

Property Registration

Smart Contract Solution Document

Ankit Kumar

4/20/2023

Document contains step by step guide to user who would like to understand different methods available implemented in the smart contracts and execute to understand the output.

Introduction

There are two smart contracts

- 1) for User
- 2) Registrar. NodeJS is used to write these smart contracts.

Pre-requisites

These smart contracts were developed using the VM provided by UpGrad which contains necessary software for deploying and executing smart contracts.

Users

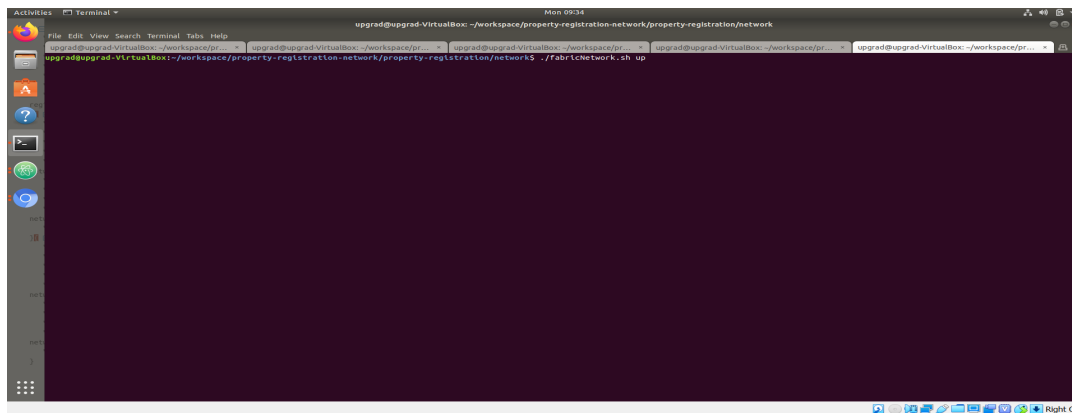
- Seller – AnkitKumar1, ankit.kkumar@gmail.com, 1234123412341231
- Buyer – Ankit Kumar Dev, dev.ankit.kkumar@gmail.com, 1234123412341232

Step 1: Bootstrap the network

Command

1. Go to the 'network' folder of the project
2. Execute the command `./fabricNetwork.sh up`, which will prompt for the confirmation to boot the network. Enter 'Y' in the terminal to bring up the network.

Terminal Screenshot:



```
Activities Terminal Mon 09:41
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network

+ set *x
2020-01-06 04:10:23.569 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-01-06 04:10:23.643 UTC [channelCmd] executeJoin -> INFO 002 Successfully submitted proposal to join channel
===== peerB.users.registration-network.com joined channel 'registrationchannel' =====
+ peer channel join -b registrationchannel.block
+ res=b
+ set *x
2020-01-06 04:10:28.775 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-01-06 04:10:28.838 UTC [channelCmd] executeJoin -> INFO 002 Successfully submitted proposal to join channel
===== peer1.users.registration-network.com joined channel 'registrationchannel' =====
+ peer channel join -b registrationchannel.block
+ res=b
+ set *x
2020-01-06 04:10:33.997 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-01-06 04:10:34.070 UTC [channelCmd] executeJoin -> INFO 002 Successfully submitted proposal to join channel
Updating anchor peers for REGISTRAR...
+ peer channel update -o orderer.property-registration-network.com:7050 -c registrationchannel -f ./channel-artifacts/registrarMSPanchors.tx
+ res=b
+ set *x
2020-01-06 04:10:34.244 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-01-06 04:10:34.278 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
===== Anchor peers updated for org 'registrarMSP' on channel 'registrationchannel' =====
Updating anchor peers for USERS...
+ peer channel update -o orderer.property-registration-network.com:7050 -c registrationchannel -f ./channel-artifacts/usersMSPanchors.tx
+ res=b
+ set *x
2020-01-06 04:10:39.459 UTC [channelCmd] InitCmdFactory -> INFO 001 Endorser and orderer connections initialized
2020-01-06 04:10:39.481 UTC [channelCmd] update -> INFO 002 Successfully submitted channel update
===== Anchor peers updated for org 'usersMSP' on channel 'registrationchannel' =====

===== All GOOD, Hyperledger Fabric Property Registration Network Is Now Up and Running! =====

END
upgrad@upgrad-VirtualBox:~/workspace/property-registration-network/property-registration/network$
```

Step 2: Chaincode Installation and Instantiation

Command:

1. Once Step1 is complete, execute below command which will install & instantiate the smart contracts in chaincode container and allow us to invoke different methods listed below.
2. `./fabricNetwork.sh install`

Terminal

```
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network$ ./fabricNetwork.sh install
Installing chaincode for channel 'registrationchannel' with CLI timeout of '15' seconds and CLI delay of '5' seconds and chaincode version '1.1'
Continue? [Y/n] y
proceeding ...
LOCAL_VERSION=1.4.2
DOCKER_IMAGE_VERSION=1.4.4
===== WARNING =====
Local fabric binaries and docker images are
out of sync. This may cause problems.
=====
START
Deploying Chaincode REGNET On Property Registration Network
Channel name : registrationchannel
+ peer chaincode install -n regnet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
Installing chaincode on peer0.registrar.property-registration-network.com ...
+ res=0
+ set +x
2020-01-06 04:12:14.935 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001 Using default esc
2020-01-06 04:12:14.935 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002 Using default vsc
2020-01-06 04:12:15.263 UTC [chaincodeCmd] install -> INFO 001 Installed remotely response:<status:200 payload:"OK" >
===== Chaincode is installed on peer0.registrar =====
Installing chaincode on peer1.registrar.property-registration-network.com ...
+ peer chaincode install -n regnet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
+ res=0
+ set +x
2020-01-06 04:12:15.370 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001 Using default esc
2020-01-06 04:12:15.370 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002 Using default vsc
2020-01-06 04:12:15.568 UTC [chaincodeCmd] install -> INFO 001 Installed remotely response:<status:200 payload:"OK" >
===== Chaincode is installed on peer1.registrar =====
Installing chaincode on peer0.users.property-registration-network.com ...
+ peer chaincode install -n regnet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
+ res=0
+ set +x
2020-01-06 04:12:15.945 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001 Using default esc
2020-01-06 04:12:15.946 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002 Using default vsc
2020-01-06 04:12:16.331 UTC [chaincodeCmd] install -> INFO 001 Installed remotely response:<status:200 payload:"OK" >
===== Chaincode is installed on peer0.users =====
```

```
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network$ ./fabricNetwork.sh install
+ set +x
2020-01-06 04:12:14.935 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001 Using default esc
2020-01-06 04:12:14.935 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002 Using default vsc
2020-01-06 04:12:15.263 UTC [chaincodeCmd] install -> INFO 001 Installed remotely response:<status:200 payload:"OK" >
===== Chaincode is installed on peer0.registrar =====
Installing chaincode on peer1.registrar.property-registration-network.com ...
+ peer chaincode install -n regnet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
+ res=0
+ set +x
2020-01-06 04:12:15.370 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001 Using default esc
2020-01-06 04:12:15.370 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002 Using default vsc
2020-01-06 04:12:15.568 UTC [chaincodeCmd] install -> INFO 001 Installed remotely response:<status:200 payload:"OK" >
===== Chaincode is installed on peer1.registrar =====
Installing chaincode on peer0.users.property-registration-network.com ...
+ peer chaincode install -n regnet -v 1.1 -l node -p /opt/gopath/src/github.com/hyperledger/fabric/peer/chaincode/
+ res=0
+ set +x
2020-01-06 04:12:15.945 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001 Using default esc
2020-01-06 04:12:15.946 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002 Using default vsc
2020-01-06 04:12:16.331 UTC [chaincodeCmd] install -> INFO 001 Installed remotely response:<status:200 payload:"OK" >
===== Chaincode is installed on peer0.users =====
Instantiating chaincode on channel using peer0.registrar.property-registration-network.com ...
+ peer chaincode instantiate -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -l node -v 1.1 -c '{"Args":["org.property-registration-network.regnet.users:instantiate","org.property-registration-network.regnet.registrar:instantiate"]}' -P 'OR ("registrarMSP.member","usersMSP.member")'
+ res=0
+ set +x
2020-01-06 04:12:16.486 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 001 Using default esc
2020-01-06 04:12:16.486 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 002 Using default vsc
===== Chaincode is instantiated on peer0.registrar on channel 'registrationchannel' =====
===== All GOOD, Chaincode REGNET Is Now Installed & Instantiated On Registration Network =====
END
upgrad@upgrad-VirtualBox:~/workspace/property-registration-network/property-registration/network$
```

