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!”

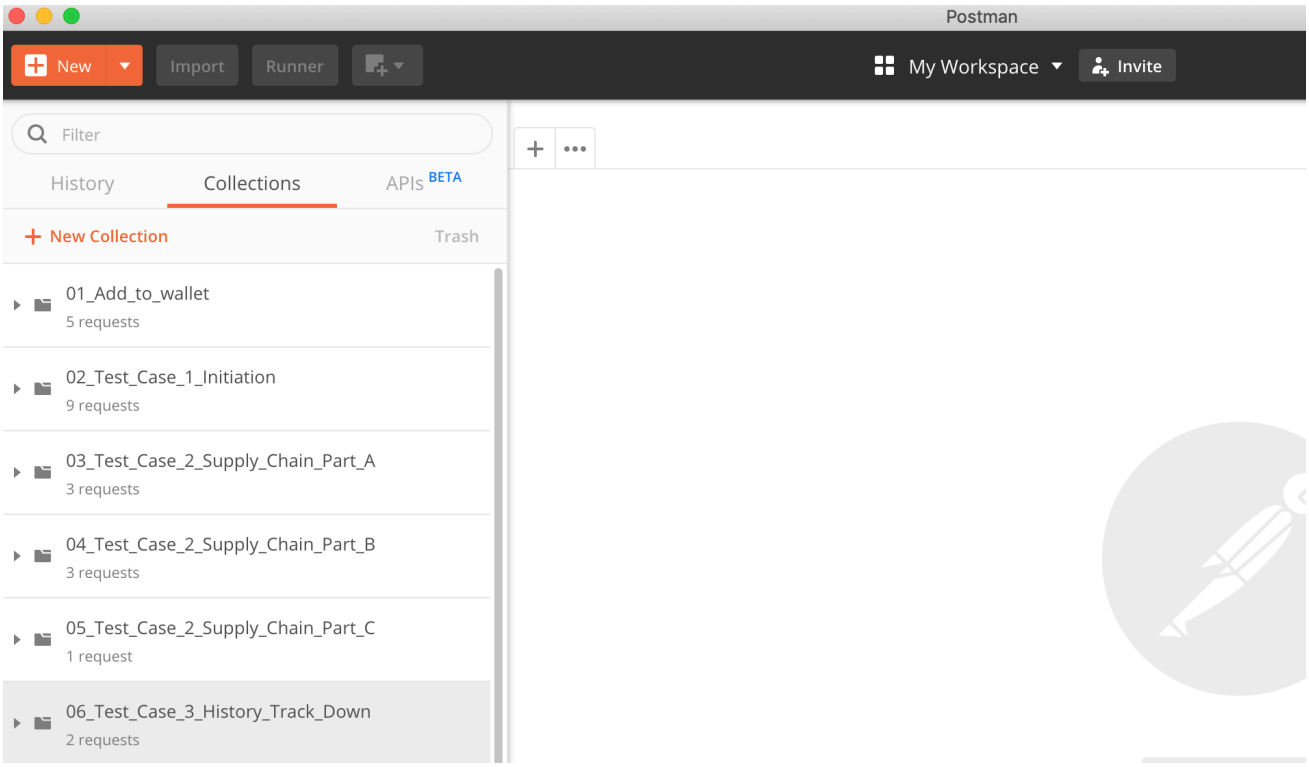
Command 4.2: Open postman application for testing.

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



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.

