5/9/2021

Pharma-Net

Instruction Document

By - Saikh Saif Ali

Introduction

This is a step by step walk through guide on the pharma-network project. This guide will cover all the steps starting with setting up the network to running the collection file of all the test cases. Appropriate screenshots are provided after each step.

We will be using Hyperledger Fabric v2.2.3 (LTS) for our project. Chaincode is written in javascript. The application client is in Node.js.

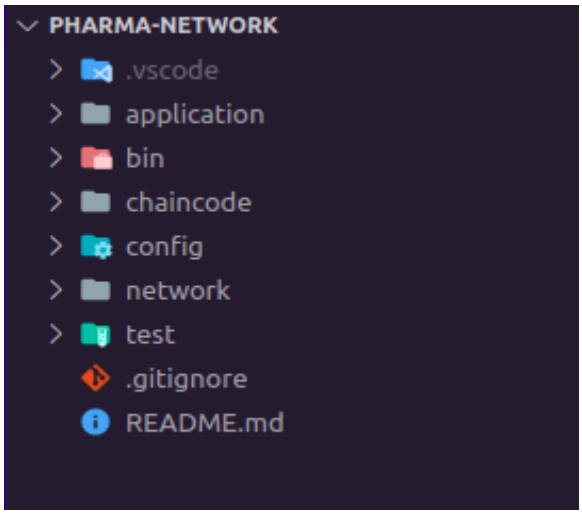
Few pointers on what we will be building-

Fabric Version	2.2.3
Number of Participating Orgs	5
Number of Peers per Org	2
Anchor Peer	peer0
Certificate Authority	Fabric-CA
Orderer Type	Raft
Channel	pharmachannel
Chaincode	pharmanet
Chaincode Installed on	Both peers(peer0, peer1)
Endorsement Policy	Any one of the organizations should endorse the transaction

Directory Structure

On the right is the directory structure of the project. The project is named as “Pharma-Network”. We will be concerned with the following folders-

- Network – Contains the code to bring up the pharma network.
- Chaincode – Contains the smart-contract to be used.
- Application – Contains the client code to communicate with the network.
- Bin- contains the binary for Hyperledger Fabric v2.2.3



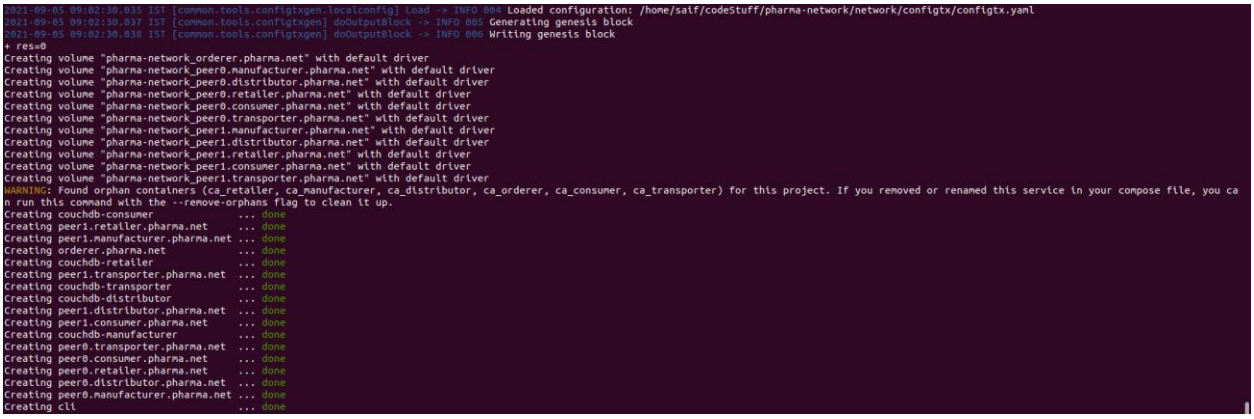
Network Creation

Follow the below steps to setup the network.

1. Navigate to the **network** directory of the project.
2. Execute the below script to bootstrap the network.

   ./network.sh up createChannel -s couchdb -ca

   This script will be doing the following tasks:
   - ✓ Bring up the certificate Authorities for all the 5 participating orgs and generate the certificate/MSPs.
   - ✓ Bring up both the network (peers, orderer)
   - ✓ Bring up the worldState database as couchdb
   - ✓ Create the pharmachannel
   - ✓ Join the peers to the channel
   - ✓ Update the Anchor Peers
   - ✓ Create connection profiles for each Org.

