Delegated Proof-of-Stake

Objectives

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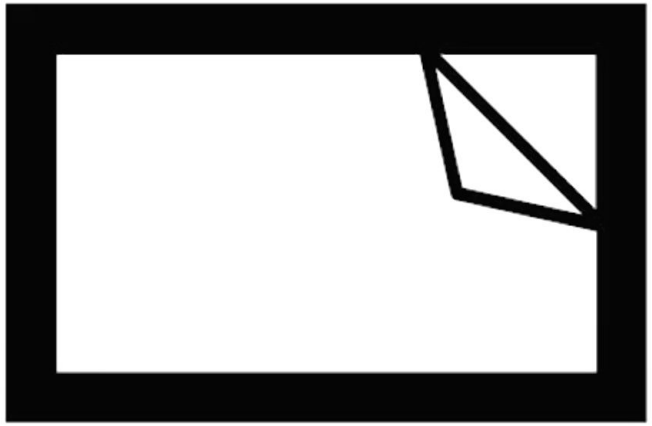
Describe Delegated Proof-of-State Consensus

Background

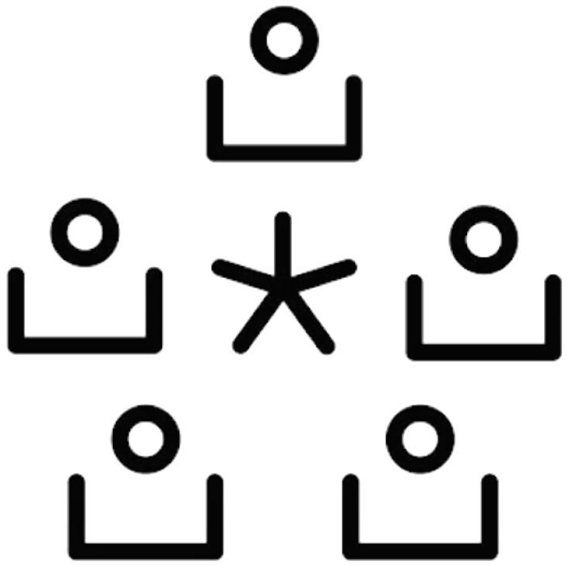
- Algorithms that allowed anyone to participate in the process of creating new blocks, given some limiting economic resource
  - Proof-of-Work (computing power)
  - Proof-of-Stake (stake in network)
- Algorithms that specify a group of actors that may participate in the consensus process
  - May decrease latency, increase reliability, etc.
  - Will lose aspects of the intrinsic decentralization found in protocols that use open-participation consensus algorithms



Delegated Proof-of-Stake (DPoS)

Consensus algorithm in which those with a stake in the network elect block producers to participate in the consensus process

- Differs from traditional Proof-of-Stake, in which those with a stake in the network are the block producers
- Created by Dan Larimer in 2013 for BitShares



Two main components

1. Process by which block producers get elected
2. Process in which producers produce blocks

BitShares Implementation - Election

1. **Those who want to be delegated as a block producer** register with the network
2. **Those with BTS Tokens** vote, proportionally to their stake of coins, on who they want to be block producers.
3. **The top 101 block producers with the most votes** from the network are the designated block producers for a single round of production.

NOTE: As a BTS holder, you can allocate your vote(s) to a single account, or a proxy, whom you trust. The chosen proxy will then have the ability to vote on your behalf.

BitShares Implementation - Production

1. Set of block producers get ordered such that each is allowed one time slot to produce a block per round.
2. Block producers produce valid blocks within their designated time slot.
    - If a block producer fails to produce a block (or produces an invalid block) within their timeslot, their timeslot is skipped and the following block producer produces a block during their designated time slot. The network at large can detect this behavior and take it into account when electing block producers.
3. Block producers collect a reward for every valid block created within their time slot.

NOTE: The ordering of block producers get shuffled every 101 blocks so that there is a new ordering each “round.”

BitShares Implementation - Other

- Consensus Chain Rule - the longest valid chain with the highest witness participation rate
- Electing delegates to decide on other properties of the network such as block size, block time interval, number of delegates
- Transaction as Proof of Stake (TaPoS)

NOTE: The participation rate is calculated by computing the expected number of blocks produced divided by the actual number of blocks produced within a certain time period.