Context

Gas is an important concept in most Layer 1 blockchain networks. Filecoin adapted a version of EIP1559 at network launch. While one may understand the rules of a mechanism pretty well, it is often challenging to understand the dynamics among agents in interacting with the system. We would like to deepen our understanding of Filecoin gas dynamics based on empirical data from the network.

Useful links

- General Background https://filecoin.io/2020-engineering-filecoins-economy-en.pdf
- Gas Blogpost https://filecoin.io/blog/filecoin-features-gas-fees/
- Gas Concepts https://docs.filecoin.io/about-filecoin/how-filecoin-works/#gas-fees
- EIP1559 https://github.com/ethereum/EIPs/blob/master/EIPS/eip-1559.md
- Game Theoretic Analysis https://timroughgarden.org/papers/eip1559.pdf

Dataset

An aggregated per-minute dataset on network gas metrics between Jun 1, 2021 and Jun 25, 2021.

https://drive.google.com/file/d/1gVRWG6nWyG8tqI-n1pMPkYIvMyQL4gdL/view?usp=sharing
Legend & Unit

Each field is a mean over blocks produced within a particular minute. The epoch time in Filecoin is 30 seconds and there are five blocks in a tipset on expectation. Gas outputs are calculated in the lotus Filecoin implementation here.

Field	Unit	Note
mean_gas_fee_cap	GasUnit	
mean_gas_premium	GasUnit	
mean_gas_limit	GasUnit	
mean_gas_used	GasUnit	
mean_parent_base_fee	attoFIL	1 FIL = 10^18 attoFIL Parent base fee is the base fee in the parent epoch.
mean_base_fee_burned	attoFIL	

mean_over_estimate_burned	attoFIL	
mean_gas_refund	attoFIL	
mean_gas_burned	attoFIL	

Deliverables

- An exploratory data analysis on the dataset with a write up and visualization on derived insights.
- Suggest directions (which may require additional dataset or information) in which one can take the analysis further.

We’re looking forward to hearing back from you!