Dynamic Blockchain Mechanisms

Stefanos Leonardos

Fei Wu, Thomas Thiery, Carmine Ventre, Georgios Piliouras,
Pedro Braga, Georgios Chionas, Piotr Krysta

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Overview

We will focus on **two** topics

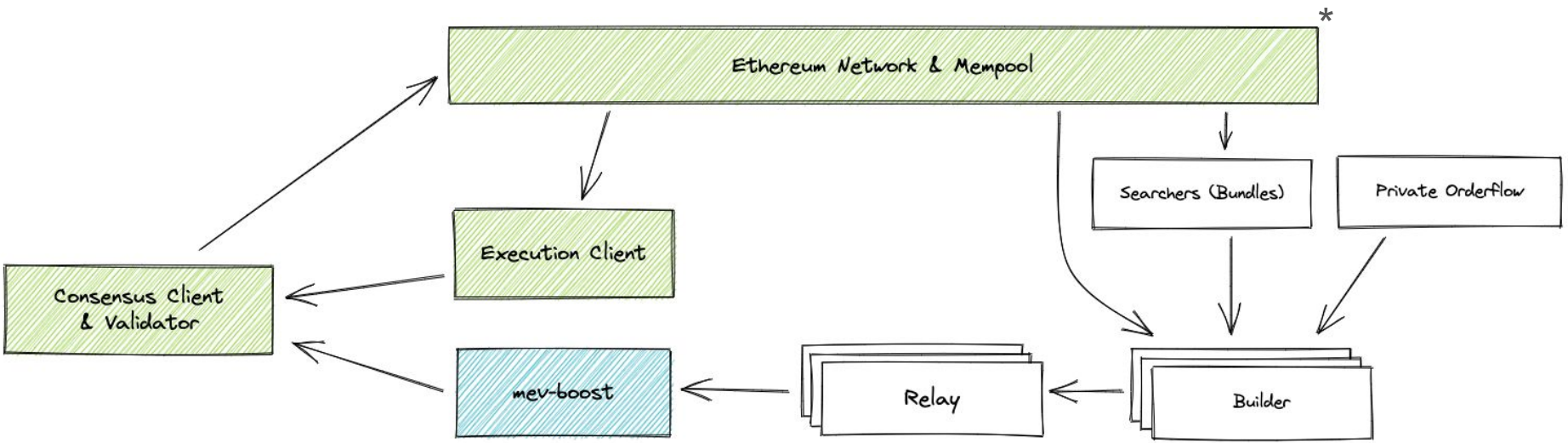
1. **MEV-Boost auctions**
2. **MEV sharing mechanisms**

