

# Pharma-Net Instruction Doc/Runbook

## Notes :

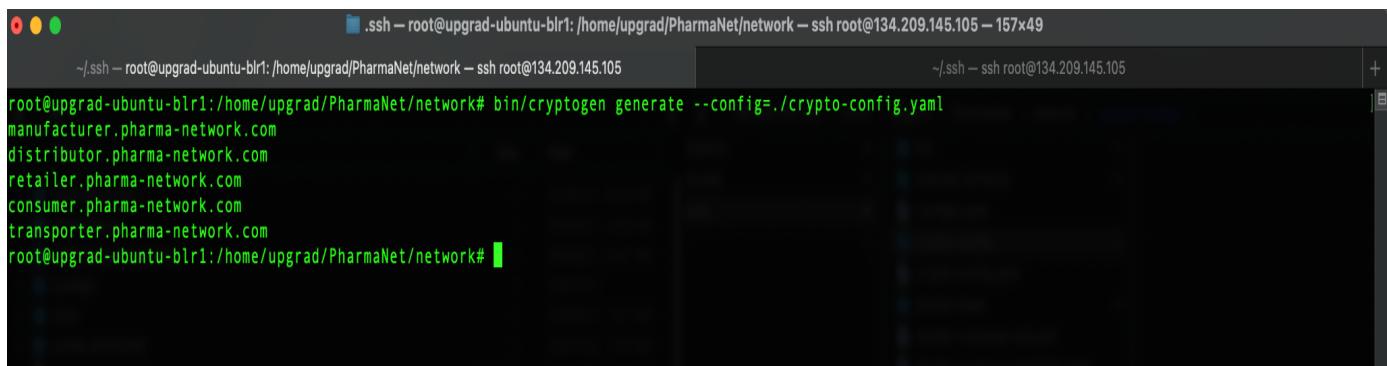
- This document assumes that the **pharma-net** project folder is copied to the path : **/home/upgrad/** as the setup for this project is a custom linux box and not the virtualBox image provided by Upgrad.
- All the Postman screenshots show an app running at <http://134.209.145.105:3000/> and not <http://localhost:3000/> - because that is the public IP of an Ubuntu instance I provisioned on a cloud (DigitalOcean). I didn't have access to a local linux machine. But updated all the Postman collections to have *localhost*.
- APIs being called in this document show both Success & Error scenario screenshots. However, screenshots for common errors that have common code for validation (e.g. invalid Buyer/Seller/Transporter CRN, invalid Drug details etc.) are only included once. This is to prevent the doc. from becoming too cumbersome and tedious to go through. **But screenshots of all the validation rules in the Upgrad tech. Spec. are included.**
- Kindly zoom 125-150% as required for easy reading as screenshots lose resolution when inserted into doc. For further proof that I executed all the scenarios, I also included an additional folder called **UpgradCapstoneScreenshots** inside the project **test** folder for reference. All of the screenshots there are sequentially numbered in order of execution.

## Prerequisites to Setup:

### 1. Generate Crypto Materials:

Run the following command :

```
cryptogen generate --config=./crypto-config.yaml
```



The screenshot shows a terminal window with a dark background and light-colored text. At the top, it displays the command: `cryptogen generate --config=./crypto-config.yaml`. Below this, the terminal output shows the generation of various certificates and keys for different entities: manufacturer.pharma-network.com, distributor.pharma-network.com, retailer.pharma-network.com, consumer.pharma-network.com, and transporter.pharma-network.com. The terminal window has a standard OS X-style title bar with icons for close, minimize, and maximize.

```
cryptogen generate --config=./crypto-config.yaml
./ssh - root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network - ssh root@134.209.145.105 - 157x49
~/ssh - root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network - ssh root@134.209.145.105
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# bin/cryptogen generate --config=./crypto-config.yaml
manufacturer.pharma-network.com
distributor.pharma-network.com
retailer.pharma-network.com
consumer.pharma-network.com
transporter.pharma-network.com
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network#
```

## 2. Generate Channel Artifacts:

Run the following commands in sequence :

To generate genesis block, create a channel pharmachannel, update anchor peers.

```
configtxgen -profile OrdererGenesis -channelID pharma-sys-channel -outputBlock  
./channel-artifacts/genesis.block
```

```
configtxgen -profile PharmaChannel -outputCreateChannelTx ./channel-artifacts/channel.tx  
-channelID pharmachannel
```

```
configtxgen -profile PharmaChannel -outputAnchorPeersUpdate  
./channel-artifacts/manufacturerMSPanchors.tx -channelID pharmachannel -asOrg  
manufacturerMSP
```

```
configtxgen -profile PharmaChannel -outputAnchorPeersUpdate  
./channel-artifacts/distributorMSPanchors.tx -channelID pharmachannel -asOrg distributorMSP
```

```
configtxgen -profile PharmaChannel -outputAnchorPeersUpdate  
./channel-artifacts/retailerMSPanchors.tx -channelID pharmachannel -asOrg retailerMSP
```

```
configtxgen -profile PharmaChannel -outputAnchorPeersUpdate  
./channel-artifacts/consumerMSPanchors.tx -channelID pharmachannel -asOrg consumerMSP
```

```
configtxgen -profile PharmaChannel -outputAnchorPeersUpdate  
./channel-artifacts/transporterMSPanchors.tx -channelID pharmachannel -asOrg transporterMSP
```

```
● .ssh — root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network — ssh root@134.209.145.105 — 157x49
~/ssh — root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network — ssh root@134.209.145.105 +-
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# bin/configtxgen -profile OrdererGenesis -channelID pharma-sys-channel -outputBlock ./channel-artifacts/ordererGenesis.block
2022-02-07 17:03:35.126 UTC [common.tools.configtxgen] main -> INFO 001 Loading configuration
2022-02-07 17:03:35.151 UTC [common.tools.configtxgen.localconfig] completeInitialization -> INFO 002 orderer type: solo
2022-02-07 17:03:35.151 UTC [common.tools.configtxgen.localconfig] Load -> INFO 003 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:03:35.168 UTC [common.tools.configtxgen.localconfig] completeInitialization -> INFO 004 orderer type: solo
2022-02-07 17:03:35.168 UTC [common.tools.configtxgen.localconfig] LoadToplevel -> INFO 005 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:03:35.173 UTC [common.tools.configtxgen] doOutputBlock -> INFO 006 Generating genesis block
2022-02-07 17:03:35.173 UTC [common.tools.configtxgen] doOutputBlock -> INFO 007 Writing genesis block
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# bin/configtxgen -profile PharmaChannel -outputCreateChannelTx ./channel-artifacts/channel.tx -channelID pharmachannel
2022-02-07 17:06:04.706 UTC [common.tools.configtxgen] main -> INFO 001 Loading configuration
2022-02-07 17:06:04.722 UTC [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:06:04.737 UTC [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2022-02-07 17:06:04.737 UTC [common.tools.configtxgen.localconfig] LoadToplevel -> INFO 004 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:06:04.737 UTC [common.tools.configtxgen] doOutputChannelCreateTx -> INFO 005 Generating new channel configtx
2022-02-07 17:06:04.737 UTC [common.tools.configtxgen.encoder] NewChannelGroup -> WARN 006 Default policy emission is deprecated, please include policy specifications for the channel group in configtx.yaml
2022-02-07 17:06:04.740 UTC [common.tools.configtxgen.encoder] NewChannelGroup -> WARN 007 Default policy emission is deprecated, please include policy specifications for the channel group in configtx.yaml
2022-02-07 17:06:04.743 UTC [common.tools.configtxgen] doOutputChannelCreateTx -> INFO 008 Writing new channel tx
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# bin/configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/manufacturerMSPanchors.tx -channelID pharmachannel -asOrg manufacturerMSP
2022-02-07 17:12:01.751 UTC [common.tools.configtxgen] main -> INFO 001 Loading configuration
2022-02-07 17:12:01.767 UTC [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:12:01.782 UTC [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2022-02-07 17:12:01.782 UTC [common.tools.configtxgen.localconfig] LoadToplevel -> INFO 004 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:12:01.782 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2022-02-07 17:12:01.782 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network#
```

```
● .ssh — root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network — ssh root@134.209.145.105 — 157x49
~/ssh — root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network — ssh root@134.209.145.105 +-
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# bin/configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/distributorMSPanchors.tx -channelID pharmachannel -asOrg distributorMSP
2022-02-07 17:13:29.133 UTC [common.tools.configtxgen] main -> INFO 001 Loading configuration
2022-02-07 17:13:29.148 UTC [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:13:29.163 UTC [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2022-02-07 17:13:29.163 UTC [common.tools.configtxgen.localconfig] LoadToplevel -> INFO 004 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:13:29.164 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2022-02-07 17:13:29.164 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# bin/configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/retailerMSPanchors.tx -channelID pharmachannel -asOrg retailerMSP
2022-02-07 17:14:12.321 UTC [common.tools.configtxgen] main -> INFO 001 Loading configuration
2022-02-07 17:14:12.336 UTC [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:14:12.351 UTC [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2022-02-07 17:14:12.351 UTC [common.tools.configtxgen.localconfig] LoadToplevel -> INFO 004 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:14:12.351 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2022-02-07 17:14:12.351 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# bin/configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/consumerMSPanchors.tx -channelID pharmachannel -asOrg consumerMSP
2022-02-07 17:14:38.676 UTC [common.tools.configtxgen] main -> INFO 001 Loading configuration
2022-02-07 17:14:38.701 UTC [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:14:38.717 UTC [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2022-02-07 17:14:38.717 UTC [common.tools.configtxgen.localconfig] LoadToplevel -> INFO 004 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:14:38.717 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2022-02-07 17:14:38.717 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# bin/configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/transporterMSPanchors.tx -channelID pharmachannel -asOrg transporterMSP
2022-02-07 17:15:12.658 UTC [common.tools.configtxgen] main -> INFO 001 Loading configuration
2022-02-07 17:15:12.673 UTC [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:15:12.688 UTC [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2022-02-07 17:15:12.688 UTC [common.tools.configtxgen.localconfig] LoadToplevel -> INFO 004 Loaded configuration: /home/upgrad/PharmaNet/network/configtx.yaml
2022-02-07 17:15:12.688 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2022-02-07 17:15:12.688 UTC [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network#
```

