

DoxChain - Week 2

Architecture

Last meeting: blockchain choice



HYPERLEDGER FABRIC

- Permissioned
- Allows the creation of tokens and the use of chain code (smart contracts)
- Better oriented to industry
- Strong community and documentation
- Does not use proof of work (relevant since this project is related to sustainability)
- Flexible

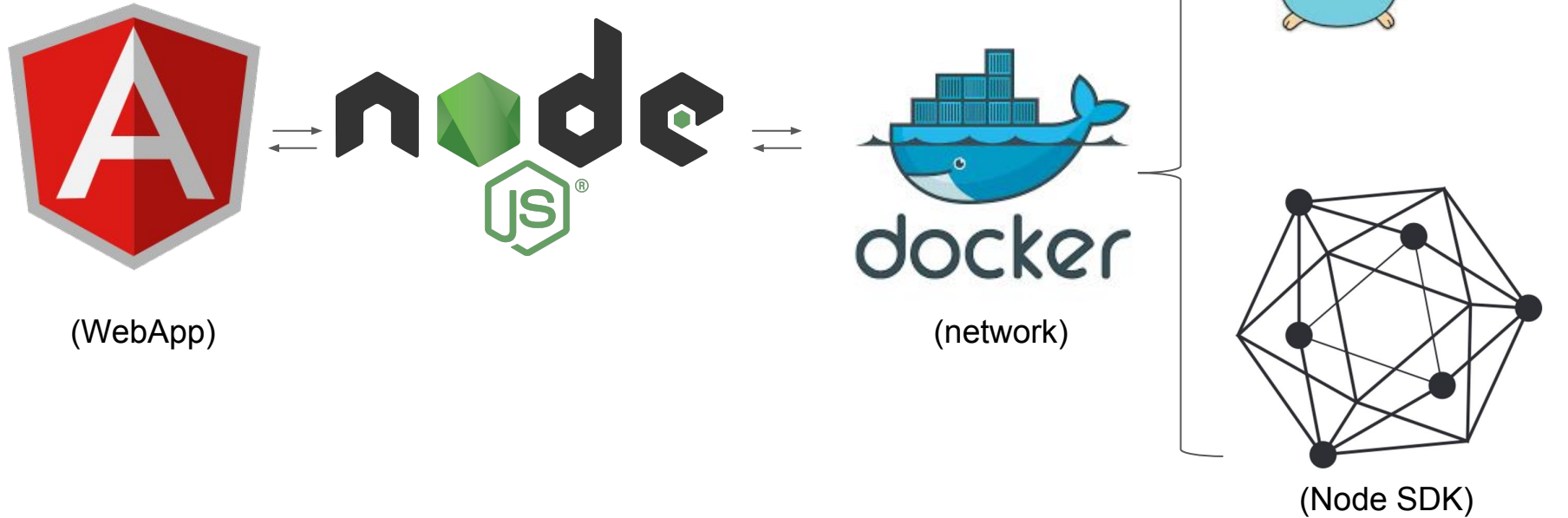
Last meeting: requirements summary

- Focus on settlements of NOX emissions
- Bring together supply and demand for both future and on spot demand
- Companies measure NOX, cannot double spend or exchange more than allowed
- Full audit trail needed
- Parties involved in settlement should remain unknown to each other
- Allowed emission depends on different factors (zip code, size, type)
- Real data complicated to obtain, we must propose a model

Emission trading regulation

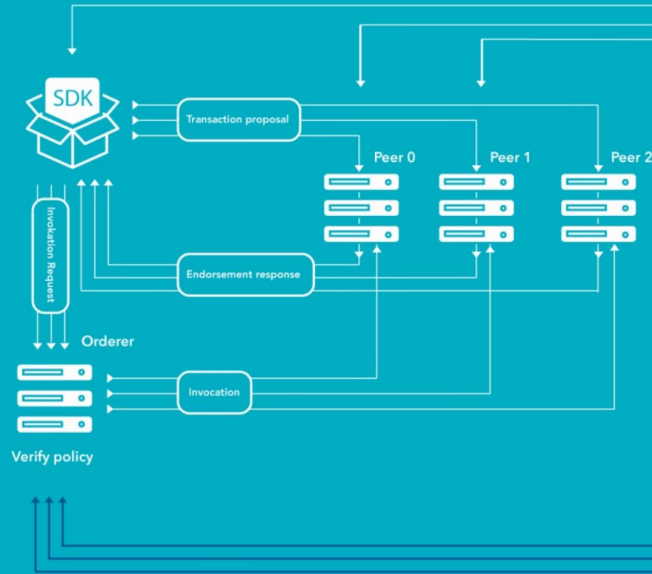
- Part 1: “Account holders”, “baseline emission rate”, “Director”, “emission credit”, “emission trading account”, “Registry operator”.
- Part 2: Compliance with Privacy regulation. Authority allowed to collect fees.
- Part 3: When required the registry operator must issue documentation as evidence of an electronic record required by the administration. Registry contains the emission trading accounts. Maintains a history of transfers for each emission credit. Public: identity of account holders, baseline emission rate for each generating unit. Confidential: emission credits in a holding account, emission credits in a holding account. Units can apply to be part or withdraw from the registry.
- Part 4: The Director must establish a baseline emission rate for every generating unit. NOX in kg/MWh, depends on operating conditions and period of operation.

Overview

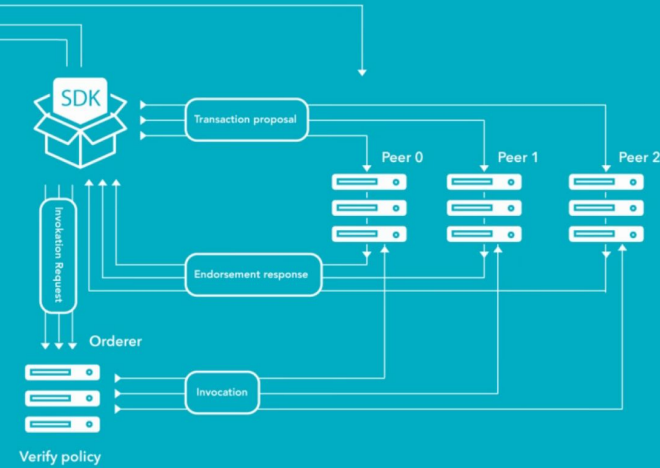


Network/Blockchain architecture

1 ORGANISATION



2 ORGANISATION



Implementation decisions

- Government (regulator) node
- Separate channel (blockchain) per geofence with members and regulator
- Token issued per year and distributed by regulator
- Each year new tokens are issued to prevent leftovers
- Regulator chaincode (creation and distribution)
- Transference chaincode (per channel)
- Accounting chaincode
- Account model (not UTXO)
- Companies register with Fabric CA, and can participate in many channels

Role assignment for upcoming weeks

1. Application - Gabriel, Guangze

Frontend: Angular

Backend: Node SDK

Composer: Smart contracts, model file, access control

2. Blockchain infrastructure - Stefan, Tamara, Valentin

Docker containers, Fabric

Orderer ,Fiber CA(Certificate Authority), Policy

MSP (Membership provider)

To be done

- Decide on consensus algorithm (not relevant for now because it is “plug and play”).
- Propose data model
- Propose frontend design
- Functionality details
- Start building!

