ASSA 2025

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Who Wins Ethereum Block Building Auctions and Why?

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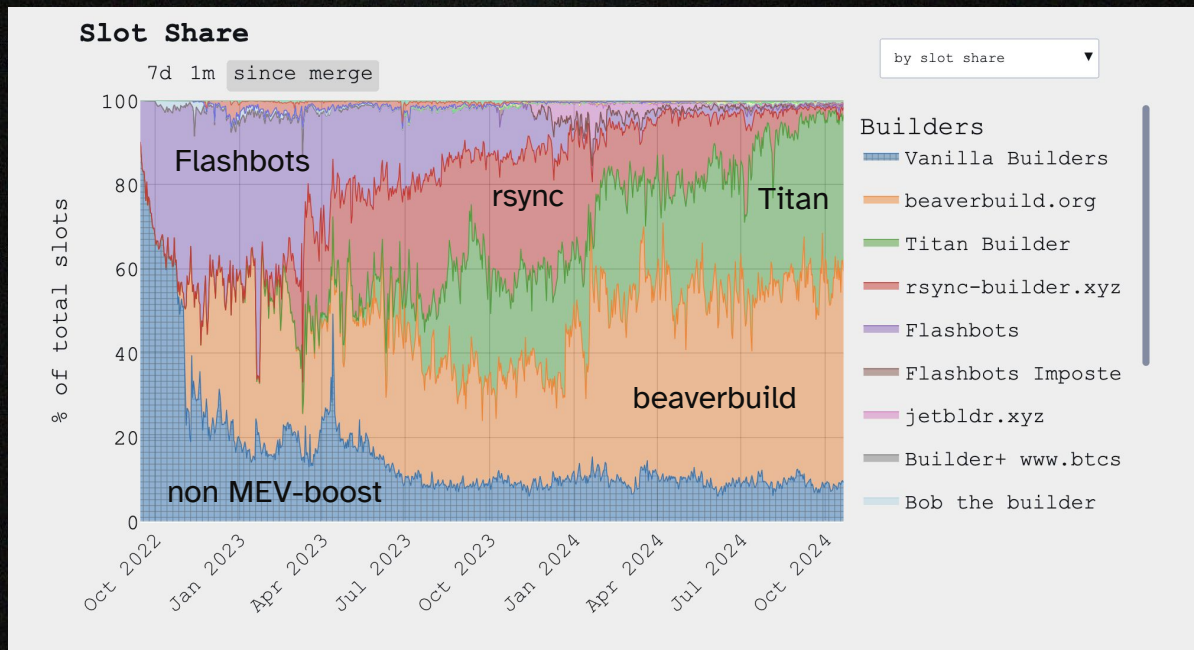# How are Ethereum blocks built today?

~10%

local

+ Full autonomy over block content

- Risk losing out on MEV rewards!

Ethereum
Validators

MEV-Boost

+ Get paid well
- Lose control over block content

~90%

# Today's block builder market is centralized

- Over 90% Ethereum blocks are built via MEV-Boost

- Over ~~80%~~ 95%! MEV-Boost blocks are built by 2 builders!

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Builder profiles vary by market share & profitability

- Generally, bigger market share builder maintain a positive profitability profile.

- How do some builder with tiny market share get to keep high profitability?

- Why are there builders keeping building blocks while losing money?

