Block 6387091 Report

Below, we outline our findings for a possible MEV event included in block 6387091 proposed on January 20th, 2024 by P2P.

All the relevant data mentioned in the report can be found here: 6387091
The Numia query used to gather the data can be found here.

Incident

On January 20th, 2024 at 10:46:06, a user submitted a stop loss order on SOL-USD to sell 403.3 SOL at $82.76 or better if the market price reached $92.00. The order transaction can be seen here. In block 6387090, the price of SOL-USD hit $92.00, making the stop loss eligible for execution in the following block – 6387091.

P2P proposed block 6387091 with the order included in its proposed matches. However, the method with which this order was executed resulted in unexpected losses to the user.

The order was filled in full at an average price of **$88.59** for a total value of 35,728.83 USDC credited to the user. This was done matching the taker order with 11 different maker orders:

Date Submitted	Trade Volume	Matched Amount	Price	Value
01/13/2024 15:28:33	20	19.90	$87.00	$1,731.30
01/18/2024 16:52:48	400	113.30	$86.58	$9,809.51
01/19/2024 18:22:11	5.00	5.00	$88.00	$440.00
01/19/2024 22:23:44	5.00	5.00	$89.00	$445.00
01/20/2024 03:21:18	35.00	35.00	$87.43	$3,060.05
01/20/2024 07:06:12	83.60	83.60	$89.65	$7,494.74
01/20/2024 11:00:08	50.00	50.00	$87.00	$4,350.00
01/20/2024 11:01:17	41.90	41.90	$91.81	$3,846.84
01/20/2024 11:01:21	41.30	41.30	$91.77	$3,790.10
01/20/2024 11:01:21	7.90	7.90	$91.72	$724.59
01/20/2024 11:01:29	0.40	0.40	$91.74	$36.70

The market price for SOL-USD at block time was **$91.79**. The average execution price for the taker represents a ~3.5% spread from the market. Given Solana's relatively high liquidity as a popular market on dYdX, such a wide spread is not expected for a market order of this size. Below, we see the significance with which the order diverged from market activity, highlighted by the single candle drop on the block time:

By reviewing the maker orders used to match above, we find some abnormalities with P2P's method for executing. P2P proposed an execution with:

- An order dating back a week at $87
- An order dating back two days at $86.58
- Multiple recent orders below $90

Reviewing mempool data, we found over a hundred open maker orders that would have been eligible for matching with this order at better prices, namely at $90 or above. Many of these were long term orders submitted days in advance, which should be available to all validators.

Given the amount of open orders available, there was no reason for the user to be filled anywhere below $90 on the stop loss. We can assume that a different proposer executing the order would have earned the user an additional ~$1,000.