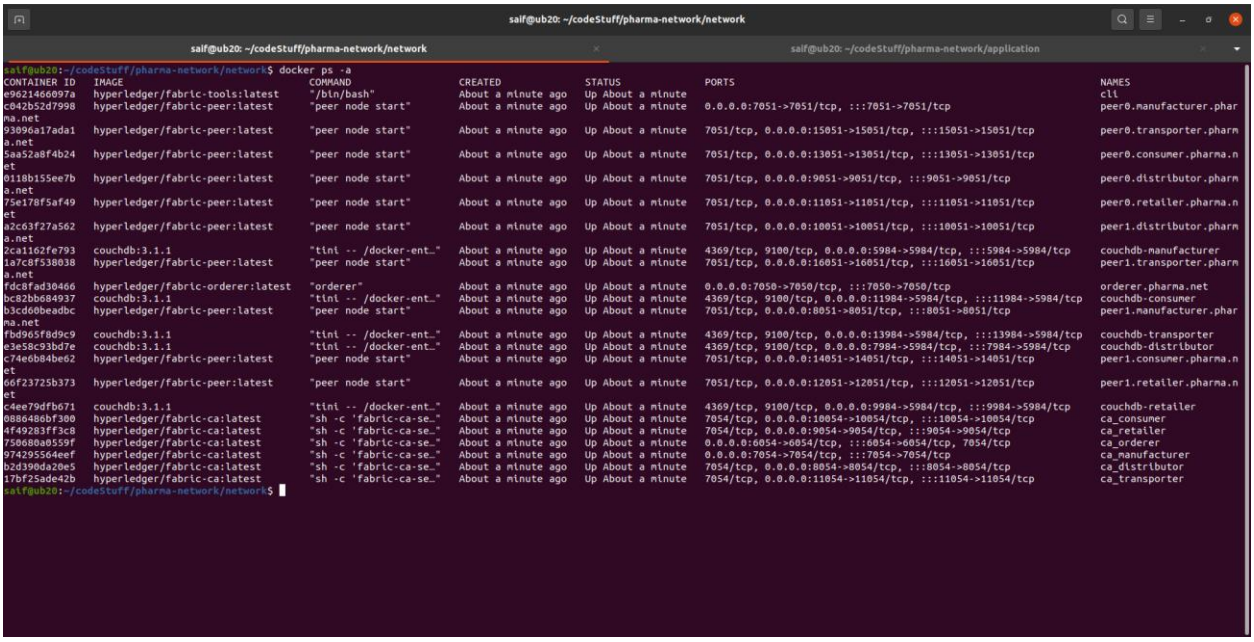


```
CONTAINER ID   IMAGE                                 COMMAND                  CREATED                  STATUS                  PORTS                                                 NAMES
56bbe1d4101c   hyperledger/fabric-tools:latest       "/bin/bash"              Less than a second ago   Up Less than a second                                                         cli
d29c806bf70b   hyperledger/fabric-peer:latest        "peer node start"        1 second ago             Up Less than a second   0.0.0.0:7051->7051/tcp, :::7051->7051/tcp             peer0.manufacturer.pharma.net
a31b624db476   hyperledger/fabric-peer:latest        "peer node start"        2 seconds ago            Up Less than a second   7051/tcp, 0.0.0.0:9051->9051/tcp, :::9051->9051/tcp   peer0.distributor.pharma.net
9c6f5b1dce73   hyperledger/fabric-peer:latest        "peer node start"        2 seconds ago            Up Less than a second   7051/tcp, 0.0.0.0:11051->11051/tcp, :::11051->11051/tcp   peer0.retailer.pharma.net
e74dd63eb40c   hyperledger/fabric-peer:latest        "peer node start"        2 seconds ago            Up Less than a second   7051/tcp, 0.0.0.0:13051->13051/tcp, :::13051->13051/tcp   peer0.consumer.pharma.net
2028f7e8cd01   hyperledger/fabric-peer:latest        "peer node start"        2 seconds ago            Up 1 second             7051/tcp, 0.0.0.0:15051->15051/tcp, :::15051->15051/tcp   peer0.transporter.pharma.net
6c799b44a759   hyperledger/fabric-peer:latest        "peer node start"        3 seconds ago            Up 1 second             7051/tcp, 0.0.0.0:14051->14051/tcp, :::14051->14051/tcp   peer1.consumer.pharma.net
8ee59a85c52e   couchdb:3.1.1                         "tini -- /docker-ent…"   3 seconds ago            Up 1 second             4369/tcp, 9100/tcp, 0.0.0.0:5984->5984/tcp, :::5984->5984/tcp   couchdb-manufacturer
80bab87be6aa   couchdb:3.1.1                         "tini -- /docker-ent…"   3 seconds ago            Up 1 second             4369/tcp, 9100/tcp, 0.0.0.0:7984->5984/tcp, :::7984->5984/tcp   couchdb-distributor
f6807a151b43   hyperledger/fabric-peer:latest        "peer node start"        3 seconds ago            Up 1 second             7051/tcp, 0.0.0.0:10051->10051/tcp, :::10051->10051/tcp   peer1.distributor.pharma.net
5151bd294c67   hyperledger/fabric-peer:latest        "peer node start"        3 seconds ago            Up 1 second             7051/tcp, 0.0.0.0:16051->16051/tcp, :::16051->16051/tcp   peer1.transporter.pharma.net
fc9c2ac568d3   couchdb:3.1.1                         "tini -- /docker-ent…"   3 seconds ago            Up 2 seconds            4369/tcp, 9100/tcp, 0.0.0.0:9984->5984/tcp, :::9984->5984/tcp   couchdb-retailer
dce38867024e   hyperledger/fabric-orderer:latest     "orderer"                3 seconds ago            Up 1 second             0.0.0.0:7050->7050/tcp, :::7050->7050/tcp             orderer.pharma.net
ecdf3c4aea25   couchdb:3.1.1                         "tini -- /docker-ent…"   3 seconds ago            Up 2 seconds            4369/tcp, 9100/tcp, 0.0.0.0:13984->5984/tcp, :::13984->5984/tcp   couchdb-transporter
0817a44486c8   hyperledger/fabric-peer:latest        "peer node start"        3 seconds ago            Up 2 seconds            7051/tcp, 0.0.0.0:8051->8051/tcp, :::8051->8051/tcp   peer1.manufacturer.pharma.net
940d890b3344   couchdb:3.1.1                         "tini -- /docker-ent…"   4 seconds ago            Up 2 seconds            4369/tcp, 9100/tcp, 0.0.0.0:11984->5984/tcp, :::11984->5984/tcp   couchdb-consumer
386e167c30a9   hyperledger/fabric-peer:latest        "peer node start"        4 seconds ago            Up 2 seconds            7051/tcp, 0.0.0.0:12051->12051/tcp, :::12051->12051/tcp   peer1.retailer.pharma.net
fc1b2c87015b   hyperledger/fabric-ca:latest          "sh -c 'fabric-ca-se…"   12 seconds ago           Up 11 seconds           7054/tcp, 0.0.0.0:9054->9054/tcp, :::9054->9054/tcp   ca_retailer
04992d638c40   hyperledger/fabric-ca:latest          "sh -c 'fabric-ca-se…"   12 seconds ago           Up 12 seconds           7054/tcp, 0.0.0.0:11054->11054/tcp, :::11054->11054/tcp   ca_transporter
ad71215ec3bf   hyperledger/fabric-ca:latest          "sh -c 'fabric-ca-se…"   12 seconds ago           Up 11 seconds           7054/tcp, 0.0.0.0:8054->8054/tcp, :::8054->8054/tcp   ca_distributor
06ebe4aa2f2b   hyperledger/fabric-ca:latest          "sh -c 'fabric-ca-se…"   12 seconds ago           Up 12 seconds           0.0.0.0:6054->6054/tcp, :::6054->6054/tcp, 7054/tcp   ca_orderer
384a7573fe75   hyperledger/fabric-ca:latest          "sh -c 'fabric-ca-se…"   12 seconds ago           Up 11 seconds           7054/tcp, 0.0.0.0:10054->10054/tcp, :::10054->10054/tcp   ca_consumer
d4dd82d29cbb   hyperledger/fabric-ca:latest          "sh -c 'fabric-ca-se…"   13 seconds ago           Up 12 seconds           0.0.0.0:7054->7054/tcp, :::7054->7054/tcp             ca_manufacturer
```

```
Generating channel create transaction 'pharmachannel.tx'
+ configtxgen -profile TwoOrgsChannel -outputCreateChannelTx ./channel-artifacts/pharmachannel.tx -channelID pharmachannel
2021-09-05 09:02:34.938 IST [common.tools.configtxgen] main -> INFO 001 Loading configuration
2021-09-05 09:02:34.981 IST [common.tools.configtxgen] doOutputChannelCreateTx -> INFO 003 Generating new channel configtx
2021-09-05 09:02:34.981 IST [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/saif/codeStuff/pharma-network/network/configtx/configtx.yaml
2021-09-05 09:02:34.987 IST [common.tools.configtxgen] doOutputChannelCreateTx -> INFO 004 Writing new channel tx
+ res=0
Creating channel pharmachannel
Using organization 1
+ peer channel create -o localhost:7050 -c pharmachannel --ordererTLSHostnameOverride orderer.pharma.net -f ./channel-artifacts/pharmachannel.tx --outputBlock ./channel-artifacts/pharmachannel.block --tls --cafile /home/saif/codeStuff/pharma-network/network/organizations/ordererOrganizations/pharma.net/orderers/orderer.pharma.net/msp/tlscacerts/tlsca.pharma.net-cert.pem
+ res=0
2021-09-05 09:02:38.038 IST [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2021-09-05 09:02:38.061 IST [cli.common] readBlock -> INFO 002 Expect block, but got status: &{NOT_FOUND}
2021-09-05 09:02:38.067 IST [channelCmd] InitCmdFactory -> INFO 003 Endorser and orderer connections initialized
2021-09-05 09:02:38.269 IST [cli.common] readBlock -> INFO 004 Expect block, but got status: &{SERVICE_UNAVAILABLE}
2021-09-05 09:02:38.271 IST [channelCmd] InitCmdFactory -> INFO 005 Endorser and orderer connections initialized
2021-09-05 09:02:38.472 IST [cli.common] readBlock -> INFO 006 Expect block, but got status: &{SERVICE_UNAVAILABLE}
2021-09-05 09:02:38.474 IST [channelCmd] InitCmdFactory -> INFO 007 Endorser and orderer connections initialized
2021-09-05 09:02:38.676 IST [cli.common] readBlock -> INFO 008 Expect block, but got status: &{SERVICE_UNAVAILABLE}
2021-09-05 09:02:38.679 IST [channelCmd] InitCmdFactory -> INFO 009 Endorser and orderer connections initialized
2021-09-05 09:02:38.880 IST [cli.common] readBlock -> INFO 00a Expect block, but got status: &{SERVICE_UNAVAILABLE}
2021-09-05 09:02:38.882 IST [channelCmd] InitCmdFactory -> INFO 00b Endorser and orderer connections initialized
2021-09-05 09:02:39.085 IST [cli.common] readBlock -> INFO 00c Received block: 0
Channel 'pharmachannel' created
Joining manufacturer peer0 to the channel...
Using organization 1 peer 0
+ peer channel join -b ./channel-artifacts/pharmachannel.block
+ res=0
2021-09-05 09:02:42.131 IST [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2021-09-05 09:02:42.227 IST [channelCmd] executeJoin -> INFO 002 Successfully submitted proposal to join channel
Joining distributor peer0 to the channel...
Using organization 2 peer 0
+ peer channel join -b ./channel-artifacts/pharmachannel.block
+ res=0
2021-09-05 09:02:45.277 IST [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2021-09-05 09:02:45.380 IST [channelCmd] executeJoin -> INFO 002 Successfully submitted proposal to join channel
Joining retailer peer0 to the channel...
Using organization 3 peer 0
+ peer channel join -b ./channel-artifacts/pharmachannel.block
+ res=0
2021-09-05 09:02:48.428 IST [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2021-09-05 09:02:48.565 IST [channelCmd] executeJoin -> INFO 002 Successfully submitted proposal to join channel
Joining consumer peer0 to the channel...
Using organization 4 peer 0
```

```
Using organization 1
Fetching channel config for channel pharmachannel
Using organization 1
Fetching the most recent configuration block for the channel
+ peer channel fetch config config_block.pb -o orderer.pharma.net:7050 --ordererTLSHostnameOverride orderer.pharma.net -c pharmachannel --tls --cafile /opt/gopath/src/github.com/hyperledger/fabric/peer/organizations/ordererOrganizations/pharma.net/orderers/orderer.pharma.net/msp/tlscacerts/tlsca.pharma.net-cert.pem
2021-09-05 03:33:10.558 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2021-09-05 03:33:10.560 UTC [cli.common] readBlock -> INFO 002 Received block: 0
2021-09-05 03:33:10.561 UTC [channelCmd] fetch -> INFO 003 Retrieving last config block: 0
2021-09-05 03:33:10.564 UTC [cli.common] readBlock -> INFO 004 Received block: 0
Decoding config block to JSON and isolating config to ManufacturerMSPconfig.json
+ configtxlator proto_decode --input config_block.pb --type common.Block
+ jq '.data.data[0].payload.data.config'
Generating anchor peer update transaction for Org1 on channel pharmachannel
+ jq '.channel_group.groups.Application.groups.ManufacturerMSP.values += {"AnchorPeers":{"mod_policy": "Admins","value":{"anchor_peers": [{"host": "peer0.manufacturer.pharma.net","port": 7051}]},"version":"0"}}' ManufacturerMSPconfig.json
+ configtxlator proto_encode --input ManufacturerMSPconfig.json --type common.Config
+ configtxlator proto_encode --input ManufacturerMSPmodified_config.json --type common.Config
+ configtxlator compute_update --channel_id pharmachannel --original original_config.pb --updated modified_config.pb
+ configtxlator proto_decode --input config_update.pb --type common.ConfigUpdate
+ jq .
++ cat config_update.json
+ echo '{"payload":{"header":{"channel_header":{"channel_id":"pharmachannel", "type":2}},"data":{"config_update":{' '"channel_id":' '"pharmachannel",' '"isolated_data":' '{},' '"read_set":' '{' '"groups":' '{' '"Application":' '{' '"groups":' '{' '"ManufacturerMSP":' '{' '"groups":' '{},' '"mod_policy":' '"",' '"policies":' '{' '"Admins":' '{' '"mod_policy":' '"",' '"policy":' null, '"version":' '"0"' '},' '"Endorsement":' '{' '"mod_policy":' '"",' '"policy":' null, '"version":' '"0"' '},' '"Readers":' '{' '"mod_policy":' '"",' '"policy":' null, '"version":' '"0"' '},' '"Writers":' '{' '"mod_policy":' '"",' '"policy":' null, '"version":' '"0"' '}' '},' '"values":' '{' '"MSP":' '{' '"mod_policy":' '"",' '"value":' null, '"version":' '"0"' '}' '},' '"version":' '"0"' '}' '},' '"mod_policy":' '"",' '"policies":' '{},' '"values":' '{},' '"version":' '"1"' '}' '},' '"mod_policy":' '"",' '"policies":' '{},' '"values":' '{},' '"version":' '"0"' '},' '"write_set":' '{' '"groups":' '{' '"Application":' '{' '"groups":' '{' '"ManufacturerMSP":' '{' '"groups":' '{},' '"mod_policy":' '"Admins",' '"policies":' '{' '"Admins":' '{' '"mod_policy":' '"",' '"policy":' null, '"version":' '"0"' '},' '"Endorsement":' '{' '"mod_policy":' '"",' '"policy":' null, '"version":' '"0"' '},' '"Readers":' '{' '"mod_policy":' '"",' '"policy":' null, '"version":' '"0"' '},' '"Writers":' '{' '"mod_policy":' '"",' '"policy":' null, '"version":' '"0"' '},' '"values":' '{' '"AnchorPeers":' '{' '"mod_policy":' '"Admins",' '"value":' '{' '"anchor_peers":' '[' '{' '"host":' '"peer0.manufacturer.pharma.net",' '"port":' 7051 '}' ']' '},' '"version":' '"0"' '},' '"MSP":' '{' '"mod_policy":' '"",' '"value":' null, '"version":' '"0"' '}' '},' '"version":' '"1"' '}' '},' '"mod_policy":' '"",' '"policies":' '{},' '"values":' '{},' '"version":' '"1"' '}' '},' '"mod_policy":' '"",' '"policies":' '{},' '"values":' '{},' '"version":' '"0"' '}' '}}}}'
+ configtxlator proto_encode --input config_update_in_envelope.json --type common.Envelope
2021-09-05 03:33:10.745 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2021-09-05 03:33:10.757 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
Anchor peer set for org 'ManufacturerMSP' on channel 'pharmachannel'
Setting anchor peer for distributor...
Using organization 2
Fetching channel config for channel pharmachannel
Using organization 2
Fetching the most recent configuration block for the channel
+ peer channel fetch config config_block.pb -o orderer.pharma.net:7050 --ordererTLSHostnameOverride orderer.pharma.net -c pharmachannel --tls --cafile /opt/gopath/src/github.com/hyperledger/fabric/peer/organizations/ordererOrganizations/pharma.net/orderers/orderer.pharma.net/msp/tlscacerts/tlsca.pharma.net-cert.pem
2021-09-05 03:33:10.979 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2021-09-05 03:33:10.982 UTC [cli.common] readBlock -> INFO 002 Received block: 1
2021-09-05 03:33:10.982 UTC [channelCmd] fetch -> INFO 003 Retrieving last config block: 1
2021-09-05 03:33:10.983 UTC [cli.common] readBlock -> INFO 004 Received block: 1
Decoding config block to JSON and isolating config to DistributorMSPconfig.json
```

