Caelum Protocol

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Abstract

Currently there are few to any decentralized order books that work for anything other than pure crypto exchanges. Among current order books in the crypto space AMM is king at the moment, and for good reason. However, outside of pure crypto trades limit order books are extremely desirable for stock trades, peer-to-peer sales, gaming lines, and futures. Slippage in AMM is highly undesirable for larger contracts and is one of the main reasons against using it for trades and gaming lines. Centralization in traditional order books has caused a great deal of contention. The broker's cut, or juice in gaming, prevents inclusion and participation by siphoning funds that would otherwise be invested by the holding party. In gaming books, brokers take anywhere from 7-15%. After being even for approximately 6-7 games, your original value would decrease by almost 50% due to what the house takes. We propose a decentralized order book which would remove a broker's cut causing a net increase in funds, solidified by the use of secondary protocols during the deposit and holding phases. By providing a decentralized order book without broker fees / juice, participants can set specific prices and time periods, opening up a robust peer-to-peer system built targeting users looking for something beyond traditional DeFi.

Introduction

Betting on the outcomes of sporting events is a massive industry with mainstream audiences. However, this industry is plagued by high broker fees. We propose a decentralized order book that serves as a betting platform, where users can initialize smart contracts for various sporting events. This would serve as a bridge between the sports betting and crypto ecosystems. Due to the Caelum Protocol's focus on sports betting there is a seamless event result validation process, leading to very smooth transaction settlements. With smart contracts linked to external APIs of various sport outlets we can access validated event results. This provides us with an extremely low probability of any peer-to-peer bet disputes, as the entire world of sport validates results for us.

Mechanics

When two unbalanced teams face off brokers seek to attract equal money on both sides to maximize their profits, no matter the outcome of the event. Often teams are unbalanced in terms of strengths, weaknesses, and the likelihood of winning an event. Therefore, bettors for the underdog need to be enticed with favorable betting terms in order to back these teams. Betting "on the moneyline" only considers the result of an event, ignoring the point spread. Moneyline odds are reported to show the amount won compared to the wager. Underdog odds of +130 to the favorite of -150 means that underdog bettors risk 100 and win 130 if the underdog wins. Favorite bettors risk 150 and would only win 100. The difference in moneyline odds goes to the broker.

A point spread is set by odds makers based on the perceived strengths and weaknesses of each team. The favorite may have a spread of -3.7 and thus the underdog is equal to the opposite at +3.7. The favorite always has a negative spread. This handicap is subtracted from the final score of the favorite. In this example, betting parties backing the favorite are betting this team will win by at least 4 points. A push occurs when teams tie in terms of the spread. This can only happen if the spread is set as an integer (and half points do not exist in the game). In the event of a push, both parties get their money back. Odds for point spread bets are reported with broker fees or juice included. Odds of -110 mean that a 110 wager wins 100 (plus the original wager) if the backed team covers the spread. Money from the losing side of the bet covers the winners payouts and supplies the broker with a 10% commission. Odds makers may change odds prior to an event due to weather, injuries, or other circumstances. It also may be an adjustment due to betting markets favoring one team over another. These moves may ultimately reflect advantages or disadvantages to each of the betting parties, as previous bets are still evaluated at the spread at which they were placed.

Application

The smart contract allows peers to trustlessly bet on the outcome of sporting event, without the need (or cost) of a broker. As users submit bets, matchups are instantiated as new blocks. Matchups must be added by the contract administrator, as a reliable oracle must be designated to publish the outcomes. Adding a matchup creates a new instance of the contract, and all bets are tracked in the contract data. Anyone can propose a wager at self-set odds for one of the teams in the matchup. Wagered funds are deposited to the contract escrow. A proposed bet can be cancelled, until another party has matched the other side of the bet. For an MVP, we only implement complete matching on moneyline wagers, meaning one party must supply all of the capital needed to meet the payout requirements of the proposed wager. A moneyline wager is the simplest form of a sports bet, only considering the final outcome of the game. When the oracle publishes final results, the contract will settle up and payout the winning parties. Several functions are implemented to query the contract state, none of which alter contract data. \end{flushleft}