



Consensus Mechanisms

Consensus Mechanisms are the rules by which a network agrees to the validity of transactions. The process ensures participants process the same set of transactions in the same order on the blockchain.

Different Types of Consensus

Practical Byzantine Fault Tolerance (PBFT)

- Participants or nodes in a network sign off on a transaction by executing the chaincode correctly
- Consensus that a transaction is valid is reached once a certain number of identical responses is reached
- Works best for permissioned blockchains
- Used on Hyperledger Fabric v1

Pros:

- Tolerant of a failure by a minority of nodes, which is a strength for permissioned networks

Cons:

- Failure of more than 1/3 of nodes can result in a lack of consensus and transactions not being executed
- This method is only viable for permissioned blockchains



Proof of Work (PoW)

- In order to change a record on a blockchain, you must redo the proof of work, a complex computational task that requires an arbitrary amount of computing power
- You receive a fee as a reward for exerting this power
- Used on Bitcoin blockchain, and Ethereum Homestead release (Ethash)

Pros:

- Requires a lot of computing power to attack

Cons:

- This is an expensive solution resource-wise, in that it requires a lot of computing power
- This method has a limited scale



Proof of Stake (PoS)

- Consensus is determined on valid peers agreeing
- Agreement is determined by a participants reputation or stake in the system / network
- Used on PPCoin

Pros:

- Participants are accountable for their own actions
- Participants ability to make future validations or changes requires trustworthy reputation in the system, which incentivizes good behavior

Cons:

- Difficult to succeed in a public network
- Trust and reputation of the participants is necessary for validation

