

# Proposer/Builder Separation material

This document aims at aggregating all the various research notes and material regarding PBS as well as various surrounding concepts

## Research / discussion

- [Proposer/block builder separation-friendly fee market designs](#) - June 2021
- [Censorship resistance under PBS](#) - Vitalik, January 2022
- [Why enshrine Proposer-Builder Separation?](#) — Mike Neuder, May 2023

## Implementation research

- [Two-slot PBS](#) - October 2021
- [Single-slot PBS using attestors as distributed availability oracle](#) - January 2022
- [Current crList proposal](#) - April 2022
- [Possible censorship with PBS + EIP1559](#) - July 2022
- [PBS censorship-resistance notes](#) - Francesco, ongoing
- [Block vs Slot auctions](#)

## Alternatives

- [Protocol-Enforced Proposer Commitments \(PEPC\)](#) - Barnabé Monnot, October 2022

## Talks

- [MEV on ETH2: MEV-boost, PBS, Danksharding](#) - Vitalik Buterin, May 2022
- [A study of the transaction supply chain from CryptoKitties to MEV-Boost to PBS\(slides\)](#) - Barnabé Monnot, May 2022
- In-protocol PBS ([slides](#)) - Vitalik Buterin, July 2022
- [Decentralizing the Builder Role \(slides\)](#) - Vitalik Buterin, September 2022

## Implementations out of protocol

- [MEV Boost](#)
- [Builder specs repository](#)
- [Flashbot's consideration of crLists](#)

## Further applications of PBS

- Committee-driven MEV smoothing: [notes](#), [ethresearch](#) - August 2021
- [Multidimensional EIP 1559](#) - January 2022
- [PBS for Data Availability Sampling](#) - August 2022
- [Sharding design with tight beacon and shard block integration](#) (also known as danksharding)

- [EIP-4844: Shard Blob Transaction](#) (proto-danksharding) and related [FAQ](#)
- [Danksharding workshop](#) (PBS+crList overview at [12:25](#))
- [Mathematical Theory of Danksharding](#)