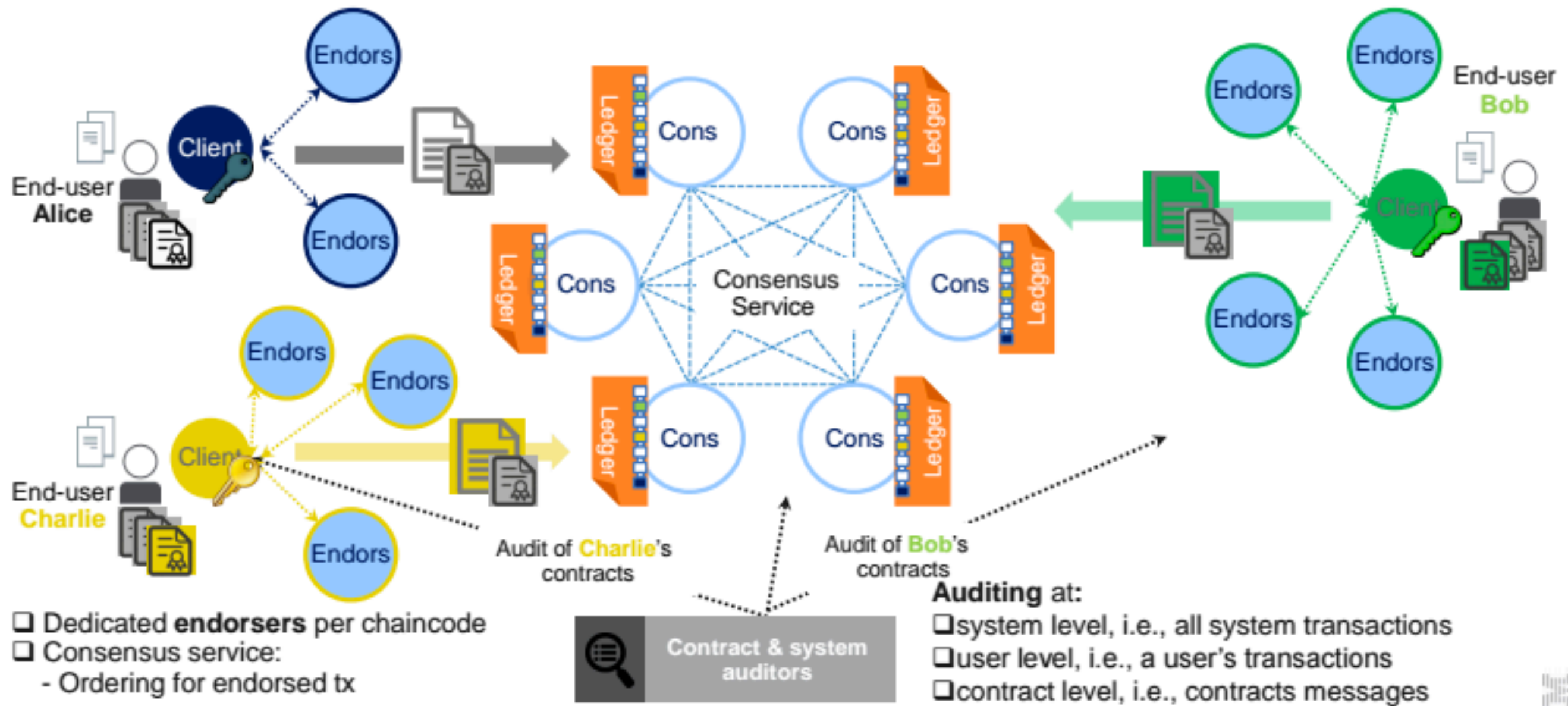


Fabric v1.0.1 區塊鏈部 署實務

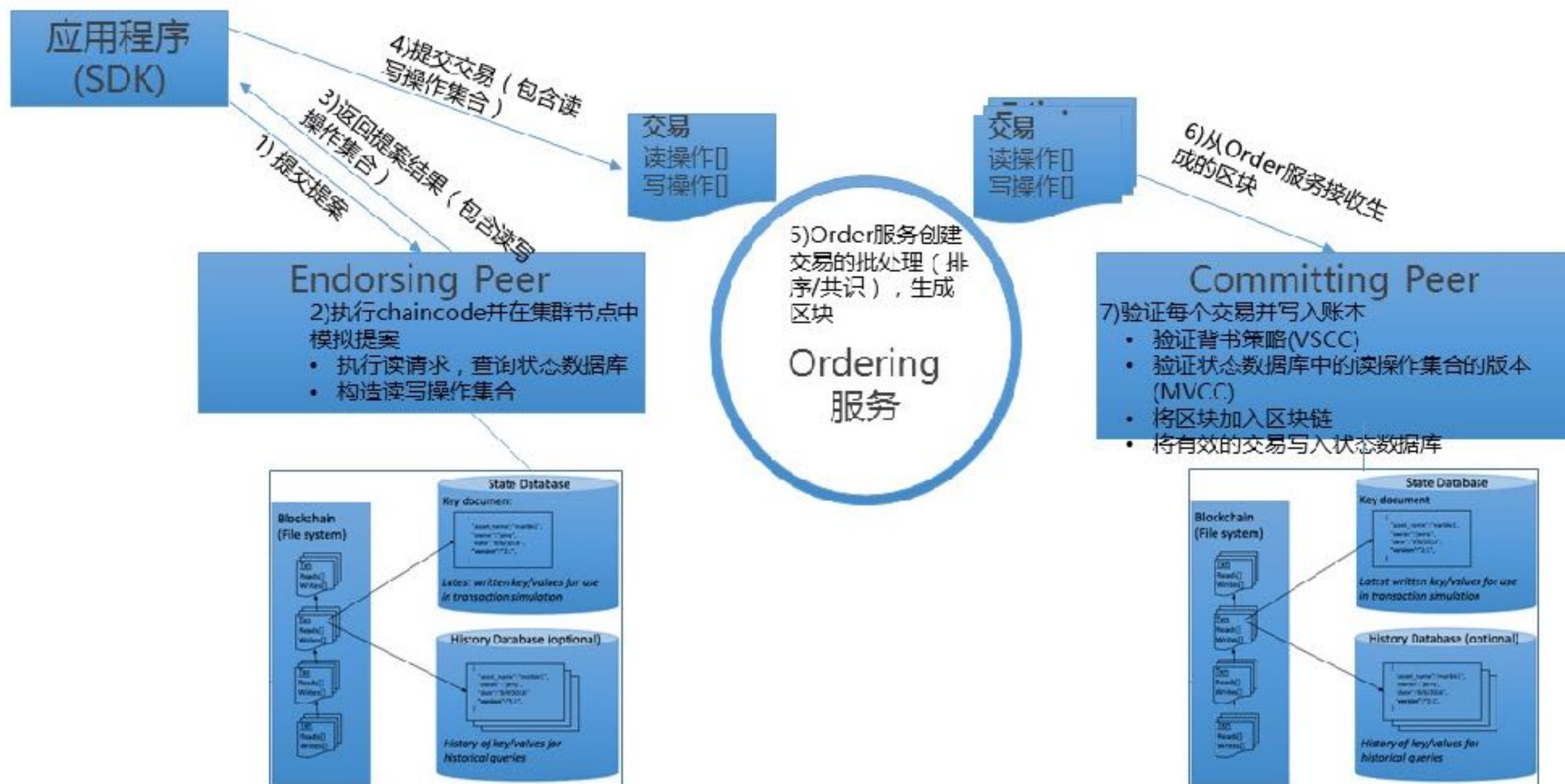
盧瑞山 教授

Fabric network (v1.0.0 alpha)

Separating transaction endorsement from consensus



Fabric 1.0 交易的完整生命周期（流程图）



Binary code download

- `curl -sSL https://goo.gl/eYdRbX | bash`

```
rslu@hyperledger-fabrice-0-6-4peer:~/bin$ ls
configtxgen configtxlator cryptogen get-byfn.sh get-docker-images.sh orderer peer
rslu@hyperledger-fabrice-0-6-4peer:~/bin$ ls -l
total 81540
-rwxrwxr-x 1 rslu rslu 15247600 Aug 10 10:43 configtxgen
-rwxrwxr-x 1 rslu rslu 16710031 Aug 10 10:43 configtxlator
-rwxrwxr-x 1 rslu rslu  7657096 Aug 10 10:43 cryptogen
-rwxrwxr-x 1 rslu rslu    441 Aug 10 10:43 get-byfn.sh
-rwxrwxr-x 1 rslu rslu    757 Aug 10 10:43 get-docker-images.sh
-rwxrwxr-x 1 rslu rslu 20450203 Aug 10 10:43 orderer
-rwxrwxr-x 1 rslu rslu 23412781 Aug 10 10:43 peer
rslu@hyperledger-fabrice-0-6-4peer:~/bin$
```


