

HYPERLEDGER FABRIC

RUN STEPS-INTERACTING WITH THE NETWORK

Commented [D1]:

Install fabric and fabric samples

```
Activities Terminal 10:00 17 مارچ
vboxuser@Ubuntu22: ~/fabric/fabric-samples/test-network

vboxuser@Ubuntu22: $ mkdir fabric
vboxuser@Ubuntu22: $ cd fabric
vboxuser@Ubuntu22: ~/fabric $ ls
vboxuser@Ubuntu22: ~/fabric $ curl -sSLO https://raw.githubusercontent.com/hyperledger/fabric/main/scripts/install-fabric.sh &
+X install-fabric.sh
vboxuser@Ubuntu22: ~/fabric $ ls
install-fabric.sh
vboxuser@Ubuntu22: ~/fabric $ ./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: 14637, done.
remote: Counting objects: 100% (324/324), done.
remote: Compressing objects: 100% (255/255), done.
remote: Total 14637 (delta 154), reused 76 (delta 67), pack-reused 14313 (from 2)
Receiving objects: 100% (14637/14637), 23.64 MiB | 1.13 MiB/s, done.
Resolving deltas: 100% (8041/8041), done.
fabric-samples v2.5.11 does not exist, defaulting to main. fabric-samples main branch is intended to work with recent version
of fabric.

Pull Hyperledger Fabric binaries

====> Downloading version 2.5.11 platform specific fabric binaries
====> Downloading: https://github.com/hyperledger/fabric/releases/download/v2.5.11/hyperledger-fabric-linux-amd64-2.5.11.tar.gz
====> Will unpack to: /home/vboxuser/fabric/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 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
100 117M 100 117M 0 0 2059k 0 0:00:58 0:00:58 --:--:-- 2221k
====> Done.
====> Downloading version 1.5.15 platform specific fabric-ca-client binary
====> Downloading: https://github.com/hyperledger/fabric-ca/releases/download/v1.5.15/hyperledger-fabric-ca-linux-amd64-1.5.15.tar.gz
====> Will unpack to: /home/vboxuser/fabric/fabric-samples
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
```

Pulling the docker containers

Remove any containers and artifacts:

```
vboxuser@Ubuntu22:~/fabric/fabric-samples/test-network$ cd test-network
bash: cd: test-network: No such file or directory
vboxuser@Ubuntu22:~/fabric/fabric-samples/test-network$ ls
addOrg3                                compose                                network.config                        prometheus-grafana                  setOrgEnv.sh
bft-config                             configtx                               network.sh                           README.md                          system-genesi
CHAINCODE_AS_A_SERVICE_TUTORIAL.md    monitordocker.sh                     organizations                        scripts
vboxuser@Ubuntu22:~/fabric/fabric-samples/test-network$ ./network.sh down
Using docker and docker-compose
Stopping network
[+] Running 11/11
✔ Container peer0.org1.example.com      Removed
✔ Container peer0.org2.example.com      Removed
✔ Container orderer.example.com         Removed
✔ Volume compose_orderer3.example.com   Removed
✔ Volume compose_orderer.example.com    Removed
✔ Volume compose_peer0.org3.example.com  Removed
✔ Volume compose_orderer2.example.com   Removed
✔ Volume compose_orderer4.example.com   Removed
✔ Volume compose_peer0.org2.example.com  Removed
✔ Volume compose_peer0.org1.example.com  Removed
✔ Network fabric_test                  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
Removing remaining containers
Removing generated chaincode docker images
Unable to find image 'busybox:latest' locally
latest: Pulling from library/busybox
9c0abc9c5bd3: Pull complete
Digest: sha256:498a000f370d8c37927118ed80afe8adc38d1edcbfc071627d17b25c88efcab0
Status: Downloaded newer image for busybox:latest
vboxuser@Ubuntu22:~/fabric/fabric-samples/test-network$ ./network.sh up
Using docker and docker-compose
Starting nodes with CLI timeout of '5' tries and CLI delay of '3' seconds and using database 'leveldb' w
```