### 3. Install Node dependencies :

Navigate to our project application folder (*../pharma-net/application*) and run the following command :

```
npm install
```

## Network Setup & Script Execution:

### 1. Start Network using fabricNetwork shell script:

We create the Docker containers, initialize connections, join channels etc running the automation script as follows:

```
./fabricNetwork.sh up
```

It runs a series of commands to initialize connections, create peers, update peers, join channels etc. Once these commands are run and the bootstrapping of the network finishes, you will see the following screen.

```
./.ssh - root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network - ssh root@134.209.145.105 - 157x49
~/.ssh - root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network - ssh root@134.209.145.105 - ./.ssh - ssh root@134.209.145.105

+ peer channel update -o orderer.pharma-network.com:7050 -c pharmachannel -f ./channel-artifacts/manufacturerMSPanchors.tx
+ res=0
+ set +x
2022-02-07 17:37:19.013 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2022-02-07 17:37:19.036 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
===== Anchor peers updated for org 'manufacturerMSP' on channel 'pharmachannel' =====

Updating anchor peers for DISTRIBUTOR...
+ peer channel update -o orderer.pharma-network.com:7050 -c pharmachannel -f ./channel-artifacts/distributorMSPanchors.tx
+ res=0
+ set +x
2022-02-07 17:37:24.097 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2022-02-07 17:37:24.115 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
===== Anchor peers updated for org 'distributorMSP' on channel 'pharmachannel' =====

Updating anchor peers for RETAILER...
+ peer channel update -o orderer.pharma-network.com:7050 -c pharmachannel -f ./channel-artifacts/retailerMSPanchors.tx
+ res=0
+ set +x
2022-02-07 17:37:29.178 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2022-02-07 17:37:29.203 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
===== Anchor peers updated for org 'retailerMSP' on channel 'pharmachannel' =====

Updating anchor peers for CONSUMER...
+ peer channel update -o orderer.pharma-network.com:7050 -c pharmachannel -f ./channel-artifacts/consumerMSPanchors.tx
+ res=0
+ set +x
2022-02-07 17:37:34.264 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2022-02-07 17:37:34.280 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
===== Anchor peers updated for org 'consumerMSP' on channel 'pharmachannel' =====

Updating anchor peers for TRANSPORTER...
+ peer channel update -o orderer.pharma-network.com:7050 -c pharmachannel -f ./channel-artifacts/transporterMSPanchors.tx
+ res=0
+ set +x
2022-02-07 17:37:39.342 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2022-02-07 17:37:39.359 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
===== Anchor peers updated for org 'transporterMSP' on channel 'pharmachannel' =====

===== All GOOD. Hyperledger Fabric Pharma Network Is Now Up and Running! =====

[ 1 ] [ N ] [ 0 ]
[ 2 ] [ R ] [ 1 ]
[ 3 ] [ E ] [ 2 ]
[ 4 ] [ S ] [ 3 ]
[ 5 ] [ T ] [ 4 ]
[ 6 ] [ C ] [ 5 ]
[ 7 ] [ H ] [ 6 ]
[ 8 ] [ A ] [ 7 ]
[ 9 ] [ P ] [ 8 ]
[ 0 ] [ 9 ] [ 0 ]
```

## 2. Start Chaincode container:

Start the Chaincode container in a new tab in the terminal by running the following:

```
docker exec -it chaincode /bash
```

Download node dependencies by running:

npm install

```
npm run start-dev
```

### 3. Install Chaincode:

Now run below command in the first terminal tab to install chaincode:

```
./fabricNetwork.sh install
```

After a slew of commands, you will see the below screen stating the chaincode installation is done.

```
2022-02-07 17:49:22.475 UTC [chaincodeCmd] install -> INFO 005 Installed remotely response.<>status.200 payload: OK >
=====
Chaincode is installed on peer0.transporter =====

Instantiating chaincode on channel using peer0.manufacturer.pharma-network.com ...
+ peer chaincode instantiate -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -l node -v 1.1 -c '{"Args":["org.pharma-network.pharmanet.manufacturer:instantiate"]}' -P 'OR ('\"'manufacturerMSP.member'\\"', '\"'distributorMSP.member'\\"', '\"'retailerMSP.member'\\"', '\"'consumerMSP.member'\\"', '\"'transporterMSP.member'\\"')'
+ res=0
+ peer chaincode instantiate -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -l node -v 1.1 -c '{"Args":["org.pharma-network.pharmanet.distributor:instantiate"]}' -P 'OR ('\"'manufacturerMSP.member'\\"', '\"'distributorMSP.member'\\"', '\"'retailerMSP.member'\\"', '\"'consumerMSP.member'\\"', '\"'transporterMSP.member'\\"')'
+ res=0
+ peer chaincode instantiate -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -l node -v 1.1 -c '{"Args":["org.pharma-network.pharmanet.retailer:instantiate"]}' -P 'OR ('\"'manufacturerMSP.member'\\"', '\"'distributorMSP.member'\\"', '\"'retailerMSP.member'\\"', '\"'consumerMSP.member'\\"', '\"'transporterMSP.member'\\"')'
+ res=0
+ peer chaincode instantiate -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -l node -v 1.1 -c '{"Args":["org.pharma-network.pharmanet.transporter:instantiate"]}' -P 'OR ('\"'manufacturerMSP.member'\\"', '\"'distributorMSP.member'\\"', '\"'retailerMSP.member'\\"', '\"'consumerMSP.member'\\"', '\"'transporterMSP.member'\\"')'
+ res=0
+ set +x
2022-02-07 17:49:56.467 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001 Using default escc
2022-02-07 17:49:56.467 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002 Using default vscc
=====
Chaincode is instantiated on peer0.manufacturer on channel 'pharmachannel' =====

=====
All GOOD, Chaincode PHARMANET Is Now Installed & Instantiated On Pharma Network =====

[  ] [  ] [  ]
[  ] [  ] [  ]
[  ] [  ] [  ]
[  ] [  ] [  ]

root@upgrad-ubuntu-blr1:/home/upgrad/PharmaNet/network# 
```

The Chaincode container terminal tab also updates the status as seen below:

```

root@upgrad-ubuntu-blr1:~# docker exec -it chaincode /bin/bash
root@8cff3271f45:/opt/gopath/src/chaincode# npm run start-dev

> pharma-network@0.0.2 start-dev /opt/gopath/src/chaincode
> fabric-chaincode-node start --peer.address peer0.manufacturer.pharma-network.com:7053 --chaincode-id-name pharmanet:1.2

Configuring yargs through package.json is deprecated and will be removed in the next major release, please use the JS API instead.
Configuring yargs through package.json is deprecated and will be removed in the next major release, please use the JS API instead.
Configuring yargs through package.json is deprecated and will be removed in the next major release, please use the JS API instead.
2022-02-08T10:40:07.584Z info [shim:contracts-spi/bootstrap.js] No metadata file supplied in contract, introspection will generate all the
data
2022-02-08T10:40:07.585Z info [shim:contracts-spi/chaincodefromcontract.js] Using serializers {"transaction":"jsonSerializer","serializers":{}}
Configuring yargs through package.json is deprecated and will be removed in the next major release, please use the JS API instead.
2022-02-08T10:40:07.621Z info [shim:lib/chaincode.js] Registering with peer peer0.manufacturer.pharma-network.com:7053 as chainco
de "pharmanet:1.2"

Command succeeded

2022-02-08T10:40:07.649Z info [shim:lib/handler.js] Successfully registered with peer node. State transferred to "established"
2022-02-08T10:40:07.650Z info [shim:lib/handler.js] Successfully established communication with peer node. State transferred to
"ready"
PharmaNet - Manufacturer Smart Contract Instantiated
2022-02-08T10:40:26.473Z info [shim:lib/handler.js] [pharmachannel-e257859a] Calling chaincode Init() succeeded. Sending COMPLE
TED message back to peer
PharmaNet - Distributor Smart Contract Instantiated
2022-02-08T10:40:26.566Z info [shim:lib/handler.js] [pharmachannel-0582a884] Calling chaincode Init() succeeded. Sending COMPLE
TED message back to peer
PharmaNet - Retailer Smart Contract Instantiated
2022-02-08T10:40:26.659Z info [shim:lib/handler.js] [pharmachannel-128a7ba6] Calling chaincode Init() succeeded. Sending COMPLE
TED message back to peer
PharmaNet - Transporter Smart Contract Instantiated
2022-02-08T10:40:26.745Z info [shim:lib/handler.js] [pharmachannel-61aee23f] Calling chaincode Init() succeeded. Sending COMPLE
TED message back to peer

```

## Start the Node App:

Navigate to the application folder of our project like so :

```
cd /home/upgrad/pharma-net/application/
```

And run the below command :

```
node index.js
```

## API Invocation through Postman :

Now, the fun part.

