

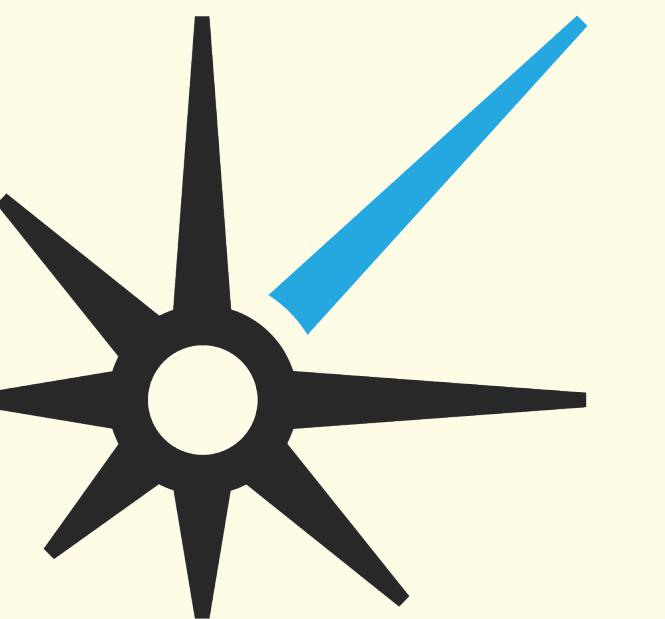
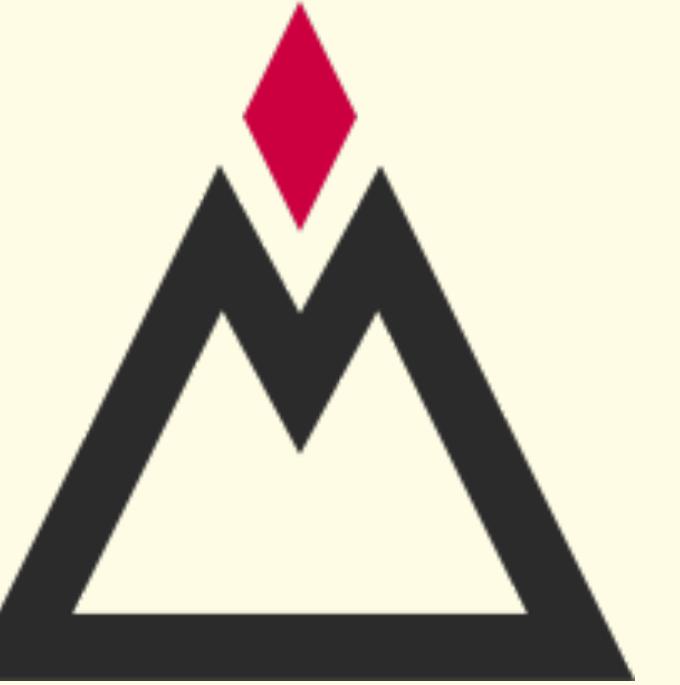
# Decentralizing Ethereum Data With VulcanizeDB

