

Execution tickets & hypothetical changes to Ethereum's blockspace allocation mechanism



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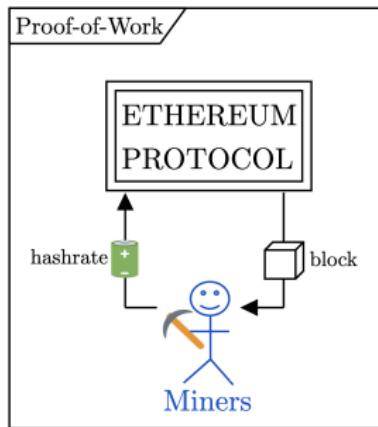
Outline

- Historical context
 - ◊ Proof-of-Work
 - ▶ Mining
 - ▶ mev-geth
 - ◊ Proof-of-Stake
 - ▶ Local building
 - ▶ mev-boost (PBS)
 - ▶ Negative side-effects:
validator economics, timing
games, censorship, fragility
- Execution Tickets
 - ◊ Separate block production and attestations
 - ◊ Secondary market
 - ◊ Brief analysis
 - ◊ Is eTix == two-tiered staking?



Proof-of-Work

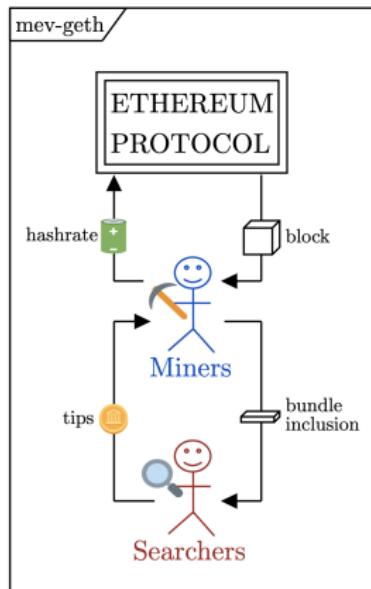
Mining



- Protocol allocates (sells) block production rights to miners based on their hashrate.

Proof-of-Work

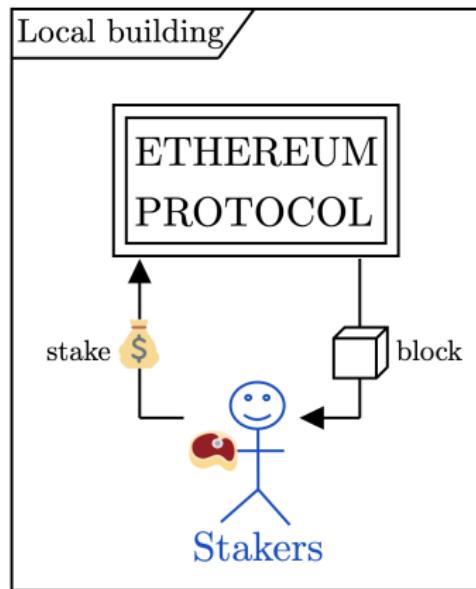
mev-geth



- Miners sell bundle inclusion (+atomicity) to searchers in exchange for tips.

