

Instruction Document for PHARMANET

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Pre-setup

1. Generate Crypto Materials

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

[upgrade@upgrad-VirtualBox:~/Desktop/pharma-network/network]$ cryptogen generate --config=./crypto-config.yaml
manufacturer.pharma-network.com
distributor.pharma-network.com
pretailer.pharma-network.com
strconsumer.pharma-network.com
transporter.pharma-network.com
[upgrade@upgrad-VirtualBox:~/Desktop/pharma-network/network]$
```

2. Generate Channel Artifacts

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

```
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ configtxgen -profile PharmaChannel -outputCreateChannelTx ./channel-artifacts/channel.tx -channelID pharmachannel
2020-05-16 06:04:00.063 IST [common.tools.configtxgen] main -> INFO 001 Loading configuration
2020-05-16 06:04:00.083 IST [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:04:00.101 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2020-05-16 06:04:00.101 IST [common.tools.configtxgen.localconfig] LoadTopLevel -> INFO 004 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:04:00.102 IST [common.tools.configtxgen] doOutputChannelCreateTx -> INFO 005 Generating new channel configtx
2020-05-16 06:04:00.102 IST [common.tools.configtxgen.encoder] NewChannelGroup -> WARN 006 Default policy emission is deprecated, please include policy specifications for the channel group in configtx.yaml
2020-05-16 06:04:00.149 IST [common.tools.configtxgen.encoder] NewChannelGroup -> WARN 007 Default policy emission is deprecated, please include policy specifications for the channel group in configtx.yaml
2020-05-16 06:04:00.167 IST [common.tools.configtxgen] doOutputChannelCreateTx -> INFO 008 Writing new channel tx
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$
```

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

File Edit View Search Terminal Help
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ ls -l
total 64
drwxrwx--- 1 root vboxsf 64 May 16 05:52 channel-artifacts
-rw-rwx--- 1 root vboxsf 5931 May 15 07:00 configtx.yaml
drwxrwx--- 1 root vboxsf 128 May 15 06:55 crypto-config
-rw-rwx--- 1 root vboxsf 794 May 15 06:54 crypto-config.yaml
drwxrwx--- 1 root vboxsf 128 May 9 06:18 docker-base
-rw-rwx--- 1 root vboxsf 8910 May 9 06:18 docker-compose-e2e.yaml
-rw-rwx--- 1 root vboxsf 8705 May 9 06:18 docker-compose-template.yaml
-rw-rwx--- 1 root vboxsf 8928 May 9 06:18 docker-compose.yaml
-rw-rwx--- 1 root vboxsf 15087 May 9 06:18 fabricNetwork.sh
drwxrwx--- 1 root vboxsf 192 May 9 06:18 scripts
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ configtxgen -profile OrdererGenesis -channelID upgrad-sys-channel -outputBlock ./channel-artifacts/genesis.block
2020-05-16 05:54:26.374 IST [common.tools.configtxgen] main -> INFO 001 Loading configuration
2020-05-16 05:54:26.431 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 002 orderer type: solo
2020-05-16 05:54:26.431 IST [common.tools.configtxgen.localconfig] Load -> INFO 003 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 05:54:26.457 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 004 orderer type: solo
2020-05-16 05:54:26.457 IST [common.tools.configtxgen.localconfig] LoadTopLevel -> INFO 005 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 05:54:26.505 IST [common.tools.configtxgen] doOutputBlock -> INFO 006 Generating genesis block
2020-05-16 05:54:26.512 IST [common.tools.configtxgen] doOutputBlock -> INFO 007 Writing genesis block
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$
```

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

```
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/manufacturerMSPanchors.tx -channelID pharmachannel -asOrg manufacturerMSP
2020-05-16 06:18:00.038 IST [common.tools.configtxgen] main -> INFO 001 Loading configuration
2020-05-16 06:18:00.060 IST [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:18:00.081 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2020-05-16 06:18:00.081 IST [common.tools.configtxgen.localconfig] LoadTopLevel -> INFO 004 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:18:00.081 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2020-05-16 06:18:00.081 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$
```

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

```
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/distributorMSPanchors.tx -channelID pharmachannel -asOrg distributorMSP
2020-05-16 06:19:38.787 IST [common.tools.configtxgen] main -> INFO 001 Loading configuration
2020-05-16 06:19:38.809 IST [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:19:38.827 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2020-05-16 06:19:38.827 IST [common.tools.configtxgen.localconfig] LoadTopLevel -> INFO 004 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:19:38.827 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2020-05-16 06:19:38.827 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$
```

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

```
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/retailerMSPanchors.tx -channelID pharmachannel -asOrg retailerMSP
2020-05-16 06:20:05.341 IST [common.tools.configtxgen] main -> INFO 001 Loading configuration
2020-05-16 06:20:05.379 IST [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:20:05.412 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2020-05-16 06:20:05.420 IST [common.tools.configtxgen.localconfig] LoadTopLevel -> INFO 004 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:20:05.420 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2020-05-16 06:20:05.420 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$
```

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

```
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/consumerMSPanchors.tx -channelID pharmachannel -asOrg consumerMSP
2020-05-16 06:20:31.875 IST [common.tools.configtxgen] main -> INFO 001 Loading configuration
2020-05-16 06:20:31.916 IST [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:20:31.945 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo
2020-05-16 06:20:31.945 IST [common.tools.configtxgen.localconfig] LoadTopLevel -> INFO 004 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-16 06:20:31.945 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update
2020-05-16 06:20:31.945 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$
```

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

```
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$  
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ configtxgen -profile PharmaChannel -outputAnchorPeersUpdate ./channel-artifacts/transporterMSPanchors.tx -channelID pharmachannel -asOrg transporterMSP  
2020-05-16 06:21:03.361 IST [common.tools.configtxgen] main -> INFO 001 Loading configuration  
2020-05-16 06:21:03.396 IST [common.tools.configtxgen.localconfig] Load -> INFO 002 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml  
2020-05-16 06:21:03.417 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 003 orderer type: solo  
2020-05-16 06:21:03.429 IST [common.tools.configtxgen.localconfig] LoadToplevel -> INFO 004 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml  
2020-05-16 06:21:03.429 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 005 Generating anchor peer update  
2020-05-16 06:21:03.429 IST [common.tools.configtxgen] doOutputAnchorPeersUpdate -> INFO 006 Writing anchor peer update  
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$
```

Network Setup & Start

With the above Crypto Materials & Channel Artifacts, we have to configure the network automation scripts with required **docker-compose-template.yml** and **others**. Once the required changes are completed in docker yaml files, follow the below instructions to start and install chaincode.

Start the Network - using Network Automation Scripts

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

```

upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/network
File Edit View Search Terminal Tabs Help
upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D...

upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ ./fabricNetwork.sh up
Starting for channel 'pharmacchannel' with CLI timeout of '15' seconds and CLI delay of '5' seconds and chaincode version '1.1'
Continue? [Y/n]
proceeding ...
LOCAL_VERSION=1.4.2
DOCKER_IMAGE_VERSION=1.4.3
----- WARNING -----
Local fabric binaries and docker images are
out of sync. This may cause problems.
-----/home/upgrad/Desktop/pharma-network/network/bin/cryptogen

#####
##### Generate certificates using cryptogen tool #####
#####
+ 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
+ res=0
+ set +x

/home/upgrad/Desktop/pharma-network/network/bin/configtxgen
#####
##### Generating Orderer Genesis block #####
#####
+ configtxgen -profile OrdererGenesis -channelID upgrad-sys-channel -outputBlock ./channel-artifacts/genesis.block
2020-05-27 17:06:53.982 IST [common.tools.configtxgen] main-> INFO 001 Loading configuration
2020-05-27 17:06:54.048 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 002 orderer type: solo
2020-05-27 17:06:54.048 IST [common.tools.configtxgen.localconfig] Load -> INFO 003 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-27 17:06:54.067 IST [common.tools.configtxgen.localconfig] completeInitialization -> INFO 004 orderer type: solo
2020-05-27 17:06:54.067 IST [common.tools.configtxgen.localconfig] Load topLevel -> INFO 005 Loaded configuration: /home/upgrad/Desktop/pharma-network/network/configtx.yaml
2020-05-27 17:06:54.105 IST [common.tools.configtxgen] doOutputBlock -> INFO 006 Generating genesis block
2020-05-27 17:06:54.113 IST [common.tools.configtxgen] doOutputBlock -> INFO 007 Writing genesis block
+ res=0
+ set +x

```

....after series of commands, you should see the following screen.

```

upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/network
File Edit View Search Terminal Tabs Help
upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D... upgrad@upgrad-VirtualBox: ~/D...
Updating anchor peers for DISTRIBUTOR...
+ peer channel update -o orderer.pharma-network.com:7050 -c pharmacchannel -f ./channel-artifacts/distributorMSPanchors.tx
+ res=0
+ set +x
2020-05-27 11:38:20.787 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-05-27 11:38:20.814 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
----- Anchor peers updated for org 'distributorMSP' on channel 'pharmacchannel' -----

Updating anchor peers for RETAILER...
+ peer channel update -o orderer.pharma-network.com:7050 -c pharmacchannel -f ./channel-artifacts/retailerMSPanchors.tx
+ res=0
+ set +x
2020-05-27 11:38:25.920 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-05-27 11:38:25.942 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
----- Anchor peers updated for org 'retailerMSP' on channel 'pharmacchannel' -----

Updating anchor peers for CONSUMER...
+ peer channel update -o orderer.pharma-network.com:7050 -c pharmacchannel -f ./channel-artifacts/consumerMSPanchors.tx
+ res=0
+ set +x
2020-05-27 11:38:31.018 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-05-27 11:38:31.070 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
----- Anchor peers updated for org 'consumerMSP' on channel 'pharmacchannel' -----

Updating anchor peers for TRANSPORTER...
+ peer channel update -o orderer.pharma-network.com:7050 -c pharmacchannel -f ./channel-artifacts/transporterMSPanchors.tx
+ res=0
+ set +x
2020-05-27 11:38:36.195 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-05-27 11:38:36.250 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
----- Anchor peers updated for org 'transporterMSP' on channel 'pharmacchannel' -----

----- All GOOD, Hyperledger Fabric Pharma Network Is Now Up and Running! -----

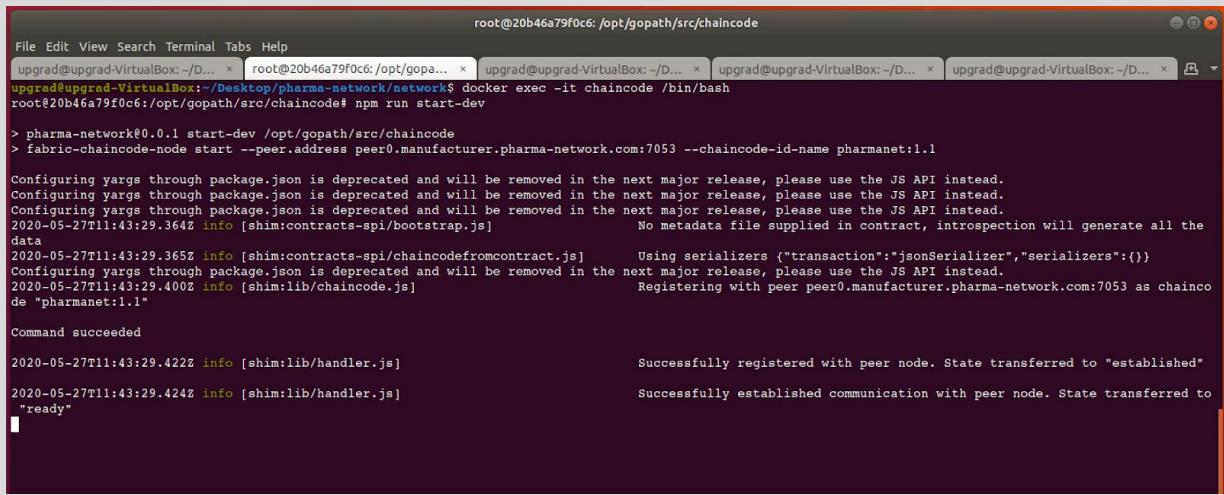
```

END

Start the Chaincode in DEV MODE

SSH to **chaincode** container in new terminal/tab using the following command

```
docker exec -it chaincode /bin/bash  
  
npm run start-dev
```



The screenshot shows a terminal window with multiple tabs open. The active tab is titled 'root@20b46a79f0c6:/opt/gopath/src/chaincode'. The command 'npm run start-dev' is being executed. The output shows several warning messages about deprecated 'yargs' usage and the use of the JS API instead. It also shows the chaincode starting up, connecting to a peer node, and successfully establishing communication.

```
root@20b46a79f0c6:/opt/gopath/src/chaincode  
File Edit View Search Terminal Tabs Help  
upgrade@upgrad-VirtualBox:~/Desktop/pharma-network$ docker exec -it chaincode /bin/bash  
root@20b46a79f0c6:/opt/gopath/src/chaincode$ npm run start-dev  
  
> pharma-network@0.0.1 start-dev /opt/gopath/src/chaincode  
> fabric-chaincode-node start --peer.address peer0.manufacturer.pharma-network.com:7053 --chaincode-id-name pharmanet:1.1  
  
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.  
2020-05-27T11:43:29.364Z info [shim:contracts-spi/bootstrap.js] No metadata file supplied in contract, introspection will generate all the data  
2020-05-27T11:43:29.365Z 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.  
2020-05-27T11:43:29.400Z info [shim:lib/chaincode.js] Registering with peer peer0.manufacturer.pharma-network.com:7053 as chaincode "pharmanet:1.1"  
Command succeeded  
  
2020-05-27T11:43:29.422Z info [shim:lib/handler.js] Successfully registered with peer node. State transferred to "established"  
2020-05-27T11:43:29.424Z info [shim:lib/handler.js] Successfully established communication with peer node. State transferred to "ready"
```