1. Import into Postman the API collections ***Initiation***, ***Supply Chain***, ***History*** from the **test** folder of the pharma-net project.

The screenshot shows the Postman interface with the title "My Workspace". The left sidebar lists categories: Collections, APIs, Environments, Mock Servers, Monitors, and History. The "Monitors" category is currently selected. The main area displays three imported API collections: "History", "initiation", and "Supply Chain".

- History:**
  - POST viewHistory
  - POST viewDrugCurrentState
- initiation:**
  - GET addAllStakeholderIdentities
  - POST registerCompany\_Manufacturer\_SunPharma
  - POST registerCompany\_Transporter\_FedEx
  - POST registerCompany\_Transporter\_BlueDart
  - POST registerCompany\_Distributor\_VGPharma
  - POST registerCompany\_Retailer\_Upgrad
  - POST addDrug
  - POST addDrug\_002
  - POST addDrug\_003
  - POST addDrug\_004
- Supply Chain:**
  - POST createPO\_VGPharmaToSunPharma
  - POST createShipment\_SunPharmaToVGPharmaViaFedEx
  - POST updateShipment\_FedEx\_SunPharmaToVGPharma
  - POST createPO\_upgradToVGPharma
  - POST createShipment\_VGPharmaToUpgradViaBlueDart
  - POST updateShipment\_BlueDart\_VGPharmaToUpgrad
  - POST retailDrug

2. Start invoking the functions in order - beginning with ***Initiation*** through ***History***.

## I. Entity Registration

**Initiation - addAllStakeholderidentities** : adds all the identities to wallet.

The screenshot shows a Postman collection named "initiation". A GET request is made to `http://134.209.145.105:3000/addAllStakeholderIdentitities`. The response status is 200 OK, time taken is 400 ms, and size is 320 B. The response body is:

```
1 "status": "success",
2 "message": "All stakeholder identities added to wallet."
```

**Initiation - registerCompany** : registers Company on the network.

Manufacturer - Sun Pharma :

The screenshot shows a Postman collection named "initiation". A POST request is made to `http://134.209.145.105:3000/registerCompany`. The response status is 200 OK, time taken is 50.62 s, and size is 769 B. The response body is:

```
1 "status": "success",
2 "message": "registerCompany invoked successfully.",
3 "response": {
4     "companyID": "Org.pharma-network.pharmanet.companyMAN001Sun Pharma",
5     "name": "Sun Pharma",
6     "location": "Chennai",
7     "organisationRole": "MANUFACTURER",
8     "hierarchyKey": 1,
9     "createdBy": "x509:/C=US/ST=California/L=San Francisco/OU=client/CN=Admin@manufacturer.pharma-network.com:/C=US/ST=California/L=San Francisco/O=manufacturer.pharma-network.com/CN=ca.manufacturer.pharma-network.com",
10    "createdDate": "2022-02-08T10:49:09.197Z"
11 }
```

## Transporter - FedEx :

## Transporter - Blue Dart :

## Distributor - VG Pharma :

The screenshot shows the Postman interface with the following details:

- Request URL:** http://134.209.145.105:3000/registerCompany
- Method:** POST
- Body (x-www-form-urlencoded):**

KEY	VALUE	DESCRIPTION
orgType	distributor	
companyCRN	DIST001	
companyName	VG Pharma	
location	Vizag	
organisationRole	Distributor	
Key	Value	Description
- Response Status:** 200 OK
- Response Body (Pretty JSON):**

```

1
2     "status": "success",
3     "message": "registerCompany invoked successfully.",
4     "response": {
5         "companyID": "Org.pharma-network.pharmanet.company0DIST001VG Pharma",
6         "name": "VG Pharma",
7         "location": "Vizag",
8         "organisationRole": "DISTRIBUTOR",
9         "hierarchyKey": 2,
10        "createdBy": "x509::/C=US/ST=California/L=San Francisco/OU=client/CN=Admin@distributor.pharma-network.com:/C=US/ST=California/L=San Francisco/0=distributor.pharma-network.com/CN=ca.distributor.pharma-network.com",
11        "createdDate": "2022-02-08T10:59:41.126Z"
12    }
  
```

## Retailer - Upgrad :

The screenshot shows the Postman interface with the following details:

- Request URL:** http://134.209.145.105:3000/registerCompany
- Method:** POST
- Body (x-www-form-urlencoded):**

KEY	VALUE	DESCRIPTION
orgType	retailer	
companyCRN	RET002	
companyName	upgrad	
location	Mumbai	
organisationRole	Retailer	
Key	Value	Description
- Response Status:** 200 OK
- Response Body (Pretty JSON):**

```

1
2     "status": "success",
3     "message": "registerCompany invoked successfully.",
4     "response": {
5         "companyID": "Org.pharma-network.pharmanet.company0RET002upgrad",
6         "name": "upgrad",
7         "location": "Mumbai",
8         "organisationRole": "RETAILER",
9         "hierarchyKey": 3,
10        "createdBy": "x509::/C=US/ST=California/L=San Francisco/OU=client/CN=Admin@retailer.pharma-network.com:/C=US/ST=California/L=San Francisco/0=retailer.pharma-network.com/CN=ca.retailer.pharma-network.com",
11        "createdDate": "2022-02-08T11:02:02.673Z"
12    }
  
```

## Error # Company already exists :

The screenshot shows a Postman interface with the following details:

- Initiation / registerCompany**
- POST** http://134.209.145.105:3000/registerCompany
- Body** (x-www-form-urlencoded)
- Params**, **Authorization**, **Headers (8)**, **Tests**, **Settings** tabs are visible.
- Body** table:
 

KEY	VALUE	DESCRIPTION
orgType	manufacturer	
companyCRN	MAN001	
companyName	Sun Pharma	
location	Chennai	
organisationRole	Manufacturer	
Key	Value	Description
- Body Results** tab shows a response with status 500 Internal Server Error:
 

```

1 "status": "ERROR",
2 "message": "Failed to registerCompany.",
3 "error": "Error while invoking registerCompany : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: A company with given CRN already exists!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: A company with given CRN already exists!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: A company with given CRN already exists!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: A company with given CRN already exists!"
5
      
```

## II. Drug Registration

**Initiation - addDrug** : adds Drugs to the network.  
Paracetamol - Strip 001:

The screenshot shows a Postman interface with the following details:

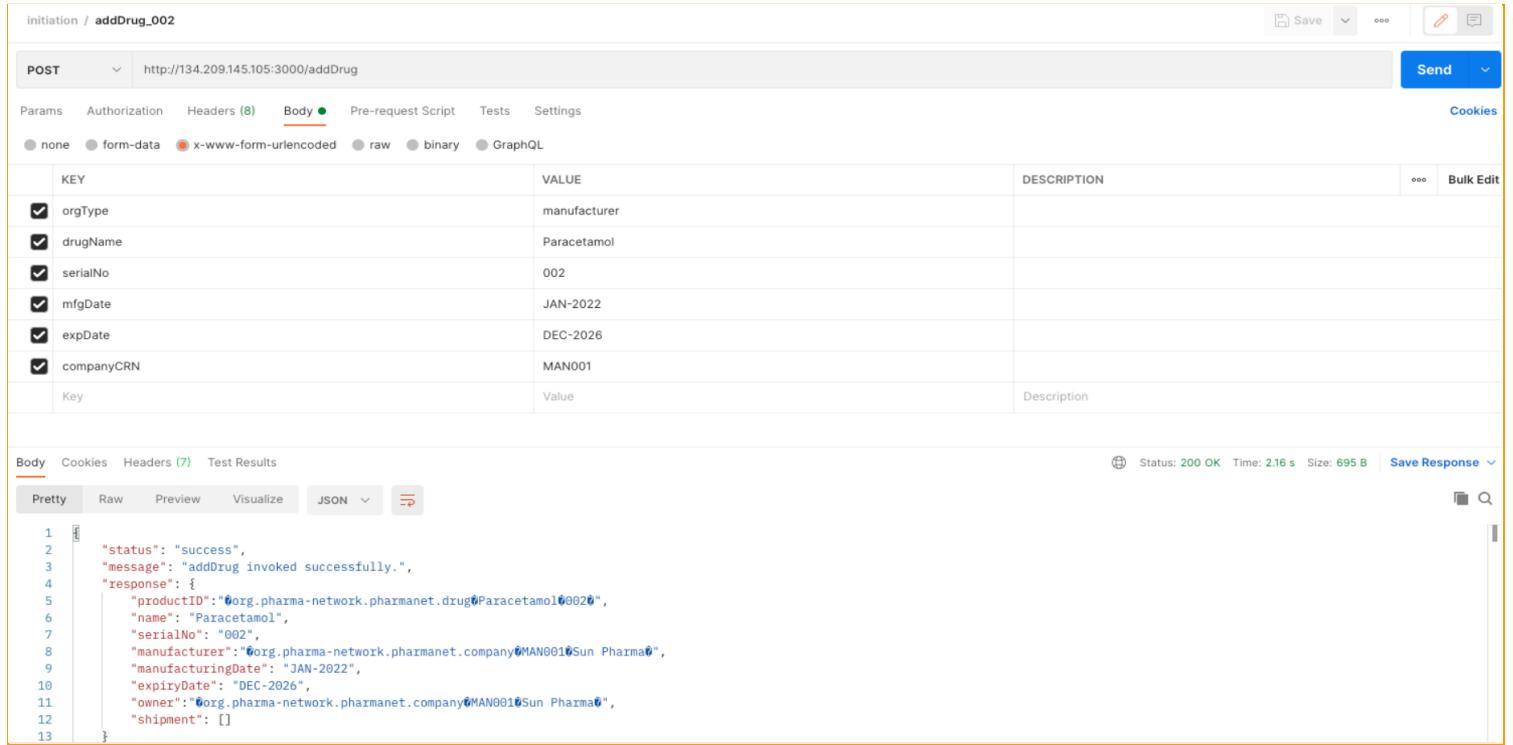
- Initiation / addDrug**
- POST** http://134.209.145.105:3000/addDrug
- Body** (x-www-form-urlencoded)
- Params**, **Authorization**, **Headers (8)**, **Tests**, **Settings** tabs are visible.
- Body** table:
 

KEY	VALUE	DESCRIPTION
orgType	manufacturer	
drugName	Paracetamol	
serialNo	001	
mfgDate	JAN-2022	
expDate	DEC-2026	
companyCRN	MAN001	
Key	Value	Description
- Body Results** tab shows a response with status 200 OK:
 

```

1 "status": "success",
2 "message": "addDrug invoked successfully.",
3 "response": {
4   "productID": "Org.pharma-network.pharmanet.drug@Paracetamol0001",
5   "name": "Paracetamol",
6   "serialNo": "001",
7   "manufacturer": "Org.pharma-network.pharmanet.company@MAN001@Sun Pharma",
8   "manufacturingDate": "JAN-2022",
9   "expiryDate": "DEC-2026",
10  "owner": "Org.pharma-network.pharmanet.company@MAN001@Sun Pharma",
11  "shipment": []
12 }
13
      
```

## Paracetamol - Strip 002:



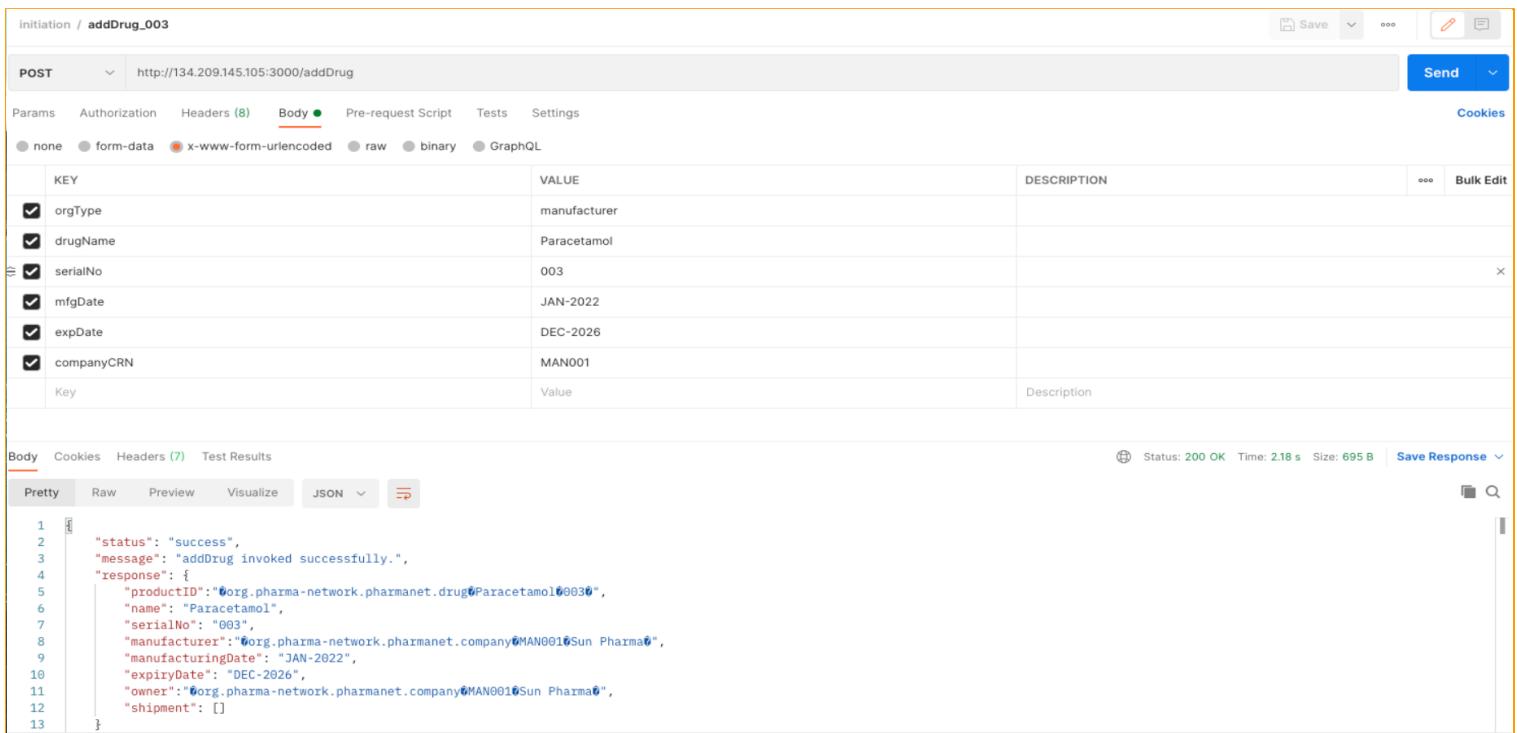
The screenshot shows a Postman API request for adding a drug. The URL is `http://134.209.145.105:3000/addDrug`. The method is POST. The Body tab is selected, showing an x-www-form-urlencoded body with the following fields:

KEY	VALUE	DESCRIPTION
orgType	manufacturer	
drugName	Paracetamol	
serialNo	002	
mfgDate	JAN-2022	
expDate	DEC-2026	
companyCRN	MAN001	

The response status is 200 OK, and the JSON response is:

```
1 "status": "success",
2 "message": "addDrug invoked successfully.",
3 "response": {
4     "productID": "Org.pharma-network.pharmanet.drugParacetamol0002",
5     "name": "Paracetamol",
6     "serialNo": "002",
7     "manufacturer": "Org.pharma-network.pharmanet.companyMAN001Sun Pharma",
8     "manufacturingDate": "JAN-2022",
9     "expiryDate": "DEC-2026",
10    "owner": "Org.pharma-network.pharmanet.companyMAN001Sun Pharma",
11    "shipment": []
12 }
```

## Paracetamol - Strip 003:



The screenshot shows a Postman API request for adding a drug. The URL is `http://134.209.145.105:3000/addDrug`. The method is POST. The Body tab is selected, showing an x-www-form-urlencoded body with the following fields:

KEY	VALUE	DESCRIPTION
orgType	manufacturer	
drugName	Paracetamol	
serialNo	003	
mfgDate	JAN-2022	
expDate	DEC-2026	
companyCRN	MAN001	

The response status is 200 OK, and the JSON response is:

```
1 "status": "success",
2 "message": "addDrug invoked successfully.",
3 "response": {
4     "productID": "Org.pharma-network.pharmanet.drugParacetamol0003",
5     "name": "Paracetamol",
6     "serialNo": "003",
7     "manufacturer": "Org.pharma-network.pharmanet.companyMAN001Sun Pharma",
8     "manufacturingDate": "JAN-2022",
9     "expiryDate": "DEC-2026",
10    "owner": "Org.pharma-network.pharmanet.companyMAN001Sun Pharma",
11    "shipment": []
12 }
```

