



Transaction graphs with reth-db

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My day job includes a lot of competitive analysis

(Strategy & Operations @ Uniswap Labs)

Who's using our products?

Who's using our competitors' products?

What's new in the DEX landscape?

Token discovery leaderboards incentivize fake activity

24H VOLUME: \$14.48B

24H TXNS: 21,795,200

Last 24 hours

Trending

Top

Volume

Txns

Gainers

New Pairs

Rank by: Volume

TOKEN	PRICE	AGE	TXNS	VOLUME	MAKERS	5M	1H	6H	24H
#1 WLF / USDT World Liberty Fin	\$0.02046	14h	8,144	\$907.4M	3,527	21.48%	57.63%	123%	818K%
#2 X / WBNB X	\$3,457.21	2d	2,673	\$756.9M	20	147%	8.25%	725K%	88Q%
#3 KOGE / USDT BNB48 Club Toki	\$48.00	2mo	488,882	\$653.1M	21,871	-	-	-	-
#4 USDC / USDT USD Coin	\$0.9997	4mo	2,321	\$555.0M	1,484	-	-	0.01%	-
#5 BR / USDT Bedrock	\$0.05010	1mo	377,965	\$517.8M	18,495	-	-	-	-
#6 TKC / WBNB The Kingdom Co	\$0.9167	59m	2,876	\$442.5M	4	-98.25%	232T%	232T%	232T%
#7 T / WBNB T	\$39.00	41m	2,859	\$442.3M	5	18.33%	9Q%	9Q%	9Q%

Tabular data structures don't work well for this analysis

	block_timestamp	transaction_hash	#_used_amount	transaction_from_address
0	2024-07-02T00:40:47+00:00	0xbef4332a120485f930460b3b95a9c2f098d9121fb8f402992c85c1f	6395235.016784166	0xd215ffa0f8f5b6f93f11e49b6d6175ac
1	2024-07-02T00:40:47+00:00	0xbef4332a120485f930460b3b95a9c2f098d9121fb8f402992c85c1f	6395231.580231117	0xd215ffa0f8f5b6f93f11e49b6d6175ac
2	2024-07-02T02:49:11+00:00	0xbef43bebc46a9bcb687befdab04a303b837b716511bd199f8d57c9	4900200.905917455	0xd215ffa0f8f5b6f93f11e49b6d6175ac
3	2024-07-02T02:49:11+00:00	0xbef43bebc46a9bcb687befdab04a303b837b716511bd199f8d57c9	4900197.468464107	0xd215ffa0f8f5b6f93f11e49b6d6175ac
4	2024-07-02T04:57:35+00:00	0xbef62d1cf4646201053cfa26f5d9dc0d0592dcbb9c3abe408d39d9	4943299.953972256	0xd215ffa0f8f5b6f93f11e49b6d6175ac
5	2024-07-02T04:57:35+00:00	0xbef62d1cf4646201053cfa26f5d9dc0d0592dcbb9c3abe408d39d9	4943303.394971271	0xd215ffa0f8f5b6f93f11e49b6d6175ac
6	2024-07-02T07:05:59+00:00	0xbecaa0b8fdd7166c32fb4d4e56f7badb3c3c6f5f5f5f55af1d92c3d0	216049.0133215954	0xf5dea4b05305636dc37442f4bbea2
7	2024-07-02T07:05:59+00:00	0xbecaa0b8fdd7166c32fb4d4e56f7badb3c3c6f5f5f5f55af1d92c3d0	216045.6263144705	0xf5dea4b05305636dc37442f4bbea2
8	2024-07-02T09:14:23+00:00	0xf0d2486c4c31857d58af07c834b34d0a0d7cc89c7fc040c7bf8a4a68f	216438.5304216401	0xf5dea4b05305636dc37442f4bbea2
9	2024-07-02T09:14:23+00:00	0xf0d2486c4c31857d58af07c834b34d0a0d7cc89c7fc040c7bf8a4a68f	216435.1443868488	0xf5dea4b05305636dc37442f4bbea2
10	2024-07-02T11:22:47+00:00	0xc13dfebf0d3e9212068f231860b3bb2ee975067b4694ea498d7cbf4	216864.6107633279	0xf5dea4b05305636dc37442f4bbea2
11	2024-07-02T11:22:47+00:00	0xc13dfebf0d3e9212068f231860b3bb2ee975067b4694ea498d7cbf4	216861.226013824	0xf5dea4b05305636dc37442f4bbea2
12	2024-07-02T13:31:11+00:00	0xd63ab783abebec046f823701469c5c210153c329f9f87733f3d29a	216288.2670081024	0xf5dea4b05305636dc37442f4bbea2
13	2024-07-02T13:31:11+00:00	0xd63ab783abebec046f823701469c5c210153c329f9f87733f3d29a	216284.8999690451	0xf5dea4b05305636dc37442f4bbea2
14	2024-07-02T16:41:11+00:00	0xec58149e54ab4e29c75b6f8704c401de30663eecd7b4e3fb605d1b0c	214878.0541655782	0xf5dea4b05305636dc37442f4bbea2

