test	Draft	2016 Oct 20 15:23:04	Open							

8. You can test the rules by clicking on the Run all Scenarios. You will see that all the tests will pass as shown below.



Chapter 5 Development Environment Setup the Docker Way

5.1 Introduction

5.1.1 Major Docker Components

Understanding the following concepts and their roles is very important when using the Docker ecosystem:

- Docker Engine (Docker Runtime, Docker Daemon) Shipping Yard
- Images (Templates, Recipes) Shipping Manifests (Build Time)
- Containers (Run Time)
- Index, Registries and Repositories

5.1.2 Tools Installed on Local Development Machine (Windows/OS X)

When installing Docker on a local development machine for Windows/OS X, tools are installed in two environments:

- a) Windows/OS X environment which serves as the Virtual Machine Host. docker-machine command, docker command, docker-compose command, Kitematic GUI, and Docker QuickStart shell are installed in this environment.
 - docker-machine command is the CLI to create and manage virtual machines running docker, such as creating VM (with Docker Daemon installed), setting active VM, and etc.
 - docker command is the Docker CLI client to connect to Docker Daemon as well as Docker Registry to manage images and containers.
 - docker-compose command is the CLI to define and run multi-container applications with Docker.
 - Kitematic is the GUI version of docker command line.
- b) Boot2Docker lightweight Linux virtual machine, which serves as the Docker Host.
 - Docker Daemon is installed in this environment.
 - Images are pulled from Docker registry to the Docker host or built from Dockerfile to the Docker host.
 - Containers are in this host as well.

5.2 Install Docker on Local Development Machine

5.2.1 Install Docker on Windows

5.2.1.1 Prerequisites

1. Install VirtualBox:

You can download VirtualBox binary package from <u>https://www.virtualbox.org/wiki/Downloads</u> for Windows hosts (x86/amd64). Follow instructions to install VirtualBox.

 Install Git for Windows: We are using Git 1.x not 2.x for Windows. It should already be installed on developers' Windows machine.

5.2.1.2 Install Docker ToolBox

- 1. Go to the Docker Toolbox page (<u>https://www.docker.com/products/docker-toolbox</u>).
- 2. Download the installer for Windows.
- 3. Run the installer and follow the instructions. Make sure you make the following changes to the default options in the installation wizard.
- 4. In the dialog of Select Components, uncheck VirtualBox and Git for Windows.

🖶 Setup - Docker Toolbox	
Select Components Which components should be installed?	a
Select the components you want to install; dear the components install. Click Next when you are ready to continue.	you do not want to
Docker Client for Windows	24.3 MB
Docker Machine for Windows	64.9 MB
Docker Compose for Windows	5.9 MB
VirtualBox	81.8 MB
Kitematic for Windows (Alpha)	137.3 MB
Git for Windows	29.3 MB
Current selection requires at least 233.4 MB of disk space.	
< Back	Vext > Cancel

5. After finishing the installation, since we did not check Git for Windows, you need fix the path to Git for Windows in the Docker Quickstart Terminal. Right click Docker Quickstart Terminal, click Properties in the context menu and open the dialog.

De altres Outielesters	T	2/9/2016 11-22 DM	Chartent	2 1/10
Docker Quickstart		3/8/2016 11:32 PM	Shortcut	2 KB
🔁 Kitematic (Alpha)		3/8/2016 11:32 PM	Shortcut	1 KB
Docker Quickstar	t Terminal Properties	22)	
Security	Details	Previous Versions		
General Docks	Shortcut er Quickstart Terminal	Compatibility		
	plication			
Target location: bir				
Target:	C:\Program Files\Git\bin\	bash.exe" Hogin i "C:\		
Start in: "O	C:\Program Files\Docker	Toolbox"		
Shortcut key: N	one			
Run: N	omal window	•		
Comment:				
Open File Loca	tion Change Icon.	Advanced		
	ОК С	Apply		

6. Change the path as shown in the following screenshot and then click OK to save and quit.

Docker Quicks	tart Terminal P	roperties		23
Compatibility	Security	Details	Previous V	ersions
General Sho	ortcut Option	ns Font	Layout	Colors
	cker Quickstart	Teminal		
Target type:	Application			
Target location:	bin			
Target:	"C:\Program Fil	es (x86)\Git\bi	n\bash.exe" -	gin
-				_
Start in:	"C:\Program Fil	es\Docker To	olbox''	
_				
Shortcut key:	None			
Run:	Normal window	,		-
Comment:				
comment.				
Open File Lo	cation Ch	ange Icon	Advance	d
	OK	Car	ncel	Apply