Docker images

```
==> List out hyperledger docker images
```

hyperledger/fabric-ca	latest	5f30bda5f7ee	7 days ago	238MB
hyperledger/fabric-ca	x86_64-1.0.1	5f30bda5f7ee	7 days ago	238MB
hyperledger/fabric-tools	latest	259847d24868	7 days ago	1.34GB
hyperledger/fabric-tools	x86_64-1.0.1	259847d24868	7 days ago	1.34GB
hyperledger/fabric-couchdb	latest	dd645e1e92c7	7 days ago	1.48GB
hyperledger/fabric-couchdb	x86_64-1.0.1	dd645e1e92c7	7 days ago	1.48GB
hyperledger/fabric-kafka	latest	cbdc916590a0	7 days ago	1.3GB
hyperledger/fabric-kafka	x86_64-1.0.1	cbdc916590a0	7 days ago	1.3GB
hyperledger/fabric-zookeeper	latest	eb07e5cc9674	7 days ago	1.31GB
hyperledger/fabric-zookeeper	x86_64-1.0.1	eb07e5cc9674	7 days ago	1.31GB
hyperledger/fabric-orderer	latest	bbf2708c9487	7 days ago	179MB
hyperledger/fabric-orderer	x86_64-1.0.1	bbf2708c9487	7 days ago	179MB
hyperledger/fabric-peer	latest	abb05def5cfb	7 days ago	182MB
hyperledger/fabric-peer	x86_64-1.0.1	abb05def5cfb	7 days ago	182MB
hyperledger/fabric-javaenv	latest	2bd60859415d	7 days ago	1.42GB
hyperledger/fabric-javaenv	x86_64-1.0.1	2bd60859415d	7 days ago	1.42GB
hyperledger/fabric-ccenv	latest	7e2019cf8174	7 days ago	1.29GB
hyperledger/fabric-ccenv	x86_64-1.0.1	7e2019cf8174	7 days ago	1.29GB

```
sudo apt-get install docker-compose
```

```
git clone https://github.com/hyperledger/fabric-samples.git
```

```
cd fabric-samples
```

```
cd first-network
```

`./byfn.sh -m generate`

```
rslu@hyperledger-fabrice-0-6-4peer:~/fabric-samples/first-network$ ./byfn.sh -m generate
Generating certs and genesis block for with channel 'mychannel' and CLI timeout of '10000'
Continue (y/n)? y
proceeding ...
/home/rslu/bin/cryptogen

#####
##### Generate certificates using cryptogen tool #####
#####
org1.example.com
org2.example.com

/home/rslu/bin/configtxgen
#####
##### Generating Orderer Genesis block #####
#####
2017-08-17 14:31:05.900 UTC [common/configtx/tool] main -> INFO 001 Loading configuration
2017-08-17 14:31:05.923 UTC [common/configtx/tool] doOutputBlock -> INFO 002 Generating genesis block
2017-08-17 14:31:05.924 UTC [common/configtx/tool] doOutputBlock -> INFO 003 Writing genesis block

#####
### Generating channel configuration transaction 'channel.tx' ###
#####
2017-08-17 14:31:05.939 UTC [common/configtx/tool] main -> INFO 001 Loading configuration
2017-08-17 14:31:05.942 UTC [common/configtx/tool] doOutputChannelCreateTx -> INFO 002 Generating new channel configtx
2017-08-17 14:31:05.942 UTC [common/configtx/tool] doOutputChannelCreateTx -> INFO 003 Writing new channel tx

#####
##### Generating anchor peer update for Org1MSP #####
#####
2017-08-17 14:31:05.956 UTC [common/configtx/tool] main -> INFO 001 Loading configuration
2017-08-17 14:31:05.959 UTC [common/configtx/tool] doOutputAnchorPeersUpdate -> INFO 002 Generating anchor peer update
2017-08-17 14:31:05.959 UTC [common/configtx/tool] doOutputAnchorPeersUpdate -> INFO 003 Writing anchor peer update

#####
##### Generating anchor peer update for Org2MSP #####
#####
2017-08-17 14:31:05.974 UTC [common/configtx/tool] main -> INFO 001 Loading configuration
2017-08-17 14:31:05.977 UTC [common/configtx/tool] doOutputAnchorPeersUpdate -> INFO 002 Generating anchor peer update
2017-08-17 14:31:05.977 UTC [common/configtx/tool] doOutputAnchorPeersUpdate -> INFO 003 Writing anchor peer update
```


