

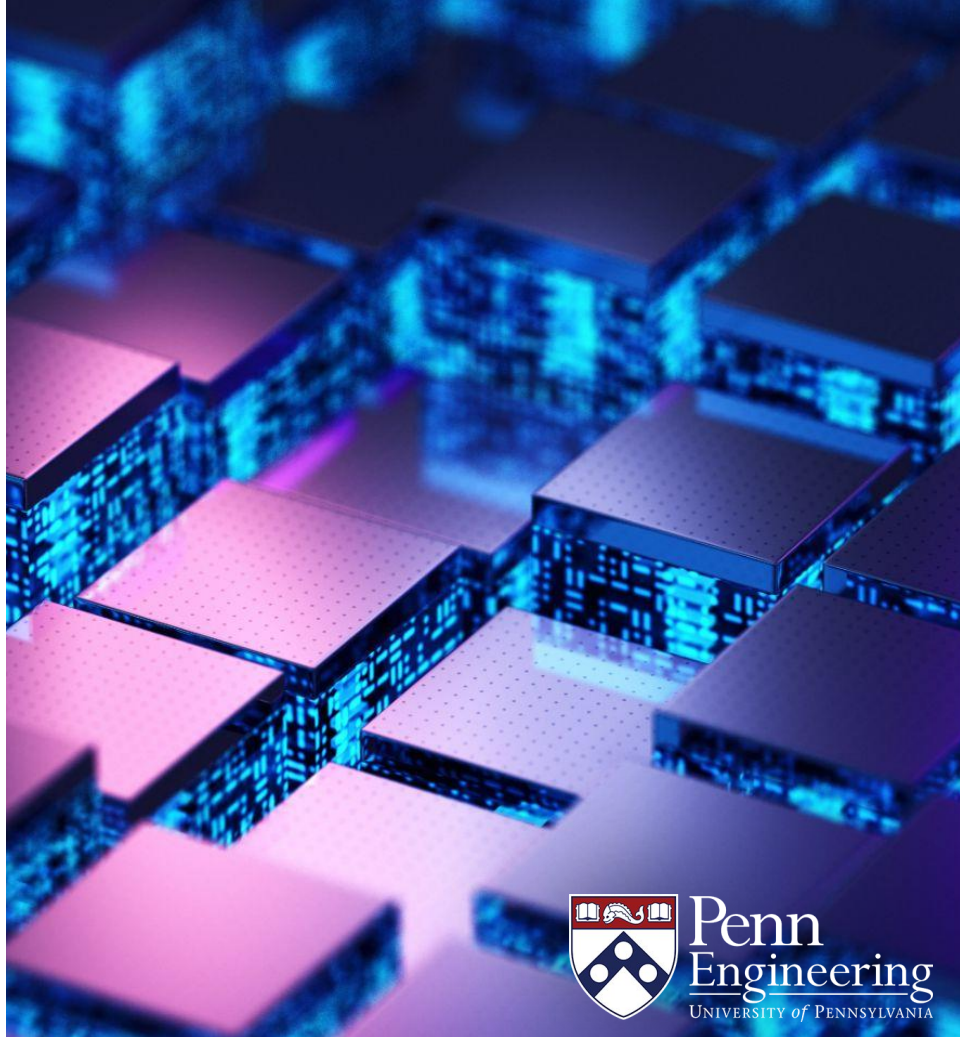
EAS 5830: BLOCKCHAINS

Incentivizing Validators

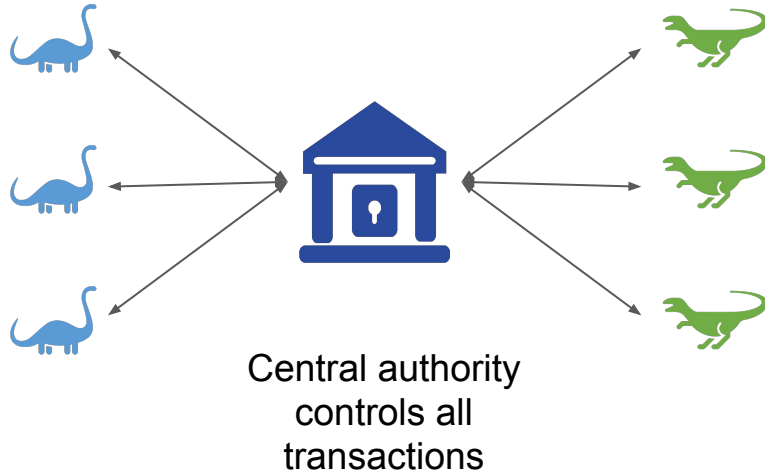
Professor Brett Hemenway Falk



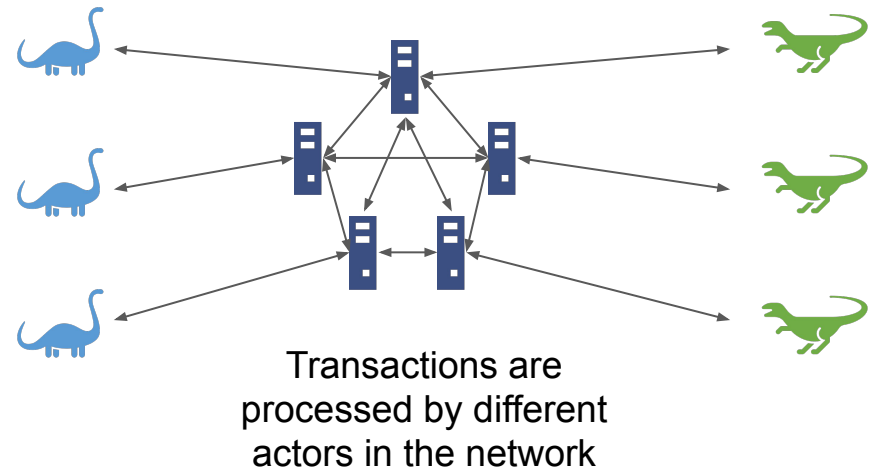
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Centralized System



Decentralized System



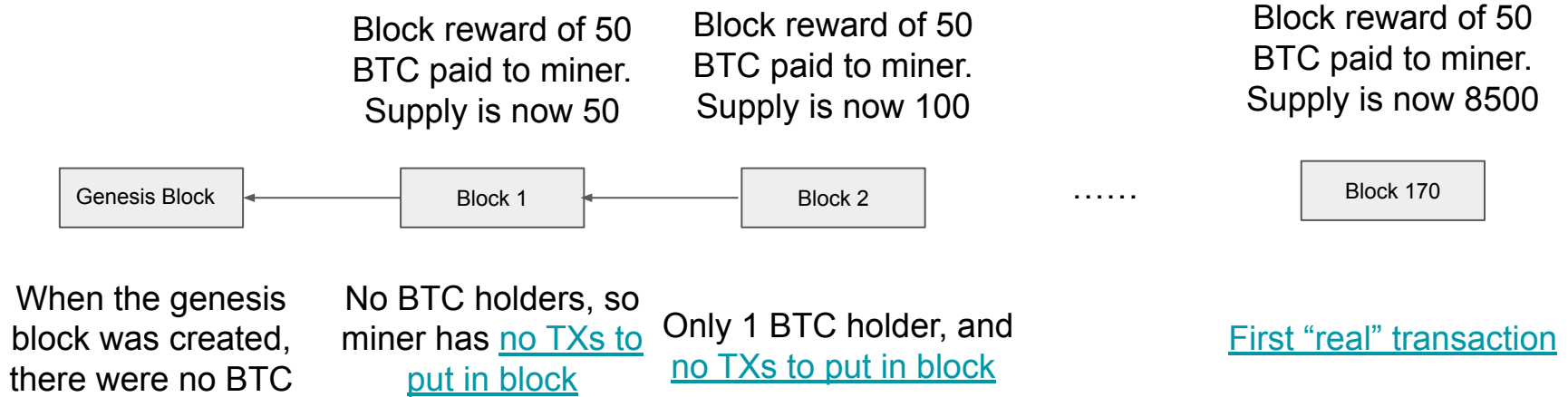
The blockchain economic cycle

- Why do validators put in the effort to maintain the blockchain?
 - They get paid in tokens
- Where do these tokens come from?
 - Inflation (block rewards)
 - Users (transaction fees)
- Where do users get tokens to pay transaction fees?

Bitcoin: a case study

- The Bitcoin blockchain was created to track BTC
- In the beginning there were no BTC