Can you tell if these transactions describe wash trading?

1

Search algos are clunky to implement in SQL

2

Impractical to download the entire history of ERC20 transfers

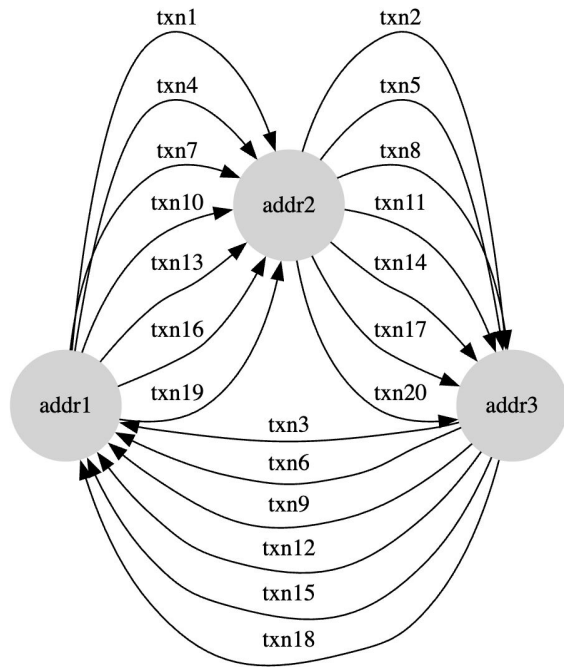
3

Searching with RPC possible but very expensive + days to complete with commercial RPC limits

4

Hard to read **directionality** or **cyclicity** of fund flows from a table

A graph would be much easier to reason about!



Flows in this diagram are obviously circular

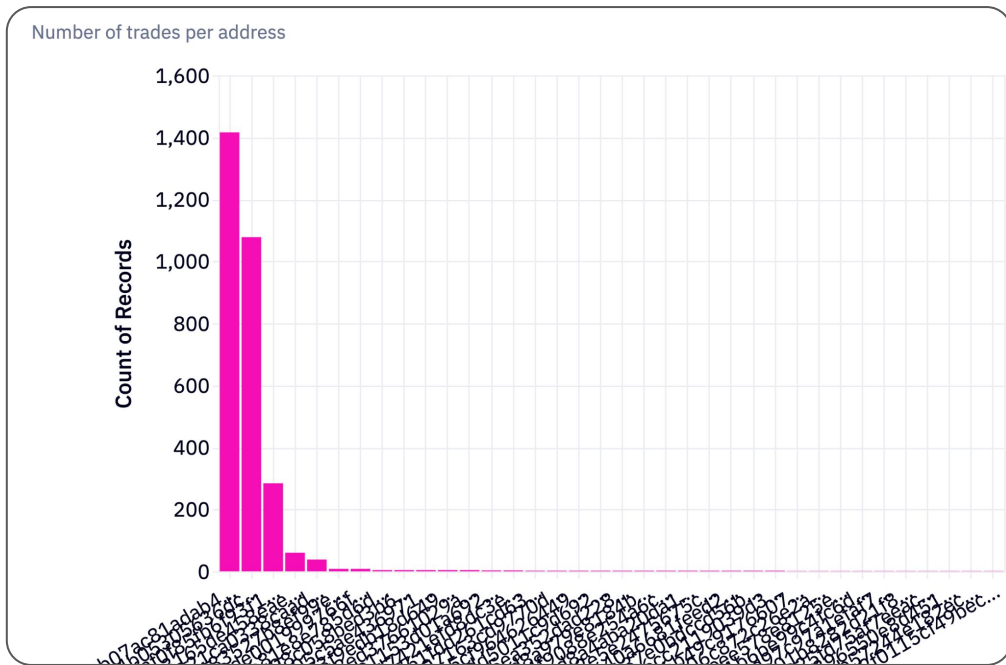
Introducing the 7AΩ∞ token..