MEV = Miner/Maximal Extractable Value

MEV-Boost auctions*

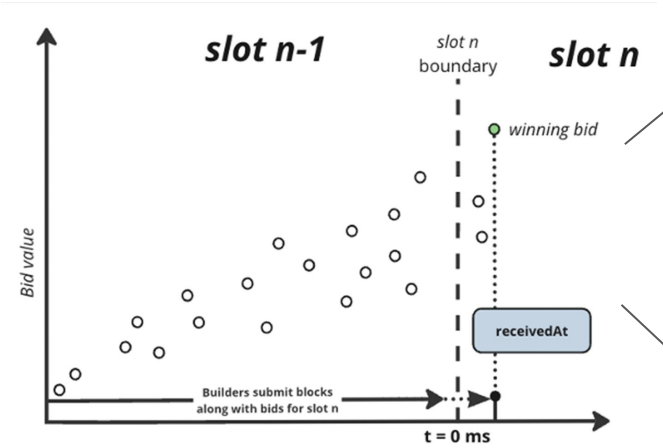
*slides credit: Fei

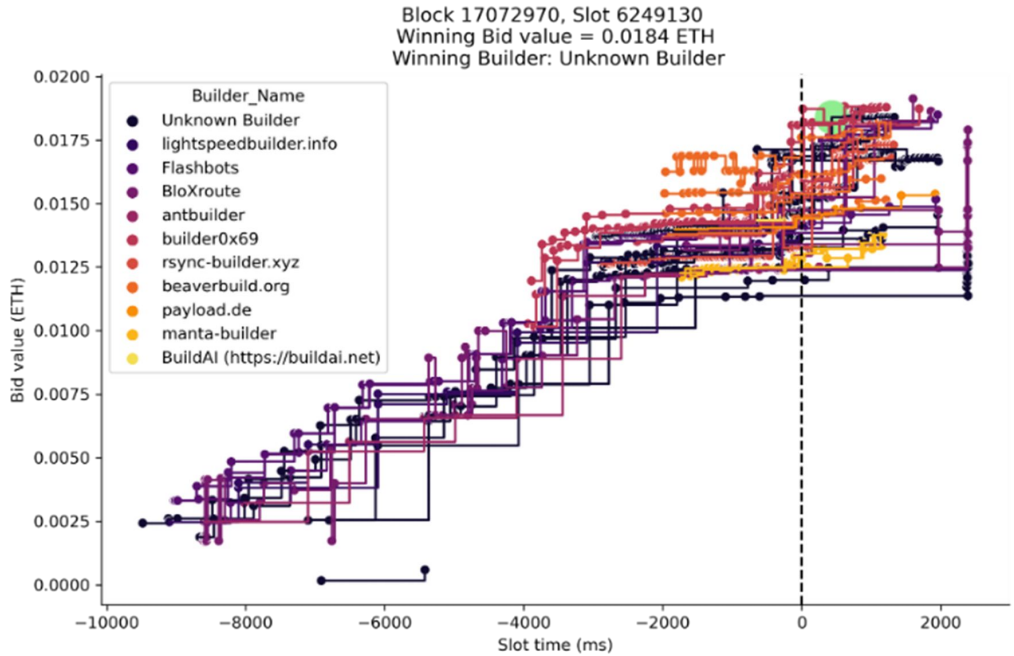
MEV-Boost



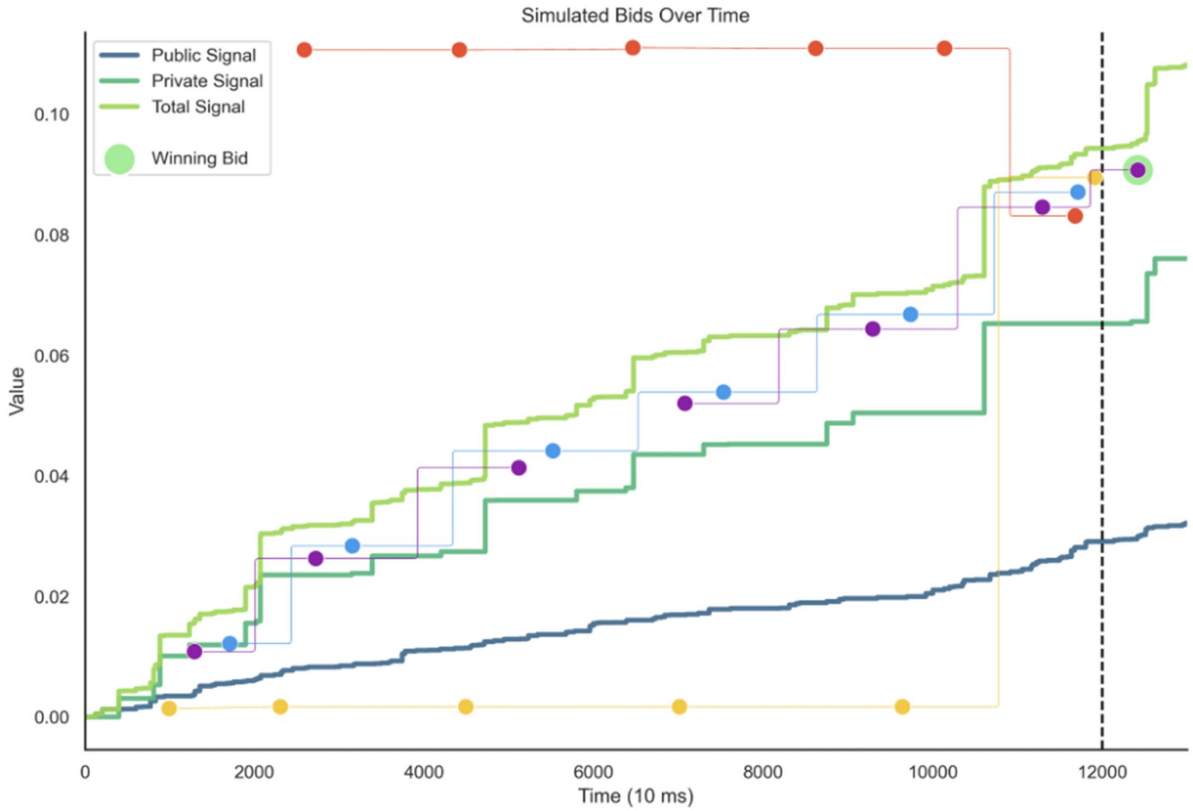
*source: https://github.com/flashbots/mev-boost

