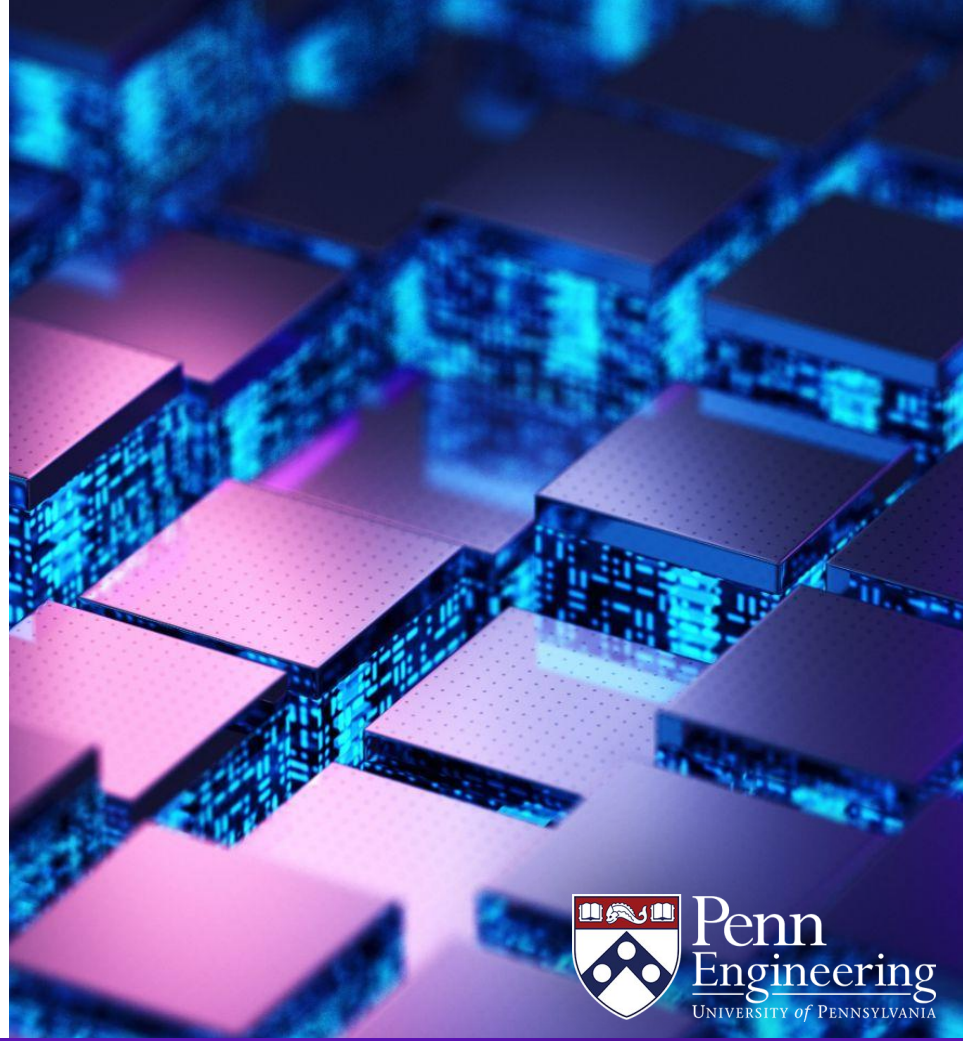
EAS 5830: BLOCKCHAINS

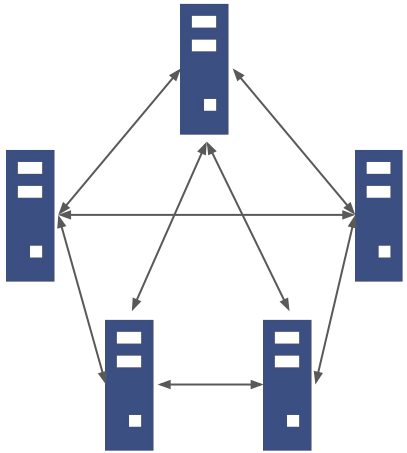
# Interacting with the Blockchain

Professor Brett Hemenway Falk



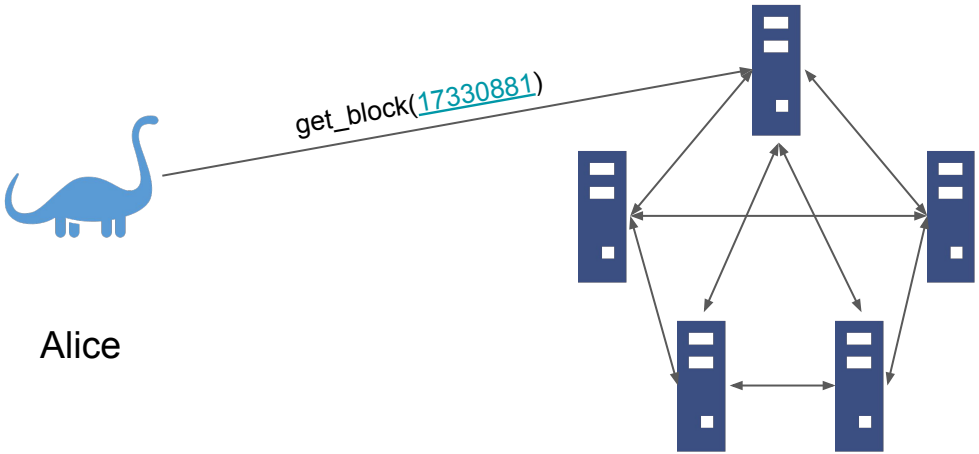
# Reading from the blockchain

Alice



- Nodes all keep a copy of the blockchain
