Abstract: The Ethereum block-building process has changed significantly since the emergence of Proposer-Builder Separation. Validators access blocks through a marketplace, where block builders bid for the right to construct the block and earn MEV (Maximal Extractable Value) rewards in an on-chain competition, known as the MEV-boost auction. While more than 90% of blocks are currently built via MEV-Boost, trade-offs between builders' strategic behaviors and auction design remain poorly understood. In this paper we address this gap. We introduce a game-theoretic model for MEV-Boost auctions and use simulations to study different builders' bidding strategies observed in practice. We study various strategic interactions and auction setups and evaluate how the interplay between critical elements such as access to MEV opportunities and improved connectivity to relays impact bidding performance. Our results demonstrate the importance of latency on the effectiveness of builders' strategies and the overall auction outcome from the proposer's perspective.

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Strategic Bidding Wars in On-chain Auctions

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