Hyperledger Fabric Deployment

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# About Me

- **Researcher in IBM**
  - Fintech, Cloud and Analytics
- **Open-Source contributor**
  - Hyperledger, OpenStack, OpenDaylight, etc.
- **Hyperledger developer**
  - Code committer to fabric, sdk, Cello etc.
  - PTL of Cello project and fabric-sdk-py project
  - Chair of Hyperledger Technical Working Group China
  - Drafter of fabric sdk spec and multi-channel consensus spec

Fabric 1.0 Deployment Scenarios
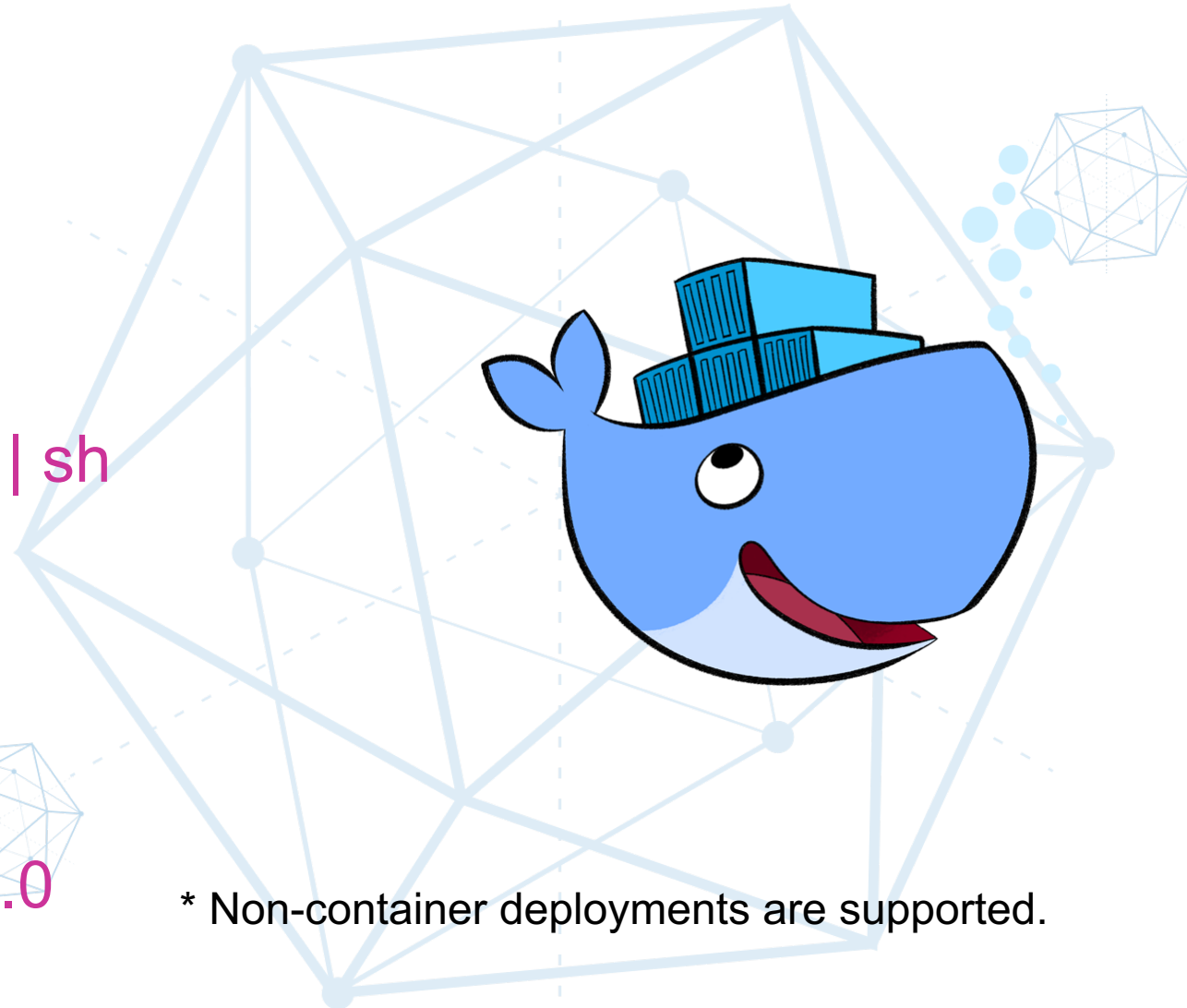

A peer can be a E&C physically.