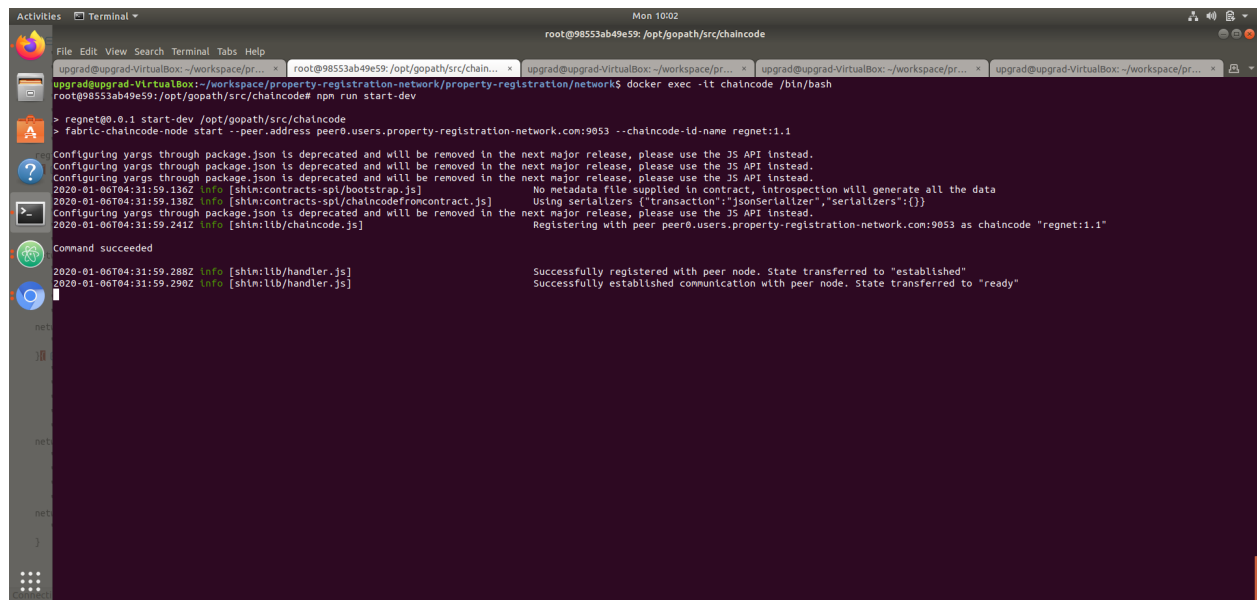
Step 3: Start the chaincode node application

This is a must have step before proceeding to Step 4

Command:

1. Enter into docker container for chaincode using command `docker exec -it chaincode /bin/bash`
2. Install node modules using `'npm install'` command which will install all necessary Node modules inside chaincode container.
3. Start the node application: `npm run start-dev`

Terminal:



```
root@98553ab49e59: /opt/gopath/src/chaincode# npm run start-dev
> regnet@0.0.1 start-dev /opt/gopath/src/chaincode
> fabric-chaincode-node start --peer.address peer0.users.property-registration-network.com:9053 --chaincode-id-name regnet: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.
2020-01-06T04:31:59.136Z info [shim:contracts-spi/bootstrap.js] No metadata file supplied in contract, introspection will generate all the data
2020-01-06T04:31:59.138Z info [shim:contracts-spi/chaincodefromcontract.js] Using serializers {"transaction":"jsonSerializer","serializers":{}}
2020-01-06T04:31:59.242Z info [shim:lib/chaincode.js] Registering with peer peer0.users.property-registration-network.com:9053 as chaincode "regnet:1.1"

Command succeeded
2020-01-06T04:31:59.288Z info [shim:lib/handler.js] Successfully registered with peer node. State transferred to "established"
2020-01-06T04:31:59.290Z info [shim:lib/handler.js] Successfully established communication with peer node. State transferred to "ready"
```

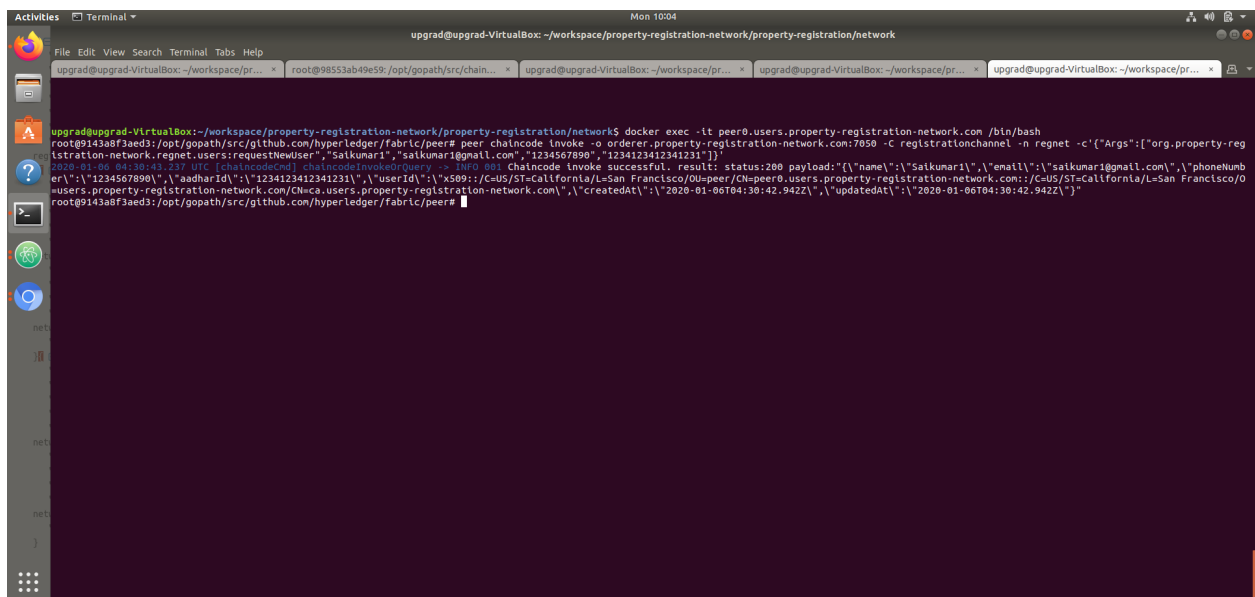
Step 4: Invoke Smart Contract Methods

Method 1: requestNewUser

Commands:

1. Enter into Peer0 of users org: `docker exec -it peer0.users.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:requestNewUser","Ankit Kumar","ankit.kkumar@gmail.com","1234567890","1234123412341231"]}'`

