



101 Blockchains

POW VS POS

KEY DIFFERENCES

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What is Proof of Work?



Proof of Work is a type of consensus mechanism. Here, users (a.k.a. miners) use their computational devices to solve complex mathematical problems in order to verify and add blocks to the ledger system.

It needs heavy computational power to function properly.

Working Principles of Proof of Work

- ➔ Miners solve complex mathematical problems. After that new block gets created and the transaction is confirmed.
- ➔ Depends on the number of users available on the network, overall load of the network and minimum current power.
- ➔ Each block will contain a new hash function and the hash function of the previous block.



Advantages of Proof of Work

- ➔ Proof of Work consensus offers a high level of security compared to other consensus mechanisms.
- ➔ It can establish a true decentralized network and offers a transparent transaction verifying process for every user.
- ➔ This process also offers a reward system for the users participating in the mining process.



● Issues with **Proof of Work** Consensus Algorithm ...

- ➔ It does not offer efficiency. The process is slow and can amount to high expensive fees.
- ➔ It needs a massive amount of energy to function, which is not an environmentally friendly process.
- ➔ The mining process damages hardware; therefore, miners have to invest in expensive equipment. It's vulnerable to 51% attack.



What Is Proof of Stake?

Proof of Stake is a consensus mechanism that addresses the issues of Proof of Work and offers a better solution.

Here, users will need to stake their coins in order to participate in the verification process. This one does not need computational resources like PoW.



How Does It **Work**?

- ➔ In Proof of Stake, users have to be qualified to take part in the verification process. To qualify one needs to store a certain amount of coin in their wallets.
- ➔ Once you are qualified, you will need to deposit or stake an amount of coin to take part in the voting system. This voting system will choose the validators.
- ➔ The more you stake the more you can mine or validate a new block.



Advantages of Proof of Stake

- ➔ Proof of Stake is a highly efficient consensus protocol as it does not need heavy computational power to function.
- ➔ It can offer inexpensive transaction processing fees and can also verify and process a transaction faster.
- ➔ It does not need any special hardware or equipment to function.



● Issues with Proof of Stake Consensus Algorithm ...

- ➔ The process is not as robust or secured compared to Proof of Work.
- ➔ It can promote unfairness as validators with larger coins at stake can influence the transaction verifications.
- ➔ In some cases, users may have to lock up their staked coins for an amount of time.



● Key Differences between PoW and PoS ...

	PoW	PoS
Verification Mechanism	Mining	Validators
Incentive Policy	Transaction fees + new coins	Transaction fees
Vulnerability	51% attack	Nothing at stake
Motivation	Profit	Loyalty
Requirement	Hash Power/Computational Power	Number of coins owned
Scalability	Low	High
Main Issues	Energy Inefficient	Wealth concentration

Verification Mechanism

In PoW, the verification process is called mining. Here, miners have to verify the block by solving complex mathematical problems.

In PoS, validators have to stake their coins in order to take part in the verification process. The more users stake, the more they can verify.



Incentive Policy

In PoW, the users will need to pay a transaction fee to the miners as an incentive in order to get their transactions verified. However, this mechanism also rewards miners with new native coins.

In PoS, the users will need to pay a small transaction fee to the validators for validating their blocks. Here, the validators will only get the network fee or transaction fee as an incentive.



Vulnerability



In PoW, the network is vulnerable to 51% attack. Therefore, if an entity or organization owns 51% of the computational power available on the network, they can manipulate the network as they want.

In PoS, if no users are staking their coins in the network, no transactions will get validated. So, the transaction processing will stop indefinitely.

Motivation

PoW motivated users to become miners by offering them profits. Without the extra reward points, no one would take part in the validation process.

PoS does not offer users anything extra like PoW to motivate them in becoming validators. The system runs on the factor of loyalty. PoS requires users to be loyal to the network and take part according to their own accord.



Requirement

PoW requires a lot of computational power or hash power to function. However, this process is extremely costly and is affecting the environment negatively.

PoS requires users to own a certain number of coins in order to be eligible. The more coins users own the better their chances.



Scalability

PoW can become extremely slow when there are many users on the network. Therefore, it has a low scalability problem.

PoS is a much faster process even if there are many users on the network. It can offer high scalability.



Main Issues



PoW can't use energy efficiently. It needs a massive amount of energy to function, which is not an environmentally friendly process.

PoS can become unfair if a few users have a high wealth concentration than others. Using that, those users can dominate the verification process.

Learn More About PoW and PoS



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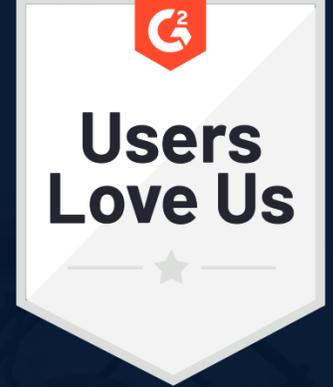




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