./byfn.sh -m up

```
rs1u@hyperledger-fabrice-0-6-4peer:~/fabric-samples/first-network$ ./byfn.sh -n up
Starting with channel 'mychannel' and CLI timeout of '10000'
Continue (y/n)? y
proceeding ...
Creating peer0.org2.example.com
Creating peer1.org2.example.com
Creating peer1.org1.example.com
Creating orderer.example.com
Creating peer0.org1.example.com
Creating cli
```

START

Build your first network (BYFN) end-to-end test

Channel name : mychannel

Creating channel...

CORE_PEER_TLS_ROOTCERT_FILE=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org1.example.com/peers/peer0.org1.example.com/tls/ca.crt

CORE_PEER_TLS_KEY_FILE=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org1.example.com/peers/peer0.org1.example.com/tls/server.key

CORE_PEER_LOCALMSPID=Org1MSP

CORE_VM_ENDPOINT=unix:///host/var/run/docker.sock

CORE_PEER_TLS_CERT_FILE=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org1.example.com/peers/peer0.org1.example.com/tls/server.crt

CORE_PEER_TLS_ENABLED=true

CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org1.example.com/users/Admin@org1.example.com/msp

CORE_PEER_ID=cli

CORE_LOGGING_LEVEL=DEBUG

CORE_PEER_ADDRESS=peer0.org1.example.com:7051

2017-08-17 14:56:41.034 UTC [msp] SetLocalMSP -> DEBU 001 Returning existing local MSP

2017-08-17 14:56:41.034 UTC [msp] SetDefaultSigningIdentity -> DEBU 002 Obtaining default signing identity

2017-08-17 14:56:41.037 UTC [channelCmd] InitCmdFactory -> INFO 003 Endorser and orderer connections initialized

2017-08-17 14:56:41.037 UTC [msp] SetLocalMSP -> DEBU 004 Returning existing local MSP

2017-08-17 14:56:41.037 UTC [msp] SetDefaultSigningIdentity -> DEBU 005 Obtaining default signing identity

2017-08-17 14:56:41.037 UTC [msp] SetLocalMSP -> DEBU 006 Returning existing local MSP

2017-08-17 14:56:41.037 UTC [msp] SetDefaultSigningIdentity -> DEBU 007 Obtaining default signing identity

2017-08-17 14:56:41.037 UTC [msp/identity] Sign -> DEBU 008 Sign: plaintext: QABC060A074F7267314D53501280D62D...53616D706C65436F6E736F727469756D

`./byfn.sh -m up`

```
===== Chaincode is installed on remote peer PEER3 =====

Querying chaincode on org2/peer3...
===== Querying on PEER3 on channel 'mychannel'... =====
CORE_PEER_TLS_ROOTCERT_FILE=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org2.example.com/peers/peer0.org2.example.com/tls/ca.crt
CORE_PEER_TLS_KEY_FILE=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org1.example.com/peers/peer0.org1.example.com/tls/server.key
CORE_PEER_LOCALMSPID=Org2MSP
CORE_VM_ENDPOINT=unix:///host/var/run/docker.sock
CORE_PEER_TLS_CERT_FILE=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org1.example.com/peers/peer0.org1.example.com/tls/server.crt
CORE_PEER_TLS_ENABLED=true
CORE_PEER_MSPCONFIGPATH=/opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/peerOrganizations/org2.example.com/users/Admin@org2.example.com/msp
CORE_PEER_ID=cli
CORE_LOGGING_LEVEL=DEBUG
CORE_PEER_ADDRESS=peer1.org2.example.com:7051
Attempting to Query PEER3 ...3 secs

2017-08-17 14:57:17.565 UTC [msp] GetLocalMSP -> DEBU 001 Returning existing local MSP
2017-08-17 14:57:17.565 UTC [msp] GetDefaultSigningIdentity -> DEBU 002 Obtaining default signing identity
2017-08-17 14:57:17.565 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 003 Using default escc
2017-08-17 14:57:17.565 UTC [chaincodeCmd] checkChaincodeCmdParams -> INFO 004 Using default vscc
2017-08-17 14:57:17.565 UTC [msp/identity] Sign -> DEBU 005 Sign: plaintext: 0A95070A6708031A0C08CEDDDD5CC0510...6D7963631A0A0A0571756572790A0161
2017-08-17 14:57:17.565 UTC [msp/identity] Sign -> DEBU 006 Sign: digest: 4215E31A1C53BA09848D3814177B92F51EDEDCA20CA270C19A5C0D143CC891C6
Query Result: 90
2017-08-17 14:57:26.386 UTC [main] main -> INFO 007 Exiting.....
===== Query on PEER3 on channel 'mychannel' is successful =====

===== All GOOD, BYFN execution completed =====
```