Up the network:

```
Activities Terminal 10:10 17 م
vboxuser@Ubuntu22: ~/fabric/fabric-samples/test-network
latest: Pulling from library/busybox
9c0abc9c5bd3: Pull complete
Digest: sha256:498a000f370d8c37927118ed80afe8adc38d1edcbfc071627d17b25c88efcab0
Status: Downloaded newer image for busybox:latest
vboxuser@Ubuntu22:~/fabric/fabric-samples/test-network$ ./network.sh up
Using docker and docker-compose
Starting nodes with CLI timeout of '5' tries and CLI delay of '3' seconds and using database 'leveldb' with crypto from 'cryptoge
LOCAL VERSION=2.5.11
DOCKER_IMAGE_VERSION=2.5.11
/home/vboxuser/fabric/fabric-samples/test-network/./bin/cryptogen
Generating certificates using cryptogen tool
Creating Org1 Identities
+ cryptogen generate --config=./organizations/cryptogen/crypto-config-org1.yaml --output=organizations
org1.example.com
+ res=0
Creating Org2 Identities
+ cryptogen generate --config=./organizations/cryptogen/crypto-config-org2.yaml --output=organizations
org2.example.com
+ res=0
Creating Orderer Org Identities
+ cryptogen generate --config=./organizations/cryptogen/crypto-config-orderer.yaml --output=organizations
+ res=0
Generating CCP files for Org1 and Org2
[+] Running 7/7
✔ Network fabric_test                  Created
✔ Volume "compose_peer0.org1.example.com" Created
✔ Volume "compose_peer0.org2.example.com" Created
✔ Volume "compose_orderer.example.com" Created
✔ Container peer0.org2.example.com     Started
✔ Container peer0.org1.example.com     Started
✔ Container orderer.example.com        Started
CONTAINER ID        IMAGE                                COMMAND                  CREATED          STATUS          PORTS
80eFeb492576       hyperledger/fabric-peer:latest     "peer node start"       1 second ago    Up Less than a second    0.0.0.0:7051->7051/
, ::7051->7051/tcp, 0.0.0.0:9444->9444/tcp, ::9444->9444/tcp    peer0.org1.example.co
c7e4d1a6526f       hyperledger/fabric-orderer:latest  "orderer"               1 second ago    Up Less than a second    0.0.0.0:7050->7050/
, ::7050->7050/tcp, 0.0.0.0:7053->7053/tcp, ::7053->7053/tcp    orderer.example.com
fc6764078b9d       hyperledger/fabric-peer:latest     "peer node start"       1 second ago    Up Less than a second    0.0.0.0:9051->9051/
```

Channel for the peer created:

```
vboxuser@Ubuntu22: ~/fabric/fabric-samples/test-network
✓ Network fabric_test Created
✓ Volume "compose_peer0.org1.example.com" Created
✓ Volume "compose_peer0.org2.example.com" Created
✓ Volume "compose_orderer.example.com" Created
✓ Container peer0.org2.example.com Started
✓ Container peer0.org1.example.com Started
✓ Container orderer.example.com Started
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS NAMES
80efeb492576	hyperledger/fabric-peer:latest	"peer node start"	1 second ago	Up	Less than a second
peer0.org1.example.com	hyperledger/fabric-orderer:latest	"orderer"	1 second ago	Up	Less than a second
peer0.org2.example.com	hyperledger/fabric-peer:latest	"peer node start"	1 second ago	Up	Less than a second
orderer.example.com	hyperledger/fabric-peer:latest	"peer node start"	1 second ago	Up	Less than a second

