

Hyperledger Overview and Fabric 1.0

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Mar 4, 2017

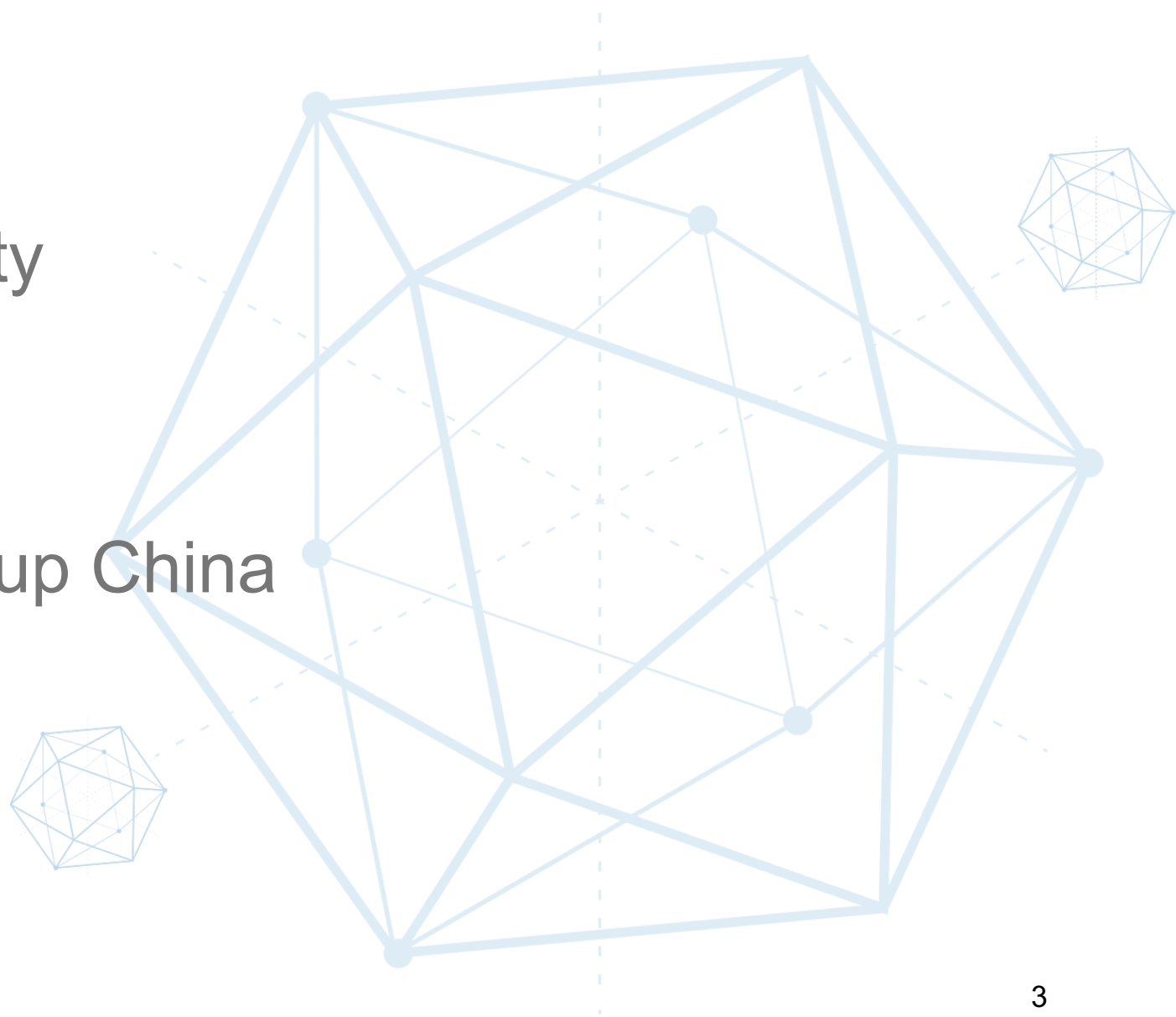
About Me

- **Researcher in IBM**
 - Fintech, Cloud and Analytics
- **Open-Source contributor**
 - [OpenDaylight](#), [OpenStack](#), [Hyperledger](#), etc.
- **Hyperledger fan**
 - 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](#)
 - Mentor of Summer Intern Program



Outline

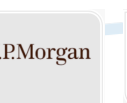
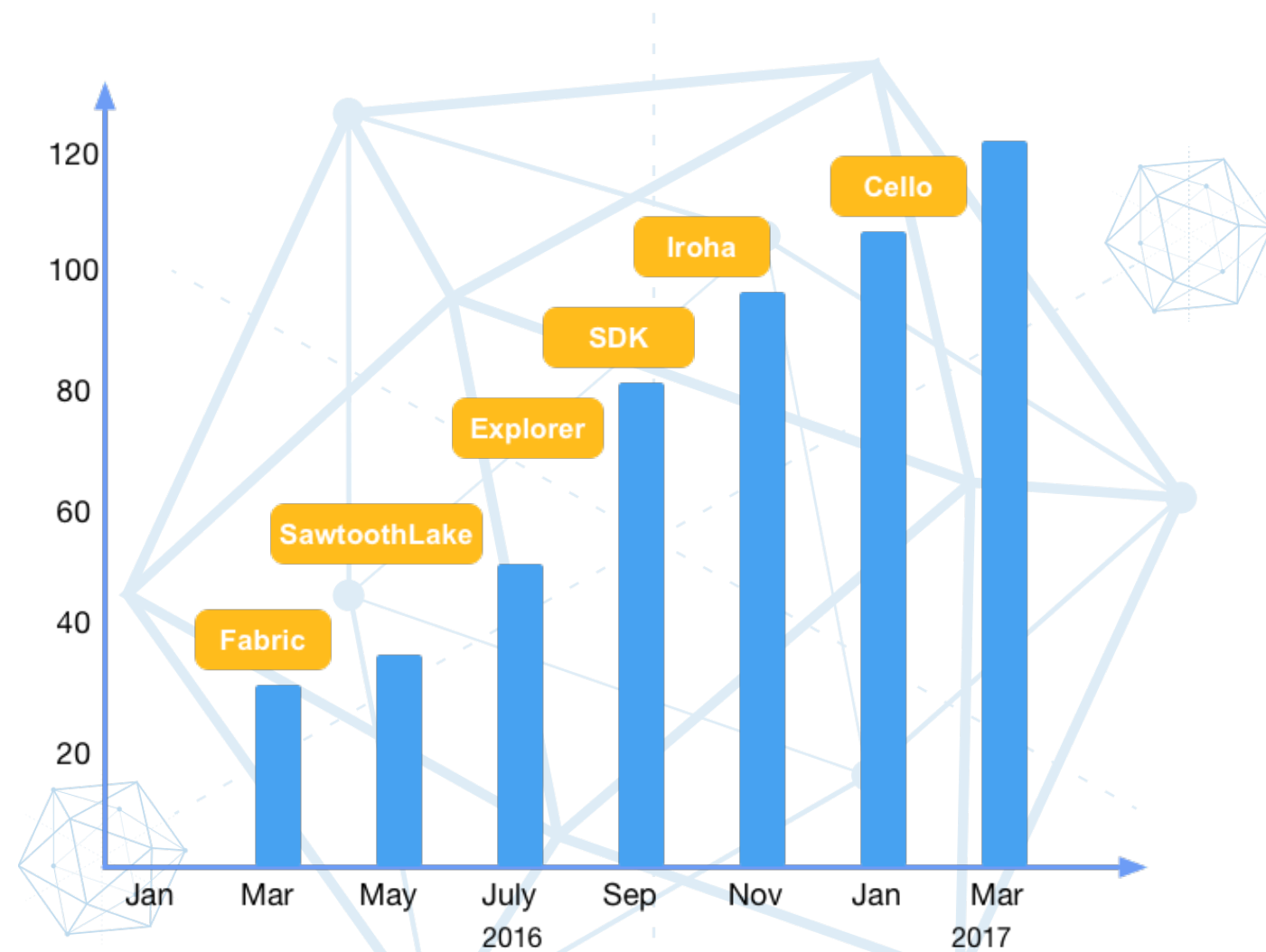
- Hyperledger Projects
- Hyperledger Community
- Fabric 1.0 Introduction
- Fabric 1.0 in Action
- Technical Working Group China
- Q&A



