

**Roll No:** 20BCE204

**Course:** 2CSDE93 - Blockchain Technology

**Practical No:** 7

**Aim:** To perform a thorough study of blockchain development on Hyperledger Fabric using Composer

```
./install-fabric.sh
echo $HOME
- ~ echo $HOME
/home/rajkp
- ~ cd
- ~ ls
Programming golib hadoop-3.3.2 hadoop-practicals sandbox vcpkg
- ~ pw
dzsh: command not found: pw
- ~ pd
zsh: command not found: pd
- ~ pwd
/home/rajkp
- ~
- ~ ls
Programming golib hadoop-3.3.2 hadoop-practicals sandbox vcpkg
- ~ cd Programming
- Programming ls
CP compiler file-uploader go-backend kilo mern raylib s
advent-of-code-2022 dist-system go gocached letterboxd micro redis-from-scratch s
- Programming cd go
- go ls
bin pkg src
- go cd src
- src ls
github.com
- src cd github.com
- github.com cd imrraaj
- imrraaj ls
firstapp
- imrraaj pwd
/home/rajkp/Programming/go/src/github.com/imrraaj
- imrraaj $ curl -sLO https://raw.githubusercontent.com/hyperledger/fabric/main/scripts/install-fa
zsh: command not found: $
- imrraaj curl -sLO https://raw.githubusercontent.com/hyperledger/fabric/main/scripts/install-fa
- imrraaj ls
firstapp install-fabric.sh
```

```
./install-fabric.sh
. src cd github.com
. github.com cd imrraaj
. imrraaj ls
firstapp
. imrraaj pwd
/home/rajkp/Programming/go/src/github.com/imrraaj
. imrraaj $ curl -sSL0 https://raw.githubusercontent.com/hyperledger/fabric/main/scripts/install-fabric.sh && chmod +x install-fabric.sh
zsh: command not found: $
. imrraaj curl -sSL0 https://raw.githubusercontent.com/hyperledger/fabric/main/scripts/install-fabric.sh && chmod +x install-fabric.sh
. imrraaj ls
firstapp install-fabric.sh
. imrraaj ./install-fabric.sh
No options selected: Getting all samples, binaries, and docker images
Abort now if not the intention

Clone hyperledger/fabric-samples repo

=> Cloning hyperledger/fabric-samples repo
Cloning into 'fabric-samples'...
remote: Enumerating objects: 12991, done.
remote: Counting objects: 100% (1023/1023), done.
remote: Compressing objects: 100% (589/589), done.
remote: Total 12991 (delta 537), reused 733 (delta 383), pack-reused 11968
Receiving objects: 100% (12991/12991), 22.93 MiB | 1.62 MiB/s, done.
Resolving deltas: 100% (6991/6991), done.
fabric-samples v2.5.4 does not exist, defaulting to main. fabric-samples main branch is intended to work with recent versions of fabric.

Pull Hyperledger Fabric binaries

=> Downloading version 2.5.4 platform specific fabric binaries
=> Downloading: https://github.com/hyperledger/fabric/releases/download/v2.5.4/hyperledger-fabric-linux-amd64-2.5.4.tar.gz
=> Will unpack to: /home/rajkp/Programming/go/src/github.com/imrraaj/fabric-samples
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left   Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--    0
89 99.3M  89 88.7M    0     0  198k      0  0:08:33  0:07:38  0:00:55 280k
```

$$X + V$$

```
No options selected: Getting all samples, binaries, and docker images
Abort now if not the intention
```

```

Changing directory to fabric-samples
fabric-samples v2.5.4 does not exist, defaulting to main. fabric-samples main branch is intended

```

```

Downloading version 2.5.4 platform specific fabric binaries
Downloading: https://github.com/hyperledger/fabric/releases/download/v2.5.4/hyperledger-fab
Will unpack to: /home/rajkp/Programming/go/src/github.com/imr-raaj/fabric-samples

```

```
Done
Downloading version 1.5.7 platform specific fabric-ca-client binary
Downloading: https://github.com/hyperledger/fabric-ca/releases/download/v1.5.7/hyperledger-
Will unpack to: /home/rajkp/Programming/go/src/github.com/imrraaj/fabric-samples
```

Done.

```
FABRIC IMAGES: peer orderer ccenv tools baseos
```

```
docker.io/hyperledger/fabric-peer:2.5.4
2.5.4: Pulling from hyperledger/fabric-peer
01085d60b3a6: Pull complete
5920bb1ab585: Pull complete
```

§1 .b.com/mrraaj

ccl6ebc66c1e: Pull complete  
cfb66da0a833: Pull complete  
daa87923bf69: Pull complete

Digest: sha256:cab2ed27ed8d27e4cacde447a1de51884f0bd9e103a6119e74521e1b90b6d106

Status: Downloaded newer image for hyperledger/fabric-baseos:2.5.4

docker.io/hyperledger/fabric-baseos:2.5.4

Pulling fabric ca Image

====> docker.io/hyperledger/fabric-ca:1.5.7

1.5.7: Pulling from hyperledger/fabric-ca

edaadc954fb5: Pull complete

793f509072c1: Pull complete

40231dd4f3a4: Pull complete

5799c17ab94e: Pull complete

Digest: sha256:db814e013fc29f94f75a5df6e3920c08a4e96e53a079152df2ffa99e6db24861

Status: Downloaded newer image for hyperledger/fabric-ca:1.5.7

docker.io/hyperledger/fabric-ca:1.5.7

List out hyperledger images

hyperledger/fabric-ca	1.5	0f07bbee6fb8	2 months ago	223MB
hyperledger/fabric-ca	1.5.7	0f07bbee6fb8	2 months ago	223MB
hyperledger/fabric-ca	latest	0f07bbee6fb8	2 months ago	223MB
hyperledger/fabric-tools	2.5	b2f3af4021be	3 months ago	551MB
hyperledger/fabric-tools	2.5.4	b2f3af4021be	3 months ago	551MB
hyperledger/fabric-tools	latest	b2f3af4021be	3 months ago	551MB
hyperledger/fabric-peer	2.5	4f8d1b54d8b0	3 months ago	135MB
hyperledger/fabric-peer	2.5.4	4f8d1b54d8b0	3 months ago	135MB
hyperledger/fabric-peer	latest	4f8d1b54d8b0	3 months ago	135MB
hyperledger/fabric-orderer	2.5	7a73187b5c49	3 months ago	106MB
hyperledger/fabric-orderer	2.5.4	7a73187b5c49	3 months ago	106MB
hyperledger/fabric-orderer	latest	7a73187b5c49	3 months ago	106MB
hyperledger/fabric-ccenv	2.5	6dac93f94c87	3 months ago	656MB
hyperledger/fabric-ccenv	2.5.4	6dac93f94c87	3 months ago	656MB
hyperledger/fabric-ccenv	latest	6dac93f94c87	3 months ago	656MB
hyperledger/fabric-baseos	2.5	3854817b987d	3 months ago	122MB
hyperledger/fabric-baseos	2.5.4	3854817b987d	3 months ago	122MB
hyperledger/fabric-baseos	latest	3854817b987d	3 months ago	122MB

.imrraaj

```
@ ..test-network x +  
.  
imrraaj ls  
fabric-samples firstapp install-fabric.sh  
imrraaj cd fabric-samples/test-network  
test-network [main] ./network.sh down
```

```
[+] Running 7/0
```

```
Volume compose_peer0.org2.example.com Removed  
Volume compose_orderer2.example.com Removed  
Volume compose_orderer4.example.com Removed  
Volume compose_peer0.org1.example.com Removed  
Volume compose_orderer3.example.com Removed  
Volume compose_peer0.org3.example.com Removed  
Volume compose_orderer.example.com Removed
```

```
Error response from daemon: get docker_orderer.example.com: no such volume  
Error response from daemon: get docker_peer0.org1.example.com: no such volume  
Error response from daemon: get docker_peer0.org2.example.com: no such volume
```

```
Unable to find image 'busybox:latest' locally
```

```
latest: Pulling from library/busybox
```

```
3f4d90098f5b: Pull complete
```

```
Digest: sha256:3fbc632167424a6d997e74f52b878d7cc478225cfffac6bc977eedfe51c7f4e79
```

```
Status: Downloaded newer image for busybox:latest
```

```
test-network [main]
```

\$) | /test-network

```
cryptogen generate --config=./organizations/cryptogen/crypto-config-org2.yaml --output=organizations
org2.example.com
```

res=0

```
cryptogen generate --config=./organizations/cryptogen/crypto-config-orderer.yaml --output=organizations
```

res=0

Networkfabric test

Volume "compose\_peer0.org2.example.com" C 1-eated

Volume "compose\_orderer.example.com" C 1-eated

Volume "compose\_peer0.org1.example.com" C 1-eated

Container peer0.org2.example.com Star- ted

Container peer0.org1.example.com Star- ted

Container orderer.example.com Sta r- ted

Container cli Sta l- ted

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	
	NAME				
2dc82591cb45	hyperledger/fabric-tools:latest	"/bin/bash"	2 seconds ago	Up	Less than as
	cli				
5edce006ead9	hyperledger/fabric-peer:latest	"peer node start"	2 seconds ago	Up	Less than as
	peer0.org2.example.com				
a9b199080c42	hyperledger/fabric-peer:latest	"peer node start"	2 seconds ago	Up	Less than as
	peer0.org1.example.com				
4dd39fa35a4a	hyperledger/fabric-orderer:latest	"orderer"	2 seconds ago	Up	Less than as
tcp	orderer.example.com				
cb7e42e90b5a	mysql:latest	"docker-entrypoint.s.	3 days ago	Exited	(255) 7 m
	nervous cannon				
e6959c78454b	node kong	"docker-entrypoint.s.	3 days ago	Exited	(255) 3 d
	node kong				
bc9574e55c53	ng/kong-gateway:3.4.1.1	"/entrypoint.sh kong.	3 days ago	Exited	(255) 3 d
	kong-gateway				
9446-8447/tcp	postgres:13				
1253d3c0ae5a	postgres:13	"docker-entrypoint.s.	3 days ago	Exited	(255) 3 d
	kong-database				

- test-network [main]

Neh1ork Running Already

Channel 'mychannel' created

Allcl101" lieel- set for- Ol"ij 'Or-u2MSP' 011 cl1al111el 'mycl1al111el'

```
test-network [main]
```

```

test-network [main]
test-network [main] /network.sh deployCC -ccn basic -ccp ../asset-transfer-basic/chaincode-go -eel go

```

executing with the following

```

- CHANNEL_NAME mycl1a1117e]
- CC_NAME basic
- CC_SRC_PATH ../asset-transfer-basic/chaincode-go
- CC_SRC_LANGUAGE go
- CC_VERSION 1.0.1
- CC_SEQUENCE auto
- CC_END_POLICY IIA
- CC_COLL_CONFIG IIA
- CC_INIT_FCN IIA
- DELAY 3
- MAX_RETRY 5
- VERBOSE false

```

executing with the following

```

- CC_NAME basic
- CC_SRC_PATH ../asset-transfer-basic/chaincode-go
- CC_SRC_LANGUAGE go
- CC_VERSION 1.0.1

```

```

~/Programming/go/src/github.com/imrtaaj/fabric-samples/asset-transfer-basic/chaincode-go •Programming/go/src/github.com/imrtaaj/fabric-samples/test-network
go: downloading github.com/hyperledger/fabric-chaincode-go v0.0.0-20230228194215-b84622ba6a7a
go: downloading github.com/hyperledger/fabric-protos-go v0.3.0
go: downloading github.com/hyperledger/fabric-contract-api-go v1.2.1
go: downloading github.com/stretchr/testify v1.8.2
go: downloading google.golang.org/grpc v1.53.0
go: downloading github.com/golang/protobuf v1.5.2
go: downloading github.com/xepuv/gojsonschema v1.2.8
go: downloading github.com/go-openapi/spec v0.20.0
go: downloading github.com/gobuffalo/packr v1.30.1
go: downloading github.com/gobuffalo/packd v1.0.1

```

Finished vendoring Go dependencies

```

peer lifecycle chaincode package basic.tar.gz --path ../asset-transfer-basic/chaincode-go --lang golang --label basic_1.0.1
res=0
Chaincode is packaged

```

```

peer lifecycle chaincode queryinstalled --output json
jq -r 'try (.installed_chaincodes[].package_id)'
grep "basic_1.0.1: 650b7b4f5a8545d710651dc01edee8cf83518ef4b36a67a08be061ba14da653a$"
test 1 -ne 0
peer lifecycle chaincode install basic.tar.gz
res=0
[cli.lifecycle.chaincode] submitInstallProposal: Installed remotely: response: <status:200 package_id:basic_1.0.1>
[cli.lifecycle.chaincode] submitInstallProposal: Chaincode code package identifier: basic_1.0.1
Chaincode is installed on peer1-0.0.1-g1

```

```

peer lifecycle chaincode queryinstalled --output json
jq -r 'try (.installed_chaincodes[].package_id)'
grep "basic_1.0.1: 650b7b4f5a8545d710651dc01edee8cf83518ef4b36a67a08be061ba14da653a$"
test 1 -ne 0
peer lifecycle chaincode install basic.tar.gz

```



```
./network
```

Chaincode is installed 011 peer1-0.01-g1

```
+ peer lifecycle chaincode queryinstalled --output json
+ jq -r 'try (.installed_chaincodes[].package_id)
+ grep 'basic_1.0.1:650b7b4f5a8545d710651dc01edee8cf83518ef4b36a67a08be061ba14da653a$
+ test -ne 0
+ peer lifecycle chaincode install basic.tar.gz
+ res=0
[cli] lifecycle chaincode install basic.tar.gz --peerAddresses peer1-0.01-g1:7050 --tls --cafile /home/raj/kp/Programs/test-network/organizations/ordererOrganizations/example.com/tlsca/tlsca.example.com-cert.pem --channelID mychannel --name basic --version 1.0.1 --sequence 1
518ef4b36a67a08be061ba14da653a022013basic_1.0.1:650b7b4f5a8545d710651dc01edee8cf83518ef4b36a67a08be061ba14da653a
[cli] lifecycle chaincode queryinstalled --peerAddresses peer1-0.01-g1:7050 --tls --cafile /home/raj/kp/Programs/test-network/organizations/ordererOrganizations/example.com/tlsca/tlsca.example.com-cert.pem --channelID mychannel --name basic --version 1.0.1 --sequence 1
Chaincode code package identifier: basic_1.0.1:650b7b4f5a8545d710651dc01edee8cf83518ef4b36a67a08be061ba14da653a
```

Chaincode is installed 011 peer1-8.01-g2

```
- peer lifecycle chaincode querycommitted --channelID mychannel --name basic
- sed -n '/Version:/{s/.*/Sequence: //; s/.*/Endorsement Plugin:.*$/; p;}
Error: query failed with status: 404 - namespace basic is not defined
+ COMMITTED_SEQUENCE
+ res=0
```

```
+ peer lifecycle chaincode queryinstalled --output json
+ jq -r 'try (.installed_chaincodes[].package_id)
+ grep 'basic_1.0.1:650b7b4f5a8545d710651dc01edee8cf83518ef4b36a67a08be061ba14da653a$
+ res=0
basic_1.0.1:650b7b4f5a8545d710651dc01edee8cf83518ef4b36a67a08be061ba14da653a
```

Query successful 011 peer1-0.org1 011 chaincode1

```
+ peer lifecycle chaincode approveformyorg -o localhost:7050 --ordererTLSHostnameOverride orderer.example.com --tls --cafile /home/raj/kp/Programs/test-network/organizations/ordererOrganizations/example.com/tlsca/tlsca.example.com-cert.pem --channelID mychannel --name basic --version 1.0.1 --sequence 1
+ res=0
```

```
[chaincodeCmd] Client: peer1-0.org1 txid [1722fc25c2ed15fd598ca2bfee4a41ac86b5972ac7849e8f18b747cbce0c15a]
Chaincode clef11itio11 approved on peer0.org1 011 chaincode1 'mychannel'
```

```
+ peer lifecycle chaincode checkcommitreadiness --channelID mychannel --name basic --version 1.0.1 --sequence 1 --output json
+ res=0
```

```
{
  "approvals": {
    "Org1MSP": true,
    "Org2MSP": false
  }
}
```

```
+ peer lifecycle chaincode checkcommitreadiness --channelID mychannel --name basic --version 1.0.1 --sequence 1 --output json
+ res=0
```

```
{
  "approvals": {
    "Org1MSP": true,
    "Org2MSP": false
  }
}
```

```
+ peer lifecycle chaincode approveformyorg -o localhost:7050 --ordererTLSHostnameOverride orderer.example.com --tls --cafile /home/raj/kp/Programs/test-network/organizations/ordererOrganizations/example.com/tlsca/tlsca.example.com-cert.pem --channelID mychannel --name basic --version 1.0.1 --sequence 1
+ res=0
```

```
[chaincodeCmd] Client: peer1-0.org1 txid [32e6107a665d7553665794d132b369df7b0f1a11db13f335f984d4954f50eed5] com
```

```
1 approvals 1 1
1 Org1MSP 1 1 true
1 "Org2MSP": true
```

```
[chaincodeCmd] Clie11t',Ja it [txid] [ecla9805f43d521320f8c802fcb5led690f90f46f5f54ea947e6f60a49f5614] committed wit
[chaincodeCmd] Clie11t',Ja it [txid] [ecla9805f43d521320f8c802fcb5led690f90f46f5f54ea947e6f60a49f5614] committed ...]
```

```
+ peer lifecycle chaincode querycommitted --channelID mychannel --name basic
+ res=0
Committed chaincode definition for chaincode 'basic' on channel 'mychannel'
Version 1.0.1 Sequence: 1, Endorsement Plugin escc, Validation Plugin vsccl Approvals: [Org1MSP: true, Org2MSP: true]
Query chaincode clef11it011 successful 011 11e0r.01-u1 011 claf1111el 'mycha1111el'
```

```
+ peer lifecycle chaincode querycommitted --channelID mychannel --name basic
+ res=0
Committed chaincode definition for chaincode 'basic' on channel 'mychannel'
Version 1.0.1 Sequence: 1, Endorsement Plugin escc, Validation Plugin vsccl Approvals {Org1MSP: true, Org2MSP: true}
Query chaincode clef111tion successful 011 11eer0.01-g2 011 clat111el mycha1111el'
```

```
• test-network [main]
```