Proof-of-Stake

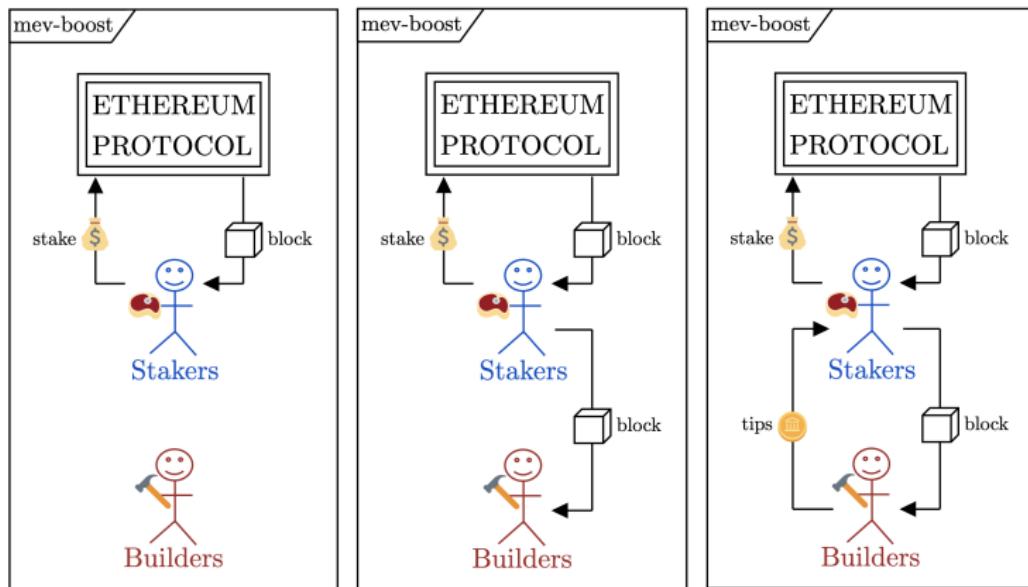
Local building



- Stakers may locally construct blocks when they are elected as the proposer for a given slot.

Proof-of-Stake

mev-boost

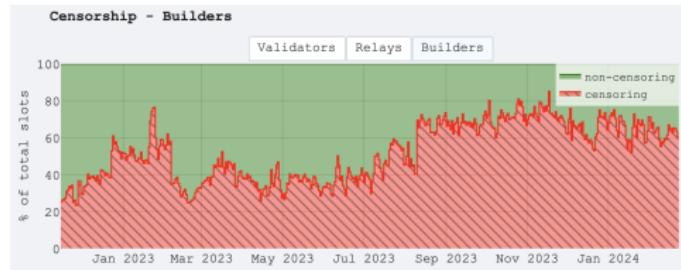


- Stakers outsource block production when they are elected as the proposer for a given slot.

Proof-of-Stake

Negative side effects of Proposer-Builder Separation

Builder (extra_data)	Blocks	Percent
beaverbuild.org	2,844	42.59 %
Titan (titanbuilder.xyz)	1,787	26.78 %
rsync-builder.xyz ⓘ	1,333	19.96 %
Illuminate Dmocratize Distribute	159	2.38 %
jetbuilder.xyz	146	2.19 %
rpc.tbuilder.xyz	101	1.51 %
fttb.io	94	1.41 %
builder0x69 ⓘ	40	0.60 %



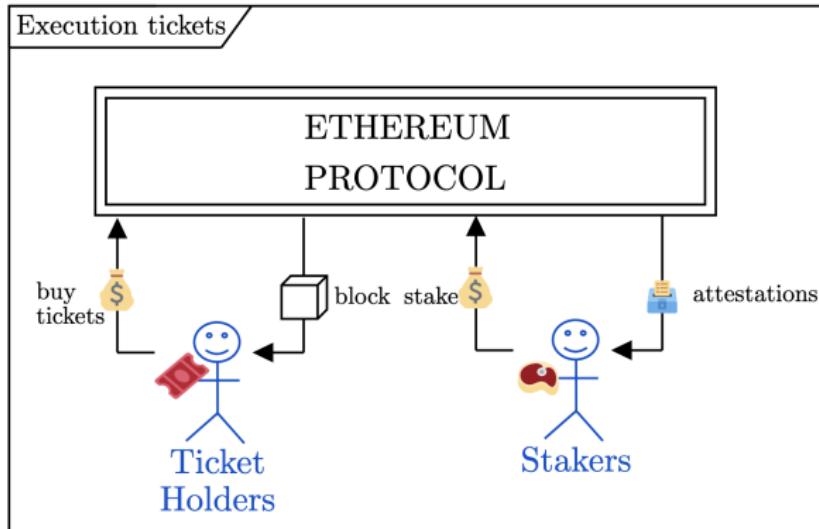
- Censorship/builder centralization
- Exogenous validator rewards
- Timing games
- Fragility (Feb 6, March 27)

