

## FPC implimentation: Demo HLGF 2022

There are few things to notedown:

**Part I: Path, repo and docker and env file creation: you must do inside the docker-dev enviornment.**

**Part II: Starting a fabric network: you can do inside or outside the dev-env).**

**Part III: Interaction with network through CLI: you can do inside or outside the dev-env.**

### PART - I

Provide path address

```
export FPC_PATH=$GOPATH/src/github.com/hyperledger/fabric-private-chaincode
```

Clonning the go-support branch

```
git clone -b go-support-preview --recursive https://github.com/hyperledger/fabric-private-chaincode.git $FPC_PATH
```

Once you have cloned the repository, to pull the docker image and start the development container execute the following:

```
cd $FPC_PATH/utls/docker
make pull-dev
make run-dev
```

If there is error then you can do the following by pulling the docker files

```
cd $FPC_PATH
make -C $FPC_PATH/utls/docker pull
```

or you can build all required FPC componenet and run the intgration test using folloiwng commands

```
cd $FPC_PATH
make
```

For docker based enviornment:

```
cd $FPC_PATH/utls/docker
make pull-dev
make run-dev
```

```

Step 9/17 : ENV FPC_VERSION=${FPC_VERSION}
--> Using cache
--> a933d38b79a5
Step 10/17 : ENV SGX_MODE=SIM
--> Using cache
--> 747f634283c9
Step 11/17 : RUN apt-get update && apt-get install -y -q      ${APT_ADD_PKGS}
--> Using cache
--> 0e6bd9aa6284
Step 12/17 : ARG GIT_USER_NAME=tester
--> Using cache
--> 7cfa060c3f2
Step 13/17 : ARG GIT_USER_EMAIL=tester@fpc
--> Using cache
--> 1131ba5bc127
Step 14/17 : RUN git config --global user.name "${GIT_USER_NAME}" && git config --global user.email "${GIT_USER_EMAIL}"
--> Using cache
--> 5ffade4ef24b
Step 15/17 : ENV FABRIC_PATH=${GOPATH}/${FABRIC_REL_PATH}
--> Using cache
--> 1b3fa09abb61
Step 16/17 : RUN git clone --branch v${FABRIC_VERSION} ${FABRIC_REPO} ${FABRIC_PATH}
--> Using cache
--> 68ad5ec8436f
Step 17/17 : WORKDIR ${FPC_PATH}
--> Using cache
--> 32feafc2223
Successfully built 32feafc2223
Successfully tagged hyperledger/fabric-private-chaincode-dev:go-support
# Cleanup existing but non-running (note absence of --force in rm!) old dev containers
dev_container_id=$(docker ps -a | grep fpc-development-go-support | awk '{ print $1 }'); \
[ -z "${dev_container_id}" ] || DOCKER_BUILDKIT=0 docker rm "${dev_container_id}"
5b831545d43b
# Now run a new instance
DOCKER_BUILDKIT=0 docker run -v /var/run/docker.sock:/var/run/docker.sock -v "/home/rp/go/src/github.com/hyperledger/fabric-private-chaincode:/project/src/github.com/hyperledger/fabric-private-chaincode" --env DOCKERD_FPC_PATH=/home/rp/go/src/github.com/hyperledger/fabric-private-chaincode/ --net=host --env SGX_MODE=SIM -i -e CI=true --name fpc-development-go-support -t hyperledger/fabric-private-chaincode-dev:go-support
root@fpc:/project/src/github.com/hyperledger/fabric-private-chaincode#
  
```

Once the development enviornment is running: now you can go the write the chaincode and build it usign the make command: It is better to run the make inside the dev environment.