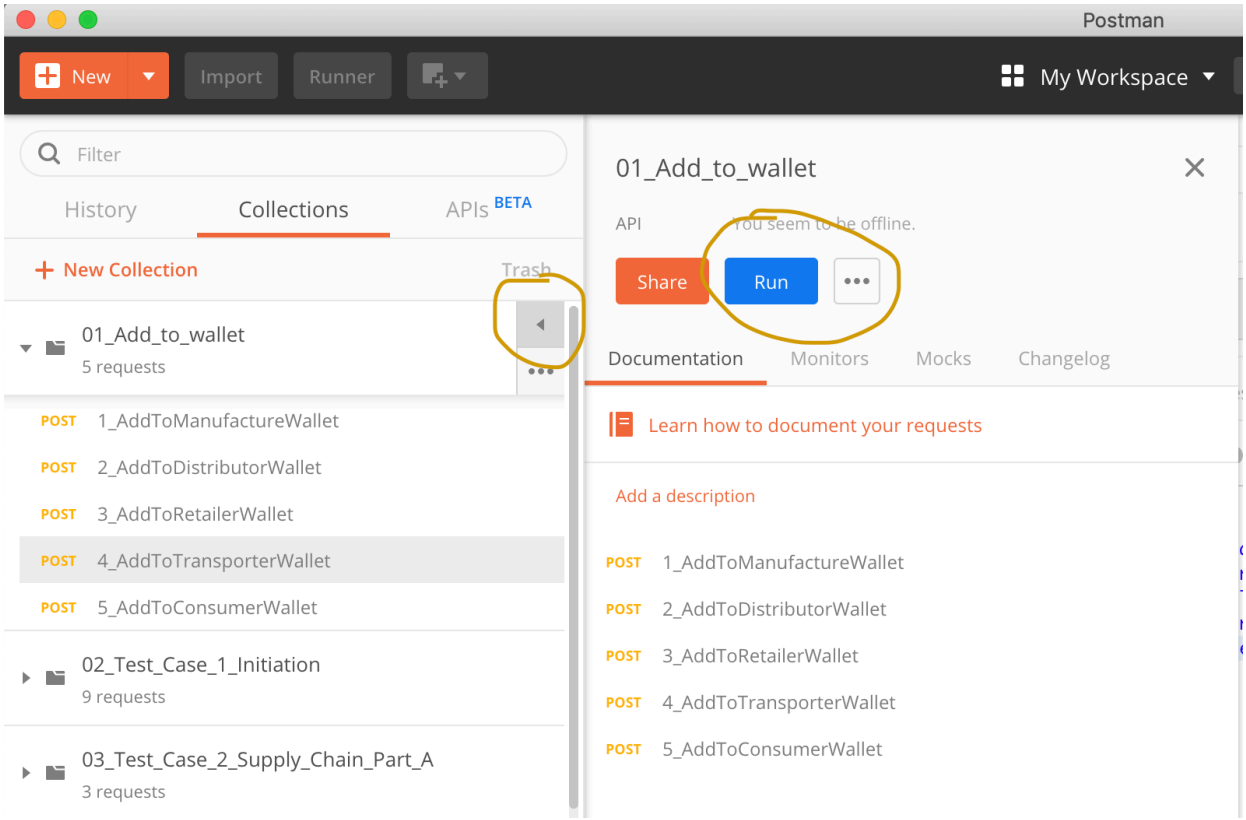
"certificatePath":"<basefolder>/Capstone_Project_Sathish_Kumar/pharma-net/network/crypto-config/peerOrganizations/manufacturer.pharma-network.com/users/Admin@manufacturer.pharma-network.com/msp/signcerts/Admin@manufacturer.pharma-network.com-cert.pem"

"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.