MEV-Boost auctions





Bidding strategies

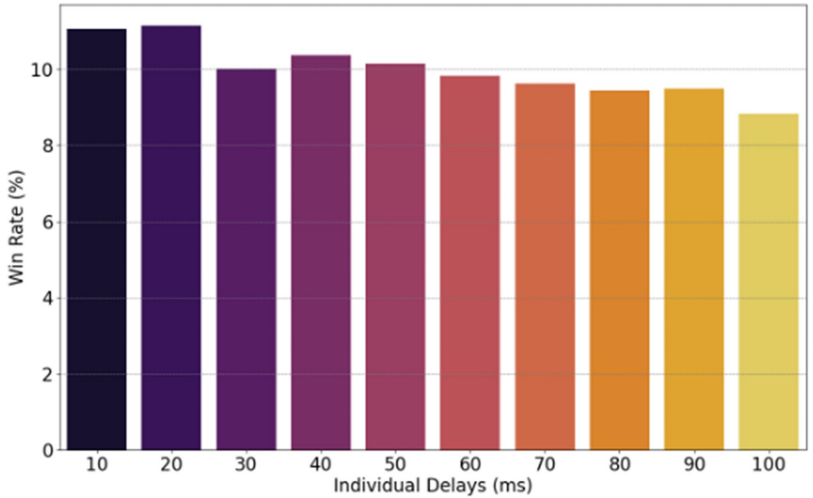


- Naive Strategy*
- Adaptive Strategy
- Last-Minute Strategy
- Bluff Strategy

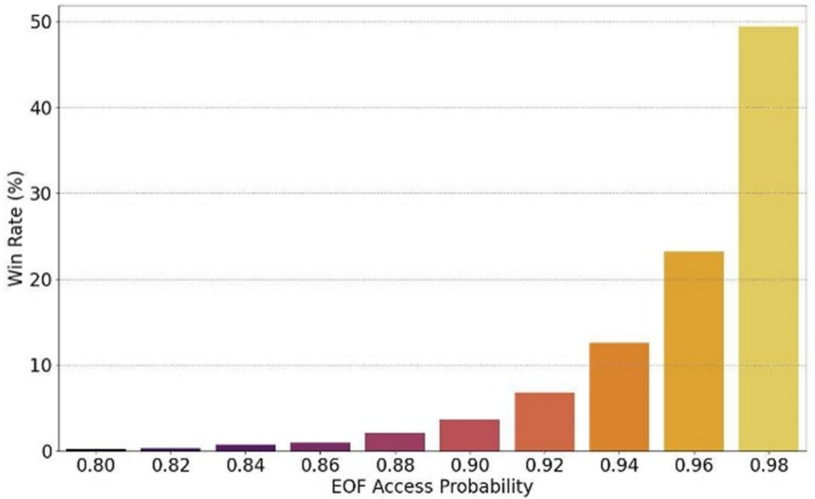
*Naive = truthful

Main Results: latency vs orderflow

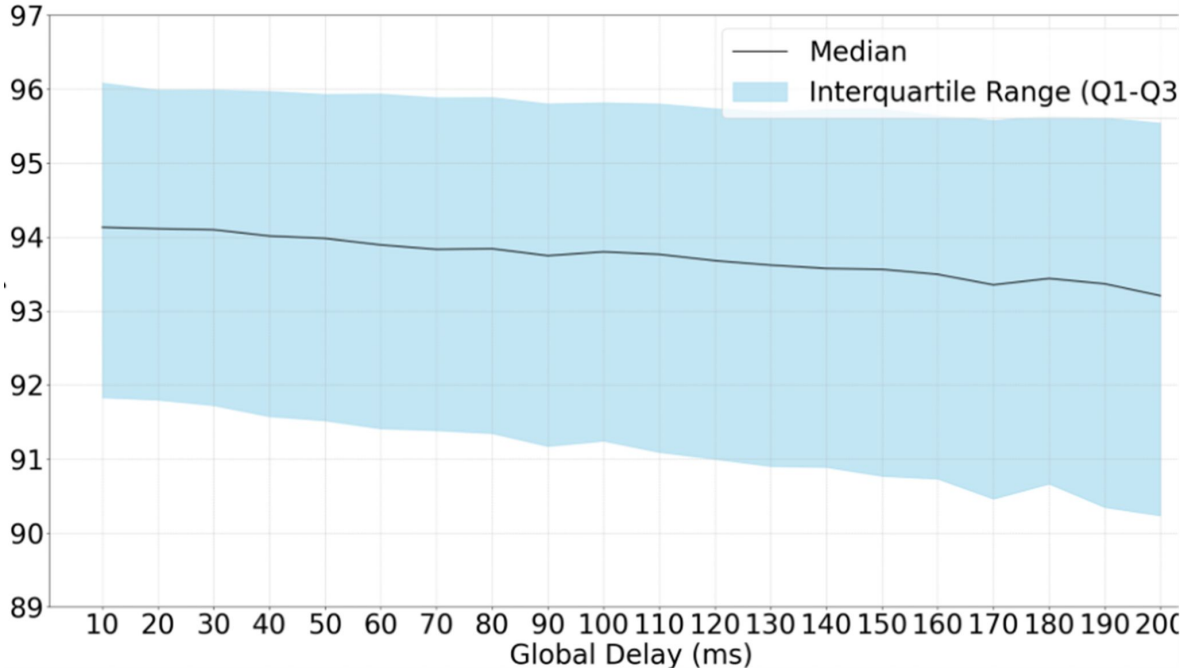
Individual latency



Private transaction access

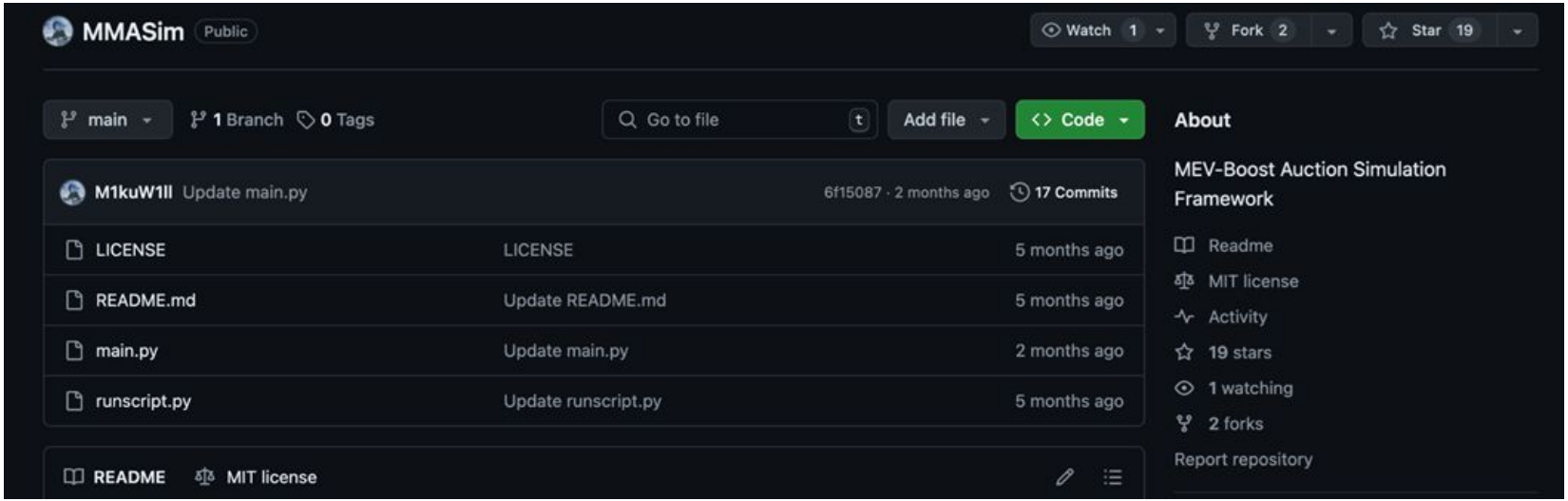


Main Results: auction efficiency



Optimistic relays

Code - simulation framework



All the code is open source (credit to Fei):
https://github.com/M1kuW1ll/MMASim

MEV-Sharing

MEV-sharing

Design goals:

- **Participation incentives:**
  - reduce harm/cost for users
  - maintain participation incentives for miners (stabilise prices)
- **Posted extraction rates***:* publicly known
- **Dynamic:** adjust to changing ***market conditions***

Can “EIP-1559 designs” solve other problems?

Abstract away EIP-1559’s design elements:

- **Target**: balance participation incentives between
  - MEV-generators (users) and
  - MEV-extractors (miners)
- **Signal***:* participation in previous time frame (epoch)
- **Learning**: use learning rate and target deviations to balance ***updates***