Install the Chaincode

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

```

upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/network
File Edit View Search Terminal Tabs Help
upgrad@upgrad-VirtualBox: ~/D... x root@20b46a79f0c6:/opt/gopath... x upgrad@upgrad-VirtualBox: ~/D... x upgrad@upgrad-VirtualBox: ~/D... x upgrad@upgrad-VirtualBox: ~/D... x
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ ./fabricNetwork.sh install
Installing chaincode for channel 'pharmacchannel' with CLI timeout of '15' seconds and CLI delay of '5' seconds and chaincode version '1.1'
Continue? [Y/n]
proceeding ...
LOCAL VERSION=1.4.2
DOCKER IMAGE VERSION=1.4.3
===== WARNING =====
Local fabric binaries and docker images are
out of sync. This may cause problems.
=====

E T A R T

Deploying Chaincode PHARMANET On Pharma Network

Channel name : pharmacchannel
Installing chaincode on peer0.manufacturer.pharma-network.com ...
+ peer chaincode install -n pharmanet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
+ res=0
+ set +x
2020-05-27 11:44:55.536 UTC [chaincodeCmd] checkChaincodeCmdParams >= INFO 001 Using default escc
2020-05-27 11:44:55.536 UTC [chaincodeCmd] checkChaincodeCmdParams >= INFO 002 Using default vscc
2020-05-27 11:44:57.684 UTC [chaincodeCmd] install >= INFO 003 Installed remotely response:<status:200 payload:"OK" >
===== Chaincode is installed on peer0.manufacturer =====

Installing chaincode on peer0.distributor.pharma-network.com ...
+ peer chaincode install -n pharmanet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
+ res=0
+ set +x
2020-05-27 11:44:57.754 UTC [chaincodeCmd] checkChaincodeCmdParams >= INFO 001 Using default escc
2020-05-27 11:44:57.754 UTC [chaincodeCmd] checkChaincodeCmdParams >= INFO 002 Using default vscc
2020-05-27 11:44:59.194 UTC [chaincodeCmd] install >= INFO 003 Installed remotely response:<status:200 payload:"OK" >
===== Chaincode is installed on peer0.distributor =====

Installing chaincode on peer0.retailer.pharma-network.com ...
+ peer chaincode install -n pharmanet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
+ res=0
+ set +x

```

....after series of commands, you should see the following screen.

```

upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/network
File Edit View Search Terminal Tabs Help
upgrad@upgrad-VirtualBox: ~/D... x root@20b46a79f0c6:/opt/gopath... x upgrad@upgrad-VirtualBox: ~/D... x upgrad@upgrad-VirtualBox: ~/D... x upgrad@upgrad-VirtualBox: ~/D... x
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ ./fabricNetwork.sh instantiate
Installing chaincode on peer0.transporter.pharma-network.com ...
+ peer chaincode install -n pharmanet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
+ res=0
+ set +x
2020-05-27 11:45:02.922 UTC [chaincodeCmd] checkChaincodeCmdParams >= INFO 001 Using default escc
2020-05-27 11:45:02.922 UTC [chaincodeCmd] checkChaincodeCmdParams >= INFO 002 Using default vscc
2020-05-27 11:45:04.299 UTC [chaincodeCmd] install >= INFO 003 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 pharmacchannel -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 pharmacchannel -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 pharmacchannel -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 pharmacchannel -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
2020-05-27 11:45:04.741 UTC [chaincodeCmd] checkChaincodeCmdParams >= INFO 001 Using default escc
2020-05-27 11:45:04.741 UTC [chaincodeCmd] checkChaincodeCmdParams >= INFO 002 Using default vscc
===== Chaincode is instantiated on peer0.manufacturer on channel 'pharmacchannel' =====

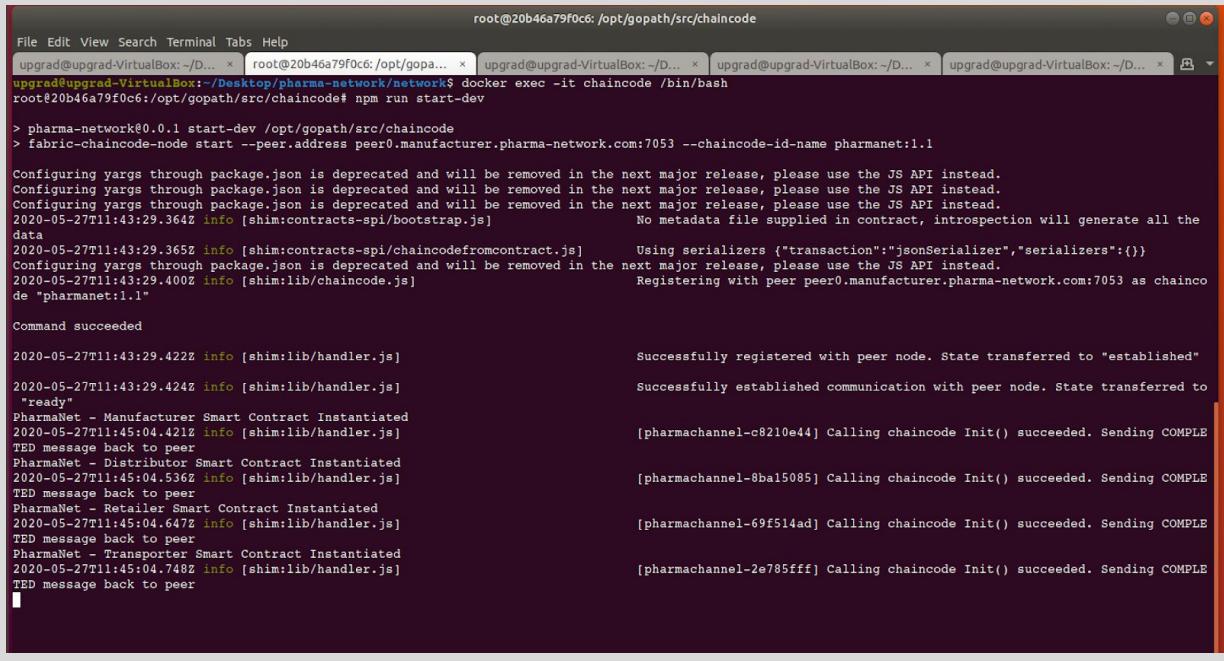
===== All GOOD, Chaincode PHARMANET Is Now Installed & Instantiated On Pharma Network =====

E N D

upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ 

```

Now, we can see our **console statements of each Smart Contract** have been instantiated in the following **chaincode** tab



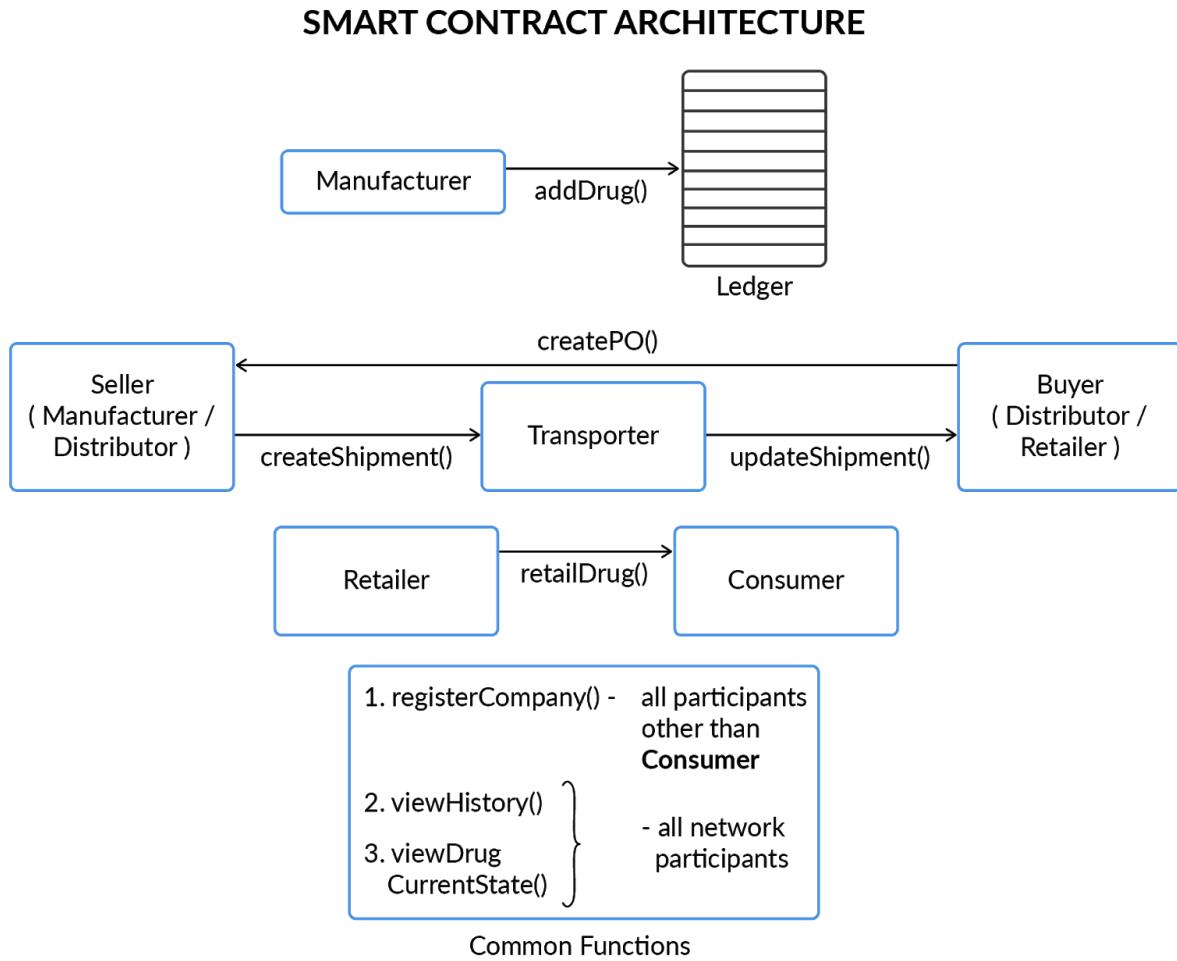
```
root@20b46a79f0c6:/opt/gopath/src/chaincode
File Edit View Search Terminal Tabs Help
[upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ docker exec -it chaincode /bin/bash
root@20b46a79f0c6:/opt/gopath/src/chaincode# npm run start-dev
> pharma-network@0.0.1 start-dev /opt/gopath/src/chaincode
> fabric-chaincode-node start --peer.address peer0.manufacturer.pharma-network.com:7053 --chaincode-id-name pharanet:1.1

configuring args through package.json is deprecated and will be removed in the next major release, please use the JS API instead.
configuring args through package.json is deprecated and will be removed in the next major release, please use the JS API instead.
configuring args through package.json is deprecated and will be removed in the next major release, please use the JS API instead.
2020-05-27T11:43:29.364Z info [shim:contracts-spi/bootstrap.js] No metadata file supplied in contract, introspection will generate all the data
2020-05-27T11:43:29.365Z info [shim:contracts-spi/chaincodefromcontract.js] Using serializers {"transaction":"jsonSerializer","serializers":{}}
configuring args through package.json is deprecated and will be removed in the next major release, please use the JS API instead.
2020-05-27T11:43:29.400Z info [shim:lib/chaincode.js] Registering with peer peer0.manufacturer.pharma-network.com:7053 as chaincode "pharanet:1.1"

Command succeeded

2020-05-27T11:43:29.422Z info [shim:lib/handler.js] Successfully registered with peer node. State transferred to "established"
2020-05-27T11:43:29.424Z info [shim:lib/handler.js] Successfully established communication with peer node. State transferred to "ready"
PharmaNet - Manufacturer Smart Contract Instantiated
2020-05-27T11:45:04.421Z info [shim:lib/handler.js] [pharmacchannel-c8210e44] Calling chaincode Init() succeeded. Sending COMPLE
TED message back to peer
PharmaNet - Distributor Smart Contract Instantiated
2020-05-27T11:45:04.536Z info [shim:lib/handler.js] [pharmacchannel-8ba15085] Calling chaincode Init() succeeded. Sending COMPLE
TED message back to peer
PharmaNet - Retailer Smart Contract Instantiated
2020-05-27T11:45:04.647Z info [shim:lib/handler.js] [pharmacchannel-69f514ad] Calling chaincode Init() succeeded. Sending COMPLE
TED message back to peer
PharmaNet - Transporter Smart Contract Instantiated
2020-05-27T11:45:04.748Z info [shim:lib/handler.js] [pharmacchannel-2e785fff] Calling chaincode Init() succeeded. Sending COMPLE
TED message back to peer
```

Verification of Chaincode functionalities



Terminal Setup

Keep a separate terminal tab for each organisation so that we can invoke functions on behalf of the specific organisation.