- Some nodes run an RPC server

# Reading from the blockchain

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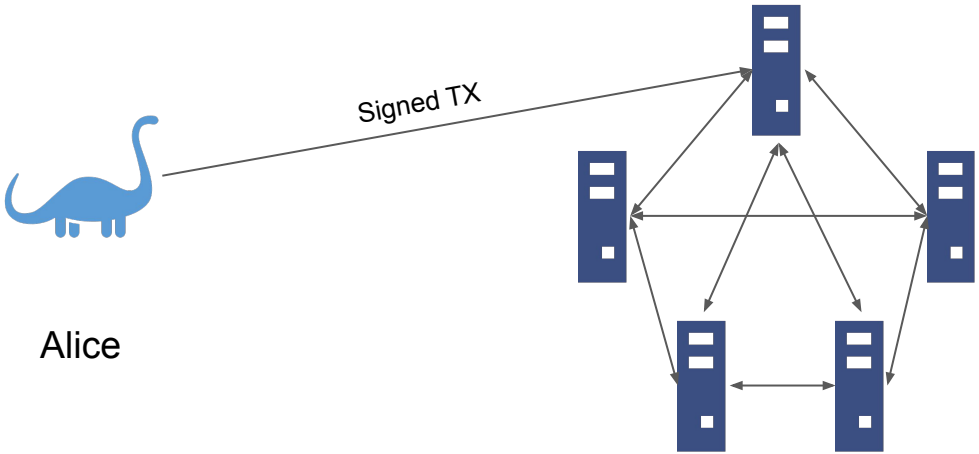
# Writing to the blockchain

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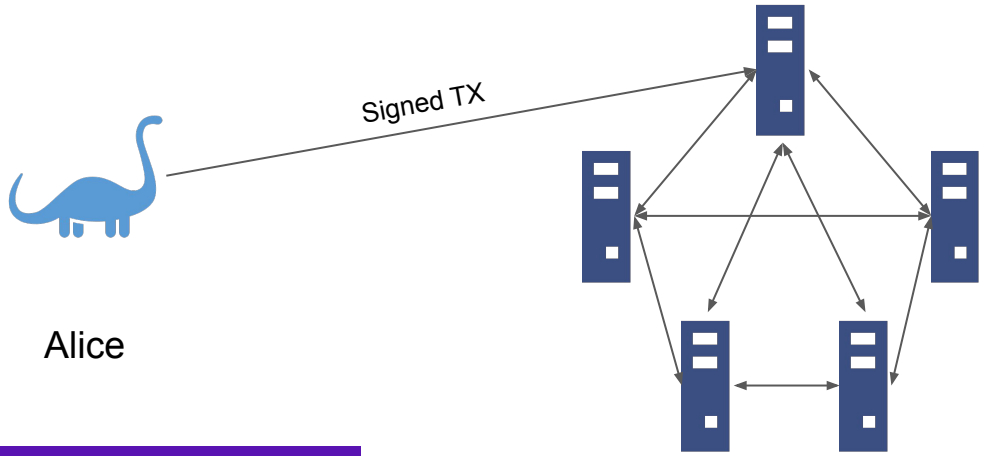