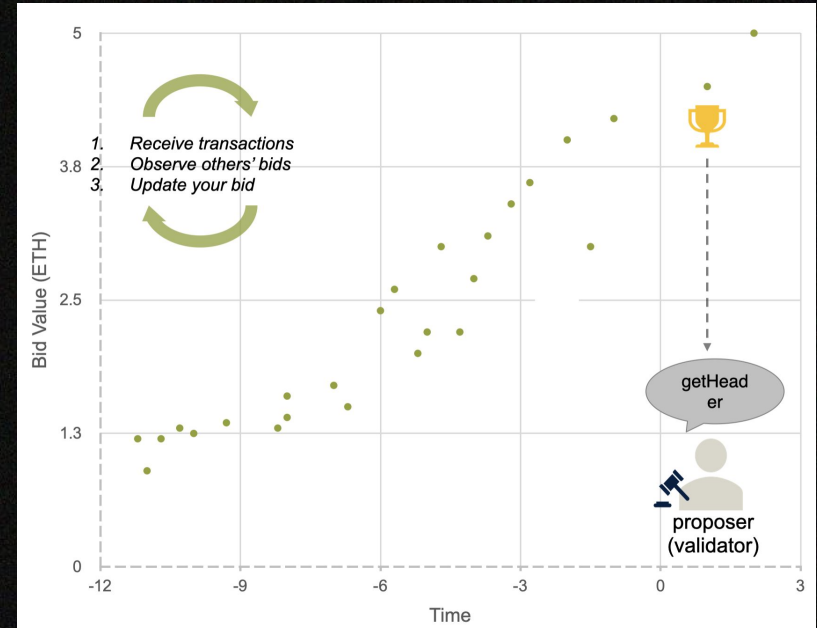MEV-Boost Block Builders by Profitability and Market Share
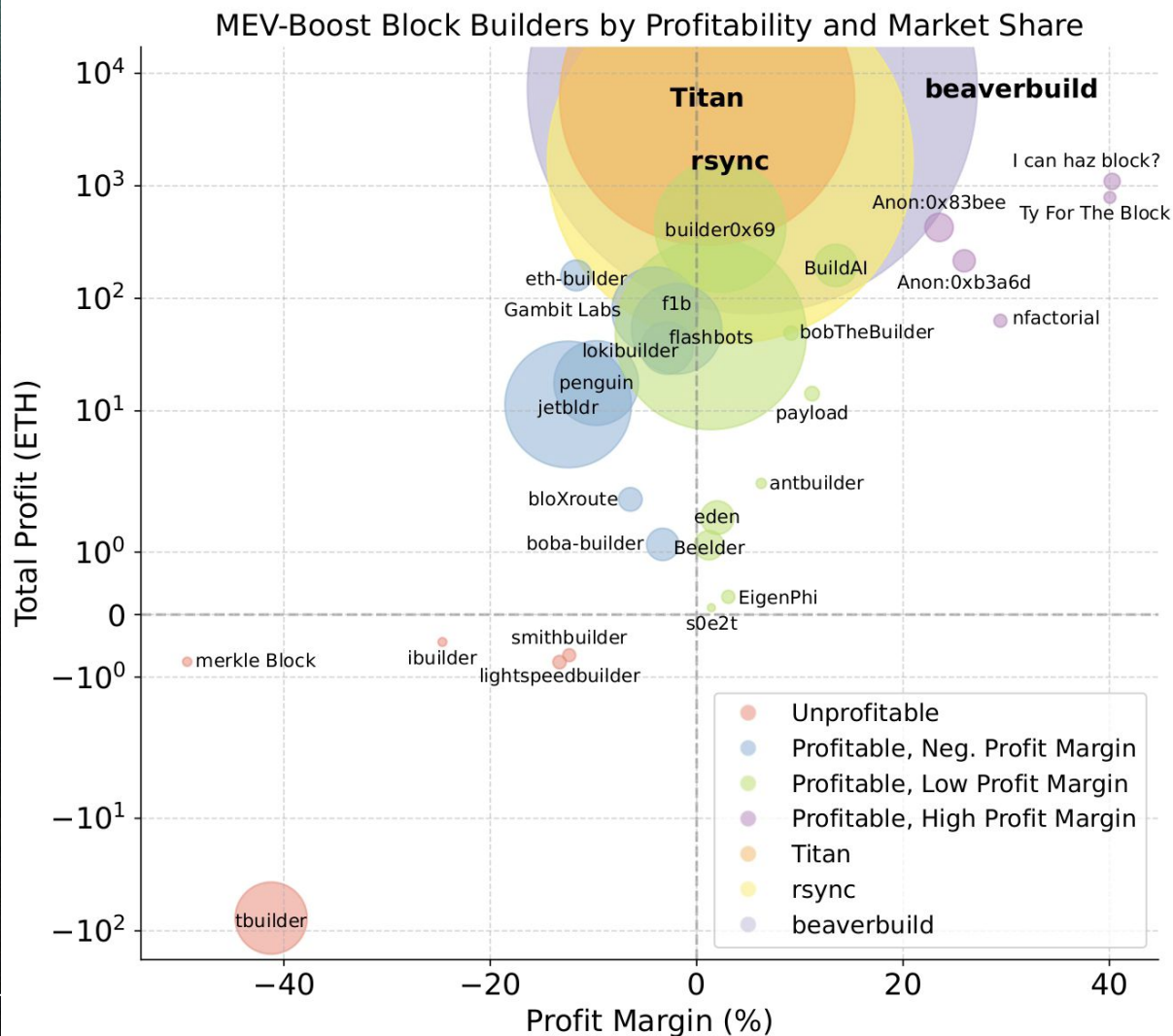
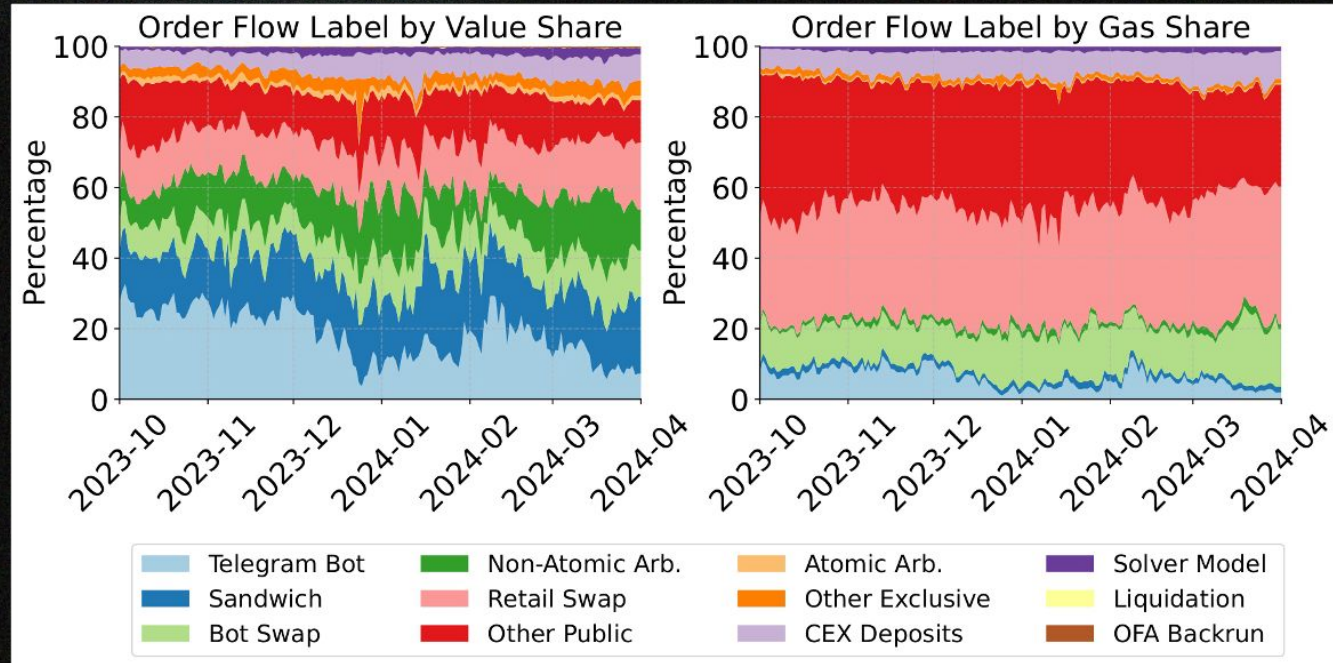# Recap: How does Ethereum's 12s block auction work?