Terminal:



```
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration-network
upgrad@upgrad-VirtualBox: ~/workspace/pr... * root@98553ab49e59: /opt/gopath/src/chain... * upgrad@upgrad-VirtualBox: ~/workspace/pr... * upgrad@upgrad-VirtualBox: ~/workspace/pr... * upgrad@upgrad-VirtualBox: ~/workspace/pr... *
upgrad@upgrad-VirtualBox:~/workspace/property-registration-network/property-registration/network$ docker exec -it peer0.users.property-registration-network.com /bin/bash
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:requestNewUser","Saikumar1","saikumar1@gmail.com","1234567890","1234123412341231"]}'
2020-01-06 04:30:43.237 UTC [chaincodeCmd] chaincodeInvokeOrQuery => INFO 003 Chaincode invoke successful. result: status:200 payload:"{'name':'Saikumar1','email':'saikumar1@gmail.com','phoneNumb
er':'1234567890','aadharId':'1234123412341231','userId':'x509::/C=US/ST=California/L=San Francisco/OU=peer/CN=peer0.users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O
=users.property-registration-network.com/CN=ca.users.property-registration-network.com','createdAt':'2020-01-06T04:30:42.942Z','updatedAt':'2020-01-06T04:30:42.942Z'}"
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Method 2: approveNewUser

Commands:

1. Enter into Peer0 of registrar org: `docker exec -it peer0.registrar.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.registrar:approveNewUser","Ankit Kumar","1234123412341231"]}'`

Terminal:

Activities Terminal Mon 10:06

upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration-network

File Edit View Search Terminal Tabs Help

upgrad@upgrad-VirtualBox: ~/workspace/pr... root@98553b549e59:/opt/gopath/src/chain... upgrad@upgrad-VirtualBox: ~/workspace/pr... upgrad@upgrad-VirtualBox: ~/workspace/pr... upgrad@upgrad-VirtualBox: ~/workspace/pr...

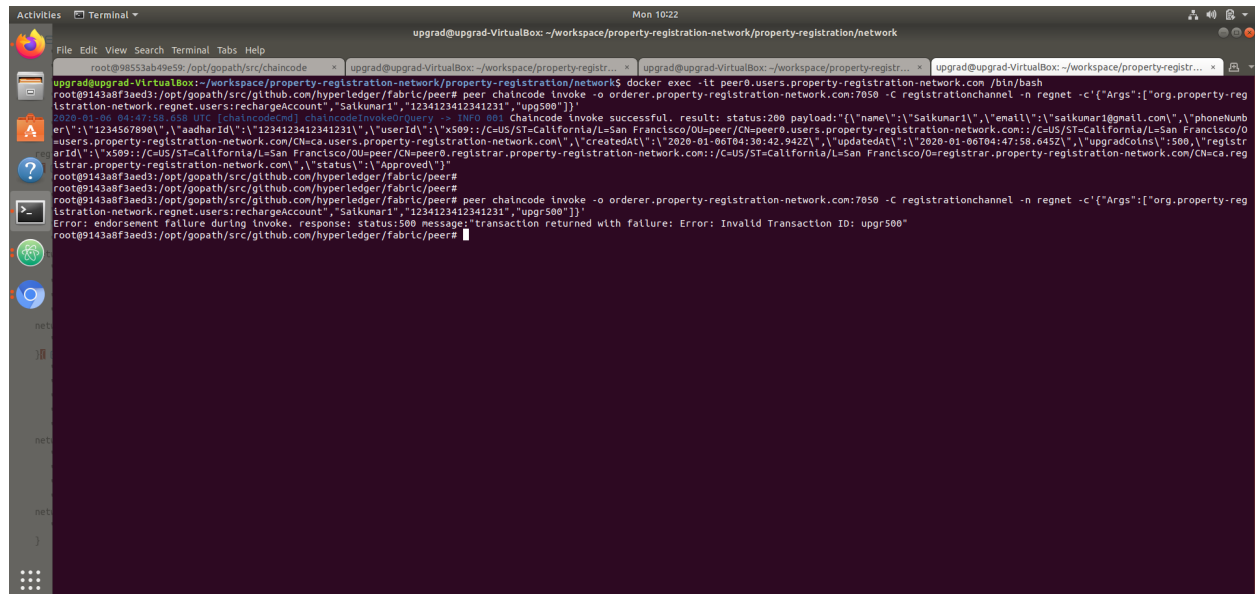
```
upgrad@upgrad-VirtualBox:~/workspace/property-registration-network/property-registration-network$ docker exec -lt peer0.registrar.property-registration-network.com /bin/bash
root@be563e5848a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -c registrationchannel -n regnet -c '{"Args":["org.property-reg
istration-network.regnet.registrar:approveNewUser","Sakunari","1234123412341231"]}'
2020-01-06 10:42:39.989 src/chaincode/pkg/chaincodeinvoke.go:149: info: Chaincode invoke successful, result: status:200 payload:{"{\"name\":\"Sakunari\",\"email\":\"sakunari@gmail.com\",\"phoneNumb
er\":\"1234567890\",\"aadharId\":\"1234123412341231\",\"userId\":\"XS09\":\"/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O
users.property-registration-network.com/CN=ca.users.property-registration-network.com\"}, {\"createdAt\":\"2020-01-06T04:30:42.942Z\", \"updatedAt\":\"2020-01-06T04:36:10.841Z\", \"upgradCoins\":0, \"registrar
Id\":\"XS09\":\"/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/CN=ca.regis
trar.property-registration-network.com\"}, {\"status\":\"Approved\"}"}
root@be563e5848a:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Method 3: rechargeAccount

Commands:

1. Enter into Peer0 of users org: `docker exec -it peer0.users.property-registration-network.com /bin/bash`
2. Execute command:
 - a. Success: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:rechargeAccount","Ankit Kumar","1234123412341231","upg500"]}'`
 - b. Failure: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:rechargeAccount","Ankit Kumar","1234123412341231","upgr500"]}'`

Terminal for Success & Failure:



```
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration-network
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:rechargeAccount","Ankit Kumar","1234123412341231","upg500"]}'
2020-01-06 04:47:58.058 UTC [chaincodeCmd] chaincodeInvokeOrQuery => 200 001 Chaincode invoke successful. result: status:200 payload:"[{\n  'name':\n  'Saikumar1'\n  ,\n  'email':\n  'saikumar1@gmail.com'\n  ,\n  'phoneNum':\n  '1234567890'\n  ,\n  'aadharId':\n  '1234123412341231'\n  ,\n  'userId':\n  'x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.users.property-registration-network.com/C=ca.users.property-registration-network.com/CN=ca.users.property-registration-network.com'\n  ,\n  'createdAt':\n  '2020-01-06T04:30:42.942Z'\n  ,\n  'updatedAt':\n  '2020-01-06T04:47:58.045Z'\n  ,\n  'upgradCollns':\n  '500'\n  ,\n  'registr':\n  '1234123412341231'\n  ,\n  'status':\n  'Approved'\n  }]"
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:rechargeAccount","Ankit Kumar","1234123412341231","upgr500"]}'
Error: endorsement failure during invoke. response: status:500 message:transaction returned with failure: Error: Invalid Transaction ID: upgr500"
```


