



My Journey In Building Blockchain Applications

Let's get Hyperlegendary!



About me!



CIO & Head of Blockchain Division,
Skript Technologies Pvt. Ltd.

- Hyperledger Fabric & Sawtooth
- Managing Google Developers Group
Chennai
- Blockchain Tutor in Amity University &
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Skript

**How many
Developers/Architects?**

How many Business Analyst?

What is Blockchain?

When to go Blockchain?

& When not?





Go with Blockchain when your system is

- Transparent
- Prone to attacks
- Holds transactional data
- Multiple people involved in data generation and moderation

Ex. Banking, Supply Chain, Some cases in of IoT, Consortium of Organization



Don't go with Blockchain when your system is

- Only One Party Involved
- A Highly Closed System
- Holds more of static or archive data
- More Realtime Data

Ex. Highly centralized systems, CRM, Project Management Systems, IM Systems

Things to remember when you go to Production with Hyperledger Fabric





A Quick Brief About Hyperledger Fabric

- By **IBM**
- Pluggable Components
- Mainly used for Asset Management
- Composer is a chaincode development framework

What is Hyperledger Fabric?



Composer Vs. Fabric Native SDK

Avoid using Hyperledger Composer when your system is

- A Large Scale / Production Grade Implementation
- When dealing with complex relationship in data
- Multi channel network
- IoT Based Applications



Generate the crypto certificates only once

- Always have two sets of crypto certs, one for production and one for the development.
- Never replace the certs after deploying as you might have to reset the ledger and restart everything from scratch.



Don't create random numbers or timestamps at chaincode

- In a distributed system, random numbers or identifiers are not supposed to be created in the smart contract
- The Endorsement will fail on different read/write sets.



Never use OR endorsement policy in Production Deployment

- The stronger Endorsement policy builds stronger trust in the system
- Also makes the system less vulnerable.



Trigger Events in Chaincode

- Don't write your trigger events like sending email in chaincode
- Since during endorsement every endorsing peer will run the chaincode, the triggers will be ran those many times



Never use solo orderers in production

- Solo orderers can result in single point of failure.
- Kafka Based Ordering Service will help in fault tolerance



Deployments Environments

On Prem

- Nodes are Decentralized in Various Locations
- Connected by Public IPs and Public Network (Internet)
- Clients connect with Public Static IP

Cloud Instances

- Nodes are Decentralized in Various Locations or In Same location
- Connected by Local IPs and Private Network (VPC)
- Clients connect with Public Static IP
- Docker swarm can be used



Hybrid Deployments

On Prem + Cloud

- Few Nodes are On Prem Nodes and Few or Cloud Nodes.
- Sometimes challenge is On Prem nodes doesn't have Static IP. In that case it cannot involve in endorsement.
- Orderers & Kafka instances are managed in cloud and made reachable to On Prem Nodes with Public IP

Performance in Hyperledger Fabric

What are the factors impacts it?





Chaincode Payloads

LARGER PAYLOAD = HIGHER LATENCY

Also computation is expensive



Data Processing in Chaincode

HAVE ATOMIC OPERATIONS IN CHAINCODE

Suits better for distribution in the network



Endorsement Policy

MANY ENDORSERS = HIGHER LATENCY
But creates more trust in system



Network Architecture

PRIVATE NETWORK > PUBLIC NETWORK

But private network is not scalable



Data Structures

**DECIDE WHAT TO GO INSIDE BLOCKCHAIN AND
WHAT NOT**

Not all day needs to be on the chain!

Some Must Try Tools For Hyperledger Fabric!





Some pretty cool tools

- Composer Playground : <https://composer-playground.mybluemix.net>
- Caliper : <https://github.com/hyperledger/caliper>
- Gauge : <https://github.com/persistentsystems/gauge>
- HLF Network Gen : <https://hlfgen.skript.com/>

Any Questions?





Thank You!



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