Transactions with varying value comes into mempool
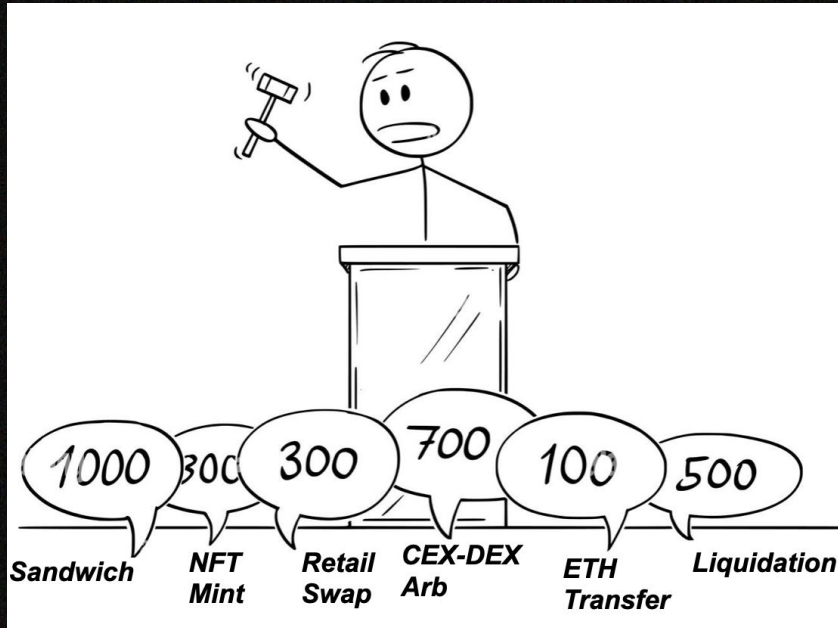
Builder pack txs into higher value block to bid to proposer
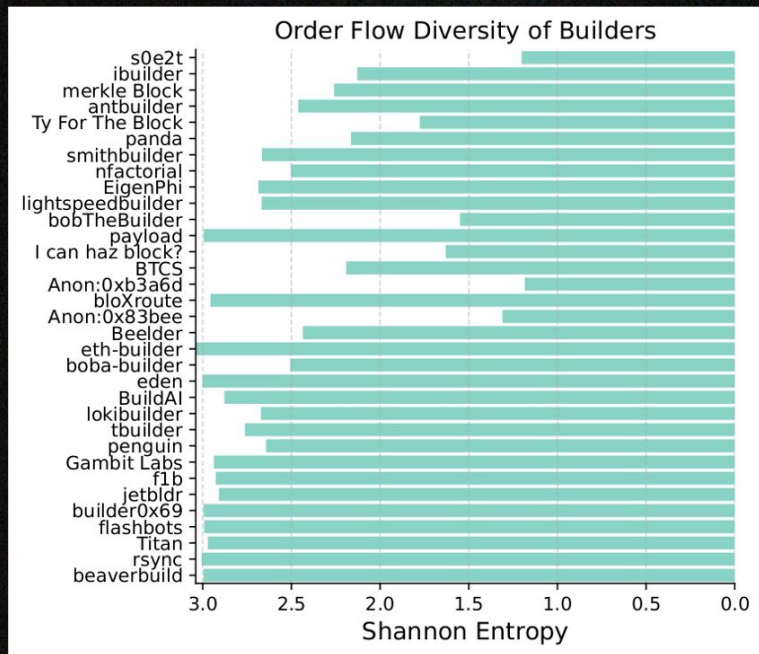
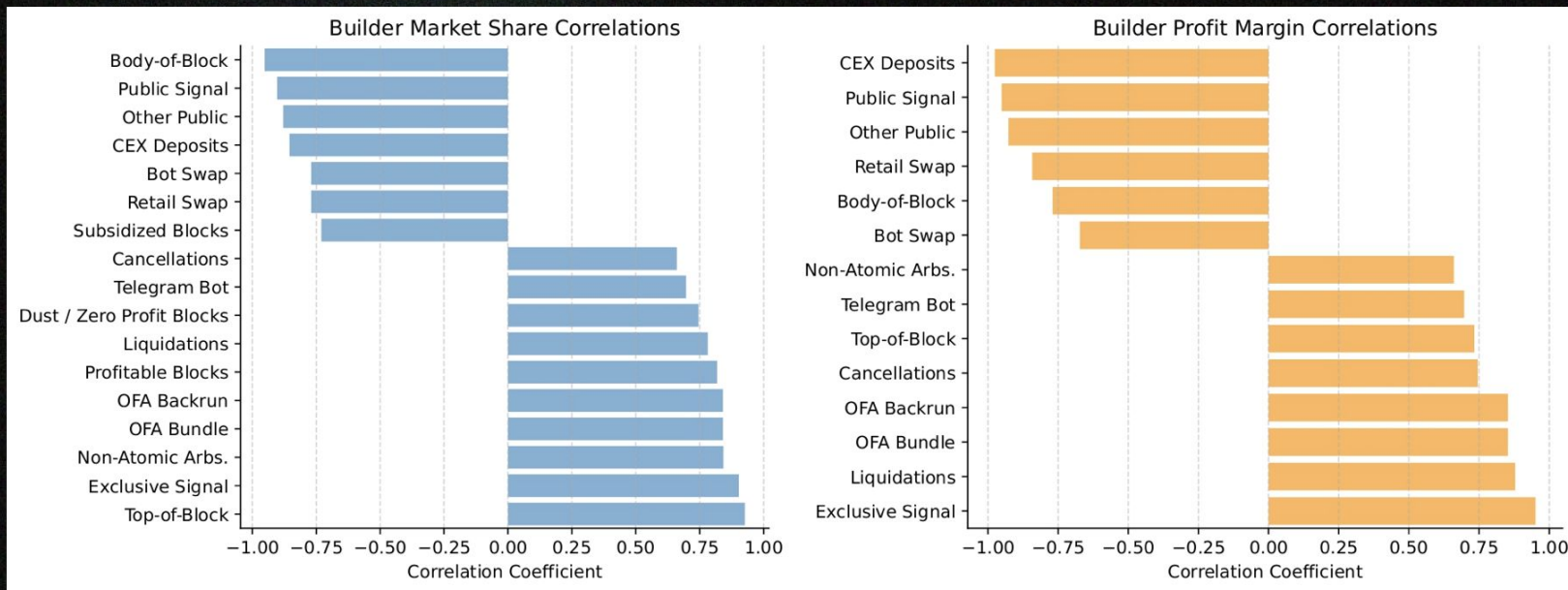# Order Flow Significance: The 80-20 Rule