Hyperledger Projects

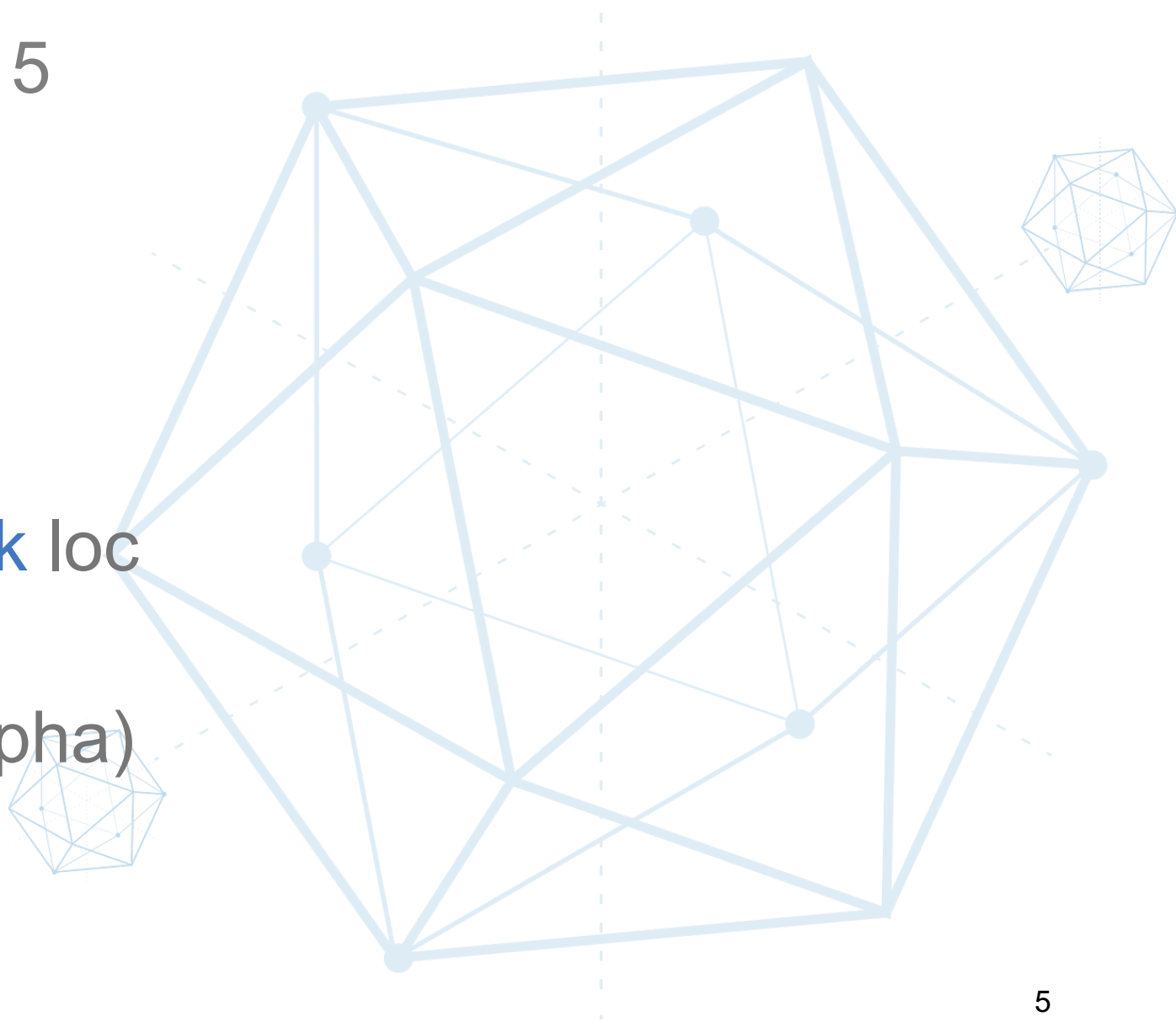
- Since Dec 17, 2015
- [Apache v2 License](#)
- 30 founded members
- 29/122 (China) members
- 5 main projects
- 200+ contributors
- 8000+ commits

Enterprise grade, open source
distributed ledger framework!



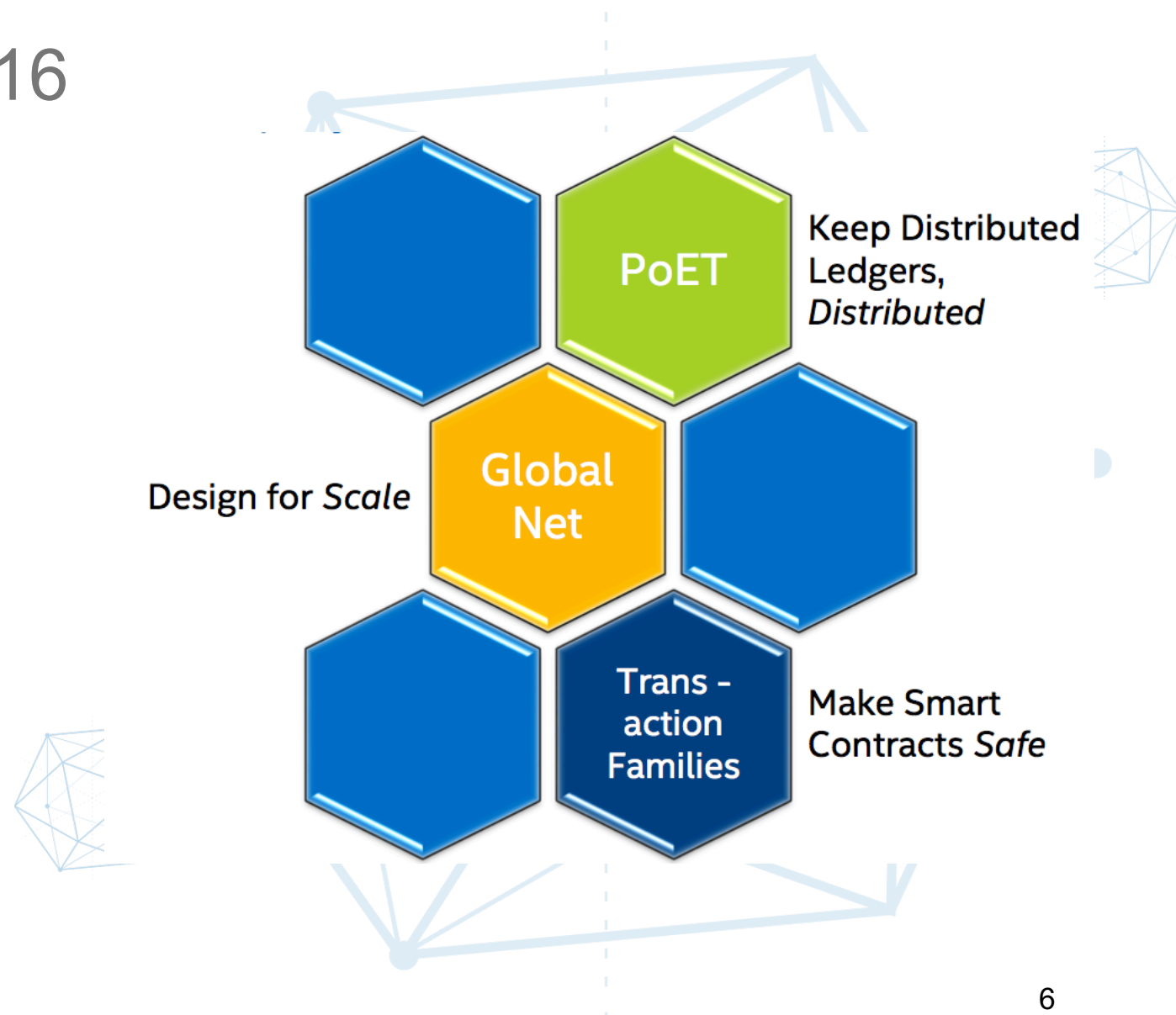
Hyperledger Fabric

- Open-sourced at Dec, 2015
- Proposed by IBM
- Written in Golang
- 70+ contributors
- 4000+ commits
- v0.6: ~80k loc; v1.0: ~120k loc
- Now in 1.0 pre-release (alpha)



Hyperledger SawtoothLake

- Open-sourced at April, 2016
- Proposed by Intel
- Python
- 20+ contributors
- 2000+ commits
- Key features
 - PoET consensus
 - Transaction Families
 - Scalability



