MLabs –Cardano Throughput Solution Close-Out Report

A. Name of project and Project URL

Seath (AKA MLabs - Cardano Throughput Solution) - 900153 - https://cardano.ideascale.com/c/idea/64655

B. Name of project manager

Ben Hart / Mark Florisson

C. Date project started

November 2022

D. Date project completed

May 2023

E. List of challenge KPIs and how the project addressed them

Overview

Seath is an innovative solution addressing the commonly referenced issue of UTXO contention for Cardano smart contracts. In short, the issue arises when multiple parties attempt to perform transactions against the same UTXO thereby altering its state and causing transactions to be mutually exclusive. To date, other solutions like batching have left something to be desired. Seath proposes a novel approach wherein a leader chains the transactions of other participants, optimizing L1 throughput. Although this introduces a degree of centralization, it does not necessarily compromise trust. Leadership roles and selection remain an area of ongoing development.

KPIs

MLabs submitted its Cardano Throughput Solution (AKA Seath) in the Fund9 Developer Ecosystem challenge. In general, the challenge aimed to provide tooling and solutions to create a better developer experience on Cardano. Suggested directions included:

- Developer productivity: IDEs, scripts to automate stuff.
- Support structures
- Knowledge base & Documentation
- APIs, and oracles.

And so on.

An early and well-known issue for dApps building on Cardano is of course UTXO contention which has the potential to drastically limit the throughput and usability of applications. Batching has addressed the issue to a significant extent, but criticisms exist and there is open interest in other solutions.

Seath successfully addressed its objective of providing an early-stage, alternative solution to batching. The leader mechanism works as described, and it allows several users to submit transactions against a piece of state succinctly.

F. List of project KPIs and how the project addressed them

Essentially, the main objective of our Fund9 proposal was to provide an alternative mechanism to batching for dApp developers to address the contention issue. The main goal of our proposal was to create a protocol that accomplishes several criteria:

Create a leader and user protocol dynamic

We have provided an off-chain framework based on our Cardano Transaction Library allowing developers to describe user-intended state transitions in terms that can be translated into Cardano transactions. This mechanism relies on a leader to orchestrate a chain of transactions that then must be validated by the end users.

Accept user's intent into the ledger

While Seath provides a layer of abstraction and a minimal layer of trust, dApp developers are able to circumscribe how a user can affect the ledger state and their "account" status relative to the dApp they are interacting with.

G. Key achievements

As mentioned, the successful implementation of the original Seath design was the main accomplishment of this project, and we are glad to share this MVP with the community. Moving forward, we'd like to make further improvements to make the protocol more trustless as well as integrate with user-facing applications.

H. Key learnings

Cardano's off-chain terrain is always challenging. However, tools like our CTL framework are very beneficial for coordinating the action of Seath. We feel that the combination of CTL and Seath offers a promising foundation for dApp developers. Applied thoughtfully, it

provides another contention solution alternative that can improve usability in many situations in our opinion.

I. Next steps for the product

There are several steps remaining to make Seath a more robust and trustless contention solution. Particularly, this involves leader selection, and also improving the expressibility of user action easily-amenable to transaction chaining. A detailed list is available in the Seath repo here:

https://github.com/mlabs-haskell/seath/issues/47

We plan to act upon these improvements by participating in Fund10

J. Final thoughts

We are excited to share the successful results of this proposal with the Catalyst community and look forward to further collaborations similar to this.

K. Links

MLabs website: https://mlabs-digital.com
https://github.com/mlabs-haskell/seath