PRACTICAL 6

AIM:

Install the development environment to set up the Hyperledger Composer Playground.

Tool Introduction:

1. Hyperledger Composer Playground–
   - o Hyperledger Composer is an extensive, open development toolset and framework to make developing blockchain applications easier. Our primary goal is to accelerate time to value, and make it easier to integrate your blockchain applications with the existing business systems. You can use Composer to rapidly develop use cases and deploy a blockchain solution in weeks rather than months. Composer allows you to model your business network and integrate existing systems and data with your blockchain applications.
   - o Hyperledger Composer supports the existing Hyperledger Fabric blockchain infrastructure and runtime, which supports pluggable blockchain consensus protocols to ensure that transactions are validated according to policy by the designated business network participants.
   - o Everyday applications can consume the data from business networks, providing end users with simple and controlled access points.
   - o You can use Hyperledger Composer to quickly model your current business network, containing your existing assets and the transactions related to them; assets are tangible or intangible goods, services, or property. As part of your business network model, you define the transactions which can interact with assets. Business networks also include the participants who interact with them, each of which can be associated with a unique identity, across multiple business networks.

Steps to install Hyperledger Composer Playground :

1. To install Hyperledger Composer Playground, first we have to install prerequisites for it. To install prerequisites run below command into ubuntu cmd/Terminal.
   1. curl -O https://hyperledger.github.io/composer/latest/prereqs-ubuntu.sh
   2. chmod u+x prereqs-ubuntu.sh
   3. ./prereqs-ubuntu.sh

2.   There are a few useful **CLI tools** for Composer developers. The most important one is **composer-cli**, which contains all the essential operations, so we'll install that first. Next, we'll also pick up **generator-hyperledger-composer**, **composer-rest-server** and **Yeoman**. Those last 3 are not core parts of the development environment, but they'll be useful if you're following the tutorials or developing applications that interact with your Business Network, so we'll get them installed now.

Note: you should not use su or sudo for the following npm commands.

3.   Essential CLI tools:
a.   npm install -g composer-cli@0.19

4.   Utility for running a REST Server on your machine to expose your business networks as RESTful APIs:
a.   npm install -g composer-rest-server@0.19

5.   Useful utility for generating application assets:
a.   npm install -g generator-hyperledger-composer@0.19

6.   Yeoman is a tool for generating applications, which utilises generator-hyperledger-composer:
a.   npm install -g yo

```
npm WARN deprecated uuid@3.4.0: Please upgrade  to version 7 or higher.  Older v
ersions may use Math.random() in certain circumstances, which is known to be pro
blematic.  See https://v8.dev/blog/math-random for details.
npm WARN deprecated request@2.88.2: request has been deprecated, see https://git
hub.com/request/request/issues/3142
npm WARN deprecated har-validator@5.1.5: this library is no longer supported
/home/rushit/.nvm/versions/node/v8.17.0/bin/yo -> /home/rushit/.nvm/versions/nod
e/v8.17.0/lib/node_modules/yo/lib/cli.js
/home/rushit/.nvm/versions/node/v8.17.0/bin/yo-complete -> /home/rushit/.nvm/ver
sions/node/v8.17.0/lib/node_modules/yo/lib/completion/index.js

> core-js@3.18.3 postinstall /home/rushit/.nvm/versions/node/v8.17.0/lib/node_mo
dules/yo/node_modules/core-js
> node -e "try{require('./postinstall')}catch(e){}"

Thank you for using core-js ( https://github.com/zloirock/core-js ) for polyfill
ing JavaScript standard library!

The project needs your help! Please consider supporting of core-js:
> https://opencollective.com/core-js
> https://patreon.com/zloirock
> https://paypal.me/zloirock
> bitcoin: bc1qlea7544qtsmi2ravg0lthvza9fau63ux0fstcz
```

7.   Now we will install playground. If you've already tried Composer online, you'll have seen the browser app "Playground". You can run this locally on your development machine too, giving you a UI for viewing and demonstrating your business networks.