Tab 1 : manufacturerMSP

SSH to **cli** container in new terminal/tab using the following command

```
docker exec -it cli /bin/bash
```

The terminal window shows the following session:

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo $CORE_PEER_LOCALMSPID
manufacturerMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Tab 2 : distributorMSP

SSH to **cli** container in new terminal/tab using the following command

```
docker exec -it cli /bin/bash
```

```
CORE_PEER_LOCALMSPID="distributorMSP"
CORE_PEER_ADDRESS=peer0.distributor.pharma-network.com:9051
CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/distributor.pharma-network.com/users/Admin@distributor.pharma-network.com/msp
```

The terminal window shows the following session:

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
upgrad@upgrad-VirtualBox:/Desktop/pharma-network/network$ docker exec -it cli /bin/bash
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_LOCALMSPID="distributorMSP"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_ADDRESS=peer0.distributor.pharma-network.com:9051
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/distributor.pharma-network.com/users/Admin@distributor.pharma-network.com/msp
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo $CORE_PEER_LOCALMSPID
distributorMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Tab 3 : retailerMSP

SSH to **cli** container in new terminal/tab using the following command

```
docker exec -it cli /bin/bash
```

```
CORE_PEER_LOCALMSPID="retailerMSP"
CORE_PEER_ADDRESS=peer0.retailer.pharma-network.com:11051
CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/retailer.pharma-network.com/users/Admin@retailer.pharma-network.com/msp
```

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/application$ docker exec -it cli /bin/bash
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_LOCALMSPID="retailerMSP"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_ADDRESS=peer0.retailer.pharma-network.com:11051
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/retailer.pharma-network.com/users/Admin@retailer.pharma-network.com/msp
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo $CORE_PEER_LOCALMSPID
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo $CORE_PEER_LOCALMSPID
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo $CORE_PEER_LOCALMSPID
retailerMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Tab 4 : transporterMSP

SSH to **cli** container in new terminal/tab using the following command

```
docker exec -it cli /bin/bash

CORE_PEER_LOCALMSPID="transporterMSP"
CORE_PEER_ADDRESS=peer0.transporter.pharma-network.com:15051
CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/transporter.pharma-network.com/users/Admin@transporter.pharma-network.com/msp
```

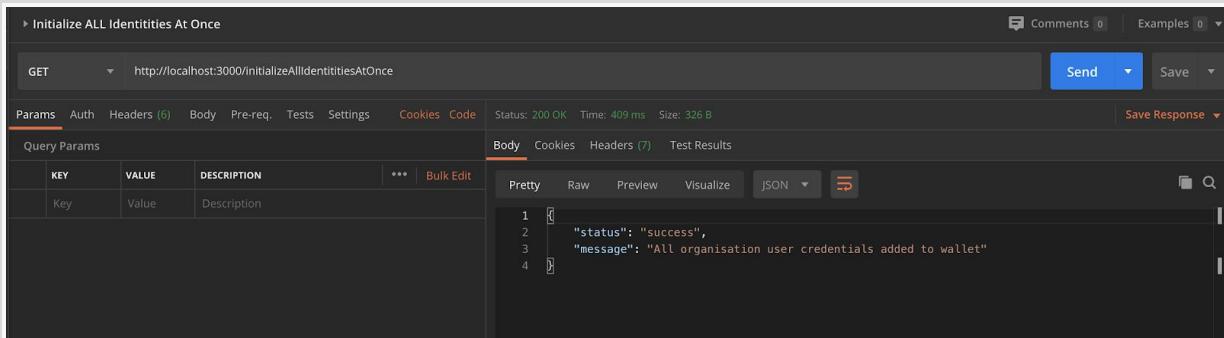
```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/application$ docker exec -it cli /bin/bash
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_LOCALMSPID="transporterMSP"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_ADDRESS=peer0.transporter.pharma-network.com:15051
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/transporter.pharma-network.com/users/Admin@transporter.pharma-network.com/msp
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo $CORE_PEER_LOCALMSPID
transporterMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Tab 5 : NODE API Client

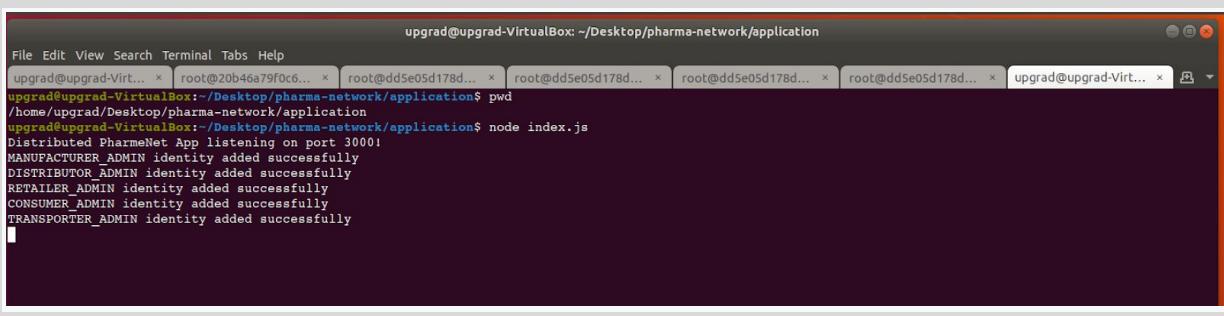
Run the following command in application folder

```
node index.js
```

Invoke "**initializeAllIdentitiesAtOnce**" from Postman to add identities of all organisations to the WALLET.



```
▶ Initialize ALL Identities At Once
GET http://localhost:3000/initializeAllIdentitiesAtOnce
Status: 200 OK Time: 409 ms Size: 326 B
Params Auth Headers (6) Body Pre-req. Tests Settings Cookies Code
Query Params
Body Cookies Headers (7) Test Results
Pretty Raw Preview Visualize JSON ↻
1 [
2   "status": "success",
3   "message": "All organisation user credentials added to wallet"
4 ]
```



```
File Edit View Terminal Tabs Help
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/application$ pwd
/home/upgrad/Desktop/pharma-network/application
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/application$ node index.js
Distributed PharmaNet App listening on port 3000!
MANUFACTURER ADMIN identity added successfully
DISTRIBUTOR ADMIN identity added successfully
RETAILER ADMIN identity added successfully
CONSUMER ADMIN identity added successfully
TRANSPORTER ADMIN identity added successfully
```

Invoking functions through CLI and Postman

Initiation : registerCompany

CLI

```
peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c
'{"Args": ["org.pharma-network.pharmanet.manufacturer:registerCompany", "MAN001", "Sun Pharma", "Chennai", "Manufacturer"]}'
```

```

root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.manufacturer:registerCompany","MAN001","Sun Pharma","Chennai","Manufacturer"]}
2020-05-27 12:41:41.124 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke successful. result: status:200 payload:(\\"companyID\":\"\\u00000000000000000000000000000000\\",\\"name\":\"Sun Pharma\",\"location\":\"Chennai\",\"organisationRole\":\"MANUFACTURER\",\"hierarchyKey\":1,\\\"updatedBy\\\":\"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\\\",\\\"updatedOn\\\":\\\"2020-05-27T12:41:41.112Z\\\"")
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#

```

Validation

Scenario#1: Invalid CRN (already exists)

```

root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.manufacturer:registerCompany","MAN001","Sun Pharma","Chennai","Manufacturer"]}
2020-05-27 12:41:41.124 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke successful. result: status:200 payload:(\\"companyID\":\"\\u00000000000000000000000000000000\\",\\"name\":\"Sun Pharma\",\"location\":\"Chennai\",\"organisationRole\":\"MANUFACTURER\",\"hierarchyKey\":1,\\\"updatedBy\\\":\"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\\\",\\\"updatedOn\\\":\\\"2020-05-27T12:41:41.112Z\\\"")
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.manufacturer:registerCompany","MAN001","Sun Pharma","Chennai","Manufacturer"]}
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid COMPANY Details. Another company with this CRN already exists."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#

```

Postman

The screenshot shows the Postman interface with the following details:

- Collection:** Manufacturer - registerCompany
- Method:** POST
- URL:** http://localhost:3000/registerCompany
- Status:** 200 OK
- Body (JSON):**

```

1 - {
2   "orgType": "manufacturer",
3   "companyCRN": "MAN001",
4   "companyName": "Sun Pharma",
5   "location": "Chennai",
6   "organisationRole": "Manufacturer"
7 }

```
- Response (JSON):**

```

1 {
2   "status": "success",
3   "message": "registerCompany invoked successfully",
4   "response": {
5     "companyID": "org.pharma-network.pharmanet.company:MAN001@Sun Pharma",
6     "name": "Sun Pharma",
7     "location": "Chennai",
8     "organisationRole": "MANUFACTURER",
9     "hierarchyKey": 1,
10    "updatedBy": "x509::/C=US/ST=California/L=San Francisco/OU=client/CN=Admin@manufacturer.pharma-network.com",
11    "updatedOn": "2020-05-27T06:14:30.087Z"
12  }
13

```

Launchpad

POST Manufacturer - registerCompany

POST http://localhost:3000/registerCompany

Status: 200 OK Time: 2.29 s Size: 766 B

Params Auth Headers (8) Body Pre-req. Tests Settings Cookies Code

raw JSON Beautify

```

1 {
2   "orgType": "manufacturer",
3   "companyCRN": "MAN002",
4   "companyName": "Dr Reddys",
5   "location": "Hyderabad",
6   "organisationRole": "Manufacturer"
7 }

```

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1 {
2   "status": "success",
3   "message": "registerCompany invoked successfully",
4   "response": {
5     "companyID": "@org.pharma-network.pharmanet.company@MAN002@Dr Reddys@",
6     "name": "Dr Reddys",
7     "location": "Hyderabad",
8     "organisationRole": "MANUFACTURER",
9     "hierarchyKey": 1,
10    "updatedBy": "x509::/C=US/ST=California/L=San Francisco/OU=client/CN=Admin@manufacturer.pharma-network.com:/C=US/ST=California/L=San Francisco/0=manufacturer.pharma-network.com/cn=ca.manufacturer.pharma-network.com",
11    "updatedOn": "2020-05-27T13:35:37.758Z"
12  }
13

```

POST Manufact...

[DELETED] POST [DELETED] POST [DELETED] POST POST Distribut... X POST Retailer ... POST Transpo... POST Transpo...

No Environment

Comments Examples

Send Save

POST Distributor - registerCompany

POST http://localhost:3000/registerCompany

Status: 200 OK Time: 2.33 s Size: 762 B

Params Auth Headers (8) Body Pre-req. Tests Settings Cookies Code

raw JSON Beautify

```

1 {
2   "orgType": "distributor",
3   "companyCRN": "DIST001",
4   "companyName": "VG pharma",
5   "location": "Vizag",
6   "organisationRole": "Distributor"
7 }

```

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1 {
2   "status": "success",
3   "message": "registerCompany invoked successfully",
4   "response": {
5     "companyID": "@org.pharma-network.pharmanet.company@DIST001@VG pharma@",
6     "name": "VG pharma",
7     "location": "Vizag",
8     "organisationRole": "DISTRIBUTOR",
9     "hierarchyKey": 2,
10    "updatedBy": "x509::/C=US/ST=California/L=San Francisco/OU=client/CN=Admin@manufacturer.pharma-network.com:/C=US/ST=California/L=San Francisco/0=manufacturer.pharma-network.com/cn=ca.manufacturer.pharma-network.com",
11    "updatedOn": "2020-05-27T06:21:09.749Z"
12  }
13

```

Filter

History Collections APIs

+ New Collection Trash

FIO ★ 21 requests

PharmaNet ★ 25 requests

- Identity Setup
- Manufacturer
- Distributor
- Retailer
- Transporter

POST Manufacturer - v...

GET Initialize ALL Iden...

POST Distributor - regi...

POST Retailer - regi...

POST Transporter - re...

POST Transporter - re...

No Environment

Comments Examples

Send Save

POST Retailer - registerCompany

POST http://localhost:3000/registerCompany

Status: 200 OK Time: 2.53 s Size: 741 B

Params Auth Headers (8) Body Pre-req. Tests Settings Cookies Code

raw JSON Beautify

```

1 {
2   "orgType": "retailer",
3   "companyCRN": "RET002",
4   "companyName": "upgrad",
5   "location": "Mumbai",
6   "organisationRole": "Retailer"
7 }

```

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```

1 {
2   "status": "success",
3   "message": "registerCompany invoked successfully",
4   "response": {
5     "companyID": "@org.pharma-network.pharmanet.company@RET002@upgrad@",
6     "name": "upgrad",
7     "location": "Mumbai",
8     "organisationRole": "RETAILER",
9     "hierarchyKey": 3,
10    "updatedBy": "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    "updatedOn": "2020-05-27T12:58:36.324Z"
12  }
13

```

The screenshot displays two separate Postman environments, each showing a POST request to register a company.