3
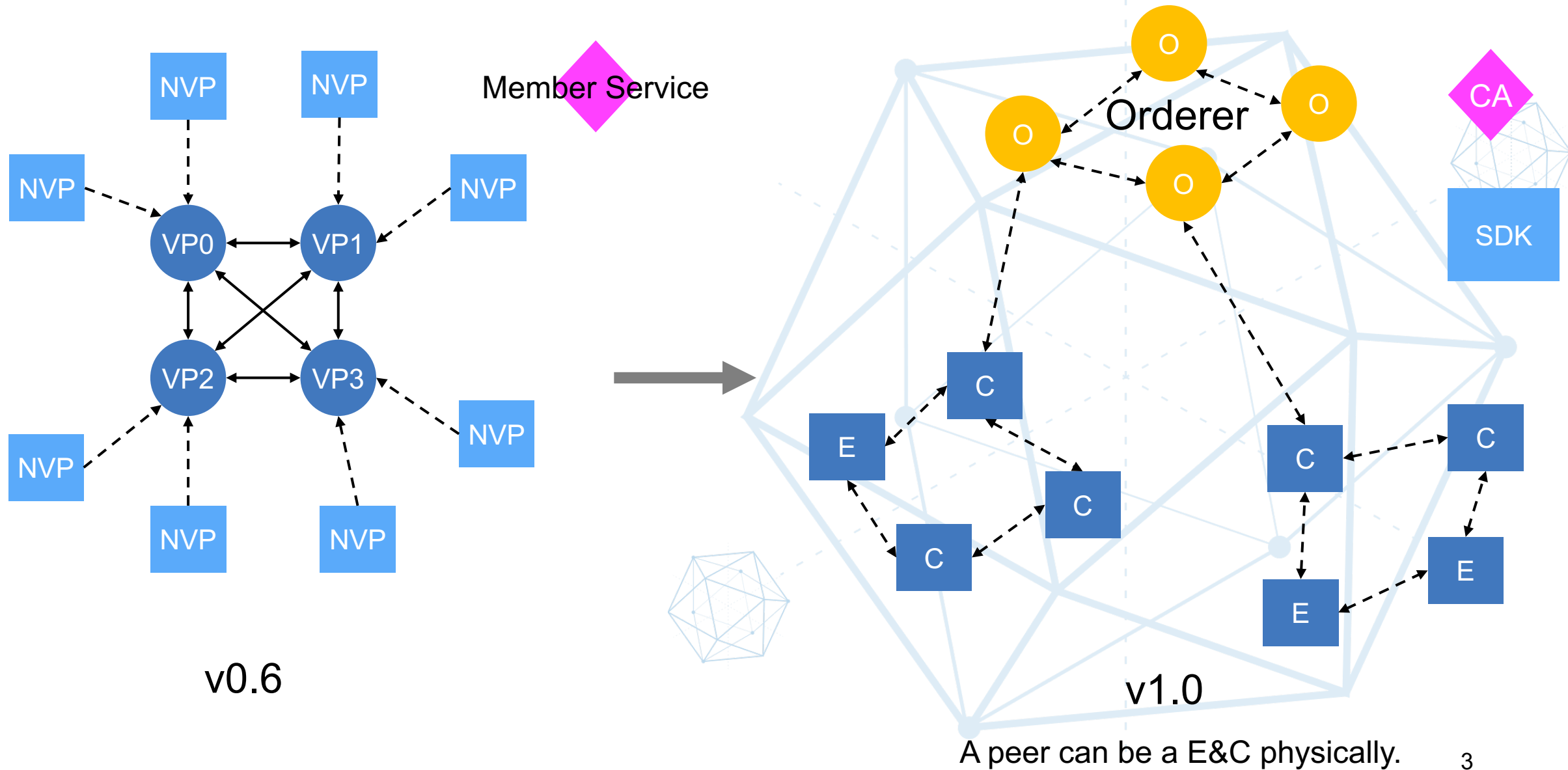
Fabric 1.0 