

- tls服务上注册peer身份

```
- export FABRIC_CA_CLIENT_TLS_CERTFILES=/home/ubuntu/fabric/tls-ca/crypto/tls-ca-cert.pem

- export FABRIC_CA_CLIENT_HOME=/home/ubuntu/fabric/tls-ca/admin

- fabric-ca-client register --id.name PB20000096_v5 --id.secret pty --id.type peer -u https://172.16.4.35:7052
```

- 请求证书

```
- export FABRIC_CA_CLIENT_MSPDIR=/home/ubuntu/fabric/org1/peer2/tls-msp

- fabric-ca-client enroll -d -u https://PB20000096_v5:pty@172.16.4.35:7052 --enrollment.profile tls --csr.hosts PB20000096_v5
```

- 注册组织的peer身份

```
- export FABRIC_CA_CLIENT_TLS_CERTFILES=/home/ubuntu/fabric/org1/ca/crypto/ca-cert.pem

- export FABRIC_CA_CLIENT_HOME=/home/ubuntu/fabric/org1/ca/admin

- fabric-ca-client register --id.name PB20000096_v5 --id.secret pty --id.type peer -u https://172.16.4.35:7054 --csr.hosts PB20000096_v5
```

- unset 并请求证书

```
- export FABRIC_CA_CLIENT_MSPDIR=

- export FABRIC_CA_CLIENT_MSPDIR=/home/ubuntu/fabric/org1/peer2/msp

- fabric-ca-client enroll -u https://PB20000096_v5:pty@172.16.4.35:7054
```

- 把keystore下的文件存储为证书

- mv tls-msp/keystore/\*\_sk tls-msp/keystore/key.pem

- mv msp/keystore/\*\_sk msp/keystore/key.pem

```
ubuntu@pty:~/fabric/org1/peer2$ tree
```

```
.
├── msp
│   ├── IssuerPublicKey
│   ├── IssuerRevocationPublicKey
│   ├── cacerts
│   │   └── 172-16-4-35-7054.pem
│   ├── keystore
│   │   └── key.pem
│   ├── signcerts
│   │   └── cert.pem
│   └── user
└── tls-msp
    ├── IssuerPublicKey
    ├── IssuerRevocationPublicKey
    ├── cacerts
    ├── keystore
    │   └── key.pem
    ├── signcerts
    │   └── cert.pem
    ├── tlscacerts
    │   └── tls-172-16-4-35-7052.pem
    └── user
```

- 查看 pem 证书

```
ubuntu@pty:~/fabric/org1/peer2$ openssl x509 -in ./msp/signcerts/cert.
pem -text
Certificate:
    Data:
        Version: 3 (0x2)
        Serial Number:
            6e:a7:62:79:c8:1e:80:35:89:8b:39:19:f3:8c:31:06:b0:87:5d:c
1
        Signature Algorithm: ecdsa-with-SHA256
        Issuer: C = US, ST = North Carolina, O = Hyperledger, OU = Fab
ric, CN = ca-org1
        Validity
            Not Before: May 18 14:25:00 2022 GMT
            Not After : Jun 26 09:22:00 2023 GMT
        Subject: C = US, ST = North Carolina, O = Hyperledger, OU = pe
er, CN = PB20000096_v5
        Subject Public Key Info:
            Public Key Algorithm: id-ecPublicKey
            Public-Key: (256 bit)
            pub:
                04:6e:32:f3:5e:02:0d:7f:7a:bf:da:15:2c:64:52:
                54:f0:14:40:4f:a8:f6:c4:4c:7f:67:85:a7:d0:b8:
                96:bf:ff:bb:57:34:8b:12:3d:1c:a2:82:45:4d:57:
                cf:3b:bb:0d:e0:c9:92:1a:99:86:27:82:74:71:cc:
                d8:86:4f:ba:e1
            ASN1 OID: prime256v1
            NIST CURVE: P-256
        X509v3 extensions:
            X509v3 Key Usage: critical
                Digital Signature
            X509v3 Basic Constraints: critical
                CA:FALSE
            X509v3 Subject Key Identifier:
                44:F2:5F:47:73:84:70:18:C0:4F:B0:17:41:B9:24:31:E6:91:
5E:17
```