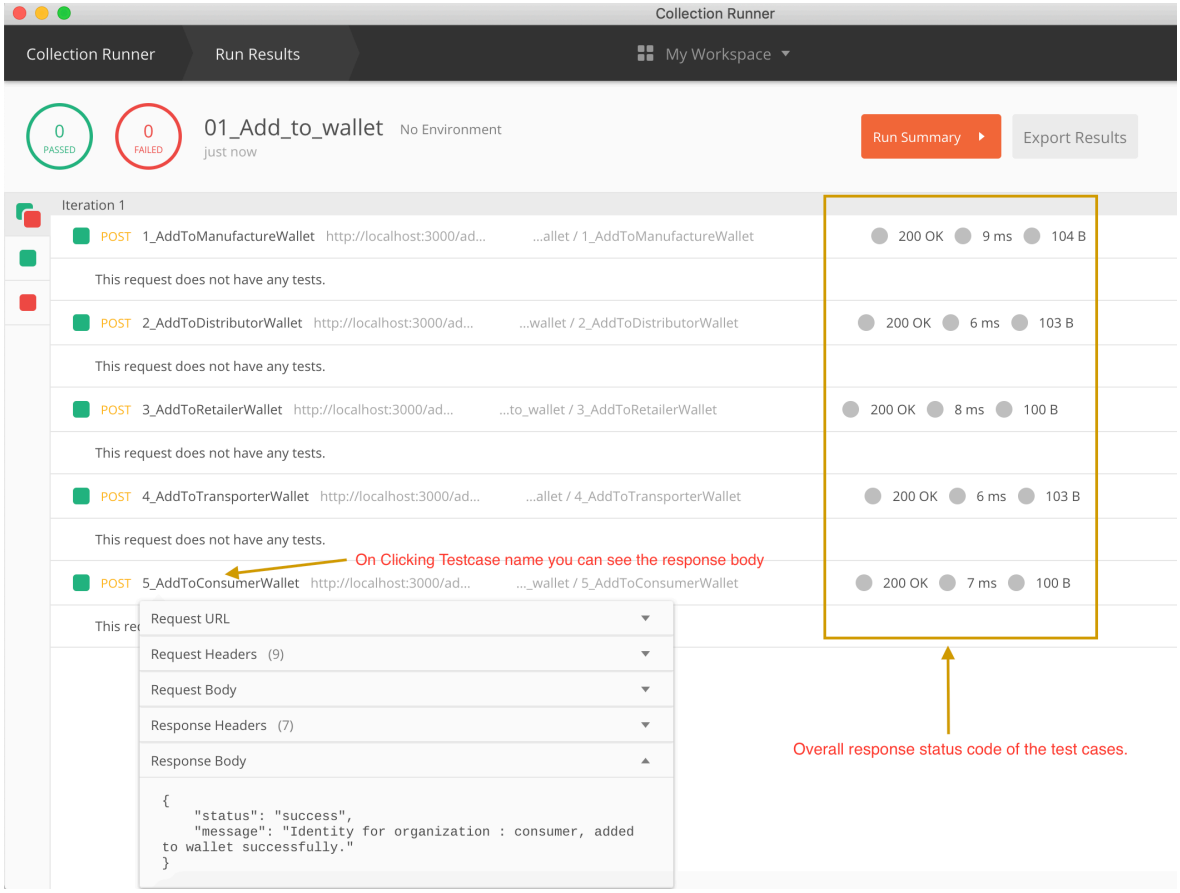
Command 4.5: Once you added certificatePath & privateKeyPath for all the 5 organizations. You can use postman collection runner util to run 01_Add_to_Wallet test cases at once as below.



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.

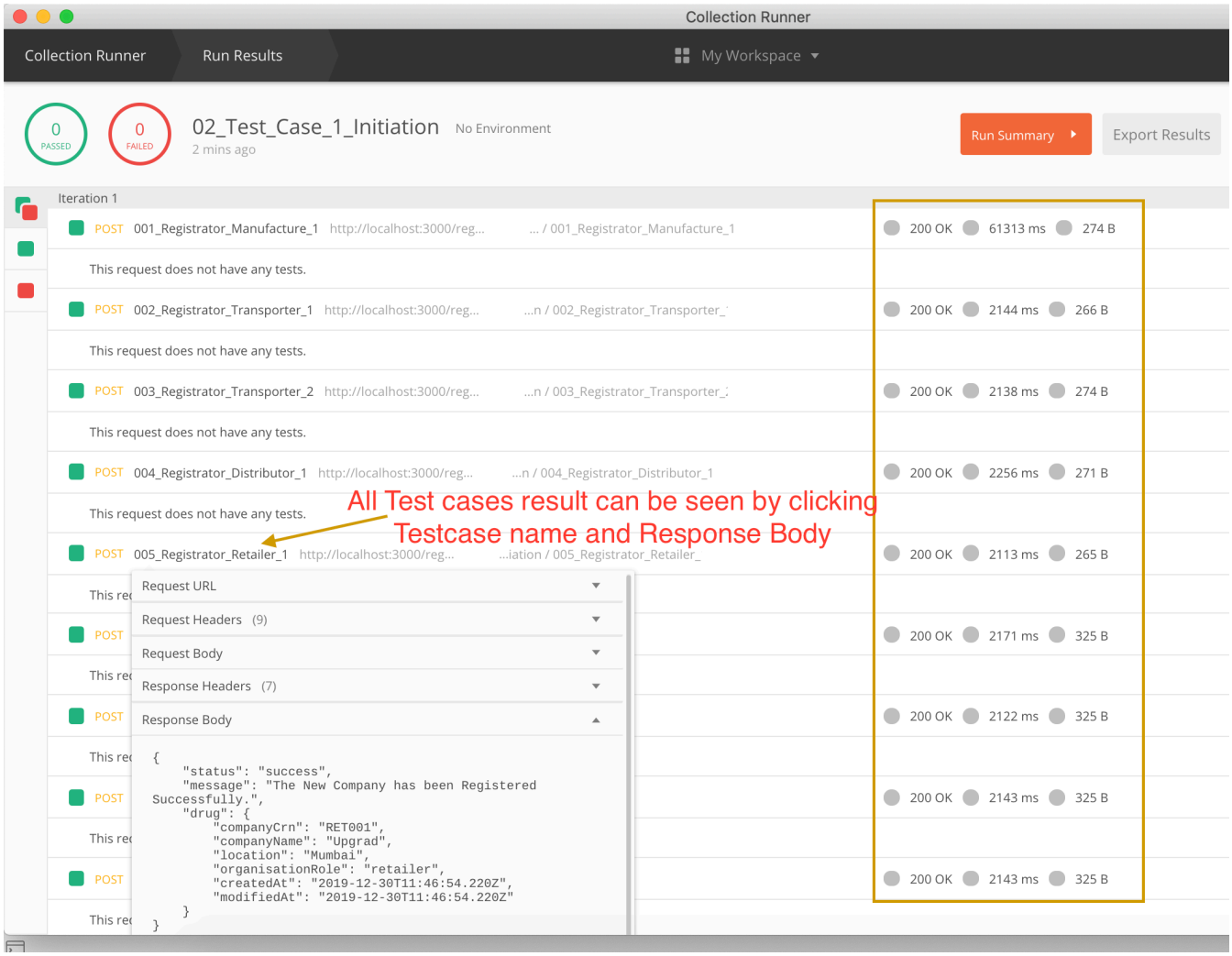
And output would be.

Add To Wallet testcases output.

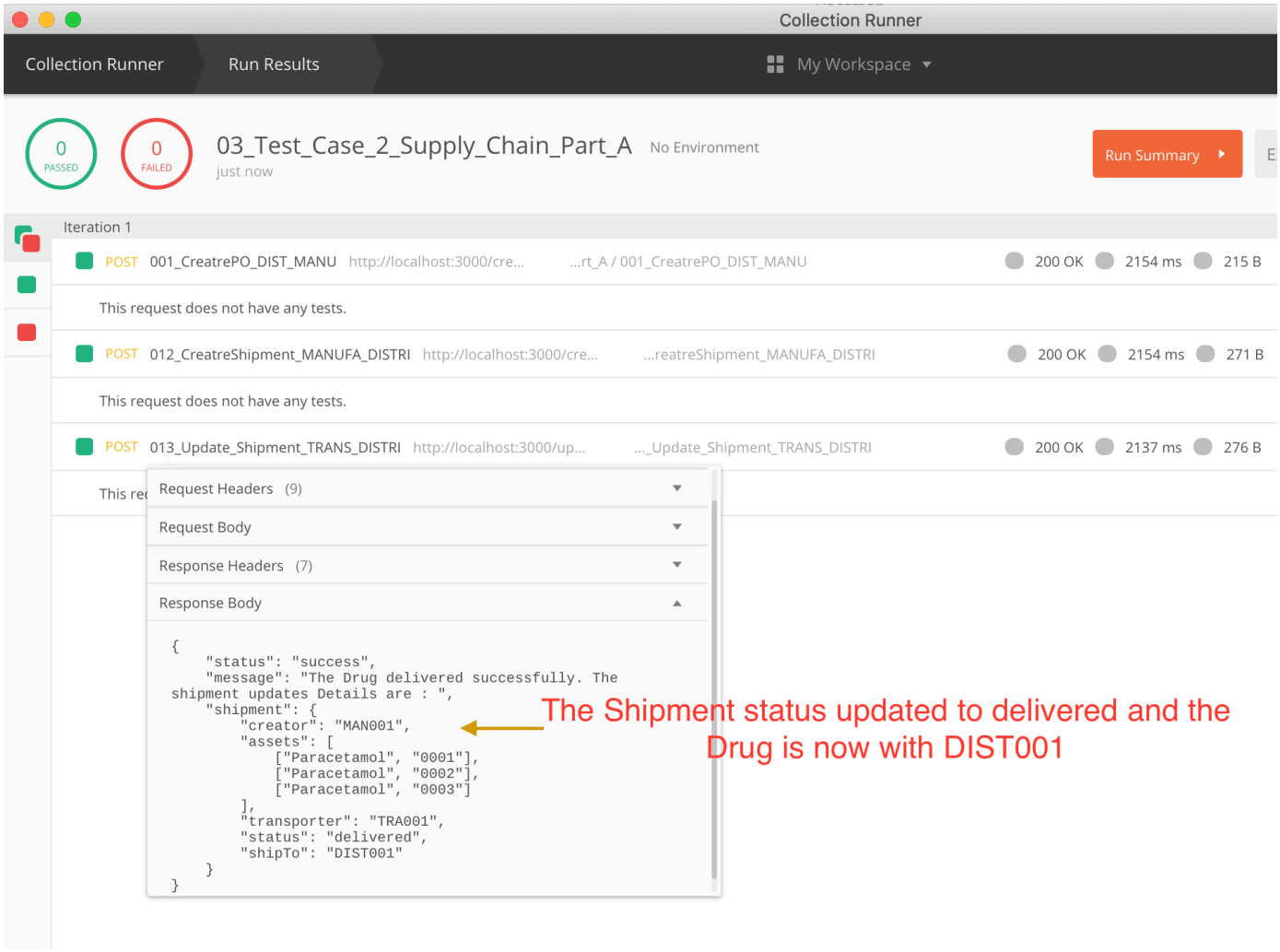


Command 4.6: Like this you can execute one by one collections.

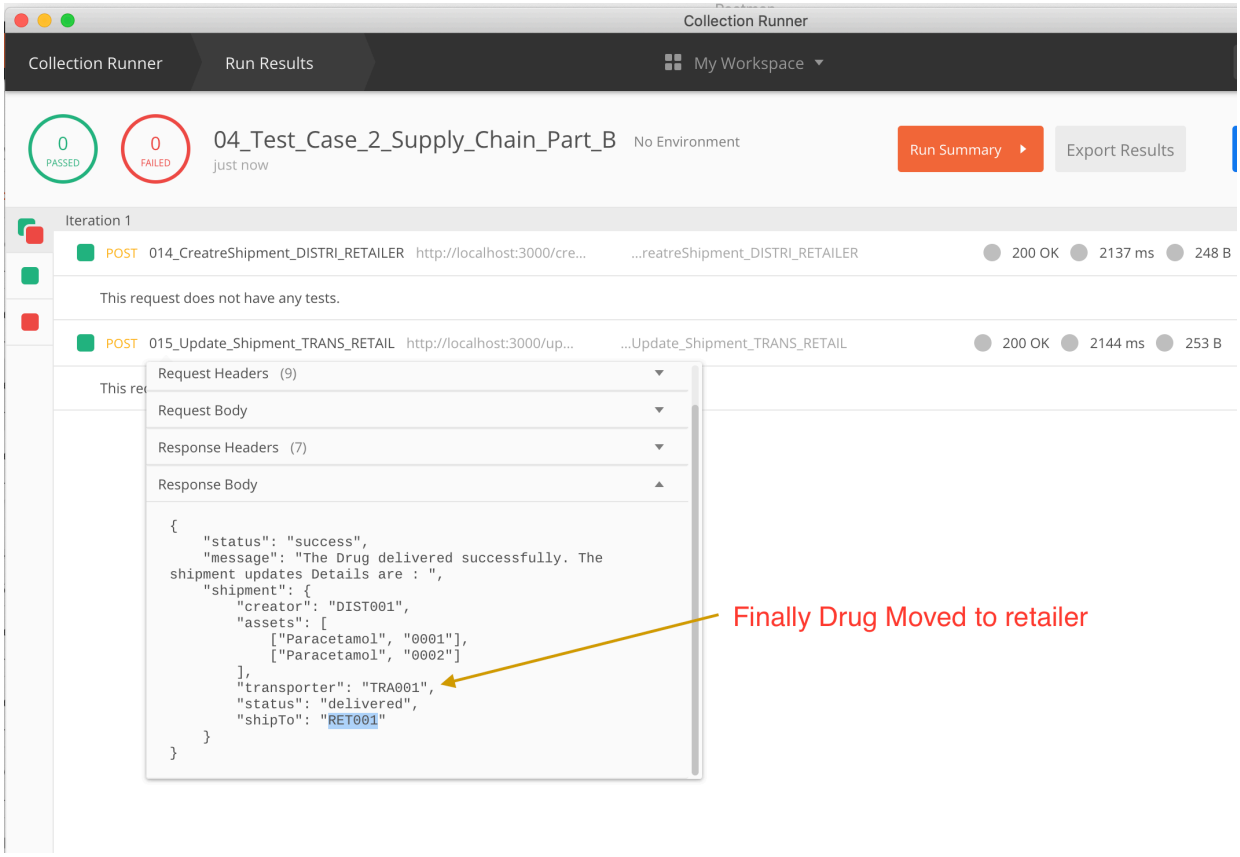
Executing 02_Test_Case_1_Initiation collection and result would be.