Workflow
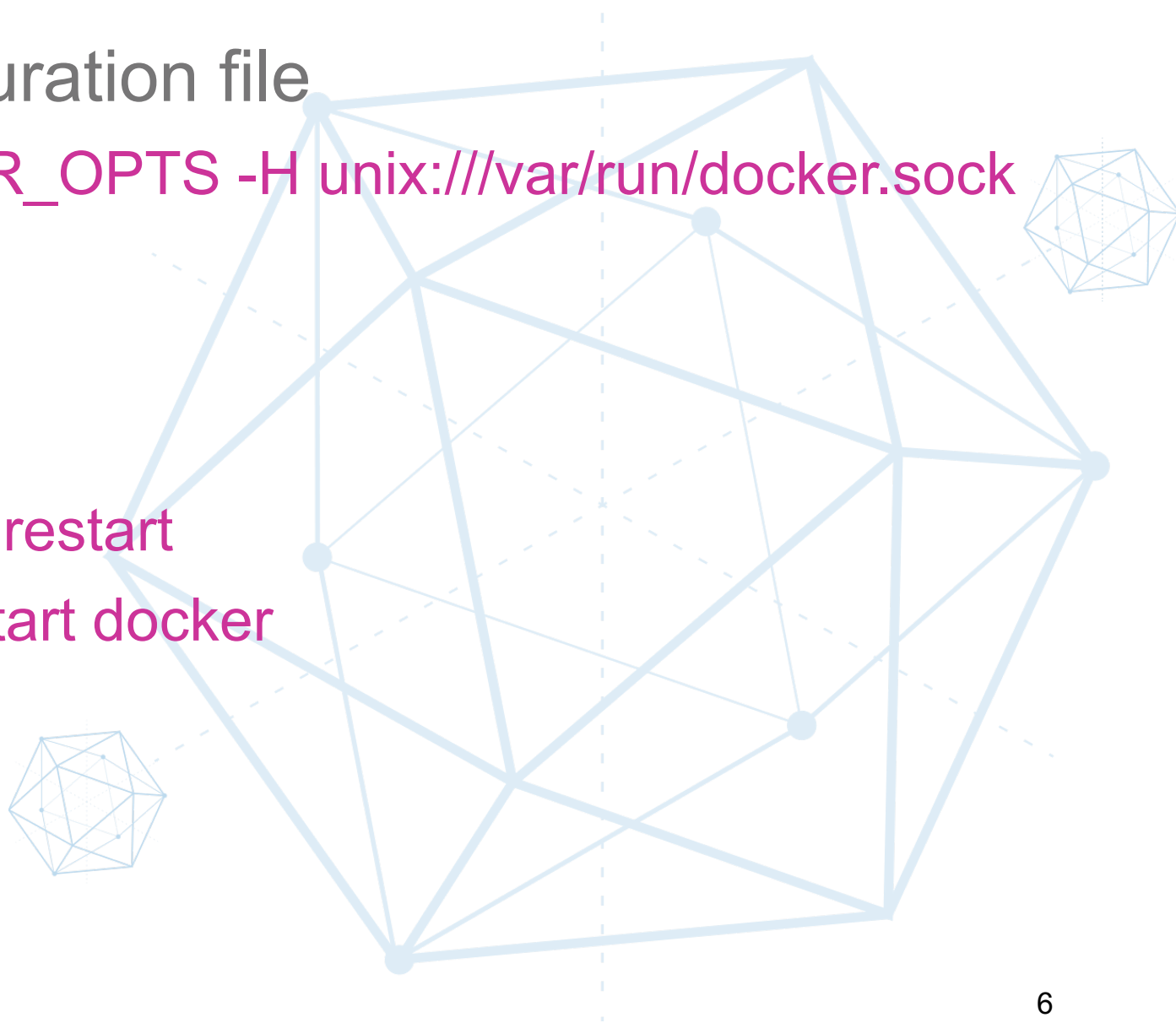