Method 4: viewUser

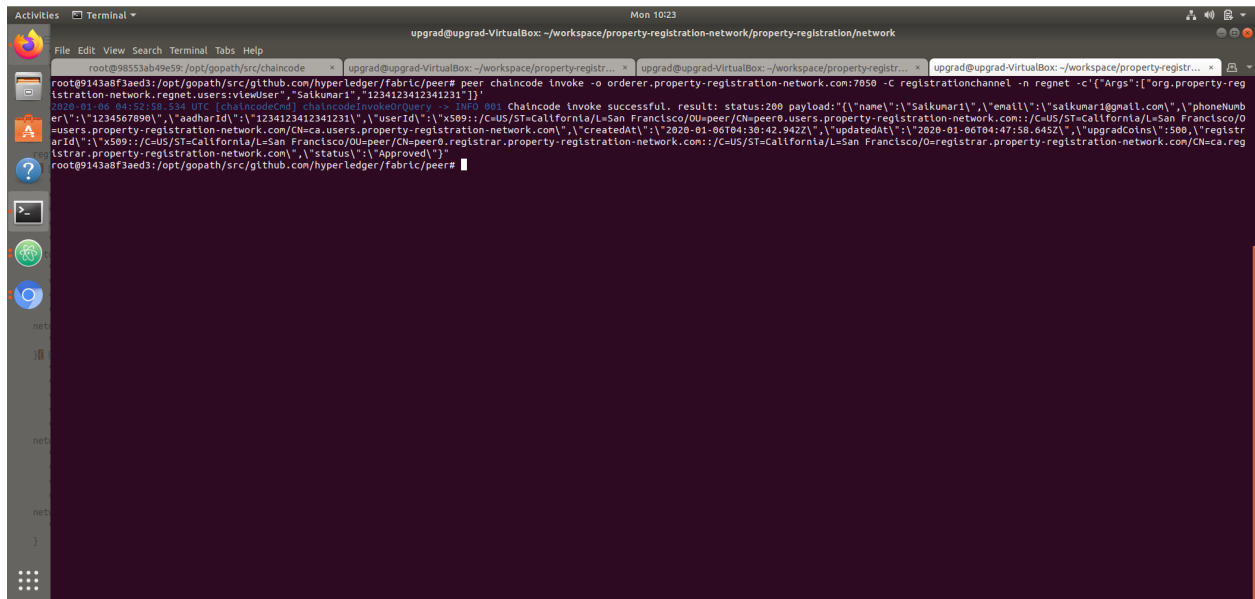
Commands for Users Org:

1. Enter into Peer0 of users org: `docker exec -it peer0.users.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:viewUser","Ankit Kumar","1234123412341231"]}'`

Commands for Registrar Org:

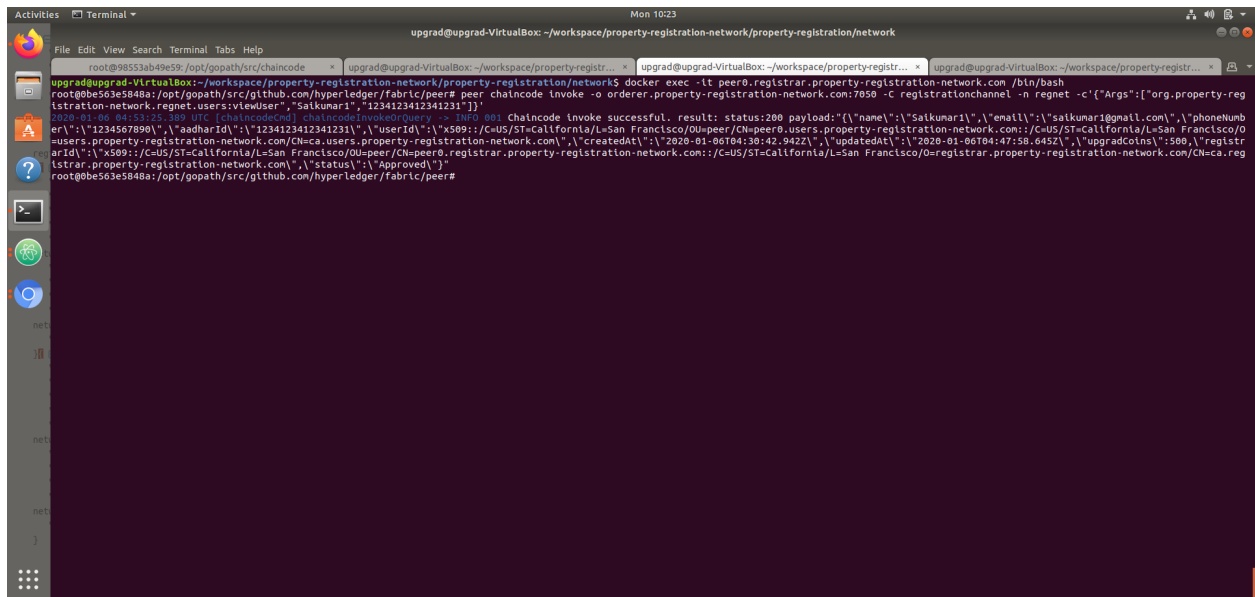
1. Enter into Peer0 of registrar org: `docker exec -it peer0.registrar.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.registrar:viewUser","Ankit Kumar","1234123412341231"]}'`

Terminal for User:



```
root@98553ab49e59:/opt/gopath/src/chaincode * upgrad@upgrad-VirtualBox: ~/workspace/property-registr... * upgrad@upgrad-VirtualBox: ~/workspace/property-registr... * upgrad@upgrad-VirtualBox: ~/workspace/property-registr... * upgrad@upgrad-VirtualBox: ~/workspace/property-registr...
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network:regnet.users:viewUser","Saikumar1","1234123412341231"]}'
2020-01-06 10:23:58.558 UTC [chaincode@4] ChaincodeInvokeRequest -> INFO 001 Chaincode invoke successful. result: status:200 payload:"({\"name\":\"Saikumar1\", \"email\":\"saikumar1@gmail.com\", \"phoneNumbe
er\":\"1234567890\", \"aadharId\":\"1234123412341231\", \"userId\":\"x509::/C=US/ST=California/L=San Francisco/OU=peer/CN=peer0.users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O
=users.property-registration-network.com/CN=ca.users.property-registration-network.com\", \"createdAt\":\"2020-01-06T04:30:42.942Z\", \"updatedAt\":\"2020-01-06T04:47:58.645Z\", \"upgradCoins\":\"500\", \"registr
arId\":\"x509::/C=US/ST=California/L=San Francisco/OU=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/CN=ca.reg
istrar.property-registration-network.com\", \"status\":\"Approved\"})"
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Terminal for Registrar:



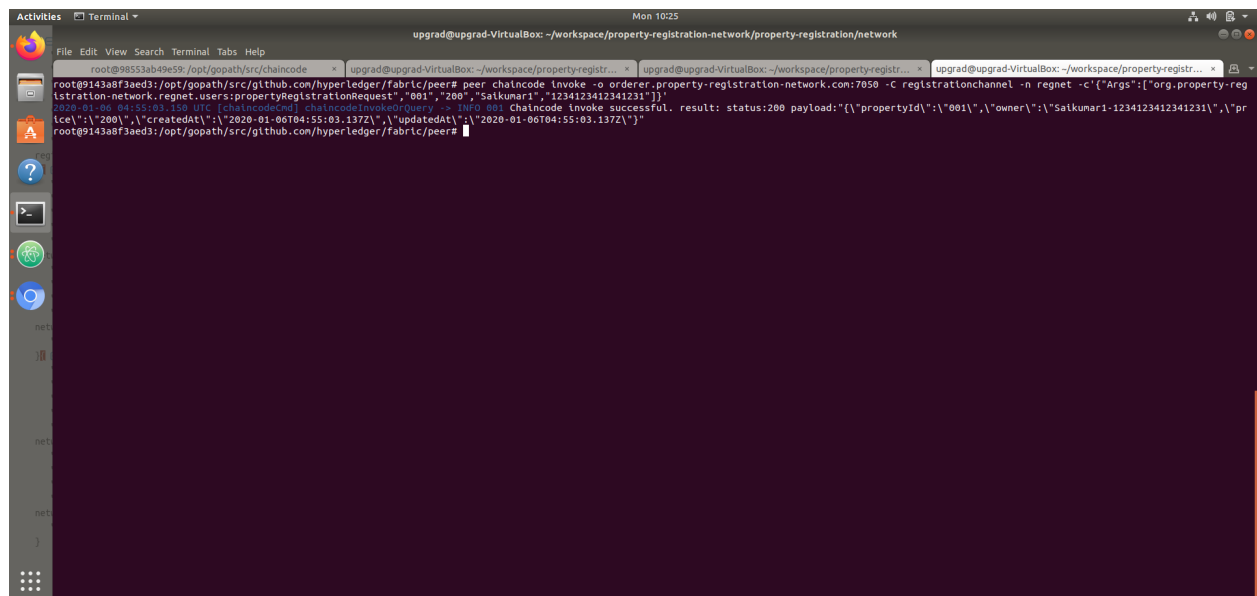
```
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network
root@98553ab49e59:/opt/gopath/src/chaincode * upgrad@upgrad-VirtualBox: ~/workspace/property-registr... * upgrad@upgrad-VirtualBox: ~/workspace/property-registr... * upgrad@upgrad-VirtualBox: ~/workspace/property-registr...
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network$ docker exec -it peer0.registrar.property-registration-network.com /bin/bash
root@98563e5848a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-reg
istration-network:regnet.users:viewUser","Saikumar1","1234123412341231"]}'
2020-01-06 10:23:58.558 UTC [chaincode@4] ChaincodeInvokeRequest -> INFO 001 Chaincode invoke successful. result: status:200 payload:"({\"name\":\"Saikumar1\", \"email\":\"saikumar1@gmail.com\", \"phoneNumbe
er\":\"1234567890\", \"aadharId\":\"1234123412341231\", \"userId\":\"x509::/C=US/ST=California/L=San Francisco/OU=peer/CN=peer0.users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O
=users.property-registration-network.com/CN=ca.users.property-registration-network.com\", \"createdAt\":\"2020-01-06T04:30:42.942Z\", \"updatedAt\":\"2020-01-06T04:47:58.645Z\", \"upgradCoins\":\"500\", \"registr
arId\":\"x509::/C=US/ST=California/L=San Francisco/OU=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/CN=ca.reg
istrar.property-registration-network.com\", \"status\":\"Approved\"})"
root@98563e5848a:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Method 5: propertyRegistrationRequest