## Paracetamol - Strip 004:

initiation / addDrug\_004

POST http://134.209.145.105:3000/addDrug

Body (8) Body Pre-request Script Tests Settings

Params Authorization Headers (8) Body Body Pre-request Script Tests Settings Cookies

none  form-data  x-www-form-urlencoded  raw  binary  GraphQL

KEY	VALUE	DESCRIPTION
orgType	manufacturer	
drugName	Paracetamol	
serialNo	004	
mfgDate	JAN-2022	
expDate	DEC-2026	
companyCRN	MAN001	
Key	Value	Description

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON JSON

```

1
2 "status": "success",
3 "message": "addDrug invoked successfully.",
4 "response": {
5     "productID": "#org.pharma-network.pharmanet.drug#Paracetamol#004#",
6     "name": "Paracetamol",
7     "serialNo": "004",
8     "manufacturer": "#org.pharma-network.pharmanet.company#MAN001#Sun Pharma#",
9     "manufacturingDate": "JAN-2022",
10    "expiryDate": "DEC-2026",
11    "owner": "#org.pharma-network.pharmanet.company#MAN001#Sun Pharma#",
12    "shipment": []
13 }

```

Status: 200 OK Time: 2.19 s Size: 695 B Save Response

## Error # Duplicate Drug :

initiation / addDrug

POST http://134.209.145.105:3000/addDrug

Body (8) Body Pre-request Script Tests Settings

Params Authorization Headers (8) Body Body Pre-request Script Tests Settings Cookies

none  form-data  x-www-form-urlencoded  raw  binary  GraphQL

KEY	VALUE	DESCRIPTION
orgType	manufacturer	
drugName	Paracetamol	
serialNo	001	
mfgDate	JAN-2022	
expDate	DEC-2026	
companyCRN	MAN001	
Key	Value	Description

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON JSON

```

1
2 "status": "ERROR",
3 "message": "Failed to addDrug.",
4 "error": "Error while invoking addDrug : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: A Drug with name: Paracetamol & serialNo: 001 already exists!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: A Drug with name: Paracetamol & serialNo: 001 already exists!\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: A Drug with name: Paracetamol & serialNo: 001 already exists!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: A Drug with name: Paracetamol & serialNo: 001 already exists!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: A Drug with name: Paracetamol & serialNo: 001 already exists!"
5

```

Status: 500 Internal Server Error Time: 176 ms Size: 1.24 KB Save Response

## Error # Invalid Manufacturer - Does not exist :

Initiation / addDrug

POST http://134.209.145.105:3000/addDrug

Params Authorization Headers (8) Body ● Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL

KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/> orgType	manufacturer	
<input checked="" type="checkbox"/> drugName	Paracetamol	
<input checked="" type="checkbox"/> serialNo	001	
<input checked="" type="checkbox"/> mfgDate	JAN-2022	
<input checked="" type="checkbox"/> expDate	DEC-2026	
<input checked="" type="checkbox"/> companyCRN	MAN009	
Key	Value	Description

body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1 "status": "ERROR",
2 "message": "Failed to addDrug.",
3 "error": "Error while invoking addDrug : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: No Manufacturer exist with given CRN!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: No Manufacturer exists with given CRN!\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: No Manufacturer exists with given CRN!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: No Manufacturer exists with given CRN!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: No Manufacturer exists with given CRN!"
5

```

## Error # Invalid Manufacturer - Valid org. but not registered as a manufacturer:

initiation / addDrug

POST http://134.209.145.105:3000/addDrug

Params Authorization Headers (8) Body ● Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL

KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/> orgType	manufacturer	
<input checked="" type="checkbox"/> drugName	Paracetamol	
<input checked="" type="checkbox"/> serialNo	001	
<input checked="" type="checkbox"/> mfgDate	JAN-2022	
<input checked="" type="checkbox"/> expDate	DEC-2026	
<input checked="" type="checkbox"/> companyCRN	DIST001	
Key	Value	Description

body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1 "status": "ERROR",
2 "message": "Failed to addDrug.",
3 "error": "Error while invoking addDrug : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: You are not registered as a Manufacturer, so cannot add drugs!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: You are not registered as a Manufacturer, so cannot add drugs!\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: You are not registered as a Manufacturer, so cannot add drugs!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: You are not registered as a Manufacturer, so cannot add drugs!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: You are not registered as a Manufacturer, so cannot add drugs!"
5

```

### III. Transfer Drug

**Supply Chain - createPO (VG Pharma raises PO to Sun Pharma):** creates a purchase order with buyer, seller, drugName, Qty. details.

The screenshot shows a Postman request for "Supply Chain / createPO". The method is "POST" and the URL is "http://134.209.145.105:3000/createPO". The "Body" tab is selected, showing an x-www-form-urlencoded payload:

KEY	VALUE	DESCRIPTION
orgType	distributor	
buyerCRN	DIST001	
sellerCRN	MAN001	
drugName	Paracetamol	
quantity	3	
Key	Value	Description

The response status is 200 OK, and the response body is:

```

1
2   "status": "success",
3   "message": "createPO invoked successfully.",
4   "response": {
5     "poID": "Org.pharma-network.pharmanet.po#DIST001#Paracetamol",
6     "drugName": "Paracetamol",
7     "buyer": "Org.pharma-network.pharmanet.company#DIST001#VG Pharma",
8     "seller": "Org.pharma-network.pharmanet.company#MAN001#Sun Pharma",
9     "quantity": 3,
10    "otherInfo": {
11      "buyerName": "VG Pharma",
12      "sellerName": "Sun Pharma"
13    }
14  }

```

Error # Invalid Buyer :

The screenshot shows a Postman request for "Supply Chain / createPO\_VGPharmaToSunPharma". The method is "POST" and the URL is "http://134.209.145.105:3000/createPO". The "Body" tab is selected, showing an x-www-form-urlencoded payload identical to the previous request.

The response status is 500 Internal Server Error, and the response body is:

```

1
2   "status": "ERROR",
3   "message": "Failed to createPO.",
4   "error": "Error while invoking createPO : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500,
        message=transaction returned with failure: Error: No Buyer company exists with given CRN!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction
        returned with failure: Error: No Buyer company exists with given CRN!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error:
        No Buyer company exists with given CRN!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: No Buyer company exists with
        given CRN!\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: No Buyer company exists with given CRN!"

```

## Error # Invalid Seller :

Supply Chain / createPO\_VGPharmaToSunPharma

POST http://134.209.145.105:3000/createPO

Params Authorization Headers (8) Body  Pre-request Script Tests Settings Cookies

Body Type: x-www-form-urlencoded

KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/> orgType	distributor			
<input checked="" type="checkbox"/> buyerCRN	DIST001			
<input checked="" type="checkbox"/> sellerCRN	MAN009			
<input checked="" type="checkbox"/> drugName	Paracetamol			
<input checked="" type="checkbox"/> quantity	3			
Key	Value	Description		

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1
2     "status": "ERROR",
3     "message": "Failed to createPO.",
4     "error": "Error while invoking createPO : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500,
      message=transaction returned with failure: Error: No Seller company exists with given CRN!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction
      returned with failure: Error: No Seller company exists with given CRN!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure:
      Error: No Seller company exists with given CRN!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: No Seller company
      exists with given CRN!\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: No Seller company exists with given CRN!"
5

```

## Error # Invalid Drug :

Supply Chain / createPO\_VGPharmaToSunPharma

POST http://134.209.145.105:3000/createPO

Params Authorization Headers (8) Body  Pre-request Script Tests Settings Cookies

Body Type: x-www-form-urlencoded

KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/> orgType	distributor			
<input checked="" type="checkbox"/> buyerCRN	DIST001			
<input checked="" type="checkbox"/> sellerCRN	MAN001			
<input checked="" type="checkbox"/> drugName	Dolo650			
<input checked="" type="checkbox"/> quantity	3			
Key	Value	Description		

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1
2     "status": "ERROR",
3     "message": "Failed to createPO.",
4     "error": "Error while invoking createPO : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500,
      message=transaction returned with failure: Error: No drug exists with given name: Dolo650\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction
      returned with failure: Error: No drug exists with given name: Dolo650\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error:
      No drug exists with given name: Dolo650\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: No drug exists with given
      name: Dolo650\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: No drug exists with given name: Dolo650"
5

```

## Error # Buyer cannot be Manufacturer :

Supply Chain / `createPO_VGPharmaToSunPharma`

POST http://134.209.145.105:3000/createPO

**Body** (8) **Params** **Authorization** **Headers** **Body** **Pre-request Script** **Tests** **Settings** **Cookies**

KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/> orgType	distributor	
<input checked="" type="checkbox"/> buyerCRN	MAN001	
<input checked="" type="checkbox"/> sellerCRN	DIST001	
<input checked="" type="checkbox"/> drugName	Paracetamol	
<input checked="" type="checkbox"/> quantity	3	
Key	Value	Description

**Body** **Cookies** **Headers (7)** **Test Results** Status: 500 Internal Server Error Time: 109 ms Size: 1.1 KB Save Response

```

1 "status": "ERROR",
2 "message": "Failed to createPO : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500,
3     message=transaction returned with failure: Error: Buyer cannot be the Manufacturer!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned
4     with failure: Error: Buyer cannot be the Manufacturer!\n    peer=peer0.tidaller.pharma-network.com, status=500, message=transaction returned with failure: Error: Buyer cannot
5     be the Manufacturer!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: Buyer cannot be the Manufacturer!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: Buyer cannot be the Manufacturer!"