4
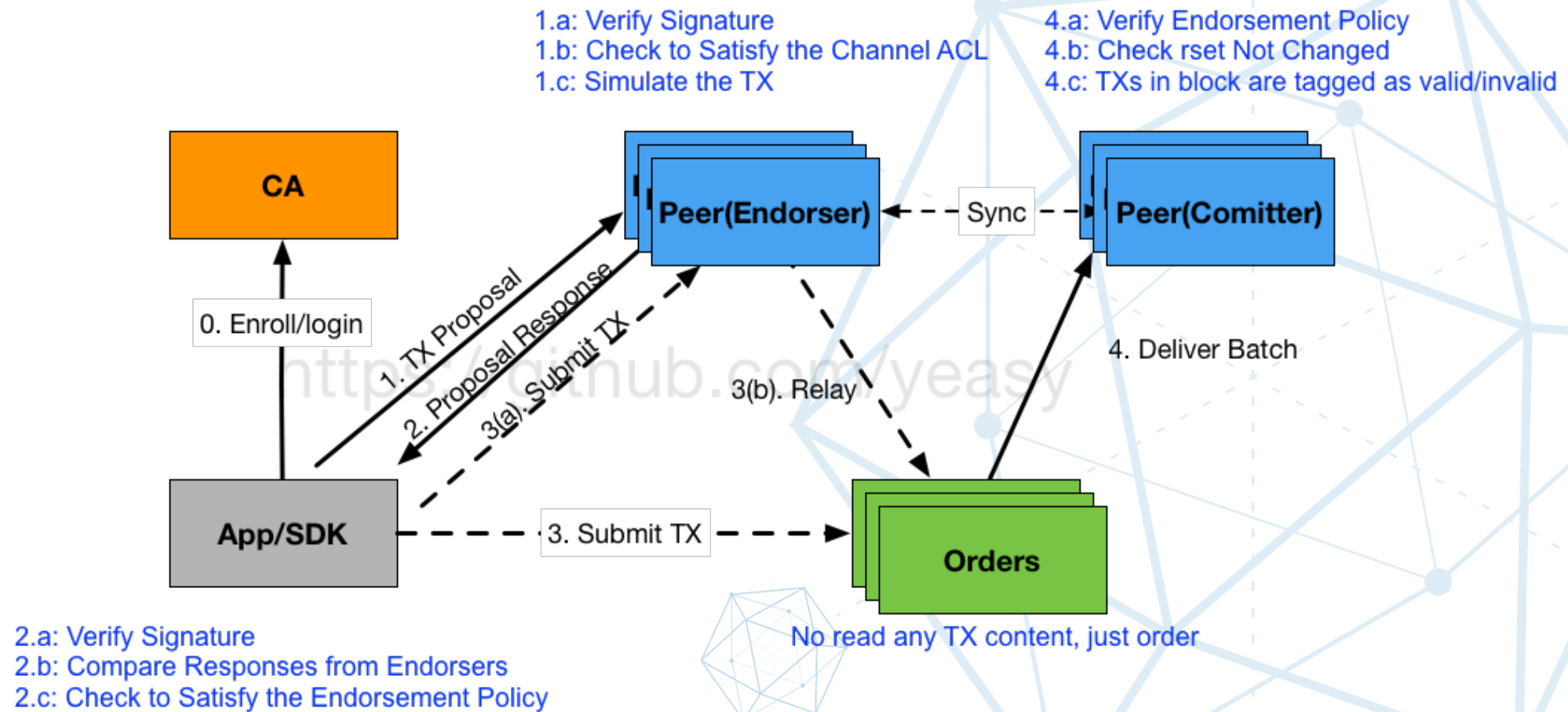
Environment Setup – Docker Installation