7. Next, double-click the Docker Quickstart Terminal shortcut to open the terminal. It may not run correctly and you may get the following screen:



Don't worry, just close this window and run Docker Quickstart Terminal shortcut again. You will bet the following:



8. To verify the installation, type the following commands in the Docker Quick Start Terminal (you should see the output shown in the screenshot below for each command):

• MINGW32:/c/Users/tao.lin		23							
tao.lin@TAOLINLT2 ~ \$ docker-machineversion docker-machine.exe version 0.6.0, build e27fb87									
tao.lin@TAOLINLT2 ~ \$ dockerversion Docker version 1.10.1, build 9e83765									
tao.lin@TAOLINLT2 ~ \$ docker-composeversion docker-compose version 1.6.0, build cdb920a									
tao.lin@TAOLINLT2 ~ \$ docker-machine ls NAME ACTIVE DRIVER STATE URL SWARM default * virtualbox Running tcp://192.168.99.100:2376	DOCKER v1.10.1								
tao.lin@TAOLINLT2 ~		-							
		▶							

- Open the Oracle VM Virtual Box Manager. You should see that the Docker host named "default" is running as well.
- 10. You should also be able to run the command *docker images* to connect to the Docker daemon running on the VM named "default."
- 11. Keep the Docker host running and open the Window Batch Command Line. You should be able to run all of the commands in the screenshot above (i.e. "docker-machine --version", "docker -version", "docker-compose --version", "docker-machine ls") without error.

However, if you run the command *docker images*, you will get the error in the below screenshot:



The reason for this error is because the Docker client doesn't know the location of the Docker host. In Section 5.3, we will discuss how to resolve this error.

If you want to know more details about installing Docker, please refer to the "Install Docker for Windows" page here: https://docs.docker.com/windows/step_one/.

5.2.2 Install Docker on Mac OS X 5.2.2.1 Prerequisites Install VirtualBox:

You can directly download VirtualBox to install, or you can use Homebrew to install. Using the OS X package manger Homebrew is the preferred way to install VirtualBox. If you do not have Homebrew installed on your Mac, you can obtain it by following the instructions on the <u>Homebrew</u> website.

To Install VirtualBox Using Homebrew:

First, reset the permissions of /usr/local and Homebrew's caches to the current user:

sudo chown -R \$USER:admin /usr/local /Library/Caches/Homebrew

Then use the following command to install VirtualBox:

brew cask install virtualbox

Install Git:

Git should be already installed on a developers' Mac machine, so you should not have to install Git yourself.

5.2.2.2 Install Docker ToolBox

- 1. Go to the Docker Toolbox page (<u>https://www.docker.com/products/docker-toolbox</u>).
- 2. Download the installer for Mac OSX.
- 3. Run the installer and follow the instructions to install.
- 4. To verify the installation, type the following commands on by one in the Docker Quick Start Terminal:

\$docker-machine -version
\$dockerversion
\$docker-composeversion
\$docker-machine ls

5. You should see the output shown in the screenshot below for each command:



- 6. Open Oracle VM Virtual Box Manager. You should see that the Docker host named "default" is running as well.
- 7. You should also be able to run *docker images* command to connect to Docker daemon running on the VM named default.
- 8. Keep the Docker host running and open the regular Terminal Command Line. You should be able to run all of the commands in the screenshot above (i.e. "docker-machine --version", "docker -- version", "docker-compose --version", "docker-machine Is") without error.

However, if you run the command *docker images*, you will get the error as shown below.

		😭 taolin —	bash — 85×14		
Last login: Fri Ma	ar 11 09:28:44	on ttys0	00		
[shildebrandlt1:~ t	aolin\$ docker	-machine	version		1
docker-machine ver	sion 0.6.0, b	uild e27f	b87		
[shildebrandlt1:~ t	aolin\$ docker	versio	n		1
Docker version 1.1	0.2, build c3	959b1			
[shildebrandlt1:~ t	aolin\$ docker	-machine	ls		1
NAME ACTIVE ERRORS	DRIVER	STATE	URL	SWARM	DOCKER
default -	virtualbox	Running	tcp://192.168.99.100:2376		v1.10.3
[shildebrandlt1:~ t Cannot connect to shildebrandlt1:~ t	the Docker da	-	the docker daemon running on	this hos	;t?