- Telegram bot & MEV flow contribute 60% block value but consume 10% gas/blockspace
- Retail Swap & Other public flow takes up 70% of gas/blockspace but counts for 30% value

Higher Market Share correlates with higher OF Diversity & share of high value OF

Order Flow Diversity of Builders

Builder Order Flow by Value Share
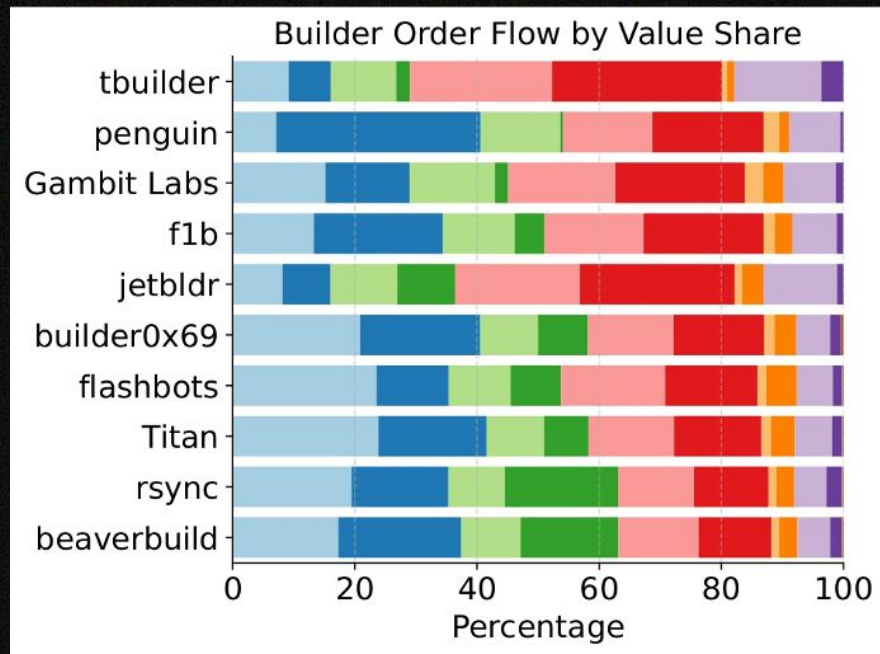
Key Features for Market Share and Profitability

Builder Market Share Correlations / Builder Profit Margin Correlations

- Many features (TOB, Cancellations) & orderflow (Non-atomic, OFA, Liquidations, Telegram Bot) correlate with both metrics;
- Exclusive Signal has the highest correlation to profitability;

Detect Searcher-Builder Vertical Integration
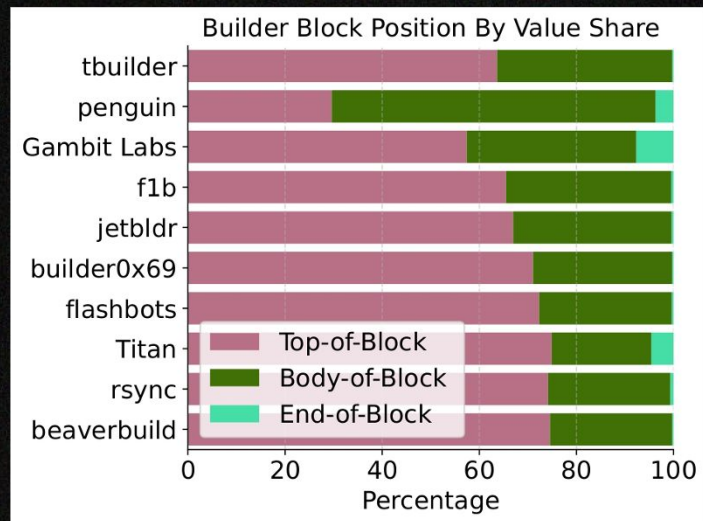

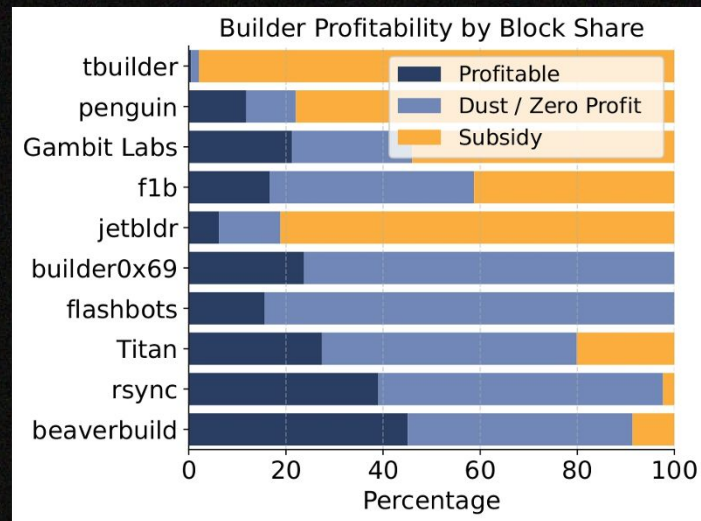Builder Exclusive Order Flow Provider by Decoding Accuracy
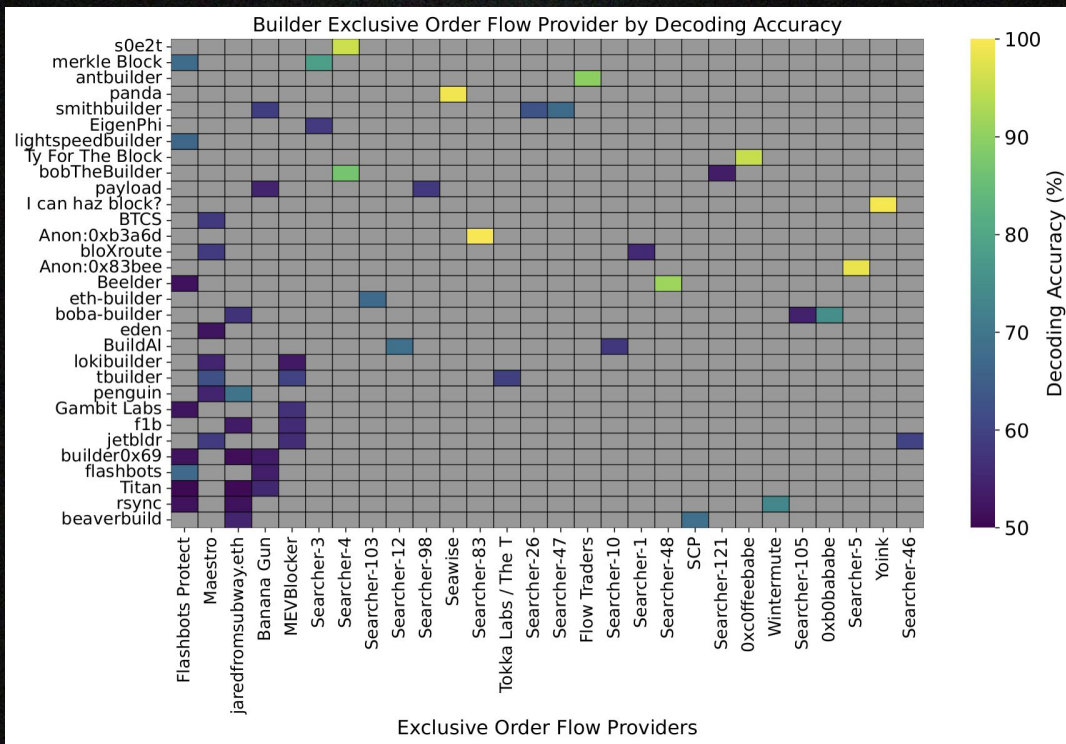
- ~55% of the builders have at least one Exclusive Provider (EP)

