**Abstract:** Polygon has seen an explosion in staking in the over one year mainnet has been active. All 100 validator slots are now filled, but the distribution of delegated MATIC is clustered around large validators with low or 0% commission. Unfortunately, this has caused centralization and puts the network at risk. By increasing the minimum commission, the validators, delegators, and the network can benefit:

* Validators will be able to afford more performant hardware, increasing their uptime and decreasing latency between nodes on the network.
* Delegators who stake with more performant validators will receive more rewards compared to those staking with validators that miss many checkpoints (and therefore do not receive that reward).
* It can encourage delegators to look at more than just commission when choosing a validator, thus making the network more decentralized.
* With a higher average uptime among validators, the network stability will improve, giving all users a better experience when sending transactions over Polygon.

**Motivation:** The top 10 validators have received 82% of the total delegation. Out of those validators, only the Binance node has a commission greater than 4%, with 7 out of 10 having a 0% commission. These low commissions incentivize additional delegations, which further centralizes the network. 0% commission also removes incentive for validators to keep a high uptime, which further threatens network security.  
Increasing the minimum commission charged will give validators more incentive to utilize professional hardware and maintain the highest possible uptime. Increasing the minimum commission will also give delegators more nodes to choose from at the same reward level. This will certainly help to decentralize the network. A decentralized network is more secure, leading to safety of funds for both delegators and the Polygon network as a whole. Properly funding validators will allow nodes to invest in performant hardware, which will allow a greater uptime percentage. With greater uptime percentage, fewer checkpoints will be missed and that will translate into more block rewards for delegators.

**Specification:** Currently, there is only a MAX\_COMMISSION\_RATE set to 100 in the [Matic Stake Manager 7](https://etherscan.io/address/0xd6f5c46d4e1a02f9d145cee41d2f8af30d8d2d76#code) contract. A new contract would be required to include a MIN\_COMMISSION\_RATE, possibly as a configurable variable for easy update in the future. In the below code, this MIN\_COMMISSION\_RATE is created, along with the code enforcing the new minimum.

uint256 constant MIN\_COMMISSION\_RATE = 5;

uint256 constant MAX\_COMMISSION\_RATE = 100;

...

**function** **updateCommissionRate**(uint256 validatorId, uint256 newCommissionRate) external {

...

require(newCommissionRate >= MIN\_COMMISSION\_RATE, "Incorrect value");

require(newCommissionRate <= MAX\_COMMISSION\_RATE, "Incorrect value");

validators[validatorId].commissionRate = newCommissionRate;

}

A minimum of a 5% commission was selected as enough room for the average validator to maintain their servers, but not too much that it starts to cut into delegators rewards. This is also in line with many other PoS blockchains, where 0% commission is not as common. Tezos’ bakers average 8-15%, Harmony One validators average 2.5-10%, Persistence One validators average 5-10%, and Solana validators average 10%, to name a few.

**Rationale:** **A common misconception about the Polygon network is that staking rewards are distributed when a validator creates a block or sends a checkpoint, and delegators will get more rewards by staking with larger validators. This isn’t completely accurate, as any validator that is online to validate a checkpoint will receive rewards. Rewards are sent to validators and delegators based on their total stake in the network. Therefore, outside of commission, the only variables in rewards are how much a delegator stake, and the uptime of the validator. Not only does staking with smaller validators provide the same rewards, it encourages better decentralization of the network.**

Other options explored:

* Putting a max cap on each validator’s total stake
* Decreasing rewards if a validator’s total stake surpasses a threshold
* Requiring a validator to stake a percentage of the total stake on their node, which incentivizes good behavior among larger validators

**Backwards Compatibility:** There are no backwards compatibility issues in terms of functionality, as having a validator change their commission is already built in. However, the current contract would not be usable as there is no way to enforce a minimum commission, so a contract would need to be deployed.

**Security Considerations:** Although there is not much risk in implementing a minimum commission, any modification or new deployment of a contract inherits risks of bugs. Issues with the updateCommissionRate should only be limited to allowing validators to choose any number for their commission, and should not extend into other parts of the contract or Polygon ecosystem.

**FAQ:**

**1. Any alternatives considered?** Yes, we looked at other blockchains to see how they handle the decentralized approach; if we could rebalance delegators across the validators, commission would have a higher impact for lower-staked validators.

a. Tezos requires a minimum amount of self-stake that corresponds to the total-stake (a validator would need 1 token for every 10 total-staked tokens). Validators would need to put up extra capital or start turning delegators away.  
b. Cardano starts reducing rewards to pools over a ‘saturation point’, thus punishing pools with too much stake.  
c. Harmony caps the maximum stake of the validator.

**Will this take away too much from the delegators?** It shouldn’t, as this means delegators will still receive 95% of their current rewards. For example, using today’s reward of 13.7% APR, a user delegated to a 0% commission validator with 10,000 Matic and receives 1,370 Matic per year. If the validator changes to 5% commission, they will then receive 1,301.5 Matic per year; a difference of 68.5 Matic, or 0.685% of their total delegation. To note, many delegators have chosen a 5% commission or higher validator, in which case this PIP will not have any impact on their rewards.