You can see that the Docker client doesn't know the location of the Docker host. In Section 3, we will discuss how to resolve this issue.

If you want to know more installation details, please refer to the Install Docker for Mac OSX page (<u>https://docs.docker.com/mac/step_one/</u>).

5.3 Configure Docker on Local Development Machine

5.3.1 Configure Docker on Windows

5.3.1.1 Make Docker Work in Batch Command Line

If you do not want to know the details, you can go directly to Section 5.3.1.2 to set up the environment variables.

At the end of section 5.2.1, we know that there was an error when using Docker client in Windows Batch command line: Docker client doesn't know where the Docker host is.

- We need to set a "DOCKER_HOST" environment variable. One way to do it is to use the following command in the command line to set it up for just this command line session: SET DOCKER_HOST=tcp://192.168.99.100:2376
- 2. The IP address is the Docker host virtual machine IP address that you get by using the following command:

docker-machine Is

3. Try again to issue the *docker images* command to query Docker Daemon on Docker host. (Note: make sure the Docker host is running first.)



4. You will still get an error message, but now it is related to TLS. To fix it, you need to set up another environment variable:

SET DOCKER_TLS_VERIFY=1

5. Now try the *docker images* command again. You will get another error message:



- It looks like we need to set up the certificate path. Docker Toolbox installation already provides one. Use the following command to set it up: SET DOCKER_CERT_PATH=%USERPROFILE%\.docker\machine\certs
- 7. Now try running the *docker images* command yet again. You should see the following:

C:\WINDOWS\system32\cmd.exe			• X
x03\x01\x00\x02\x02". * Are you trying to connect to a	TLS-enabled daem	on without TLS?	^
C:\Users\tao.lin>SET_DOCKER_TLS_U	ERIFY=1		
C:\Users\tao.lin>docker images Could not read CA certificate "C: rs\tao.lin\.docker\ca.pem: The sy C:\Users\tao.lin>SET DOCKER_CERT_	stem cannot find	the file specified.	C:\Use
C:\Users\tao.lin>docker images REPOSITORY	TAG	IMAGE ID	CRE
ATED SIZE			23
springio/gs-spring-boot-docker hours ago 669.1 MB	latest	385ecbb73f93	23
nginx	latest	fd19524415dc	8 d
ays ago 134.6 MB mongo	latest	598dØdef97f1	3 w -

- 8. Now, the Docker client can connect to the Docker Daemon running on the Docker host.
- 9. We needed to set up three Environment Variables to get Docker client and Docker Daemon connected. In this section, we set these Environment Variables in the command line session, but they will be gone after you close the command line.
- 10. We need a persisted location to save these Environment Variables.

5.3.1.2 Set User Environment Variables for Docker

In order to make the Docker client work everywhere in Windows, we can set up three User Environment Variables:

1. Note that the IP address in the screenshot below for the "DOCKER_HOST" variable is the Docker host virtual machine IP address that you get by using the command: *docker-machine ls*

New User Variable	22
Variable name:	DOCKER_HOST
Variable value:	tcp://192.168.99.100:2376
	OK Cancel

New User Variable	×
Variable name:	DOCKER_CERT_PATH
Variable value:	%USERPROFILE%\.docker\machine\certs
	OK Cancel

New User Variable	x
Variable name:	DOCKER_TLS_VERIFY
Variable value:	1
	OK Cancel

Variable		Value			1
DOCKER_CERT_P/ DOCKER_HOST	АТН	C:\Users\tao.lin\.do tcp://192.168.99.1			
DOCKER_TLS_VER	IFY	1		Þ	-
		w Edit		Delete	
ystem variables Variable	Value	w Edit		Delete	4
Variable APACHE_HOME ChocolateyInstall	Value C:\too C:\Pro	ols \apache \Apache 24 ogramData \chocolate		Delete	-
Variable APACHE_HOME	Value C: \too C: \Pro C: \clo	ols\apache\Apache24	y	Delete	

2. Click the OK button to save these new variables.

3. Open Windows Batch command line and issue the *docker images* command. As long as the Docker host is running, you should get a response from Docker Daemon.