- 配置org1/msp

```
cp /home/ubuntu/fabric/org1/admin/msp/signcerts/cert.pem
org1/msp/admincerts/admin-org1-cert.pem

cp /home/ubuntu/fabric/org1/ca/crypto/ca-cert.pem org1/msp/cacerts/org1-ca-
cert.pem

cp /home/ubuntu/fabric/org1/peer2/assets/tls-ca/tls-ca-cert.pem
org1/msp/tlscacerts/tls-ca-cert.pem
```

- 其中 peer2/assets/tls-ca/tls-ca-cert.pem 证书来源为

```
ubuntu@pty:~/fabric/org1/peer2$ tree
```

```
.
├── assets
│   └── tls-ca
│       └── tls-ca-cert.pem
├── docker-compose
│   └── docker-compose.yml
├── msp
│   ├── IssuerPublicKey
│   ├── IssuerRevocationPublicKey
│   ├── cacerts
│   │   └── 172-16-4-35-7052.pem
│   ├── config.yaml
│   ├── keystore
│   │   └── key.pem
│   ├── signcerts
│   │   └── cert.pem
│   └── user
├── tls-msp
│   ├── IssuerPublicKey
│   ├── IssuerRevocationPublicKey
│   ├── cacerts
│   ├── keystore
│   │   └── key.pem
│   ├── signcerts
│   │   └── cert.pem
│   ├── tlscacerts
│   │   └── tls-172-16-4-35-7052.pem
│   └── user
```

- 配置结果目录

```
ubuntu@pty:~/fabric/org1/msp$ tree
```

```
.
├── admincerts
│   └── admin-org1-cert.pem
├── cacerts
│   └── org1-ca-cert.pem
└── tlscacerts
    └── tls-ca-cert.pem
```

- 配置config.yaml证书

org1/admin/msp下:  
cacerts/172-16-4-35-7054.pem

org1/msp下:

```
cacerts/org1-ca-cert.pem
```

```
peer2/msp下:
```

```
cacerts/172-16-4-35-7054.pem
```

- 启动peer服务

按照要求编辑docker-compose.yml

```
version: "3"
networks:
  fabric-ca:
    external:
      name: fabric-ca
services:
  PB20000096_v5:

    container_name: PB20000096_v5
    image: hyperledger/fabric-peer:amd64-2.2.0
    environment:
      - GOPROXY=https://goproxy.cn,direct
      - GO111MODULE=on

      - CORE_PEER_ID=org-peer
      - CORE_PEER_ADDRESS=PB20000096_v5:7051
      - CORE_PEER_LOCALMSPID=org1MSP

      - CORE_PEER_MSPCONFIGPATH=/etc/hyperledger/org1/peer2/msp
      - CORE_VM_ENDPOINT=unix:///host/var/run/docker.sock
      - CORE_VM_DOCKER_ATTACHSTDOUT=true
      - CORE_VM_DOCKER_HOSTCONFIG_NETWORKMODE=fabric-ca
      - CORE_PEER_TLS_ENABLED=true

      - CORE_PEER_TLS_CERT_FILE=/etc/hyperledger/org1/peer2/tls-
msp/signcerts/cert.pem

      - CORE_PEER_TLS_KEY_FILE=/etc/hyperledger/org1/peer2/tls-
msp/keystore/key.pem

      - CORE_PEER_TLS_ROOTCERT_FILE=/etc/hyperledger/org1/peer2/tls-
msp/tlscacerts/tls-172-16-4-35-7052.pem

      - CORE_PEER_GOSSIP_USELEADERELECTION=false
      - CORE_PEER_GOSSIP_ORGLEADER=true

      - CORE_PEER_GOSSIP_EXTERNALENDPOINT=PB20000096_v5:7051
      - CORE_PEER_GOSSIP_SKIPHANDSHAKE=true
    working_dir: /opt/gopath/src/github.com/hyperledger/fabric/org1/peer2
```

```
volumes:
  - /var/run:/host/var/run

  - /home/ubuntu/fabric/org1/peer2:/etc/hyperledger/org1/peer2
networks:
  - fabric-ca
```