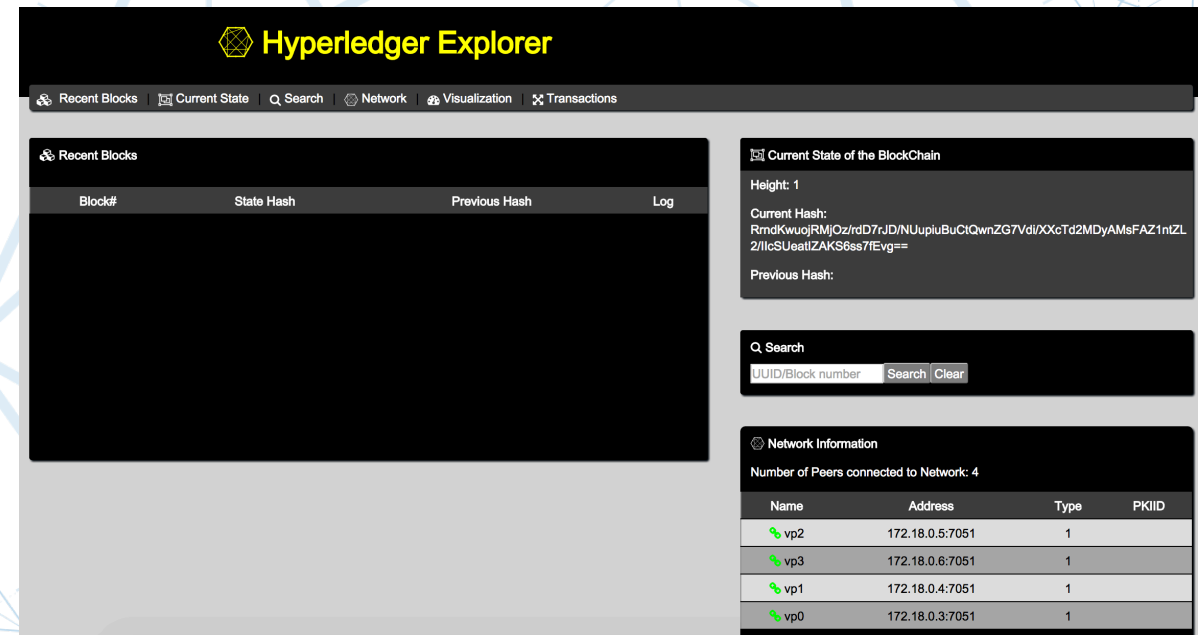
Hyperledger Iroha

- [Open-sourced](#) at Oct, 2016
- Proposed by [Soramitsu](#)
- C++
- 10+ contributors
- 1000+ commits
- Key features
 - C++ environment
 - Mobile and Web application Support
 - Sumeragi consensus



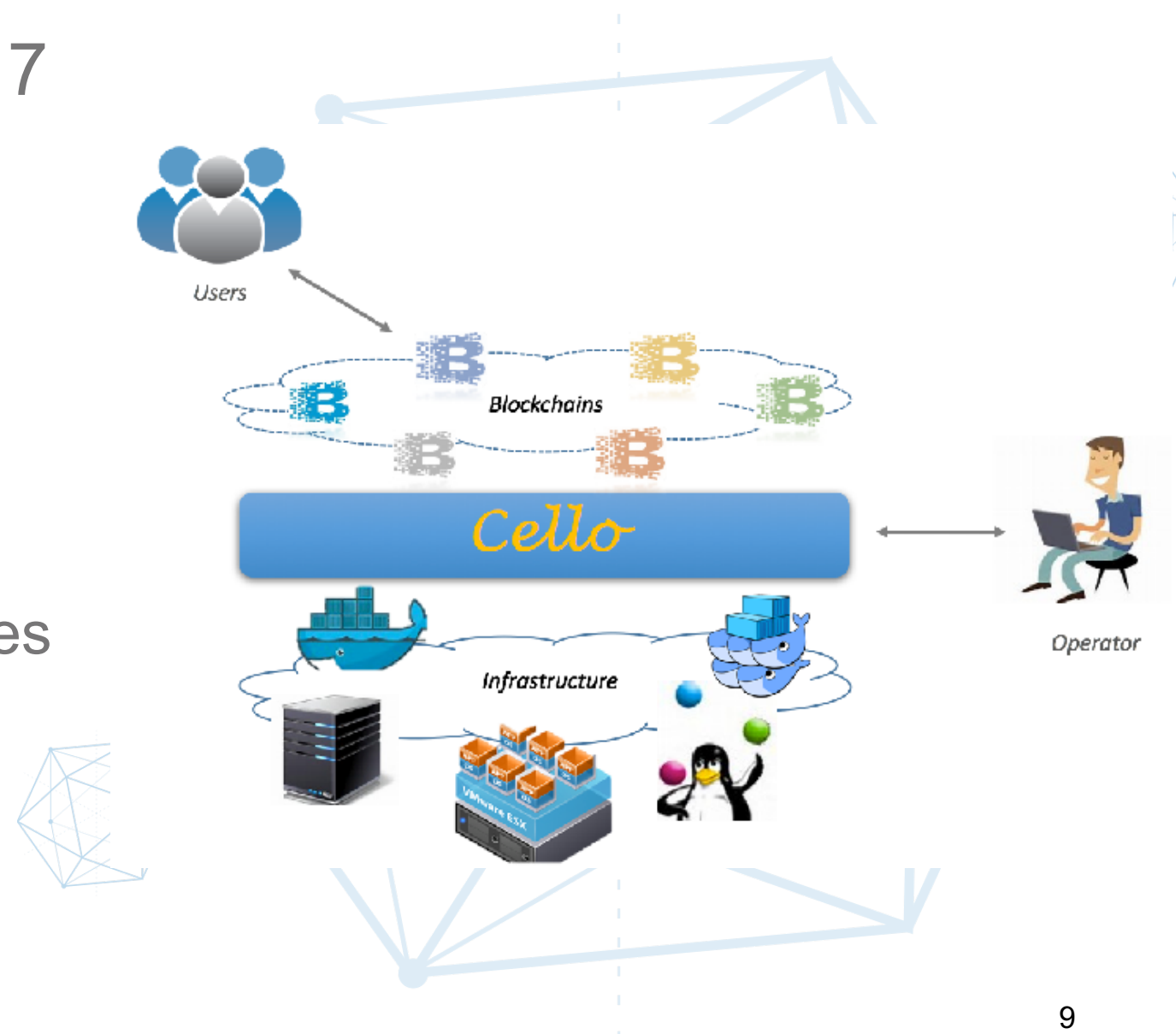
Hyperledger Blockchain-Explorer

- Open-sourced at Aug, 2016
- Proposed by Intel, DTCC, IBM
- UI to interact with ledger
- Node.js
- Under-development
- Key features
 - Web UI to explorer a blockchain
 - Single-Page Application



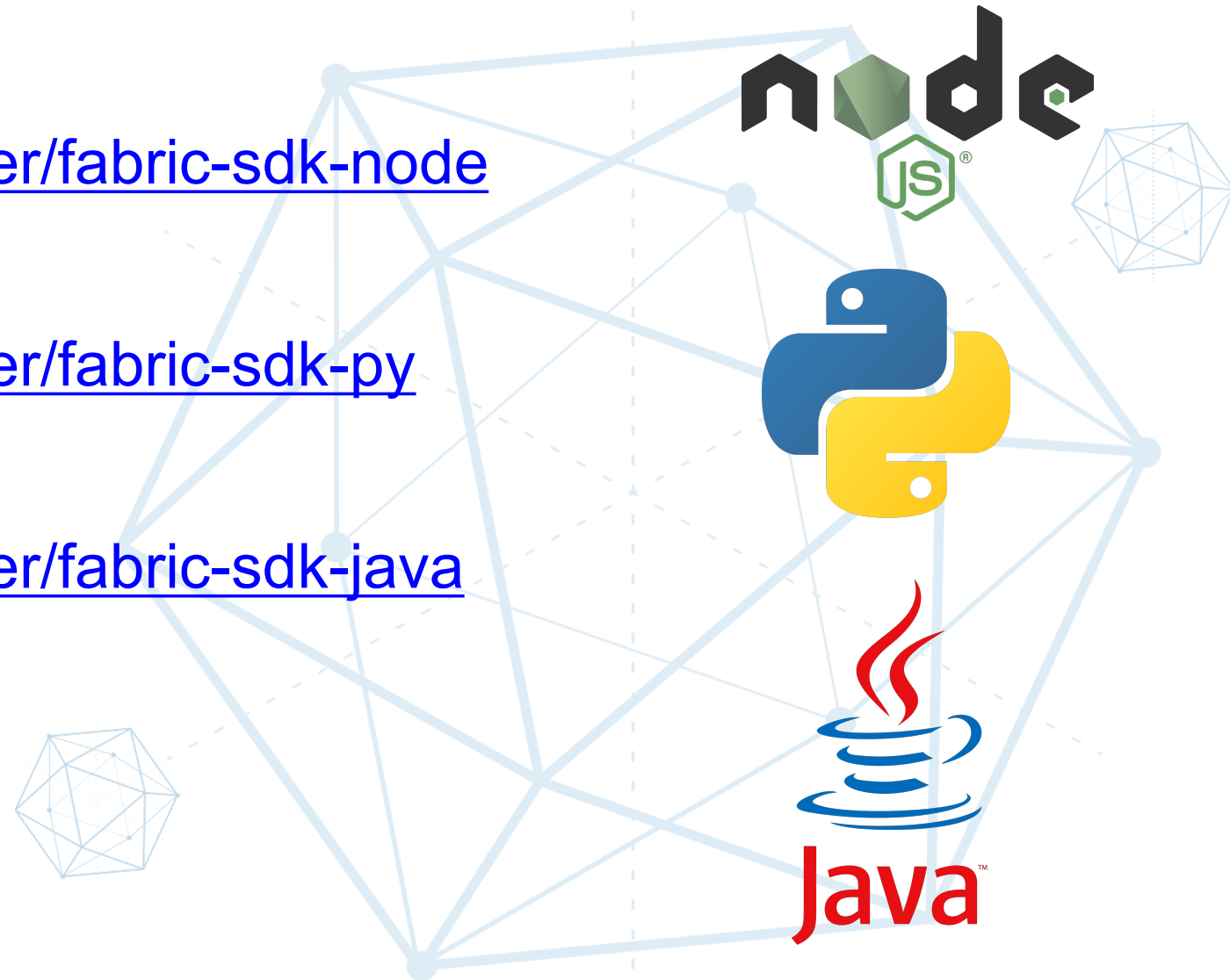
Hyperledger Cello

- Open-sourced at Jan, 2017
- Proposed by IBM
- Python, JavaScript
- 270+ commits
- Key features
 - Blockchain as a Service
 - Support various infrastructures
 - High-performance
 - Scalability
 - Pluggability