8.   Browser app for simple editing and testing Business Networks:

a.   npm install -g composer-playground@0.19

```
npm WARN deprecated composer-playground@0.19.20: Hyperledger Composer has been d
eprecated. Please see the README for more details: https://github.com/hyperledge
r/composer/blob/master/README.md
npm WARN deprecated composer-wallet-inmemory@0.19.20: Hyperledger Composer has b
een deprecated. Please see the README for more details: https://github.com/hyper
ledger/composer/blob/master/README.md
npm WARN deprecated composer-wallet-filesystem@0.19.20: Hyperledger Composer has
 been deprecated. Please see the README for more details: https://github.com/hyp
erledger/composer/blob/master/README.md
npm WARN deprecated composer-common@0.19.20: Hyperledger Composer has been depre
cated. Please see the README for more details: https://github.com/hyperledger/co
mposer/blob/master/README.md
npm WARN deprecated composer-playground-api@0.19.20: Hyperledger Composer has be
en deprecated. Please see the README for more details: https://github.com/hyperl
edger/composer/blob/master/README.md
npm WARN deprecated axios@0.17.1: Critical security vulnerability fixed in v0.21
.1. For more information, see https://github.com/axios/axios/pull/3410
npm WARN deprecated mkdirp@0.5.1: Legacy versions of mkdirp are no longer suppor
ted. Please update to mkdirp 1.x. (Note that the API surface has changed to use
Promises in 1.x.)
npm WARN deprecated uuid@3.0.1: Please upgrade  to version 7 or higher.  Older v
```

9.   After installing playground, lets install hyperledger fabric.

10.   In a directory of your choice (we will assume ~/fabric-dev-servers), get the .tar.gz file that contains the tools to install Hyperledger Fabric:

a.   mkdir ~/fabric-dev-servers && cd ~/fabric-dev-servers

b.   curl   -O   https://raw.githubusercontent.com/hyperledger/composer-tools/master/packages/fabric-dev-servers/fabric-dev-servers.tar.gz

c.   tar -xvf fabric-dev-servers.tar.gz

```
package.json
_loader.sh
createComposerProfile.sh
createPeerAdminCard.sh
downloadFabric.sh
startFabric.sh
stopFabric.sh
teardownAllDocker.sh
teardownFabric.sh
fabric-scripts/hlfv1/
fabric-scripts/hlfv11/
fabric-scripts/hlfv12/
fabric-scripts/hlfv1/composer/
fabric-scripts/hlfv1/createComposerProfile.sh
fabric-scripts/hlfv1/createPeerAdminCard.sh
```

11.   Use the scripts you just downloaded and extracted to download a local Hyperledger Fabric v1.2 runtime:

a.   cd ~/fabric-dev-servers

b.   export FABRIC_VERSION=hlfv12

c.   ./downloadFabric.sh

```
Development only script for Hyperledger Fabric control
Running 'downloadFabric.sh'
FABRIC_VERSION is set to 'hlfv11'
FABRIC_START_TIMEOUT is unset, assuming 15 (seconds)
x86_64-1.1.0: Pulling from hyperledger/fabric-peer
1be7f2b886e8: Pull complete
6fbc4a21b806: Pull complete
c71a6f8e1378: Pull complete
4be3072e5a37: Pull complete
06c6d2f59700: Pull complete
4d536120d8a5: Pull complete
0baaf9ec263e: Pull complete
770563795186: Pull complete
15763b7bd14b: Pull complete
62f2823da7f3: Pull complete
Digest: sha256:57417699ddf50c5ebd47a9a2cc74c0324fbba0281eb1104b9ddd05a67776b01f
Status: Downloaded newer image for hyperledger/fabric-peer:x86_64-1.1.0
docker.io/hyperledger/fabric-peer:x86_64-1.1.0
x86_64-1.1.0: Pulling from hyperledger/fabric-ca
1be7f2b886e8: Already exists
```

