🧊The Principles of Zoo Chain

Consensus Mechanism: The Zoo Chain will initially be a POA (Proof of Authority), a privately maintained chain by Singularity Studio. Singularity Studio will use the mechanism of POA (Proof of Authority) to ensure and maintain on-chain consensus. In the future, a conversion process to a DAO owned chain by the community can be implemented by a change of the consensus mechanism through hard forks. If the POA consensus that comes with Go Ethereum (geth) is used, the Zoo Chain can continue to be compatible with future versions of Ether. Note that there is no reward for mining within this protocol and there needs to be allocated Ether in the genesis block.

Hardware: The number of authoritative nodes can be denoted by N. If more than $\frac{1}{2} \cdot N + 1$ authoritative nodes are trusted, the blockchain network will be classified as safe and will continue to function flawlessly. Since all nodes are under the control of Singularity Studio initially, all of them are trusted by default. However, considering the Byzantine fault tolerance problem, $\frac{2}{3} \cdot N + 1$ authoritative nodes are needed to establish consistency within the POA chain. In addition, to ensure availability, three validation servers will be prepared to ensure that the service is still available after one server goes down. One full node provides services such as querying and initiating transactions for users and acts as a boot node to help nodes discover each other.

Transactions Per Second (TPS): With a transaction size of 4MB and 50 nodes, Zoo Chain can reach 8000tps [1], so the block generation rate can be set to 3s or less. However, due to the 1kb size of the empty block and the gradual increase of subsequent transaction data, a 3s block-out speed will be integrated to ensure a balanced solution.

Interface: The Zoo Chain will maintain Ethereum compatibility, which will be compatible with most of the dApp, ecosystem components, and tools of the Ethereum ecosystem. This will allow the Zoo Chain to achieve integration through easy interface modifications and will propel the evolution of the chain in the future by preventing redundancy from plaguing the Zoo Chain ecosystem.

[1] A. Ahmad, M. Saad, J. Kim, D. Nyang and D. Mohaisen, "Performance Evaluation of Consensus Protocols in Blockchain-based Audit Systems," 2021 International Conference on Information Networking (ICOIN), 2021, pp. 654-656, doi: 10.1109/ICOIN50884.2021.9333867.