Hyperledger Fabric SDK

- Node.Js
 - <https://github.com/hyperledger/fabric-sdk-node>
- Python
 - <https://github.com/hyperledger/fabric-sdk-py>
- Java
 - <https://github.com/hyperledger/fabric-sdk-java>



Hyperledger Projects

- Open Communications
 - [Mail-list](#)
 - [Rocket chat](#)
 - [Meetings](#)



Blockchain Explorer

Fabric

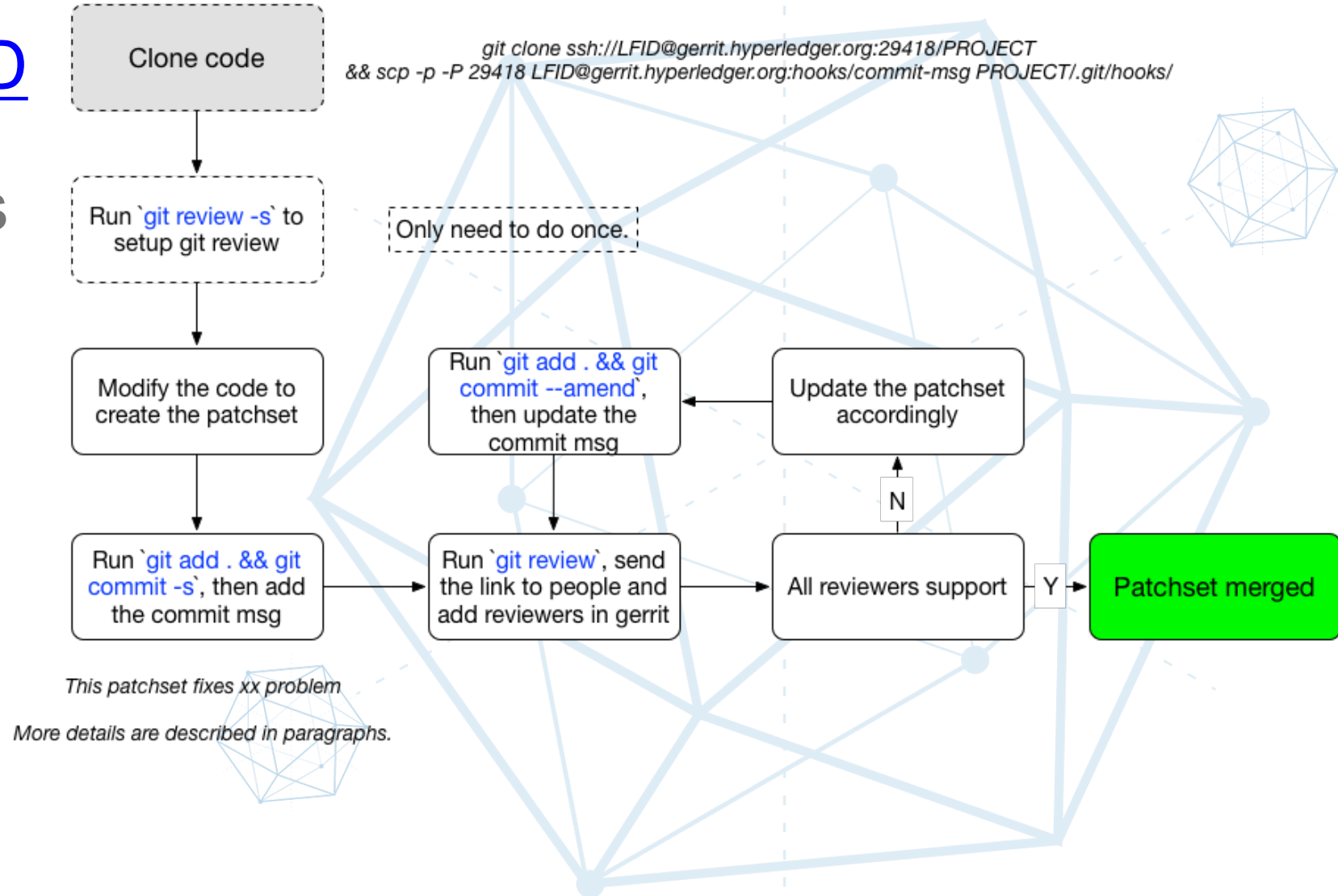
STL

Iroha

Cello

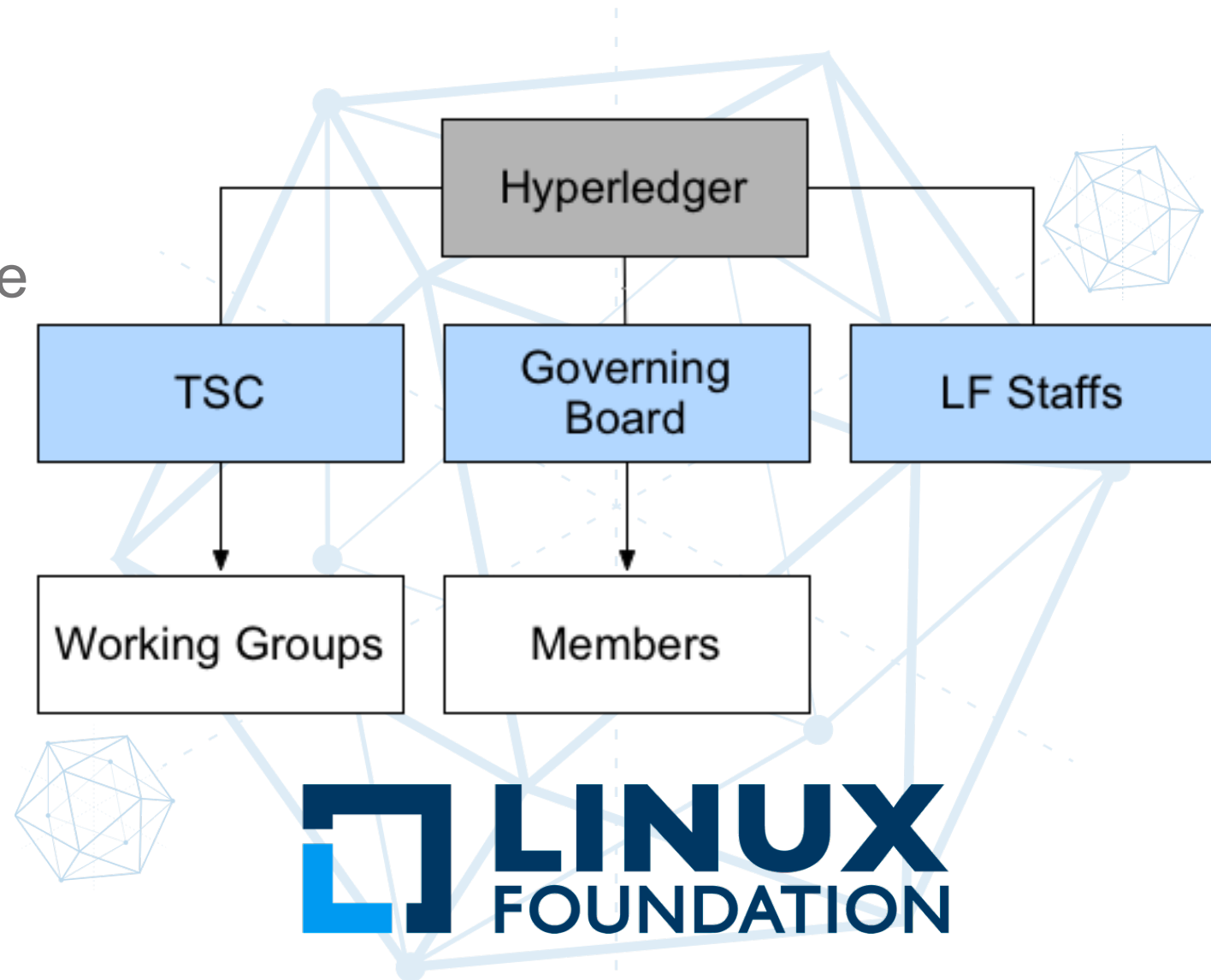
How to Contribute

- [Linux Foundation ID](#)
- [Jira](#) to manage tasks
- [Gerrit](#) to host code
- [RocketChat](#)



Hyperledger Community

- Linux Foundation Support
- Organizations
 - Technical Steering Committee
 - Governing Board
 - Linux Foundation Staffs
- TWG-China



