Shardlabs Internal Audit
Lido On Polygon V2

Warning

Some validators can be ignored if their stake is close to the average stake to get the protocol balanced

Issue

https://github.com/lidofinance/polygon-contracts/blob/main/contracts/NodeOperatorRegistry.sol#L546

Description

ValidatorsStake = [1000, 1200, 1250, 950]
DistanceThresholdPercentage = 120 // Set by the DAO

1. Calculate the average stake to get the system balanced.
   averageStake = (1000 + 1200 + 1250 + 950) / 4
   averageStake = 1100
   currentDistanceThreshold = 1250 * 100 / 950 = 131

   The protocol is not balanced because
   ****currentDistanceThreshold > DistanceThresholdPercentage****

2. Select validators that will receive the delegation
   a. Ignore the validators V2 and V2 because their stake is bigger than the **averageStake.**

   b. We do a second check to ignore validators with almost the **averageStake** (safe gas when the validators list is big)
   ****(averageStake * 100) / ValidatorStake****

   Stake_V1 = 1100 * 100 / 1000 = 110 < DistanceThresholdPercentage
   Stake_V4 = 1100 * 100 / 950 = 115 < DistanceThresholdPercentage

3. Conclusion: We are doing a second check to ignore validators with a close stake to research the **averageStake**, the **DistanceThresholdPercentage** will have a second effect on the stake which will multiply the default value per 2.

Case2: Delegation will go to 1 validator

1. Calculate the average stake to get the system balanced.
   averageStake = (1000 + 1200 + 1300 + 900) / 4
   averageStake = 1100
   currentDistanceThreshold = 1250 * 100 / 950 = 131

   The protocol is not balanced because
   ****currentDistanceThreshold > DistanceThresholdPercentage****

2. Select validators that will receive the delegation
   a. Ignore the validators V2 and V2 because their stake is bigger than the **averageStake.**

   b. We do a second check to ignore validators with almost the **averageStake** (safe gas when the validators list is big)
   ****(averageStake * 100) / ValidatorStake****

   Stake_V1 = 1100 * 100 / 1000 = 110 < DistanceThresholdPercentage
   Stake_V4 = 1100 * 100 / 900 = 122 > DistanceThresholdPercentage

3. Conclusion: the **Stake_V4** will get the total delegated tokens