- 启动docker容器
  - docker-compose up -d
- 观察日志, 启动成功

```
2022-06-26 12:13:17.104 UTC [nodeCmd] serve -> INFO 01b Starting peer with ID=[org-peer]
, network ID=[dev], address=[PB20000096_v5:7051]
2022-06-26 12:13:17.125 UTC [nodeCmd] serve -> INFO 01c Started peer with ID=[org-peer],
network ID=[dev], address=[PB20000096_v5:7051]
```

- 配置cli/docker-compose.yml

```
version: "3"
networks:
  fabric-ca:
    external:
      name: fabric-ca
services:
  cli-org1:
    container_name: cli-org1
    image: hyperledger/fabric-tools:amd64-2.2.0
    tty: true
    stdin_open: true
    environment:
      - GOPROXY=https://goproxy.cn,direct
      - GO111MODULE=on
      - GOPATH=/opt/gopath
      - CORE_VM_ENDPOINT=unix:///host/var/run/docker.sock
      - FABRIC_LOGGING_SPEC=DEBUG
      - CORE_PEER_ID=cli-org1

      - CORE_PEER_ADDRESS=PB20000096_v5:7051
      - CORE_PEER_LOCALMSPID=org1MSP
      - CORE_PEER_TLS_ENABLED=true

      - CORE_PEER_TLS_ROOTCERT_FILE=/etc/hyperledger/org1/peer2/tls-
msp/tlscacerts/tls-172-16-4-35-7052.pem

      - CORE_PEER_TLS_CERT_FILE=/etc/hyperledger/org1/peer2/tls-
msp/signcerts/cert.pem

      - CORE_PEER_TLS_KEY_FILE=/etc/hyperledger/org1/peer2/tls-
msp/keystore/key.pem
      - CORE_PEER_MSPCONFIGPATH=/etc/hyperledger/org1/peer2/msp
```

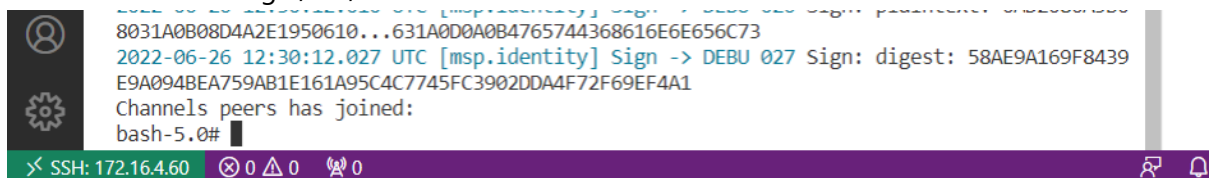
```

working_dir: /opt/gopath/src/github.com/hyperledger/fabric/org1
command: /bin/bash
volumes:
  - /home/ubuntu/fabric/org1/peer2:/etc/hyperledger/org1/peer2
  - /home/ubuntu/fabric/org1/peer2/assets/chaincode:/opt/gopath/src/github.com/hyperledger/fabric-samples/chaincode
  - /home/ubuntu/fabric/org1/admin:/etc/hyperledger/org1/admin
networks:
  - fabric-ca

```

- 启动docker并将节点加入通道

- docker-compose up -d
- docker exec -it cli-org1 /bin/bash



- 设置身份并检查结果

```

export CORE_PEER_MSPCONFIGPATH=/etc/hyperledger/org1/admin/msp
//添加通道对应的区块
peer channel join -b mychannel.block
//查看加入的通道
peer channel list

