

Table of variable precisions

To try and avoid rounding errors, we store fractions as numerator and denominator. This leads to potential overflow errors when we do calculations. Each of these potential overflow errors is treated separately in the specifications below. uint256 can store numbers up to $\sim 10^{77}$. In general, we need to try and keep all numbers to below 10^{60} or lower to avoid issues.

Symbol	Description	Stored As	Comment	Order of Magnitude
Sigma	Total Staked amount on Validator	uint256	1e12 for number 1e18 for MATIC decimals	1.00E+30
S	Shares in circulation	uint256	1e12 for number 1e18 for MATIC decimals	1.00E+30
R	total unstaked rewards on validator	uint256	1e12 for number 1e18 for MATIC decimals	1.00E+30
Delta	total pending deposits / claimed rewards	uint256	log ₁₀ (theta_delta) for threshold, 1e18 for MATIC	1.00E+22
phi	Fee Amount * 1e4	uint256	integer less than phi_precision	1.00E+04
phi_precision	precision to which fee is stored	uint256	constant set at 1e4 to be able to take fees in bps	1.00E+04
theta_r	restaking threshold	uint256	log ₁₀ (theta_R) for threshold, 1e18 for MATIC	1.00E+22
theta_delta	claimed rewards staking threshold	uint256	log ₁₀ (theta_Delta) for threshold, 1e18 for MATIC	1.00E+22
alpha_d(r)	amount allocated from	uint256	1e12 for number, 1e18 for MATIC decimals	1.00E+30

Symbol	Description	Stored As	Comment	Order of Magnitude
	distributor to recipient			
pi_d(r)[num]	average price at which allocation from d to r happened	uint256	numerator is max precision (Sigma, S, R, Delta) * phi_precision * 1e18 for rounding	1.00E+52
pi_d(r)[denom]	average price at which allocation from d to r happened	uint256	precision of S	1.00E+30
alpha_d	total amount allocated by distributor	uint256	1e12 for number, 1e18 for MATIC decimals	1.00E+30
pi_d[num]	average price of distributor allocation	uint256	numerator is max precision (Sigma, S, R, Delta) * phi_precision * 1e18 for rounding	1.00E+52
pi_d[denom]	average price of distributor allocation	uint256	precision of S	1.00E+30
P[num]	share price numerator	uint256	numerator is max precision (Sigma, S, R, Delta) * phi_precision * 1e18 for rounding	1.00E+52
P[denom]	share price denominator	uint256	numerator is max precision (Sigma, S, R, Delta) * phi_precision * 1e18 for rounding	1.00E+30
D	dust	uint256	phi * R / phi_precision	

Symbol	Description	Stored As	Comment	Order of Magnitude
A_d	total balance allocated	uint256	total MATIC balance allocated	1.00E+30