- EP builders have a higher rate of profitable blocks (46%) compared to those no-EP builders (20%).

Builder Strategies Summary

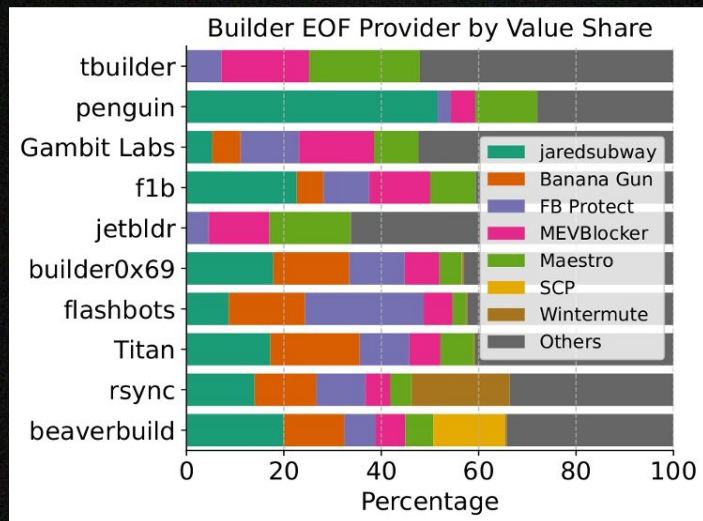## Block Packing   Subsidy

- Top-of-Block (ToB) contributes the most value to all top builders except penguin
- More than 50% of exclusive tx volume resides in ToB (~88.5% of the total exclusive value)
- BRT have the highest shares of profitable blocks, with beaverbuild exceeding 40%

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Builder Strategies Summary

Exclusive OF Access

Builder EOF Provider by Value Share

Latency and Bidding

Table 2 Bidding and Latency Metrics of Top Ten Builders (UltraSound Relay).

Builder	Total Blocks [#]	Avg. Bids [#]	Avg. Update Lag [ms]	Avg. Winner Time [ms]	Total Cancels [#]	Avg. Cancels [#]
beaverbuild	137,721	31.54	130.41	586.59	248,195	1.74
rsync	95,310	25.27	166.21	531.38	212,504	2.29
Titan	47,539	31.11	186.25	605.83	91,337	1.78
flashbots	32,612	16.25	411.36	348.45	3,014	0.1
builder0x69	23,294	20.64	183.08	575.09	17,445	0.65
jetbldr	12,960	35.2	103.08	605.75	904	0.09
Gambit Labs	9,530	15.85	349.05	496.3	492	0.1
f1b	9,242	25.42	214.18	680.45	10,494	0.98
penguin	7,783	49.64	69.92	652.91	966	0.13
tbuilder	4,786	6.1	476.68	104.71	81	0.01

- Seven EOF providers contribute ~70% of exclusive value in more than half of the blocks
- BRT issue more than one cancellation per slot (further increased after UltraSound's bid adjustment feature)
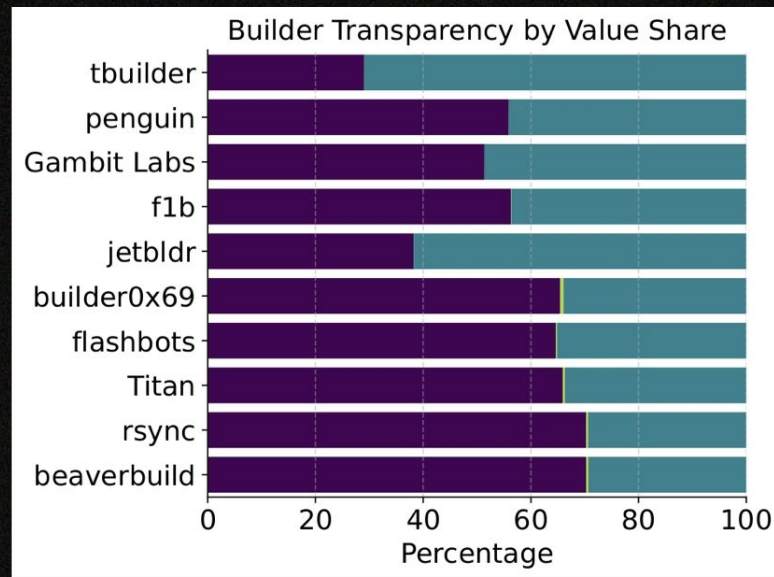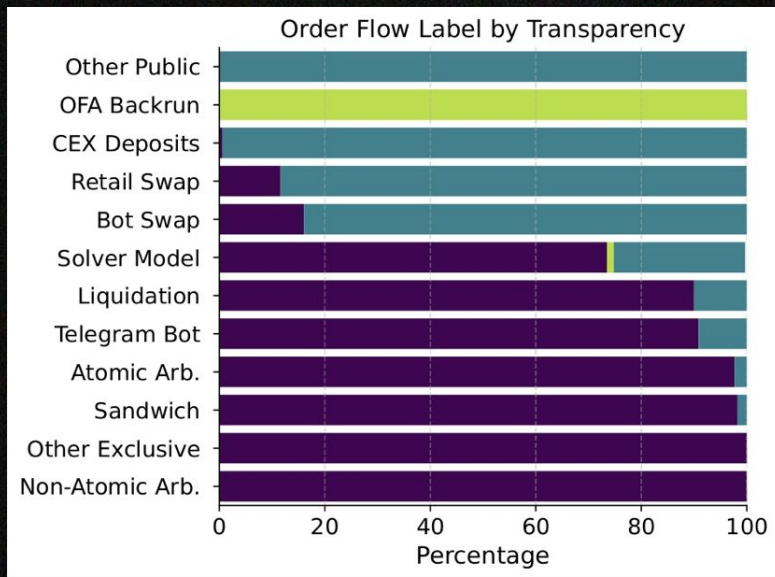
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So how did we end up with a such **centralized** market structure today?

