

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



mike neuder
nyu reading club
monday, april 1, 2024

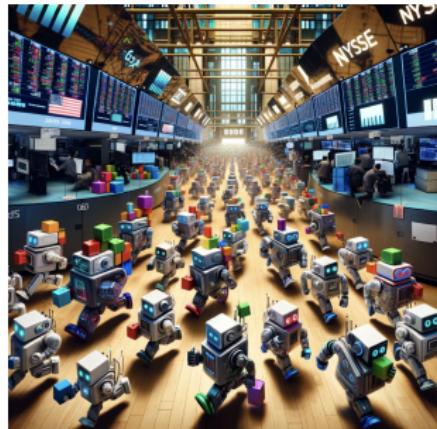
Outline

- Historical context
 - ◊ Proof-of-Work
 - ▶ Mining
 - ▶ mev-geth



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 - ▶ mev-boost (PBS)
 - ▶ Negative side-effects:
validator economics, timing
games, censorship, fragility



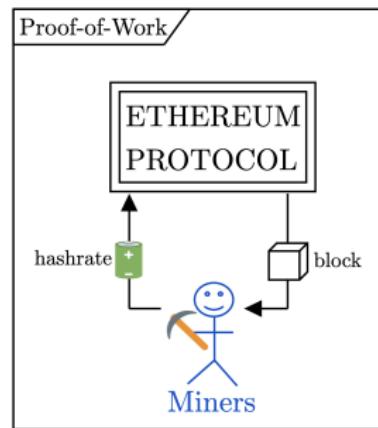
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 - ◊ Separate block production and attestations
 - ◊ Secondary market
 - ◊ Brief analysis
 - ◊ Is eTix == two-tiered staking?



