Exploiting Ethereum after “The Merge”: The Interplay between PoS and MEV Strategies

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Ethereum: The Merge

The Merge
15/9/2022

Proof of Work

Ethereum Blockchain

Proof of Stake

Beacon Chain
Concerns about decentralization

**Ethereum at the center of centralization debate as SEC lays claim**

Ethereum's transition to PoS was celebrated as a key upgrade. However, a month after the move, centralization concerns are mounting high.

**Big Firms Dominate Post-Merge Ethereum Validation**

The shift to proof-of-stake has analysts exploring its impact on the blockchain's much-touted decentralization.
Maximal Extractable Value (MEV) strategies acting on including, excluding or, rearranging transactions to obtain additional value in terms of cryptocurrency.
Arbitrage

Buy at a lower price

Sell at a higher price

Frontrunning

User

tx1_u1

Gas fee $

Mempool

Searcher

tx2_u2

Gas fee $$
MEV Ecosystem in Ethereum

Searcher 1 → Builder 1 → Relay 1
Searcher n → Builder n → Relay n

Builder 1 → Block → Relay 1
Builder 2 → Block → Relay n

MEV-Boost

Validator
MEV and rewards

- **Searcher**
  - MEV transactions

- **Builder**
  - Block Rewards (Priority fee)

- **Validator**
  - Builder’s payment
Data Collection

936,839 blocks from The Merge from 15/9/2022 to 24/1/2023

Data Collection

- Flashbots Relay API
- Infura API
- Etherscan API
Blocks after Ethereum’s “The Merge”
Fee recipient analysis

First 1,000 blocks

First 936,869 blocks
936,839 blocks after Ethereum’s “The Merge”
Fee recipient analysis
Cleaned 936,839 blocks after Ethereum’s “The Merge”
Open Questions

• For validators, are the rewards of the off-chain MEV ecosystem greater than Priority fees?

• How many different actors act within the MEV off-chain ecosystem?

• How much competition is there among builders to propose the most profitable block to the validator?
Thank you for the attention

Questions?