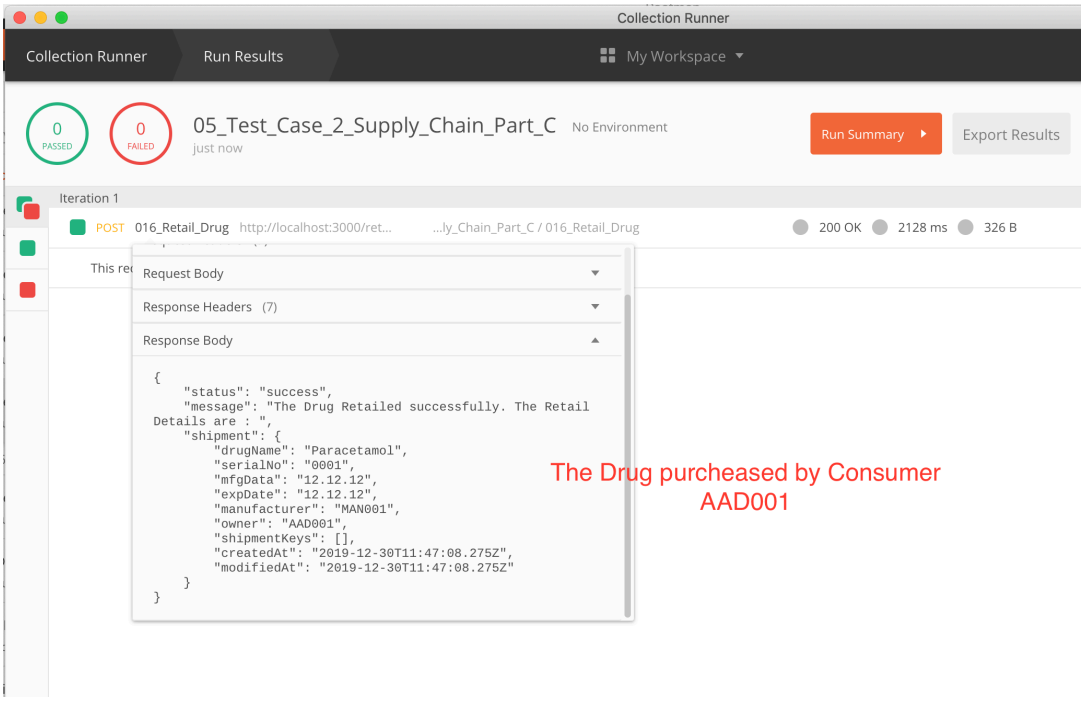
Command 4.7: Executing 03_Test_Case_2_Supply_Chain_Part_A and its result would be