```

```
[[Pb19151776:7051] [admin2:7051] [peer2-org1:7051] [peer1-org1:7051] [PB19051069:7052 PB
19051069:7051] [PB19000352:7052 PB19000352:7051] [PB20000025_cckk:7051] [p19051068:7052
p19051068:7051]]]
2022-06-26 14:55:38.860 UTC [gossip.comm] sendToEndpoint -> WARN 596d Failed obtaining c
onnection for p19051068:7051, PKIId:ac16ddebfd24703c59d804e8961bc6ef13805d8da3d386dfa38a4
181322e735d4 reason: context deadline exceeded
2022-06-26 14:55:38.862 UTC [gossip.discovery] expireDeadMembers -> WARN 596e Entering [
ac16ddebfd24703c59d804e8961bc6ef13805d8da3d386dfa38a4181322e735d4]
2022-06-26 14:55:38.862 UTC [gossip.discovery] expireDeadMembers -> WARN 596f Closing co
nnection to Endpoint: p19051068:7052, InternalEndpoint: p19051068:7051, PKI-ID: ac16ddeb
fd24703c59d804e8961bc6ef13805d8da3d386dfa38a4181322e735d4, Metadata:
2022-06-26 14:55:38.862 UTC [gossip.discovery] expireDeadMembers -> WARN 5970 Exiting
2022-06-26 14:55:38.869 UTC [gossip.comm] sendToEndpoint -> WARN 5971 Failed obtaining c
onnection for admin2:7051, PKIId:1ee842e5ba778a0de6adde2856a0d1768fd9bfe718b69bc3d3a4afa
3e1ce8f94 reason: context deadline exceeded
2022-06-26 14:55:38.869 UTC [gossip.discovery] expireDeadMembers -> WARN 5972 Entering [
1ee842e5ba778a0de6adde2856a0d1768fd9bfe718b69bc3d3a4afa3e1ce8f94]
2022-06-26 14:55:38.869 UTC [gossip.discovery] expireDeadMembers -> WARN 5973 Closing co
nnection to Endpoint: admin2:7051, InternalEndpoint: admin2:7051, PKI-ID: 1ee842e5ba778a
0de6adde2856a0d1768fd9bfe718b69bc3d3a4afa3e1ce8f94, Metadata:
2022-06-26 14:55:38.869 UTC [gossip.discovery] expireDeadMembers -> WARN 5974 Exiting
2022-06-26 14:55:39.819 UTC [gossip.comm] sendToEndpoint -> WARN 5975 Failed obtaining c
onnection for PB19051069:7051, PKIId:5f3c843f50758e8256cd59e2e2f4edbf5e5be1ab998192a3ac7
31453064eac86 reason: context deadline exceeded
2022-06-26 14:55:39.820 UTC [gossip.discovery] expireDeadMembers -> WARN 5976 Entering [
5f3c843f50758e8256cd59e2e2f4edbf5e5be1ab998192a3ac731453064eac86]
2022-06-26 14:55:39.820 UTC [gossip.discovery] expireDeadMembers -> WARN 5977 Closing co
nnection to Endpoint: PB19051069:7052, InternalEndpoint: PB19051069:7051, PKI-ID: 5f3c84
3f50758e8256cd59e2e2f4edbf5e5be1ab998192a3ac731453064eac86, Metadata:
2022-06-26 14:55:39.820 UTC [gossip.discovery] expireDeadMembers -> WARN 5978 Exiting
2022-06-26 14:55:39.855 UTC [gossip.comm] sendToEndpoint -> WARN 5979 Failed obtaining c
onnection for PB19071503:7051, PKIId:2ac4d108c864e47d0fbfd9bd6f848ba87b0911ff2f03f0ee6fe
05485da848e30 reason: context deadline exceeded
2022-06-26 14:55:39.864 UTC [gossip.comm] sendToEndpoint -> WARN 597a Failed obtaining c
onnection for PB19111700_3:7051, PKIId:17bb5b4b36a4f816fbd2e9af755eff75524ed90c04fcfeec4
705d1ffefe5bd6d reason: context deadline exceeded
2022-06-26 14:55:39.866 UTC [gossip.comm] sendToEndpoint -> WARN 597b Failed
```

如图所示，图中的区块已加入账本中，正在通过gossip协议进行传播