Commands:

1. Enter into Peer0 of users org: `docker exec -it peer0.users.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:propertyRegistrationRequest","001","200","Ankit Kumar","1234123412341231"]}'`

Terminal:



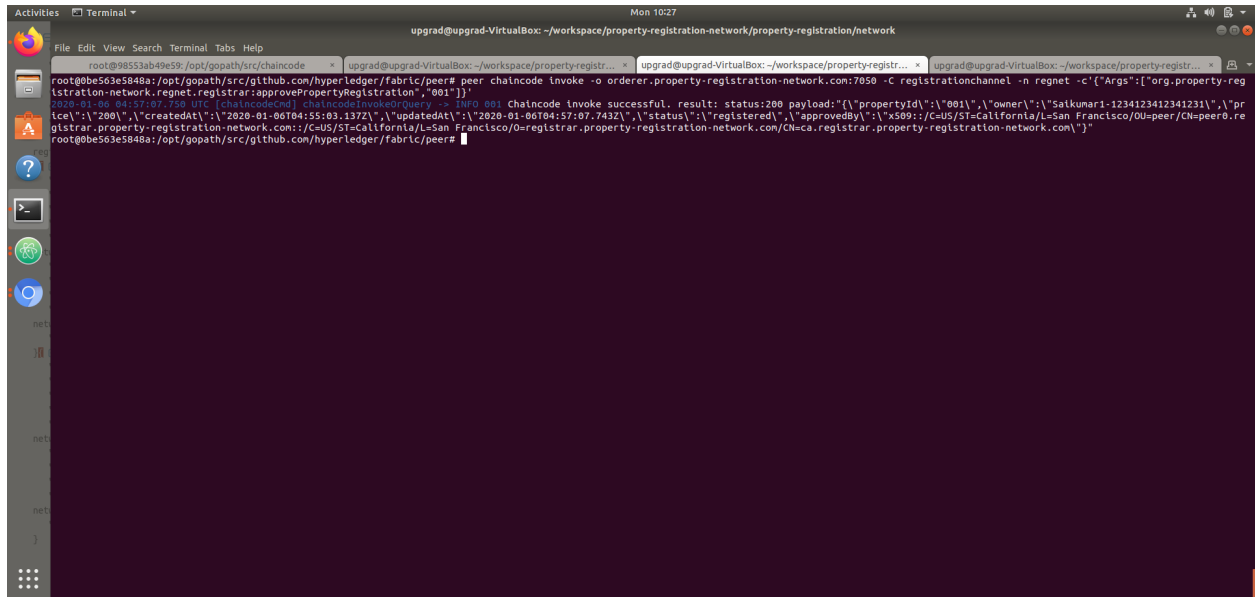
```
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network
root@99853ab45e59:/opt/gopath/src/chaincode# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:propertyRegistrationRequest","001","200","Ankit Kumar","1234123412341231"]}'
2020-01-06 04:55:03.150 UTC [chaincodeCmd] chaincodeInvokeorQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:"{'propertyId':'001','owner':'Sakunari-1234123412341231','pr
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Method 6: approvePropertyRegistration

Commands:

1. Enter into Peer0 of registrar org: `docker exec -it peer0.registrar.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.registrar:approvePropertyRegistration","001"]}'`

Terminal:



```
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network
root@98553ab49e59:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.registrar:approvePropertyRegistration","001"]}'
2020-01-06 04:57:07.758 UTC [chaincode] chaincodeInvokeOrQuery >> INFO 001 chaincode invoke successful. result: status:200 payload:{"propertyId":"001","owner":"saikumar1-1234123412341231","pr
ice":"200","createdAt":"2020-01-06T04:55:03.137Z","updatedAt":"2020-01-06T04:57:07.743Z","status":"registered","approvedBy":"x509:/C=US/ST=California/L=San Francisco/OU=peer/CN=peer0.re
gistrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/CN=ca.registrar.property-registration-network.com"}
root@98553ab49e59:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Method 7: viewProperty