```

**Supply Chain - createShipment (Sun Pharma creates Shipment order for VG Pharma to be delivered by FedEx): creates a shipment order to transport drugs from Seller to Buyer.**

Supply Chain / `createShipment_SunPharmaToVGPharmaViaFedEx`

POST http://134.209.145.105:3000/createShipment

**Body** (8) **Params** **Authorization** **Headers** **Body** **Pre-request Script** **Tests** **Settings** **Cookies**

KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/> orgType	manufacturer	
<input checked="" type="checkbox"/> buyerCRN	DIST001	
<input checked="" type="checkbox"/> drugName	Paracetamol	
<input checked="" type="checkbox"/> listOfAssets	001,002,003	
<input checked="" type="checkbox"/> transporterCRN	TRA001	
Key	Value	Description

**Body** **Cookies** **Headers (7)** **Test Results** Status: 200 OK Time: 2.13 s Size: 793 B Save Response

```

1 "status": "success",
2 "message": "createShipment invoked successfully.",
3 "response": {
4     "shipmentID": "#org.pharma-network.pharmanet.shipment#DIST001#Paracetamol#",
5     "creator": "#org.pharma-network.pharmanet.company#MAN001#Sun Pharma#",
6     "assets": ["#org.pharma-network.pharmanet.drug#Paracetamol#001#", "#org.pharma-network.pharmanet.drug#Paracetamol#002#", "#org.pharma-network.pharmanet.drug#Paracetamol#003#"],
7     "transporterCRN": "TRA001",
8     "status": "IN-TRANSIT"
9 }
10
11
12

```

Error # The length of 'listOfAssets' is not equal to the quantity specified in the PO :

The screenshot shows a Postman request to `http://134.209.145.105:3000/createShipment`. The 'Body' tab is selected, showing a JSON payload with fields: orgType (manufacturer), buyerCRN (DIST001), drugName (Paracetamol), listOfAssets (001,002), and transporterCRN (TRA001). The response status is 500 Internal Server Error, with the message: "status": "ERROR", "message": "Failed to createShipment.", "error": "Error while invoking createShipment : No valid responses from any peers. 5 peer error responses:\n peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: The length of list of assets should be exactly equal to the quantity specified in the PO.\n peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: The length of list of assets should be exactly equal to the quantity specified in the PO.\n peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: The length of list of assets should be exactly equal to the quantity specified in the PO.\n peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: The length of list of assets should be exactly equal to the quantity specified in the PO.\n peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: The length of list of assets should be exactly equal to the quantity specified in the PO."

Error # The ID of the Asset is not a valid ID which is registered on the network. (e.g. the serialNos passed are not the ones we registered.).

The screenshot shows a Postman request to `http://134.209.145.105:3000/createShipment`. The 'Body' tab is selected, showing a JSON payload with fields: orgType (manufacturer), buyerCRN (DIST001), drugName (Paracetamol), listOfAssets (007,006,009), and transporterCRN (TRA001). The response status is 500 Internal Server Error, with the message: "status": "ERROR", "message": "Failed to createShipment.", "error": "Error while invoking createShipment : No valid responses from any peers. 5 peer error responses:\n peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: No drug Paracetamol exists with given info. Please check the Drug info provided.\n peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: No drug Paracetamol exists with given info. Please check the Drug info provided.\n peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: No drug Paracetamol exists with given info. Please check the Drug info provided.\n peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: No drug Paracetamol exists with given info. Please check the Drug info provided.\n peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: No drug Paracetamol exists with given info. Please check the Drug info provided."

Error # No PO exists for this Shipment request (if trying to create shipment before/without creating a relevant PO) :

The screenshot shows a POST request to <http://134.209.145.105:3000/createShipment>. The request body contains the following parameters:

KEY	VALUE	DESCRIPTION
orgType	manufacturer	
buyerCRN	TRA001	
drugName	Paracetamol	
listOfAssets	001,002,003	
transporterCRN	TRA001	

The response status is 500 Internal Server Error, with a message indicating that no PO exists for the drug Paracetamol by buyer TRA001 across multiple peers.

```

1
2 "status": "ERROR",
3 "message": "Failed to createShipment.",
4 "error": "Error while invoking createShipment : No valid responses from any peers. 5 peer error responses:\n      message=transaction returned with failure: Error: No PO exists for drug Paracetamol by buyer TRA001!\n      message=transaction returned with failure: Error: No PO exists for drug Paracetamol by buyer TRA001!\n      message=transaction returned with failure: Error: No PO exists for drug Paracetamol by buyer TRA001!\n      message=transaction returned with failure: Error: No PO exists for drug Paracetamol by buyer TRA001!\n      message=transaction returned with failure: Error: No PO exists for drug Paracetamol by buyer TRA001!"
5
  
```

Error # Invalid Transporter :

The screenshot shows a POST request to <http://134.209.145.105:3000/createShipment>. The request body contains the following parameters:

KEY	VALUE	DESCRIPTION
orgType	manufacturer	
buyerCRN	DIST001	
drugName	Paracetamol	
listOfAssets	001, 002, 003	
transporterCRN	TRA009	

The response status is 500 Internal Server Error, with a message indicating that no Transporter company exists with the given CRN across multiple peers.

```

1
2 "status": "ERROR",
3 "message": "Failed to createShipment.",
4 "error": "Error while invoking createShipment : No valid responses from any peers. 5 peer error responses:\n      peer=peer0.manufacturer.pharma-network.com, status=500,\n      peer=peer0.distributor.pharma-network.com, status=500,\n      peer=peer0.retailer.pharma-network.com, status=500,\n      peer=peer0.consumer.pharma-network.com, status=500,\n      peer=peer0.transporter.pharma-network.com, status=500,\n      message=transaction returned with failure: Error: No Transporter company exists with given CRN!\n      peer=peer0.manufacturer.pharma-network.com, status=500,\n      peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: No Transporter company exists with given CRN!\n      peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: No Transporter company exists with given CRN!\n      peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: No Transporter company exists with given CRN!\n      peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: No Transporter company exists with given CRN!"
5
  
```

**Supply Chain - updateShipment** (**FedEx** updates Shipment status after delivering drugs to **VG Pharma**): updates Shipment status of the order when delivered.

Supply Chain / updateShipment\_FedEx\_InTransitFromSunPharmaToVGPharma

Save

POST http://134.209.145.105:3000/updateShipment

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL

KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/> orgType	transporter	
<input checked="" type="checkbox"/> buyerCRN	DIST001	
<input checked="" type="checkbox"/> drugName	Paracetamol	
<input checked="" type="checkbox"/> transporterCRN	TRA001	

Key Value Description

Observe that the creator still says Sun Pharma. This is intentional. Though the txn is created by FedEx, it's only the transporter and should only be able to update logistics related info. The shipment object must still reflect original transactional parties for creator field. This helps for audit and reconciliation purposes down the line.

Body Cookies Headers (7) Test Results

Status: 200 OK Time: 2.14 s Size: 806 B Save Response

Pretty Raw Preview Visualize JSON

```
1 "status": "success",
2 "message": "updateShipment invoked successfully.updateShipment",
3 "response": {
4     "shipmentID": "Org.pharma-network.pharmanet.shipment#DIST001#Paracetamol",
5     "creator": "Org.pharma-network.pharmanet.company#MAN001#Sun Pharma",
6     "assets": ["Org.pharma-network.pharmanet.drug#Paracetamol#001#", "Org.pharma-network.pharmanet.drug#Paracetamol#002#", "Org.pharma-network.pharmanet.drug#Paracetamol#003#"],
7     "transporterCRN": "TRA001",
8     "status": "DELIVERED"
9 }
10 }
```

Error # Invalid Transporter (if the Transporter in PO doesn't match Transporter in Shipment):

Supply Chain / updateShipment\_FedEx\_SunPharmaToVGPharma

Save

POST http://134.209.145.105:3000/updateShipment

Send Cookies

Params Authorization Headers (8) **Body** Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL

KEY	VALUE	DESCRIPTION
<input checked="" type="checkbox"/> orgType	transporter	
<input checked="" type="checkbox"/> buyerCRN	DIST001	
<input checked="" type="checkbox"/> drugName	Paracetamol	
<input checked="" type="checkbox"/> transporterCRN	TRA002	
Key	Value	Description

Body Cookies Headers (7) Test Results

Status: 500 Internal Server Error Time: 98 ms Size: 1.23 KB Save Response

Pretty Raw Preview Visualize JSON

```
1 "status": "ERROR",
2 "message": "Failed to updateShipment.",
3 "error": "Error while invoking updateShipment : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: Transporter CRN given does not match with this shipment!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: Transporter CRN given does not match with this shipment!\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: Transporter CRN given does not match with this shipment!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: Transporter CRN given does not match with this shipment!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: Transporter CRN given does not match with this shipment!"
```

**Supply Chain - createPO (upgrad raises PO to VG Pharma)** : creates a purchase order with buyer, seller, drugName, Qty. details.

