Pharma Net

Network setup and Execution as follows.

**Introduction:**

This project contains 4 phases

Phase 1: Project Setup

Step 1.1: Extract Zip file

Step 1.2: About zip file and its content

Step 1.3: Path Setup

Phase 2: Pre-Network setup

Step 2.1: Generate Certification and confix tx gen files.

Step 2.2: bring up network

Step 3.3: Join all the peers to the network.

Phase 3: Install & Instantiate Chain Code.

Step 3.1: install Chaincode into all the peers.

Step 3.2: Instantiate chiancode into any one peer. In this case peer0.manufacturer.

Phase 4: Node application and client testing.

Step 4.1: Bring up the node application.

Step 4.2: Execute test cases from Postman collections result details.

**Phase 5: Each Test case results**

Lets go-over each and every phase in detail step by step.

**Phase 1: Project Setup**

Step 1.1: Download the zip file Capstone\_Project\_Sathish\_Kumar.zip and extract it in any directory.

Step 1.2: You can see 4 folders and few files.

1. Application: This folder contains client and server application required files.
2. Chaincode: This folder contains fabric network business logic that is chaincode files.
3. Network: this folder contains all the fabric network setup files. Like crypto-config, channel-artificates, scripts, and .sh files.
4. Tests: This folder contains postman collection json files to test the application and chain code.
5. Instructions.docx and pdf files. These files explains how to setup, run and test this application.

Step 1.3: Set or Add path variable in .base\_profile or terminal. <basefolder> can be any user specific folder.

<basefolder>/Capstone\_Project\_Sathish\_Kumar/pharma-net/network/bin

The bin folder contains files for Mac-OS. If user uses different os then need to copy the required files into the bin folder to verify this application.

**Phase 2: Pre-Network setup**

Step 2.1: Generate Certificate files using fabricnetwork.sh shell script file.

In new terminal window execute below commands.

Command 2.1: cd <basefolder>/Capstone\_Project\_Sathish\_Kumar/pharma-net/network

Command 2.2: create crypto-config & channel-artifacts folder if not available.

Command 2.3: execute fabricNetwork.sh generate command

. fabricNetwork.sh generate

This will generate the following network setup files for each organizations.

File 1: genesis.block

File 2: channel.tx

File 3: distributorMSPanchors.tx

File 4: manufacturerMSPanchors.tx

File 5: transporterMSPanchors.tx   
File 6: consumerMSPanchors.tx

File 7: retailerMSPanchors.tx

Command 2.4: execute below command to bring up the all the required docker container. If no container available, then this will download the required container.

. fabricNetwork.sh up

And also this command will create a new channel in orderer and also ask all other peers to join in this channel.

**Phase 3: Install & Instantiate Chain Code**

Command 3.1: execute below command to install the chain code on all the peer servers.

. fabricNetwork.sh install

Command 3.2: in a new terminal window execute below commands. This will login to chaincode container and install node app on chaincode container.

docker exec -it chaincode /bin/bash

npm install

npm run start-dev

Command 3.3: goto previous terminal windows and execute below command. This command will instantiate the chaincode in node application.

. fabricNetwork.sh instantiate

**Phase 4: Node server application and client testing.**

Command 4.1: In a new terminal window execute below commands one by one. This will install node application.

cd <basefolder>/Capstone\_Project\_Sathish\_Kumar/pharma-net/application

npm install

node index.js

The node application is ready execute the transactions in fabric network blockchain application. You can see below the log statement “Distributed Pharma Network App listening on port 3000!”

Command 4.2: Open postman application for testing.

**Note : While executing postman if you get any error please try to execute again. It might take some more time to commit the data into the network. Hence postman some time may throw exception.**

Command 4.3: Import all the postman collections available in<basefolder>/Capstone\_Project\_Sathish\_Kumar/pharma-net/test folder in the same order.

1. 01\_Add\_to\_wallet.postman\_collection.json
2. 02\_Test\_Case\_1\_Initiation.postman\_collection.json
3. 03\_Test\_Case\_2\_Supply\_Chain\_Part\_A.postman\_collection.json
4. 04\_Test\_Case\_2\_Supply\_Chain\_Part\_B.postman\_collection.json
5. 05\_Test\_Case\_2\_Supply\_Chain\_Part\_C.postman\_collection.json
6. 06\_Test\_Case\_3\_History\_Track\_Down.postman\_collection.json

The postman collection snapshot looks below

A screenshot of a cell phone

Description automatically generated

Command 4.4: Edit and add the wallet private key files in add\_to\_wallet test case for all the organizations to execute the postman client application as below.

