Appendix K: DIDO Consensus

Return to Reference Architecture (RA) or Return to Appendices

Why is it important

Consensus Algorithm are essential in establishing confidence in a DIDO.

Thus there are various types of consensus algorithms in blockchain prospect, some of them are explained below[1)]

- K.1 Definition of Terms
- K.3 Consensus Mechanisms
- K.4 Consensus Platforms
- K.5 Consensus Algorithm References
- platform

Table 1:

Consensus Alorithym	Description	Platform Examples	Pros	Cons	Type
Proof of Work (PoW)		Bitcoin, Litecoin, ZCash, Primecoin, Monero, Vertcoin	Less opportunity for 51% attack Better Security	Greater energy consumption Centralization of Miners	Competitive ConsensusWebpage: SAINI
Proof of Stake (PoS)		Ethereum, Dash, Peercoin, Decred, Reddcoin, PivX	• Energy efficient Webpage: SAINI • More expensive to attack for attackers Webpage: SAINI • Not susceptible to economies of scale Webpage: SAINI	• nothing-at-stake problem Webpage: SAINI	Competitive Consensus Webpage: SAINI
Delegated Proof of Stake (DPoS)		• Steem, EOS, and BitShares Webpage: BHARDWAJ • BitShares, Steemit, EOS, Lisk, Ark Webpage: SAINI	• Energy efficient. Webpage: SAINI • Fast. Steemit, a high traffic blogging site uses it. EOS has a block-time of 0.5 sec. Webpage: SAINI	• A bit centralized.Webpage: SAINI • Participants with high stakes can vote themselves in to become a validator. Something which is seen recently in EOS.Webpage: SAINI	Collaborative consensusWebpage: SAINI
Leased Proof of Stake (LPoS)		Waves			
Proof of Elapsed Time (PoET)		Hyperledger Sawtooth, Resource-Efficient Mining (REM)			
Practical Byzantine Fault Tolerance (PBFT)		Stellar, Ripple, Hyperledger FabricWebpage: BHARDWAJ			
Simplified Byzantine Fault Tolerance (SBFT)		Chain			
Delegated Byzantine Fault Tolerance (DBFT)		NEO Webpage: BHARDWAJ			
Directed Acyclic Graphs (DAG)		Iota, Hedera Hashgraph Webpage: BHARDWAJ			
Proof of Activity (PoA)		• Espers and Decred Webpage: BHARDWAJ • Decred Webpage: SAINI			Collaborative consensusWebpage: SAINI

Consensus Alorithym	Description	Platform Examples	Pros	Cons	Type
Proof of Indentity (PoI)					
Proof of Importance (PoI)		NEM			
Proof of Capacity (PoC) Proof of Space (PoS)		Burstcoin and SpaceMint Webpage: BHARDWAJ	• Similar to PoW but uses space instead of computation. Thus much environmental friendly. • Can be used for malware detection, by determining whether the L1 cache of a processor is empty (e.g., has enough space to evaluate the PoSpace routine without cache misses) or contains a routine that resisted being evicted. • Can be used for anti-spam measures and denial of service attack prevention. • PoC can use any regular hard drives including those with Android-based systems. • It is reportedly up to 30-times more energy efficient than the ASIC-based mining of the bitcoin cryptocurrency. • There is no need for dedicated hardware or constant upgrading of hard drives. • Mining data can be easily wiped-off and the drive can be reused for any other data storage purpose. https://www.investopedia.com/terms/p/proof-capacity-cryptocurrency.asp	• Not many developers have adopted the system. • It is possible for malware to affect mining activities. • Widespread adoption of PoC could start an “arms race” to produce higher capacity hard drives. https://www.investopedia.com/terms/p/proof-capacity-cryptocurrency.asp	Collaborative consensusWebpage: SAINI
Proof of Burn (PoB)		Slim Coin Webpage: BHARDWAJ			
Proof of Weight (PoW)		Algorand, Filecoin, Chia	• Energy efficient.Webpage: SAINI • Highly Customisable and scalable.Webpage: SAINI	• Incentivization can be hard.Webpage: SAINI	Competitive consensus Webpage: SAINI

1)

Coinjoker, Consensus Algorithms in Blockchain, Accessed: 9 July 2021, https://www.cryptoexchangescript.com/blockchain-consensus-algorithms

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