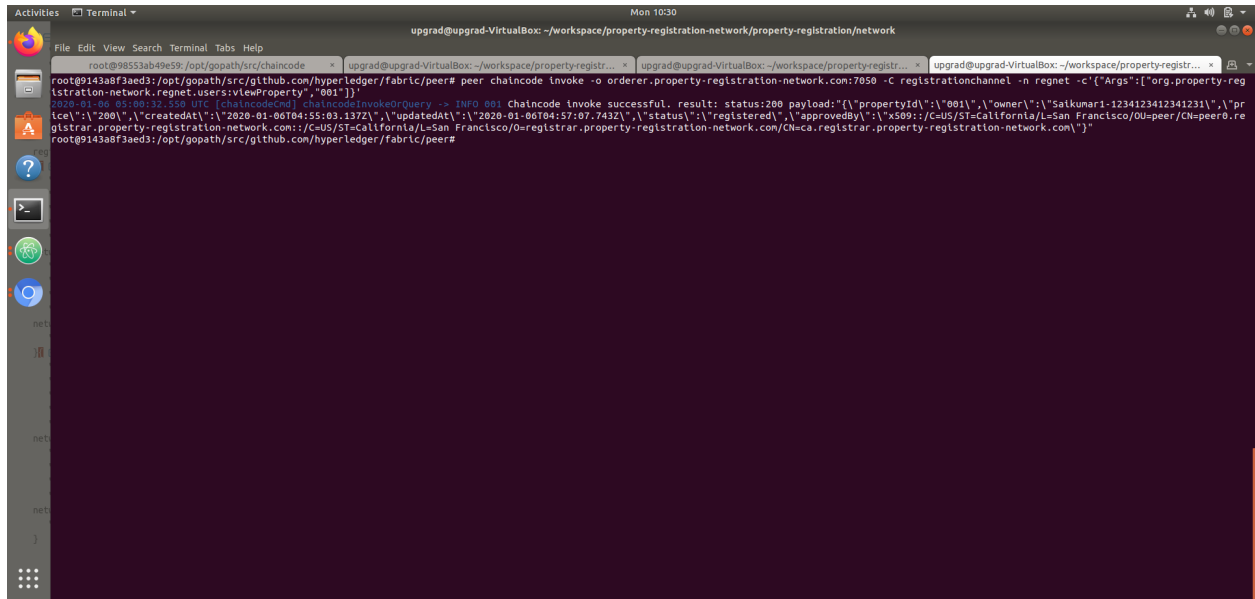
Commands for Users Org:

1. Enter into Peer0 of users org: `docker exec -it peer0.users.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:viewProperty","001"]}'`

Commands for Registrar Org:

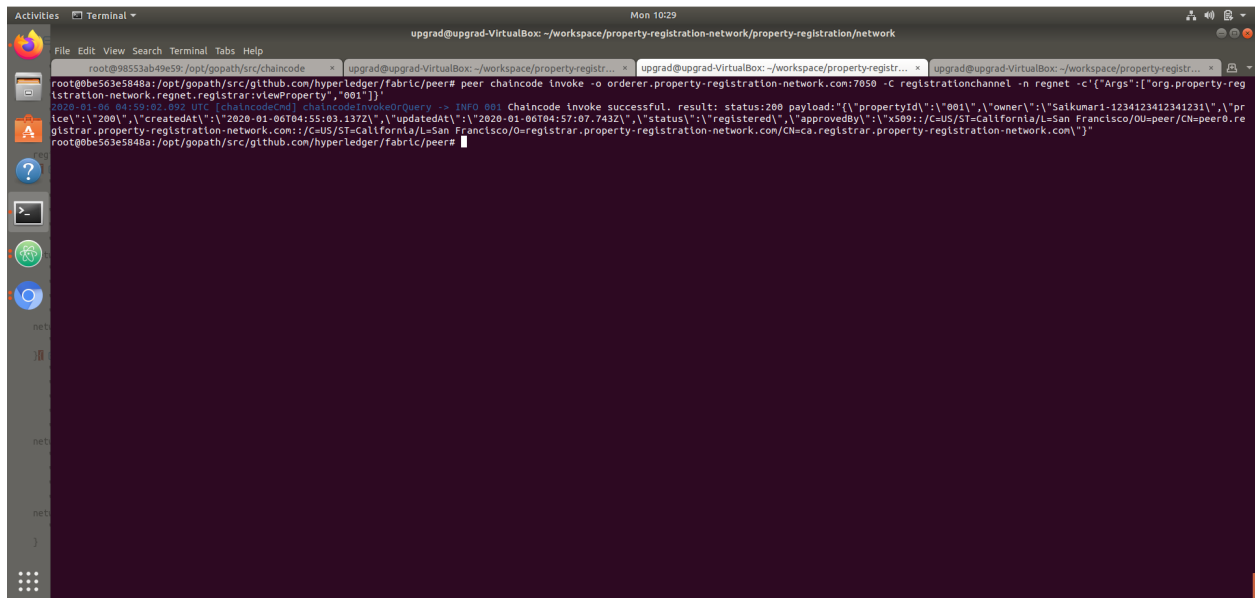
1. Enter into Peer0 of registrar org: `docker exec -it peer0.registrar.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.registrar:viewProperty","001"]}'`

Terminal for Users:

A terminal window titled 'upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network'. The terminal shows a command being executed: 'peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network:regnet.users:viewProperty","001"]}''. The output shows a successful transaction with a status of 200 and a payload containing property details. The terminal also shows the command 'peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network:regnet.registrar:viewProperty","001"]}''. The output shows a successful transaction with a status of 200 and a payload containing property details.

```
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network:regnet.users:viewProperty","001"]}'
2020-01-06 04:59:02.992 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:{"propertyId":"001","owner":"Saikumar1-1234123412341231","price":"200","createdAt":"2020-01-06T04:55:03.137Z","updatedAt":"2020-01-06T04:57:07.743Z","status":"registered","approvedBy":"x509:/C=US/ST=California/L=San Francisco/OU=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/CN=ca.registrar.property-registration-network.com"}
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Terminal for Registrar:

A terminal window titled 'upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network'. The terminal shows a command being executed: 'peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network:regnet.registrar:viewProperty","001"]}''. The output shows a successful transaction with a status of 200 and a payload containing property details. The terminal also shows the command 'peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network:regnet.registrar:viewProperty","001"]}''. The output shows a successful transaction with a status of 200 and a payload containing property details.

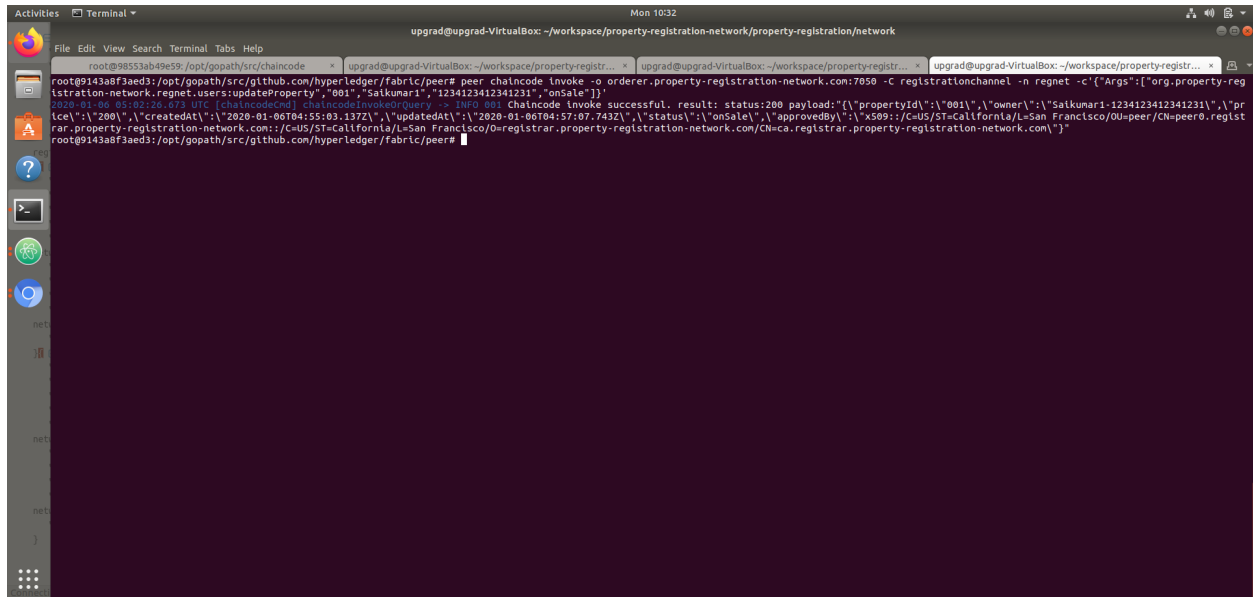
```
root@0be563e5848a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network:regnet.registrar:viewProperty","001"]}'
2020-01-06 04:59:02.992 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status:200 payload:{"propertyId":"001","owner":"Saikumar1-1234123412341231","price":"200","createdAt":"2020-01-06T04:55:03.137Z","updatedAt":"2020-01-06T04:57:07.743Z","status":"registered","approvedBy":"x509:/C=US/ST=California/L=San Francisco/OU=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/CN=ca.registrar.property-registration-network.com"}
root@0be563e5848a:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

Method 8: updateProperty

Commands:

1. Enter into Peer0 of users org: `docker exec -it peer0.users.property-registration-network.com /bin/bash`
2. Execute command: `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:updateProperty","001","Ankit Kumar","1234123412341231","onSale"]}'`

Terminal:



```
upgrad@upgrad-VirtualBox: ~/workspace/property-registration-network/property-registration/network
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:updateProperty","001","Sakunari","1234123412341231","onSale"]}'
2020-01-06 03:40:22.673 UTC [chaincode] INFO: Chaincode invoke successful. result: status:200 payload:{"propertyId":"001","owner":"Sakunari-1234123412341231","price":"200","createdAt":"2020-01-06T04:55:03.137Z","updatedAt":"2020-01-06T04:57:07.743Z","status":"onSale","approvedBy":"x599:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/CN=ca.registrar.property-registration-network.com"}
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

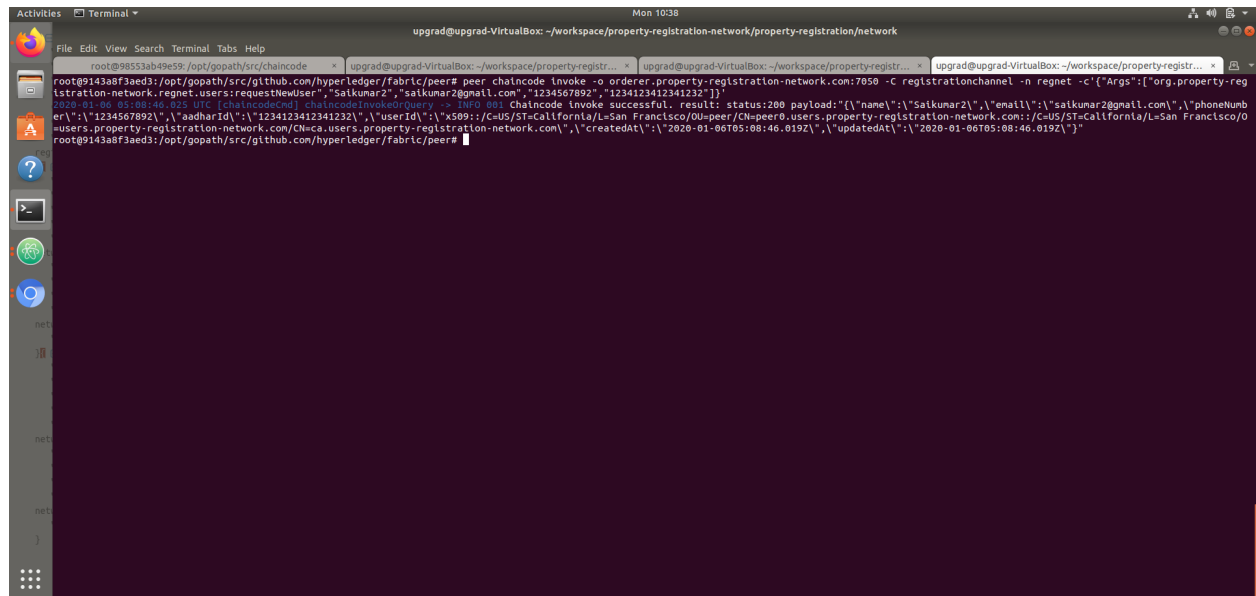
Method 9: purchaseProperty

Pre-requisite:

In order to purchase property, we need to register new user as mentioned below before proceeding with purchase of the property.

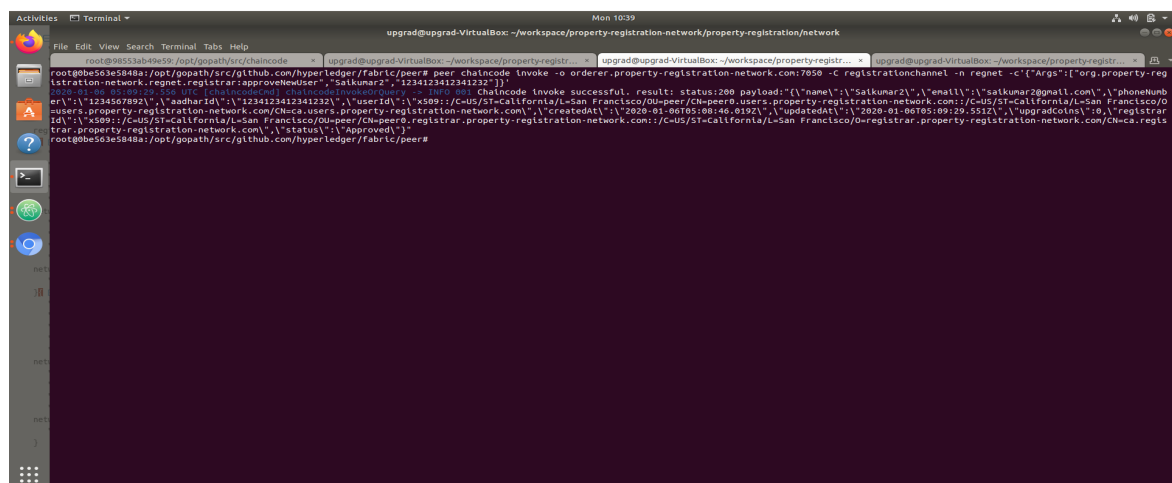
Steps to register new user (Ankit Kumar Dev) in the network and request property purchase

1. **requestNewUser:** `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:requestNewUser","Ankit Kumar Dev","dev.ankit.kkumar@gmail.com","1234567892","1234123412341232"]}'`



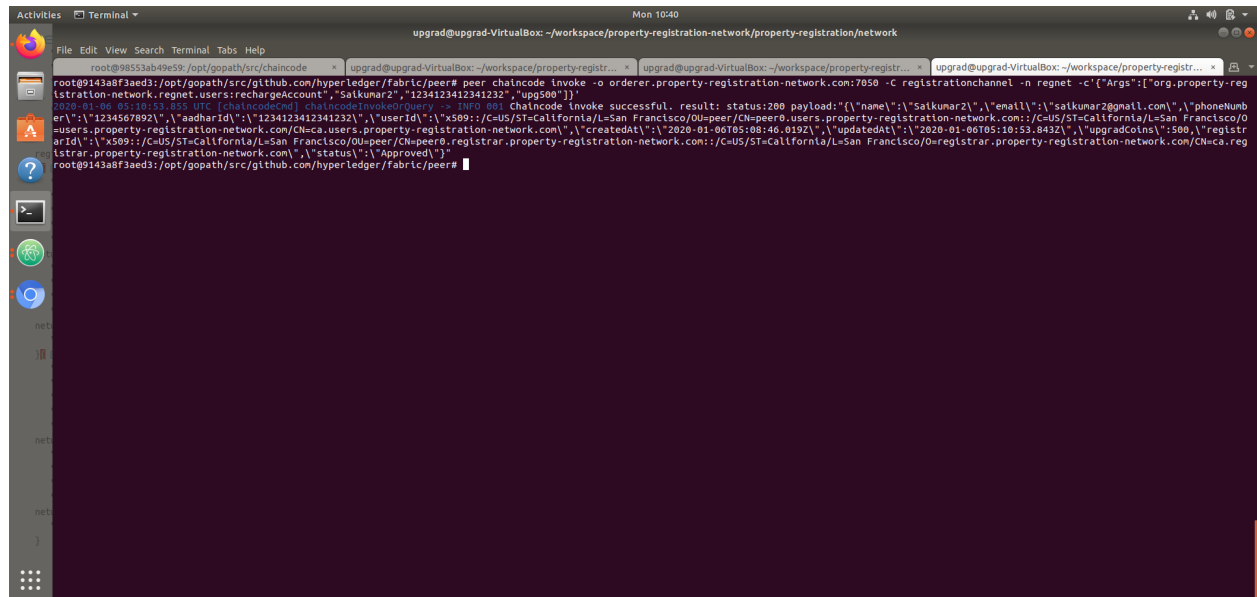
```
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:requestNewUser","Sakumar2","sakumar2@gmail.com","1234567892","1234123412341232"]}'
2020-01-06 05:09:46.925 UTC [chaincode] INFO: 001 Chaincode invoke successful. result: status:200 payload:{"name":"Sakumar2","email":"sakumar2@gmail.com","phoneNumbe
er":"1234567892","aadharId":"1234123412341232","userId":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0/users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O
users.property-registration-network.com/CN=ca.users.property-registration-network.com","createdAt":"2020-01-06T05:08:46.019Z","updatedAt":"2020-01-06T05:08:46.019Z"}
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```

2. **approveNewUser:** `peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.registrar:approveNewUser","Ankit Kumar Dev","1234123412341232"]}'`



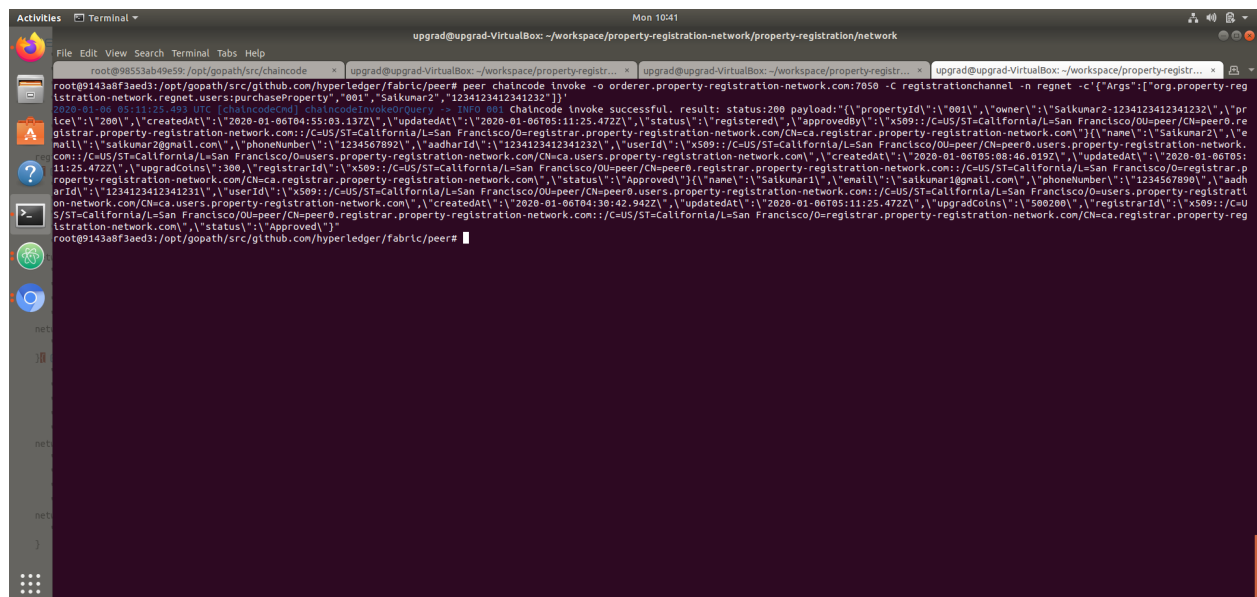
```
root@be563e5848a:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-reg
istration-network.regnet.registrar:approveNewUser","Sakumar2","1234123412341232"]}'
2020-01-06 05:09:29.266 UTC [chaincode] INFO: 001 Chaincode invoke successful. result: status:200 payload:{"name":"Sakumar2","email":"sakumar2@gmail.com","phoneNumbe
er":"1234567892","aadharId":"1234123412341232","userId":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0/users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O
users.property-registration-network.com/CN=ca.users.property-registration-network.com","createdAt":"2020-01-06T05:08:46.019Z","updatedAt":"2020-01-06T05:09:29.551Z","upgradedChaincode":"registrar
.property-registration-network.com","status":"Approved"}
root@be563e5848a:/opt/gopath/src/github.com/hyperledger/fabric/peer#
```


3. **rechargeAccount:** peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:rechargeAccount","Ankit Kumar Dev","1234123412341232","upg500"]}'



```
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:rechargeAccount","Saikumar2","1234123412341232","upg500"]}'
2020-01-06 05:11:53.453 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status=200 payload:{"name":"Saikumar2","email":"saikumar2@gmail.com","phoneNumber":"1234567892","aadharId":"1234123412341232","userId":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=users.property-registration-network.com/Cnca.users.property-registration-network.com","createdAt":"2020-01-06T05:08:46.019Z","updatedAt":"2020-01-06T05:10:53.843Z","upgradCoins":500,"registrarId":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/Cnca.registrar.property-registration-network.com","status":"Approved"}
```

4. **purchaseProperty:** peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:purchaseProperty","001","Ankit Kumar Dev","1234123412341232"]}'



```
root@9143a8f3aed3:/opt/gopath/src/github.com/hyperledger/fabric/peer# peer chaincode invoke -o orderer.property-registration-network.com:7050 -C registrationchannel -n regnet -c '{"Args":["org.property-registration-network.regnet.users:purchaseProperty","001","Saikumar2","1234123412341232"]}'
2020-01-06 05:11:25.493 UTC [chaincodeCmd] chaincodeInvokeOrQuery -> INFO 001 Chaincode invoke successful. result: status=200 payload:{"propertyId":"001","owner":"Saikumar2-1234123412341232","price":"200","createdAt":"2020-01-06T04:55:03.137Z","updatedAt":"2020-01-06T05:11:25.472Z","status":"registered","approvedBy":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/Cnca.registrar.property-registration-network.com","name":"Saikumar2","email":"saikumar2@gmail.com","phoneNumber":"1234567892","aadharId":"1234123412341232","userId":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=users.property-registration-network.com/Cnca.users.property-registration-network.com","createdAt":"2020-01-06T05:08:46.019Z","updatedAt":"2020-01-06T05:11:25.472Z","upgradCoins":300,"registrarId":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/Cnca.registrar.property-registration-network.com","status":"Approved","name":"Saikumar2","email":"saikumar2@gmail.com","phoneNumber":"1234567892","aadharId":"1234123412341232","userId":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.users.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=users.property-registration-network.com/Cnca.users.property-registration-network.com","createdAt":"2020-01-06T04:30:42.942Z","updatedAt":"2020-01-06T05:11:25.472Z","upgradCoins":"500200","registrarId":"x509:/C=US/ST=California/L=San Francisco/O=peer/CN=peer0.registrar.property-registration-network.com:/C=US/ST=California/L=San Francisco/O=registrar.property-registration-network.com/Cnca.registrar.property-registration-network.com","status":"Approved"}
```