Hyperledger Fabric version 1.2.1

Ubuntu OS version 16.04.5 LTS (Xenial)

**MANUAL INSTALLATION**

These are the manual steps to install Hyperledger Fabric version 1.2.1. This process will create the following docker containers:

* Solo orderer: orderer.blockchain.org:7050
* CA: ca.blockchain.org:7054
* Peers:
  + peer0.org1.blockchain.org:7051
  + peer1.org1.blockchain.org:8051
* State database
  + couchdb0:5984
  + couchdb1:6984

The setup installs the chaincode “chaincode\_example02”, part of the Hyperledger Fabric samples, instantiates the chaincode, performs the query, invokes the chaincode, and verify the result with the final query.

**Prerequisites:**

Note: The installation of prerequisites is only required if the binaries do not exist in the default OS setup. The highlighted binaries below are required to run Hyperledger Fabric.

1. Clone the git repo. <https://github.com/daretobebetter/us-dlt.git>
2. Move the sub folder ledger to the installation directory /usr/local/
3. Install required Tools
   1. Node version 8.9.3
   2. NPM version 5.6.0
   3. Go Programming Language version 1.11.2
   4. libltdl7
   5. Python version 2.7.X
4. Add GO to the system path
5. Install the Docker Prerequisites
   1. apt-transport-https
   2. ca-certificates
   3. curl
   4. gnupg-agent
   5. software-properties-common
6. Add docker repo:
   1. curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add –
   2. add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu $(lsb\_release -cs) stable"
7. Install Docker:
   1. docker-ce version 18.06.1
   2. ~~docker-ce-cli version 18.06.1~~
   3. ~~containerd.io version 18.06.1~~
8. Install Docker Compose
   1. % sudo curl -L "https://github.com/docker/compose/releases/download/1.23.1/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
   2. % sudo chmod +x /usr/local/bin/docker-compose
9. Verify binaries, specifically the versions of:
   1. docker
   2. docker-compose
   3. go version
   4. node
   5. npm
   6. python

**Hyperledger Fabric:**

1. Install the samples and binaries for Hyperledger Fabric
   1. % sudo tar -C /usr/local -zxvf ./hyperledger-fabric-1.2.1.tar.gz
2. Go to the directory where the fabric is installed
   1. % cd /usr/local/hyperledger/fabric/network
3. Generate the genesis artifacts
   1. % sudo ./byfn generate
4. Start the fabric network. Note: in this example, the fabric is configured as a single organization with two peers. The script will build the docker containers for the solo orderer, two peers for the single organization, and the database (couchdb). Then, it installs an example chaincode, instantiates the chaincode, performs a sample query, invokes the chaincode to perform changes to the data, then performs the query to verify the changes
   1. % sudo ./byfn up -l node -s couchdb

**Hyperledger Fabric Network simple operations:**

1. Shutdown the network, maintaining containers and data
   1. % sudo docker stop $(docker ps -q)
2. Start the network after stopping the containers
   1. % sudo docker start $(docker ps -aq)
3. Bring down the network and remove the containers and data and all artifacts
   1. % cd /usr/local/hyperledger/fabric/network
   2. % sudo ./byfn.sh down
4. Bring up the new network with genesis artifacts
   1. % cd /usr/local/hyperledger/fabric/network
   2. % sudo ./byfn.sh generate
   3. % sudo ./byfn.sh up -l node -s couchdb
5. Install the new chaincode
   1. Copy the new chaincode into the chaincode directory (based on nodejs)
      1. % sudo cp /usr/local/hyperledger/fabric/chaincode/<chaincode-name>/node/<chaincode source>
   2. Install the new chaincode
      1. % sudo docker exec -e "CORE\_PEER\_LOCALMSPID=Org1MSP" -e "CORE\_PEER\_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org1.blockchain.org/users/Admin@org1.blockchain.org/msp" cli peer chaincode install -n <chaincode-name> -v 1.0 -l node -p /opt/gopath/src/github.com/chaincode/<chaincode-name/node
6. Instantiate the new chaincode
   1. % sudo docker exec cli peer chaincode instantiate -o orderer.blockchain.org:7050 --tls true --cafile /opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/ordererOrganizations/blockchain.org/orderers/orderer.blockchain.org/msp/tlscacerts/tlsca.blockchain.org-cert.pem -C mychannel -n <chaincode-name> -l node -v 1.0 -c '{"Args":["init"]}' -P “OR (‘Org1MSP.member’)”