In a postman application goto -> 01\_Add\_to\_wallet -> 1\_AddToManufactureWallet -> In body change certificatePath and privateKeyPath attributes.

“certificatePath”:”<basefolder>/Capstone\_Project\_Sathish\_Kumar/pharma-net/network/crypto-config/peerOrganizations/manufacturer.pharma-network.com/users/Admin@manufacturer.pharma-network.com/msp/signcerts/Admin@manufacturer.pharma-network.com-cert.pem”

“privateKeyPath”:”<basefolder>/Capstone\_Project\_Sathish\_Kumar/pharma-net/network/crypto-config/peerOrganizations/manufacturer.pharma-network.com/users/Admin@manufacturer.pharma-network.com/msp/keystore/d5a4efd1ad5cd7cab757afa3f25a86afe79bc1725d4349cb3ebfbd31b51b48f3\_sk”

Note : The keystore file wil be generated at runtime hence you cannot use the same file mentioned in examples.

Command 4.5: Once you added certificatePath & privateKeyPath for all the 5 organizations. You can use postman collection runner util to run 01\_Add\_to\_Wallet test cases at once as below.

A screenshot of a cell phone

Description automatically generated

Hit the run button it will prompt to select the test cases. Beased on the need you can chose multiple test cases. Or All, Or None. Please select all the test case and run.

And output would be.

Add To Wallet testcases output.

A screenshot of a cell phone

Description automatically generated

Command 4.6: Like this you can execute one by one collections.

Executing 02\_Test\_Case\_1\_Initiation collection and result would be.

A screenshot of a social media post

Description automatically generated

Command 4.7: Executing 03\_Test\_Case\_2\_Supply\_Chain\_Part\_A and its result would be

A screenshot of a social media post

Description automatically generated

Command 4.8: Executing 04\_Test\_Case\_2\_Supply\_Chain\_Part\_B and its result would be

A screenshot of a social media post

Description automatically generated

Command 4.8: Executing 05\_Test\_Case\_2\_Supply\_Chain\_Part\_C and its result would be

A screenshot of a social media post

Description automatically generated

Command 4.9: Executing 06\_Test\_Case\_3\_History\_Track\_Down and its result would be

A screenshot of a cell phone

Description automatically generated

**Phase 5: Each Test case results.**

Test Case 1: 1\_AddToManufactureWallet

URL:

<http://localhost:3000/addToWallet>

Input Json:

{

"organization":"manufacturer",

"certificatePath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/manufacturer.pharma-network.com/users/Admin@manufacturer.pharma-network.com/msp/signcerts/Admin@manufacturer.pharma-network.com-cert.pem",

"privateKeyPath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/manufacturer.pharma-network.com/users/Admin@manufacturer.pharma-network.com/msp/keystore/10fd7730fa19002b17c90da1d6385d25db7745cf2a6706545e8e9616f81d6349\_sk"

}

Output Json:

{

"status": "success",

"message": "Identity for organization : manufacturer, added to wallet successfully."

}

Test Case 2: 2\_AddToDistributorWallet

URL:

<http://localhost:3000/addToWallet>

Input Json:

{

"organization":"distributor",

"certificatePath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/distributor.pharma-network.com/users/Admin@distributor.pharma-network.com/msp/signcerts/Admin@distributor.pharma-network.com-cert.pem",

"privateKeyPath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/distributor.pharma-network.com/users/Admin@distributor.pharma-network.com/msp/keystore/d4b5cc7a9b3571bbce02d1f0a66efc78011677388306768d68d61caeabe86da1\_sk"

}

Output Json:

{

"status": "success",

"message": "Identity for organization : distributor, added to wallet successfully."

}

Test Case 3: 3\_AddToRetailerWallet

URL:

<http://localhost:3000/addToWallet>

Input Json:

{

"organization":"retailer",

"certificatePath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/retailer.pharma-network.com/users/Admin@retailer.pharma-network.com/msp/signcerts/Admin@retailer.pharma-network.com-cert.pem",

"privateKeyPath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/retailer.pharma-network.com/users/Admin@retailer.pharma-network.com/msp/keystore/2374068a766437a78180a576b8fa8617ea1e15198bce954969ce3d9abbbc7e6e\_sk"

}

Output Json:

{

"status": "success",

"message": "Identity for organization : retailer, added to wallet successfully."

}

Test Case 4: 4\_AddToTransporterWallet

URL :

<http://localhost:3000/addToWallet>

Input Json :

{

"organization":"transporter",

"certificatePath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/transporter.pharma-network.com/users/Admin@transporter.pharma-network.com/msp/signcerts/Admin@transporter.pharma-network.com-cert.pem",

"privateKeyPath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/transporter.pharma-network.com/users/Admin@transporter.pharma-network.com/msp/keystore/45546a7646f8b9f2165776c5accf0b4a528d985a3b861915f6793fbcfd15e20a\_sk"

}

Output Json:

{

"status": "success",

"message": "Identity for organization : transporter, added to wallet successfully."

}

Test Case 5: 5\_AddToConsumerWallet

URL :

<http://localhost:3000/addToWallet>

Input Json :

{

"organization":"consumer",

"certificatePath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/consumer.pharma-network.com/users/Admin@consumer.pharma-network.com/msp/signcerts/Admin@consumer.pharma-network.com-cert.pem",

"privateKeyPath":"/Users/sathishkumar\_su/personal/blockchain/git/pharma-net/network/crypto-config/peerOrganizations/consumer.pharma-network.com/users/Admin@consumer.pharma-network.com/msp/keystore/bffa3c1a6a5eec44cc4471e8e00ab35a1376296a083cf0344a0fe6aec9c6b714\_sk"

}

Output Json:

{

"status": "success",

"message": "Identity for organization : consumer, added to wallet successfully."

}

Test Case 6: 001\_Registrator\_Manufacture\_1

URL :

<http://localhost:3000/registerCompany>

Input Json :

{

"companyName":"Sun Pharma",

"companyCrn":"MAN001",

"location":"Chennai",

"organisationRole":"manufacturer"

}

Output Json:

{

"status": "success",

"message": "The New Company has been Registered Successfully.",

"drug": {

"companyCrn": "MAN001",

"companyName": "Sun Pharma",

"location": "Chennai",

"organisationRole": "manufacturer",

"createdAt": "2019-12-30T15:16:52.355Z",

"modifiedAt": "2019-12-30T15:16:52.355Z"

}

}

Test Case 7: 002\_Registrator\_Transporter\_1

URL :

<http://localhost:3000/registerCompany>

Input Json :

{

"companyName":"FedEx",

"companyCrn":"TRA001",

"location":"Delhi",

"organisationRole":"transporter"

}

Output Json:

{

"status": "success",

"message": "The New Company has been Registered Successfully.",

"drug": {

"companyCrn": "TRA001",

"companyName": "FedEx",

"location": "Delhi",

"organisationRole": "transporter",

"createdAt": "2019-12-30T15:17:51.062Z",

"modifiedAt": "2019-12-30T15:17:51.062Z"

}

}

Test Case 8: 003\_Registrator\_Transporter\_2

URL :

<http://localhost:3000/registerCompany>

Input Json :

{

"companyName":"Blue Dart",

"companyCrn":"TRA002",

"location":"Bangalore",

"organisationRole":"transporter"

}

Output Json:

{

"status": "success",

"message": "The New Company has been Registered Successfully.",

"drug": {

"companyCrn": "TRA002",

"companyName": "Blue Dart",

"location": "Bangalore",

"organisationRole": "transporter",

"createdAt": "2019-12-30T15:17:53.231Z",

"modifiedAt": "2019-12-30T15:17:53.231Z"

}

}

Test Case 9: 004\_Registrator\_Distributor\_1

URL :

<http://localhost:3000/registerCompany>

Input Json :

{

"companyName":"VG Pharma",

"companyCrn":"DIST001",

"location":"Vizag",

"organisationRole":"distributor"

}

Output Json:

{

"status": "success",

"message": "The New Company has been Registered Successfully.",

"drug": {

"companyCrn": "DIST001",

"companyName": "VG Pharma",

"location": "Vizag",

"organisationRole": "distributor",

"createdAt": "2019-12-30T15:17:55.367Z",

"modifiedAt": "2019-12-30T15:17:55.367Z"

}

}

Test Case 10: 005\_Registrator\_Retailer\_1

URL :

<http://localhost:3000/registerCompany>

Input Json :

{

"companyName":"Upgrad",

"companyCrn":"RET001",

"location":"Mumbai",

"organisationRole":"retailer"

}

Output Json:

{

"status": "success",

"message": "The New Company has been Registered Successfully.",

"drug": {

"companyCrn": "RET001",

"companyName": "Upgrad",

"location": "Mumbai",

"organisationRole": "retailer",

"createdAt": "2019-12-30T15:17:57.493Z",

"modifiedAt": "2019-12-30T15:17:57.493Z"

}

}

Test Case 11: 006\_AddDrug\_1

URL :

http://localhost:3000/addDrug

Input Json :

{

"companyName":"Upgrad",

"companyCrn":"RET001",

"location":"Mumbai",

"organisationRole":"retailer"

}

Output Json:

{

"status": "success",

"message": "The New Drug Successfully Added. The new drug details are : ",

"drug": {

"drugName": "Paracetamol",

"serialNo": "0001",

"mfgData": "12.12.12",

"expDate": "12.12.12",

"manufacturer": "MAN001",

"owner": "MAN001",

"shipmentKeys": [],

"createdAt": "2019-12-30T15:17:59.602Z",

"modifiedAt": "2019-12-30T15:17:59.602Z"

}

}

Test Case 12: 006\_AddDrug\_2

URL :

http://localhost:3000/addDrug

Input Json :

{

"companyName":"Upgrad",

"companyCrn":"RET001",

"location":"Mumbai",

"organisationRole":"retailer"

}

Output Json:

{

"status": "success",

"message": "The New Drug Successfully Added. The new drug details are : ",

"drug": {

"drugName": "Paracetamol",

"serialNo": "0002",

"mfgData": "12.12.12",

"expDate": "12.12.12",

"manufacturer": "MAN001",

"owner": "MAN001",

"shipmentKeys": [],

"createdAt": "2019-12-30T15:18:01.747Z",

"modifiedAt": "2019-12-30T15:18:01.747Z"

}

}

Test Case 13: 006\_AddDrug\_3

URL :

http://localhost:3000/addDrug

Input Json :

{

"companyName":"Upgrad",

"companyCrn":"RET001",

"location":"Mumbai",

"organisationRole":"retailer"

}

Output Json:

{

"status": "success",

"message": "The New Drug Successfully Added. The new drug details are : ",

"drug": {

"drugName": "Paracetamol",

"serialNo": "0003",

"mfgData": "12.12.12",

"expDate": "12.12.12",

"manufacturer": "MAN001",

"owner": "MAN001",

"shipmentKeys": [],

"createdAt": "2019-12-30T15:18:03.880Z",

"modifiedAt": "2019-12-30T15:18:03.880Z"

}

}

Test Case 14: 006\_AddDrug\_4

URL :

http://localhost:3000/addDrug

Input Json :

{

"companyName":"Upgrad",

"companyCrn":"RET001",

"location":"Mumbai",

"organisationRole":"retailer"

}

Output Json:

{

"status": "success",

"message": "The New Drug Successfully Added. The new drug details are : ",

"drug": {

"drugName": "Paracetamol",

"serialNo": "0004",

"mfgData": "12.12.12",

"expDate": "12.12.12",

"manufacturer": "MAN001",

"owner": "MAN001",

"shipmentKeys": [],

"createdAt": "2019-12-30T15:18:06.027Z",

"modifiedAt": "2019-12-30T15:18:06.027Z"

}

}

Test Case 15: 001\_CreatrePO\_DIST\_MANU

URL :

http://localhost:3000/createPO

Input Json :

{

"organizationRole":"distributor",

"drugName":"Paracetamol",

"quantity":"3",

"buyerCrn":"DIST001",

"sellerCrn":"MAN001"

}

Output Json:

{

"status": "success",

"message": "The New PO created successfully. The new PO Details is : ",

"po": {

"drugName": "Paracetamol",

"quantity": "3",

"buyerCrn": "DIST001",

"sellerCrn": "MAN001",

"shipmentKey": "",

"status": "initial"

}

}

Test Case 16: 002\_CreatreShipment\_MANUFA\_DISTRI

URL :

<http://localhost:3000/createShipment>

Input Json :

{

"organizationRole":"manufacturer",

"drugName":"Paracetamol",

"listOfAssets":"0001,0002,0003",

"buyerCrn":"DIST001",

"transporterCrn":"TRA001"

}

Output Json:

{

"status": "success",

"message": "New shipment created successfully. The shipment Details are : ",

"shipment": {

"creator": "MAN001",

"assets": [

["Paracetamol", "0001"],

["Paracetamol", "0002"],

["Paracetamol", "0003"]

],

"transporter": "TRA001",

"status": "in-transit",

"shipTo": "DIST001"

}

}

Test Case 17: 003\_Update\_Shipment\_TRANS\_DISTRI

URL :

http://localhost:3000/updateShipment

Input Json :

{

"organizationRole":"transporter",

"drugName":"Paracetamol",

"buyerCrn":"DIST001",

"transporterCrn":"TRA001"

}

Output Json:

{

"status": "success",

"message": "The Drug delivered successfully. The shipment updates Details are : ",

"shipment": {

"creator": "MAN001",

"assets": [

["Paracetamol", "0001"],

["Paracetamol", "0002"],

["Paracetamol", "0003"]

],

"transporter": "TRA001",

"status": "delivered",

"shipTo": "DIST001"

}

}

Test Case 18: 001\_CreatrePO\_DISTRI\_MANUFA

URL :

http://localhost:3000/createPO

Input Json :

{

"organizationRole":"retailer",

"drugName":"Paracetamol",

"quantity":"2",

"buyerCrn":"RET001",

"sellerCrn":"DIST001"

}

Output Json:

{

"status": "success",

"message": "The New PO created successfully. The new PO Details is : ",

"po": {

"drugName": "Paracetamol",

"quantity": "2",

"buyerCrn": "RET001",

"sellerCrn": "DIST001",

"shipmentKey": "",

"status": "initial"

}

}

Test Case 19: 002\_CreatreShipment\_DISTRI\_RETAILER

URL :

<http://localhost:3000/createShipment>

Input Json :

{

"organizationRole":"distributor",

"drugName":"Paracetamol",

"listOfAssets":"0001,0002",

"buyerCrn":"RET001",

"transporterCrn":"TRA001"

}

Output Json:

{

"status": "success",

"message": "New shipment created successfully. The shipment Details are : ",

"shipment": {

"creator": "DIST001",

"assets": [

["Paracetamol", "0001"],

["Paracetamol", "0002"]

],

"transporter": "TRA001",

"status": "in-transit",

"shipTo": "RET001"

}

}

Test Case 20: 003\_Update\_Shipment\_TRANS\_RETAIL

URL :

http://localhost:3000/updateShipment

Input Json :

{

"organizationRole":"transporter",

"drugName":"Paracetamol",

"buyerCrn":"RET001",

"transporterCrn":"TRA001"

}

Output Json:

{

"status": "success",

"message": "The Drug delivered successfully. The shipment updates Details are : ",

"shipment": {

"creator": "DIST001",

"assets": [

["Paracetamol", "0001"],

["Paracetamol", "0002"]

],

"transporter": "TRA001",

"status": "delivered",

"shipTo": "RET001"

}

}

Test Case 21: 016\_Retail\_Drug

URL :

http://localhost:3000/retailDrug

Input Json :

{

"organizationRole":"retailer",

"drugName":"Paracetamol",

"serialNo":"0001",

"retailerCrn":"RET001",

"customerAadhar":"AAD001"

}

Output Json:

{

"status": "success",

"message": "The Drug Retailed successfully. The Retail Details are : ",

"shipment": {

"drugName": "Paracetamol",

"serialNo": "0001",

"mfgData": "12.12.12",

"expDate": "12.12.12",

"manufacturer": "MAN001",

"owner": "AAD001",

"shipmentKeys": [],

"createdAt": "2019-12-30T15:17:59.602Z",

"modifiedAt": "2019-12-30T15:17:59.602Z"

}

}

Test Case 22: 016\_View\_History

URL :

http://localhost:3000/viewHistory

Input Json :

{

"organizationRole":"consumer",

"drugName":"Paracetamol",

"serialNo":"0001"

}

Output Json:

{

"status": "success",

"message": "The Full History of Drug is : ",

"shipment": {

"drugName": "Paracetamol",

"serialNo": "0001",

"mfgData": "12.12.12",

"expDate": "12.12.12",

"manufacturer": {

"companyCrn": "MAN001",

"companyName": "Sun Pharma",

"location": "Chennai",

"organisationRole": "manufacturer",

"createdAt": "2019-12-30T15:16:52.355Z",

"modifiedAt": "2019-12-30T15:16:52.355Z"

},

"owner": "AAD001",

"shipmentObj": [{

"creator": "MAN001",

"assets": [

["Paracetamol", "0001"],

["Paracetamol", "0002"],

["Paracetamol", "0003"]

],

"transporter": "TRA001",

"status": "delivered",

"shipTo": "DIST001"

}, {

"creator": "DIST001",

"assets": [

["Paracetamol", "0001"],

["Paracetamol", "0002"]

],

"transporter": "TRA001",

"status": "delivered",

"shipTo": "RET001"

}],

"createdAt": "2019-12-30T15:17:59.602Z",

"modifiedAt": "2019-12-30T15:17:59.602Z"

}

}

Test Case 22: 016\_View\_Drug\_Current\_State

URL :

http://localhost:3000/viewDrugCurrentState

Input Json :

{

"organizationRole":"consumer",

"drugName":"Paracetamol",

"serialNo":"0001"

}

Output Json:

{

"status": "success",

"message": "The Current State of the Drug is : ",

"shipment": {

"drugName": "Paracetamol",

"serialNo": "0001",

"CurrentState": "The Drug is currently with consumer",

"detail": "AAD001"

}

}