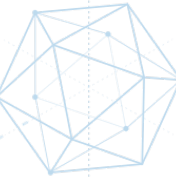
Hyperledger Community

- Events
 - Meetups
 - 9000+ attendees across 38 meetup groups
 - Hackathon
 - 1st Asia Hackathon at Shanghai on Mar 11,12
 - Hackfest
 - Beijing in June, TBD
- Wechat Public Number

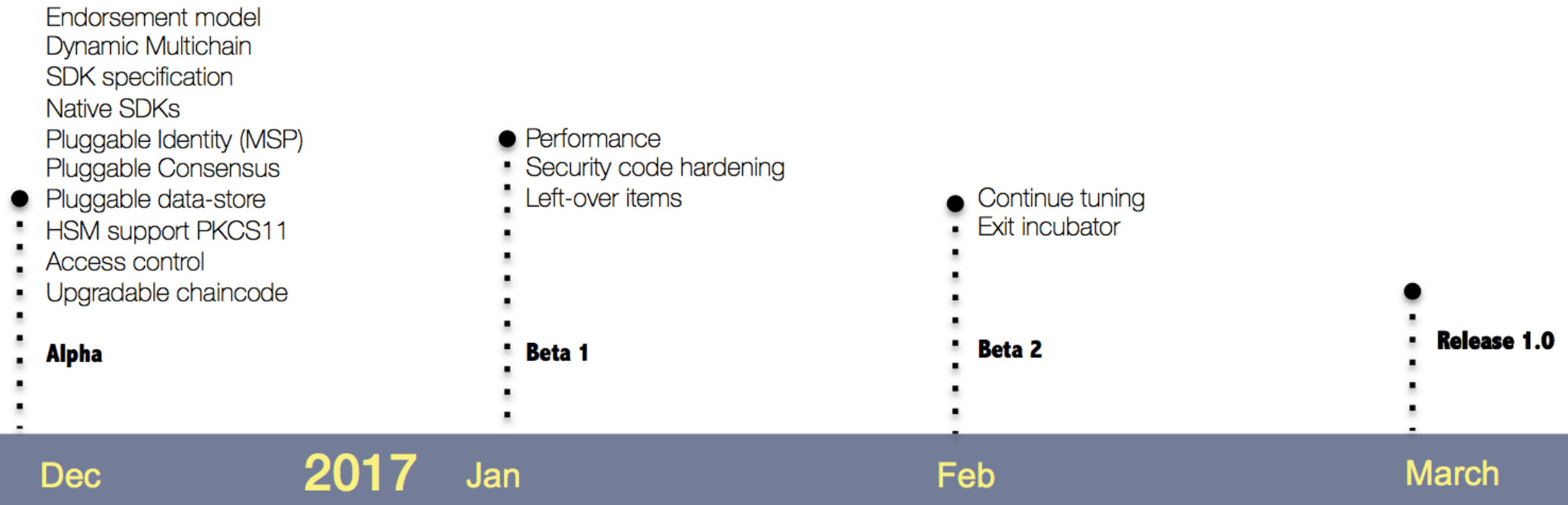


Fabric 1.0 Overview

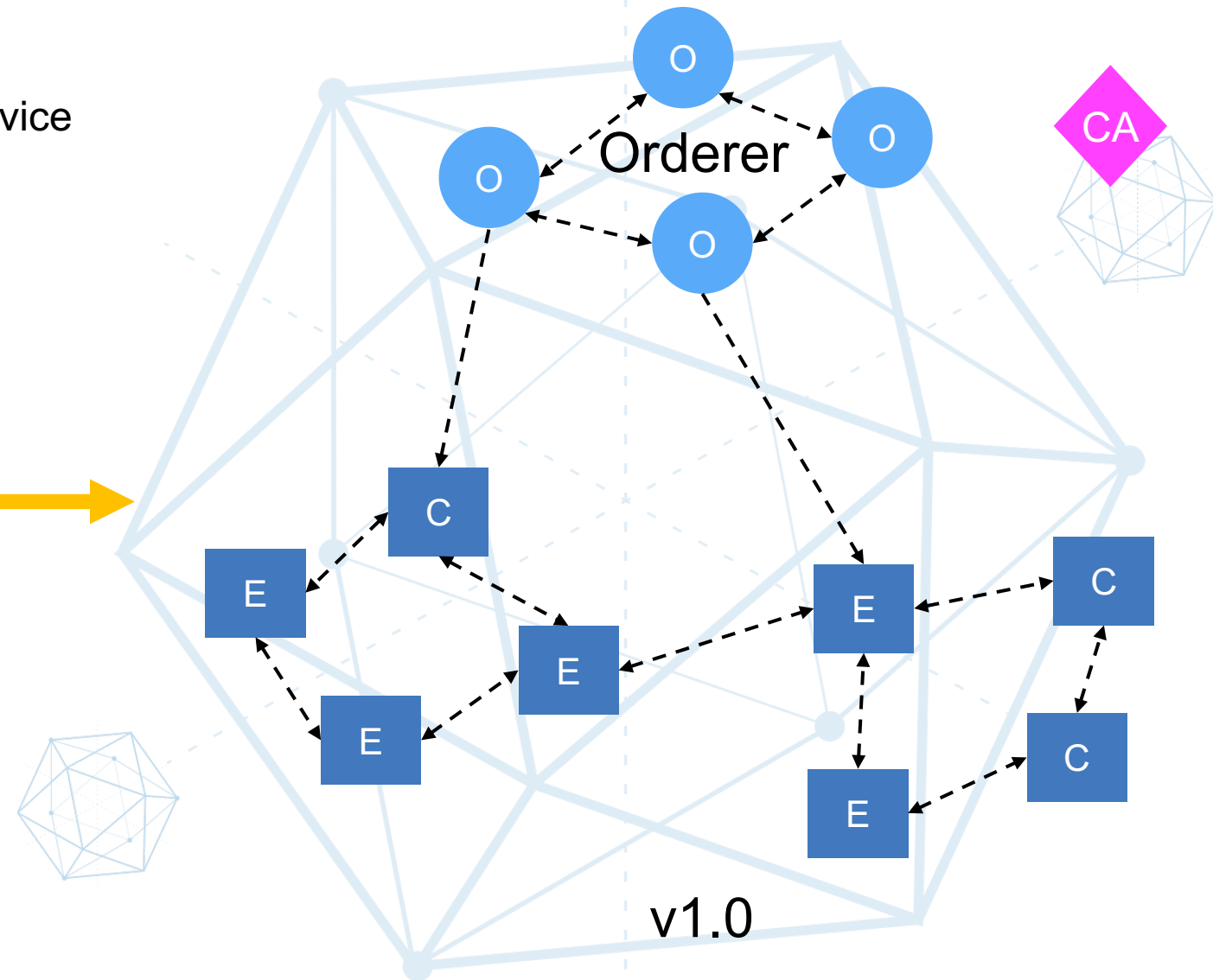
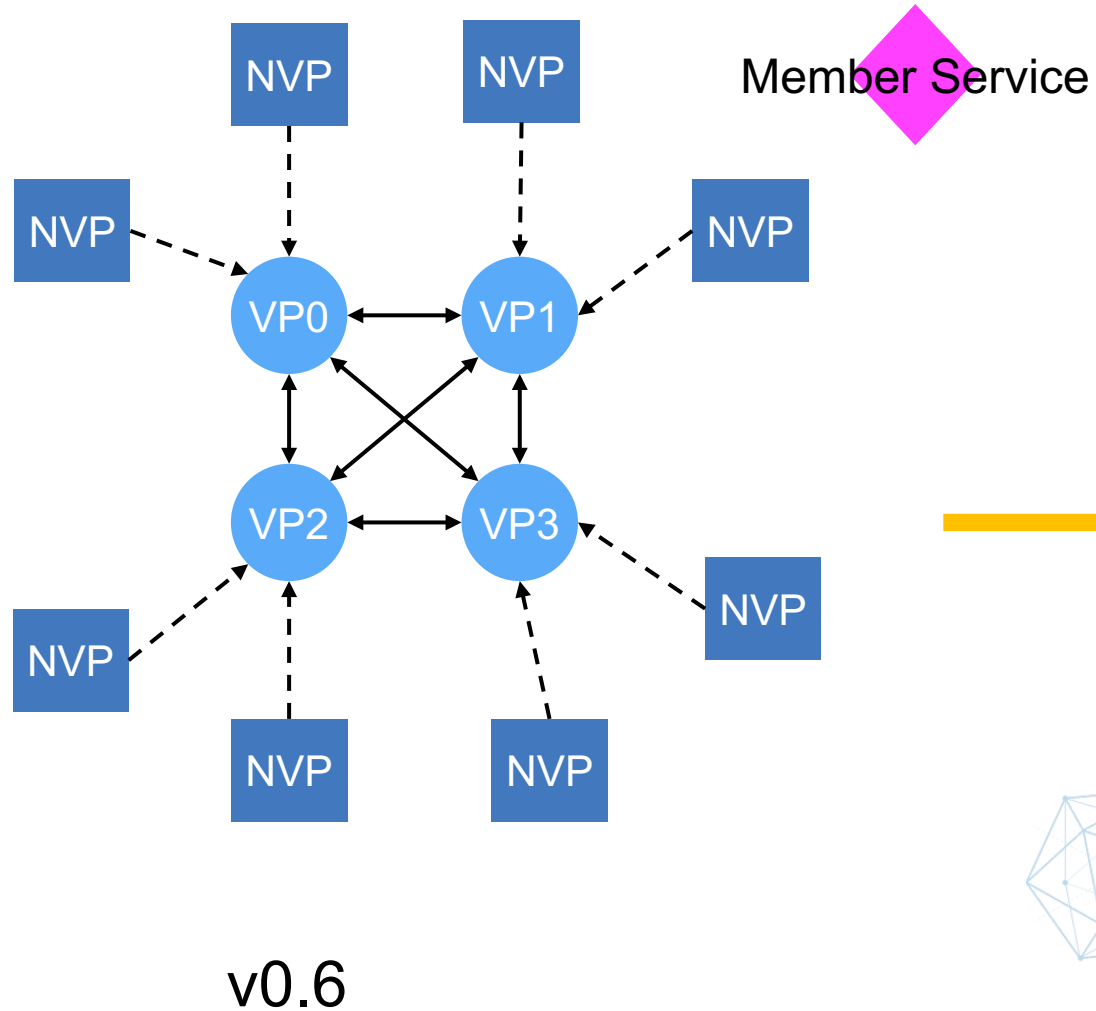
- Design principles
 - Scalability
 - Performance
 - Security/Isolation
 - Pluggability
 - Operability
 - Compatibility?
- New Features
 - Peer roles decouple
 - Multi-channel ledger
 - Pluggable components
 - Database
 - CA
 - Consensus
 - BCCSP
- System chaincode
 - csc
 - escc
 - lccc
 - qsc
 - vsc