Builder Competition Drives Private Mempool Adoption
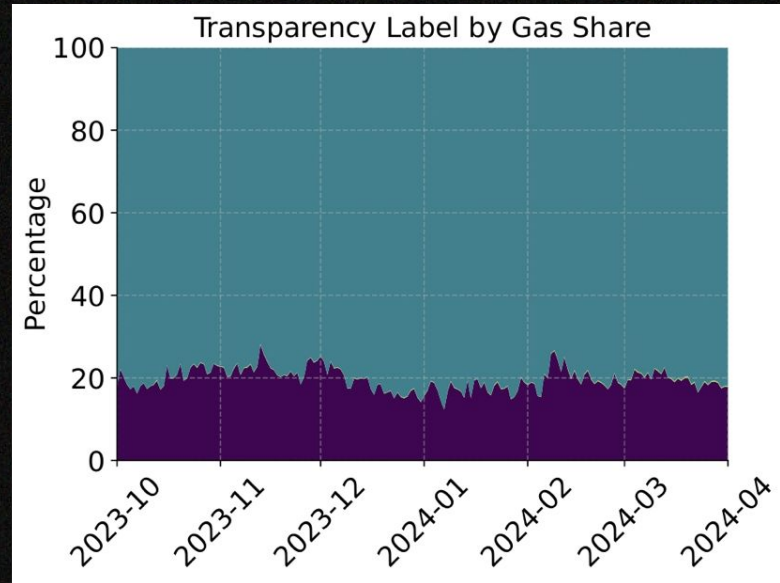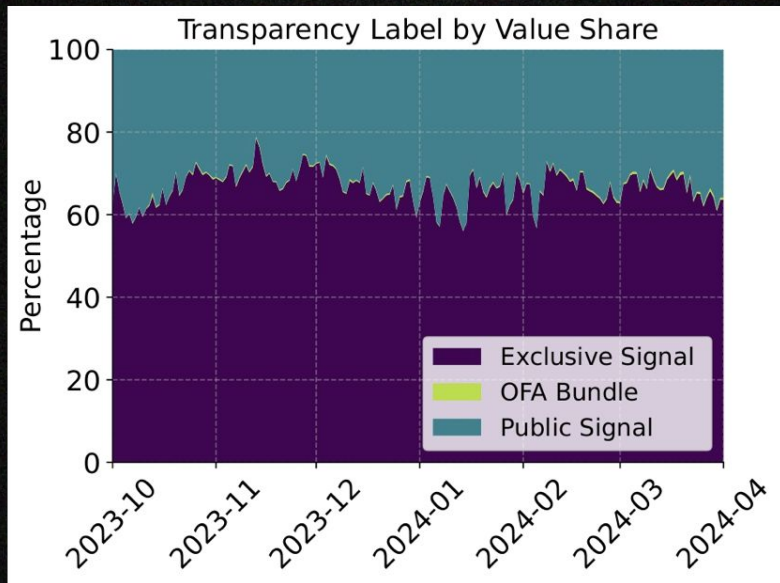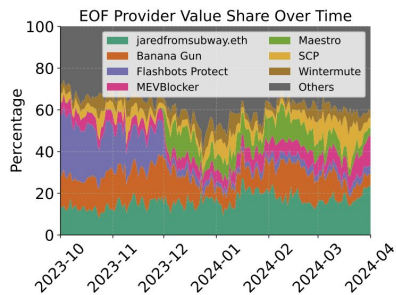

- Exclusive signal provides ~66% of all block value while taking up ~19% of all blockspace

Builder Competition Drives Private Mempool Adoption

Order Flow Label by Transparency

Builder Transparency by Value Share

- Telegram bot flow and MEV strategies mostly bypass the public mempool (~99%)
- BRT receive the highest value share from exclusive flow, exceeding 65% of their total

2024Q1: Private Orderflow Deals Started
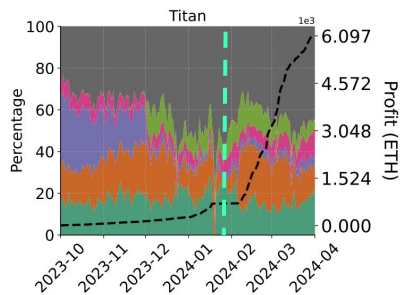
A fierce "order flow acquisition war" around Banana Gun Telegram Bot Flow and Jaredfromsubway.eth Sandwich MEV Flow happened quietly behind scenes among the top builders.

