

DPoS

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Contents

- 1 Delegated Proof of Stake blockchain
- 2 Principle of work
- 3 Advantages of DPoS
- 4 Disadvantages
- 5 See also
- 6 Resources
- 7 See Also on BitcoinWiki



Delegated Proof of Stake blockchain

Delegated Proof of Stake (DPoS) is a consensus algorithm developed to secure a blockchain by ensuring representation of transactions within it. DPoS is designed as an implementation of technology-based democracy, using voting and election process to protect blockchain from centralization and malicious usage. Delegated Proof of Stake was developed by Daniel Larimer - American software developer, cryptocurrency entrepreneur and a founder of **BitShares**, **Steemit** and EOSIO software. Many blockchains use EOSIO code, such as Telos, WAX, Wobli and **EOS**. Daniel invented DPoS as an alternative to energy-inefficient consensus of

Proof-of-Work blockchains and Proof-of-Stake consensus, that is poorly protected from malicious intentions of stakeholders. First implementation of DPoS was executed in cryptocurrency called BitShares. DPoS was also planned to be more scalable alternative to classic consensus algorithms. As every block is validated in avoidance of the need to use a lot of energy, progressing amount of computing power and other resources, all transactions can be performed relatively fast on every stage of network's development. Famous examples of cryptocurrencies that use DPoS include **Lisk**, **Steem**, **Waykichain**, **EOS** and **BitShares**.

What is DPOS - Delegated ...



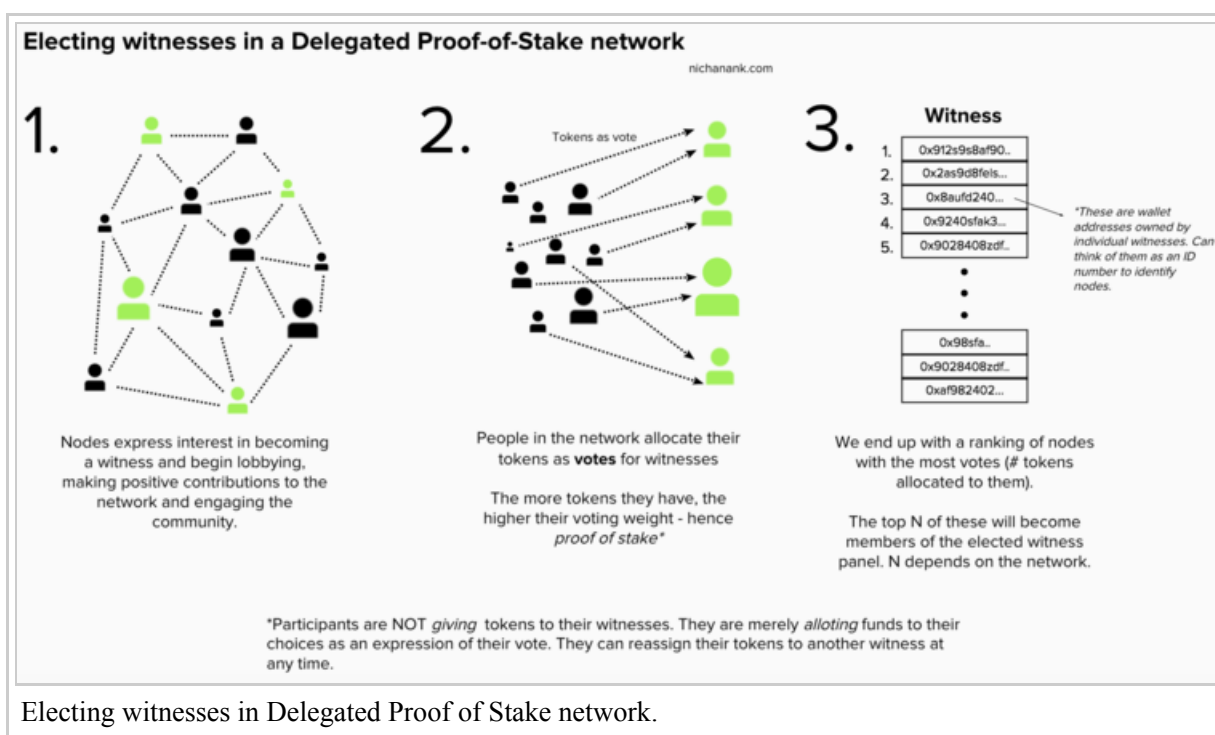
What is DPOS - Delegated Proof of Stake?

Principle of work

Delegated Proof of Stake is mostly maintained through the election process. Active users of DPoS-based

blockchain are voting for “witnesses” and “delegates” with placing their tokens on the name of their candidate (those tokens are not spend this way, they are just representing the position of stakeholder and remain his/her property). Positions of the witnesses and delegates differ in various cryptocurrencies and one role can absorb another role’s functions or even eliminate it. In case of BitShares - first DPoS-based blockchain, witnesses are responsible for creating and validating blocks, with a certain number of most popular witnesses being a part of a committee of block forgers. Top-tier witnesses are awarded with fees for every validated transaction. Most DPoS-based cryptocurrencies don’t allow witnesses to prevent transaction from happening and if a witness missed a block (e.g. because his/her server went offline), it is redirected to the next active witness immediately. On the other hand, some cryptos offer witnesses a right to block transactions, their malevolent use of this power is prevented with active voting and possible reputational damage. However, there is no DPoS blockchain, where witnesses are allowed to change any info about or within a transaction. Since it is the witness' responsibility to validate transactions and produce blocks, it's important they have a stable server 24-7/365 and close to 100% up-time.

Delegates are voted to govern the system and to propose core changes. Delegates are not in charge of block



production and transaction validation, but they oversee such parameters as transaction fees, block sizes, witness pay, and block intervals of the network. Delegates are not paid positions, but parameters that are under their competence are not expected to change very often. After major decisions being made, some DPoS blockchains offer a short opportunity window for re-electing delegates if the ruling is not approved by their voters. Election voting is a continuous process so every witness or delegate is under the pressure of losing his place to another, more popular competitor. Reputational and financial losses are primal motivation for their abstinence from malicious behavior. Most DPoS-based blockchains take stakeholder’s stake size into account. Vote power of the voter is determined by the amount of tokens he is holding. However, there is no regulation that restrict users from voting due to their stake being not big enough. The fact, that opportunity of voting is granted to every user of the network is what makes **DPoS** the most democratic approach to blockchain consensus algorithm. **PoW** blockchains don’t allow users with small computing power to actually influence the network, that is the main reason for the existence of mining pools, that currently are the only entities governing bitcoin. Most of **PoS** blockchains exclude small stakeholders from making any decisions on network’s governance.

Advantages of DPoS

1. DPoS coins are much more scalable than POW cryptocurrencies as they never start requiring high

- computing power and are generally approachable for users with poor equipment.
2. DPoS blockchains showed themselves to be faster than PoW and PoS-based blockchains.
 3. DPoS coins are more democratic and inclusive than their alternatives. DPoS vs PoS offers more governance power to users with small stakes, DPoS vs PoW does not require as much computing power and, therefore, is not so financially demanding on the user.
 4. As threshold to enter is very low, DPoS is largely considered to be the most decentralized approach to consensus mechanism.
 5. DPoS is energy efficient and environmentally friendly.
 6. DPoS networks have strong protection from double spend attack.

Disadvantages

1. Successful existence of the network requires participation and coordination of genuinely interested community for effective governance of the panel of witnesses by voting them in and out.
2. DPoS systems are vulnerable to centralization as a number of witnesses is strictly limited.
3. DPoS blockchain is exposed to flaws of classic real-life voting. For example, DPoS users with small stakes can decide that their vote doesn't matter in comparison with votes of bigger stakeholders.

See also

- Proof-of-work
- Proof-of-stake
- EOS
- Neo
- Ethereum

Resources

- CoinBureau - Delegated Proof of Stake (DPoS) – Total Beginners Guide (<https://www.coinbureau.com/education/delegated-proof-stake-dpos/>)
- Nichanank - Consensus Algorithms: Proof-of-Stake & Cryptoeconomics (<https://www.nichanank.com/blog/2018/6/4/consensus-algorithms-pos-dpos>)
- docs.BitShares.org - Delegated Proof of Stake (<http://docs.bitshares.org/bitshares/dpos.html>)
- Hackernoon - “What is Delegated Proof of Stake?” (<https://hackernoon.com/what-is-delegated-proof-of-stake-897a2f0558f9>)
- Lisk.io - Delegated Proof of Stake (<https://lisk.io/academy/blockchain-basics/how-does-blockchain-work/delegated-proof-of-stake>)
- Orbs.com - “WHAT IS PROOF-OF-STAKE (POS)?” (<https://orbs.com/what-is-proof-of-stake-pos-vs-dpos-vs-rpos/>)
- BitShares.org - Delegated Proof of Stake Consensus (<https://bitshares.org/technology/delegated-proof-of-stake-consensus/>)
- Clever-Solution.com - Consensus Algorithm. DPoS pBFT Solution for Distributed Ledger Security (<https://clever-solution.com/case-studies/consensus-algorithm-opportunity-dpos-pbft-solution-for-distributed-ledger-security/>)

See Also on BitcoinWiki

- ARROUND
- Universal Recognition Token
- Spotcoin

- ShareRing
- EVO



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