12.   For the first time you start up a new runtime, you'll need to run the start script, then generate a PeerAdmin card:

a.   cd ~/fabric-dev-servers

b.   export FABRIC_VERSION=hlfv12

c.   ./startFabric.sh

d.   ./createPeerAdminCard.sh

```
Development only script for Hyperledger Fabric control
Running 'startFabric.sh'
FABRIC_VERSION is set to 'hlfv11'
FABRIC_START_TIMEOUT is unset, assuming 15 (seconds)
Removing network composer_default
WARNING: Network composer_default not found.
Creating network "composer_default" with the default driver
Creating ca.org1.example.com ...
Creating couchdb ...
Creating orderer.example.com ...
Creating ca.org1.example.com
Creating couchdb
Creating couchdb ... done
Creating peer0.org1.example.com ...
Creating peer0.org1.example.com ... done
sleeping for 15 seconds to wait for fabric to complete start up
```

```
Development only script for Hyperledger Fabric control
Running 'createPeerAdminCard.sh'
FABRIC_VERSION is set to 'hlfv11'
FABRIC_START_TIMEOUT is unset, assuming 15 (seconds)

Using composer-cli at v0.19.20

Successfully created business network card file to
        Output file: /tmp/PeerAdmin@hlfv1.card

Command succeeded


Successfully imported business network card
        Card file: /tmp/PeerAdmin@hlfv1.card
        Card name: PeerAdmin@hlfv1

Command succeeded

The following Business Network Cards are available:
```
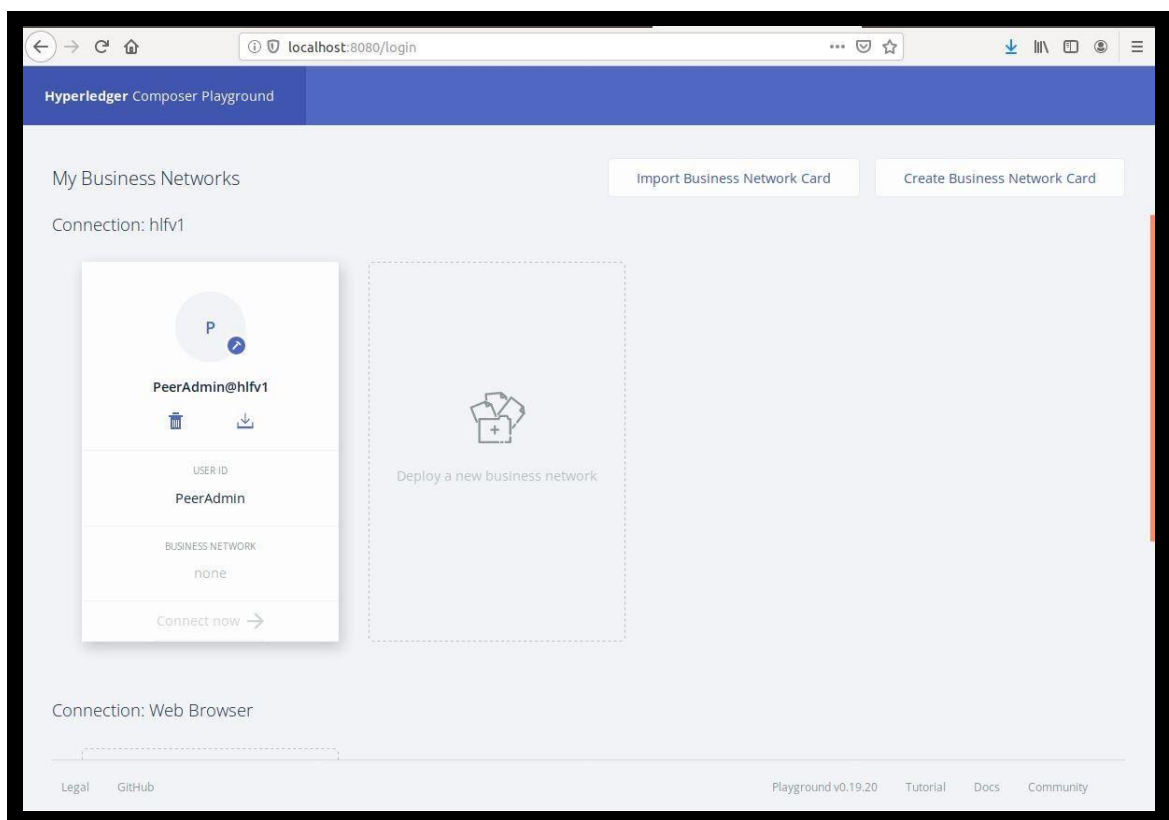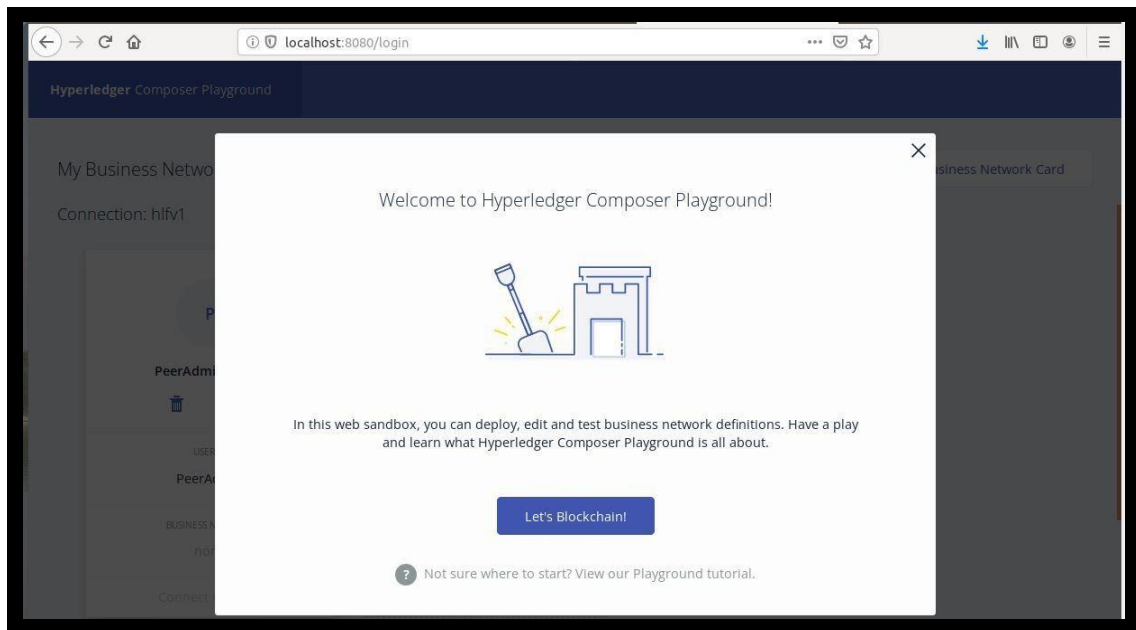
13.   To start the web app, run:
a.   composer-playground

```
2021-10-23T10:30:18.622Z INFO    :LoadModule                    :loadModule()
      Loading composer-wallet-filesystem from /home/rushit/.nvm/versions/node/v8
.17.0/lib/node_modules/composer-playground/node_modules/composer-wallet-filesyst
em {}$
2021-10-23T10:30:18.850Z INFO    :PlaygroundAPI                 :createServer()
      Playground API started on port 8080 {}$
```

14.   After running above step you will get an browser window that shown in the below images.

CONCLUSION:

In this practical, we learned about Hyperledger Composer Playground.