```
vboxuser@Ubuntu22:~/fabric/fabric-samples/test-network$ docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS NAMES
80efeb492576	hyperledger/fabric-peer:latest	"peer node start"	About a minute ago	Up	About a minute
peer0.org1.example.com	hyperledger/fabric-orderer:latest	"orderer"	About a minute ago	Up	About a minute
peer0.org2.example.com	hyperledger/fabric-peer:latest	"peer node start"	About a minute ago	Up	About a minute
orderer.example.com	hyperledger/fabric-peer:latest	"peer node start"	About a minute ago	Up	About a minute

```
vboxuser@Ubuntu22:~/fabric/fabric-samples/test-network$ ./network.sh createChannel -c mychannel
```

Using docker and docker-compose
Creating channel 'mychannel'.
If network is not up, starting nodes with CLI timeout of '5' tries and CLI delay of '3' seconds and using database 'leveldb'.
Bringing up network
LOCAL_VERSION=v2.5.11
DOCKER_IMAGE_VERSION=v2.5.11
[+] Running 3/0
✓ Container peer0.org1.example.com Running
✓ Container peer0.org2.example.com Running
✓ Container orderer.example.com Running

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS NAMES
80efeb492576	hyperledger/fabric-peer:latest	"peer node start"	5 days ago	Up	5 days

Adding 2 organizations in the created network:

```
vboxuser@Ubuntu22: ~/fabric/fabric-samples/test-network

Bringing up network
LOCAL_VERSION=v2.5.11
DOCKER_IMAGE_VERSION=v2.5.11

[+] Running 3/0
  ✓ Container peer0.org1.example.com    Running
  ✓ Container peer0.org2.example.com    Running
  ✓ Container orderer.example.com       Running

CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS
80efbe492576   hyperledger/fabric-peer:latest     "peer node start"       5 days ago    Up 5 days    0.0.0.0:7051->7051/tcp, :::7051->7051/tcp
1/tcp, 0.0.0.0:9444->9444/tcp, :::9444->9444/tcp
c7e4d1a6526f   hyperledger/fabric-orderer:latest  "orderer"               5 days ago    Up 5 days    0.0.0.0:7050->7050/tcp, :::7050->7050/tcp
0/tcp, 0.0.0.0:7053->7053/tcp, :::7053->7053/tcp, 0.0.0.0:9443->9443/tcp, :::9443->9443/tcp
fc6764078bfd   hyperledger/fabric-peer:latest     "peer node start"       5 days ago    Up 5 days    0.0.0.0:9051->9051/tcp, :::9051->9051/tcp
1/tcp, 7051/tcp, 0.0.0.0:9445->9445/tcp, :::9445->9445/tcp

Using docker and docker-compose
Generating channel genesis block 'mychannel.block'
Using organization 1
/home/vboxuser/fabric/fabric-samples/test-network/./bin/configtxgen
+ '[' 0 -eq 1 ']'
+ configtxgen -profile channelUsingRaft -outputBlock ./channel-artifacts/mychannel.block -channelID mychannel
2025-03-16 17:03:42.230 PKT 0001 INFO [common.tools.configtxgen] load -> Loading configuration
2025-03-16 17:03:42.245 PKT 0002 INFO [common.tools.configtxgen.localconfig] completeInitialization -> Orderer type: etcdraft
2025-03-16 17:03:42.245 PKT 0003 INFO [common.tools.configtxgen.localconfig] completeInitialization -> Orderer.EtcdRaft.Options
t, setting to tick interval: '500ms' election_tick:10 heartbeat_tick:1 max_inflight_blocks:5 snapshot_interval_size:16777216
2025-03-16 17:03:42.245 PKT 0004 INFO [common.tools.configtxgen.localconfig] load -> Loaded configuration: /home/vboxuser/fabric-samples/test-network/configtx/configtx.yaml
2025-03-16 17:03:42.249 PKT 0005 INFO [common.tools.configtxgen] doOutputBlock -> Generating genesis block
2025-03-16 17:03:42.252 PKT 0006 INFO [common.tools.configtxgen] doOutputBlock -> Creating application channel genesis block
2025-03-16 17:03:42.253 PKT 0007 INFO [common.tools.configtxgen] doOutputBlock -> Writing genesis block
+ res=0
Creating channel mychannel
Adding orders
+ . scripts/orderer.sh mychannel
+ '[' 0 -eq 1 ']'
+ res=0
Status: 201
{
  "name": "mychannel",
  "url": "/participation/v1/channels/mychannel",
}
```