Top Environment:

- Request URL: `http://localhost:3000/registerCompany`
- Method: POST
- Body (JSON):

```
1: {  
2:   "orgType": "transporter",  
3:   "companyCRN": "TRAO001",  
4:   "companyName": "FedEx",  
5:   "location": "Delhi",  
6:   "organisationRole": "Transporter"  
7: }
```

- Response Body (Pretty JSON):

```
1:   "status": "success",  
2:   "message": "registerCompany Invoked successfully",  
3:   "response": {  
4:     "companyID": "Org.pharma-network.phamanet.company#TRA001#FedEx",  
5:     "name": "FedEx",  
6:     "location": "Delhi",  
7:     "organisationRole": "TRANSPORTER",  
8:     "updatedBy": "x509::/C=US/ST=California/L=San Francisco/O=client/  
ON=Admin@transporter.pharma-network.com::/C=US/ST=California/L=San Francisco/  
O=transporter.pharma-network.com/Nica.transporter.pharma-network.com",  
9:     "updatedOn": "2020-05-27T12:58:43.439Z"  
10:   }  
11:  
12: }
```

Bottom Environment:

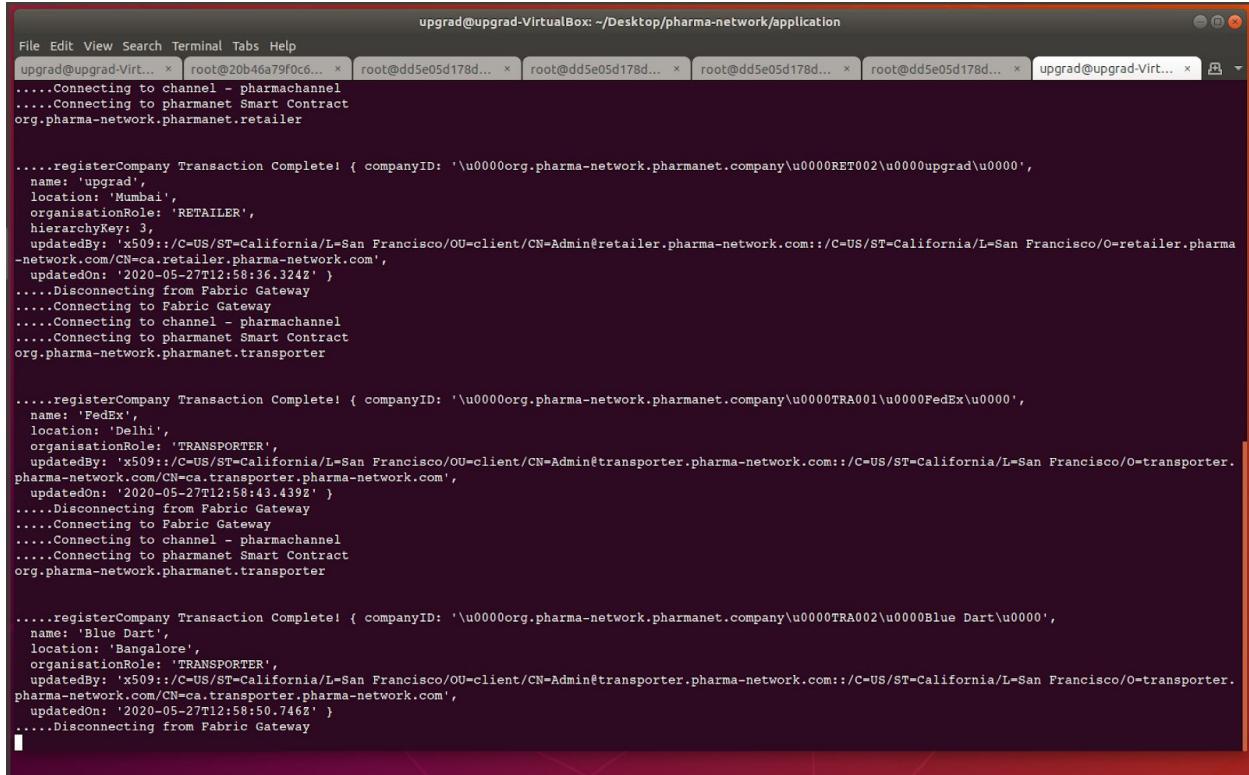
- Request URL: `http://localhost:3000/registerCompany`
- Method: POST
- Body (JSON):

```
1: {  
2:   "orgType": "transporter",  
3:   "companyCRN": "TRAO002",  
4:   "companyName": "Blue Dart",  
5:   "location": "Bangalore",  
6:   "organisationRole": "Transporter"  
7: }
```

- Response Body (Pretty JSON):

```
1:   "status": "success",  
2:   "message": "registerCompany invoked successfully",  
3:   "response": {  
4:     "companyID": "Org.pharma-network.phamanet.company#TRA002#Blue Dart",  
5:     "name": "Blue Dart",  
6:     "location": "Bangalore",  
7:     "organisationRole": "TRANSPORTER",  
8:     "updatedBy": "x509::/C=US/ST=California/L=San Francisco/O=client/  
ON=Admin@transporter.pharma-network.com::/C=US/ST=California/L=San Francisco/  
O=transporter.pharma-network.com/Nica.transporter.pharma-network.com",  
9:     "updatedOn": "2020-05-27T12:58:50.746Z"  
10:   }  
11:  
12: }
```

API Client Console



```
upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/application
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
....Connecting to channel - pharmachannel
....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.retailer

....registerCompany Transaction Complete! { companyID: '\u00000org.pharma-network.pharmanet.company\u0000RET002\u0000upgrad\u0000',
  name: 'upgrad',
  location: 'Mumbai',
  organisationRole: 'RETAILER',
  hierarchyKey: 3,
  updatedBy: 'x509::C=US/ST=California/L=San Francisco/OU=client/CN=Admin@retailer.pharma-network.com::C=US/ST=California/L=San Francisco/O=retailer.pharma-network.com/CN=ca.retailer.pharma-network.com',
  updatedOn: '2020-05-27T12:58:36.324Z' }
....Disconnecting from Fabric Gateway
....Connecting to Fabric Gateway
....Connecting to channel - pharmachannel
....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.transporter

....registerCompany Transaction Complete! { companyID: '\u00000org.pharma-network.pharmanet.company\u0000TRA001\u0000FedEx\u0000',
  name: 'FedEx',
  location: 'Delhi',
  organisationRole: 'TRANSPORTER',
  updatedBy: 'x509::C=US/ST=California/L=San Francisco/OU=client/CN=Admin@transporter.pharma-network.com::C=US/ST=California/L=San Francisco/O=transporter.pharma-network.com/CN=ca.transporter.pharma-network.com',
  updatedOn: '2020-05-27T12:58:43.439Z' }
....Disconnecting from Fabric Gateway
....Connecting to Fabric Gateway
....Connecting to channel - pharmachannel
....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.transporter

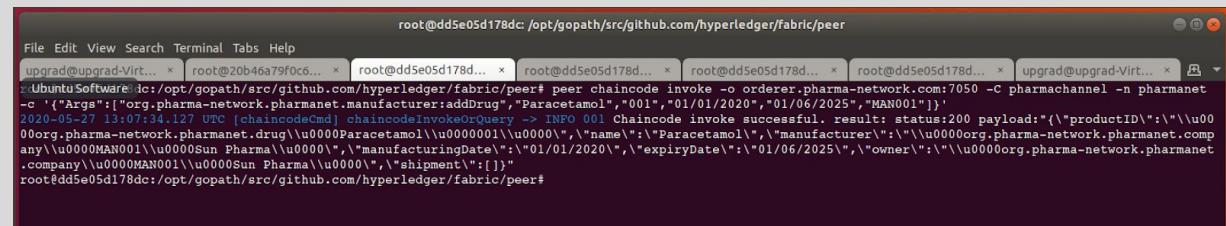
....registerCompany Transaction Complete! { companyID: '\u00000org.pharma-network.pharmanet.company\u00000TRA002\u0000Blue Dart\u0000',
  name: 'Blue Dart',
  location: 'Bangalore',
  organisationRole: 'TRANSPORTER',
  updatedBy: 'x509::C=US/ST=California/L=San Francisco/OU=client/CN=Admin@transporter.pharma-network.com::C=US/ST=California/L=San Francisco/O=transporter.pharma-network.com/CN=ca.transporter.pharma-network.com',
  updatedOn: '2020-05-27T12:58:50.746Z' }
....Disconnecting from Fabric Gateway
```

Initiation : addDrug

CLI

Execute the following command in “**manufacturerMSP**” Tab1

```
peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c
'{"Args": ["org.pharma-network.pharmanet.manufacturer:addDrug", "Paracetamol", "001", "01/01/2020", "01/06/2025", "MAN001"] }'
```



```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
: UbuntuSoftwareCenter: /opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args": ["org.pharma-network.pharmanet.manufacturer:addDrug", "Paracetamol", "001", "01/01/2020", "01/06/2025", "MAN001"] }'
2020-05-27 13:07:34.127 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload: {"productID": "\u00000org.pharma-network.pharmanet.drug\u0000Paracetamol\u000000000001\u00000000", "name": "Paracetamol", "manufacturer": "\u00000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u00000000", "manufacturingDate": "01/01/2020", "expiryDate": "01/06/2025", "owner": "\u00000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u00000000", "shipment": []}'
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Validations

Scenario#1: Already exists

Scenario#2: Invalid Initiator

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-VirtualBox:~/Desktop/pharma-network/network$ docker exec -it cli /bin/bash
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_LOCALMSPID="distributorMSP"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_ADDRESS=peer0.distributor.pharma-network.com:9051
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peer0
organizations/distributor.pharma-network.com/users/Admin@distributor.pharma-network.com/msp
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo $CORE_PEER_LOCALMSPID
$CORE_PEER_LOCALMSPID=distributorMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.manufacturer:addDrug","Paracetamol","001","01/01/2020","01/06/2025","MAN001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: You are not authorized to perform this operation"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#3: Invalid CRN

Scenario#4: Invalid Organisation Role

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.manufacturer:addDrug","Paracetamol","001","01/01/2020","01/06/2025","MAN001"]}'
2020-05-27 13:07:34.127 UTC [chaincodeCmd] chaincodeInvokeOrQuery +0 INFO 001 Chaincode invoke successful. result: status=200 payload: {"productID": "\u00000000000000000000000000000000", "name": "Paracetamol", "manufacturer": "\u00000000000000000000000000000000", "manufacturingDate": "01/01/2020", "expiryDate": "01/06/2025", "owner": "\u00000000000000000000000000000000", "company": "\u00000000000000000000000000000000", "shipment": ":"}
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.manufacturer:addDrug","Paracetamol","001","01/01/2020","01/06/2025","MAN001"]}' Error: endorsement failure during invoke. response: status=500 message:"transaction returned with failure: Error: You already have a DRUG with same Paracetamol & 001"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.manufacturer:addDrug","Paracetamol","001","01/01/2020","01/06/2025","MAN0099"]}' Error: endorsement failure during invoke. response: status=500 message:"transaction returned with failure: Error: Invalid CRN. No MANUFACTURER exists with provided CRN"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.manufacturer:addDrug","Paracetamol","001","01/01/2020","01/06/2025","DIST001"]}' Error: endorsement failure during invoke. response: status=500 message:"transaction returned with failure: Error: You are not registered as MANUFACTURER and can't add DRUGS with your license"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Postman

The screenshot displays a REST API testing interface with two separate requests for adding drugs.

Request 1 (Top): POST Manufacturer - addDrug 002

- Method: POST
- URL: http://localhost:3000/addDrug
- Body (JSON):

```
1: {  
2:   "orgType": "manufacturer",  
3:   "drugName": "Paracetamol",  
4:   "serialNo": "002",  
5:   "mfgDate": "01/06/2020",  
6:   "expDate": "01/06/2025",  
7:   "companyCRN": "MAN002"  
8: }
```

Response 1:

```
1: {  
2:   "status": "success",  
3:   "message": "addDrug invoked successfully",  
4:   "response": {  
5:     "productId": "@org.pharma-network.pharmanet.drug@Paracetamol@0002@",  
6:     "name": "Paracetamol",  
7:     "manufacturer": "@org.pharma-network.pharmanet.company@MAN001@Sun Pharma@",  
8:     "manufacturingDate": "01/06/2020",  
9:     "expiryDate": "01/06/2025",  
10:    "owner": "@org.pharma-network.pharmanet.company@MAN001@Sun Pharma@",  
11:    "shipment": []  
12:  }  
13: }
```

Request 2 (Bottom): POST Manufacturer - addDrug 005

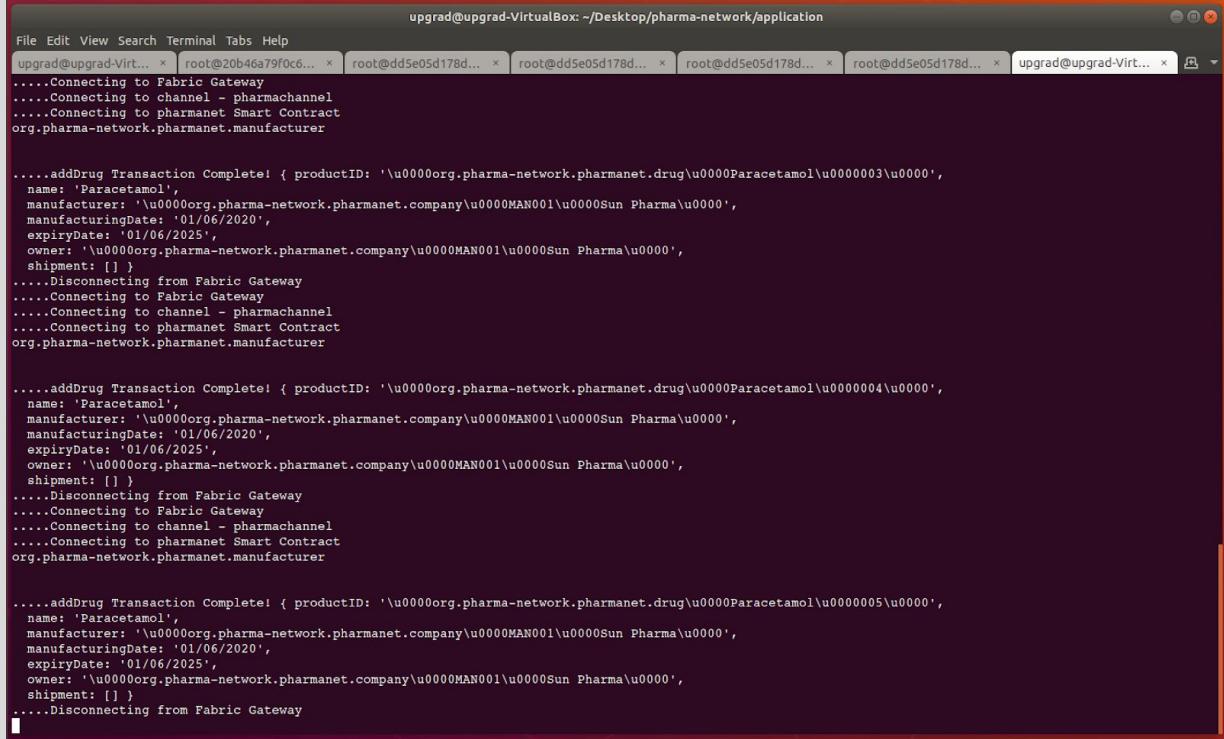
- Method: POST
- URL: http://localhost:3000/addDrug
- Body (JSON):