END

docker ps

```
rs1u@hyperledger-fabrice-0-6-4pear:~$ docker ps
```

CONTAINER ID	IMAGE	PORTS	NAMES	COMMAND	CREATED
cffd0ca02a9b	dev-peer1.org2.example.com-mycc-1.0-26c2ef32338554aac4f7ad6f100aca865e87959c9a125e86d764c8d01f8346ab		dev-peer1.org2.example.com-mycc-1.0	"chaincode -peer.a..."	4 minutes ago
Up 4 minutes					
odaafcdald6d9	dev-peer0.org1.example.com-mycc-1.0-384f11f434b9302df90b453200cfb25174305fce8f53f4e94d45ee3b6cab0ce9		dev-peer0.org1.example.com-mycc-1.0	"chaincode -peer.a..."	4 minutes ago
Up 4 minutes					
eea01c5c1149	dev-peer0.org2.example.com-mycc-1.0-15b571b3ce849066b7ec74497da3b27e54e0df1345daff3951b94245ce09c42b		dev-peer0.org2.example.com-mycc-1.0	"chaincode -peer.a..."	5 minutes ago
Up 5 minutes					
406b62e832e5	hyperledger/fabric-tools		cli	"/bin/bash -c './s..."	5 minutes ago
Up 5 minutes					
a8870c14d2d8	hyperledger/fabric-peer			"peer node start"	5 minutes ago
Up 5 minutes		0.0.0.0:8051->7051/tcp, 0.0.0.0:8053->7053/tcp	peer1.org1.example.com		
39e6f6c1ae01	hyperledger/fabric-peer			"peer node start"	5 minutes ago
Up 5 minutes		0.0.0.0:7051->7051/tcp, 0.0.0.0:7053->7053/tcp	peer0.org1.example.com		
0f7a17fc1e59	hyperledger/fabric-peer			"peer node start"	5 minutes ago
Up 5 minutes		0.0.0.0:10051->7051/tcp, 0.0.0.0:10053->7053/tcp	peer1.org2.example.com		
a2809aff3724	hyperledger/fabric-orderer			"orderer"	5 minutes ago
Up 5 minutes		0.0.0.0:7050->7050/tcp	orderer.example.com		
baa493881a88	hyperledger/fabric-peer			"peer node start"	5 minutes ago
Up 5 minutes		0.0.0.0:9051->7051/tcp, 0.0.0.0:9053->7053/tcp	peer0.org2.example.com		

