Eve: A Blockchain-Based Protocol for Matching Markets

Abstract

We propose a protocol for coordinating market matching without relying on centralized intermediaries. Eve uses blockchain transaction memos to implement an event-sourcing pattern, where market participants express bidding intents with constraints, and matches occur when sufficient compatible bids exist. The protocol enables threshold coordination where events only proceed when predetermined requirements are met, such as minimum capacity or funding thresholds. By encoding commands in transaction memos and deriving system state through deterministic processing, Eve provides complete transparency, auditability, and reply capability while minimizing on-chain computation. This approach creates efficient two-sided markets that can operate across various domains, from event ticketing to telescope time allocation, with minimal trust requirements and maximal coordination efficiency.

Protocol first approach

1. Introduction

Organizing on the internet has come to rely on large organizers selling tickets to standard event formats like conferences, concerts, and conventions or through highly visible campaigns like, to give examples of campaigns from the organizer's and the audience's perspectives, crowdsourcing and reaching funding through social media and getting an organizer to fund an event because a mass expression of audience interest was clearly visible online. While these strategies already involve putting down money to establish confidence and trust, these systems still suffer from inherent weaknesses of the trust based centralized model. Traditionally, decentralized event commitments are not common, as trust in organizers or centralized platforms remains necessary to handle payments, validate attendance pledges, and ensure sufficient collective interest to proceed. The dependency on intermediaries increases overhead costs, limiting the viability of smaller, informal gatherings and reducing spontaneity and fluidity.

The rise of blockchain technology has enabled new forms of coordination without centralized control, but current implementations rely on complex smart contracts that require advanced planning and are expensive to execute complex computation on-chain. Moreover, most blockchain-based market systems focus on simple auction mechanisms rather than multi-dimensional matching with constraints.

Parallel to develop of the blockchain, the rising economic viability of streaming to hundres of thousands of views on youtube and twitch has grown economic markets composed of a massive viewership of people willing to spend money to appeal to a streamer

What is needed is a protocol that leverages the blockchain's immutability and ordering properties while keeping complex computation off-chain, enabling transparent, efficient, and flexible market matching. The protocol should support expressing complex preferences and constraints, operate with minimal on-chain footprint, and provide deterministic outcomes that can be independently verified.

In this paper, we propose Eve, a blockchain-based protocol for market matching that addresses these challenges through an event-sourcing architecture. Eve enables users to express bidding intents with optional constraints directly in transaction memos. These intents are processed deterministically to find valid matches that satisfy all participant constraints. When matches occur, resources are allocated according to predetermined rules, creating an efficient coordination mechanism without requiring trust in a central authority.

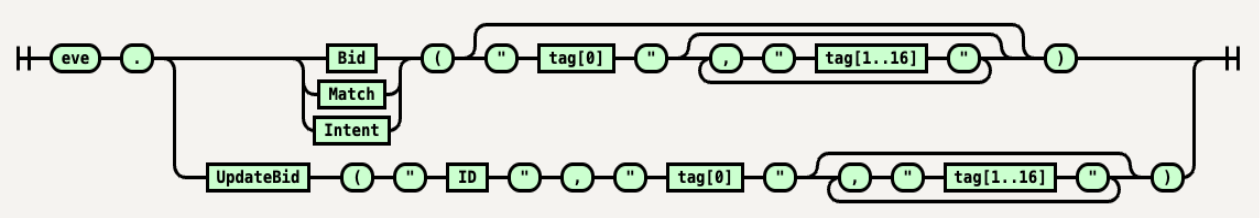
2. Transactions

Eve monitors the chain for transactions that contain memos that communicate event organizing actions, gathers valid transactions specified by the Eve Protocol, and then executes them. Commands in Eve follow a standardized syntax:

```
eve.<action>(<parameters>)
```

Where:

- <action>: represents function-call like commands such as: Bid, Match, Intent, UpdateBid, UpdateIntent, RevokeBid, RevokeIntent
- <parameters>: are key-value pairs that define constraints and properties



Examples:

```
eve.Bid("location:virtual", "dates:2025-10-01...2025-10-10")
eve.UpdateBid("42AB9335", "location:San Francisco")
eve.Match("location:virtual", "dates:2025-10-02", "min_capacity:100",
"min_bid_amount:50")
eve.Intent("location:virtual", "dates:2025-10-02", "min_capacity:100",
"min_bid_amount:50")
```

A bid represents a user's intent to participate in a market with constraints. The maximum bid amount is specified by the message value, while constraints are encoded in the memo field of the transaction.

Key aspects of bids include:

- Required parameters (such as location and dates)
- Optional parameters which may represent any number of additional constraints
- Bid ID, derived from the first eight bytes of the initial transaction creating the bid
- A bid may be marked as a “pledge”, which pledges the full maximum bid amount to the matching event, instead of refunding the difference between the minimum bid requirement and the bidder’s maximum bid
- Support for updates and revocations

For instance, a bid submitted to the even organizer, Build the Future (BTF), DAO address could look as follows:

```
sender:    000001
receiver:  000002
amount:    50 PHOTON
memo:      eve.Bid("location:virtual", "dates:2025-10-01...2025-10-10")
```

In this transaction, the sender is stating that they would like to attend a virtual event anytime between the dates of Oct 1-10 with a maximum bid of 50 PHOTON.

3. Eve Protocol

A Eve transaction is a transaction on the chain where the memo field can successfully lex. Each Organizer will set up their own multisig and all bids will be sent to that address. This is to prevent legal responsibility for the events.

4. Discussion

5. Applications

5.1 Official Product Launch Event: BTF Beta Launch

The Eve Protocol first and foremost was designed to support the BTF Launch Event, a virtual event filled with talks and details about the future of BTF. Launch events are similar to conventions and conferences, they all need a venue and a time period to run. Large organizers have been doing this kind of thing for a long time, and they know there is a market where curious people can attend a series of talks about subjects they enjoy or they can attend for

work. Either way, the Eve Protocol supports registering an event by an official event organizer and can send out advertisement links for people to purchase tickets.

5.2 Daily Event Organizing: Telescope Viewing Party

Large events like a BTF Beta Launch are standard events from a birdseye view: there have been centuries of consortiums, trade shows, conventions, banquets, conferences, working groups, concerts, and all of these from above look like singular, but momentus large gatherings that were planned in advance to support a large amount of people. Of course there is a lot of profit to be made in taking a lot of peoples money, but another important class of events are events that happen *consistently*. For example, BTF is also planning to buy a plot of land somewhere in the desert, buy a really nice telescope, and let everyone vote where it will point in the night sky that night.

5.3 Ephemerate Event Organizing: Capabilities for Streamers

You may think ticketmaster or change.org is prior art to the Eve Protocol, but you are forgetting about donations to twitch streamers!

5.4 Counterfactual Event Organizing: Transaction Data Analysis