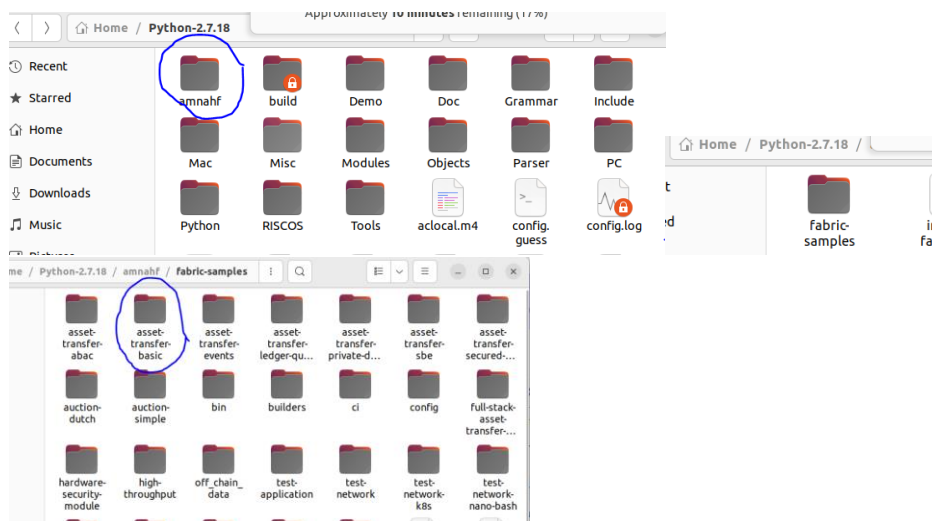
Peer set for organization,Channel Update successfully Submitted:

[illegible]

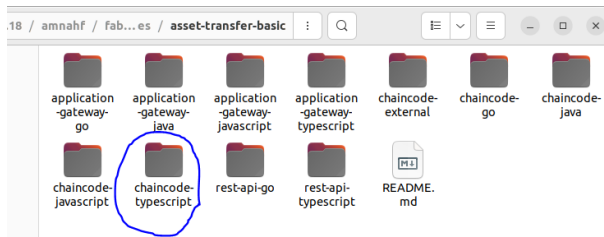
ORGANIZATION 1, ORGANIZATION 2

```
Bringing up network
LOCAL_VERSION=v2.5.11
DOCKER_IMAGE_VERSION=v2.5.11
[+] Running 3/0
  ✓ Container peer0.org1.example.com Running
  ✓ Container peer0.org2.example.com Running
  ✓ Container orderer.example.com Running
```

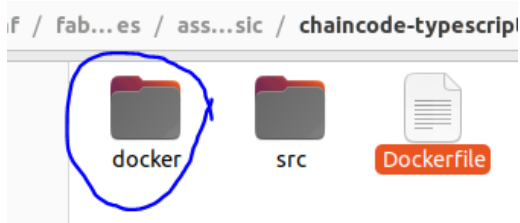
CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORT NAMES
80efeb492576	hyperledger/fabric-peer:latest	"peer node start"	5 days ago	Up 5 days	0.0.0.0:9444->9444/tcp, ::9444->9444/tcp
c7e4d1a6526f	hyperledger/fabric-orderer:latest	"orderer"	5 days ago	Up 5 days	0.0.0.0:7053->7053/tcp, ::7053->7053/tcp
fc6764078bfd	hyperledger/fabric-peer:latest	"peer node start"	5 days ago	Up 5 days	0.0.0.0:9443->9443/tcp, ::9443->9443/tcp



Chain code for mychannel;



Opening chaincode file in docker;



Docker endpoint, for fabric samples;

```

1 #!/usr/bin/env bash
2 #
3 # SPDX-License-Identifier: Apache-2.0
4 #
5 set -euo pipefail
6 : ${CORE_PEER_TLS_ENABLED:=false}
7 : ${DEBUG:=false}
8
9 if [ "${DEBUG,,}" = "true" ]; then
10  npm run start:server-debug
11 elif [ "${CORE_PEER_TLS_ENABLED,,}" = "true" ]; then
12  npm run start:server
13 else
14  npm run start:server-nontls
15 fi
16

```

AssetTransfer

```
docker-entrypoint.sh x assetTransfer.ts x
1 /*
2  * SPDX-License-Identifier: Apache-2.0
3  */
4 // Deterministic JSON.stringify()
5 import {Context, Contract, Info, Returns, Transaction} from 'fabric-contract-api';
6 import stringify from 'json-stringify-deterministic';
7 import sortKeysRecursive from 'sort-keys-recursive';
8 import {Asset} from './asset';
9
10 @Info({title: 'AssetTransfer', description: 'Smart contract for trading assets'})
11 export class AssetTransferContract extends Contract {
12
13   @Transaction()
14   public async InitLedger(ctx: Context): Promise<void> {
15     const assets: Asset[] = [
16       {
17         ID: 'asset1',
18         Color: 'blue',
19         Size: 5,
20         Owner: 'Tomoko',
21         AppraisedValue: 300,
22       },
23       {
24         ID: 'asset2',
25         Color: 'red',
26         Size: 5,
27         Owner: 'Brad',
28         AppraisedValue: 400,
29       },
30       {
31         ID: 'asset3',
32         Color: 'green',
33         Size: 10,
34         Owner: 'Jin Soo',
35         AppraisedValue: 500,
36     },
37   ]
38 }
```

This contract allow us to to have a ledger as well everytime we do a transfer.

Deploying chaincode on peers and channel:

```
vboxuser@ubuntu22:~/fabric/fabric-samples/test-network$ ./network.sh deployCC -ccn basic -ccp ../asset-transfer-basic/chaincode-typescript
script -ccl typescript
Using docker and docker-compose
Deploying chaincode on channel 'mychannel'
executing with the following
- CHANNEL_NAME: mychannel
- CC_NAME: basic
- CC_SRC_PATH: ../asset-transfer-basic/chaincode-typescript
- CC_SRC_LANGUAGE: typescript
- CC_VERSION: 1.0
- CC_SEQUENCE: auto
- CC_END_POLICY: NA
- CC_COLL_CONFIG: NA
- CC_INIT_FCN: NA
- DELAY: 5
- MAX_RETRY: 5
```

Chaincode installed on peer of org1 and org 2


```

0:a17cb3866ba22ccdd49d897e544ab940929566cfac00a1a4c23203a4af918e4d
Chaincode is installed on peer0.org2
++ 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_CC_SEQUENCE=
+ res=0
Using organization 1
+ peer lifecycle chaincode queryinstalled --output json
+ jq -r 'try (.installed_chaincodes[].package_id)'
+ grep '^basic_1.0:a17cb3866ba22ccdd49d897e544ab940929566cfac00a1a4c23203a4af918e4d'
+ res=0
basic_1.0:a17cb3866ba22ccdd49d897e544ab940929566cfac00a1a4c23203a4af918e4d
Query installed successful on peer0.org1 on channel 'mychannel'
Using organization 1
+ peer lifecycle chaincode approveformyorg -o localhost:7050 --ordererTLS
boxuser/fabric/fabric-samples/test-network/organizations/ordererOrganiza
ID mychannel --name basic --version 1.0 --package-id basic_1.0:a17cb3866
quence 1
+ res=0
2025-03-17 18:44:51.199 PKT 0001 INFO [chaincodeCmd] ClientWait -> txid
3dcdbj committed with status (VALID) at localhost:7051
Chaincode definition approved on peer0.org1 on channel 'mychannel'
Using organization 1

```

Interacting with the network

Setting up the environment variables to operate peer as org1.