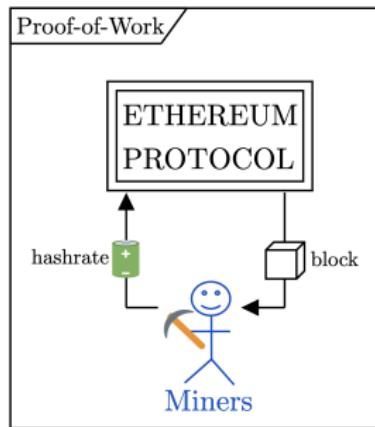
Proof-of-Work

Mining



Proof-of-Work

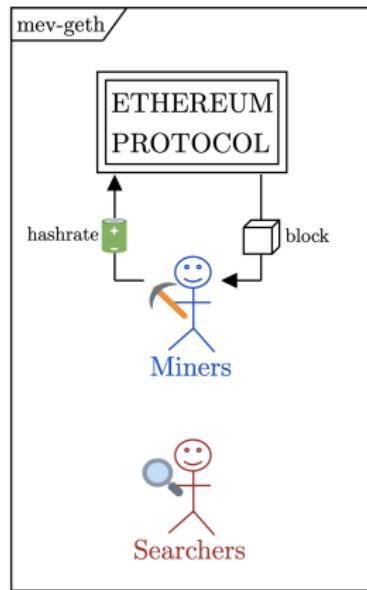
Mining



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

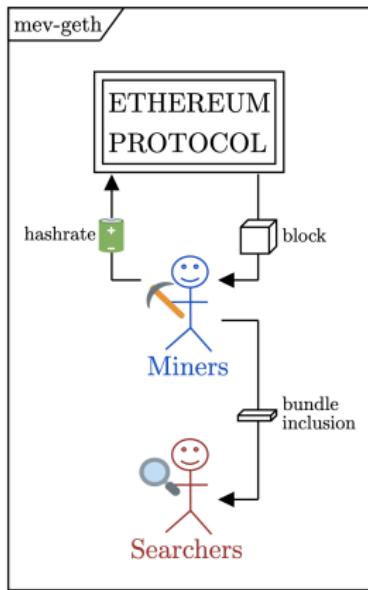
Proof-of-Work

mev-`geth`



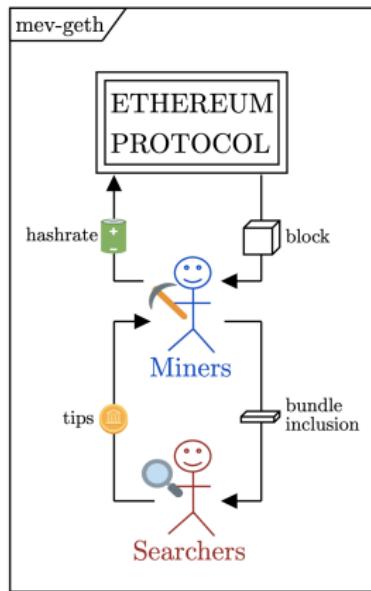
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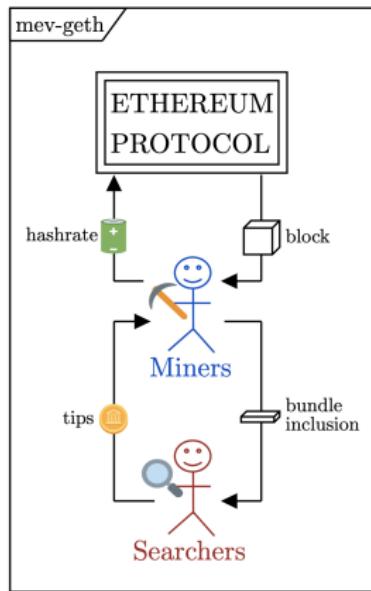
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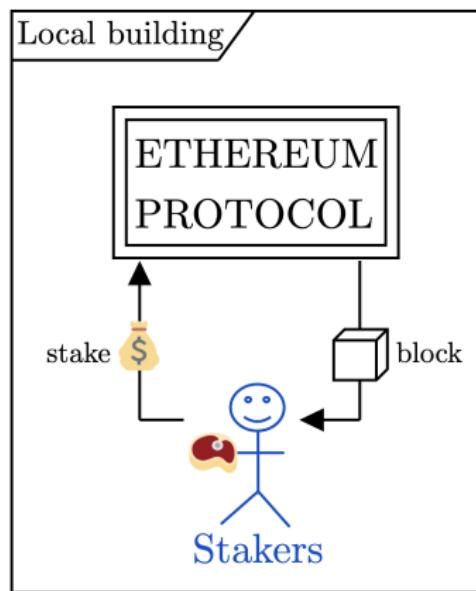
mev-geth