**Requires tokens e.g. BTC or ETH**

- Nodes all keep a copy of the blockchain
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# Finding an RPC server

- Most nodes don’t have an open RPC server
- You can run your own node
- Private, for-profit companies provide RPC access
  - Infura
  - Alchemy
  - QuickNode
  - NowNodes
  - Blockdaemon

# In a gold rush, sell shovels

- Alchemy valued at $10B
- Consensys (which owns Infura) valued at $7B
- Blockdaemon valued at $3B
- Quicknode valued at $800M
- Chainalysis valued at $8.6B
- Nansen valued at $750M
- Dune analytics valued at $1B
- The Graph’s token has a market cap of over $1B

# Data is disorganized

- The Ethereum RPC allows you to query:
  - All transactions in a block (get_block)
  - Data from a given transaction (get_transaction)
  - The ETH balance of an address (get_balance)
    - On Bitcoin you cannot even query the balance of an address!

- The Ethereum RPC does ***not*** allow you to query:
  - All transactions made by a given address
  - All transactions above a certain threshold
  - All the addresses that have interacted with a given address
  - Ask whether an address is a contract

- To answer these questions you must scan the blockchain

# Data providers organize it for you

## alchemy_getAssetTransfers

POST https://eth-mainnet.g.alchemy.com/v2/{apiKey}

The Transfers API allows you to easily fetch historical transactions for any address across Ethereum and supported L2s including Polygon, Arbitrum, and Optimism.

- They run blockchain nodes and scrape *all* transactions
- Organize them into their own database (indexed on many fields)
- Let you query the database

# Python web3

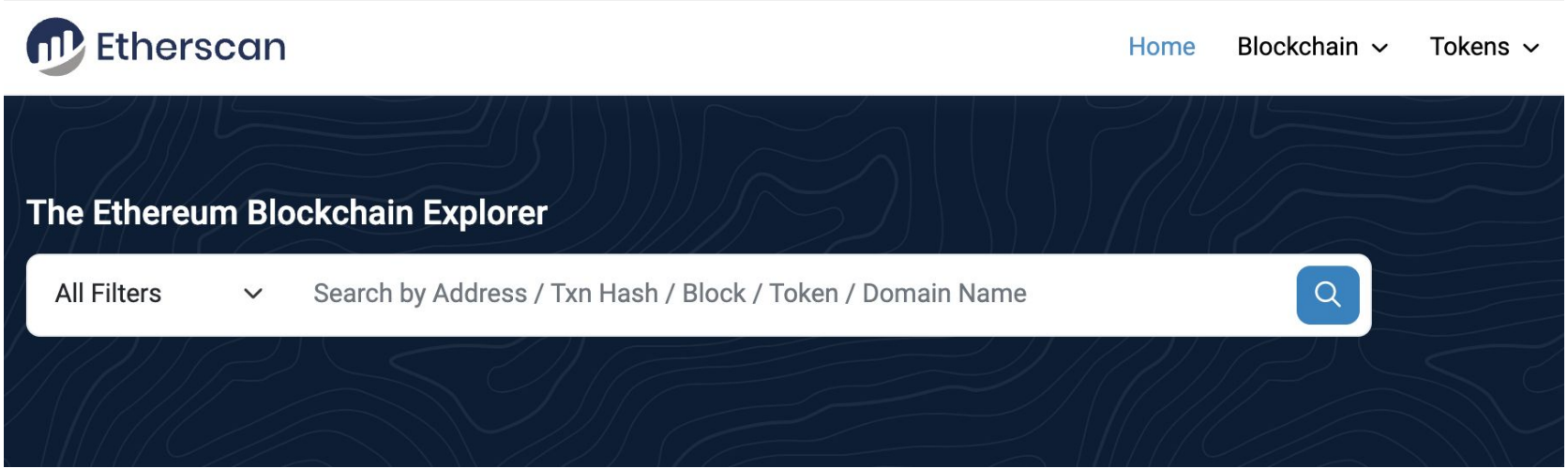
**web3.py** is a Python library for interacting with Ethereum.

