Volentix nodes and voting system

The Volentix Labs Team
sylvain@volentixlabs.com

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Abstract

Volentix Labs has put together a network using DHT and EOSIO's DPOS consensus mechanism. Here is an explanation of the voting mechanism used to rank the nodes to form the core 21 nodes that will sign transactions.

1 Network of nodes and voting system

The Volentix network are EOSIO contracts, `https://github.com/Volentix/volentix_contracts/tree/master/vdexdposvote`, linked into a network by DHT. Volentix nodes use a DPOS/quadratic mechanism to establish ranking. Nodes are currently being rewarded small amounts to test DHT and voting system functionality. OpenDHT is used to create a network of nodes from which various applications can be run. i.e EOSIO key and account matching, IP, location, uptime, chat, various chains commands and oracles.

1.0.1 DHT

- Pairing Node id: EOS public key
- Chat
- Geolocation

1.0.2 Voting system

1. Nodes are required to vote for at least one other node than themselves.
2. Required to vote is that the VTX balance of the node's EOSIO account must be greater than 1 VTX
3. Nodes are ranked according to how many votes they get
4. The amount of votes a node gets depends on how the amount of VTX owned by the node's account and the number of votes given to other nodes.

5. nodes are rewarded on their ranking

quadratic voting

If,

B = balance of tokens (cost to the voter)
V = number of votes
N = the number of given votes to other nodes
VPP = votes obtained per period (ranking)

the equation for quadratic voting is then:

$$B = V^2 \tag{1}$$

Then, reordering the equation such as to obtain the number of votes:

$$V = \sqrt[2]{B} \tag{2}$$

The amount of votes are then diluted by how many votes were given to other nodes in a period of 24h to obtain VPP, votes per period.

$$VPP = V/N \tag{3}$$

A voter is able to express how strongly they feel about a certain decision by buying and applying more votes to their desired position. Voters can vote as many times as they want, but they are assigned a set number of voting tokens over a certain period of time and the cost of each vote/token increases in a nonlinear way. Quadratic voting takes advantage of the fact that the stronger someone feels about a certain position, they more they will be willing to allocate more of their votes to that position. In terms of why quadratic voting is "quadratic", Vitalik Buterin explains in his article *On Radical Markets**, the voting is "quadratic" because the total amount you pay for N votes goes up proportionately to N^2. Quadratic voting prevents excessive vote buying from fake accounts and tyranny of the wealthy minority.

1. https://corpgov.law.harvard.edu/2013/06/06/quadratic-vote-buying-square-root-voting-and-corporate-governance/
2. https://medium.com/eximchain/what-makes-quadratic-voting-an-effective-democratic-voting-mechanism-d7a555de8f6b
3. https://economics.yale.edu/sites/default/files/files/Workshops-Seminars/MicroTheory/reny-991110.pdf
4. http://econweb.umd.edu/ davis/eventpapers./WeylVoting.pdf
5. https://vitalik.ca/general/2018/04/20/radical_markets.html

2 Conclusion

While quadratic voting seems to democratize the Volentix voting system other similar methods will be considered such as square root voting, all towards a fairer distribution of power.