Introduction to the Namada Protocol

The Namada protocol is a proof-of-stake layer 1 blockchain protocol. State transitions are governed by validity predicates, and rules of the protocol are defined by protocol parameters. The following section describes key parameters and concepts, and how to query them.

Epochs

The system relies on the concept of epochs. An epoch is a range of consecutive blocks identified by consecutive natural numbers. Each epoch lasts a minimum duration and includes a minimum number of blocks since the beginning of the last epoch. These are defined by protocol parameters.

To query the epoch duration parameters, the following command can be run:

namadac

query-protocol-parameters In order to query the current epoch of the chain, the following command can be run:

namadac

epoch

Protocol parameters

All of the current protocol parameters can be queried using the following command:

namadac

query-protocol-parameters This will display the list of protocol parameters. E.g:

Governance Parameters Min. proposal fund: 500.000000 Max. proposal code size: 600000 Min. proposal voting period: 3 Max. proposal period: 27 Max. proposal content size: 10000 Min. proposal grace epochs: 6

Public Goods Funding Parameters Pgf inflation rate: 0.1 Steward inflation rate: 0.01

Protocol parameters Min. epoch duration: 1 Min. number of blocks: 4 Max. block duration: 30 VP allowlist: [] Transactions allowlist: [] Max block gas: 20000000 Fee unshielding gas limit: 20000 Fee unshielding descriptions limit: 15 Gas cost table: tnam1qxgfw7myv4dh0qna4hq0xdg6lx77fzl7dcem8h7e: Amount { raw: 1 } PoS parameters Pipeline length: 2 Unbonding length: 3 Cubic slashing window length: 1 Max. consensus validator slots: 128 Validator stake threshold: 1000000 Duplicate vote minimum slash rate: 0.001 Light client attack minimum slash rate: 0.001 Liveness window: 100 blocks Liveness threshold: 0.9 Block proposer reward: 0.125 Block vote reward: 0.1 Max inflation rate: 0.1 Target staked ratio: 0.6667 Inflation kP gain: 0.25 Inflation kD gain: 0.25 Votes per raw token: 1 Expand

Governance parameters

- Min. proposal fund: The minimum amount of tokens required to submit a proposal.
- Max. proposal code size: The maximum size of the code that can be submitted in a proposal.
- Min. proposal voting period: The minimum duration (in epochs) of the voting period for a proposal.
- Max. proposal period: The maximum duration (in epochs) of the proposal period.
- Max. proposal content size: The maximum number of characters of the content that can be submitted in a proposal.
- Min. proposal grace epochs: The minimum number of epochs that a proposal can be in the grace period.

ð¡ Thegrace period is defined as the epochsbetween the end of the voting period and thegrace epoch as defined on the proposal. The grace epoch is the final epoch of the grace period.

Any changes enacted by a passing proposal (for example, changes to the protocol parameters) will take effect at the end of the grace period.

Public Goods Funding Parameters

- Pgf inflation rate: The inflation rate for the Public Goods Funding -- the percentage of newly minted tokens that are allotted to the PGF treasury.
- Steward inflation rate: The inflation rate for the Steward account(s) -- the percentage of newly minted tokens allotted to funding PGF Steward operations (such as reviewing PGF recipient nominees).

Protocol parameters

- Min. epoch duration: The minimum number of seconds per epoch.

- Min. number of blocks: The minimum number of blocks per epoch.
- Max. block duration: The maximum number of seconds per block.
- VP allowlist: The list of validity predicates (their wasm hashes) that are "whitelisted" and can be invoked in transactions.
- Transactions allowlist: The list of transactions (their wasm hashes) that are "whitelisted" and can be invoked in transactions.
- Max block gas: The maximum amount of gas that a block can consume.
- Fee unshielding gas limit: The maximum amount of gas that a fee unshielding transaction can consume.
- Fee unshielding descriptions limit: The maximum number of characters that can be included in the description of a fee unshielding transaction.
- Gas cost table: The gas cost table for the different tokens (indicated by address) that can pay for gas.

PoS parameters

- Pipeline length: The number of epochs that a validator must wait before they can unbond their stake.
- Unbonding length: The number of epochs that a validator must wait before they can withdraw their stake after unbonding.
- Cubic slashing window length: The number of epochs between the point of a validator's infraction and the point at which they are slashed.
- Max. consensus validator slots: The maximum number of consensus validator slots. These are sorted by bonded stake. Any validator with a stake below the "validator stake threshold" will not be participating in consensus.

Protocol parameters

- Validator stake threshold: The minimum amount of tokens that a validator must have in order to be eligible for consensus.
- Duplicate vote minimum slash rate: The minimum slashing rate for a duplicate vote.
- Light client attack minimum slash rate: The minimum slashing rate for a light client attack.
- Liveness window: The number of blocks that are considered for the liveness check (a slashable event), counted by number of blocks that a validator signs
- Liveness threshold: The proportion (decimal) of blocks that a validator must sign within the window in order to be considered live.
- Any active validator in the consensus set falling below this threshold will be jailed for inactivity.
- Block proposer reward: The reward for the block proposer.
- Block vote reward: The reward for the block voter.
- Max inflation rate: The maximum inflation rate.
- Target staked ratio: The target ratio of the total staked tokens to the total supply.
- Inflation kP gain: Thekp
- (proportional) gain for the inflation parameter in the PD controller.
- Inflation kD gain: Thekd
- (second order) gain for the inflation parameter.
- Votes per raw token: The number of votes per raw token bonded.

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