```
1: {  
2:   "orgType": "manufacturer",  
3:   "drugName": "Brufin",  
4:   "serialNo": "006",  
5:   "mfgDate": "01/06/2020",  
6:   "expDate": "01/06/2025",  
7:   "companyCRN": "MAN002"  
8: }
```

Response 2:

```
1: {  
2:   "status": "success",  
3:   "message": "addDrug invoked successfully",  
4:   "response": {  
5:     "productId": "@org.pharma-network.pharmanet.drug@Brufin@0006@",  
6:     "name": "Brufin",  
7:     "manufacturer": "@org.pharma-network.pharmanet.company@MAN002@Dr Reddys@",  
8:     "manufacturingDate": "01/06/2020",  
9:     "expiryDate": "01/06/2025",  
10:    "owner": "@org.pharma-network.pharmanet.company@MAN002@Dr Reddys@",  
11:    "shipment": []  
12:  }  
13: }
```

API Client Console



```
upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/application
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... <root@20b46a79f0c6...> root@dd5e05d178d... <root@dd5e05d178d...> root@dd5e05d178d... <root@dd5e05d178d...> root@upgrad@upgrad-Virt...
.....Connecting to Fabric Gateway
.....Connecting to channel - pharmachannel
.....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.manufacturer

.....addDrug Transaction Complete! { productID: '\u00000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000003\u0000',
name: 'Paracetamol',
manufacturer: '\u00000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
manufacturingDate: '01/06/2020',
expiryDate: '01/06/2025',
owner: '\u00000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
shipments: [] }
.....Disconnecting from Fabric Gateway
.....Connecting to Fabric Gateway
.....Connecting to channel - pharmachannel
.....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.manufacturer

.....addDrug Transaction Complete! { productID: '\u00000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000004\u0000',
name: 'Paracetamol',
manufacturer: '\u00000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
manufacturingDate: '01/06/2020',
expiryDate: '01/06/2025',
owner: '\u00000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
shipments: [] }
.....Disconnecting from Fabric Gateway
.....Connecting to Fabric Gateway
.....Connecting to channel - pharmachannel
.....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.manufacturer

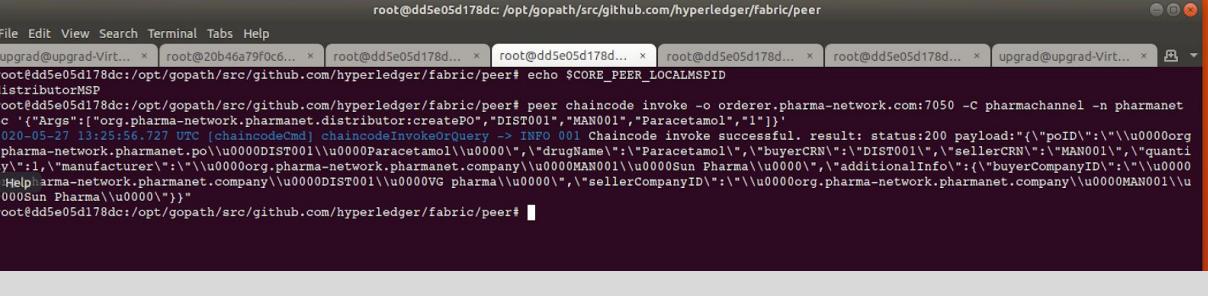
.....addDrug Transaction Complete! { productID: '\u00000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000005\u0000',
name: 'Paracetamol',
manufacturer: '\u00000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
manufacturingDate: '01/06/2020',
expiryDate: '01/06/2025',
owner: '\u00000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
shipments: [] }
.....Disconnecting from Fabric Gateway
```

Supply Chain : createPO

CLI

Execute the following command in “**distributorMSP**” Tab2

```
peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c
'{"Args": ["org.pharma-network.pharmanet.distributor:createPO", "DIST001", "MAN001", "Paracetamol", "1"]}'
```



```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... <root@20b46a79f0c6...> root@dd5e05d178d... <root@dd5e05d178d...> root@dd5e05d178d... <root@dd5e05d178d...> root@upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
distributorMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args": ["org.pharma-network.pharmanet.distributor:createPO", "DIST001", "MAN001", "Paracetamol", "1"]}'
2020-05-27 13:25:56.727 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\"poID\":\"\\u0000org.pharma-network.pharmanet.po\\u0000DIST001\\u0000Paracetamol\\u0000\", \"drugName\":\"Paracetamol\", \"buyerCRN\":\"DIST001\", \"sellerCRN\":\"MAN001\", \"quantity\":1, \"manufacturer\":\"\\u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0000Sun Pharma\\u0000\", \"additionalInfo\":{\"buyerCompanyID\":\"\\u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0000Sun Pharma\\u0000\"}}"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Validations

Scenario#1: BUYER can't be Manufacturer

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
distributorMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","Paracetamol","1"]}
2020-05-27 13:25:56.727 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\\"poID\\":\\"u0000org
.pharma-network.pharmanet.po\\u00000DIST001\\u0000Paracetamol\\u0000\",\\"drugName\\":\\"Paracetamol\\\",\"buyerCRN\\\":\\\"DIST001\\\",\\\"sellerCRN\\\":\\\"MAN001\\\",\\\"quanti
ty\\\":1,\\\"manufacturer\\\":\\\"u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0000Sun Pharma\\u0000\",\\\"additionalInfo\\\":{\\\"buyerCompanyID\\\":\\\"u0000
org.pharma-network.pharmanet.company\\u0000DIST001\\u0000VG pharma\\u0000\",\\\"sellerCompanyID\\\":\\\"u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0
000Sun Pharma\\u0000\"}}"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","MAN001","DIST001","TEST","1"]}
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: BUYER can't be Manufacturer"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#2: Invalid BUYER CRN

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
distributorMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","Paracetamol","1"]}
2020-05-27 13:25:56.727 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\\"poID\\":\\"u0000org
.pharma-network.pharmanet.po\\u00000DIST001\\u0000Paracetamol\\u0000\",\\"drugName\\":\\"Paracetamol\\\",\"buyerCRN\\\":\\\"DIST001\\\",\\\"sellerCRN\\\":\\\"MAN001\\\",\\\"quanti
ty\\\":1,\\\"manufacturer\\\":\\\"u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0000Sun Pharma\\u0000\",\\\"additionalInfo\\\":{\\\"buyerCompanyID\\\":\\\"u0000
org.pharma-network.pharmanet.company\\u0000DIST001\\u0000VG pharma\\u0000\",\\\"sellerCompanyID\\\":\\\"u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0
000Sun Pharma\\u0000\"}}"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","MAN001","DIST001","TEST","1"]}
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: BUYER can't be Manufacturer"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","TEST","1"]}
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","TEST","1"]}
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: No DRUG available with specified name TEST"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#3: No DRUG available with specified name TEST

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
distributorMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","Paracetamol","1"]}
2020-05-27 13:25:56.727 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\\"poID\\":\\"u0000org
.pharma-network.pharmanet.po\\u00000DIST001\\u0000Paracetamol\\u0000\",\\"drugName\\":\\"Paracetamol\\\",\"buyerCRN\\\":\\\"DIST001\\\",\\\"sellerCRN\\\":\\\"MAN001\\\",\\\"quanti
ty\\\":1,\\\"manufacturer\\\":\\\"u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0000Sun Pharma\\u0000\",\\\"additionalInfo\\\":{\\\"buyerCompanyID\\\":\\\"u0000
org.pharma-network.pharmanet.company\\u0000DIST001\\u0000VG pharma\\u0000\",\\\"sellerCompanyID\\\":\\\"u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0
000Sun Pharma\\u0000\"}}"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","MAN001","DIST001","TEST","1"]}
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: BUYER can't be Manufacturer"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","TEST","1"]}
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-- {"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","TEST","1"]}
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: No DRUG available with specified name TEST"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#4: SELLER does not own this DRUG

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Terminal Tabs Help
upgrad@upgrad-Virt... root@20b46a79f0c6... root@dd5e05d178d... root@dd5e05d178d... root@dd5e05d178d... root@dd5e05d178d... upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
distributorMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","Paracetamol","1"]}'
2020-05-27 13:25:56.727 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:{"poID":":\"u0000DIST001\\u0000Paracetamol\\u0000","drugName":\"Paracetamol\",buyerCRN":\"DIST001\",sellerCRN":\"MAN001\",quantity":1,"manufacturer":\"\\u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0000Sun Pharma\\u0000\",additionalInfo":{\"buyerCompanyID\":\":\\u0000org.pharma-network.pharmanet.company\\u0000MAN001\\u0000Sun Pharma\\u0000\"}}
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createPO","MAN001","TEST","1"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: BUYER can't be Manufacturer"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","TEST","1"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createPO","DIST001","MAN001","TEST","1"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: SELLER does not own this DRUG : Brufen"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Postman

Part a: Distributor - createPO (VG Pharma - 3 Strips)

Part a: Distributor - createPO (VG Pharma - 3 Strips)

POST http://localhost:3000/createPO

Status: 200 OK Time: 2.28 s Size: 790 B

Body:

```

1 {
2   "orgType": "distributor",
3   "buyerCRN": "DIST001",
4   "sellerCRN": "MAN001",
5   "drugName": "Paracetamol",
6   "quantity": 3
7 }

```

Response:

```

1 {
2   "status": "success",
3   "message": "createPO invoked successfully",
4   "response": {
5     "poID": "org.pharma-network.pharmanet.po@DIST001@Paracetamol@",
6     "drugName": "Paracetamol",
7     "buyerCRN": "DIST001",
8     "sellerCRN": "MAN001",
9     "quantity": 3,
10    "manufacturer": "org.pharma-network.pharmanet.company@MAN001@Sun Pharma@",
11    "additionalInfo": {
12      "buyerCompanyID": "org.pharma-network.pharmanet.company@DIST001@VG pharma@",
13      "sellerCompanyID": "org.pharma-network.pharmanet.company@MAN001@Sun Pharma@"
14    }
15  }
16 }
```

Part b: Retailer - createPO (upgrad - 2 Strips)

Part b: Retailer - createPO (upgrad - 2 Scripts)

POST http://localhost:3000/createPO

Status: 200 OK Time: 1 m 59.58 s Size: 691 B

```

1 = [
2   "orgType": "retailer",
3   "buyerCRN": "RET002",
4   "sellerCRN": "DIST001",
5   "drugName": "Paracetamol",
6   "quantity": "2"
7 ]
  
```

```

1 {
2   "status": "success",
3   "message": "createPO invoked successfully",
4   "response": {
5     "poID": "\u0040org.pharma-network.pharmanet.po@RET002@Paracetamol@",
6     "drugName": "Paracetamol",
7     "buyerCRN": "RET002",
8     "sellerCRN": "DIST001",
9     "quantity": 2,
10    "additionalInfo": {
11      "buyerCompanyID": "\u0040org.pharma-network.pharmanet.company@RET002@upgrad@",
12      "sellerCompanyID": "\u0040org.pharma-network.pharmanet.company@DIST001@VG pharma@"
13    }
14  }
15
  
```

API Client Console

```

File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
  
```

```

_msp: Map {},
_devMode: false,
_adminSigningIdentity: null,
_tls mutual: {},
_organizations: Map {},
_certificateAuthorities: Map {},
_channels: [Object],
_connection_options: {} },
wallet: null,
networks: Map { 'pharmacchannel' => [Object] },
options:
  { queryHandlerOptions: [Object],
  eventHandlerOptions: [Object],
  discovery: [Object],
  checkpointer: [Object],
  eventHubSelectionOptions: [Object],
  wallet: [Object],
  identity: 'DISTRIBUTOR_ADMIN' },
currentIdentity:
User {
  _name: 'DISTRIBUTOR_ADMIN',
  _roles: null,
  _affiliation: '',
  _enrolmentSecret: '',
  _identity: [Object],
  _signingIdentity: [Object],
  _mspId: 'distributorMSP',
  _cryptoSuite: [Object] },
namespace: 'org.pharma-network.pharmanet.distributor',
checkpointer: { factory: [Function: FILE_SYSTEM_CHECKPOINTER], options: {} } }

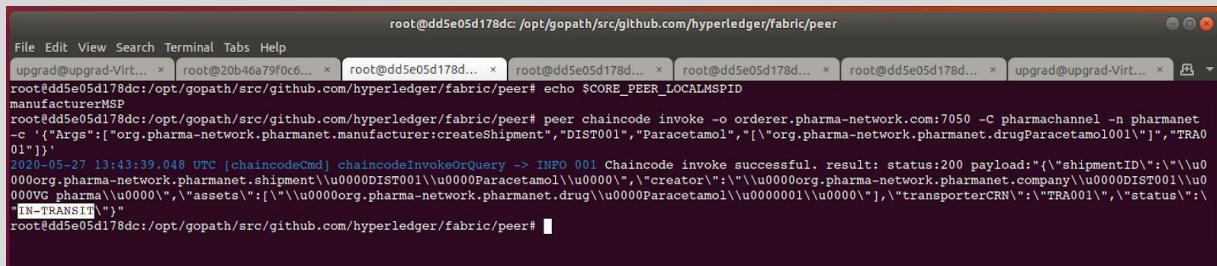
....createPO Transaction Complete! { poID: '\u0040org.pharma-network.pharmanet.po@0000DIST001@0000Paracetamol@0000',
drugName: 'Paracetamol',
buyerCRN: 'DIST001',
sellerCRN: 'MAN001',
quantity: 1,
manufacturer: '\u0040org.pharma-network.pharmanet.company@0000MAN001@0000Sun Pharma@0000',
additionalInfo:
{ buyerCompanyID: '\u0040org.pharma-network.pharmanet.company@0000DIST001@0000VG pharma@0000',
  sellerCompanyID: '\u0040org.pharma-network.pharmanet.company@0000MAN001@0000Sun Pharma@0000' } }
....Disconnecting from Fabric Gateway
  
```

Supply Chain : createShipment

CLI

Execute the following command in “manufacturerMSP” Tab1

```
peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c
'{"Args": ["org.pharma-network.pharmanet.manufacturer:createShipment","DIST001
","Paracetamol", "[\"org.pharma-network.pharmanet.drugParacetamol001\"]", "TRA00
1"]}'
```

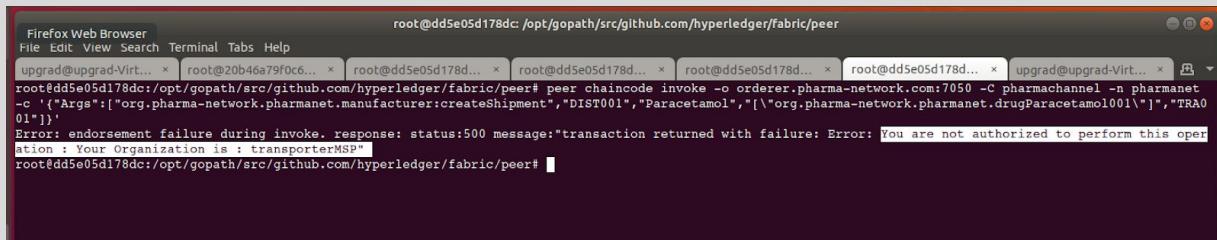


```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt... x
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
manufacturerMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args": ["org.pharma-network.pharmanet.manufacturer:createShipment","DIST001","Paracetamol", "[\"org.pharma-network.pharmanet.drugParacetamol001\"]", "TRA001"]}'
2020-05-27 13:43:39.048 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{\"shipmentID\":\"\\u0000org.pharma-network.pharmanet.shipment\\u0000DIST001\\u0000Paracetamol\\u0000\", \"creator\":\"\\u0000org.pharma-network.pharmanet.company\\u0000DIST001\\u0000VG pharma\\u0000\", \"assets\": {\"\\u0000org.pharma-network.pharmanet.drug\\u0000Paracetamol\\u00000001\\u0000\": \"TRANSPORTERCRN\\\"TRA001\\\", \"status\": \"IN-TRANSIT\"}}"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

The owner of each item of the batch should also be updated.

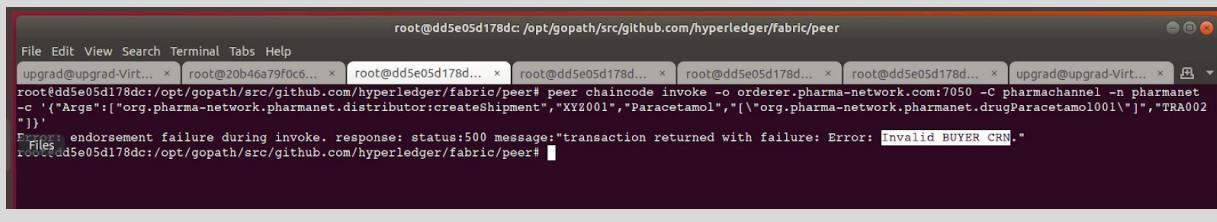
Validations

Scenario#1: Invalid Initiator



```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt... x
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args": ["org.pharma-network.pharmanet.manufacturer:createShipment","DIST001","Paracetamol", "[\"org.pharma-network.pharmanet.drugParacetamol001\"]", "TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: You are not authorized to perform this operation : Your Organization is : transporterMSP"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#2: Invalid BUYER CRN



```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt... x
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args": ["org.pharma-network.pharmanet.distributor:createShipment","XYZ001","Paracetamol", "[\"org.pharma-network.pharmanet.drugParacetamol001\"]", "TRA002"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#3: Invalid Transporter CRN

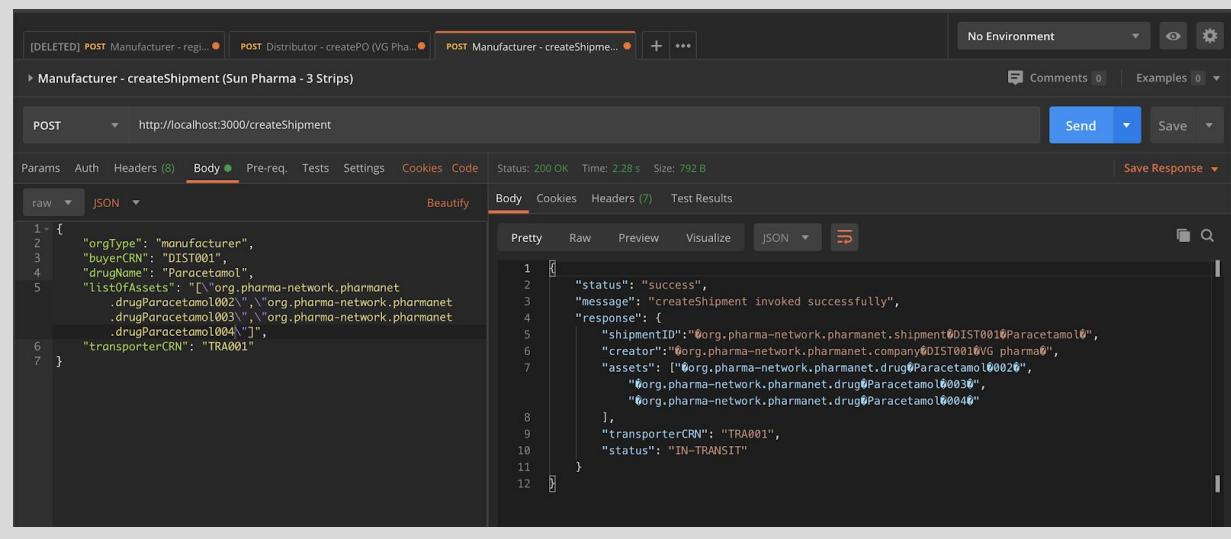
```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Terminal Tabs Help
upgrad@upgrad-Virt... < root@20b46a79f0c6... < root@dd5e05d178d... < root@dd5e05d178d... < root@dd5e05d178d... < root@dd5e05d178d... < upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createShipment","XYZ001","Paracetamol","[\"*org.pharma-network.pharmanet.drugParacetamol001\"]","TRA002"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createShipment","RET002","Paracetamol","[\"*org.pharma-network.pharmanet.drugParacetamol001\"]","XYZ001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Transporter CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#4: Invalid operation. No PO raised for specified items

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Terminal Tabs Help
upgrad@upgrad-Virt... < root@20b46a79f0c6... < root@dd5e05d178d... < root@dd5e05d178d... < root@dd5e05d178d... < root@dd5e05d178d... < upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createShipment","XYZ001","Paracetamol","[\"*org.pharma-network.pharmanet.drugParacetamol001\"]","TRA002"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createShipment","RET002","Paracetamol","[\"*org.pharma-network.pharmanet.drugParacetamol001\"]","XYZ001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Transporter CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createShipment","RET002","TEST","[\"*org.pharma-network.pharmanet.drugParacetamol001\"]","XYZ001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Transporter CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c '{"Args":["org.pharma-network.pharmanet.distributor:createShipment","RET002","TEST","[\"*org.pharma-network.pharmanet.drugParacetamol001\"]","TRA002"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid operation. No PO raised for BUYER : RET002, DRUG : TEST"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Postman

Part a: Manufacturer - createShipment (Sun Pharma - 3 Strips)



The screenshot shows a Postman collection with three requests:

- [DELETED] POST Manufacturer - regi...
- POST Distributor - createPO (VG Pha...
- POST Manufacturer - createShipment (Sun Pharma - 3 Strips)

The selected request is "Manufacturer - createShipment (Sun Pharma - 3 Strips)".

Request details:

- Method: POST
- URL: http://localhost:3000/createShipment
- Headers: Content-Type: application/json
- Body (JSON):

```
1 {  
2   "orgType": "manufacturer",  
3   "buyerCRN": "DIST001",  
4   "drugName": "Paracetamol",  
5   "listOfAssets": "[\"*org.pharma-network.pharmanet.drugParacetamol002\", \"*org.pharma-network.pharmanet.drugParacetamol003\", \"*org.pharma-network.pharmanet.drugParacetamol004\"]",  
6   "transporterCRN": "TRA001"  
7 }
```

Response details:

- Status: 200 OK
- Time: 2.28 s
- Size: 792 B

The response body is:

```
1 [ {  
2   "status": "success",  
3   "message": "createShipment invoked successfully",  
4   "response": {  
5     "shipmentID": "0*org.pharma-network.pharmanet.shipment0DIST0010Paracetamol0*",  
6     "creator": "0*org.pharma-network.pharmanet.company0DIST0010VG pharma*",  
7     "assets": "[\"*org.pharma-network.pharmanet.drug0Paracetamol0002\",  
8       \"*org.pharma-network.pharmanet.drug0Paracetamol0003\",  
9       \"*org.pharma-network.pharmanet.drug0Paracetamol0004\"  
10      ],  
11      "transporterCRN": "TRA001",  
12      "status": "IN-TRANSIT"  
13    }  
14  }]
```

Part b: Distributor - createShipment (VG Pharma to upgrad - Blue Dart)

Part b: Distributor - createShipment (VG Pharma to upgrad - Blue Dart)

POST http://localhost:3000/createShipment

Status: 200 OK Time: 2.78 s Size: 713 B

```

1+ {
2   "orgType": "distributor",
3   "buyerCRN": "RET002",
4   "drugName": "Paracetamol",
5   "listOfAssets": "[\"003\", \"004\"]",
6   "transporterCRN": "TRA002"
7 }

```

Body

```

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\$\$RET002\$upgrad\$",
7     "assets": ["\$org.pharma-network.pharmanet.drug\$Paracetamol\$003\$",
8               "\$org.pharma-network.pharmanet.drug\$Paracetamol\$004\$"],
9     "transporterCRN": "TRA002",
10    "status": "IN-TRANSIT"
11  }
12 ]

```

API Client Console

```

upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/application
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt...
discovery: [Object],
checkpoint: [Object],
eventHubSelectionOptions: [Object],
wallet: [Object],
identity: 'RETAILER_ADMIN' ,
currentIdentity:
User {
  _name: 'RETAILER_ADMIN',
  _roles: null,
  _affiliation: '',
  _enrolmentSecret: '',
  _identity: [Object],
  _signingIdentity: [Object],
  _mspId: 'retailerMSP',
  _cryptoSuite: [Object] },
namespace: 'org.pharma-network.pharmanet.retailer',
checkpoint: { factory: [Function: FILE_SYSTEM_CHECKPOINTER], options: {} } }

....createPO Transaction Complete! { poID: '\u0000org.pharma-network.pharmanet.po\$\u0000RET002\$\u0000Paracetamol\$\u0000',
drugName: 'Paracetamol',
buyerCRN: 'RET002',
sellerCRN: 'DIST001',
quantity: 1,
manufacturer: null,
additionalInfo:
{ buyerCompanyID: '\u0000org.pharma-network.pharmanet.company\$\u0000RET002\$\u0000upgrad\$\u0000',
  sellerCompanyID: '\u0000org.pharma-network.pharmanet.company\$\u0000DIST001\$\u0000VG pharma\$\u0000' } }
....Disconnecting from Fabric Gateway
....Connecting to Fabric Gateway
....Connecting to channel - pharmacchannel
....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.distributor

....createShipment Transaction Complete! { shipmentID: '\u0000org.pharma-network.pharmanet.shipment\$\u0000RET002\$\u0000Paracetamol\$\u0000',
creator: '\u0000org.pharma-network.pharmanet.company\$\u0000RET002\$\u0000upgrad\$\u0000',
assets:
[ '\u0000org.pharma-network.pharmanet.drug\$\u0000Paracetamol\$0000001\$\u0000' ],
transporterCRN: 'TRA002',
status: 'IN-TRANSIT' }
....Disconnecting from Fabric Gateway

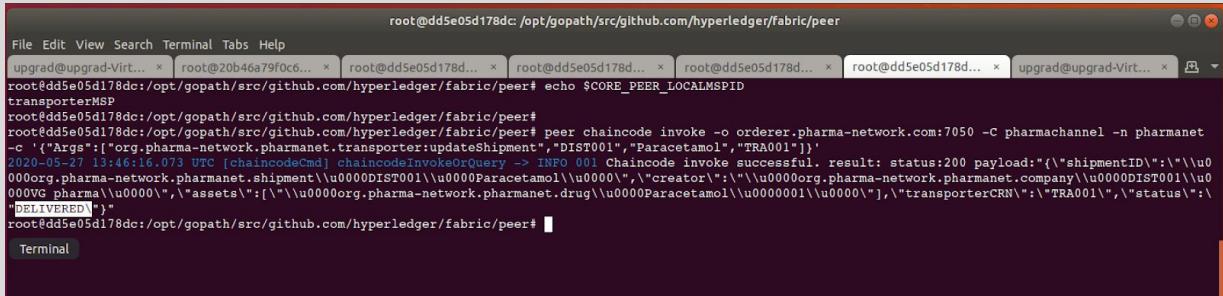
```