- Docker 1.12+
- Linux
  - 64 bit
  - kernel 3.10+
  - curl -sSL https://get.docker.com/ | sh
- Mac
  - [Docker for Mac](#)
- Docker-Compose 1.7.0+
  - pip install docker-compose>=1.7.0

* Non-container deployments are supported.

Environment Setup - Configuration

- Update the Docker configuration file

    – DOCKER_OPTS="$DOCKER_OPTS -H unix:///var/run/docker.sock -H tcp://0.0.0.0:2375"

- Restart Docker Daemon

    – Upstart: sudo service docker restart

    – Systemd: sudo systemctl restart docker

Fabric 1.0 Bootup in 3 steps

- Get Docker images
  - https://github.com/yeasy/docker-compose-files/tree/master/hyperledger/1.0
  - http://ibm.com/ibm/cn/blockchain/
  - https://hub.docker.com/r/hyperledger

- Get Compose file
  - git clone https://github.com/yeasy/docker-compose-files

- Start fabric
  - cd hyperledger/1.0 & docker-compose up

Play Transactions

- Check container status
  - watch docker ps
- Enter the cli container
  - docker exec -it fabric-cli bash

```
$ docker ps
CONTAINER ID          IMAGE                          COMMAND
c1cf099e1f76          hyperledger/fabric-peer        "bash -c 'while tr..."
0b67c42fd5cc          hyperledger/fabric-peer        "peer node start -..."
80b5fb85636e          hyperledger/fabric-orderer     "orderer"
f3680e5889b0          hyperledger/fabric-ca          "fabric-ca-server ..."
```
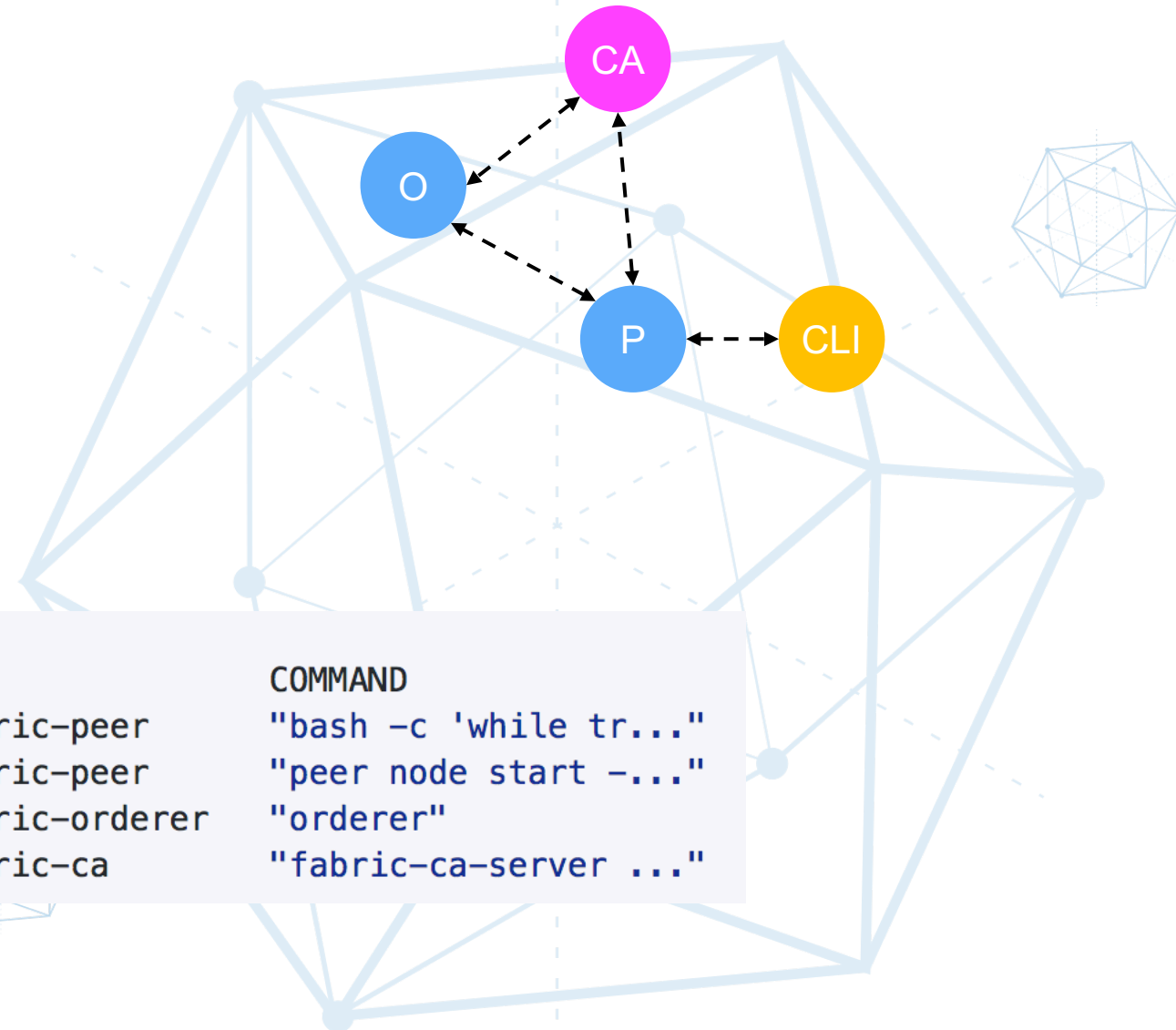
Play Transactions cont.