5.3.2 Configure Docker on Mac OS X

5.3.2.1 Make Docker Work in Terminal Command Line

If you do not want to know the details, you can go directly to Section 5.3.2.2 to set up the environment variables.

- 1. At the end of section 5.2.2.2, we know that there was an error when using Docker client in OSX Terminal command line: Docker client doesn't know where the Docker host is.
- We need to set a DOCKER_HOST environment variable. One way to do it is to use the following command in the command line to set it up for just this command line session:
 export DOCKER_HOST=tcp://192.168.99.100:2376
- 3. The IP address is the Docker host virtual machine IP address that you get by using the following command:

docker-machine Is

4. Try again to issue the *docker images* command to query Docker Daemon on Docker host. (Note: make sure the Docker host is running first.)



5. You will still get an error message, but now it is related to TLS. To fix it, you need to set up another environment variable:

export DOCKER_TLS_VERIFY=1

6. Now try the *docker images* command again. You will get another error message:

• • •	🏠 taolin — -bash — 109×13			
NAME ACTIVE DRIVER STATE default - virtualbox Running shildebrandlt1:~ taolin\$ docker images Cannot connect to the Docker daemon. Is Ishildebrandlt1:~ taolin\$ export DOCKER_ shildebrandlt1:~ taolin\$ docker images [Get http://192.168.99.100:2376/v1.22/im # Are you trying to connect to a TLS-en Ishildebrandlt1:~ taolin\$ export DOCKER_ Ishildebrandlt1:~ taolin\$ docker images Could not read CA certificate "/Users/t or directory shildebrandlt1:~ taolin\$	URL tcp://192.168.99.100:2376 the docker daemon running on HOST=tcp://192.168.99.100:2370 ages/json: malformed HTTP resp abled daemon without TLS? TLS_VERIFY=1	6 ponse "\;	x15\x03\x0	uch file

7. It looks like we need to set up the certificate path. Docker Toolbox installation already provides one. Use the following command to set it up:

export DOCKER_CERT_PATH=\$HOME/.docker/machine/certs

8. Now try running the *docker images* command yet again. You should see the following:

	😭 taolin — -bas	10.20		
Last login: Fri Mar 11 11:09:27 on				
[shildebrandlt1:~ taolin\$ docker-ma				
	ATE URL	SWARM	DOCKER ERROR	S
	nning tcp://192.168.99.	.100:2376	v1.10.3	
[shildebrandlt1:~ taolin\$ docker im				
Cannot connect to the Docker daemo	n. Is the docker daemon i	running on this hos	t?	
[shildebrandlt1:~ taolin\$ export DO	-	99.100:2376		
[shildebrandlt1:~ taolin\$ docker im	3			
Get http://192.168.99.100:2376/v1.			15\x03\x01\x00\x	(02\x02".
Get http://192.168.99.100:2376/v1. * Are you trying to connect to a T			15\x03\x01\x00\x	(02\x02".
* Are you trying to connect to a T [shildebrandlt1:~ taolin\$ export DO	LS-enabled daemon without CKER_TLS_VERIFY=1		15\x03\x01\x00\x	.02\x02".
* Are you trying to connect to a T	LS-enabled daemon without CKER_TLS_VERIFY=1		15\x03\x01\x00\x	.02\x02".
* Are you trying to connect to a T [shildebrandlt1:~ taolin\$ export DO	'LS-enabled daemon without CKER_TLS_VERIFY=1 ages	t TLS?		
* Are you trying to connect to a T [shildebrandlt1:~ taolin\$ export DO [shildebrandlt1:~ taolin\$ docker im	'LS-enabled daemon without CKER_TLS_VERIFY=1 ages	t TLS?		
* Are you trying to connect to a T [shildebrandlt1:~ taolin\$ export DO [shildebrandlt1:~ taolin\$ docker im Could not read CA certificate "/US	'LS-enabled daemon without CKER_TLS_VERIFY=1 lages ers/taolin/.docker/ca.per	t TLS? m": open /Users/tac		
* Are you trying to connect to a T [shildebrandlt1:~ taolin\$ export DO [shildebrandlt1:~ taolin\$ docker im Could not read CA certificate "/Us directory	'LS-enabled daemon without CKER_TLS_VERIFY=1 ages ers/taolin/.docker/ca.per CKER_CERT_PATH=\$HOME/.doc	t TLS? m": open /Users/tac		
* Are you trying to connect to a T [shildebrandlt1:~ taolin\$ export DO [shildebrandlt1:~ taolin\$ docker im Could not read CA certificate "/Us directory [shildebrandlt1:~ taolin\$ export DO	'LS-enabled daemon without CKER_TLS_VERIFY=1 ages ers/taolin/.docker/ca.per CKER_CERT_PATH=\$HOME/.doc	t TLS? m": open /Users/tac		
* Are you trying to connect to a T [shildebrandlt1:~ taolin\$ export DO [shildebrandlt1:~ taolin\$ docker im Could not read CA certificate "/Us directory [shildebrandlt1:~ taolin\$ export DO [shildebrandlt1:~ taolin\$ docker im	'LS-enabled daemon without CKER_TLS_VERIFY=1 lages ers/taolin/.docker/ca.per ICKER_CERT_PATH=\$HOME/.doc lages	t TLS? m": open /Users/tac cker/machine/certs	lin/.docker/ca.p	