Rob Mulholand  
Vulcanize/8th Light

# Kon'nichiwa!

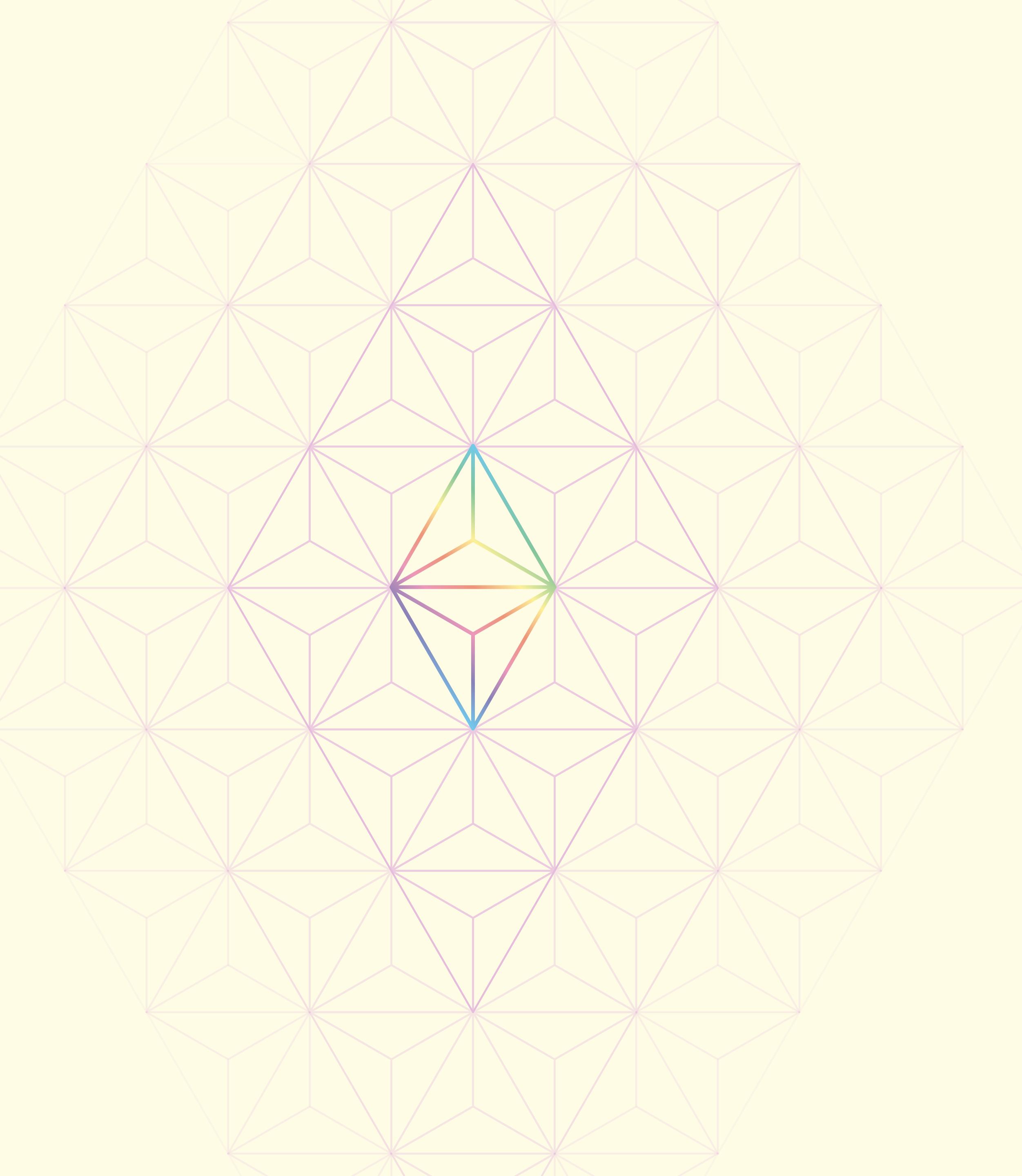
Rob Mulholand

- Lead Developer at VulcanizeDB
- Principal Software Crafter at 8th Light
- Geth contributor (+13/-10)



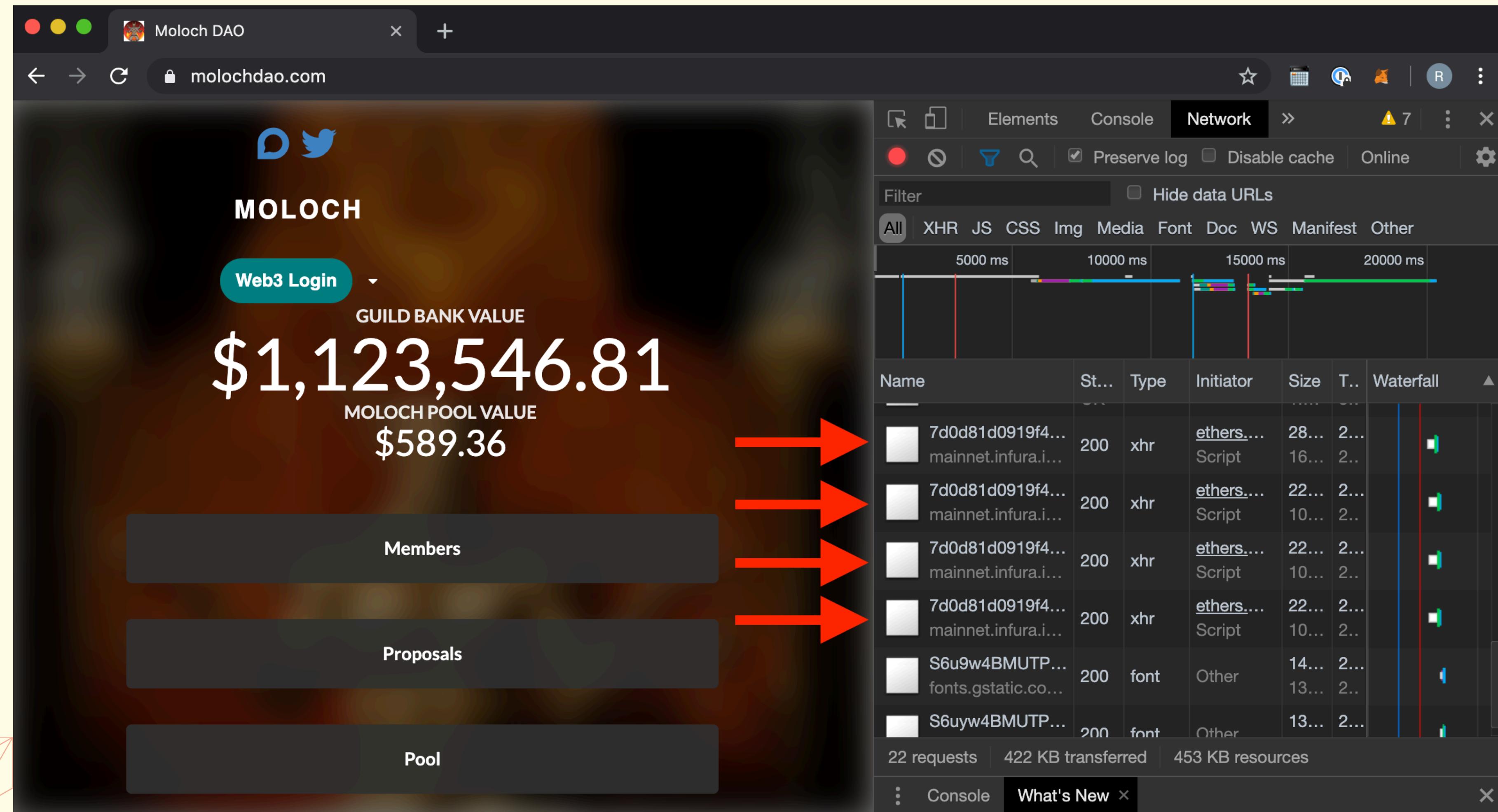
@robmulholand





Where are we  
now?

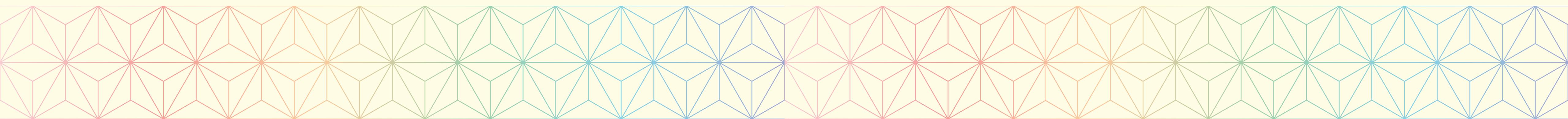
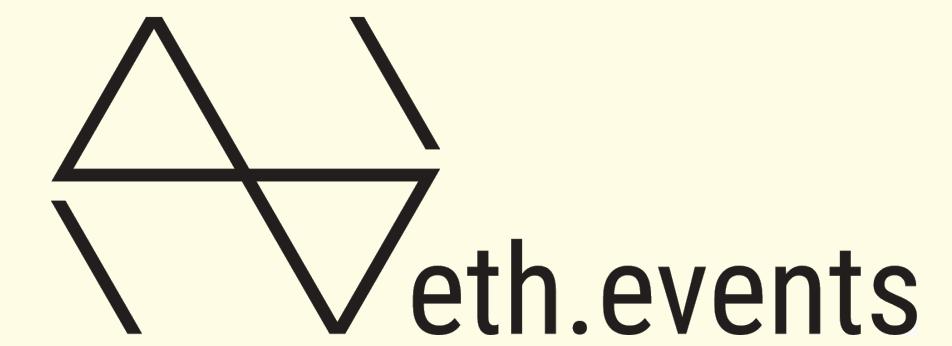
# Decentralized applications rely on centralized caching layers

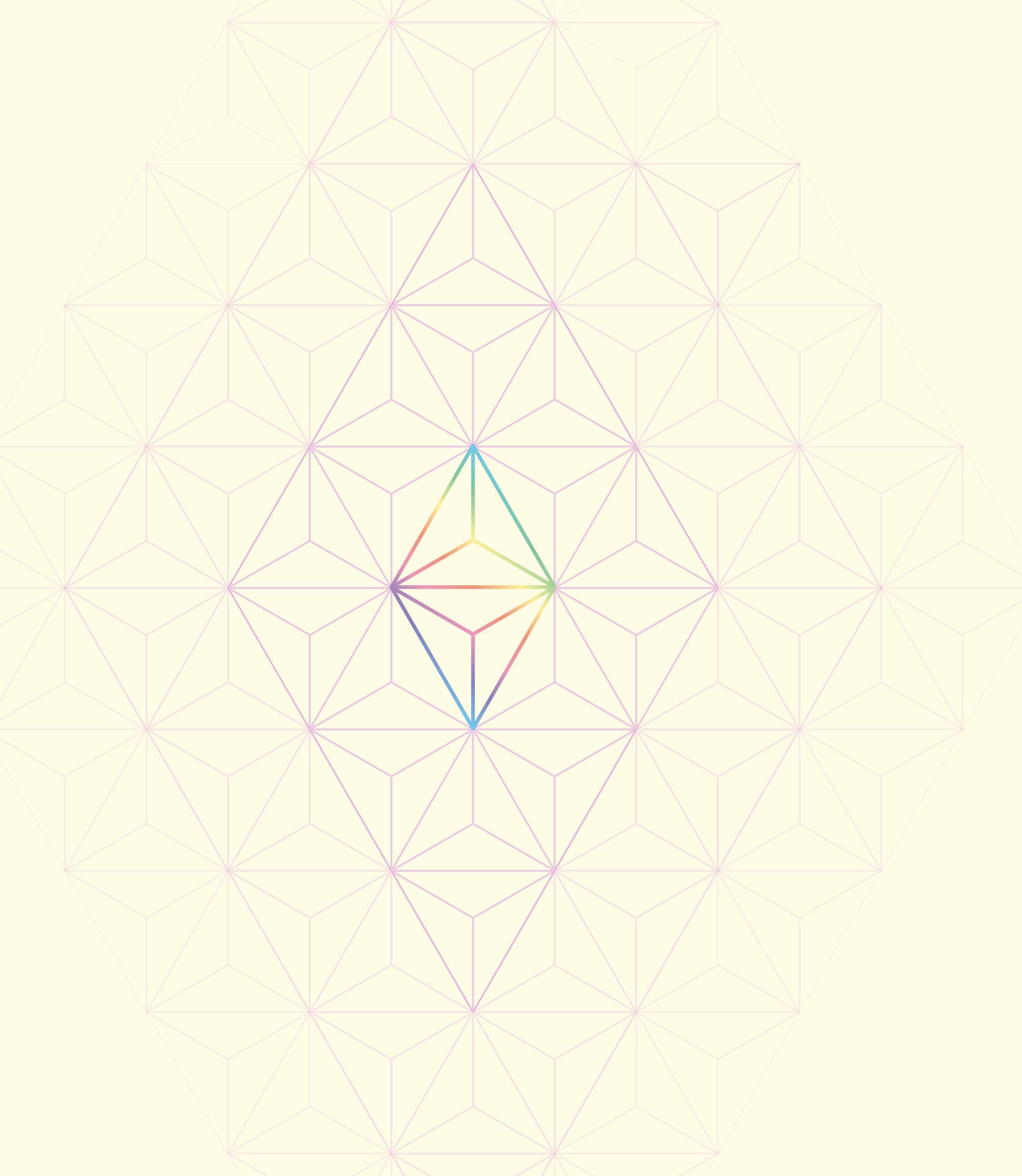


# Independent caching layers entail duplicated effort



# Lots of teams are doing great work!





Where are we  
going?

# Mission

Replace centralized and bespoke  
solutions with shared tooling that  
anyone can run

# The VulcanizeDB toolbox

headerSync



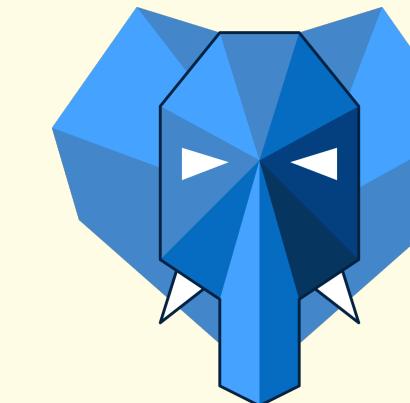
contractWatcher



composeAndExecute

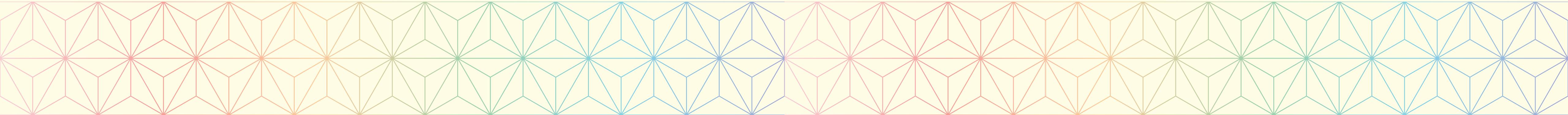


postgraphile



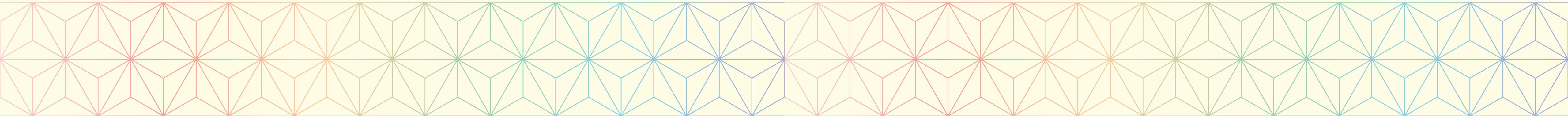
# headerSync

- Sync all block headers since a given starting point
- Continually verify headers at a configurable depth from HEAD
- Prune headers where hash has changed
- Cascade delete associated data



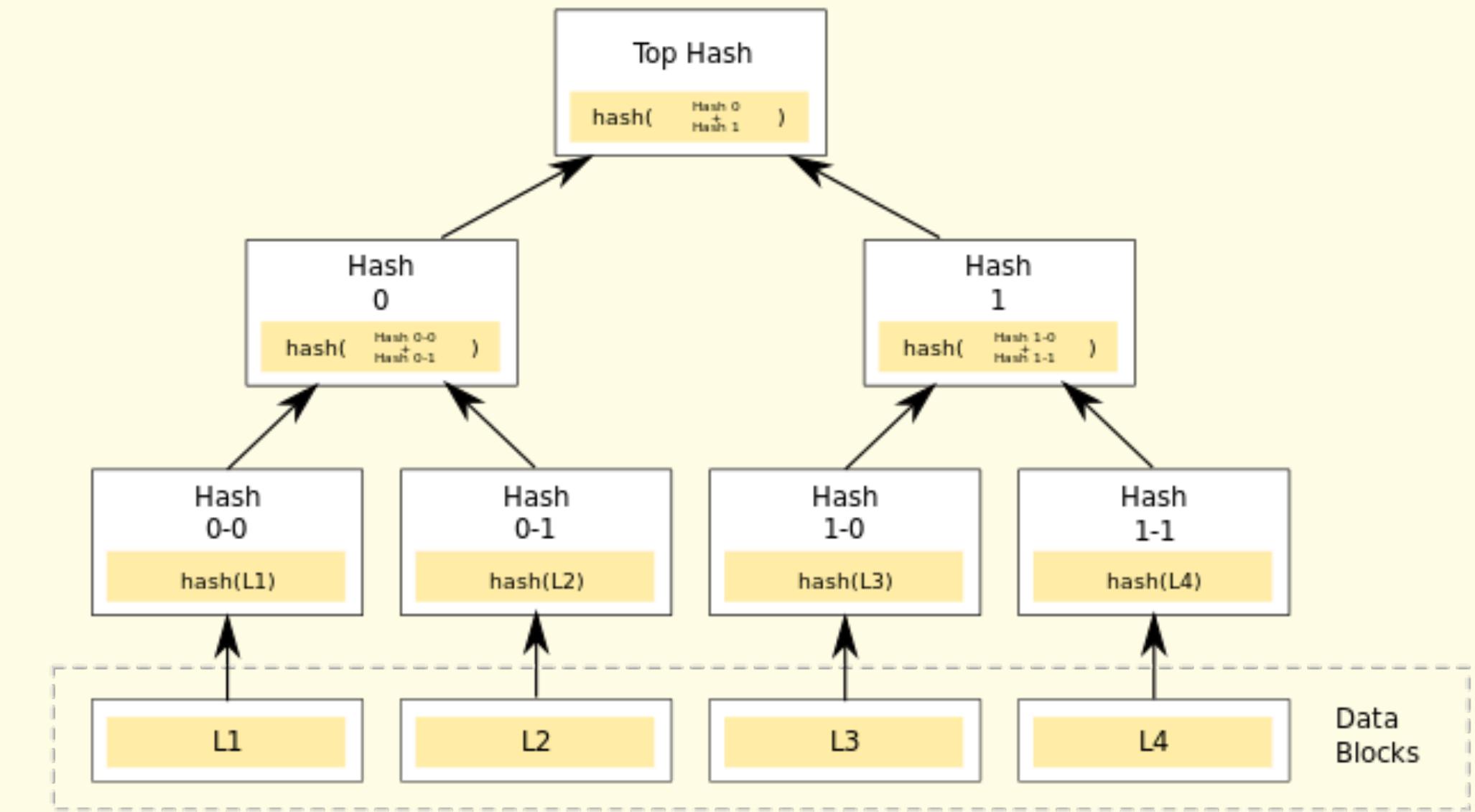
# contractWatcher

- Provided a contract address and deployment block:
  - Lookup contract ABI from Etherscan, or supply your own
  - Fetch all events and decode them against the ABI
  - Create schema for each contract + table for each event
  - Associate decoded events with synced headers



# composeAndExecute

- ❖ Create plugins to:
  - ❖ Transform anonymous events
  - ❖ Decode storage trie nodes
  - ❖ Enable complex queries



# postgraphile

- Expose GraphQL API for Postgres DB
- Automatically discover relations
- Built in filters, conditions, etc
- Subscriptions support
- Computed columns
- Custom queries

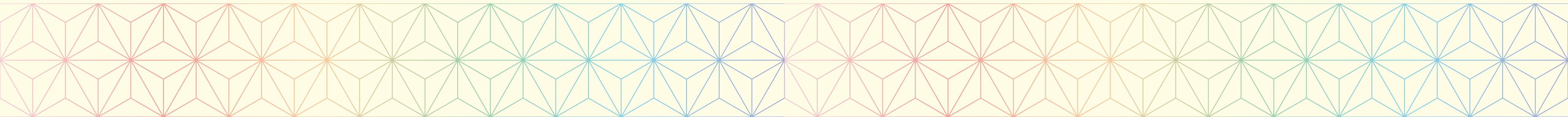
<https://www.graphile.org/postgraphile/>

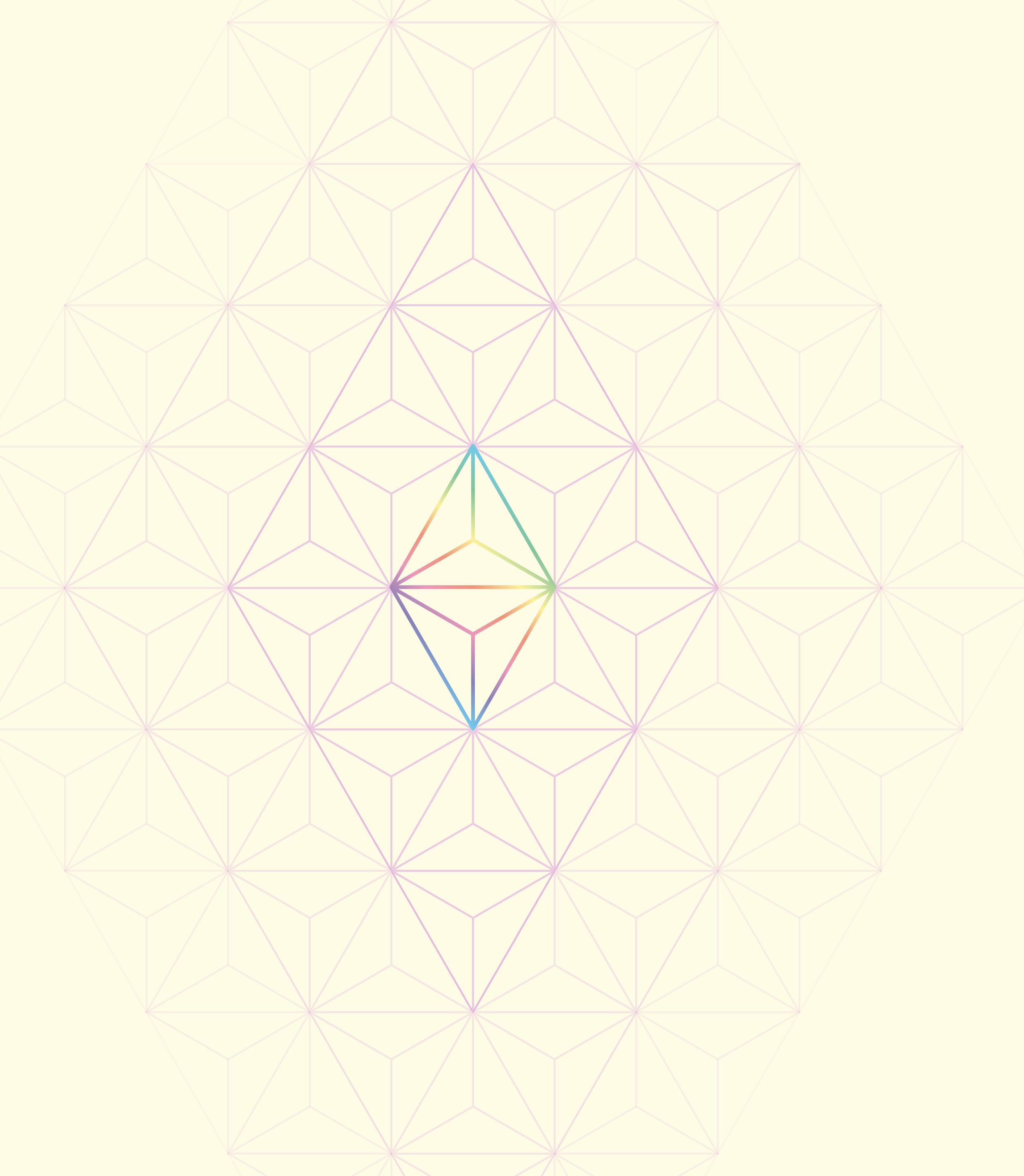


**Shout out to Benjie!**

# In the pipeline...

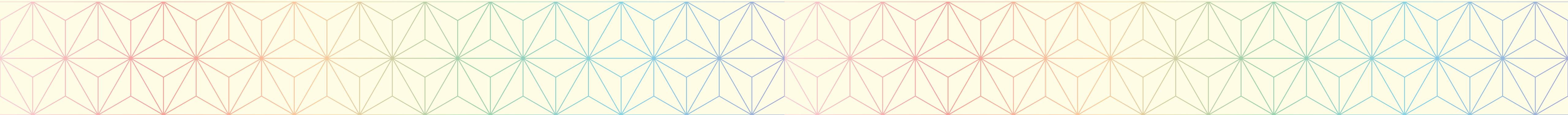
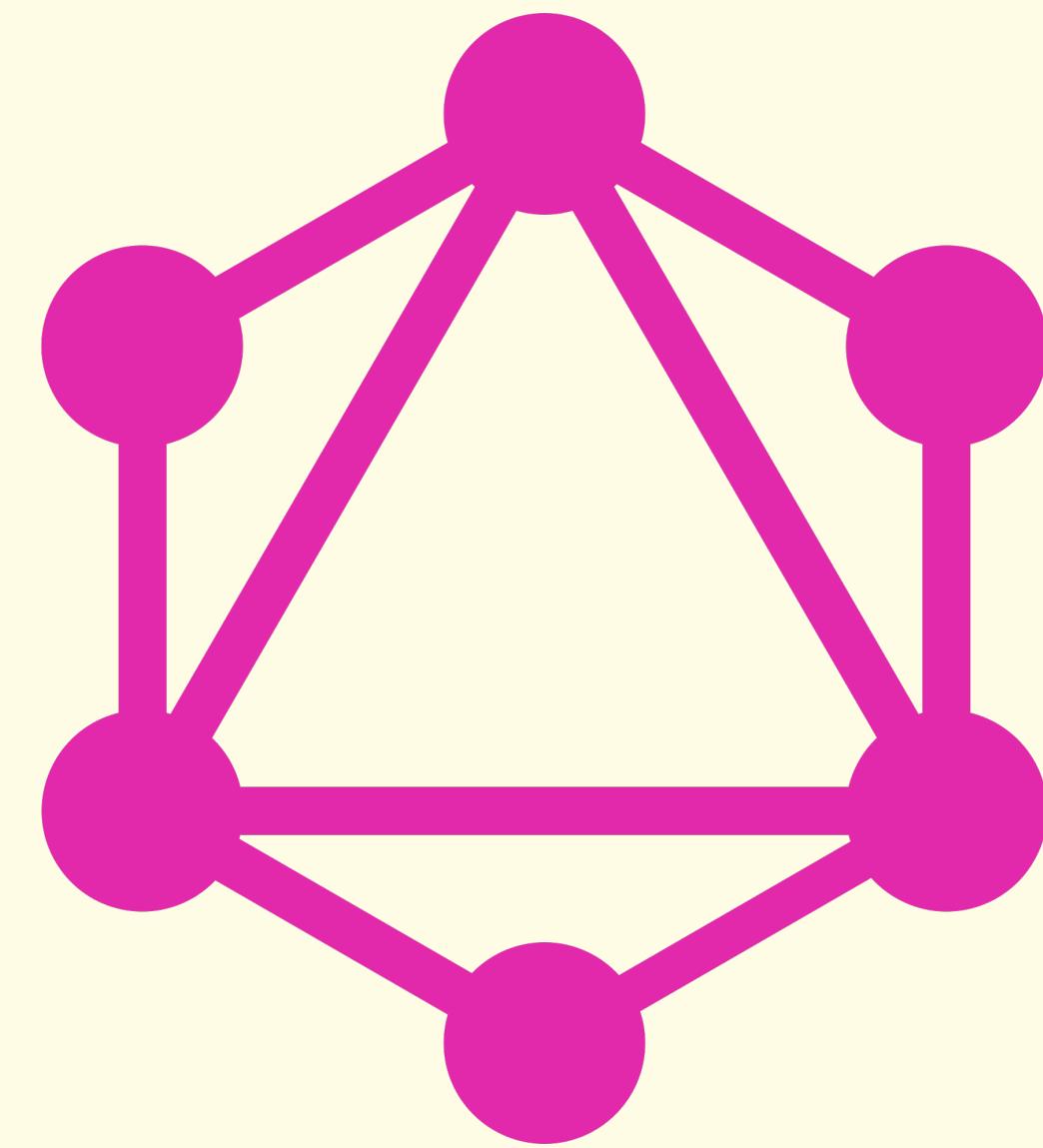
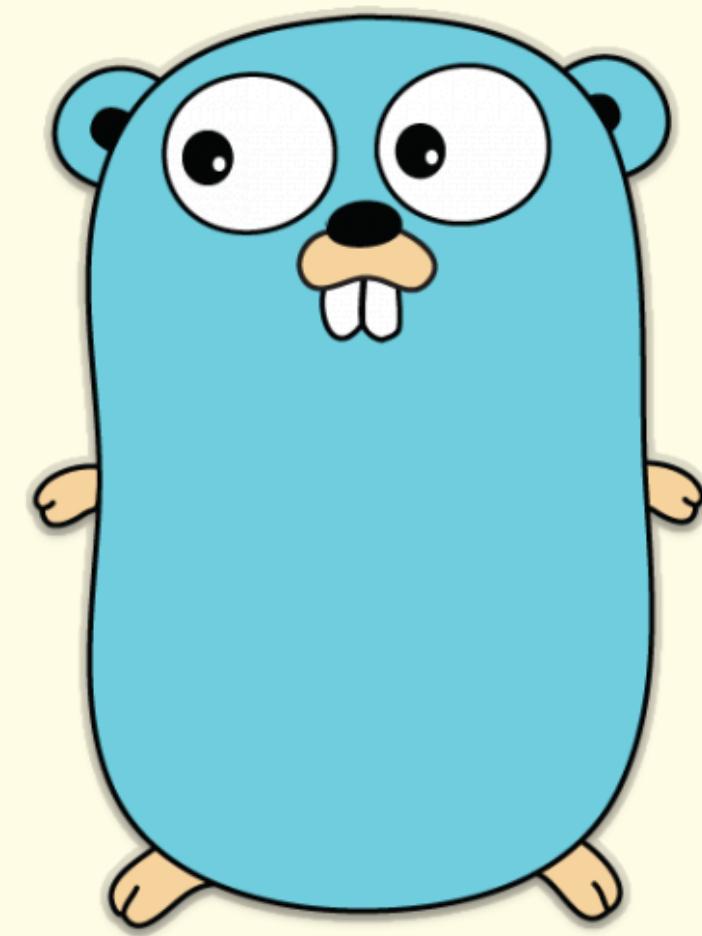
- ❖ Simplified interfaces for plugins
- ❖ Client patches to emit diffs during a full node sync
- ❖ Super node:
  - ❖ Write all blocks, state/storage diffs, and proofs to IPFS
  - ❖ Index content addresses by commonly queried fields in VDB
  - ❖ Expose API to filter desired CIDs





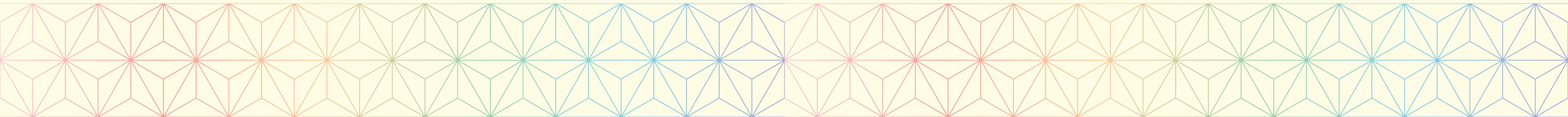
**Try it out!**

# The Stack



# Simple Setup

- ❖ go get [github.com/vulcanize/vulcanizedb](https://github.com/vulcanize/vulcanizedb)
- ❖ git checkout moloch-docker
- ❖ cd dockerfiles/moloch/
- ❖ docker-compose up



# Under the hood: Configure

```
1 [database]
2   name = "vulcanize"
3   hostname = "localhost"
4   port = 5432
5
6 [client]
7   ipcPath = "http://arch0.vulcanize.io/"
8
9 [contract]
10  addresses = [
11    "0x1fd169A4f5c59ACf79d0Fd5d91D1201EF1Bce9f1", # Moloch
12    "0x211a94468Ba1e379236B45cA42Dc63eE93139c7E", # Guild Bank
13    "0x9FEb49aC78eC80838665d7Ab75E43CFBdC4f4277", # MolochPool
14  ]
15  [contract.0x1fd169A4f5c59ACf79d0Fd5d91D1201EF1Bce9f1]
16    startingBlock = 7218566
17  [contract.0x211a94468Ba1e379236B45cA42Dc63eE93139c7E]
18    startingBlock = 7218566
19  [contract.0x9FEb49aC78eC80838665d7Ab75E43CFBdC4f4277]
20    startingBlock = 8286816
21
```

# Under the hood: Run

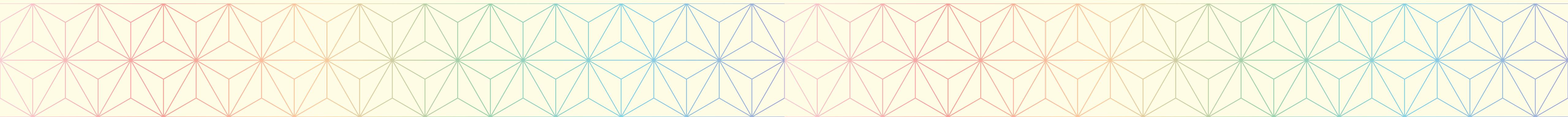
```
$ ./vulcanizedb headerSync --config=environments/moloch.toml -s 7218566
```

```
$ ./vulcanizedb contractWatcher --config=environments/moloch.toml
```

```
$ postgraphile --connection postgres://localhost/vulcanize_public  
--schema=public,header_0x1fd169a4f5c59acf79d0fd5d91d1201ef1bce9f1,  
header_0x211a94468ba1e379236b45ca42dc63ee93139c7e,  
header_0x9feb49ac78ec80838665d7ab75e43cfbdc4f4277  
--disable-default-mutations --no-ignore-rbac -w --enhance-graphiql
```

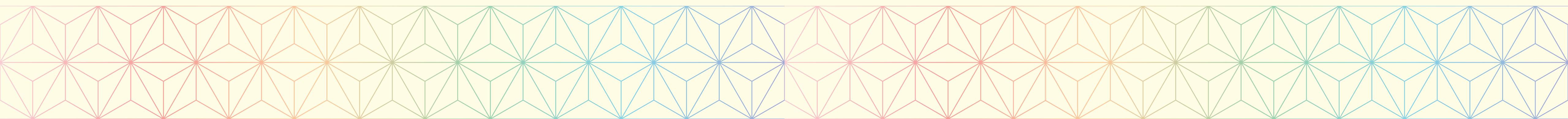
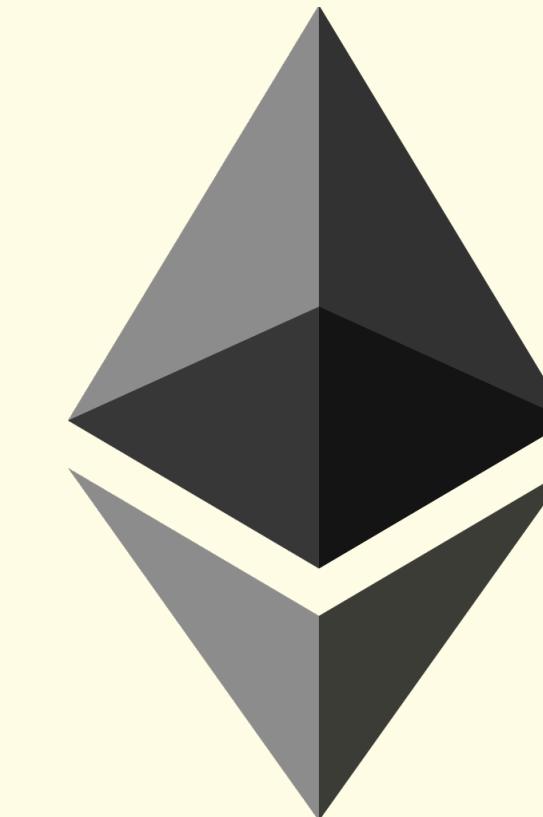
# Customize it!

- ❖ Create your own config to track a different suite of contracts
- ❖ Run locally:
  - ❖ Create database
  - ❖ `export GO111MODULE=on`
  - ❖ `go build`
- ❖ Dig into plugin architecture: libraries/shared



# Thanks!

- ❖ The team: Rick Dudley, Elizabeth Engelman, Andy Yao, Gabe Laughlin, Edvard Hübinette, Ian Norden, Connor Mendenhall, Gustin Prudner
- ❖ The Ethereum Foundation
- ❖ MakerDAO



# YOU FOUND A STAR

Speaker Track



dropparty.tech