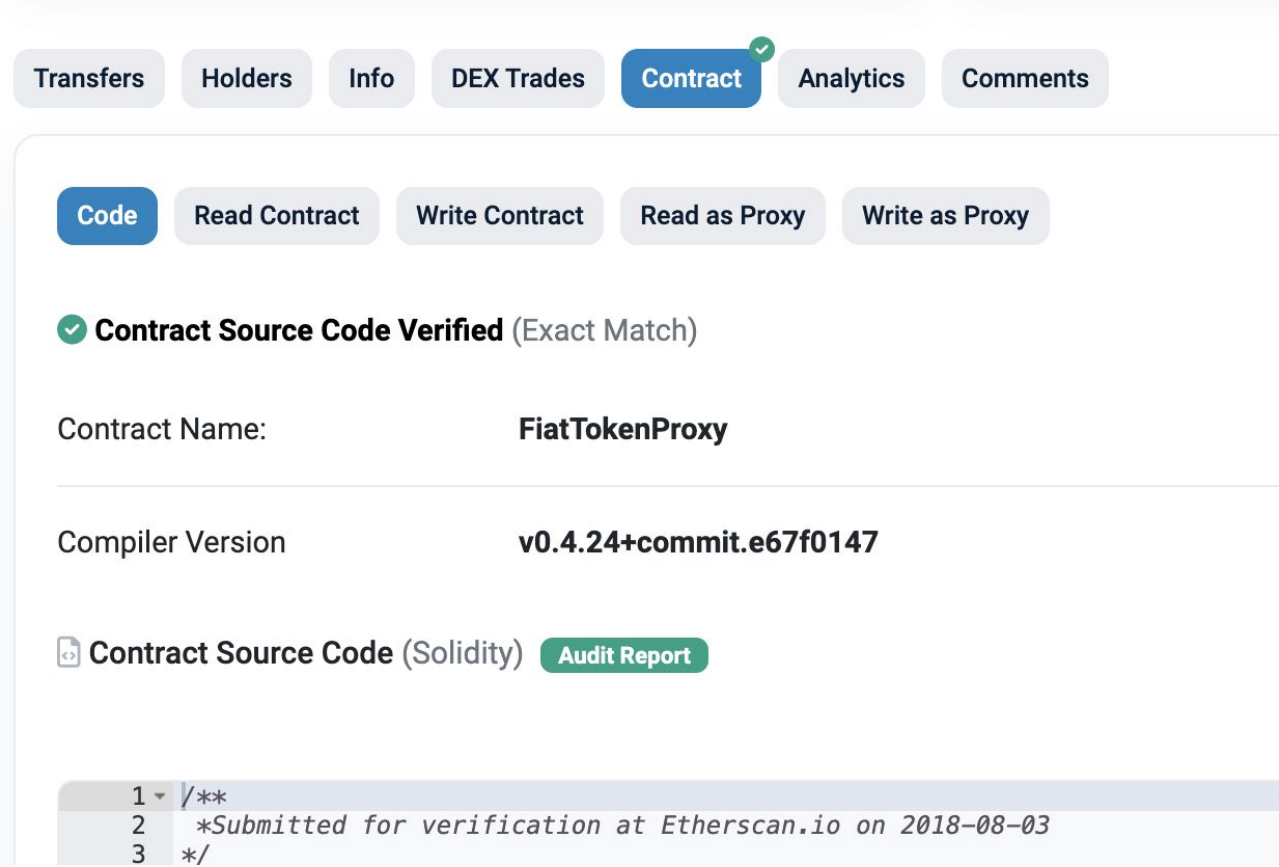
It's commonly found in decentralized apps (dapps) to help with sending transactions, interacting with smart contracts, reading block data, and a variety of other use cases.

The original API was derived from the Web3.js Javascript API, but has since evolved toward the needs and creature comforts of Python developers.

# Faucets

- Test networks have “faucets”
  - Tokens are premined and given away to anyone who asks


Etherscan
Home
Blockchain
Tokens
The Ethereum Blockchain Explorer
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name


Transfers
Holders
Info
DEX Trades
Contract
Analytics
Comments
Code
Read Contract
Write Contract
Read as Proxy
Write as Proxy
Contract Source Code Verified (Exact Match)
Contract Name:
FiatTokenProxy
Compiler Version
v0.4.24+commit.e67f0147
Contract Source Code (Solidity)
Audit Report
1 /**
2 *Submitted for verification at Etherscan.io on 2018-08-03
3 */