Input modification in main.go modification in makefile

```
assetChaincode, _ := contractapi.NewChaincode(&chaincode.SmartContract{})

chaincode := fpc.NewPrivateChaincode(assetChaincode)
```

Make sure you import

```
"github.com/hyperledger/fabric-contract-api-go/contractapi"
```

```
fpc "github.com/hyperledger/fabric-private-chaincode/ecc_go/chaincode"
"github.com/hyperledger/fabric-samples/asset-transfer-basic/chaincode-go/chaincode"
```

```

1 //go:build exclude
2 // +build exclude
3
4 // TODO remove build tag
5
6 /*
7 Copyright IBM Corp. All Rights Reserved.
8 Copyright 2020 Intel Corporation
9
10 SPDX-License-Identifier: Apache-2.0
11 */
12
13 package main
14
15 import (
16     "os"
17
18     "github.com/hyperledger/fabric-chaincode-go/shim"
19     // TODO add imports
20     "github.com/hyperledger/fabric-contract-api-go/contractapi"
21     fpc "github.com/hyperledger/fabric-private-chaincode/ecc_go/chaincode"
22     "github.com/hyperledger/fabric-samples/asset-transfer-basic/chaincode-go/chaincode"
23 )
24
25 func main() {
26
27     ccid := os.Getenv("CHAINCODE_PKG_ID")
28     addr := os.Getenv("CHAINCODE_SERVER_ADDRESS")
29
30     // create chaincode
31     // TODO add chaincode
32     assetChaincode, _ := contractapi.NewChaincode(&chaincode.SmartContract{})
33     chaincode := fpc.NewPrivateChaincode(assetChaincode)
34
35     // start chaincode as a service
36     server := &shim.ChaincodeServer{
37         CCID:    ccid,
38         Address: addr,
39         CC:      chaincode,
40         TLSProps: shim.TLSProperties{

```

To build chaincode: use the docker dev environment

Set inside the Makefile.

```
CC_NAME ?= fpc-basic-asset-transfer
```

Once it is done then you will get following:

a. A docker image: fpc-basic-asset-transfer b. environment variable: details.env

```

---> 4dfb3899dce
Step 4/12 : ENV SGX_MODE=${SGX_MODE}
---> Using cache
---> 883d68c993a7
Step 5/12 : ARG OE_SIMULATION
---> Using cache
---> 68744701854a
Step 6/12 : ENV OE_SIMULATION=${OE_SIMULATION}
---> Using cache
---> 24a8f46da9b
Step 7/12 : ARG CAAS_PORT=9999
---> Using cache
---> 833dbc154e7
Step 8/12 : ARG CC_PATH="/usr/local/bin"
---> Using cache
---> 03017dea890
Step 9/12 : COPY ecc-bundle ${CC_PATH}/chaincode
---> 7c42111af79d
Step 10/12 : WORKDIR ${CC_PATH}
---> Running in c039bd991f10
Removing intermediate container c039bd991f10
---> 767a97b97f20
Step 11/12 : EXPOSE ${CAAS_PORT}
---> Running in ecffde010e5
Removing intermediate container ecffde010e5
---> baecce640058
Step 12/12 : CMD ["chaincode"]
---> Running in 6ce9865eb2c
Removing intermediate container 6ce9865eb2c
---> 1ed93dfcf2ee
Successfully built 1ed93dfcf2ee
Successfully tagged fpc/fpc-basic-asset-transfer:go-support
echo "export CC_NAME=fpc-basic-asset-transfer" > details.env
echo "export FPC_HYPERCLAVE=75e2f5e9f98330efaf37107b830cb99b60a457adb83ebba332e525a15f5ea" > details.env
echo "export FPC_CHAINCODE_PKG=fpc/fpc-basic-asset-transfer:latest" > details.env
root@PC:/project/src/github.com/hyperledger/fabric-private-chaincode/samples/demos/hlgf22#

```

## PART - II

Here we use the the fabric-smart-client as network

Open a new terminal and firstly export the variable:

```
export FPC_PATH=$GOPATH/src/github.com/hyperledger/fabric-private-chaincode
```

then go the fabric-smart-client directory

```
cd $FPC_PATH/samples/deployment/fabric-smart-client/the-simple-testing-network
```