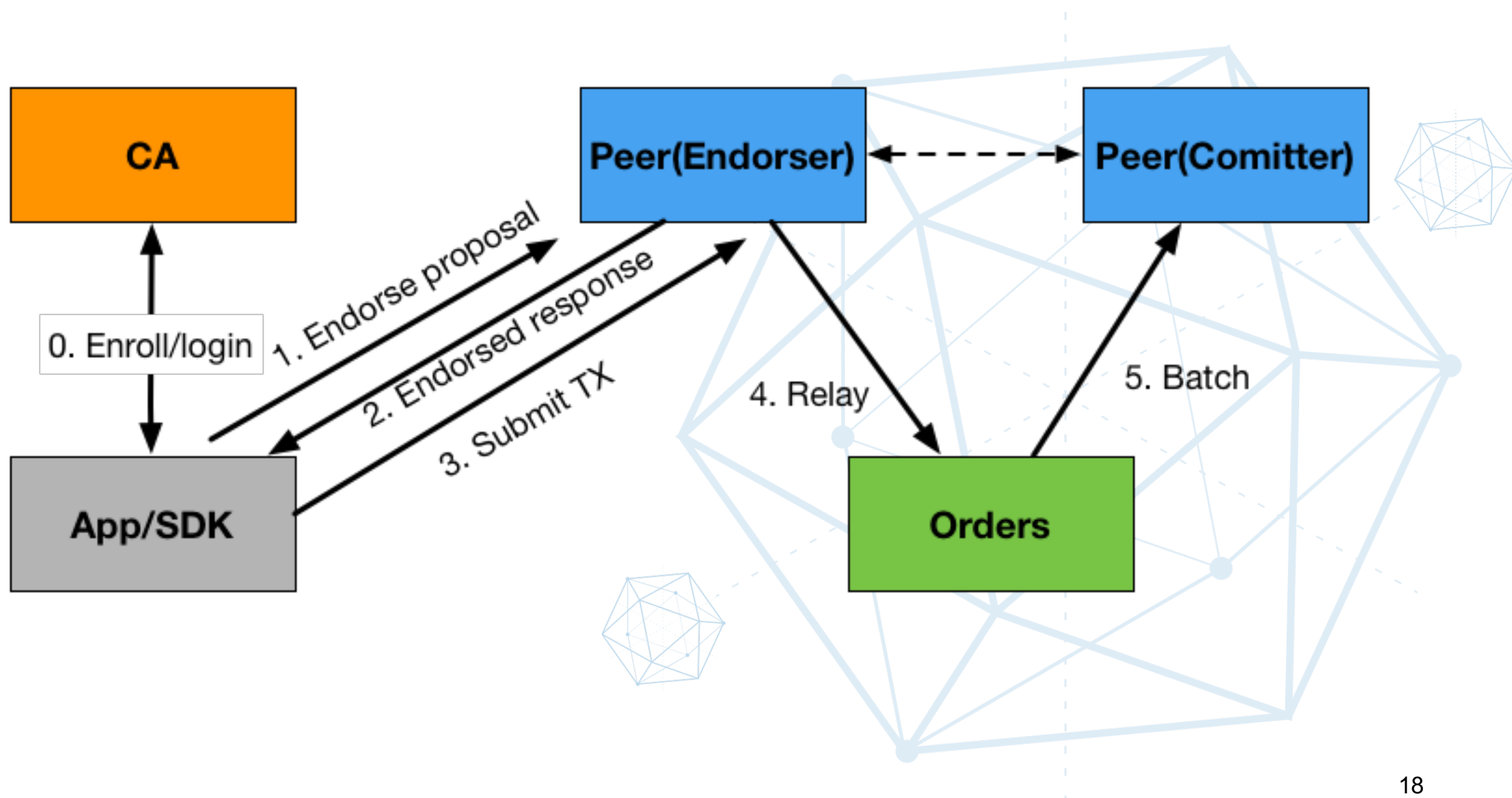
Fabric 1.0 Planned Roadmap



Fabric 1.0 Deployment Scenarios

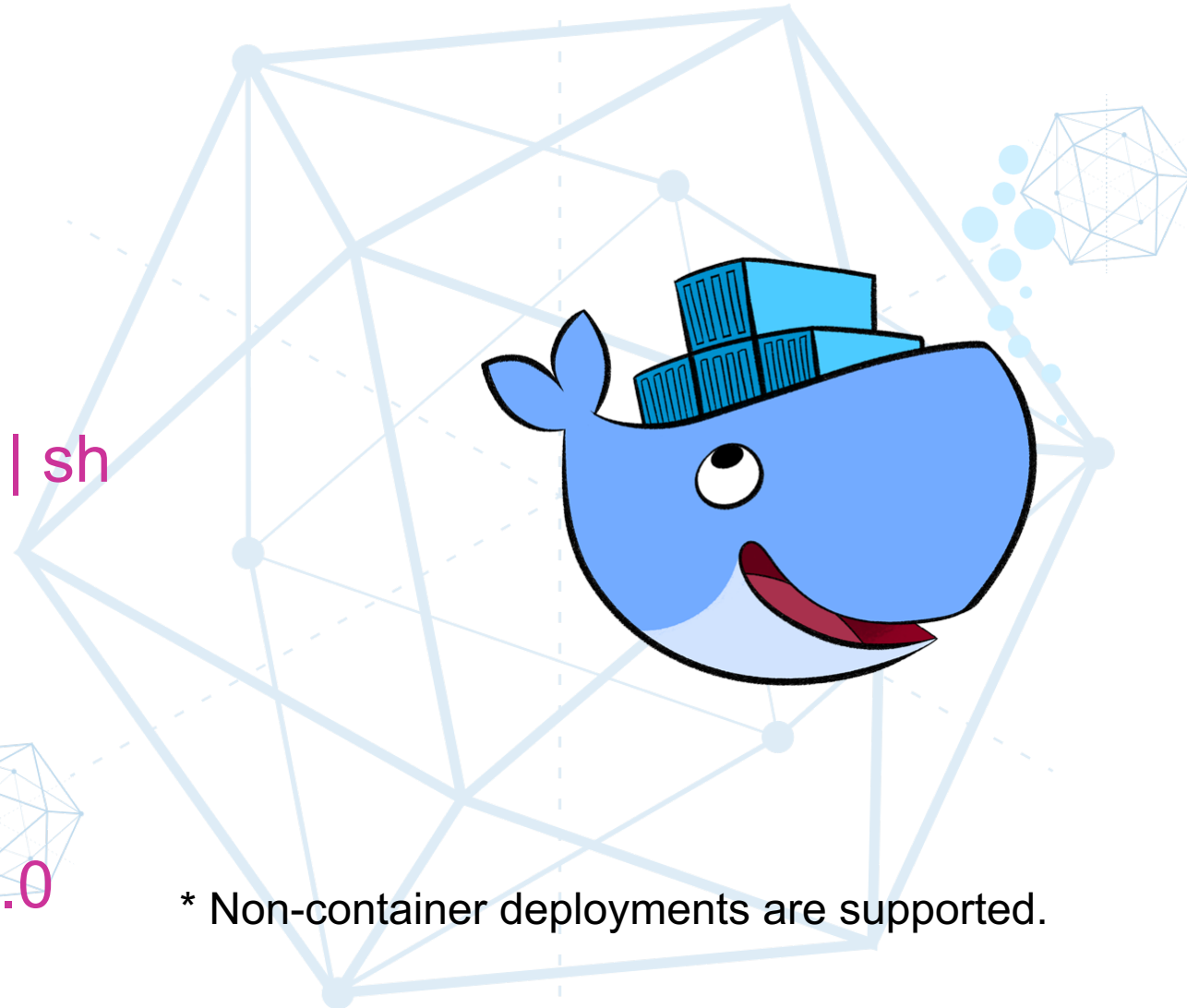


Fabric 1.0 Basic Workflow



Environment Setup – Docker Installation

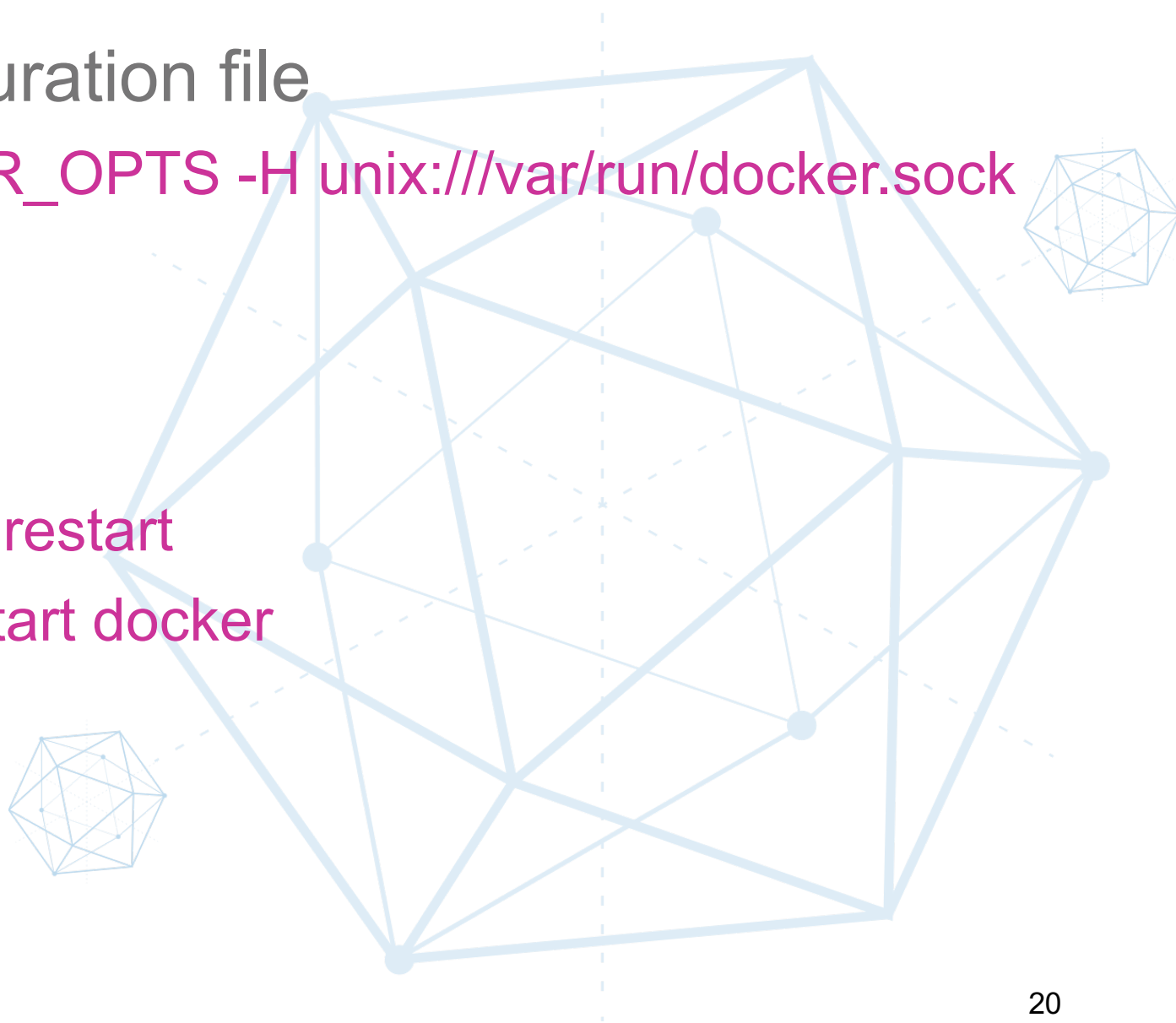
- Docker 1.12+
- Linux
 - 64 bit
 - kernel 3.10+
 - `curl -sSL https://get.docker.com/ | sh`
- Mac
 - [Docker for Mac](#)
- Docker-Compose 1.7.0+
 - `pip install docker-compose>=1.7.0`



