[Non-Constitutional AIP] Front-end interface to force transaction inclusion during sequencer downtime

Abstract

WakeUp Labs proposal outlines the development of a simple but effective front-end interface that enables users to force-include transactions directly on L1 when the Arbitrum Sequencer is down.

Inspired by a few community discussions (Link 1 & Link 2) , and validated historical events like:Sequencer Downtime 1, Sequener Downtime 2, Historical Sequencer Status and L2BEAT status.

This tool aims to empower users with the ability to bypass the Sequencer in situations where it is unavailable or censoring transactions, thus aligning with Arbitrum's vision for progressive decentralization.

WakeUp Labs has a proven track record of expertise in crafting exceptional blockchain tools and infrastructure. Their contributions extend to collaborating on open-source projects for major DAOs, enhancing Ethereum Foundation-funded initiatives, and offering a developer platform that facilitates robust and scalable API calls for smart contract deployment without requiring Solidity programming skills. (Currently operating even on the Arbitrum blockchain.).

Introduction

The Arbitrum Sequencer is a critical component of the network, responsible for submitting users' transactions to L1.

Under the current model, the Sequencer represents a point of failure that, if compromised, could delay or prevent transaction processing.

There are ways to bypass it, but non-developer users lack that capability.

This proposal seeks to mitigate such risks by providing an alternative transaction submission pathway, thereby enhancing the network's resilience and user autonomy.

Rationale

- Decentralization and user empowerment:

By enabling direct L1 transaction submissions, users can circumvent Sequencer outages or censorship, maintaining their ability to transact without interruption. This capability is crucial for ensuring the network's operational integrity and aligns with the principle of progressive decentralization.

- Enhancing trustless security:

The proposed interface would serve as a valuable tool in rare situations where the Sequencer fails to perform its duties. It ensures that the Arbitrum Rollup maintains its trustless security model, even when permissioned components of the system are not functioning correctly.

WakeUp Labs core team

- Milton Berman

, co-founder and CEO, brings extensive experience as a CTO in a decentralized identity project supported by IDB Lab and Bitcoin NGO. He has also worked as a Product Owner at Rootstock blockchain and as a CTO in a mobile game studio company. With a background in working with large corporations, Milton possesses the technical expertise and strategic vision necessary to drive the success of our project.

- Maximiliano del Hoyo

, co-founder and CBDO, has a diverse background in software and finance. His previous experience at notable companies like Microsoft and Nestle provides him with the necessary knowledge and network to navigate the intersection of technology and business, ensuring the effective achievement of the project's goals.

- Gonzalo Silman

, co-founder and COO, possesses a unique blend of expertise in economics (former university professor), finance, and entrepreneurial experience in creating gaming products for LATAM communities. This diverse background brings a fresh perspective and innovative thinking to our project, enabling us to understand user needs and craft tailored solutions that resonate with our target audience.

Proposal Details

Technical Implementation

1. Transaction Monitoring:

Develop functionality to listen for user transactions on L2 that are not included by the Sequencer, with guidance from the Arbitrum SDK documentation.

1. Manual Transaction Hash Input:

In cases where automatic detection is not feasible, provide a user interface for manually entering the transaction hash or implement manually the previous transaction in the new solution.

1. L1 Transaction Replication:

Implement mechanisms to replicate the intended L2 transaction on L1, using “Forced Withdrawal” type transactions to push the L2 transaction from L1.

1. Confirmation Display:

Ensure the interface provides feedback once the transaction has successfully been processed.

1. Processing Time Consideration:

Account for the approximately 24-hour processing period to prevent errors or transaction duplication across chains.

1. Service & Maintenance:

WakeUp will keep the service up to date with monthly updates and fixes. A senior programmer will dedicate 40 hours per month during the first 3 months.

Development Roadmap & Budget Alocation:

1. Technical Research, POC and Testing (3 weeks, $ARB 9000):

Deep dive into the Delayed Inbox functionality and its integration, while creating a PoC and validating the necessity of a new internal tool for transaction monitoring and sequencer status.

1. Endpoint Development (1.5 week, $ARB 3500):

Creation of endpoints to interact with the backend logic.

1. Logic Integration and Testing (2 week, $ARB 3500):

Connecting the frontend to the endpoints and verifying the operational logic, and test heavily the MVP.

1. Design Phase (4 weeks, $ARB 5000):

Additional time allocated for the design process, ensuring a user-friendly experience.

1. UI Development (3 weeks, $ARB 5500):

Crafting an aesthetic and intuitive user interface inspired by existing high-quality designs.

1. Open-source Preparation (3 weeks, $ARB 6000):

Finalizing and documenting the codebase for open-source release.

1. Service & Maintenance after Launch (3 months, $ARB 5000).

Budget and Resources

- Estimated Timeframe:

Approximately 4.25 months for full implementation, including design phases.

- Development Team:

One full-time Sr Solidity developer for the core implementation and Research, additional design and developer resources for the UI/UX phase. The proposal also considers a Sr part-time dev for the Maintenance after launch.

Gonzalo or Milton from the core team will also keep track of the project as PO.

- Cost Estimate:

37.500 $ARB

Conclusion

Developing a front-end interface to enable force-including transactions during Sequencer downtime is a crucial requirement in the Arbitrum ecosystem. This proposal aims to empower users by ensuring transaction capabilities even when the Sequencer is unavailable. By doing so, it aligns with Arbitrum’s goals of decentralization and enhancing user autonomy.

Additionally, the project will provide the open-source code for the back-end solution, thereby improving trust in the solution and tool.