To run the Fabric network we need the Fabric binaries. We will use the following:

```
make -C $FPC_PATH/fabric
export FAB_BINS=$FPC_PATH/fabric/_internal/bin
```

Go to

```
$FPC_PATH/samples/deployment/fabric-smart-client/the-simple-testing-network.
```

```
source $FPC_PATH/samples/demos/hlgf22/details.env
```

```
make run
// OR
go run . network start --path ./testdata
```

```
> ecc
> ecc_enclave
> ecc_go
> ecc
> fabric
> integration
> internal
> protos
> samples
> application
> chaincode
> demos
  mmitted with status (VALID) at 127.0.0.1:20011
  [e][fabric.default-peer-chaincode-invoke] 2022-10-30 15:57:42.380 IST [chaincodeCmd] chaincodeInvokeQuery -> INFO 005 Chaincode invoke successful. result: status:200
  [e][fabric.default-orderer-org.orderer] 2022-10-30 15:57:42.384 IST [orderer.common.broadcast] Handle -> WARN 02c Error reading from 127.0.0.1:39366: rpc error: code = Canceled desc = context canceled
  2022-10-30 15:57:42.394 IST [integration.mwo.fabric.fpc] generateConnections -> INFO 03c Generate connections for Org1
  2022-10-30 15:57:42.396 IST [integration.mwo.fabric.fpc] generateConnections -> INFO 03d Generate connections for Org2
  2022-10-30 15:57:50.403 IST [fsc.integration.fabric] PostRun -> INFO 03e Post execution [fabric.default]...done.
  2022-10-30 15:57:50.472 IST [fsc.integration.monitoring] PostRun -> INFO 03f Post execution [monitoring]...done.
  2022-10-30 15:57:50.572 IST [integration.mwo.fabric.hcl] startContainer -> INFO 040 Run Explorer DB...done!
  2022-10-30 15:57:51.053 IST [integration.mwo.fabric.hcl] startContainer -> INFO 041 Run Explorer DB...done!
  2022-10-30 15:58:21.070 IST [integration.mwo.fabric.hcl] startContainer -> INFO 042 Run Explorer...done!
  2022-10-30 15:58:24.592 IST [integration.mwo.fabric.hcl] startContainer -> INFO 043 Run Explorer...done!
  2022-10-30 15:58:29.593 IST [fsc.integration.monitoring] PostRun -> INFO 044 Post execution [monitoring]...done.
  2022-10-30 15:58:29.593 IST [fsc.integration] Start -> INFO 045 Run FSC nodes...
  2022-10-30 15:58:29.597 IST [fsc.integration] Start -> INFO 046 Post execution for FSC nodes...
  2022-10-30 15:58:29.597 IST [mwo.network] Start -> INFO 047
  2022-10-30 15:58:29.597 IST [mwo.network] Start -> INFO 048
  2022-10-30 15:58:29.597 IST [mwo.network] Start -> INFO 049
  2022-10-30 15:58:29.597 IST [mwo.network] Start -> INFO 04a
  2022-10-30 15:58:29.597 IST [mwo.network] Start -> INFO 04b
  2022-10-30 15:58:29.597 IST [mwo.network] Start -> INFO 04c All GOOD, networks up and running...
  2022-10-30 15:58:29.597 IST [fsc.integration] Serve -> INFO 04d If you want to shut down the networks, press CTRL+C
  2022-10-30 15:58:29.598 IST [fsc.integration] Serve -> INFO 04e Open another terminal to interact with the networks
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.553 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04a Successfully queried chaincode name 'erc' with definition (sequence 1, endorsement info: (Version: '1.0', plugin: 'essc', init required: false), validation info: (plugin: 'vscs', policy: '0a2812b120a080120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.554 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04d Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.1] 2022-10-30 15:58:51.578 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04e Successfully queried chaincode name 'erc' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.579 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04f Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
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  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.579 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04f Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.579 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04f Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.579 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04f Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.579 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04f Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.579 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04f Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.579 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04f Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
  [e][fabric.default-org1.org1.peer.0] 2022-10-30 15:58:51.579 IST [Lifecycle] QueryChaincodeDefinition -> INFO 04f Successfully queried chaincode name 'fpc-basic-asset-transfer' with definition (sequence 1, endorsement info: (Version: 'C75e2158f58333b0fa3187b08386c99b60457ad83beba33625a155ea', plugin: 'essc', init required: false), validation info: (plug in: 'vscs', policy: '0a2812b120a08012020800120208011a0b12099a0747267314d35351a0b12099a0747267324d35351), collections: ());
 