* 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`

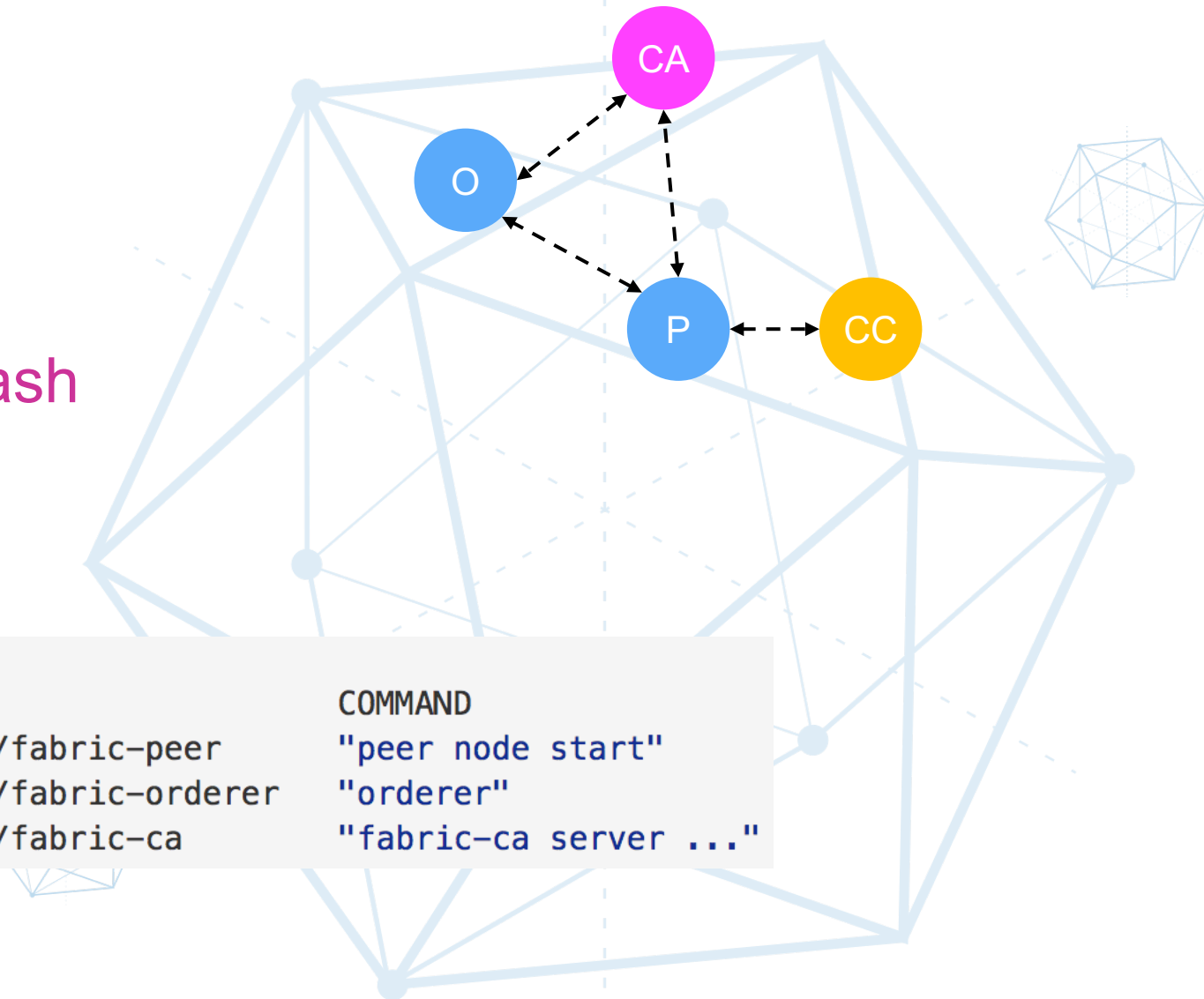


Play Transactions

- Check container status
 - watch docker ps
- Enter peer container
 - docker exec -it fabric-peer0 bash

```
$ docker ps -a
```

CONTAINER ID	IMAGE	COMMAND
2367ccb6463d	hyperledger/fabric-peer	"peer node start"
02eaf86496ca	hyperledger/fabric-orderer	"orderer"
71c2246e1165	hyperledger/fabric-ca	"fabric-ca server ..."



Play Transactions cont.