- Install/instantiate chaincode
  - CC_PATH=github.com/hyperledger/fabric/examples/chaincode/go/chaincode_example02
  - peer chaincode install -v 1.0 -n test_cc -p $CC_PATH -c '{"Args":["init", "a", "100", "b", "200"]}' -o orderer0:7050
  - peer chaincode instantiate -v 1.0 -n test_cc -p $CC_PATH -c '{"Args":["init", "a", "100", "b", "200"]}' -o orderer0:7050
- Invoke chaincode
  - peer chaincode invoke -n test_cc -c '{"Args":["query","a"]}'
  - peer chaincode invoke -n test_cc -c '{"Args":["invoke","a","b","10"]}'

```
$ docker ps
CONTAINER ID        IMAGE                          COMMAND
c0abb4b9206b        dev-peer0-test_cc-1.0          "chaincode -peer.a..."
c1cf099e1f76        hyperledger/fabric-peer        "bash -c 'while tr..."
0b67c42fd5cc        hyperledger/fabric-peer        "peer node start -..."
80b5fb85636e        hyperledger/fabric-orderer     "orderer"
f3680e5889b0        hyperledger/fabric-ca          "fabric-ca-server ..."
```
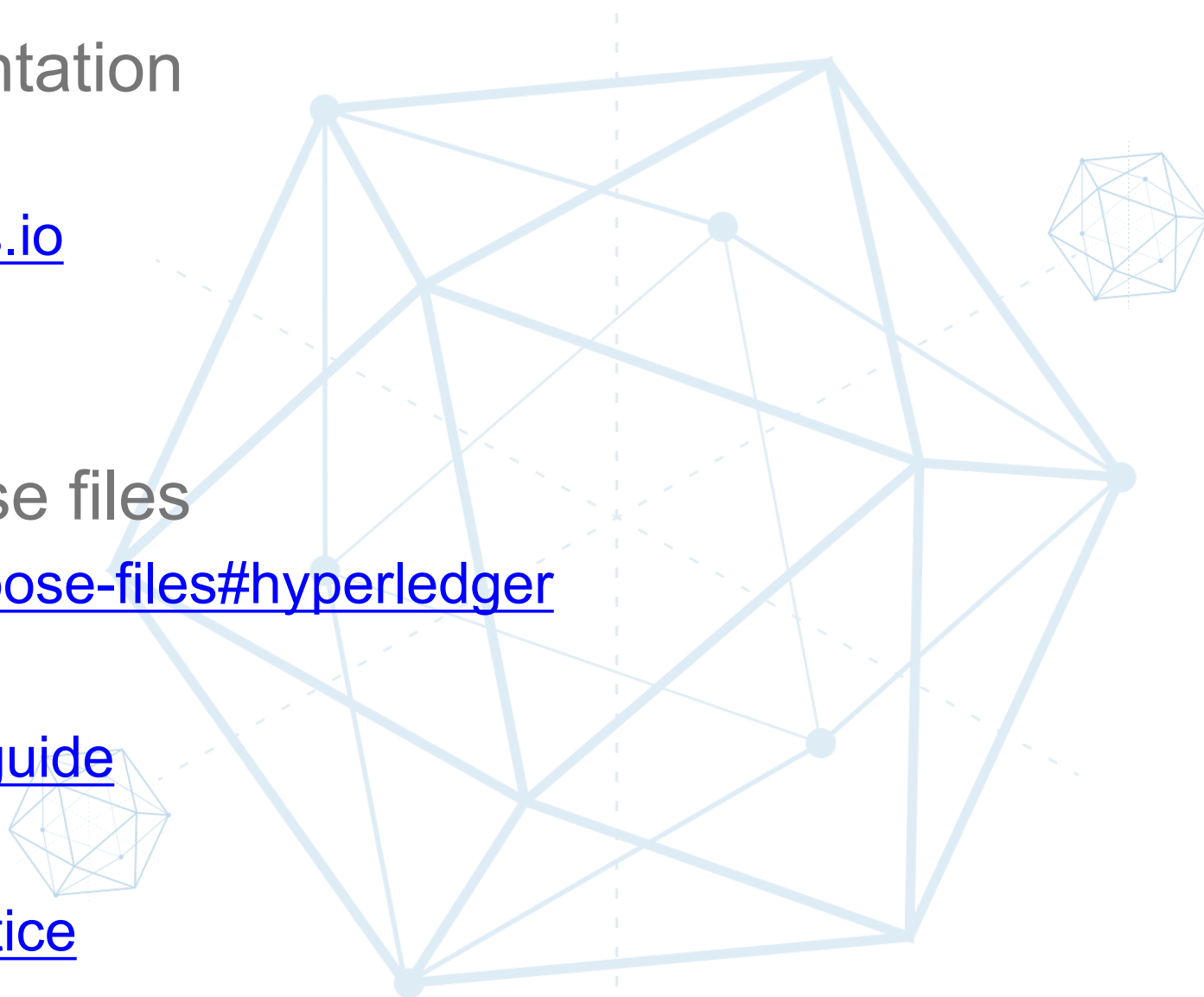
More on Using Fabric