Now we have the network up and running. Below are all the containers running:



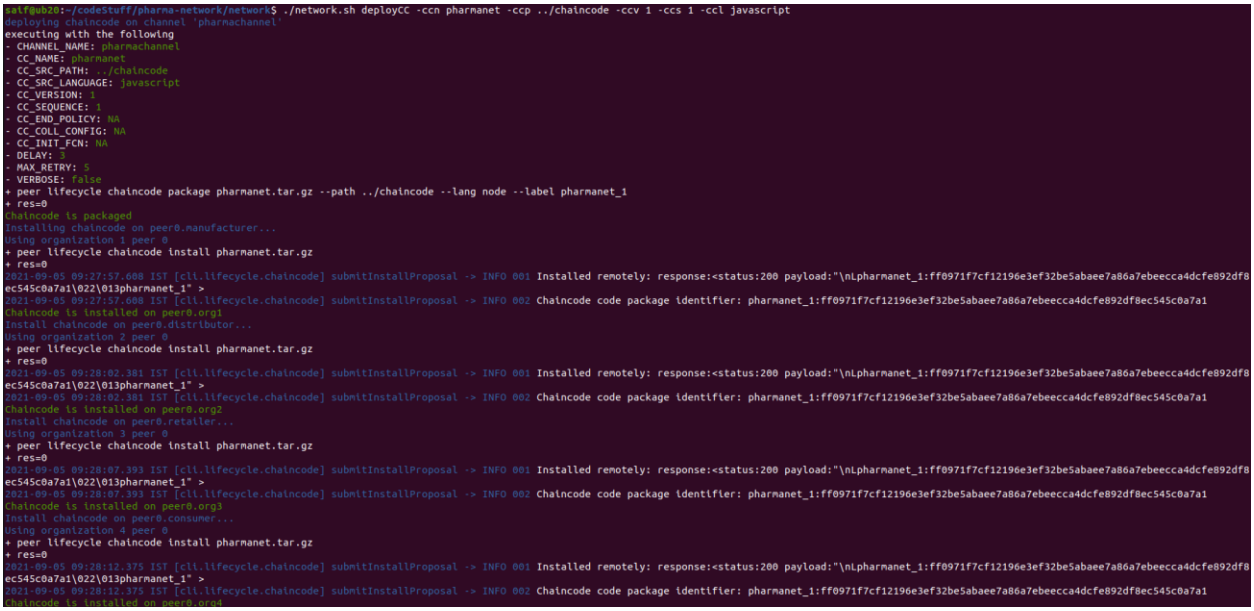
Chaincode Deployment

1. From the **network** directory, execute the below script:

   ./network.sh deployCC -ccn pharmanet -ccp ../chaincode -ccv 1 -ccs 1 -ccl javascript

   This script will be doing the following tasks:

   - ✓ Deploy the chaincode (**pharmanet**). Install the chaincode in both the peers of each Organization. Approve the chaincode from each org and then commit the chaincode.
   - ✓ Parameters passed here are-
     - ccn – chaincode name
     - ccp - chaincode path
     - ccv – chaincode version
     - ccs – chaincode sequence
     - ccl – chaincode language



Node Application

As part of network creation process, we had created the **connection profile** for each org.

For Manufacturer, the connection profile can be found in:

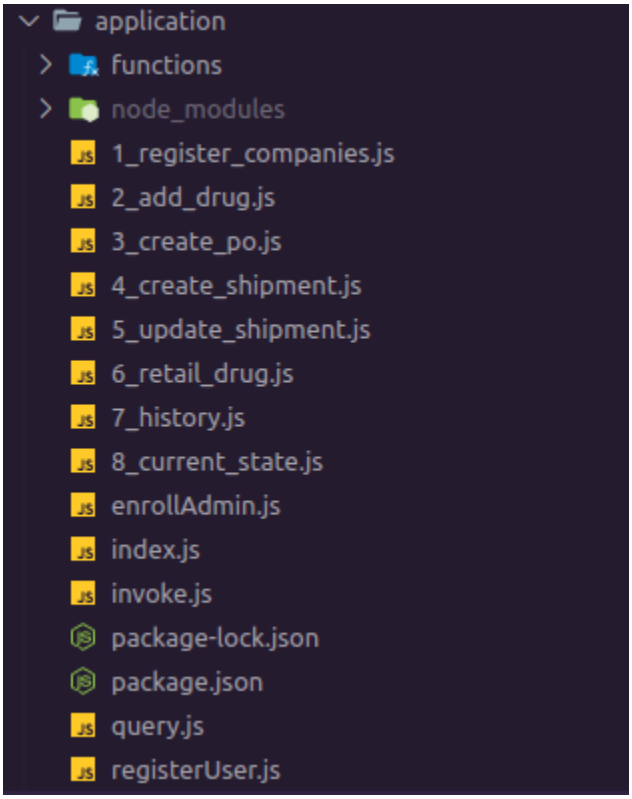
```
saif@ub20:~/codeStuff/pharma-network/network/organizations/peerOrganizations/manufacturer.pharma.net$ ls -la
total 40
drwxrwxr-x 7 saif saif 4096 Sep  5 09:35 .
drwxrwxr-x 7 saif saif 4096 Sep  5 09:02 ..
drwxrwxr-x 2 saif saif 4096 Sep  5 09:02 ca
-rw-rw-r-- 1 saif saif 2860 Sep  5 09:02 connection-manufacturer.json
-rwxr-xr-x 1 saif saif 6769 Sep  5 09:02 fabric-ca-client-config.yaml
drwx------ 7 saif saif 4096 Sep  5 09:02 msp
drwx------ 4 saif saif 4096 Sep  5 09:02 peers
drwxrwxr-x 2 saif saif 4096 Sep  5 09:02 tlsca
drwx------ 4 saif saif 4096 Sep  5 09:02 users
```

Similarly, we have connection profiles for other organizations in their respective directories.

We will be using the connection profile for our node application to connect to our network.

Follow the below steps for setting up the Node application:

1. Navigate to the **application** directory.
   Below is the directory structure of the application directory:

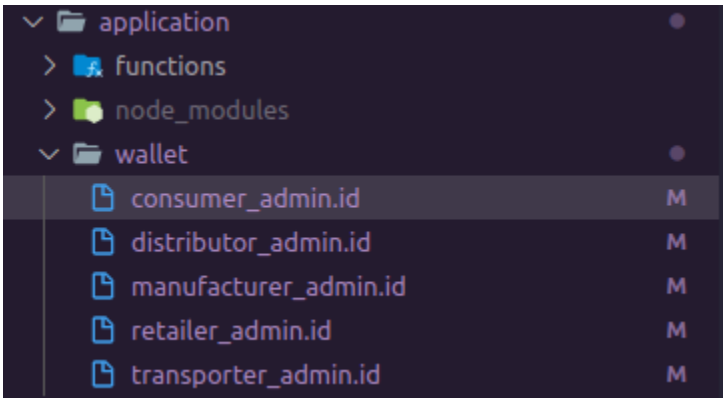


We use the connection profiles and create a wallet to store the identity of the Admin user of each organization. Execute:

node enrollAdmin.js

```
saif@ub20:~/codeStuff/pharma-network/application$ node enrollAdmin.js
Wallet path: /home/saif/codeStuff/pharma-network/application/wallet
Successfully enrolled admin user "admin" and imported it into the wallet for ManufacturerMSP
Wallet path: /home/saif/codeStuff/pharma-network/application/wallet
Successfully enrolled admin user "admin" and imported it into the wallet for DistributorMSP
Wallet path: /home/saif/codeStuff/pharma-network/application/wallet
Successfully enrolled admin user "admin" and imported it into the wallet for RetailerMSP
Wallet path: /home/saif/codeStuff/pharma-network/application/wallet
Successfully enrolled admin user "admin" and imported it into the wallet for ConsumerMSP
Wallet path: /home/saif/codeStuff/pharma-network/application/wallet
Successfully enrolled admin user "admin" and imported it into the wallet for TransporterMSP
```

A wallet directory is created which contains the “admin” credentials for each organization.



2. From the application directory, start the application using:

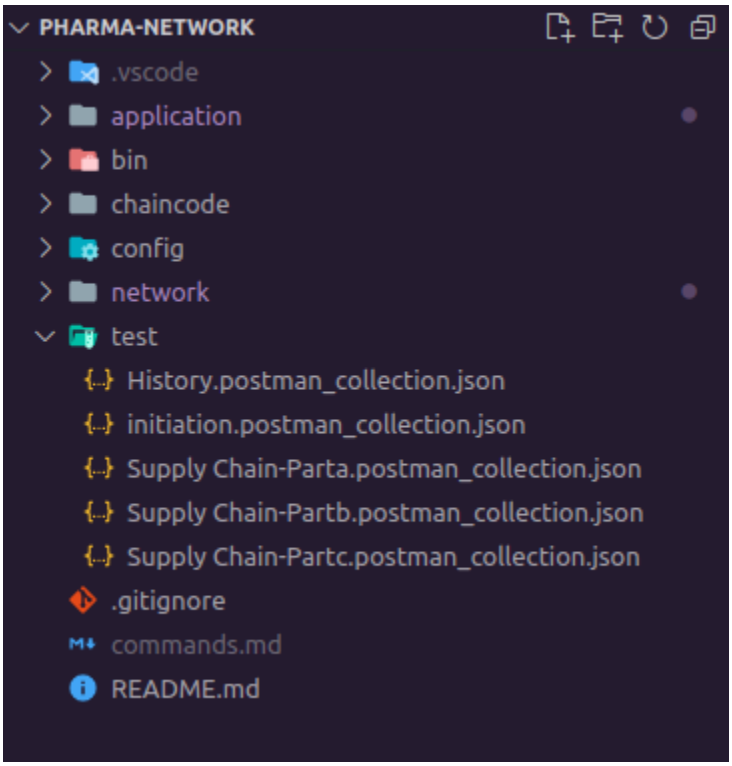
npm start

```
saif@ub20:~/codeStuff/pharma-network/application$ npm start

> pharmanet@1.0.0 start /home/saif/codeStuff/pharma-network/application
> node index.js

Pharmanet Client Application listening on port 3000!
```

The application will run on port 3000.