\$100s of mm in volume in a naive measurement



Orange Flag 1: odd price action with volume spikes

Introducing the $7A\Omega\infty$ token..



Orange Flag 2: high concentration of traders



Fast data access unlocks a new
relationship with onchain data

RethDB can be the go-to tool for I/O-bound analysis

〇〇〇

```
let factory: ProviderFactory<NodeTypesWithDBAdapter<...>;  
let provider = factory.provider()?;  
  
for bn in block_s..block_e {  
    let txns_in_block = provider.block_body_indices(bn);  
  
    for tx_num in txns_in_block.tx_num_range() {  
        let tx_receipt = provider.receipt(tx_num);  
  
        for log in &tx_receipt.logs {  
            match_erc20_transfer_and_push()  
        }  
    }  
}
```

Relatively straightforward search

1

For a `root_address` and `block_range`, BFS across ERC20 transfers to `max_depth`

2

In `rethDB`, read db tables with `DatabaseProvider`. Walk `BlockNumber` → `BlockBodyIndices` → `Receipts` → `Logs`

3

Ideally I read from `rethDB`, but `get_transfers()` is generic over any `TransferDataSource`

4

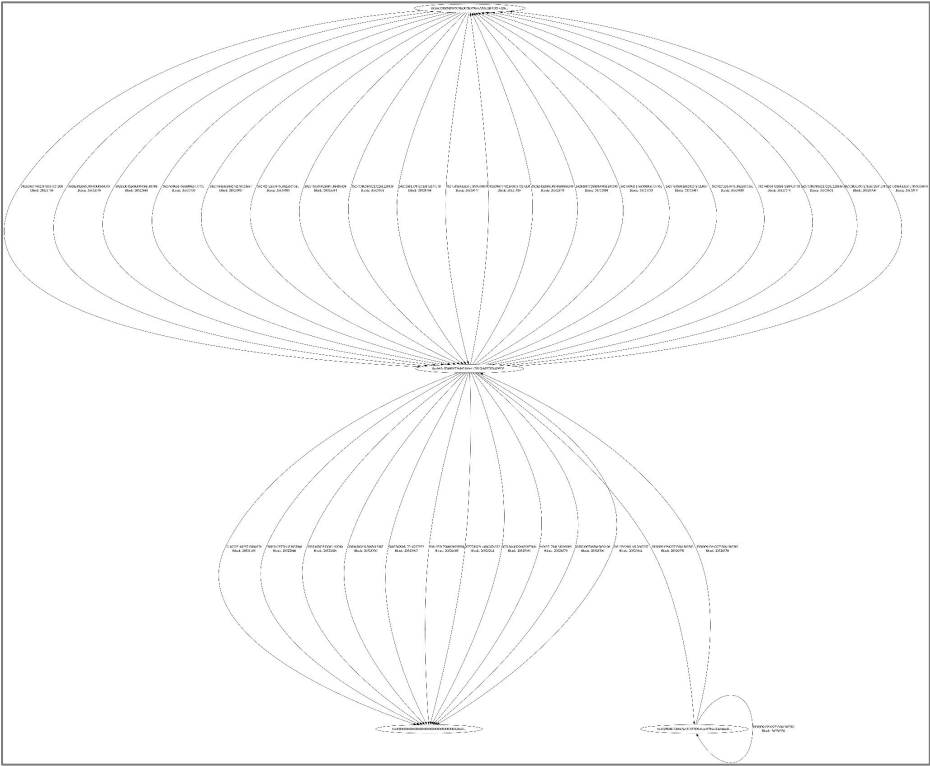
For matching transfers, encode as a `Petgraph` `DiGraph<alloy::Address, TransferEdge>` with edge weights to support algos + labeling

5

Export to DOT in text form for hackathon visualization

Table → graph

block_timestamp	transaction_hash	usd_amount	transaction_from_address
2024-07-02T00:40:47+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	6395231.01478446	0xd215f0f085a6f9311e49d6175dc
2024-07-02T00:46:47+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	6395231.080291117	0xd215f0f085a6f9311e49d6175dc
2024-07-02T00:49:11+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	4900200.905917655	0xd215f0f085a6f9311e49d6175dc
2024-07-02T02:49:11+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	4900197.468443107	0xd215f0f085a6f9311e49d6175dc
2024-07-02T04:57:35+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	4900199.953972256	0xd215f0f085a6f9311e49d6175dc
2024-07-02T04:57:35+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	4943303.384971271	0xd215f0f085a6f9311e49d6175dc
2024-07-02T07:05:59+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	216049.0133215954	0xf550a4020305a36ac37442f4b0eaa5
2024-07-02T07:05:59+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	216045.6263144705	0xf550a4020305a36ac37442f4b0eaa5
2024-07-02T09:14:23+00:00	0xf02486cc431857458a071d34b348a0a07cc99c7c940c0fba0a08f	216438.5304216401	0xf550a4020305a36ac37442f4b0eaa5
2024-07-02T09:14:23+00:00	0xf02486cc431857458a071d34b348a0a07cc99c7c940c0fba0a08f	216435.1443868488	0xf550a4020305a36ac37442f4b0eaa5
2024-07-02T11:22:47+00:00	0xc13d9f60d3e9212048731860b36a2ee97509c7b4694ea4f8b71b46	216864.0107632779	0xf550a4020305a36ac37442f4b0eaa5
2024-07-02T11:22:47+00:00	0xc13d9f60d3e9212048731860b36a2ee97509c7b4694ea4f8b71b46	216861.226013824	0xf550a4020305a36ac37442f4b0eaa5
2024-07-02T13:31:11+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	216288.267081024	0xf550a4020305a36ac37442f4b0eaa5
2024-07-02T13:31:11+00:00	0xb0ef4323a12d48f99304a0d319e9c2f09b69122b0862092c38c1c	216288.899696081	0xf550a4020305a36ac37442f4b0eaa5
2024-07-02T16:41:11+00:00	0xc03814f4a0a4a27c73b68b704401a030a36cc7b4a2fba05f23cd	214878.0541655782	0xf550a4020305a36ac37442f4b0eaa5



7AΩ∞ transfers originating from 0x3bc15 over an 8k block range in Aug. 2024

Challenges + fut. improvements

OpNode impl
challenges

This project generated a new issue! [#17762](#)

Rely on the
abstractions

Started out trying to walk `table::` directly – use the `Provider` instead (thanks to Alexey and Roman)!

Fix skill issues

Add parallel execution/other perf improvements

Add graph algos

Record quantitative metrics to compare many phenomena at once

Stay strapped

Copy reth DBs onto external hard drive w/ Thunderbolt 5 for always-on, accessible, convenient, sovereign historical read



Thanks to the reth team for hacking, hosting, and helping!

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