Essay: Choose two blockchain platforms and describe how they differ with regard to the key architectural and design characteristics of the blockchain trilemma. Conclude with a brief analysis of the two platforms based on data from the Crypto-Economics Explorer.

Ethereum and EOS are two of the most recognized blockchain platforms. Both are very popular but also very different from one another. Under the blockchain trilemma (decentralization, scalability and security) their main differences can become obvious because there are always trade-offs. While one platform focuses more on the security and decentralization (Ethereum) the other one pays more attention to the scalability side. We will see that this doesn't make one better than the other, it is just that they fit very well for different purposes.

Decentralization

Ethereum: it uses Proof-of-Work (PoW) consensus mechanism where miners, which bring the computing power to the chain, solve a mathematical challenge set up by the system. The full cycle of writing a new chain takes around fifteen seconds. Since miners, when creating blocks, are allowed to choose which pending transactions are added to the block, some low fee transactions might take considerable time to be processed.[1] Ethereum is currently working in a 2-phase scalability initiative that will help with this issue: the first phase, will be to switch to a Proof of Stake consensus (called Casper) and the second phase will be by implementing 'sharding'[2] which is a database partitioning that will be grouping transactions by different characteristics.[3]

EOS: is partially decentralized, they have a group of 21 miners which are also responsible for maintaining the system. They use a Delegated Proof of Stake (DPoS) consensus which, in this case, use all 21 miners to form 252 blocks (12 each). This method can produce one block every half second.[1]

Scalability

Ethereum: can only process around 10-15 transactions per second. Since the platform uses PoW algorithm, there is a limited amount of data it can process per block every 15 seconds (in average) it takes to solve the puzzle.

EOS: has been processing around 70 transactions per second[1] but has a capability of doing around 1 million.[4] It is very easy for the system to grow rapidly since it only requires miners to vote for it. The physical limitations such as RAM can be scaled easily.

Security

Ethereum: utilizes one of the safest consensus mechanisms, Proof of Work. As computational (hash) power increases in the network, it will make it even safer. On the other side, Solidity, Ethereum's programming language, has an area of opportunity. Right now, it is more focused on make development easy but it might lead to programming errors.[1]

EOS: because miners have the authority to rollback and block transactions and can limit access to a specific party, the system is not as secure as in Ethereum.[1] EOS security and architecture is also different from Ethereum in that they divide the system in 3 main areas: Cleos as user interface, Nodeos for data storage and Keosd for storing private keys. On the developer side, each EOS developer has to publish a Ricardian contract where they state the intent of the code so that the end user is always protected from bugs.[1]

On the developer side, like Ethereum, EOS has a great system where developers just have to write the code and they usually provide with toolkits to get started.

Comparing Ethereum and EOS using CoinDesk Crypto-Economics Explorer (all percentages are in reference to Bitcoin).[5]

- Developer: Ethereum (54%) has an advantage over EOS (30%). There is more developer interest in their platform. Most of the new ideas and projects had been generated in Ethereum.
- Network: EOS (66%) network is bigger than Ethereum's (13%). This means that there are more transactions and uses for EOS than Ethereum at the moment.
- Price: Ethereum (18%) crypto-price is greater than EOS (4%).
- Exchange: Ethereum (44%) makes more transactions than EOS (14%).
- Social: social media engagement and interest for Ethereum (26%) is greater than EOS (11%).

In most of the crypto-economics metrics Ethereum scores better than EOS, one of the main reasons is that Ethereum was founded in 2014 and has been in the market longer than EOS which was founded in 2017.

Conclusion

Ethereum's PoW mechanism prioritizes decentralization and security at the expense of scalability.[1] On the other side, EOS prioritizes scalability over decentralization and security. Both platforms have public and private implementations and most of their customers are just trying to increase trust and transparency to their customers. Both systems are robust and have thousands of dApps implementations (even some of them have dApps in both platforms).

The industry is still growing, but with the emergence of security audit firms, the application bugs and intentional attacks are minimized.[1]

References

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