- 9. Now the Docker client can connect to the Docker Daemon running on the Docker host.
- 10. We needed to set up three Environment Variables to get Docker client and Docker Daemon connected. In this section, we set these Environment Variables in the command line session, but they will be gone after you close the command line.
- 11. We need a persisted location to save these Environment Variables.

5.3.2.2 Set User Environment Variables for Docker

In order to make the Docker client work in Terminal in OS X, we can set up three User Environment Variables (note that the IP address for the "DOCKER_HOST" variable is the Docker host virtual machine IP address that you get by using the command: *docker-machine ls*):

1. Open the ~/.bash_profile file (or create a new one if it doesn't already exist).

•••	🏠 taolin — -bash — 83×8
Last login: Fri Mar 11 11:37:4 [shildebrandlt1:~ taolin\$ docker Cannot connect to the Docker of [shildebrandlt1:~ taolin\$ cat ~ cat: /Users/taolin/.bash_profi [shildebrandlt1:~ taolin\$ touch shildebrandlt1:~ taolin\$	er images daemon. Is the docker daemon running on this host? //.bash_profile ile: No such file or directory

- 2. Add the following lines to the end of the file:
 - o export DOCKER_HOST=tcp://192.168.99.100:2376
 - export DOCKER_TLS_VERIFY=1

• export DOCKER_CERT_PATH=\$HOME/.docker/machine/certs



Save the ~/.bash_profile file, and then close the terminal window. Reopen a new terminal and issue the command *docker images*; you will get response from Docker Daemon on local host.

Chapter 6 Run and Debug Apps the Docker Way

Note: This document is used to run C2S application using Docker.

Prerequisite:

Install Docker: "Setup, Configure, and Use Docker on Local Dev Machine".

Note: if some commands not run on windows shell, try to run in git bash, docker terminal, or Cygwin.

Steps to Run C2S Application with Docker

- 1. Pull all C2S project from git repository to your local workspace. https://github.com/orgs/FEISystems/dashboard
- 2. Add dockerhost to hosts under C:\Windows\System32\drivers\etc Example: 192.168.99.100 dockerhost
- 3. Config virtual box,
 - Go to Oracle VM virtualBox Manager \rightarrow power off the default VM \rightarrow click "setting"
 - Under the System, you can increase the memory.
 - Under the Network \rightarrow click Adapter $3 \rightarrow$ Enable Network Adapter \rightarrow choose Bridged Adapter \rightarrow Allow VMs \rightarrow click OK \rightarrow start the default VM

🗿 Oracle VM VirtualBox N	Manager 📃 🗖	
File Machine Help		
New Settings Discard S	how Details I Sn	apshots
64 default	General Preview	
default - Settings	ି <mark>ଅ</mark>	
General	Network	
🛒 System	Adapter 1 Adapter 2 Adapter 3 Adapter 4	≡
Display	C Enable Network Adapter	U)
Storage	Attached to: Bridged Adapter 🔻	
Audio	Name: Intel(R) Ethernet Connection I217-LM	
	▼ Advanced	
Network	Adapter Type: PCnet-FAST III (Am79C973)	
Serial Ports	MAC Address: 08002781C5DA	\mathbf{H}
USB	Cable Connected	
Shared Folders	Port Forwarding	
User Interface		•
Invalid s	ettings detected M OK Cancel Help	

4. Create images form project

* Pease refer the <u>infrastructure</u> folder in GitHub for standing up a C2S running instance and related infrastructure using*Docker* and *Docker Compose*.

- Go to ~\consent2share\infrastructure\scripts, run build-all.sh in git bash to create all C2S application images.
- 5. Manual build each images.
 - o For each project,

run "mvn clean package docker:build"

- For patient-portal-ui and admin-portal-ui run "mvn clean package -Pdocker docker:build"
- o For uaa,
 - run "gradlew install"
 - copy war under uaa/build/libs/*.war to docker/uaa.war;
 - go to docker folder, run "docker build -t uaa
- 6. images operation in Docker.
 - o check images: "docker images"
 - remove image: "docker rmi <image name or id>"
- 7. Run images in container.
 - Run all applications:
 Go to ~\consent2share\infrastructure\developmentproject and run "docker-compose up" in command line.
 - Run each application using docker-compose:
 - To Run container using scale: (including create and start container) "docker-compose scale <service name in docker-compose.yml>=1" Example : docker-compose scale uaa.c2s.com=1
 - To destroy container: (including stop and remove container)
 - "docker-compose scale < service name in docker-compose.yml>=0" Example: docker-compose scale uaa.c2s.com=1
 - To start container: (container already created)
 - "docker-compose start < service name in docker-compose.yml>" Example : docker-compose start uaa.c2s.com
 - To stop container: (including stop and remove container) "docker-compose stop < service name in docker-compose.yml>" Examples: docker-compose stop uaa.c2s.com
 - Docker operations
 - list containers: "docker ps" or "docker ps -a" (including stopped containers)
 - Remove containers: "docker rm <container name or id>"
 - run container from images: docker run –d <image name>
 Example : "docker run –d --name pcm pcm"
- 8. Enable remote debug C2S applications:
 - For spring boot application:
 - copy the entrypoint line from Dockfile.



- added "-agentlib:jdwp=transport=dt_socket,address=8000,suspend=n,server=y" to your entrypoint and put in docker-compose.yml under service.
- Map the container debug port to docker host map.



- For Tomcat application:
 - Add the following line as environment under the service.

```
" CATALINA_OPTS: -
```

agentlib:jdwp=transport=dt_socket,server=y,suspend=n,address=8000."

• Map the container debug port to docker host map.



- 9. Start remote debug in Intellij
 - In RUN→edit configuration → press + → select Remote.
 - In the remote page: use docker host ip as host field, use docker host port as port, select the module's classpath. Click ok. ("docker-machine Is" to check docker host ip and "docker ps" to check which port mapped to or check in your docker-compose.yml)
 - Start your container and click the start the debug. The debug window will show in the bottom of intellij and showing "conneted to VM".

Run/Debug Configurations	
+ — 🛐 🌮 ↑ ↓ 🛛 » <u>N</u> an	ne: L
Add New Configuration	gur
🧋 Gulp.js	
JAR Application	man
🐻 JavaScript Debug	ntl
JUnit	
JUnit Test Discovery	DK 1
Kotlin	buç
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🍄 Maven	age
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🔎 NW.js	gs
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Run/Debug Configurations		X		
+ - 🗈 % 🛧 🔹	Name: pcm	Sing		
 Q Docker Deployment Remote 	Configuration Logs			
₽ pcm	Command line arguments for running remote JVM			
🕨 💰 Spring Boot	-agentlib:jdwp=transport=dt_socket,server=y,suspend=n,address=8000			
Keine Kei	For JDK 1.4 x			
Pefaults	-Xdebug -Xrunjdwp:transport=dt socket,server=y,suspend=n,address=8000			
	-Adebug -Atunjuwp:transport-at_socket,server-y,suspend-n,address-0000			
	For JDK 1.3.x or earlier			
	-Xnoagent -Djava.compiler=NONE -Xdebug			
	-Xrunjdwp:transport=dt_socket,server=y,suspend=n,address=8000			
	Settings			
	Transport: O Socket O Shared memory			
	Debugger mode: • Attach C Listen			
	Host: 192.168.99.100 Port: 8000			
	Search sources using module's classpath:			
	<u>B</u> efore launch: Activate tool window			
	ок Cancel Apply	Help		

10. Check log file.

- Container logs can be check in command line.
 Run "docker logs <constainer name or id>".
- Tomcat logs can be find in the container under "/usr/local/tomcat/logs"
 Run "docker exec -it <constainer name or id> bash" to access container.
- Application logs are located under java/C2S_LOGS.

- 11. Useful Docker command:
 - Stop all running containers: docker ps -a -q | xargs docker stop
 - o Remove all containers: docker ps -a -q | xargs docker rm
 - o Remove all images: docker images -a -q | xargs docker rmi
 - Remove all dangling images: docker images -qf dangling=true | xargs docker rmi
- 12. (optional) Docker integration plugin for intellij
 - 1. File→setting→plugin→ Install JetBrains plugin... →search "docker integration" and install it.

Browse JetBrains Plugins	O Dear All pla	
Q• docke	Gategory: All 👻	
	Sort by: name 🔻	TOOLS IN
🔏 Docker integration	190,082 会会会会会	Docker
TOOLS INTEGRATION	6 days ago	****
		Updated

 File→setting→type "clouds" in search filed→select "Clouds" under "Build, Execcution, deployment" → + →select docker in dropdown menu. →setup url and certificate folder.

Build, Execution, Deploy	ment > Clouds		
+ -	Name: docker-default		
	API URL:	https://192.168.99.100:2376	
	Certificates folder:	C\Users\docker\machine\machines\default	
	Docker Compose executable:		
	Import credentials from D	Docker Machine	
	Docker Machine executab	le: docker-machine	Deter
	Machine:		
	<mark>+</mark> -	docker-default API URL: Certificates folder: Docker Compose executable: Import credentials from []	April URL: April URL: April URL: CrUbers/Impachine/machine/machine/default Docker Compose executable: Import credentials from Docker Machine Docker Machine



4. Example: pp-ui

Run/Debug Configurations	
+ - 🖞 🧚 🕇 🔸 »	Name: pp-ui Single instance only
V Docker Deployment	Deployment Container
🔍 pp-ui	
Carlor Contraction Contractic Contracti	
🖾 pcm	Deployment: 🔍 Docker Image
Remote	Image ID: pp-ui:latest
🕨 💰 Spring Boot	Container name: pp-ui
K Tomcat Server	
🕨 🛠 Defaults	Open browser
	After launch 💿 Default 🔹 \cdots 🗌 with JavaScript debugger
	Debug port:
	▼ Before launch: Maven Goal, Activate tool window
	Par Aven Goal
	Show this page 🗹 Activate tool window
	OK Cancel Apply Help

Run/Debug Configurations		X
+ - 🖞 ⊁ ↑ 🔸 »	Name: pp-ui	Single instance on
Docker Deployment Opp-ui	Deployment Container	
Ktrypolicy	Server: Q docker-default	▼
🔍 pcm Opis	Deployment: 🔍 Docker Image	•
 Remote 	Image ID: pp-ui:latest	
🕨 💰 Spring Boot	Container namer an ui	
K Tomcat Server	🖳 Select Maven Goal	X
Perfaults	Working directory C\intellij-workspace\patient-portal-ui\server	🖬
	Command line	
		OK Cancel
	* Before launch: Maven Goal, Activate tool window	
	<mark>+</mark> - / ↑ ↓	
	Run Maven Goal	
	Show this page 🗹 Activate tool window	
	ок	Cancel Apply Help

Go to container,

- 13. JSON file \rightarrow click \square ->choose a folder under target to generate the container setting.json.
- 14. Under links \rightarrow select "discovery-server.c2s.com" \rightarrow Apply

+ - 🗅 % 🕈 + »	Name: pp-ui		Share Single instance
Docker Deployment	Deployment Cor	ntainer	
	JSON file: vork Entrypoint Command: Publish all pc Port bindings Units		er settingsjoon 💮 🔁 🖸
	 Volume bindings Environment varia 	ables	
	■ Refore launch: Man	ven Goal Artivate tool window	Cancel Apply Hel