```

## To run the Hyperledger-explorer

in the browser window type: localhost:8080 in the login and password is admin

for next step use a new terminal

we will interact with the deployed FPC Chaincode using the FPC simple-cli-go.

Open a new terminal and firstly export the variable

```
export FPC_PATH=$GOPATH/src/github.com/hyperledger/fabric-private-chaincode
```

then Go to

```
cd $FPC_PATH/samples/application/simple-cli-go
```

run the following:

make

configure cli environment using followings:

```
source $FPC_PATH/samples/demos/hlgf22/details.env
source $FPC_PATH/samples/deployment/fabric-smart-client/the-simple-testing-network/env.sh Org1
```

then to get the FPC cli environment run the followings:

```
source Org1.env
```

to invoke a transaction

```
./fpccli invoke createAsset 101 blue 20 hart 100000
```

Here the createAsst in the function name and parameters are : 101 blue 20 hart 100000

we can see it in the transaction in the explorer

to query

./fpcclient query readAsset 101

you will see in the cli terminal window

```
> {"AppraisedValue":100000,"Color":"blue","ID":"101","Owner":"hart","Size":20}
```

we can verify the transaction on the transaction history in the hyperledger explorer.

we can see the three transactio on the chaincode

HYPERLEDGER

EXPLORER

DASHBOARD

NETWORK

BLOCKS

TRANSACTIONS

CHAINCODES

CHANNELS

testchannel

From	October 29, 2022 4:29 PM	To	October 30, 2022 4:29 PM	Select Orgs	Search	Reset	Clear Filter
Creator	Channel Name	Tx Id	Type	Chaincode	Timestamp		
Org1MSP	testchannel	7b82d9...	ENDORSER_TRANSACTION	fpc-basic-asset-transfer	2022-10-30T10:47:13.141Z		
Org1MSP	testchannel	a806f5...	ENDORSER_TRANSACTION	fpc-basic-asset-transfer	2022-10-30T10:46:56.681Z		
Org1MSP	testchannel	92eb21...	ENDORSER_TRANSACTION	fpc-basic-asset-transfer	2022-10-30T10:44:30.006Z		
Org1MSP	testchannel	3f5c6b...	ENDORSER_TRANSACTION	ercc	2022-10-30T10:27:41.341Z		
Org1MSP	testchannel	9f0d31...	ENDORSER_TRANSACTION	_lifecycle	2022-10-30T10:27:29.782Z		
Org2MSP	testchannel	7c8efe...	ENDORSER_TRANSACTION	_lifecycle	2022-10-30T10:27:21.666Z		
Org1MSP	testchannel	b75895...	ENDORSER_TRANSACTION	_lifecycle	2022-10-30T10:27:20.498Z		
Org1MSP	testchannel	042f65...	ENDORSER_TRANSACTION	_lifecycle	2022-10-30T10:27:09.133Z		
Org2MSP	testchannel	be0eaa...	ENDORSER_TRANSACTION	_lifecycle	2022-10-30T10:27:01.098Z		

Previous

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10 rows

Next

Hyperledger Explorer Client Version: 1.1.8 Fabric Compatibility: v2.3v1.4