The winners? Titan & beaverbuild

The result? Even more centralized market structure

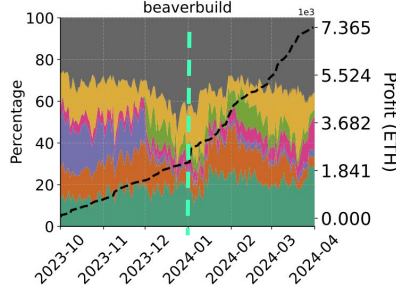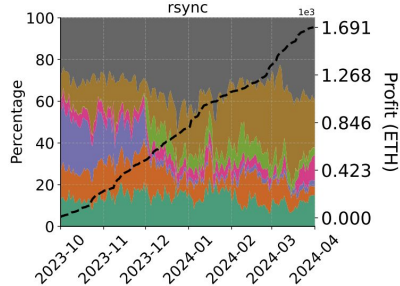# Result? Block Builder Market Share Diverged

Slot Share

7d 1m since merge

by slot share ▼

% of total slots

Flashbots
rsync
Titan
beaverbuild
non MEV-boost

Builders
- Vanilla Builders
- beaverbuild.org
- Titan Builder
- rsync-builder.xyz
- Flashbots
- Flashbots Imposte
- jetbldr.xyz
- Builder+ www.btcs
- Bob the builder
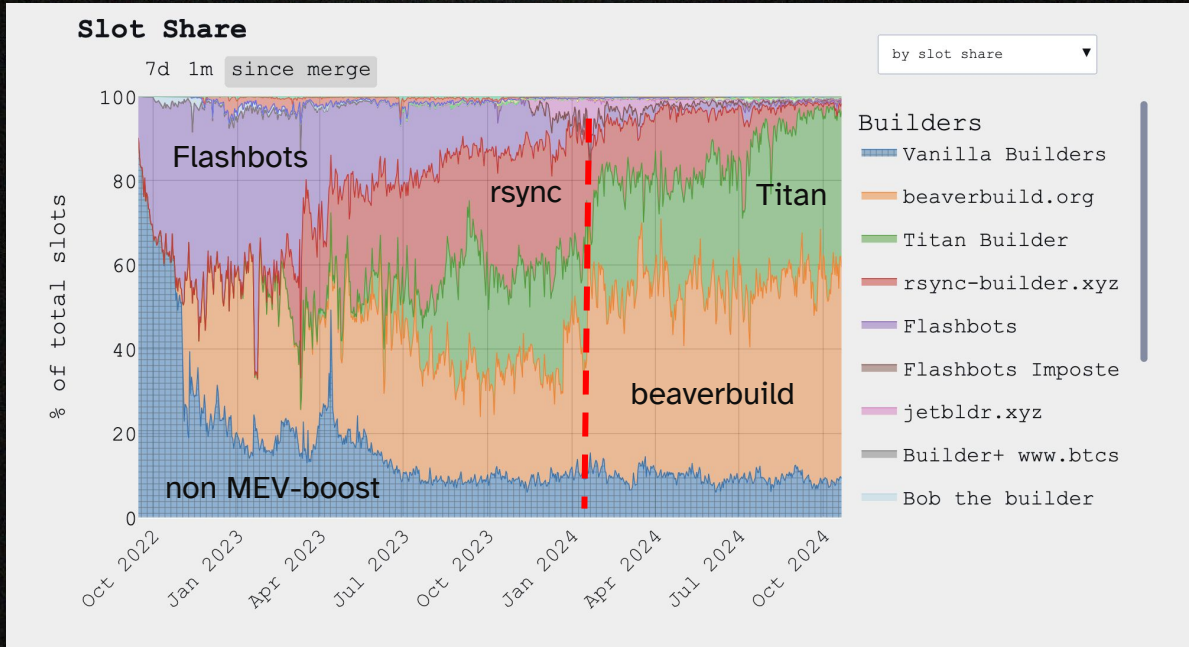
rsync gave up maintaining builder inclusion rate / market share since they lost the orderflow deal

now the game is only between the 2 other builders!

2024Q2: Metamask Orderflow Auction Started
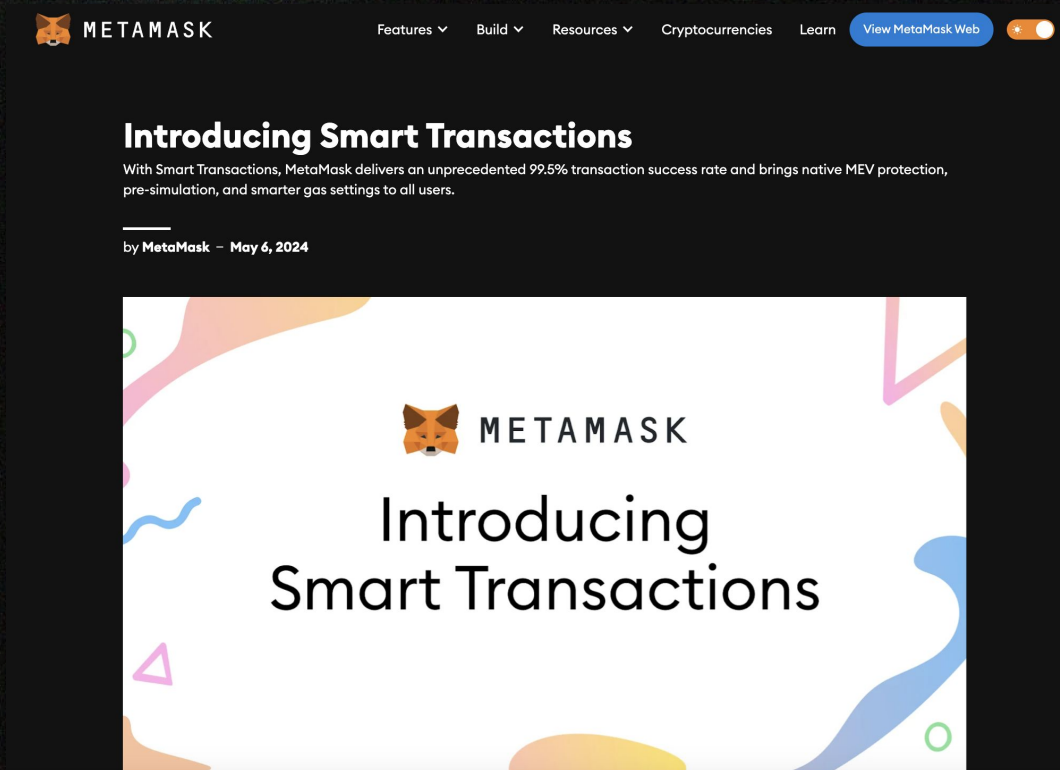
Result? Ethereum's Private Mempool Adoption Surged

