

More slides about Proposer-Builder Separation



mike neuder based on discussions with ... *everyone*
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It takes a village...

- h/t Barnabé for being a great KOL.^{1,2}
 - h/t Julian, Thomas, Francesco, et al. on extensive IL work.^{3,4}
 - h/t Terence & Potuz on relentless ePBS work.^{5,6}
 - h/t Elijah, Max, & Mallesh for talking about concurrent proposers for over a year already.^{7,8}



¹<https://efdn.notion.site/Block-construction-session-bd611621250f45948eff05fcf6a34067>

²<https://mirror.xyz/barnabe.eth/QJ6W0mmmyOwjeC-2zuH6lZb0iEl2aYFB9gE-LHWIMziQ>

³<https://ethresear.ch/t/fork-choice-enforced-inclusion-lists-focil-a-simple-committee-based-inclusion-list-proposal/19870>

⁴<https://ethresear.ch/t/uncrowdable-inclusion-lists-the-tension-between-chain-neutrality-preconfirmations-and-proposer-commitments/19372>

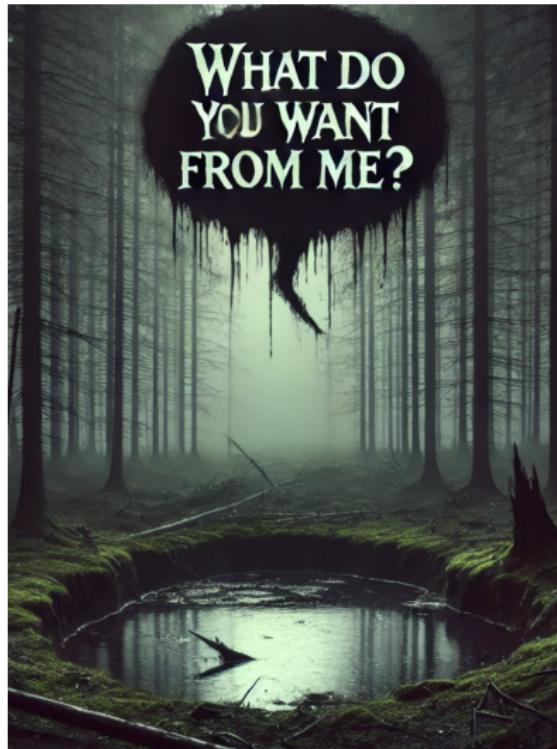
⁵ <https://eips.ethereum.org/EIPS/eip-7732>

⁶<https://ethresear.ch/t/builder-bidding-behaviors-in-epbs/20129>

⁷ <https://arxiv.org/pdf/2301.13321.pdf>

⁸<https://ethresear.ch/t/multiplicity-a-gadget-for-multiple-concurrent-block-proposers/14962>

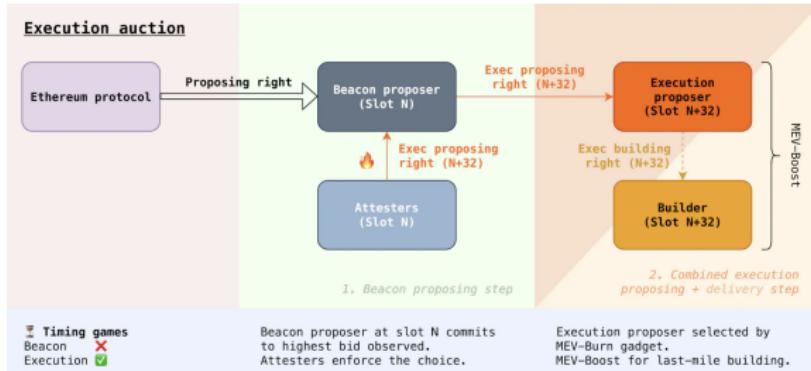
Desiderata



- Reduce validator rewards from MEV
 ⇒ “reduce sophistication.”
- Harden protocol’s censorship resistance
 ⇒ “preserve neutrality.”
- “*Block production is centralized, block validation is trustless and highly decentralized, and censorship is still prevented.*” – Vitalik’s *Endgame*, 2021.
- Remove relays? ⇒ “minimize trust.”
- Maximally burn ETH? ⇒ “maximize efficiency.”

Non-comprehensive list of related proposals

(hope you like acronyms)



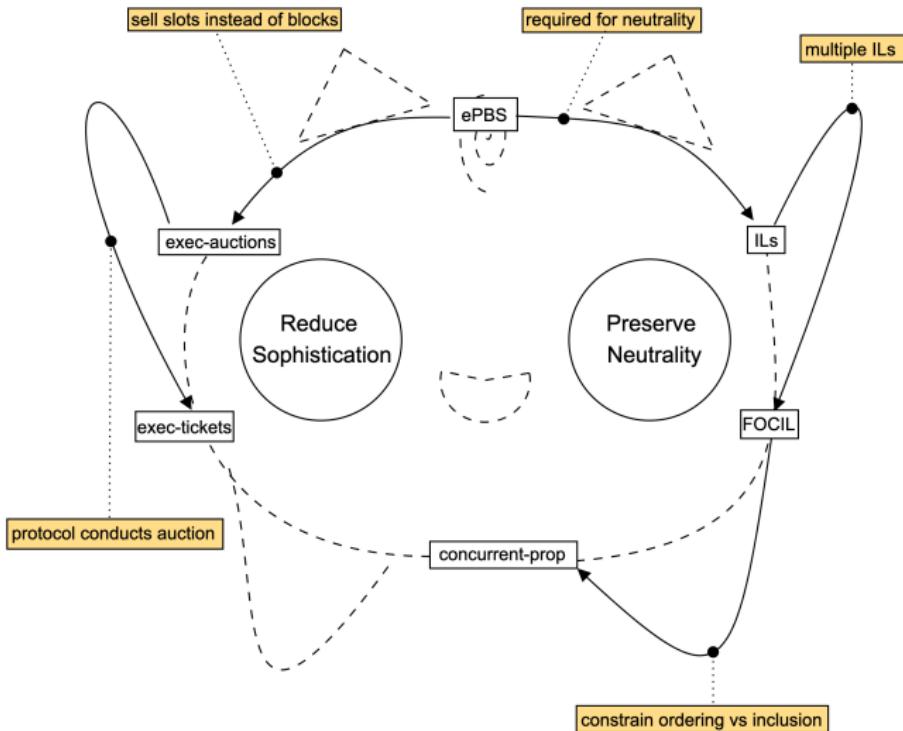
- ePBS – “*Oldie but goodie*”
- Execution tickets – “*ET phone home*”
- Execution Auctions / APS-burn – “*Tell me something I don't know*”
- Concurrent proposers – “*The more the merrier*”
- No Free Lunch ILs – “*Everything that glitters ain't gold*”
- FOCIL – “*Teamwork makes the dream work*”

Do you know what jigglypuff looks like?

(total non sequitur)



Fitting it together



Thematic analysis



- **Block co-creation** – e.g., “FOCIL, ToB/RoB split, and concurrent proposers allow multiple parties to collaborate on block construction.”
- **Committee Enforcement** – e.g., “Timeliness committee asserts over builder payloads, attesters enforce bid thresholds, validators ensure availability/validity of IL objects on gossip.”
- **Protocol incentives** – e.g., “Missed slot penalties to punish timing games, burning as a neutral way of internalizing MEV, conditional tips to disincentivize censorship.”

A few fundamental trade-offs (can't have it all)



- **Auction timing**
 - *JIT* – More builder competition, but suffers “value in flight” problem.
 - *Ex-ante* – Lower sophistication, but predictable (multi-slot MEV).
- **Transaction inclusion rules**
 - $1/N$ – Better censorship resistance, but more gameable.
 - *Quorum* – Weaker inclusion guarantees, but less valuable.
- **Partial synchrony**
 - *Faster* – Better efficiency (e.g., more burn).
 - *Slower* – Stronger liveness.

How can we get there?

(baby steps?)



- **Incrementalism (EIP maxxing)** – Block-auction ePBS + ILs → slot-auction ePBS → execution auctions.
- **Max/Paradigm's endgame** – FOCIL → missed slot penalties → concurrent proposers + detereministic ordering.
- **Mechan-stein (alt. Franken-ism)** – FOCIL → JIT ToB auctions → ex-ante RoB execution auction.

Questions to ask

(#5 is the most important)

1. *Who is involved in the block construction process?*
2. *When does the block construction occur?*
3. *How are the transactions ultimately sequenced?*
4. *Is any of this worth the complexity, especially around fork-choice?*
5. *Are you having fun?*

thanks :)