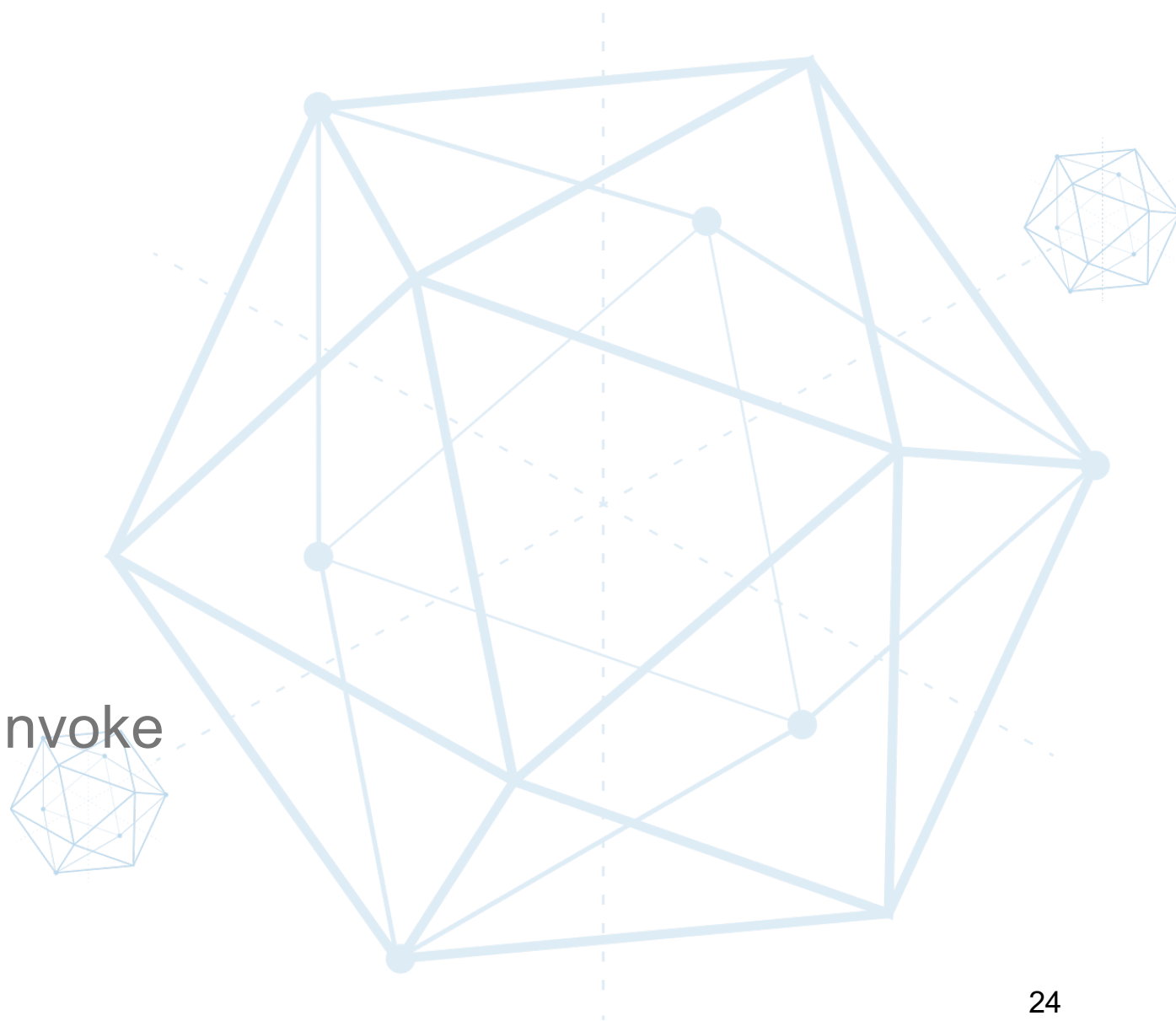
- Install/instantiate chaincode
 - CC_PATH=
github.com/hyperledger/fabric/examples/chaincode/go/chaincode_example02
 - peer chaincode install -v 1.0 -n test_cc -p \$CC_PATH -c
'{"Args":["init","a","100","b","200"]}'
 - peer chaincode instantiate -v 1.0 -n test_cc -p \$CC_PATH -c
'{"Args":["init","a","100","b","200"]}'
- 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
edc9740c265c	dev-peer0-test_cc-1.0	"/opt/gopath/bin/t..."
2367ccb6463d	hyperledger/fabric-peer	"peer node start"
02eaf86496ca	hyperledger/fabric-orderer	"orderer"
71c2246e1165	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



Technical Working Group China

- About TWG-China
 - Since Dec 1, 2016
 - wiki.hyperledger.org/groups/tsc/technical-working-group-china
- Email
 - lists.hyperledger.org/mailman/listinfo/hyperledger-twg-china
 - hyperledger-twg-china@lists.hyperledger.org
- Online Chat
 - [twg-china](#)



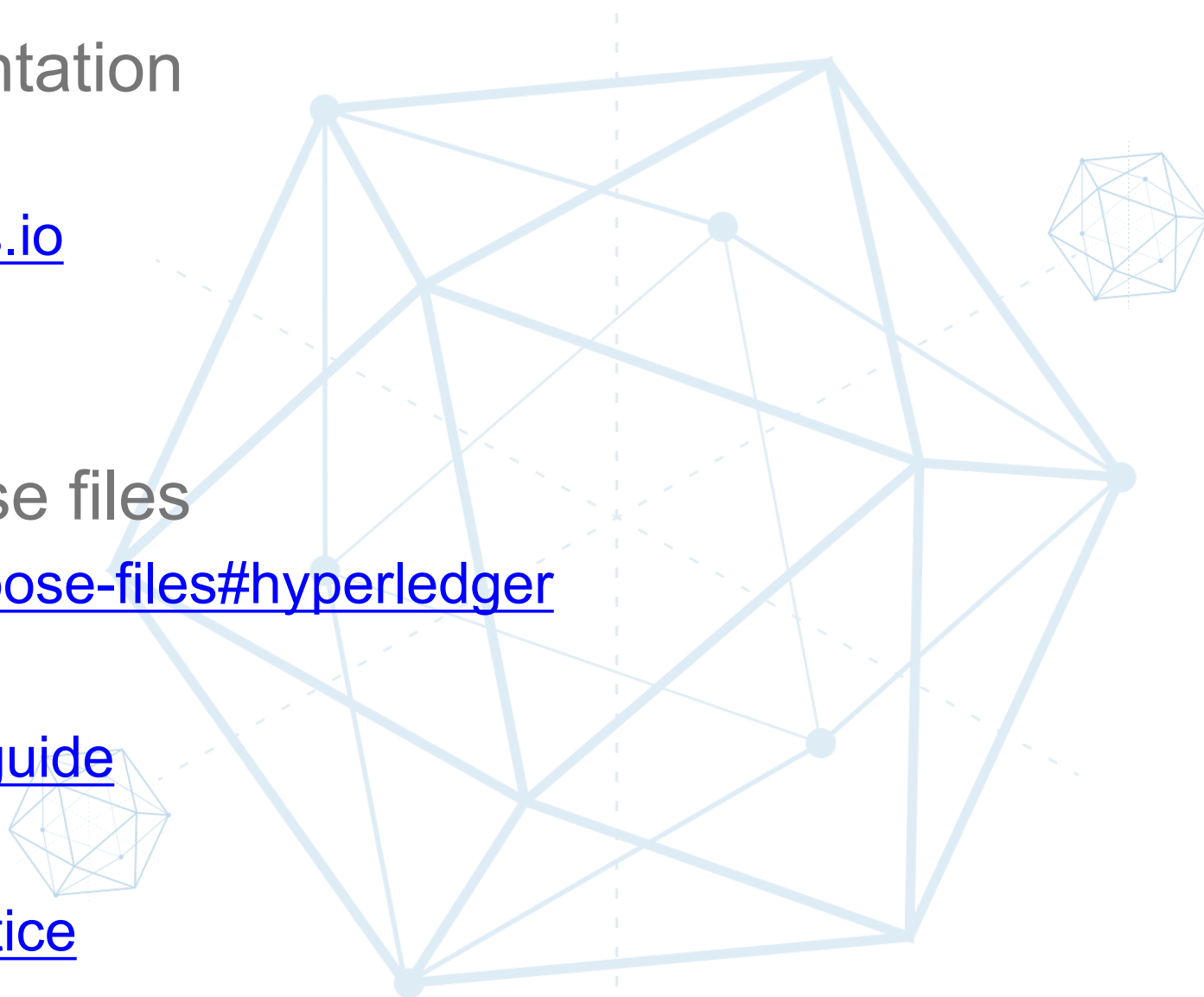
Technical Working Group China

- 1st Asia Hackathon
 - [Mar 11/12, 2017, Shanghai](#)
- Meetups
 - Beijing, Shenzhen, Shanghai
- Educations/Trainings
 - Welcome for volunteers
- Projects
- i18n Team
- Summer Open-Source Internship



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!
@baohua

Slides available after the event