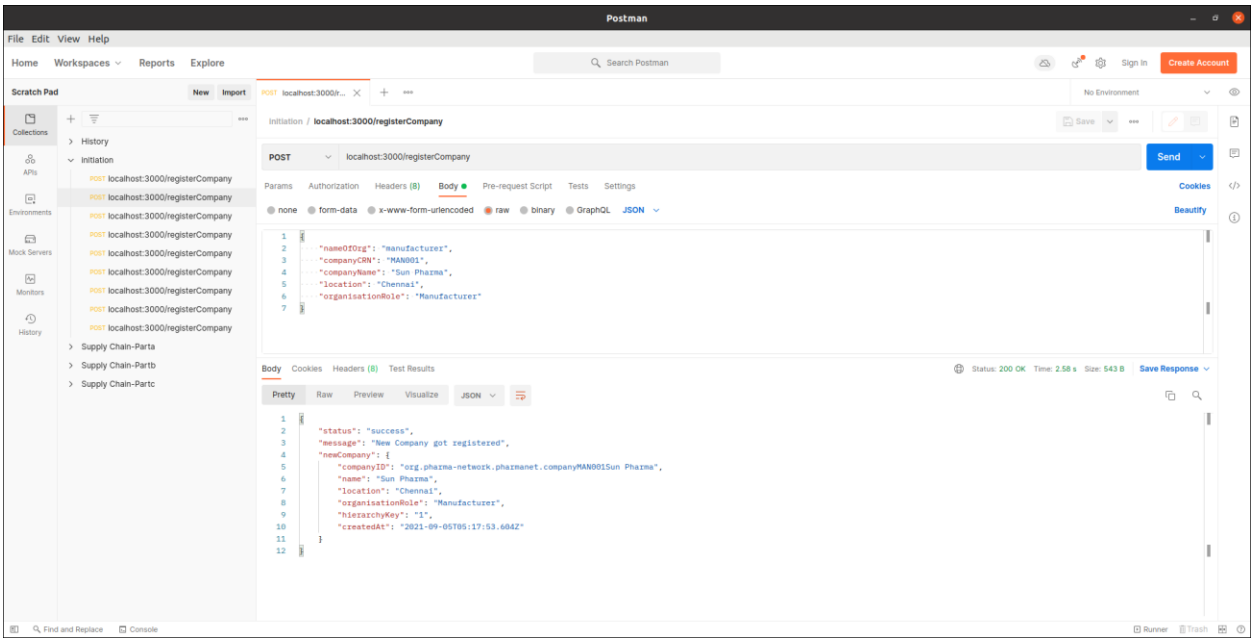
Test Cases using Postman

Collection files are provided under the **test** directory of the project. These collections can be imported in the postman to test the application.

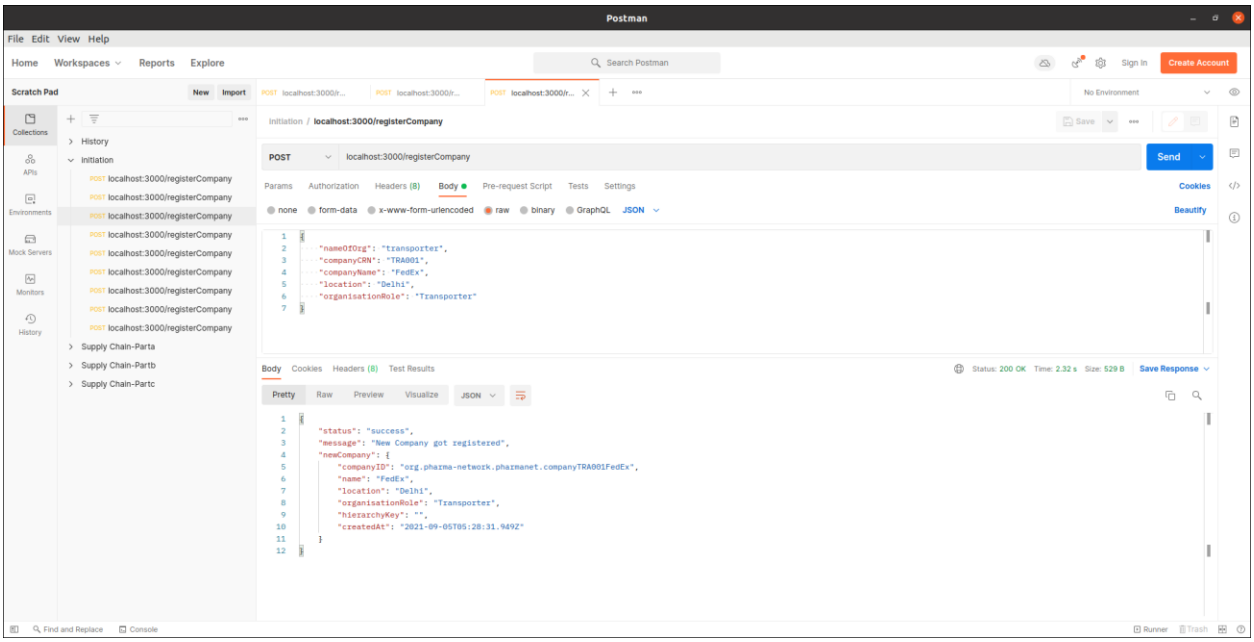


Test Case 1: Initiation

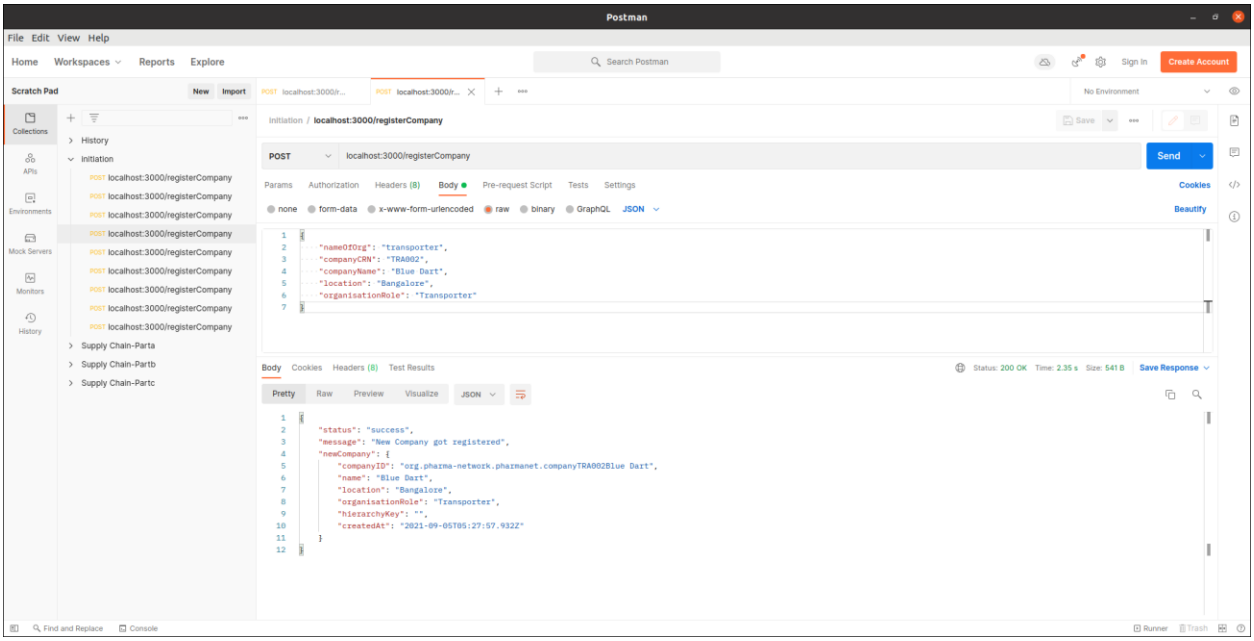
1. Create a manufacturer with the following details:
    - Name: ‘Sun Pharma’
    - CRN number: ‘MAN001’
    - Location: ‘Chennai’



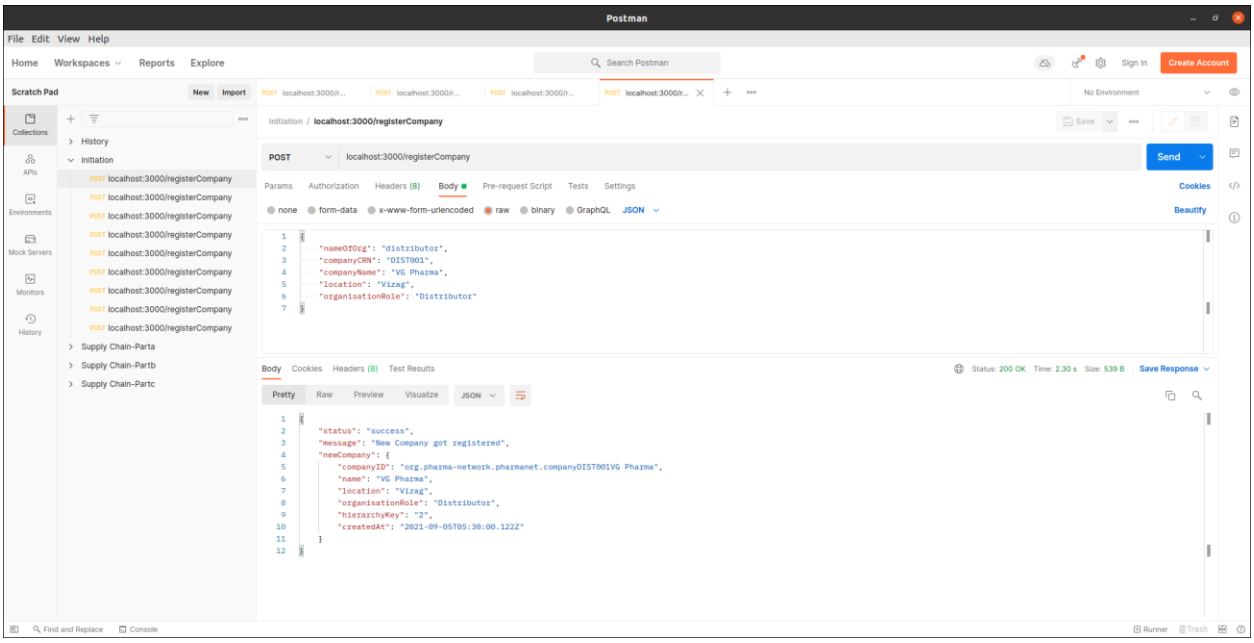
2. Create a transporter with the following details:
    - Name: ‘FedEx’
    - CRN number: ‘TRA001’
    - Location: ‘Delhi’



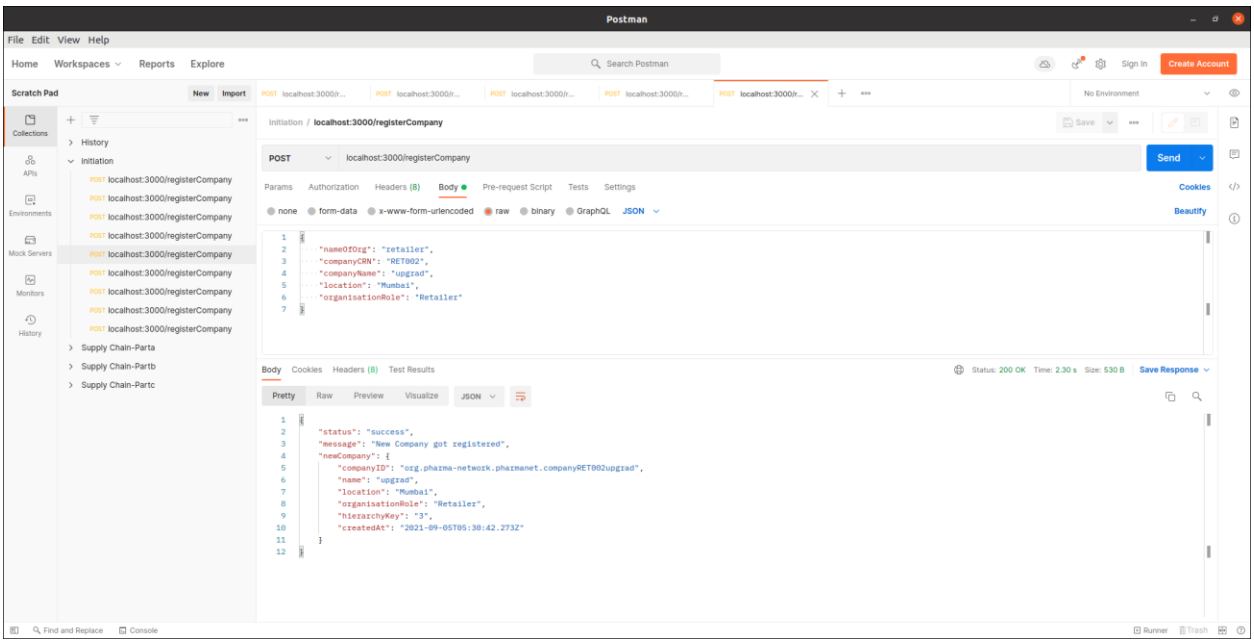
3. Create another transporter with the following details:
    - Name: ‘Blue Dart’
    - CRN number: ‘TRA002’
    - Location: ‘Bangalore’



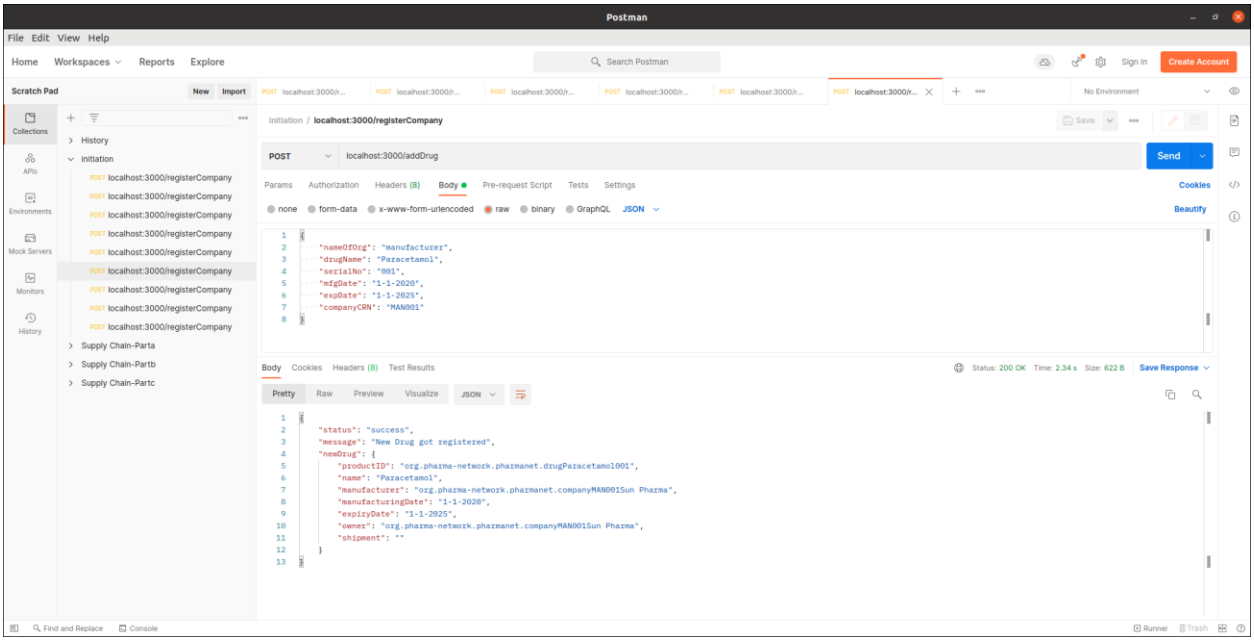
4. Create a distributor with the following details:
    - Name: ‘VG Pharma’
    - CRN number: ‘DIST001’
    - Location: ‘Vizag’

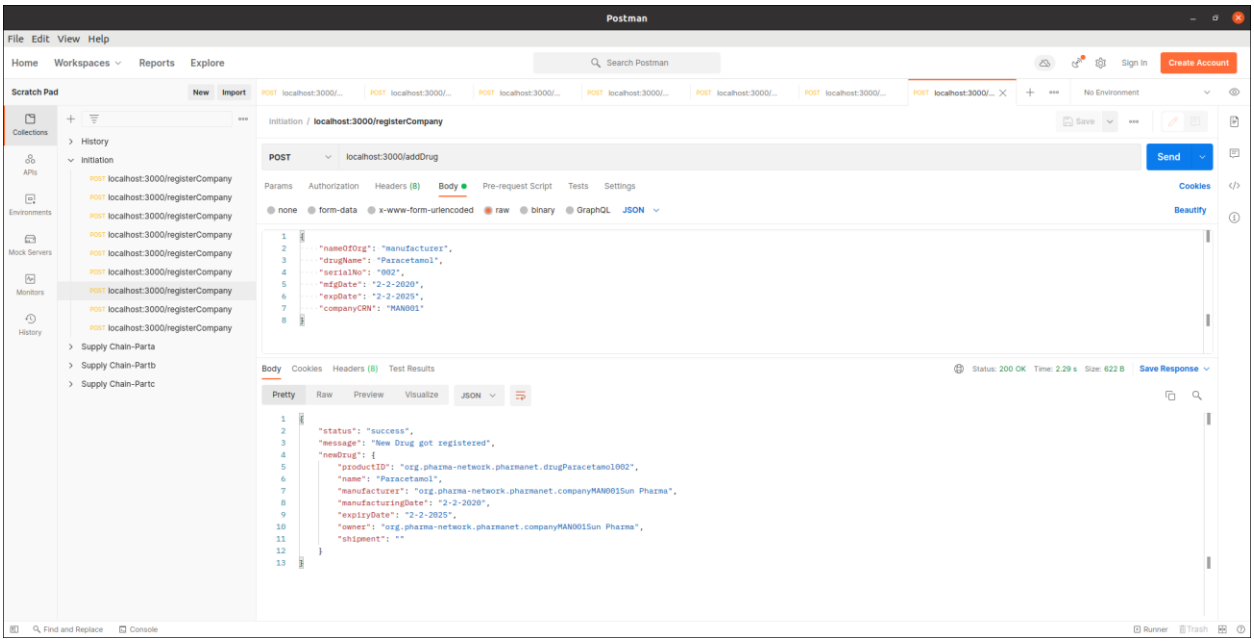


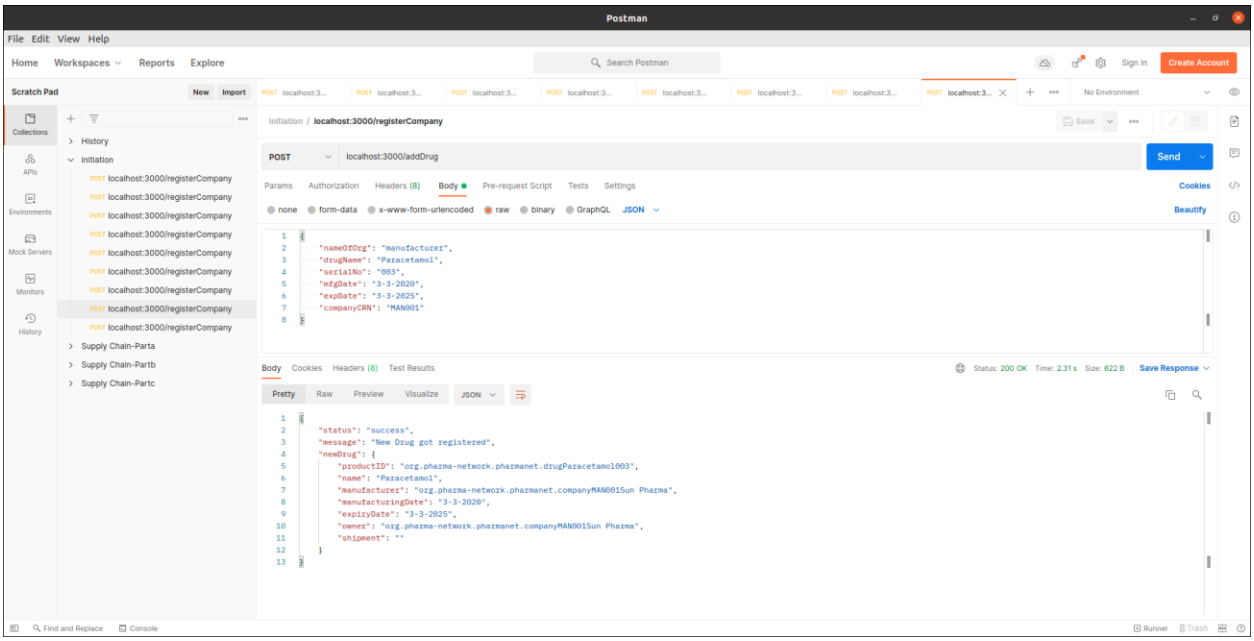
5. Create a retailer with the following details:
    - Name: ‘upgrad’
    - CRN number: ‘RET002’
    - Location: ‘Mumbai’

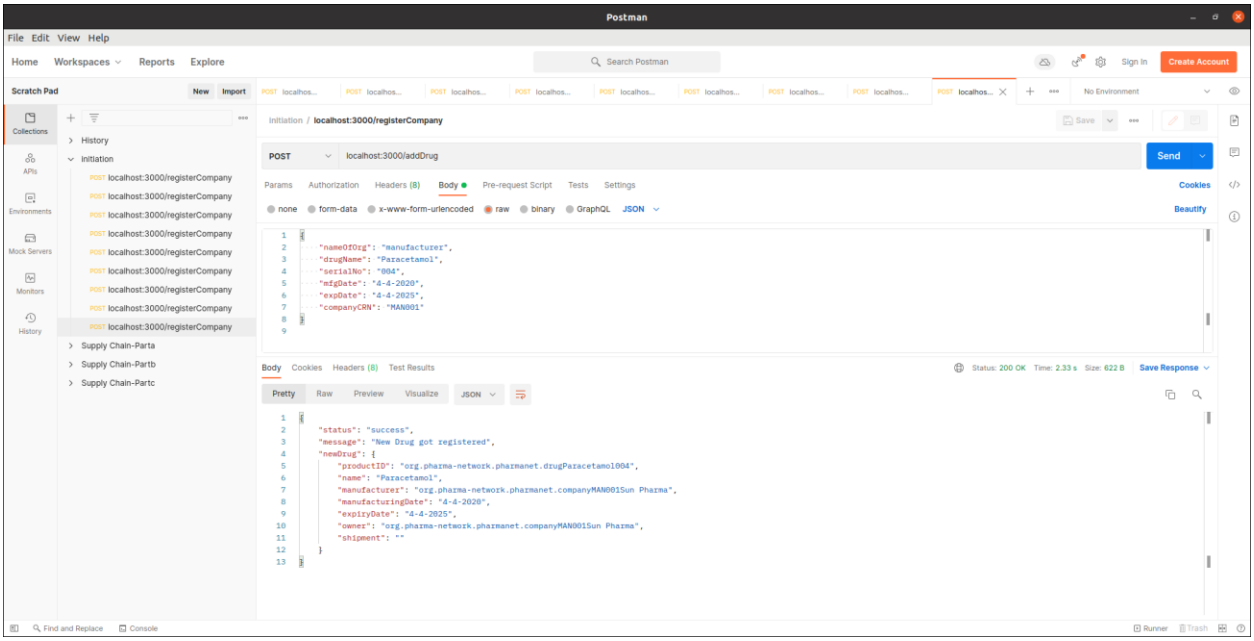


6. Create 4 strips of a drug named ‘Paracetamol’ with serial number starting from ‘001’ to ‘004’.





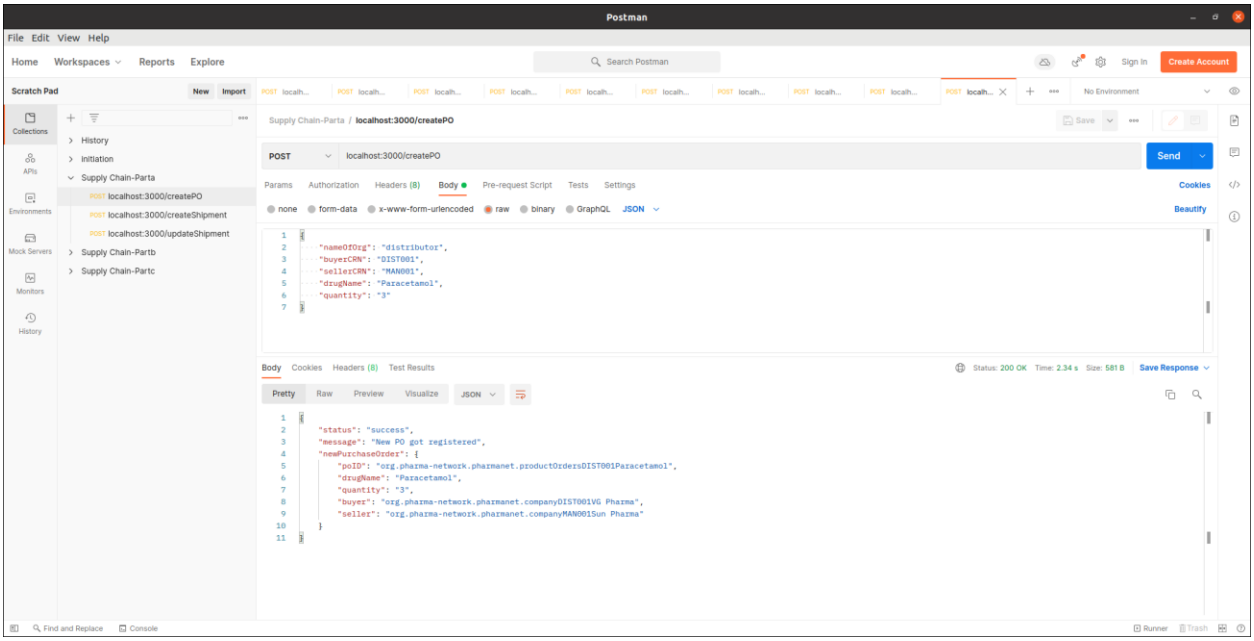

Postman
File Edit View Help
Home Workspaces Reports Explore
Search Postman
Sign In
Create Account
Scratch Pad
New Import
Collections
APIs
Environments
Mock Servers
Monitors
History
History
Initiation
POST localhost:3000/registerCompany
Supply Chain-Parta
Supply Chain-Partb
Supply Chain-Partc
initiation / localhost:3000/registerCompany
POST
localhost:3000/addDrug
Send
Params Authorization Headers (8) Body Pre-request Script Tests Settings
Cookies
none form-data x-www-form-urlencoded raw binary GraphQL JSON
Beautify
{
"nameOfOrg": "manufacturer",
"drugName": "Paracetamol",
"serialNo": "003",
"mfgDate": "3-3-2020",
"expDate": "3-3-2025",
"companyCRN": "MAN001"
}
Body Cookies Headers (8) Test Results
Status: 200 OK Time: 2.31 s Size: 622 B
Save Response
Pretty Raw Preview Visualize JSON
{
"status": "success",
"message": "New Drug got registered",
"newDrug": {
"productID": "org.pharma-network.pharmanet.drugParacetamol003",
"name": "Paracetamol",
"manufacturer": "org.pharma-network.pharmanet.companyMAN001Sun Pharma",
"manufacturingDate": "3-3-2020",
"expiryDate": "3-3-2025",
"owner": "org.pharma-network.pharmanet.companyMAN001Sun Pharma",
"shipment": ""
}
}
Find and Replace
Console
Runner
Trash


Postman
File Edit View Help
Home Workspaces Reports Explore
Search Postman
Sign In
Create Account
Scratch Pad
New Import
Collections
APIs
Environments
Mock Servers
Monitors
History
History
Initiation
POST localhost:3000/registerCompany
Supply Chain-Parta
Supply Chain-Partb
Supply Chain-Partc
initiation / localhost:3000/registerCompany
POST
localhost:3000/addDrug
Send
Params Authorization Headers (8) Body Pre-request Script Tests Settings
Cookies
none form-data x-www-form-urlencoded raw binary GraphQL JSON
Beautify
{
"nameOfOrg": "manufacturer",
"drugName": "Paracetamol",
"serialNo": "004",
"mfgDate": "4-4-2020",
"expDate": "4-4-2025",
"companyCRN": "MAN001"
}
Body Cookies Headers (8) Test Results
Status: 200 OK Time: 2.33 s Size: 622 B
Save Response
Pretty Raw Preview Visualize JSON
{
"status": "success",
"message": "New Drug got registered",
"newDrug": {
"productID": "org.pharma-network.pharmanet.drugParacetamol004",
"name": "Paracetamol",
"manufacturer": "org.pharma-network.pharmanet.companyMAN001Sun Pharma",
"manufacturingDate": "4-4-2020",
"expiryDate": "4-4-2025",
"owner": "org.pharma-network.pharmanet.companyMAN001Sun Pharma",
"shipment": ""
}
}
Find and Replace
Console
Runner
Trash

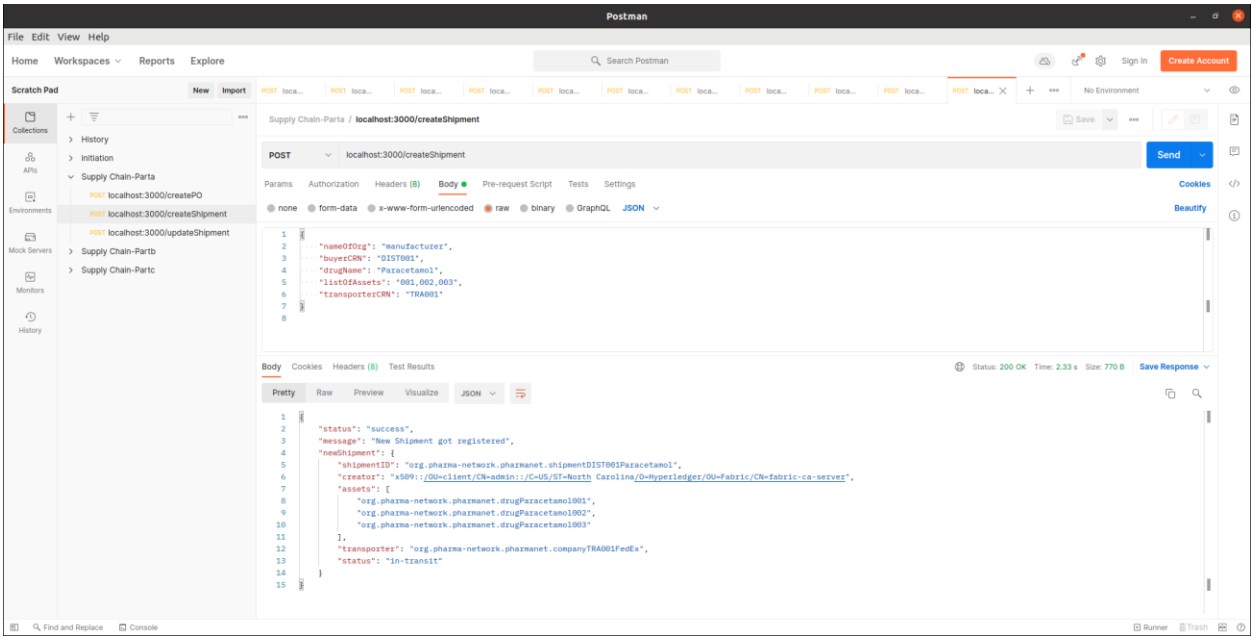
Test Case 2: Supply Chain

Part a:

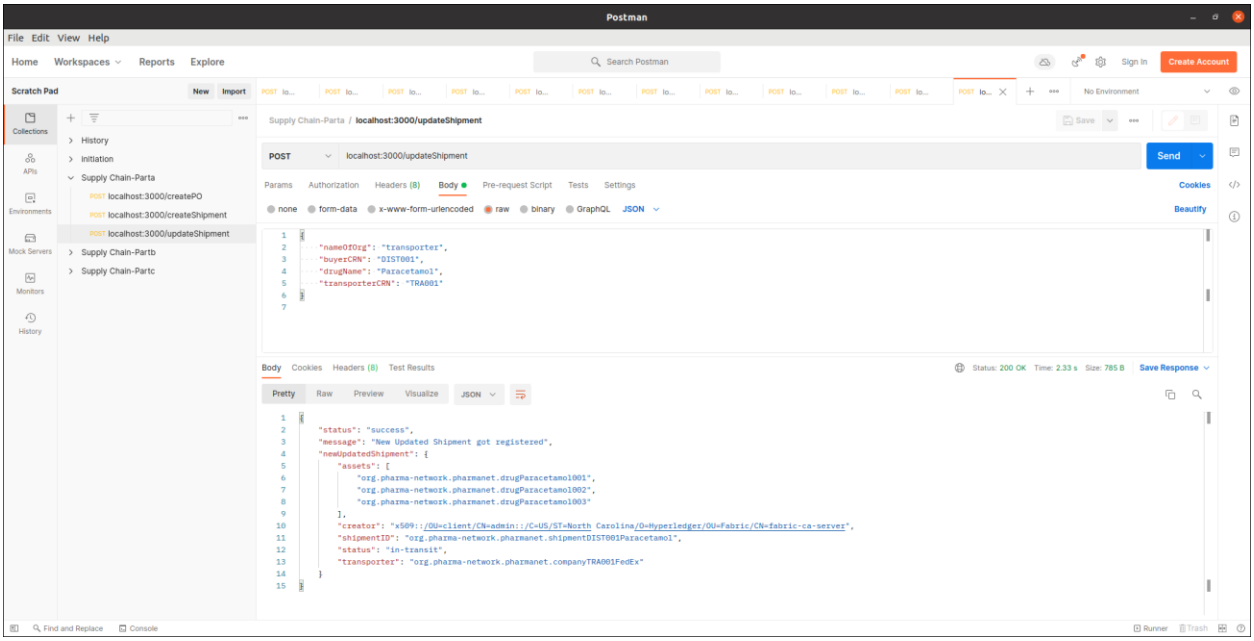
1. Purchase Order raised by ‘VG Pharma’ to purchase 3 strips of paracetamol from ‘Sun Pharma’.



2. Shipment created by ‘Sun Pharma’ in response to the raised purchase order. ‘FedEx’ acts as the transporter.

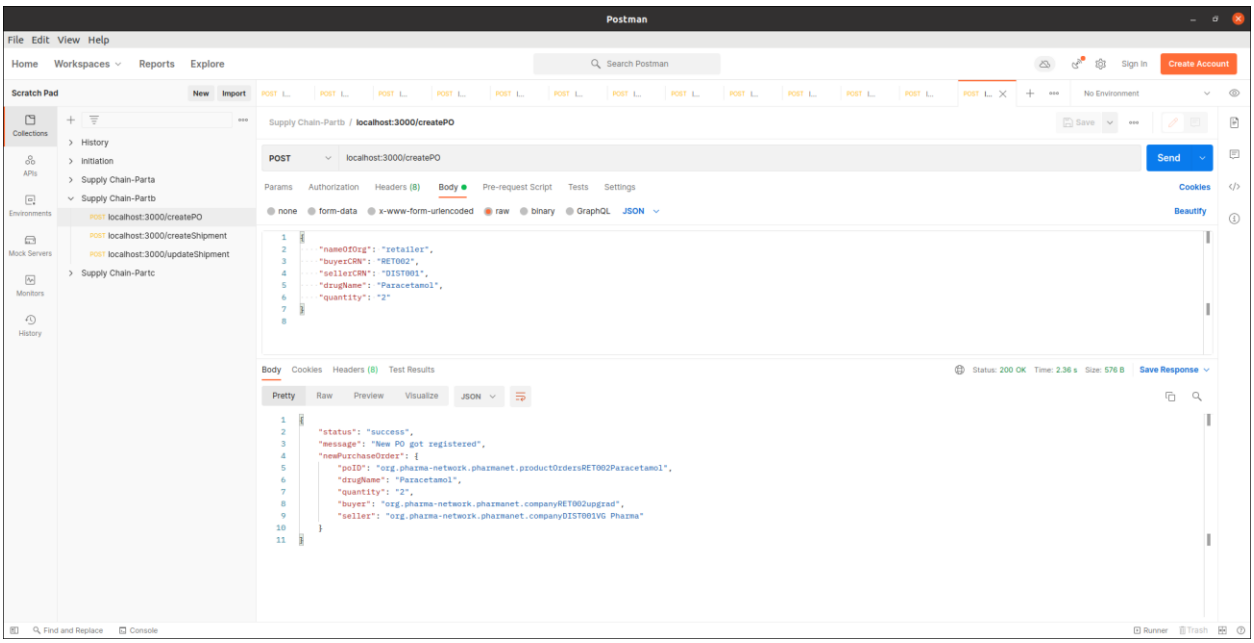


3. ‘FedEx’ delivers the shipment to ‘VG pharma’.

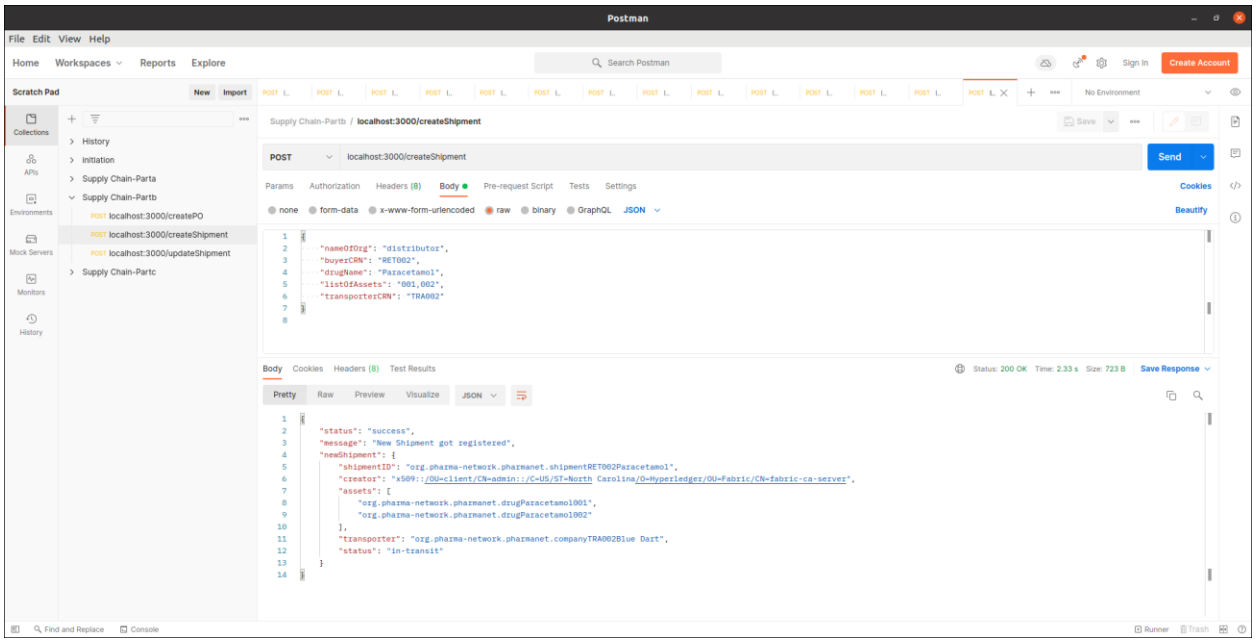


Part b:

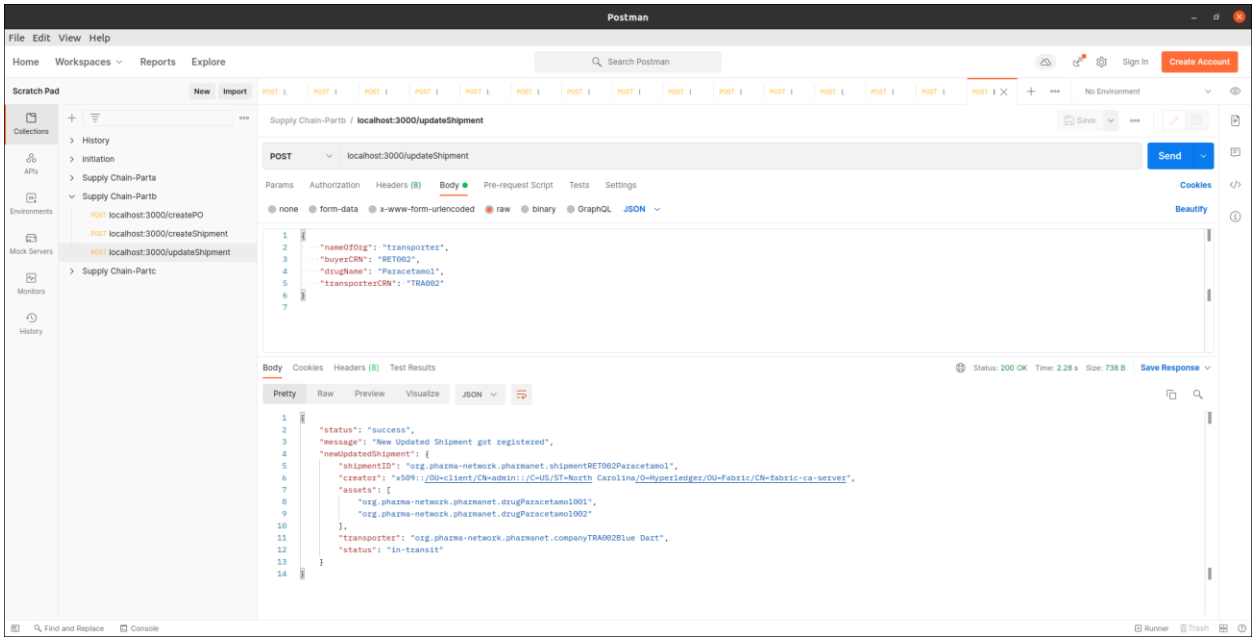
1. Purchase Order raised by ‘upgrad’ to purchase 2 strips of paracetamol from ‘VG Pharma’.



2. Shipment created by ‘VG Pharma’ in response to the raised purchase order. ‘Blue Dart’ acts as the transporter.

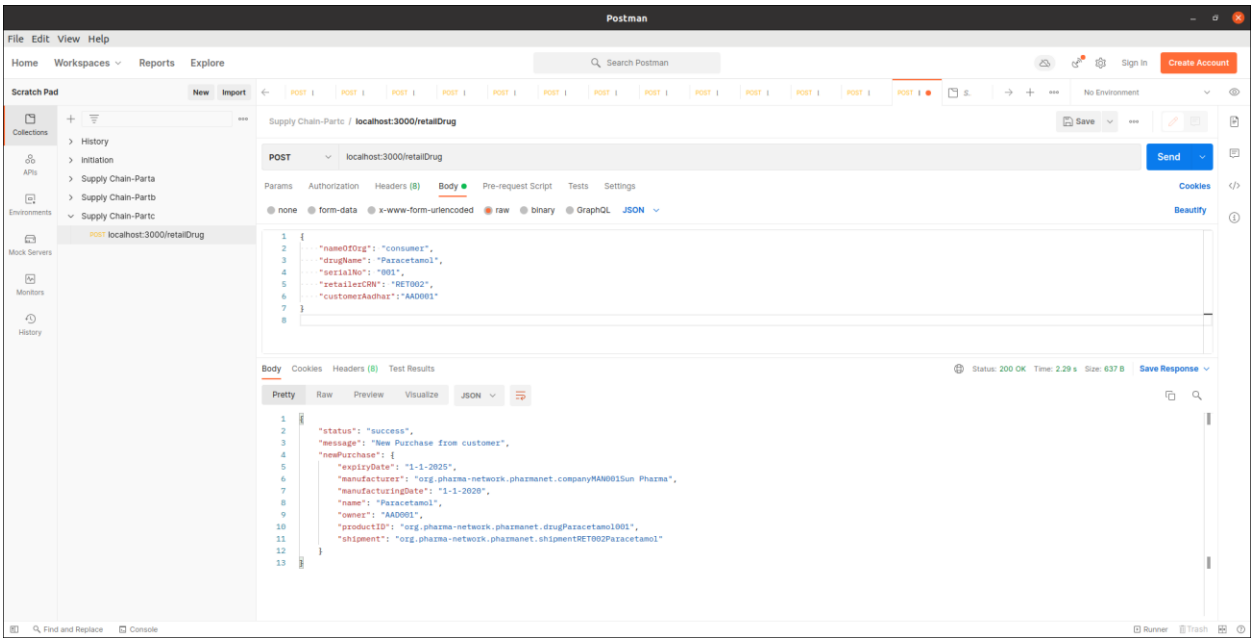


3. ‘Blue Dart’ delivers the shipment to ‘upgrad’



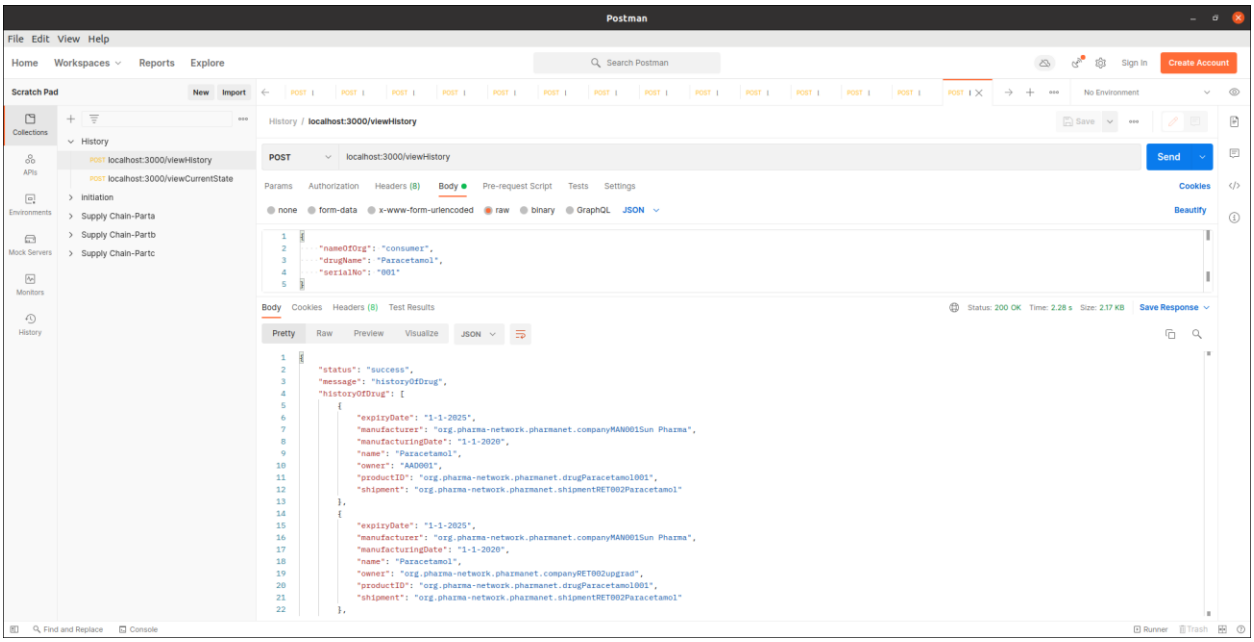
Part c:

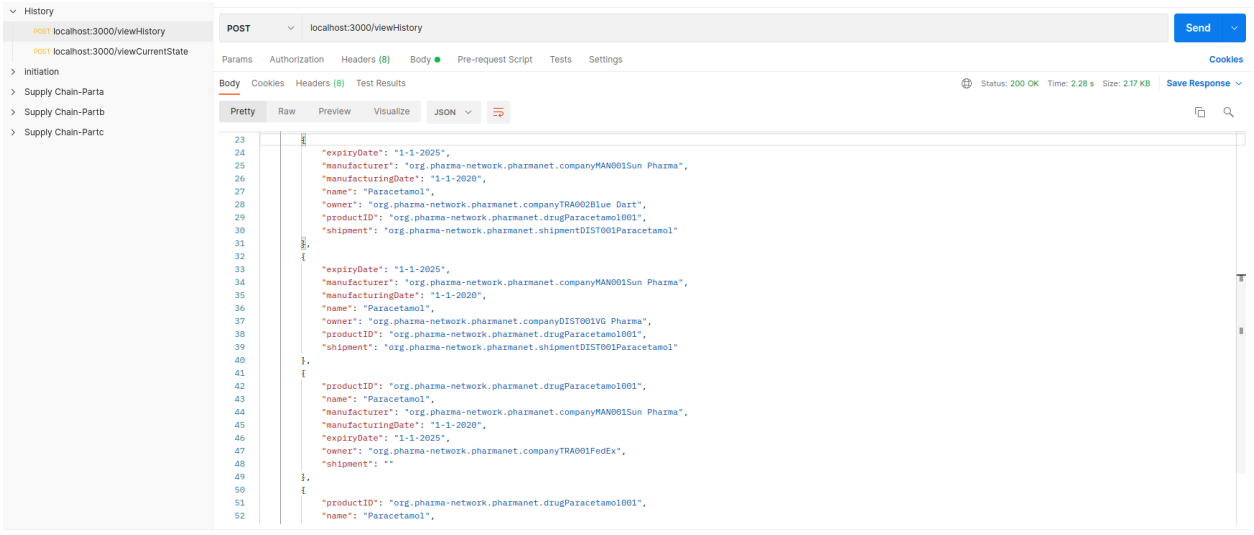
1. A customer named ‘Akash’ with Aadhar Number 'AAD001' buys 1 paracetamol strip from the retailer ‘upgrad’.

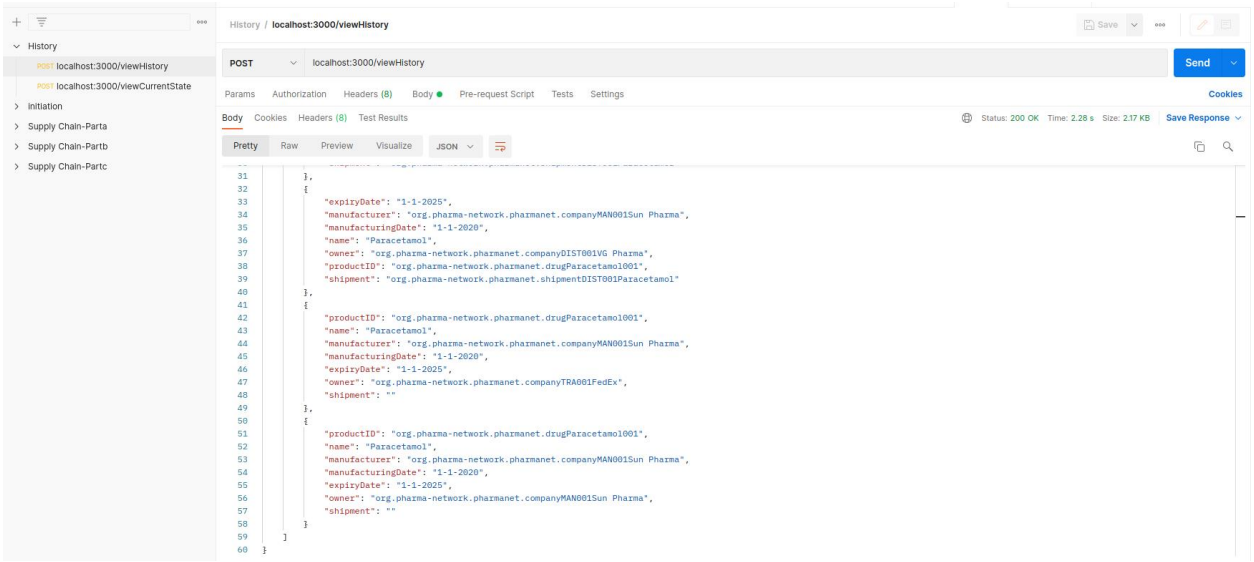


Test Case 3: History Track Down

1. The customer ‘Akash’ wishes to check the history of the paracetamol that he bought from ‘upgrad’.







2. The customer 'Akash' wishes to check the current state of the paracetamol that he bought from ‘upgrad’.