Supply Chain : updateShipment

CLI

Execute the following command in “**transporterMSP**” Tab4

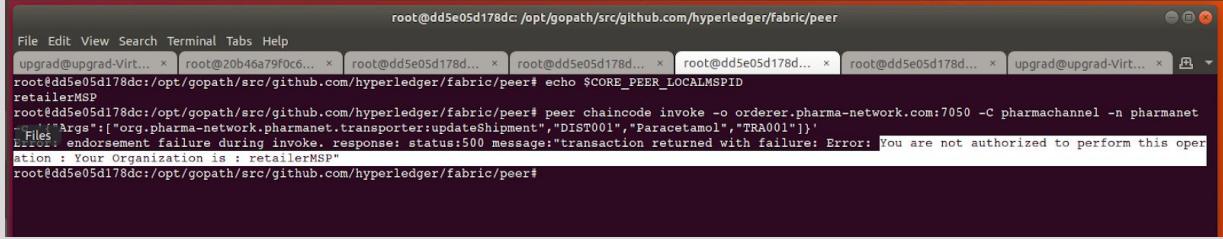
```
peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c
'{"Args": ["org.pharma-network.pharmanet.transporter:updateShipment", "DIST001", "Paracetamol", "TRA001"]}'
```



A terminal window titled "root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer". The window shows a series of tabs at the top, all labeled "root@...". The main pane displays the command being run and its output. The output shows a successful response from the chaincode, indicating a payload was updated.

Validations

Scenario#1: Invalid Initiator



A terminal window titled "root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer". The window shows a series of tabs at the top, all labeled "root@...". The main pane displays the command being run and its output. The output shows an error message indicating that the user is not authorized to perform the operation because their organization is not the correct one.

Scenario#2: Invalid BUYER CRN.

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt...  x  root@20b46a79f0c6...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
transporterMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST001","Paracetamol","TRA001"]}'
2020-05-27 14:33:00.576 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke successful. result: status:200 payload:{"\shipmentID": "\u0000org.pharma-network.pharmanet.shipment\u00000DIST001\u0000Paracetamol\u00000", "creator": "\u0000org.pharma-network.pharmanet.company\u00000DIST001\u0000VG pharma\u00000", "assets": [{"\u0000org.pharma-network.pharmanet.drug\u00000Paracetamol\u00000001\u00000"}, {"transporterCRN": "TRA001", "status": "DELIVERED"}]}
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST002","Paracetamol","TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#3: Invalid Transporter CRN

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt...  x  root@20b46a79f0c6...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
transporterMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST001","Paracetamol","TRA001"]}'
2020-05-27 14:33:00.576 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke successful. result: status:200 payload:{"\shipmentID": "\u0000org.pharma-network.pharmanet.shipment\u00000DIST001\u0000Paracetamol\u00000", "creator": "\u0000org.pharma-network.pharmanet.company\u00000DIST001\u0000VG pharma\u00000", "assets": [{"\u0000org.pharma-network.pharmanet.drug\u00000Paracetamol\u00000001\u00000"}, {"transporterCRN": "TRA001", "status": "DELIVERED"}]}
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST002","Paracetamol","TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST001","Paracetamol","TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Transporter CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#4: Can't find any SHIPMENT with specified BUYER & DRUG

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt...  x  root@20b46a79f0c6...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  root@dd5e05d178d...  x  upgrad@upgrad-Virt...
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
transporterMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST001","Paracetamol","TRA001"]}'
2020-05-27 14:33:00.576 UTC [chaincodeCmd] chaincodeInvokeOrQuery > INFO 001 Chaincode invoke successful. result: status:200 payload:{"\shipmentID": "\u0000org.pharma-network.pharmanet.shipment\u00000DIST001\u0000Paracetamol\u00000", "creator": "\u0000org.pharma-network.pharmanet.company\u00000DIST001\u0000VG pharma\u00000", "assets": [{"\u0000org.pharma-network.pharmanet.drug\u00000Paracetamol\u00000001\u00000"}, {"transporterCRN": "TRA001", "status": "DELIVERED"}]}
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST002","Paracetamol","TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid BUYER CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST001","Paracetamol","TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Transporter CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST001","Paracetamol123","TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid operation. Can't find any SHIPMENT with specified BUYER & DRUG"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Postman

Part a: Transporter - updateShipment (FedEx to VG Pharma)

The Postman interface shows a successful POST request to `http://localhost:3000/updateShipment`. The request body is JSON:

```
1 + {  
2   "orgType": "transporter",  
3   "buyerCRN": "DIST001",  
4   "drugName": "Paracetamol",  
5   "transporterCRN": "TRA001"  
6 }
```

The response status is 200 OK, with the message: "updateShipment invoked successfully". The response body is:

```
1 [ {  
2   "status": "success",  
3   "message": "updateShipment invoked successfully",  
4   "response": {  
5     "shipmentID": "Org.pharma-network.pharmanet.shipment@DIST001@Paracetamol@",  
6     "creator": "Org.pharma-network.pharmanet.company@DIST001@VG pharma@",  
7     "assets": [ "Org.pharma-network.pharmanet.drug@Paracetamol@0002@",  
8       "Org.pharma-network.pharmanet.drug@Paracetamol@0003@",  
9       "Org.pharma-network.pharmanet.drug@Paracetamol@0004@" ],  
10    },  
11    "transporterCRN": "TRA001",  
12    "status": "DELIVERED"  
13  }  
14 }
```

Part b: Transporter - updateShipment (BlueDart to upgrad)

The Postman interface shows a successful POST request to `http://localhost:3000/updateShipment`. The request body is JSON:

```
1 + {  
2   "orgType": "transporter",  
3   "buyerCRN": "RET002",  
4   "drugName": "Paracetamol",  
5   "transporterCRN": "TRA002"  
6 }
```

The response status is 200 OK, with the message: "updateShipment invoked successfully". The response body is:

```
1 [ {  
2   "status": "success",  
3   "message": "updateShipment invoked successfully",  
4   "response": {  
5     "shipmentID": "Org.pharma-network.pharmanet.shipment@RET002@Paracetamol@",  
6     "creator": "Org.pharma-network.pharmanet.company@RET002@upgrad@",  
7     "assets": [ "Org.pharma-network.pharmanet.drug@Paracetamol@0003@",  
8       "Org.pharma-network.pharmanet.drug@Paracetamol@0004@" ],  
9     },  
10    "transporterCRN": "TRA002",  
11    "status": "DELIVERED"  
12  }  
13 }
```

API Client Console

```
upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/application
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... root@20b46a79f0c6... root@dd5e05d178d... root@dd5e05d178d... root@dd5e05d178d... root@dd5e05d178d... upgrad@upgrad-Virt...
    _mspId: 'retailerMSP',
    _cryptoSuite: [Object] },
  namespace: 'org.pharma-network.pharmanet.retailer',
  checkpointer: { factory: [Function: FILE_SYSTEM_CHECKPOINTER], options: {} } }

....createPO Transaction Complete! { poID: '\u0000org.pharma-network.pharmanet.po\u0000RET002\u0000Paracetamol\u0000',
drugName: 'Paracetamol',
buyerCRN: 'RETO02',
sellerCRN: 'DIST001',
quantity: 1,
manufacturer: null,
additionalInfo:
{ buyerCompanyID: '\u0000org.pharma-network.pharmanet.company\u0000RET002\u0000upgrad\u0000',
  sellerCompanyID: '\u0000org.pharma-network.pharmanet.company\u0000DIST001\u0000VG pharma\u0000' } }
....Disconnecting from Fabric Gateway
....Connecting to Fabric Gateway
....Connecting to channel - pharmachannel
....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.distributor

....createShipment Transaction Complete! { shipmentID: '\u0000org.pharma-network.pharmanet.shipment\u0000RET002\u0000Paracetamol\u0000',
creator: '\u0000org.pharma-network.pharmanet.company\u0000RET002\u0000upgrad\u0000',
assets:
[ '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000001\u0000' ],
transporterCRN: 'TRA002',
status: 'IN-TRANSIT' }
....Disconnecting from Fabric Gateway
....Connecting to Fabric Gateway
....Connecting to channel - pharmachannel
....Connecting to pharmanet Smart Contract
org.pharma-network.pharmanet.transporter

....updateShipment Transaction Complete! { shipmentID: '\u0000org.pharma-network.pharmanet.shipment\u0000RET002\u0000Paracetamol\u0000',
creator: '\u0000org.pharma-network.pharmanet.company\u0000RET002\u0000upgrad\u0000',
assets:
[ '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000001\u0000' ],
transporterCRN: 'TRA002',
status: 'DELIVERED' }
....Disconnecting from Fabric Gateway
```

Supply Chain : retailDrug

CLI

Execute the following command in “**retailerMSP**” Tab1

```
peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet -c
'{"Args": ["org.pharma-network.pharmanet.retailer:retailDrug", "Paracetamol", "001", "RET002", "9090-1212-3434"]}'
```

Validations

Scenario#1: You can't sell this DRUG as you are not the OWNER of this DRUG

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt... x
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
retailerMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.retailer:retailDrug","Paracetamol","001","RET002","9090-1212-3434"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: You can't sell this DRUG as you are not the OWNER of this DRUG"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#2: Invalid Initiator

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt... x
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
distributorMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.retailer:retailDrug","Paracetamol","001","RET002","9090-1212-3434"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: You are not authorized to perform this operation : Your Organization is : distributorMSP"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#3: Invalid Retailer CRN

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt... x
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
retailerMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST001","Paracetamol","TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: You are not authorized to perform this operation : Your Organization is : retailerMSP"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.retailer:retailDrug","Paracetamol","001","RET003","9090-1212-3434"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Retailer CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Scenario#4: No DRUG available with specified Name & Serial No

```
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer
File Edit View Search Terminal Tabs Help
upgrad@upgrad-Virt... x root@20b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt... x
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# echo SCORE_PEER_LOCALMSPID
retailerMSP
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.transporter:updateShipment","DIST001","Paracetamol","TRA001"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: You are not authorized to perform this operation : Your Organization is : retailerMSP"
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.retailer:retailDrug","Paracetamol","001","RET003","9090-1212-3434"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: Invalid Retailer CRN."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.pharma-network.com:7050 -C pharmachannel -n pharmanet
-c '{"Args":["org.pharma-network.pharmanet.retailer:retailDrug","Paracetamol123","001","RET002","9090-1212-3434"]}'
Error: endorsement failure during invoke. response: status:500 message:"transaction returned with failure: Error: No DRUG available with specified Name & Serial No."
root@dd5e05d178dc:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Postman

The screenshot shows the Postman interface with a request to "Retailer - retailDrug (AAD001)". The request method is POST to http://localhost:3000/retailDrug. The response status is 200 OK with a time of 2.29 s and a size of 776 B. The response body is a JSON object:

```
1 {  
2   "orgType": "retailer",  
3   "drugName": "Paracetamol",  
4   "serialNo": "002",  
5   "retailerCRN": "RET002",  
6   "customerName": "Akash",  
7   "customerAadhar": "AAD001"  
8 }  
  
1 {  
2   "status": "success",  
3   "message": "retailDrug invoked successfully",  
4   "response": [  
5     {"productID": "org.pharma-network.pharmanet.drug@Paracetamol@002@",  
6      "name": "Paracetamo!",  
7      "manufacturer": "org.pharma-network.pharmanet.company@MAN001@Sun Pharma@",  
8      "manufacturingDate": "01/06/2020",  
9      "expiryDate": "01/06/2025",  
10     "owner": "AAD001",  
11     "shipment": ["org.pharma-network.pharmanet.shipment@DIST001@Paracetamol@",  
12       "org.pharma-network.pharmanet.shipment@RET002@Paracetamol@"]  
13   ]  
14 }
```

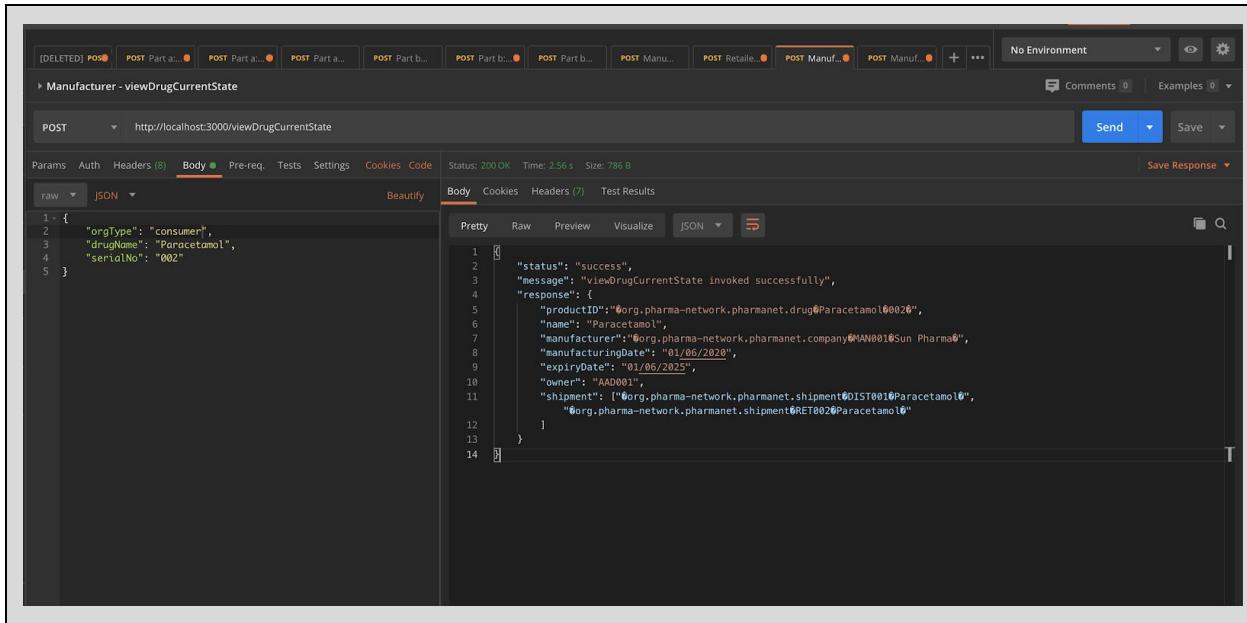
API Client Console

The screenshot shows a terminal window titled "upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/application". The window displays a series of log messages related to connecting to a Fabric Gateway, creating and updating shipments, and performing a retailDrug transaction. The logs include details about product ID, name, manufacturer, and shipment status.

```
File Edit View Search Terminal Tabs Help  
upgrad@upgrad-Virt... x root@0b46a79f0c6... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x root@dd5e05d178d... x upgrad@upgrad-Virt... x  
....Connecting to Fabric Gateway  
....Connecting to channel - pharmachannel  
....Connecting to pharmanet Smart Contract  
org.pharma-network.pharmanet.distributor  
  
....createShipment Transaction Complete! { shipmentID: '\u0000org.pharma-network.pharmanet.shipment\u0000RET002\u0000Paracetamol\u0000',  
creator: '\u0000org.pharma-network.pharmanet.company\u0000RET002\u0000upgrad\u0000',  
assets:  
[ '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000001\u0000' ],  
transporterCRN: 'TRA002',  
status: 'IN-TRANSIT' }  
....Disconnecting from Fabric Gateway  
....Connecting to Fabric Gateway  
....Connecting to channel - pharmachannel  
....Connecting to pharmanet Smart Contract  
org.pharma-network.pharmanet.transporter  
  
....updateShipment Transaction Complete! { shipmentID: '\u0000org.pharma-network.pharmanet.shipment\u0000RET002\u0000Paracetamol\u0000',  
creator: '\u0000org.pharma-network.pharmanet.company\u0000RET002\u0000upgrad\u0000',  
assets:  
[ '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000001\u0000' ],  
transporterCRN: 'TRA002',  
status: 'DELIVERED' }  
....Disconnecting from Fabric Gateway  
....Connecting to Fabric Gateway  
....Connecting to channel - pharmachannel  
....Connecting to pharmanet Smart Contract  
org.pharma-network.pharmanet.retailer  
  
....retailDrug Transaction Complete! { productID: '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000001\u0000',  
name: 'Paracetamol',  
manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',  
manufacturingDate: '01/01/2020',  
expiryDate: '01/06/2025',  
owner: '9090-1212-3434',  
shipment:  
[ '\u0000org.pharma-network.pharmanet.shipment\u0000DIST001\u0000Paracetamol\u0000',  
'\u0000org.pharma-network.pharmanet.shipment\u0000RET002\u0000Paracetamol\u0000' ] }  
....Disconnecting from Fabric Gateway
```

History : viewDrugCurrentState

Postman



POST <http://localhost:3000/viewDrugcurrentState>

Status: 200 OK Time: 2.56 s Size: 786 B

```
1 {  
2   "orgType": "consumer",  
3   "drugName": "Paracetamol",  
4   "serialNo": "002"  
5 }
```

```
1 [ {  
2   "status": "success",  
3   "message": "viewDrugcurrentState invoked successfully",  
4   "response": {  
5     "productID": "@org.pharma-network.pharmanet.drug@Paracetamol@002@",  
6     "name": "Paracetamol",  
7     "manufacturer": "@org.pharma-network.pharmanet.company@MAN001@Sun Pharma@",  
8     "manufacturingDate": "01/06/2020",  
9     "expiryDate": "01/06/2025",  
10    "owner": "AAD001",  
11    "shipment": ["@org.pharma-network.pharmanet.shipment@DIST001@Paracetamol@",  
12      "@org.pharma-network.pharmanet.shipment@RET002@Paracetamol@"]  
13  }  
14 }
```

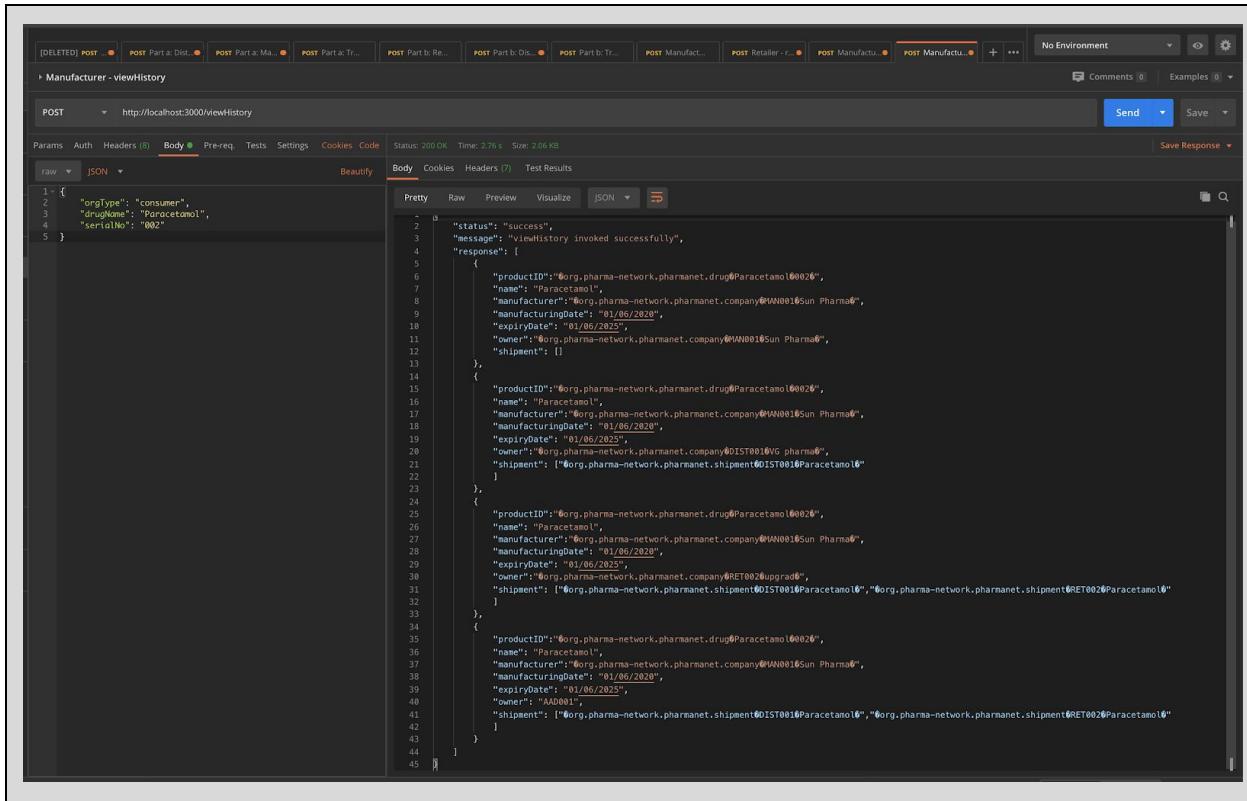
API Client Console



```
.....viewDrugcurrentState Transaction Complete! { productID: '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u0000002\u0000',  
name: 'Paracetamol',  
manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',  
manufacturingDate: '01/06/2020',  
expiryDate: '01/06/2025',  
owner: 'AAD001',  
shipment:  
[ '\u0000org.pharma-network.pharmanet.shipment\u0000DIST001\u0000Paracetamol\u0000',  
'\u0000org.pharma-network.pharmanet.shipment\u0000RET002\u0000Paracetamol\u0000' ] }  
.....Disconnecting from Fabric Gateway
```

History : viewHistory

Postman



The screenshot shows the Postman application interface. The URL in the header is `http://localhost:3000/viewHistory`. The status bar indicates a 200 OK response with a time of 2.76 ms and a size of 2.06 KB. The request method is POST. The response body is displayed in JSON format, showing a success message and a detailed product history.

```
1: {
2:   "orgType": "consumer",
3:   "drugName": "Paracetamol",
4:   "serialNo": "002"
5: }

1: {
2:   "status": "success",
3:   "message": "viewHistory invoked successfully",
4:   "response": [
5:     {
6:       "productID": "#@org.pharma-network.pharanet.drug#Paracetamol#002#",
7:       "name": "Paracetamol",
8:       "manufacturer": "#@org.pharma-network.pharanet.company#MAN01#Sun Pharma#",
9:       "manufacturingDate": "01/06/2020",
10:      "expiryDate": "01/06/2023",
11:      "owner": "#@org.pharma-network.pharanet.company#MAN01#Sun Pharma#",
12:      "shipment": []
13:    },
14:    {
15:      "productID": "#@org.pharma-network.pharanet.drug#Paracetamol#002#",
16:      "name": "Paracetamol",
17:      "manufacturer": "#@org.pharma-network.pharanet.company#MAN01#Sun Pharma#",
18:      "manufacturingDate": "01/06/2020",
19:      "expiryDate": "01/06/2023",
20:      "owner": "#@org.pharma-network.pharanet.company#DIST01#VG pharma#",
21:      "shipment": ["#@org.pharma-network.pharanet.shipment#01ST01#Paracetamol#"]
22:    },
23:    {
24:      "productID": "#@org.pharma-network.pharanet.drug#Paracetamol#002#",
25:      "name": "Paracetamol",
26:      "manufacturer": "#@org.pharma-network.pharanet.company#MAN01#Sun Pharma#",
27:      "manufacturingDate": "01/06/2020",
28:      "expiryDate": "01/06/2023",
29:      "owner": "#@org.pharma-network.pharanet.company#RET02#upgrade#",
30:      "shipment": ["#@org.pharma-network.pharanet.shipment#01ST01#Paracetamol#","#@org.pharma-network.pharanet.shipment#RET002#Paracetamol#"]
31:    },
32:    {
33:      "productID": "#@org.pharma-network.pharanet.drug#Paracetamol#002#",
34:      "name": "Paracetamol",
35:      "manufacturer": "#@org.pharma-network.pharanet.company#MAN01#Sun Pharma#",
36:      "manufacturingDate": "01/06/2020",
37:      "expiryDate": "01/06/2023",
38:      "owner": "#@AA001#",
39:      "shipment": ["#@org.pharma-network.pharanet.shipment#01ST01#Paracetamol#","#@org.pharma-network.pharanet.shipment#RET002#Paracetamol#"]
40:    }
41:  ]
42: }
```

API Client Console

```
upgrad@upgrad-VirtualBox: ~/Desktop/pharma-network/application
File Edit View Search Terminal Tabs Help
upgrad@upgrad:~ | root@20b4679f0c6... | root@dd5e05d178d... | root@dd5e05d178d... | root@dd5e05d178d... | root@dd5e05d178d... | upgrad@upgrad-Virt...
.....Connecting to Fabric Gateway
.....Connecting to channel - pharmachannel
.....Connecting to pharmanet Smart Contract

.....viewHistory Transaction Complete! { { productID: '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u00000002\u0000',
name: 'Paracetamol',
manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
manufacturingDate: '01/06/2020',
expiryDate: '01/06/2025',
owner: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
shipment: [] },
{ productID: '\u0000org.pharma-network.pharmanet.drug\u0000Paracetamol\u00000002\u0000',
name: 'Paracetamol',
manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
manufacturingDate: '01/06/2020',
expiryDate: '01/06/2025',
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\u00000002\u0000',
name: 'Paracetamol',
manufacturer: '\u0000org.pharma-network.pharmanet.company\u0000MAN001\u0000Sun Pharma\u0000',
manufacturingDate: '01/06/2020',
expiryDate: '01/06/2025',
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' ] } ]
.....Disconnecting from Fabric Gateway
.....Connecting to Fabric Gateway
.....Connecting to channel - pharmachannel
.....Connecting to pharmanet Smart Contract
```