AIP-019: Staking Service

lia@ 2021-03-31

Goals

Provide a design of staking service to be used for validator staking and general-purpose staking within apps.

Requirements

- The admin of the staking service (i.e. the app admin) can set the staking configuration such as lockup duration.
- A user can stake some of her AIN from an individual account to an app's staking service account.
- The user's staked AIN is unreachable to anyone except for the user.
- The user can unstake AIN once the lockup duration has been passed since the latest staking timestamp.

Proposed Design

Key Ideas

- Use Service Account as value-holding accounts for staking instances and _transfer for value transfer
- A staking service is tightly coupled with an app and is open automatically when the app is created. The app admin controls the staking service and its configs such as lockup duration.
- The sum of balances of an app's staking service accounts is also tracked.
- Provide the following methods by native functions:
    - _stake
        - An individual account stakes AIN, which is held by a staking service account for the 'lockup_duration'. The transfer of value is performed by _transfer.
    - _unstake
        - The original owner of the staked AIN "unstakes" (i.e. withdraws) from the staking service account and reclaims the tokens. Unstaking is only allowed after the 'lockup_duration', and by the original owner.

Design Details

Database Paths & Native Functions

Staking service config

- Path: /manage_app/<app_name>/config/service/**staking**
- Value: {
  lockup_duration: <number>
  }

Staking balances (service accounts, total)

- Account balance path: /service_accounts/staking/<app_name>/ **<user_address>|<staking_key>** /balance
- Total balance path: /staking/<app_name>/**balance_total**

_stake

- Triggered by: /staking/<app_name>/<user_address>/<staking_key>/stake/<record_id>/value
- Permissions:
  - Only the <user_address> can write at the path, thus has control over the staking service accounts balance
- Action:
  - Transfer from /accounts/<user_address>/balance to /service_accounts/ **staking** / **<app_name>** / **<user_address>|<staking_key>** /balance
  - Updates
    - /staking/<app_name>/**balance_total**
    - /staking/<app_name>/<user_address>/<staking_key>/**expire_at**
  - Set the action result to /staking/<app_name>/<user_address>/<staking_key>/stake/<record_id>/result

_unstake

- Triggered by: /staking/<app_name>/<user_address>/<staking_key>/unstake/<record_id>/value
- Permissions:
  - Only the <user_address> can write at the path, thus has control over the staking service accounts balance
- Action:
  - Check that the function execution timestamp is greater than the value at /staking/<app_name>/<user_address>/<staking_key>/expire_at (i.e., the staking has been unlocked)

    - Transfer from /service_accounts/ **staking** / **<app_name>** / **<user_address>|<staking_key>** /balance to /accounts/<user_address>/balance
    - Updates /staking/<app_name>/**balance_total**
    - Set the action result to /staking/<app_name>/<user_address>/<staking_key>/unstake/<record_id>/result

Use case: Consensus

Staking service config

/manage_app/consensus/config/service/staking/ { lockup_duration: 2592000000 }

Staking service accounts

/service_accounts/staking/consensus/0x_node_1|0/balance: 1000000
/staking/consensus/balance_total: 50000000

_stake

/staking/consensus/0x_node_1/0/stake/12345678/value: 1000000

_unstake

/staking/consensus/0x_node_1/0/unstake/12345678/value: 1000000

Advanced Topics

- Slashing
    - In the future, we may support a slashing feature, which is used quite often on blockchains and stakes to disincentivize behavior that does not benefit the application's ecosystem. In order to have the feature, the app's admin(s) would have to have some permission to the user's stakes. We can burn the slashed token, or distribute it to whistleblowers or the community.

Conclusion

A design is provided for escrow service with the following requirements:

- Value staking,
- Value unstaking,
- Permission control, and
- Staking balance tracking in both individual and app levels

Links

- AIP-011 Service Account & Transfer (link)

Document History

Date	Who	Change	Notes
2021-03-31	lia@	Initial draft	
2021-05-06	lia@, seo@	Internal review	
2021-05-07	seo@	Published	