<https://relayscan.io/>

<https://censorship.pics/>

Execution Tickets

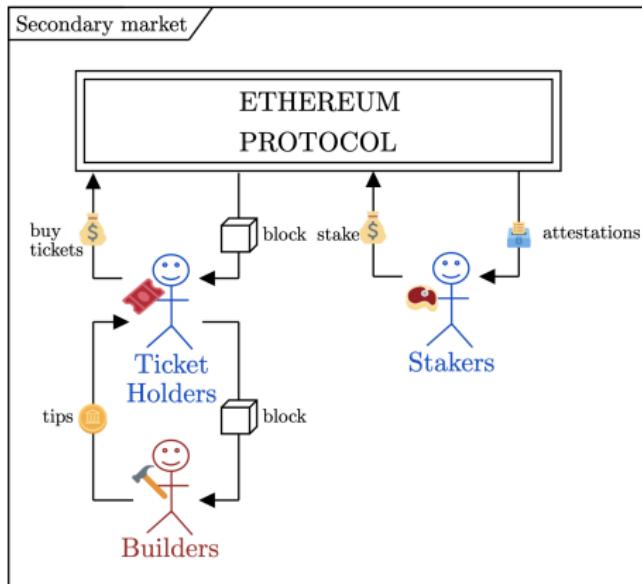
Separate block production and attestations



- Enshrine "builders" to remove "stakers" from the MEV supply chain.

Execution Tickets

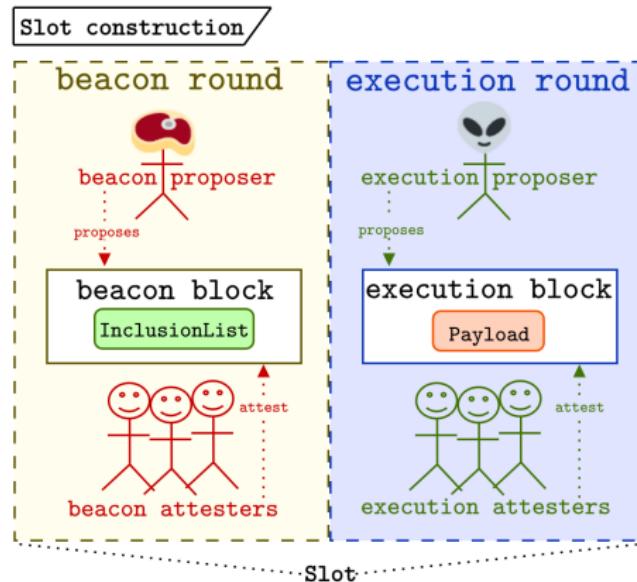
Secondary market



- Ticket holders will still sell their block space to builders (or builders could buy tickets themselves).

Execution Tickets

Slot construction



- Split slot into two rounds \implies two separate proposers and attesting committees.

Execution Tickets

Brief TM analysis

- Pros:

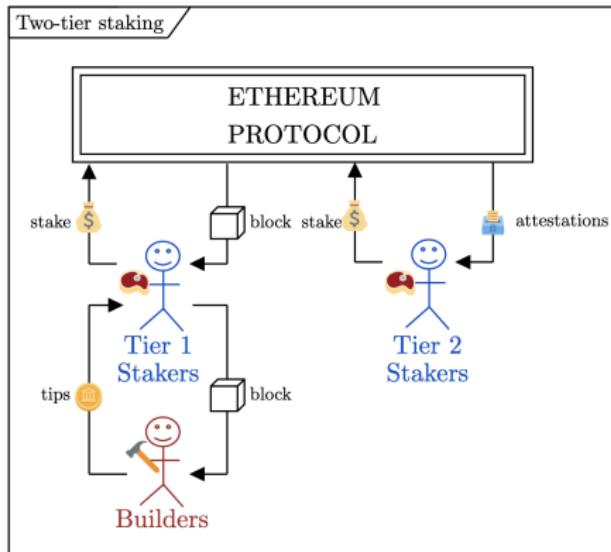
- ◊ Clean abstraction.
 - ▶ Simplification of validator tasks (no timing games).
 - ▶ Removes MEV from validator rewards (no warping consensus economics).
- ◊ Roadmap compatibility.
 - ▶ MEV burn out of the box.
 - ▶ Protocol simplicity/endgame aesthetic.
 - ▶ Inclusion lists constructed by beacon proposers (improved CR).
 - ▶ Execution proposers can be punished more heavily (less fragility).

- Cons:

- ◊ Multi-slot MEV concerns.
- ◊ Centralization generally.
- ◊ Fork-choice implications.
- ◊ Are inclusion lists sufficient?
- ◊ Unknown unknowns...

Execution Tickets

Is eTix == two-tiered staking?



- One tier for proposing, one tier for attesting.
- Only difference is the “decay” from ticket expiry.
- Is this a good thing?

thanks! :-)

