

PROOF OF ENGAGEMENT



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DECENTRALIZED FINANCE IN A SELF SOVEREIGN REGULATED
ENVIRONMENT

Proof of Engagement

Proof of Engagement (PoE) was born out of an idea to address some of the shortcomings of the Proof of Stake (PoS) consensus model. PoE contrasts with PoS through the incentives for the wider community to collaborate rather than the narrower focus seen in PoS on rewarding validators and in some variations, delegators.

The motivations

The starting point was that the strongest, and thus more secure blockchains have a highly engaged community who have common interests. In reviewing Proof of Stake, in the various implementations, it became apparent that there are some shortcomings which manifest as centralisation through the concentration of power of validators, and a possible unintended consequence of delegation creating a “nothing at stake” risk with validators.

Deficiencies of Proof of Stake and Delegated Proof of Stake

We observe in PoS that the consequence of using pure stake without any limitations is that a small number of validators dominate through their accumulation of staked tokens that in turn build voting power. Validators accumulate large stakes through several means; there is a “zero commissions attack”, early acquisition of tokens (staff, investors etc) or simply bring in a big chunk of money derived from other sources. The concentration of power leads to centralisation which is undesirable.

There is also concern around the dynamics of validators and delegators in the delegated Proof of Stake (dPoS) model. The validators invest in their infrastructure and security, however, they do not need a big budget to buy tokens as they can rely on delegators. The validator is incentivised to attract delegators to build a stake and they earn on the commissions they charge. The unintended consequence is that with a low stake the validator falls into the “nothing at stake” category and the impact of slashing is felt mainly by the delegators and not the validators who secure the network.

Collaboration not Cooperation

The big difference between PoE and PoS is that PoE is built around collaboration whereas PoS is a more cooperative strategy.

Cooperation is where self-interest is motivated towards achieving a goal, such as a validator building a sufficiently large stake to increase weight to be selected more often to achieve a good rate of return. The structure aligns the self interest to achieve an outcome.

Collaboration is actively working together with others towards the common goal, and this may mean sacrificing some self-interest. For example, an existing validator may help a new validator onboard and introduce them to the informal network of validators, add them to the channels that alert the validator group to issues.

Engagement Rewards

What are they?

A fundamental part of Proof of Engagement is the introduction of Engagement Rewards (ER) that are the incentive mechanism for collaboration. ER are allocated by a self-sovereign, Oversight Community, and is determined by off-chain research, and consensus building combined with on-chain governance mechanism.

ER are associated with an address and in order to be awarded ER there is an off-chain identity verification process, an Oversight Community member must be satisfied that the person who has done some worthwhile contribution can be linked to an on-chain address. For example, the blogger who writes informative articles about aspects of the chain must evidence that they are the author

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of the articles and disclose their on-chain address, if this is not done rigorously then there is a risk that some malevolent actors could claim ER from the endeavours of others.

To promote continued engagement rather than a one-off burst of activity there is a half-life built into ER so that after a given time-period the ER half in number, this incentivises engagement and actively accrue ER to continue benefitting.

It should be noted that ER are recorded on-chain but are not transferrable and are used in the calculation of the distribution of rewards.

How do they work?

The allocation of ER is done by the Oversight Community who are a self-sovereign group and their roles and responsibilities are determined by the constitution and on-chain governance.

Engagement is subjective and thus there are no set of rules that define what engagement is. Recognising the subjectivity of ER, the work of the Oversight Community is to engage with the wider community to identify engagement, work with those who are engaged including matching off-chain and on-chain persona and determine the ER to be allocated. The ER go through a governance process where members of the Oversight Community propose ERs to be allocated and there is a vote (with a quorum and threshold).

The chain revenue from transaction fees and commissions are collected in a reward pool for distribution. Typically, in a PoS or dPoS chain these are paid as rewards to the validators for work done, by contract PoE expands this revenue distribution by factoring in ER earned by all of those in the wider community including validators.

Who is eligible for rewards?

Anyone, not just validators, can earn ER through engagement in the wider blockchain.

As engagement is subjective, and we know what engaged looks like an exhaustive list cannot be compiled. Engagement is broadly defined as contributions and collaboration towards the secure running of the blockchain. The contributions and collaboration extend beyond the technical, a chain thrives with a strong community, and these communities do not emerge spontaneously. People who evangelise about the blockchain attract more people and businesses into the community, there are those who help others with answering questions about software, education, training, and those who build tooling that enhances the blockchain experience, businesses who build and deploy decentralised applications, core development teams, and there are the validators who get involved, help others, and bring best practice.

How do Engagement Rewards fit with validators and their stakes?

Validators are a key piece in running and securing a chain, PoE is an evolution of PoS in that it secures the chain by requiring the validators to stake tokens that creates scarcity of tokens thus making it expensive to attempt to attack the blockchain. Stake is only one element in PoE, we bring in a second dimension of ER so that a validator can build voting power by combining stake and ER.

The combination of stake and ER incentivises chains with smaller stakes to be actively engaged to build ER and gives them the same voting power as a validator who is not engaged and has a large stake.

Validators wishing to earn ER are incentivised to collaborate with others as a joint project may have more impact than a solo effort.

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How would does it work in practice?

It is hard to imagine all the scenarios of how people can be engaged in the community, however, we can consider the following to be reasonable illustrations on what constitutes engagement in practice.

- Validator who helps onboard other validators. The engagement of the validator helping onboard new validators ensures the chain remains stable and that the incoming validators can onboard smoothly. The benefit to the chain is decentralisation and the validator who helped is rewarded.
- A new business building decentralised apps on the blockchain accrues ER as they are important not only in generating transaction fees but bring value to the chain. Value is measured in how many businesses are running on the chain and the value of tokens held on the blockchain.
- A Validator collaborates with developers to introduce a new tool that helps visualise smart contract interactions. As a blockchain with a smart contract engine it is good to understand the relationships between smart contracts and a tool that helps visualise this brings benefits to the community in assessing risk and interdependencies.
- The blogger who writes a monthly article on all that is happening on the blockchain. The audience is the blockchain community to learn the news and importantly for people researching or wanting to be informed about the blockchain. This is important as it showcases what is going on and may encourage participation of developers, validators, businesses to get involved in the blockchain.
- The forum hero who helps answer questions, introduces people to others who can help. This is often overlooked but has an integral part in a community that is based around collaboration. Traditionally this role is done by people driven by passion, in some cases people funded by grants (community or foundations), and possibly by benevolent companies who want to contribute some of their peoples' time. In this case incentivising people to be active in helping others achieves a higher level of collaboration. The impact is harder to measure but needs acknowledging with ER.
- The person organising meetups to gather people interested in the blockchain. This person is like the blogger and evangelist who promote the blockchain and grow the community. The meetup maybe to promote smart contract building, or around the governance of the blockchain, the way to assess the engagement is whether it brings people into the ecosystem and helps it grow.
- Committee members. These are the committee members involved in the governance of the blockchain and the engagement is rewarded through ER, there are conflicts of interest for the Oversight Community on awarding themselves ER, however, as long as they are proportionate it would suffice.

The Oversight Community, having established the link between the off-chain activity and the on-chain address to allocate ER now must consider the weighting of ER and the impact of the engagement on the community.

The impact of engagement is again a subjective measure and for a self-sovereign committee to judge. They will need to discuss the impact in the context of the wider community.

If for example the validator set grew from 50 to 75 in 12 months through the active engagement of 3 validators who helped with the onboarding and mentoring, this can be perceived as a significant engagement as it helps further decentralise the blockchain.

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The contribution of the evangelists and meetup organisers may result in 15 new businesses adopting the blockchain as a platform to build and grow their businesses, the outcomes for the chain are that there is an increase in the value of the chain, and the generation of transactions. The Oversight Community needs to make a judgement on the impact of the new businesses and the activity of the contributors in bringing them to the blockchain.

The process of allocating ER will be an evolving process as it will have a material impact on engagement, too few rewards and it does not incentivise, too many rewards may cause issues around perceived engagement or result in many people chasing the same ER around a given topic. The Oversight Community needs to be transparent around the process and engage with the community.

The process will be a combination in relative worth of the engagement or contribution to the blockchain community for all of the activities and balanced with the overall active rewards. There must be consideration for the time period for assessing engagement against other similar periods, for example if Q1/2021 had 25 activities identified, this is compared to the last 3 quarters. If for example, the three previous quarters had seen 50 activities with a 5,000 ER allocated in total then this should be used as a benchmark in allocating ER to the 25 activities in the current period to give ER consistently.

The mechanisms and application

The detailed mechanics of Proof of Engagement are in the PoE paper, and this sets out the governance mechanisms of how the committees are made, their purpose and what their roles are. The paper also covers the economic models around the rewards paid to validators, combining ER, stakes and the sigmoid curves implemented.

<https://github.com/confio/ProofOfEngagement/blob/master/Proof%20of%20Engagement%20paper.pdf>