./byfn.sh -m down

```
rslu@hyperledger-fabrice-0-6-4peer:~/fabric-samples/first-network$ ./byfn.sh -m down
Stopping with channel 'mychannel' and CLI timeout of '10000'
Continue (y/n)? y
proceeding ...
WARNING: The CHANNEL_NAME variable is not set. Defaulting to a blank string.
WARNING: The TIMEOUT variable is not set. Defaulting to a blank string.
Stopping cli ... done
Stopping peer1.org1.example.com ... done
Stopping peer0.org1.example.com ... done
Stopping peer1.org2.example.com ... done
Stopping orderer.example.com ... done
Stopping peer0.org2.example.com ... done
Removing cli ... done
Removing peer1.org1.example.com ... done
Removing peer0.org1.example.com ... done
Removing peer1.org2.example.com ... done
Removing orderer.example.com ... done
Removing peer0.org2.example.com ... done
Removing network net_byfn
cffd0ca02a9b
cdaafdald6d9
eea01c5c1149
Untagged: dev-peer1.org2.example.com-mycc-1.0-26c2ef32838554aac4f7ad6f100aca865e87959c9a126e86d764c8d01f8346ab:latest
Deleted: sha256:9227825d684159e847a1ee0bb83e4194a426c7aea83b4fe3c9406849bb89036e
Deleted: sha256:d5c049349f2e32e13b05f6e660143dd3c8bc60427d009e0f4b610fb54d2696ab
Deleted: sha256:9625d5893114c5717da4c3bd0a8a0716e1c7f02aa1fe959b54208a885da800cb
Deleted: sha256:28a687681e5d10915995cd98ed7a3731d5408986439b3c288c7aabc99585ddd9
Deleted: sha256:d245d67e9c1980f61ffa9d6ecd96c6cbaff7ad1fe89103dba726c9a820f1f346
Deleted: sha256:030d632aec1ea74cfd41888bd015b4b6c139d82a67d6fd9aac921fb38a00f447
Deleted: sha256:75023970ab2a7215dbbc13e7b4ca984b248390a1832f05cb6a305ed5c1f0dd45
Untagged: dev-peer0.org1.example.com-mycc-1.0-384f11f484b9302df90b453200cfb25174305fce8f53f4e94d45ee3b6cab0ce9:latest
Deleted: sha256:8b9763c55022bd55f4387079f0a9141495eead5779b697f07b85fb3ccaa883e5
Deleted: sha256:5f8fd8084a8ced73620d4219f51eddc1bec055ee19f17cd5306331f06500806e
Deleted: sha256:74dc1b9798a55b862ee8477e51aad3650349f9439a76dead829215c079219bed
Deleted: sha256:e030e9ebf81bc5cb2a3043aefe15914824ef3869a8f7293eb61d6173a0e79b85
Deleted: sha256:24e229c9d610787fc9f84eb8791c381dc0849c4582451a267c7e24a7ba63aadb
Deleted: sha256:9cb8863ef81a6ba602479526c63c642db10261a56ff89ae383f48f818e5b4722
Deleted: sha256:bd4d8bea72ce563ebbc612333980f4f1684c05780acff55b080ca16c138cf719
Untagged: dev-peer0.org2.example.com-mycc-1.0-15b571b3ce849066b7ec74497da3b27e54e0df1345daff3951b94245ce09c42b:latest
Deleted: sha256:4da0b1563726dcf6c5ad16876f3a43b724237173639fad75bb32b420791cb2f4
Deleted: sha256:f2b6886d2c40c00349481f34525924d854b83317a3536390b0ad7516f60449e5
Deleted: sha256:3a16796d8235306e20d37389791e3ffd5cd264a814f1e8fb7fe33506e96d7d66
Deleted: sha256:b3700f75a9374a5827834bf9d3f77f66dc8bb79e7aa2cbf67a0e6da5d8f216b6
Deleted: sha256:d052bd41257d84aff87b2648d4314e8da8747b5f5da4485c65141296a6465a0a
Deleted: sha256:2b00154b2732cb463023c1ac18d94a39d58ca58677aa92d4012ed91b3387b2d3
Deleted: sha256:3245ce6d2b7f677d0a677a5e738160a867abefcd2a5fd772840b57c255881a6f
```


進入節點發出交易請求

- `docker exec -it peer0.org1.example.com bash`
- `peer chaincode query -C mychannel -n mycc -c '{"Args":["query","a"]}'`
- `peer chaincode invoke -o orderer.example.com:7050 -C mychannel -n mycc -c '{"Args":["invoke","a","b","10"]}'`
- `peer chaincode invoke -o orderer.example.com:7050 --tls $CORE_PEER_TLS_ENABLED --cafile /opt/gopath/src/github.com/hyperledger/fabric/peer/crypto/ordererOrganizations/example.com/orderers/orderer.example.com/msp/tlscacerts/tlsca.example.com-cert.pem -C mychannel -n mycc -c '{"Args":["invoke","a","b","10"]}'`