The screenshot shows a Postman interface for a POST request to `http://134.209.145.105:3000/createPO`. The 'Body' tab is selected, showing a table of parameters:

KEY	VALUE	DESCRIPTION
orgType	retailer	
buyerCRN	RET002	
sellerCRN	DIST001	
drugName	Paracetamol	
quantity	2	
Key	Value	Description

The response body is displayed in 'Pretty' format:

```

1 "status": "success",
2 "message": "createPO invoked successfully.",
3 "response": {
4     "poID": "Org.pharma-network.pharmanet.po@RET002@Paracetamol@",
5     "drugName": "Paracetamol",
6     "buyer": "Org.pharma-network.pharmanet.company@RET002@upgrad@",
7     "seller": "Org.pharma-network.pharmanet.company@DIST001@VG Pharma@",
8     "quantity": 2,
9     "otherInfo": {
10         "buyerName": "upgrad",
11         "sellerName": "VG Pharma"
12     }
13 }

```

Error # Drug not found (in case **upgrad** raises PO before **updateShipment** from **Sun Pharma** to **VG Pharma** is marked delivered by **FedEx**)

The screenshot shows a Postman interface for a POST request to `http://134.209.145.105:3000/createPO`. The 'Body' tab is selected, showing the same parameter table as the previous screenshot.

The response body is displayed in 'Pretty' format:

```

1 "status": "ERROR",
2 "message": "Failed to createPO.",
3 "error": "Error while invoking createPO : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500,\n    message=transaction returned with failure: Error: Drug Paracetamol not found with this Seller!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction\n    returned with failure: Error: Drug Paracetamol not found with this Seller!\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure:\n    Error: Drug Paracetamol not found with this Seller!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: Drug Paracetamol\n    not found with this Seller!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: Drug Paracetamol not found with this\n    Seller!"

```

**Supply Chain - createShipment(VG Pharma creates Shipment order for Upgrad to be delivered by Blue Dart) :** creates a shipment order to transport drugs from Seller to Buyer.

Supply Chain / `createShipment_VGPharmaToUpgradViaBlueDart`

POST http://134.209.145.105:3000/createShipment

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

Body (x-www-form-urlencoded)

KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/> orgType	distributor			
<input checked="" type="checkbox"/> buyerCRN	RET002			
<input checked="" type="checkbox"/> drugName	Paracetamol			
<input checked="" type="checkbox"/> listOfAssets	001,002			
<input checked="" type="checkbox"/> transporterCRN	TRA002			
Key	Value	Description		

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1
2 "status": "success",
3 "message": "createShipment invoked successfully.",
4 "response": {
5     "shipmentID": "Org.pharma-network.pharmanet.shipment@RET002@Paracetamol@",
6     "creator": "Org.pharma-network.pharmanet.company@DIST001@VG Pharma@",
7     "assets": ["Org.pharma-network.pharmanet.drug@Paracetamol@001@", "Org.pharma-network.pharmanet.drug@Paracetamol@002@"],
8 },
9     "transporterCRN": "TRA002",
10    "status": "IN-TRANSIT"
11 }
12

```

Status: 200 OK Time: 2.17 s Size: 718 B Save Response

**Supply Chain - updateShipment (BlueDart updates Shipment status after delivering the drugs to Upgrad):** updates Shipment status of the order when delivered.

Supply Chain / `updateShipment_BlueDart_VGPharmaToUpgrad`

POST http://134.209.145.105:3000/updateShipment

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

Body (x-www-form-urlencoded)

KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/> orgType	transporter			
<input checked="" type="checkbox"/> buyerCRN	RET002			
<input checked="" type="checkbox"/> drugName	Paracetamol			
<input checked="" type="checkbox"/> transporterCRN	TRA002			
Key	Value	Description		

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1
2 "status": "success",
3 "message": "updateShipment invoked successfully.updateShipment",
4 "response": {
5     "shipmentID": "Org.pharma-network.pharmanet.shipment@RET002@Paracetamol@",
6     "creator": "Org.pharma-network.pharmanet.company@DIST001@VG Pharma@",
7     "assets": ["Org.pharma-network.pharmanet.drug@Paracetamol@001@", "Org.pharma-network.pharmanet.drug@Paracetamol@002@"],
8 },
9     "transporterCRN": "TRA002",
10    "status": "DELIVERED"
11 }
12

```

Status: 200 OK Time: 2.17 s Size: 731 B Save Response

## Error # No Shipment found for Drug & Buyer combination (e.g. if drug name is given wrong) :

Supply Chain / updateShipment\_BlueDart\_VGPharmaToUpgrad

POST http://134.209.145.105:3000/updateShipment

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

Body (x-www-form-urlencoded)

KEY	VALUE	DESCRIPTION	Bulk Edit
<input checked="" type="checkbox"/> orgType	transporter		
<input checked="" type="checkbox"/> buyerCRN	RET002		
<input checked="" type="checkbox"/> drugName	Paracetam		
<input checked="" type="checkbox"/> transporterCRN	TRA002		
Key	Value	Description	

Body Cookies Headers (7) Test Results

Status: 500 Internal Server Error Time: 112 ms Size: 1.26 KB Save Response

Pretty Raw Preview Visualize JSON

```

1
2
3
4
5
  "status": "ERROR",
  "message": "Failed to updateShipment.",
  "error": "Error while invoking updateShipment : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: Cannot find any Shipment order with given Drug and Buyer info!\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: Cannot find any Shipment order with given Drug and Buyer info!\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: Cannot find any Shipment order with given Drug and Buyer info!\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: Cannot find any Shipment order with given Drug and Buyer info!\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: Cannot find any Shipment order with given Drug and Buyer info!"

```

## Supply Chain - retailDrug : called by Retailer to allow a customer to purchase drugs from it.

Supply Chain / retailDrug

POST http://134.209.145.105:3000/retailDrug

Params Authorization Headers (8) Body Pre-request Script Tests Settings Cookies

Body (x-www-form-urlencoded)

KEY	VALUE	DESCRIPTION	Bulk Edit
<input checked="" type="checkbox"/> orgType	retailer		
<input checked="" type="checkbox"/> drugName	Paracetamol		
<input checked="" type="checkbox"/> serialNo	002		
<input checked="" type="checkbox"/> retailerCRN	RET002		
<input checked="" type="checkbox"/> customerAadhar	AAD001		
Key	Value	Description	

Body Cookies Headers (7) Test Results

Status: 200 OK Time: 2.15 s Size: 790 B Save Response

Pretty Raw Preview Visualize JSON

```

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
  "status": "success",
  "message": "retailDrug invoked successfully.",
  "response": {
    "productID": "org.pharma-network.pharmanet.drug@Paracetamol@002@",
    "name": "Paracetamol",
    "serialNo": "002",
    "manufacturer": "org.pharma-network.pharmanet.company@MAN001@Sun Pharma",
    "manufacturingDate": "JAN-2022",
    "expiryDate": "DEC-2026",
    "owner": "AAD001",
    "shipment": ["org.pharma-network.pharmanet.shipment@DIST001@Paracetamol@", "org.pharma-network.pharmanet.shipment@RET002@Paracetamol@"]
  }

```

## Error # retailDrug is not invoked by retailer

Supply Chain / retailDrug

POST http://134.209.145.105:3000/retailDrug

Send Cookies

Params Authorization Headers (8) Body Pre-request Script Tests Settings

Body (x-www-form-urlencoded)

KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/> orgType	manufacturer			
<input checked="" type="checkbox"/> drugName	Paracetamol			
<input checked="" type="checkbox"/> serialNo	002			
<input checked="" type="checkbox"/> retailerCRN	RET002			
<input checked="" type="checkbox"/> customerAadhar	AAD001			
Key	Value	Description		

As you see below, we have curtailed unauthorized access to retailDrug API at the contract definition level itself. This helps prevent any clever attempts to bypass the orgType validation checks and satisfies the validation rule for retailDrug, as per project spec.