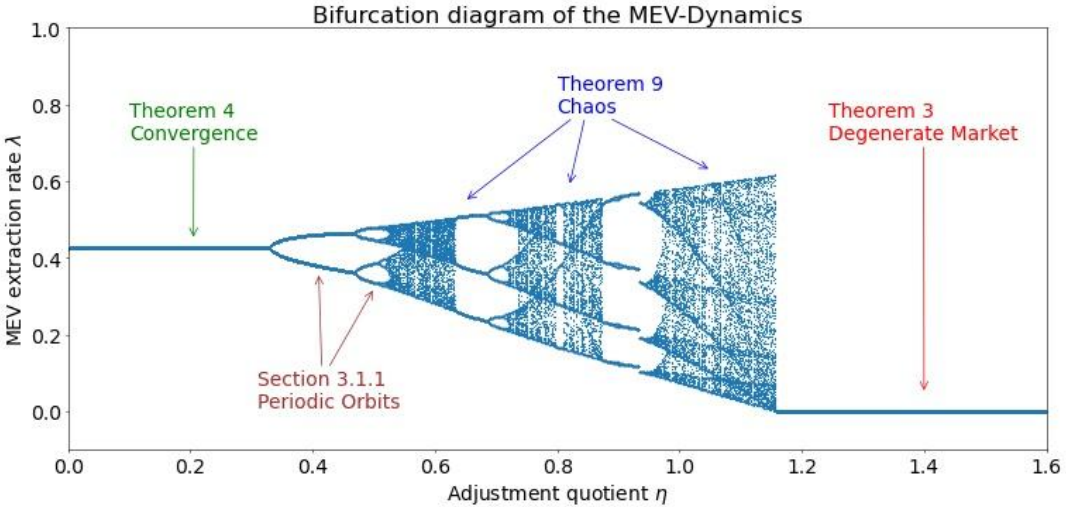
Dynamic MEV extraction rates

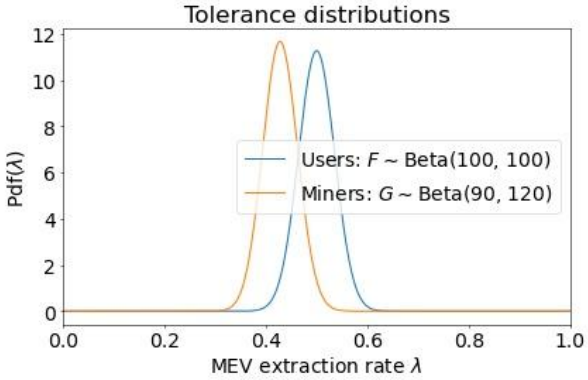
MEV-sharing ***update rule***:

$$\lambda_{t+1} = \lambda_t + \eta\lambda_t(1-\lambda_t)(\overline{F}(\lambda_t) - wG(\lambda_t))$$

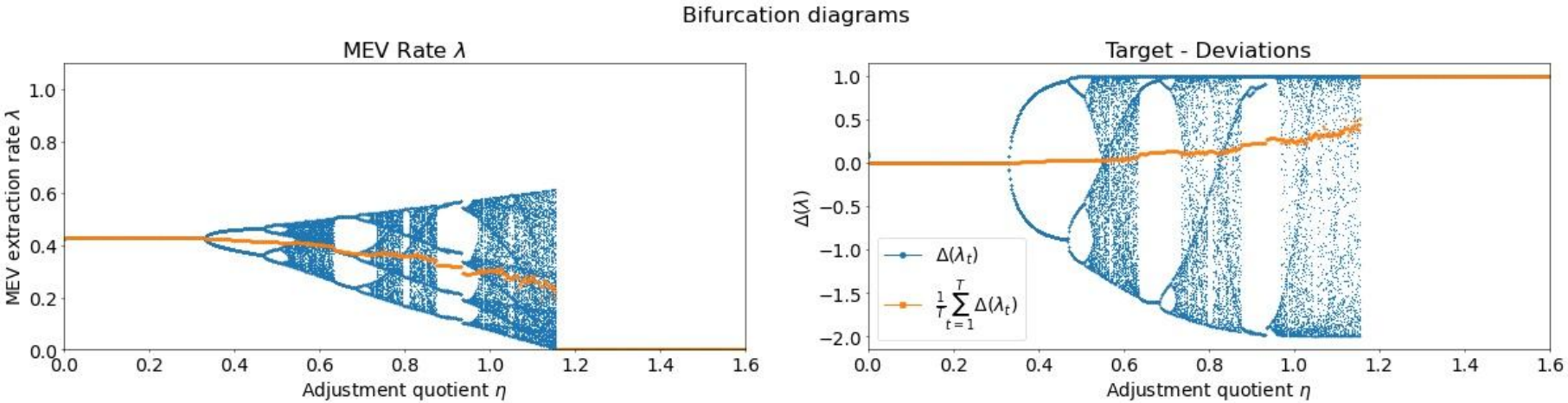
- λ_t = ***extraction rate*** time t.
- Δ_t = ***participation imbalance*** at time t.
- η = ***adjustment quotient***
- w = ***target participation ratio***.

MEV-sharing: dynamics





MEV-sharing: performance



Thank you