- Application interactions
  - APIs: gRPC
  - SDK: Node, Python, Java
- Commands
  - Peer start/stop
  - Channel create/join
  - User enroll/login
  - Chaincode install/instantiate/invoke
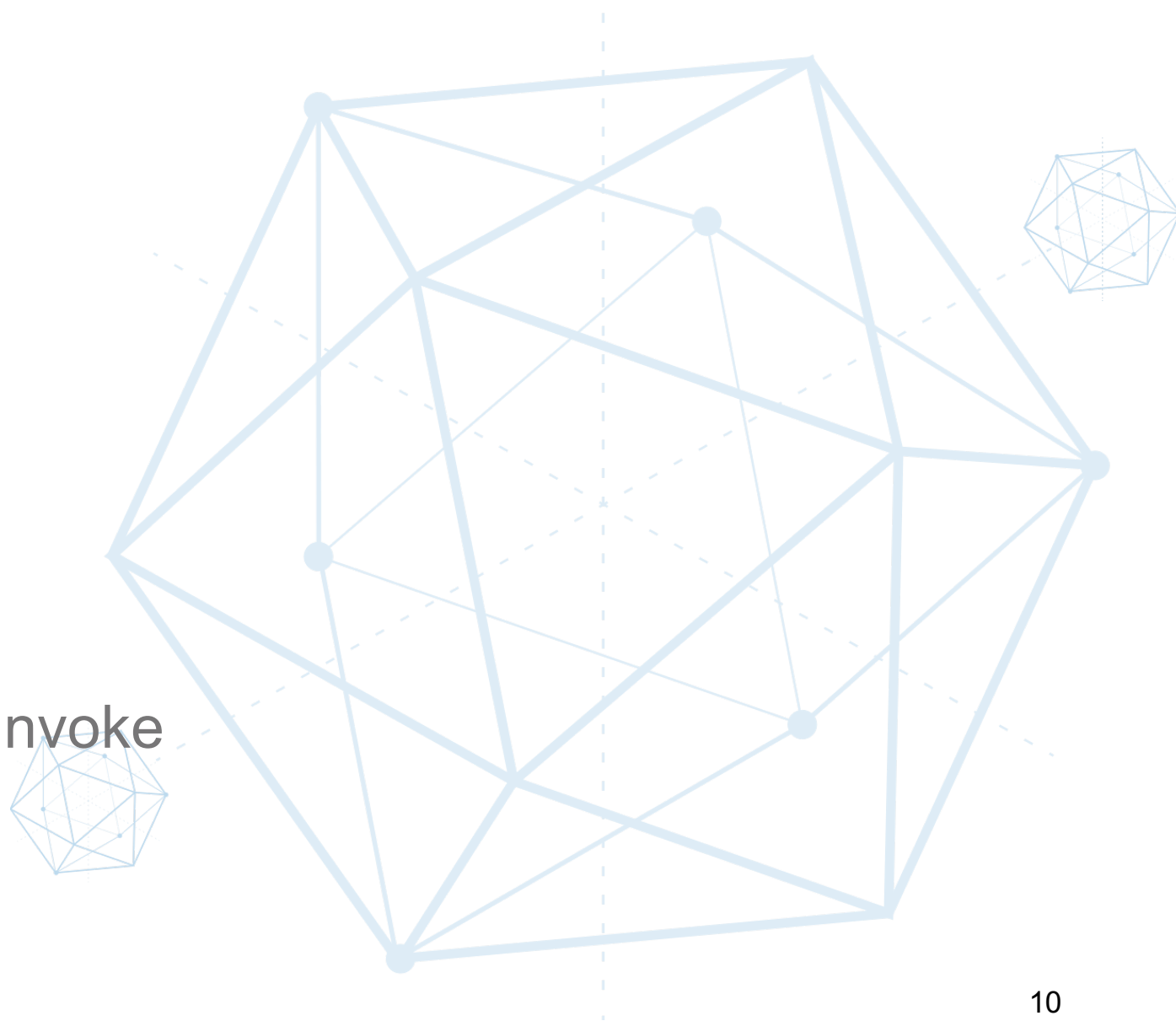
Reference

- Hyperledger Wiki&Documentation
  - wiki.hyperledger.org
  - hyperledger-fabric.readthedocs.io
- IBM 区块链
  - ibm.com/ibm/cn/blockchain/
- Hyperledger Fabric Compose files
  - github.com/yeasy/docker-compose-files#hyperledger
- 《区块链技术指南》
  - github.com/yeasy/blockchain_guide
- 《Docker 从入门到实践》
  - github.com/yeasy/docker_practice

Questions?

Thank You!
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