Pretty Raw Preview Visualize JSON

```

1 "status": "ERROR",
2 "message": "Failed to invoke retailDrug.",
3 "error": "Error while invoking retailDrug : No valid responses from any peers. 5 peer error responses:\n    peer=peer0.manufacturer.pharma-network.com, status=500, message=transaction returned with failure: Error: You've asked to invoke a function that does not exist: org.pharma-network.pharmanet.manufacturer:retailDrug\n    peer=peer0.distributor.pharma-network.com, status=500, message=transaction returned with failure: Error: You've asked to invoke a function that does not exist: org.pharma-network.pharmanet.manufacturer:retailDrug\n    peer=peer0.retailer.pharma-network.com, status=500, message=transaction returned with failure: Error: You've asked to invoke a function that does not exist: org.pharma-network.pharmanet.manufacturer:retailDrug\n    peer=peer0.consumer.pharma-network.com, status=500, message=transaction returned with failure: Error: You've asked to invoke a function that does not exist: org.pharma-network.pharmanet.manufacturer:retailDrug\n    peer=peer0.transporter.pharma-network.com, status=500, message=transaction returned with failure: Error: You've asked to invoke a function that does not exist: org.pharma-network.pharmanet.manufacturer:retailDrug"
5

```

## IV. View Lifecycle

**History - viewDrugCurrentState** : Lets us view the current state of a given drug asset.

History / viewDrugCurrentState

POST http://134.209.145.105:3000/viewDrugCurrentState

Send Cookies

Params Authorization Headers (8) Body Pre-request Script Tests Settings

Body (x-www-form-urlencoded)

KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/> orgType	consumer			
<input checked="" type="checkbox"/> drugName	Paracetamol			
<input checked="" type="checkbox"/> serialNo	002			
Key	Value	Description		

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1
2 "status": "success",
3 "message": "viewDrugCurrentState invoked successfully.",
4 "response": {
5     "productID": "org.pharma-network.pharmanet.drugParacetamol002",
6     "name": "Paracetamol",
7     "serialNo": "002",
8     "manufacturer": "org.pharma-network.pharmanet.companyMAN001Sun Pharma",
9     "manufacturingDate": "JAN-2022",
10    "expiryDate": "DEC-2026",
11    "owner": "AAD001",
12    "shipment": ["org.pharma-network.pharmanet.shipmentDIST001Paracetamol", "org.pharma-network.pharmanet.shipmentRET002Paracetamol"]
13 }
14
15

```

Status: 200 OK Time: 2.14 s Size: 800 B Save Response

**History - viewHistory** : Lets us view the entire lifecycle of a given drug asset.

History / viewHistory

Save

POST http://134.209.145.105:3000/viewHistory

Send

Params Authorization Headers (8) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL

orgType consumer

drugName Paracetamol

serialNo 002

Body Cookies Headers (7) Test Results

Status: 200 OK Time: 2.15 s Size: 2.11 KB Save Response

Pretty Raw Preview Visualize JSON

```
1 "status": "Success",
2 "message": "viewHistory invoked successfully.",
3 "response": [
4     {
5         "productID": "Org.pharma-network.phamanet.drug#Paracetamol#002",
6         "name": "Paracetamol",
7         "serialNo": "002",
8         "manufacturer": "Org.pharma-network.phamanet.company#MAN001#Sun Pharma",
9         "manufacturingDate": "JAN-2022",
10        "expiryDate": "DEC-2026",
11        "owner": "Org.pharma-network.phamanet.company#MAN001#Sun Pharma",
12        "shipment": []
13    },
14    {
15        "productID": "Org.pharma-network.phamanet.drug#Paracetamol#002",
16        "name": "Paracetamol",
17        "serialNo": "002",
18        "manufacturer": "Org.pharma-network.phamanet.company#MAN001#Sun Pharma",
19        "manufacturingDate": "JAN-2022",
20        "expiryDate": "DEC-2026",
21        "owner": "Org.pharma-network.phamanet.company#01ST001#VG Pharma",
22        "shipment": []
23    },
24    {
25        "productID": "Org.pharma-network.phamanet.drug#Paracetamol#002",
26        "name": "Paracetamol",
27        "serialNo": "002",
28        "manufacturer": "Org.pharma-network.phamanet.company#MAN001#Sun Pharma",
29        "manufacturingDate": "JAN-2022",
30        "expiryDate": "DEC-2026",
31        "owner": "Org.pharma-network.phamanet.company#RET002#upgrade",
32        "shipment": []
33    },
34    {
35        "productID": "Org.pharma-network.phamanet.drug#Paracetamol#002",
36        "name": "Paracetamol",
37        "serialNo": "002",
38        "manufacturer": "Org.pharma-network.phamanet.company#MAN001#Sun Pharma",
39        "manufacturingDate": "JAN-2022",
40        "expiryDate": "DEC-2026",
41        "owner": "AAB001",
42        "shipment": []
43    }
44 ]
```

### Request :

As visible below, we can see the entire journey of the Paracetamol strips starting from Manufacturer Sun Pharma to our Customer Aakash with the owner details being updated at each step.

## Response :

```

6   "productID": "@org.pharma-network.pharmanet.drug@Paracetamol#002",
7   "name": "Paracetamol",
8   "serialNo": "002",
9   "manufacturer": "@org.pharma-network.pharmanet.company@MAN001@Sun Pharma",
10  "manufacturingDate": "JAN-2022",
11  "expiryDate": "DEC-2026",
12  "owner": "@org.pharma-network.pharmanet.company@MAN001@Sun Pharma",
13  "shipment": []
14 },
15 {
16   "productID": "@org.pharma-network.pharmanet.drug@Paracetamol#002",
17   "name": "Paracetamol",
18   "serialNo": "002",
19   "manufacturer": "@org.pharma-network.pharmanet.company@MAN001@Sun Pharma",
20   "manufacturingDate": "JAN-2022",
21   "expiryDate": "DEC-2026",
22   "owner": "@org.pharma-network.pharmanet.company@DIST001@VG Pharma",
23   "shipment": ["@org.pharma-network.pharmanet.shipment@DIST001@paracetamol"]
24 ],
25 },
26 {
27   "productID": "@org.pharma-network.pharmanet.drug@Paracetamol#002",
28   "name": "Paracetamol",
29   "serialNo": "002",
30   "manufacturer": "@org.pharma-network.pharmanet.company@MAN001@Sun Pharma",
31   "manufacturingDate": "JAN-2022",
32   "expiryDate": "DEC-2026",
33   "owner": "@org.pharma-network.pharmanet.company@RET002@upgrad",
34   "shipment": ["@org.pharma-network.pharmanet.shipment@DIST001@Paracetamol", "@org.pharma-network.pharmanet.shipment@RET002@Paracetamol"]
35 ],
36 },
37 {
38   "productID": "@org.pharma-network.pharmanet.drug@Paracetamol#002",
39   "name": "Paracetamol",
40   "serialNo": "002",
41   "manufacturer": "@org.pharma-network.pharmanet.company@MAN001@Sun Pharma",
42   "manufacturingDate": "JAN-2022",
43   "expiryDate": "DEC-2026",
44   "owner": "AAD001",
45   "shipment": ["@org.pharma-network.pharmanet.shipment@DIST001@Paracetamol", "@org.pharma-network.pharmanet.shipment@RET002@Paracetamol"]
46 }

```

## Final CLI Screenshot of entire Drug lifecycle history:

```

....viewHistory invocation Complete! [ { productID: '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000002\u0000',
  name: 'Paracetamol',
  serialNo: '002',
  manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
  manufacturingDate: 'JAN-2022',
  expiryDate: 'DEC-2026',
  owner: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
  shipment: [] },
{ productID: '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000002\u0000',
  name: 'Paracetamol',
  serialNo: '002',
  manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
  manufacturingDate: 'JAN-2022',
  expiryDate: 'DEC-2026',
  owner: '\u0000org.pharma-network.pharmanet.company\u0000DIST001\u0000VG Pharma\u0000',
  shipment:
    [ '\u0000org.pharma-network.pharmanet.shipment\u0000DIST001\u0000Paracetamol\u0000' ] },
{ productID: '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000002\u0000',
  name: 'Paracetamol',
  serialNo: '002',
  manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
  manufacturingDate: 'JAN-2022',
  expiryDate: 'DEC-2026',
  owner: '\u0000org.pharma-network.pharmanet.company\u0000RET002\u0000upgrad\u0000',
  shipment:
    [ '\u0000org.pharma-network.pharmanet.shipment\u0000DIST001\u0000Paracetamol\u0000',
      '\u0000org.pharma-network.pharmanet.shipment\u0000RET002\u0000Paracetamol\u0000' ] },
{ productID: '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000002\u0000',
  name: 'Paracetamol',
  serialNo: '002',
  manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
  manufacturingDate: 'JAN-2022',
  expiryDate: 'DEC-2026',
  owner: 'AAD001',
  shipment:
    [ '\u0000org.pharma-network.pharmanet.shipment\u0000DIST001\u0000Paracetamol\u0000',
      '\u0000org.pharma-network.pharmanet.shipment\u0000RET002\u0000Paracetamol\u0000' ] }
....Disconnecting from Fabric Gateway

```