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

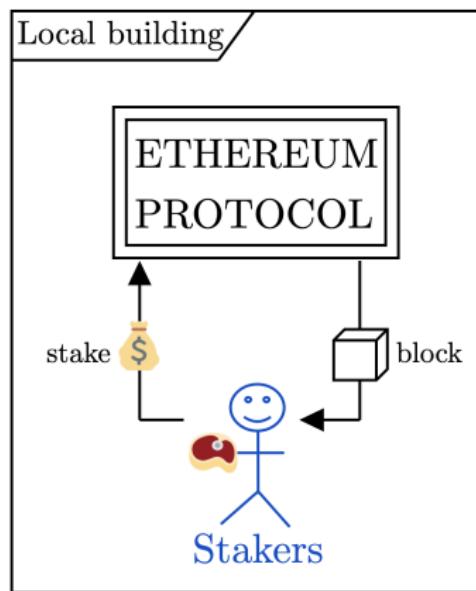
Proof-of-Stake

Local building



Proof-of-Stake

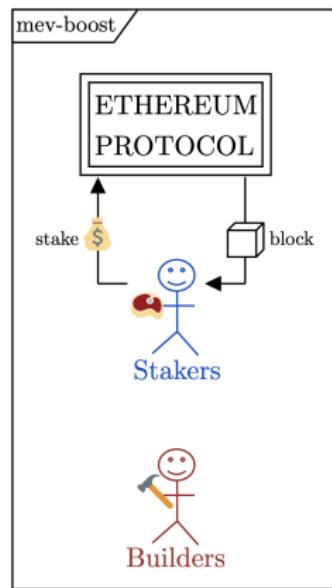
Local building



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

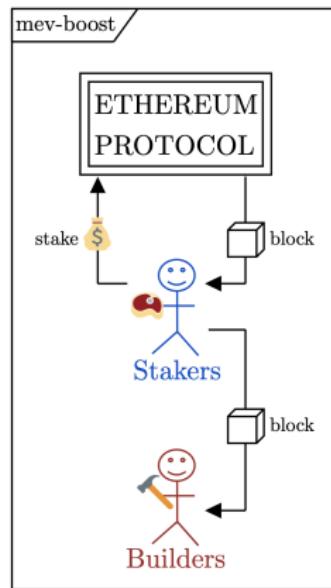
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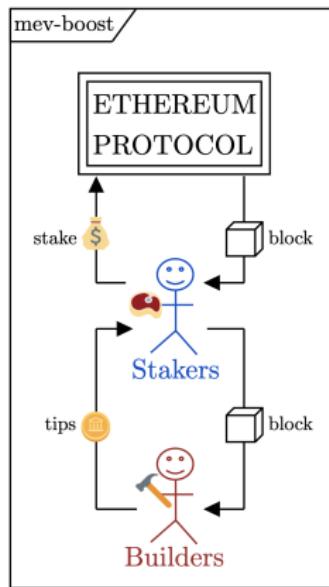
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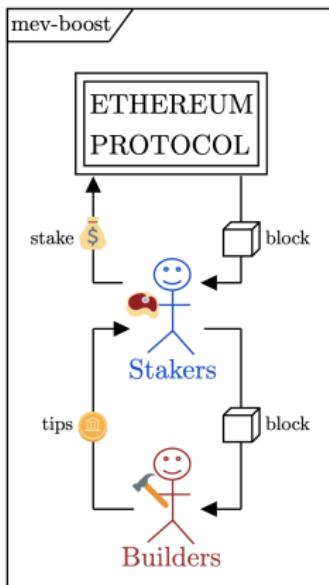
Proof-of-Stake

mev-boost



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 (titianbuilder.xyz)	1,787	26.76 %
rsync-builder.xyz ⓘ	1,333	19.96 %
illuminate Dmocratize Distribute	159	2.38 %
jetbuilder.xyz	146	2.19 %
rpc.builder.xyz	101	1.51 %
f1b.io	94	1.41 %
builder0x69 ⓘ	40	0.60 %

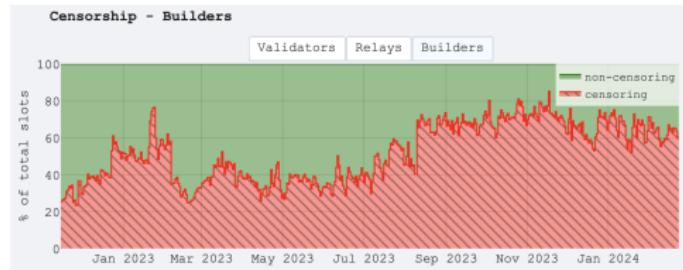
<https://relayscan.io/>

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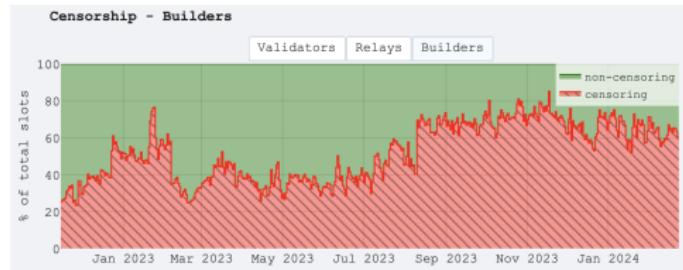
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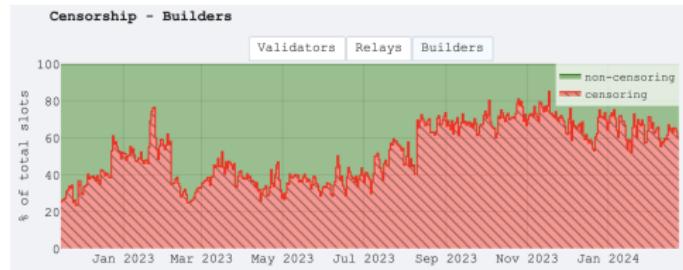
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- Exogenous validator rewards

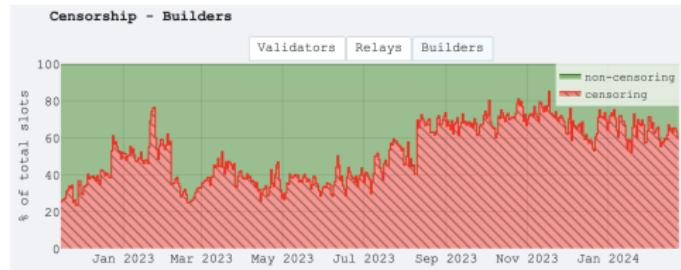
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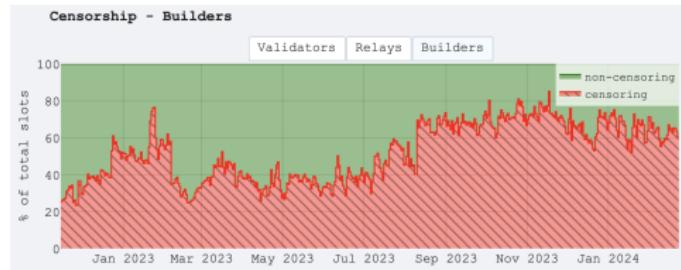
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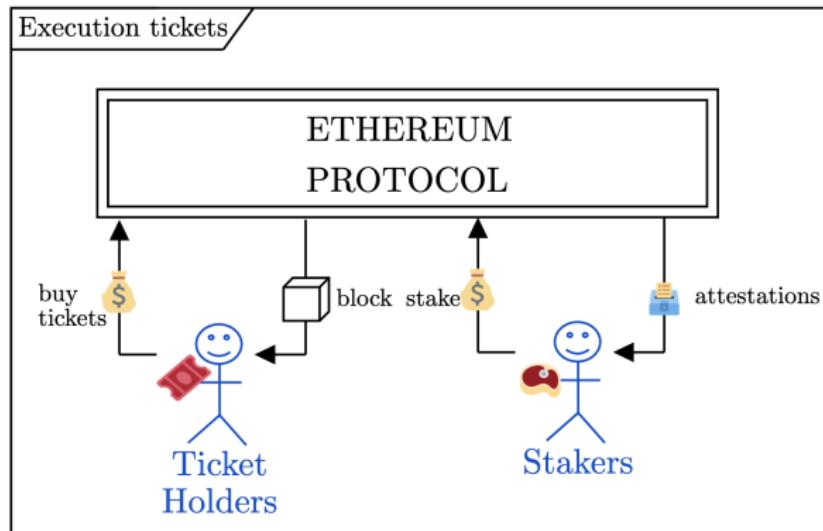
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- Fragility (Feb 6, March 27)

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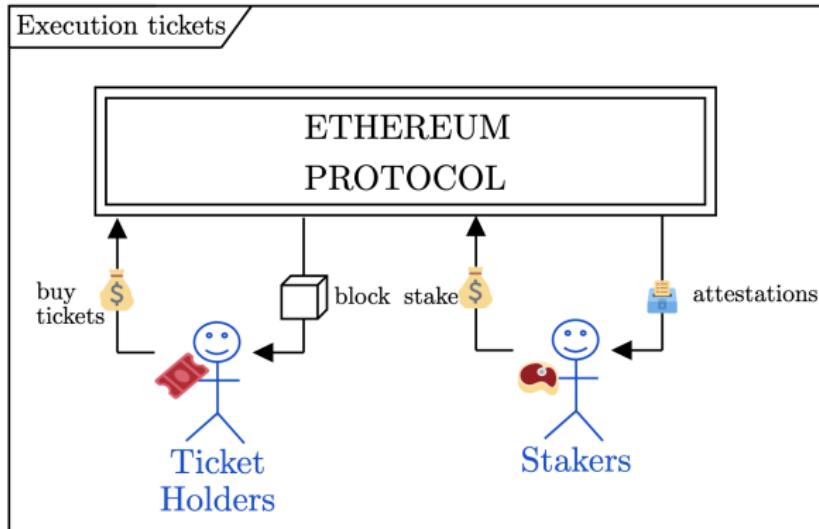
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Separate block production and attestations



Execution Tickets

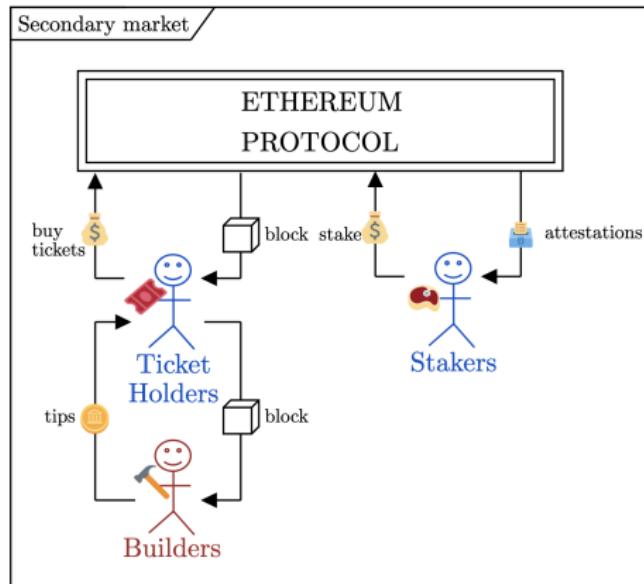
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- Enshrine "builders" to remove "stakers" from the MEV supply chain.

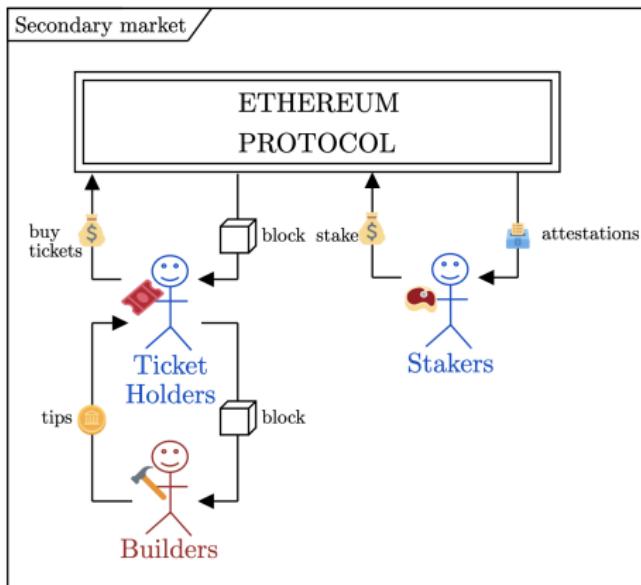
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Secondary market



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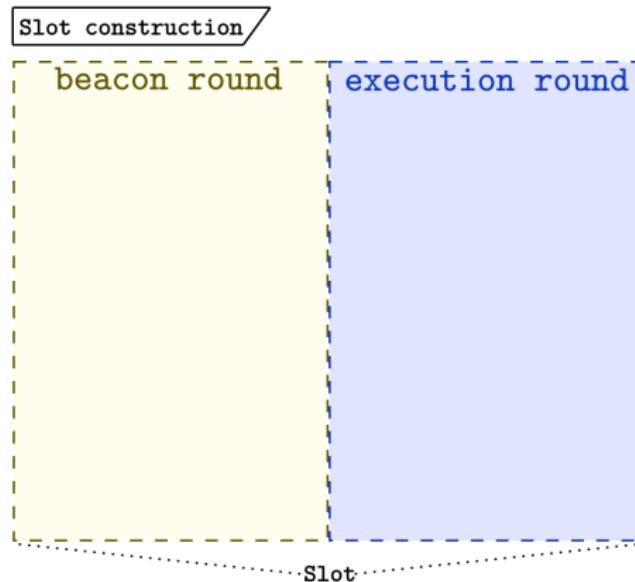
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- Ticket holders will still sell their block space to builders (or builders could buy tickets themselves).

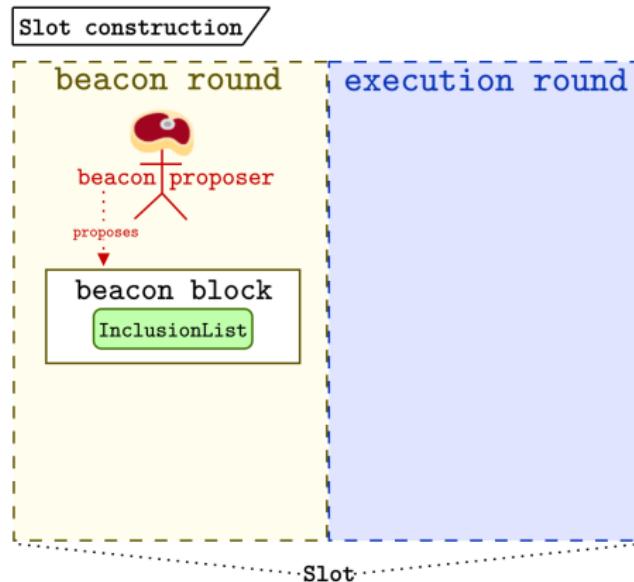
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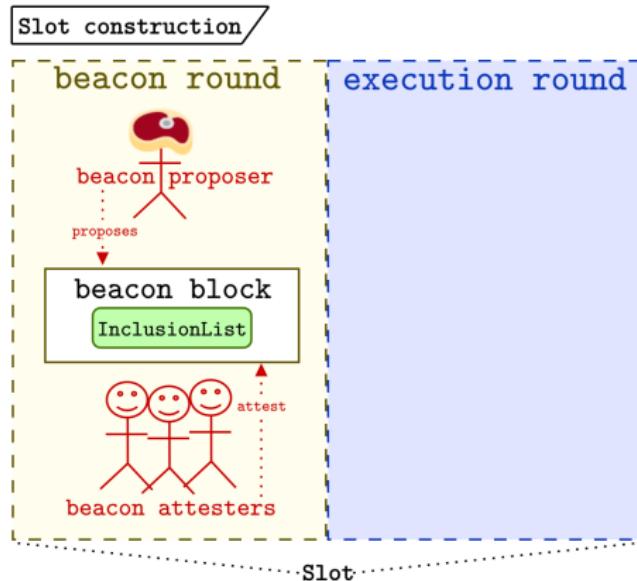
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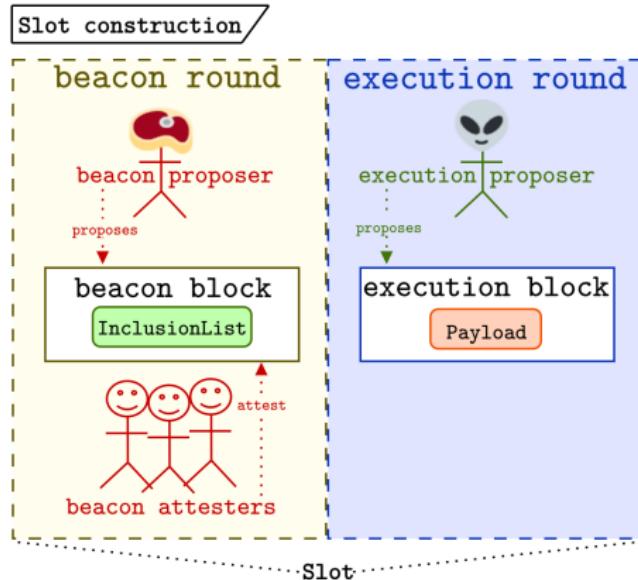
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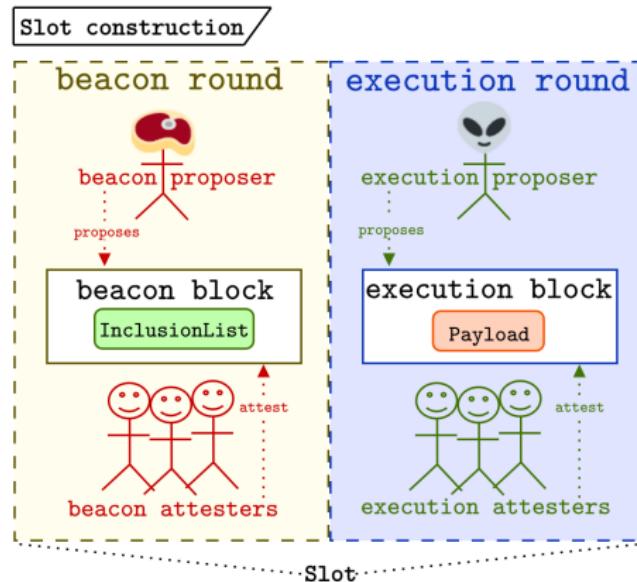
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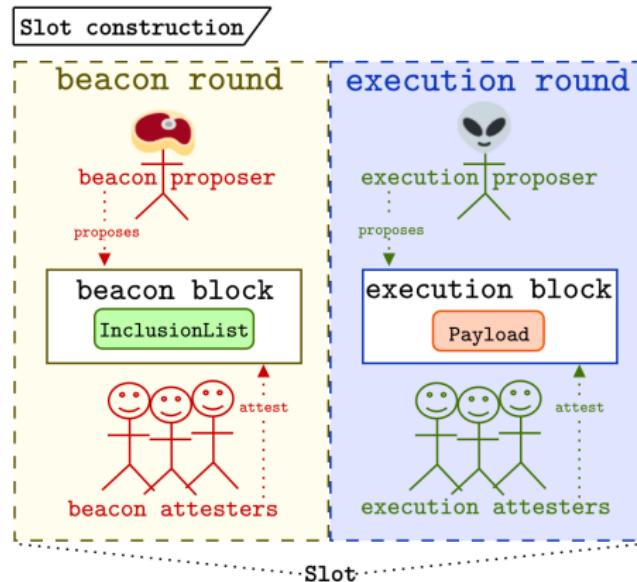
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- Split slot into two rounds \implies two separate proposers and attesting committees.

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Brief™ analysis

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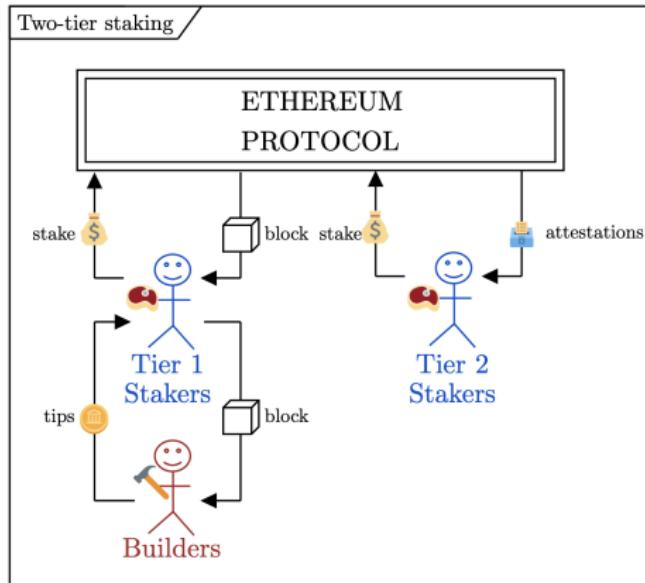
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- ◊ Fork-choice implications.
- ◊ Are inclusion lists sufficient?
- ◊ Unknown unknowns...

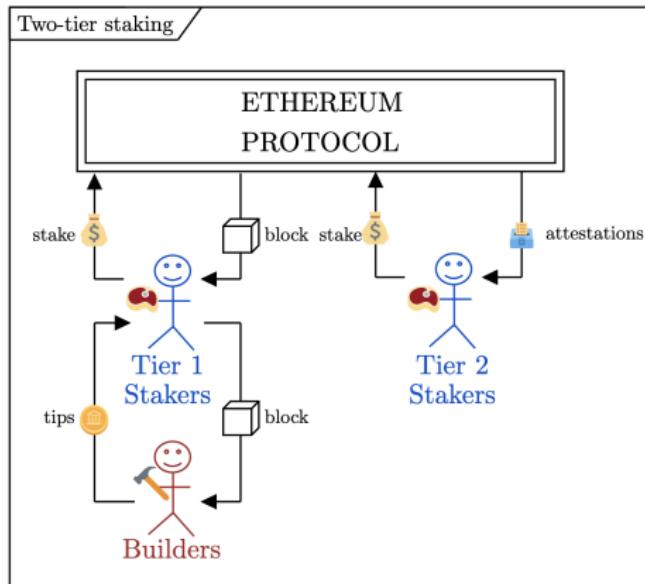
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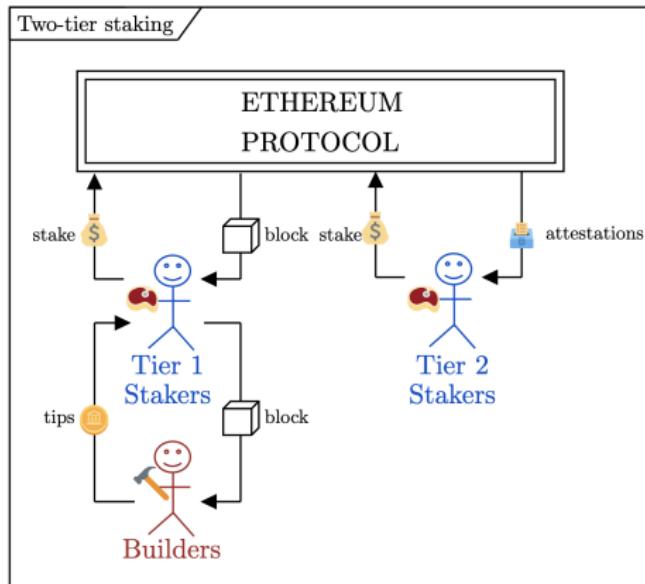
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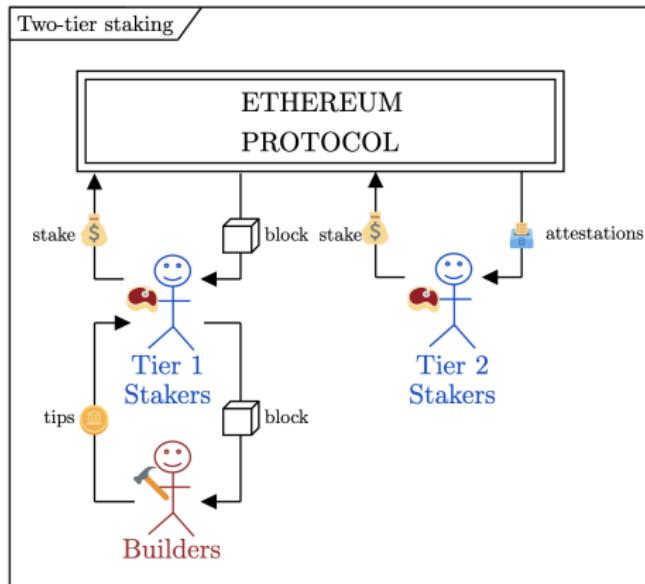
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- Only difference is the “decay” from ticket expiry.
- Is this a good thing?

<https://ethresear.ch/t/unbundling-staking-towards-rainbow-staking/18683>

thanks! :-)