Data in 2023Q1:   3-5% (private txs %)

Daily Ethereum Txs % in Private Mempool

2024Q2-Q4:   35%

2023Q3-2024Q1:   15%

Public
Private

@flashbots   ··· 8h ✅
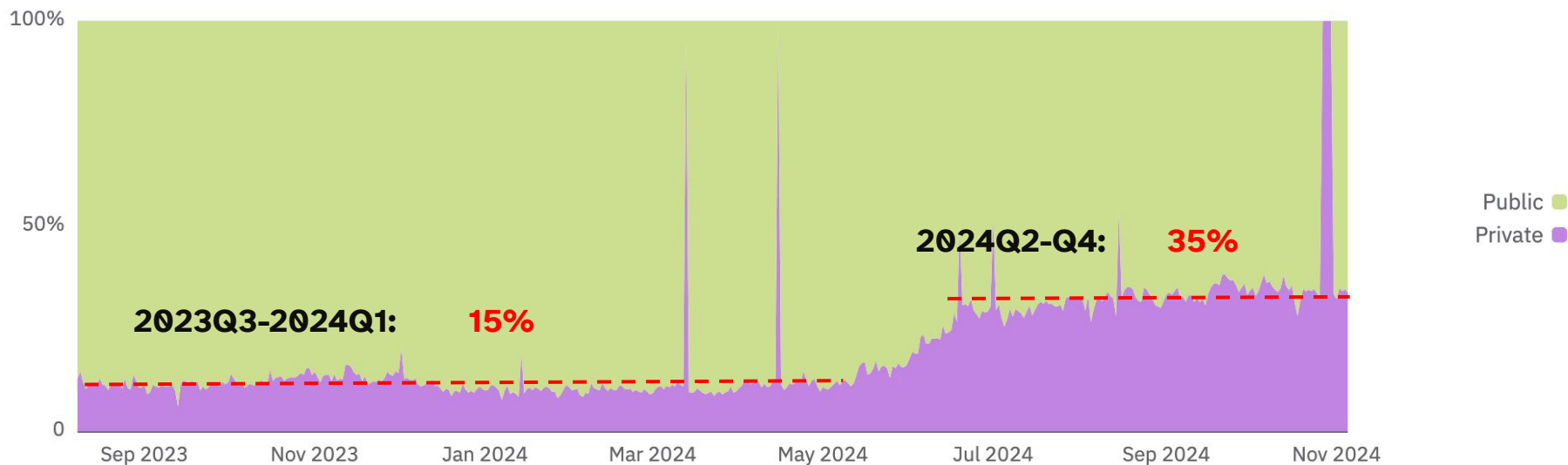
MEV-Boost successfully enables uniform access to MEV rewards for Ethereum validators.

However, the current market structure undermines Ethereum's censorship resistance and neutrality properties.

Bad Economics for Block Builder Market

Besides the ==censorship resistance== concern, there is inefficiency in current block auction competition:

- Different builders trying to acquire orderflow exclusively, which then causes non-conflicting transactions from different builders' block competing to bid out more value to proposer to be included 👉 unnecessary payouts towards proposer monopoly

- Block builders have to build up reputation to attract more orderflow to then have inclusion guarantee, which then causes them to subsidize to kickstart and market themselves. This has evolved into toxic 0-sum game that is unsustainable for builders, contributing to proposer monopoly as well.

Can we change the market structure and its economics?

What if we decentralize the builder set, and redistribute value to orderflow owners?

Flashbots launched BuilderNet

Collaborative Block Building 🤝
- All block builders' orderflow will be considered for the next block
- All operator can access the global orderflow to build the optimal block
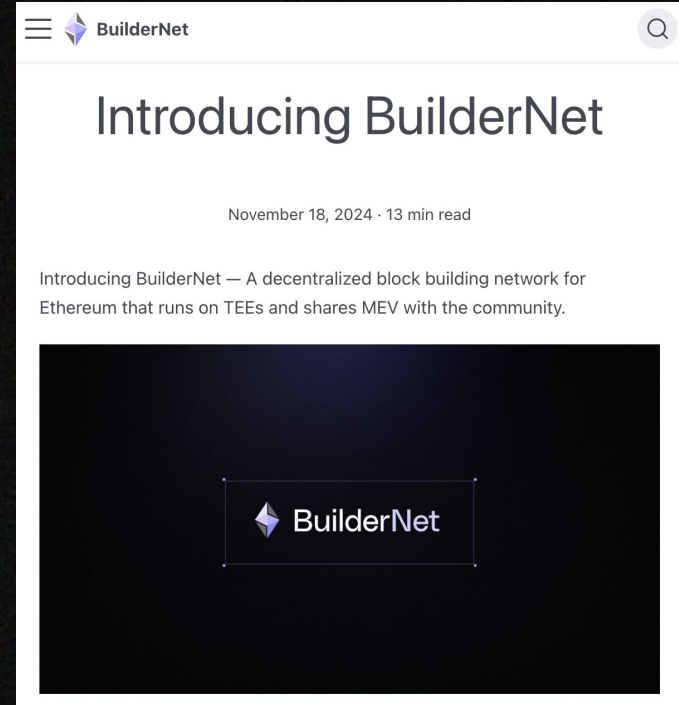- Operators avoid bidding against each other

Decentralized Multi-operator Network 🌎
- Anyone can run a block builder and access orderflow

Gas Refund Model ⛽
- Every orderflow provider will get refund proportional to their marginal contribution to the block value

More details: BuilderNet.org

BuilderNet

Introducing BuilderNet

November 18, 2024 · 13 min read

Introducing BuilderNet — A decentralized block building network for Ethereum that runs on TEEs and shares MEV with the community.

Thank You!

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AFT Paper Link: