Title:

Research on MEV in L2 Blockchains

Team:

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Status:

Completed

Github:

https://github.com/flashbots/mev-research/blob/main/FRPs/active/FRP-29.md

Flashbots Research Proposal Template

We hope to research the current MEV landscape, with an emphasis on decentralizing sequencers used by L2s beyond the EVM. Our findings would then be published in long-form format, Twitter threads, as well as in media formats such as podcasts and social media video clips, by FranklinDAO.

The first part of our analysis would be a brief, high-level overview of current L2s and how they submit transactions back to the L1, with the goal of highlighting MEV vulnerabilities and solutions, such as Flashbots's auction system.

This would then segue into the bulk of our research on how we can decentralize the sequencing protocol in important L2s built on chains such as Ethereum, Solana, and Cosmos — for example, by allowing multiple stakers to collectively sequence transactions in order of time received, or by using more incentive-aligned structures.

Finally, we would zoom back out and do a qualitative analysis of whom decentralized sequencing would benefit in the Web3 ecosystem, beyond just research institutions or MEV-dedicated organizations like Flashbots. The purpose of this is to open up a broader discussion and push for decentralizing sequencers across all decentralized protocols, not just the EVM.

The final section of our project is releasing the publication in a variety of media formats to our wide audience of students and protocols on social media. Like our previous research, we typically release in the format of a long-form piece, Twitter thread, podcast, and video clips. These are published by our FranklinDAO accounts, as well as our individual researchers.

Background and Problem Statement

The landscape of Web3 infrastructure has changed drastically over the past year due to a strong emphasis on improving scalability. Ethereum itself has released Ethereum 2.0 based on PoS, and we have seen many decentralized applications beginning to migrate to L2s like Polygon or discuss creating their own app chains on Cosmos, for example. With much of the focus being shifted to these scaling solutions, we want to consider MEV mitigation from the perspective of an L2 context and the challenges it poses. For example, some L2s are much more centralized than their respective L1s or are willing to sacrifice certain areas of security — as a result, many users are vulnerable to the "MEV" tax. With different assumptions and niche use cases from L1 transactions, can we still apply the exact same principles or analysis to mitigate MEV in the L2 future — such as with auctions or a more robust decentralized protocol? On the other hand, when considering different L1s and the scaling techniques they use, can we make MEV mitigation strategies to L2s chain agnostic so that they work on not just the EVM, but Solana and the Cosmos chain itself as well?

Plan and Deliverables

Our research projects typically follow the timeline outlined below:

In the first week, we first do preliminary research and understand, from a high-level, what the protocol does and how it relates to broader industries or philosophies in Web3. With this information, we begin to finalize a list of important sub-areas of research that we want to focus on.

We then enter the actual research portion. Members of the team typically begin with previous publications (white papers, audits, developer blogs) and do checks along the way to see if other sources and data corroborate the picture being captured. Throughout the process, we consult with other members of the team (perhaps with specialized experience) to give

updates and suggestions on each other's progress, as well as provide ideas for new viewpoints to consider and sanity-check our technical understanding.

Once the research has been compiled, teams typically take 1-2 weeks to complete the writing process and formalize their findings. Drafts are submitted to committee leaders and other members of FranklinDAO along the way for feedback, and additional research is conducted if necessary as supplements.

Finally, with long-form papers finalized, the team gets together to record a series of podcasts and video clips about their research topic. These are then used to publicize the research up until the day it is officially released. The overall process can take 4-10 weeks, depending on how involved the research area is and the need of Flashbots.

References

https://franklindao.substack.com/ https://twitter.com/franklin_dao