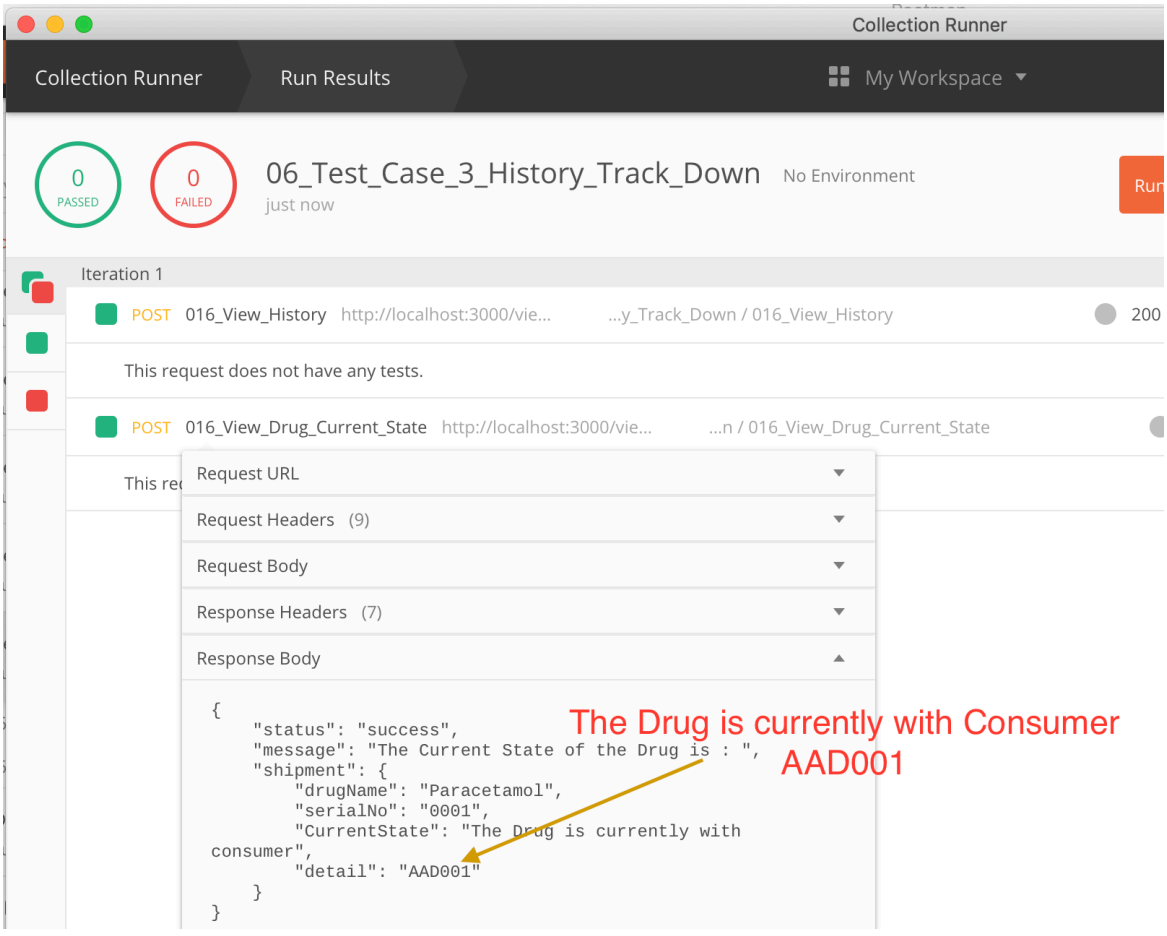
Command 4.8: Executing 04_Test_Case_2_Supply_Chain_Part_B and its result would be



Command 4.8: Executing 05_Test_Case_2_Supply_Chain_Part_C and its result would be



Command 4.9: Executing 06_Test_Case_3_History_Track_Down and its result would be



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"
   }
}
```