 - All BTC created in the form of “block rewards”
 - Initially, 50 BTC was given to each block producer

Bitcoin: a case study



Bitcoin: a case study

- All BTC created through block rewards (inflation)
- Block rewards start at 50 BTC
 - Halve every 210,000 blocks (approximately every 4 years)
 - Currently block rewards are 6.25 BTC
- Users pay transaction fees in BTC
- Fees are completely voluntary
- If there are too many TXs to fit in a block, miner should prioritize transactions with highest fee

BITCOIN'S HALVING EFFECT ON PRICE



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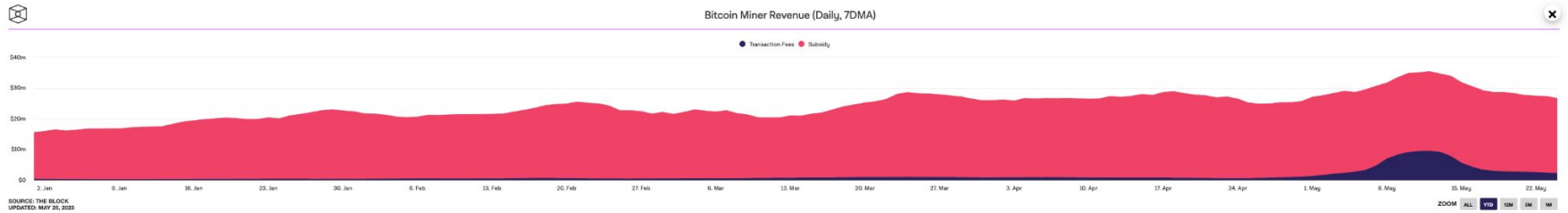
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 - Think of this as an auction for block space

How many BTC?

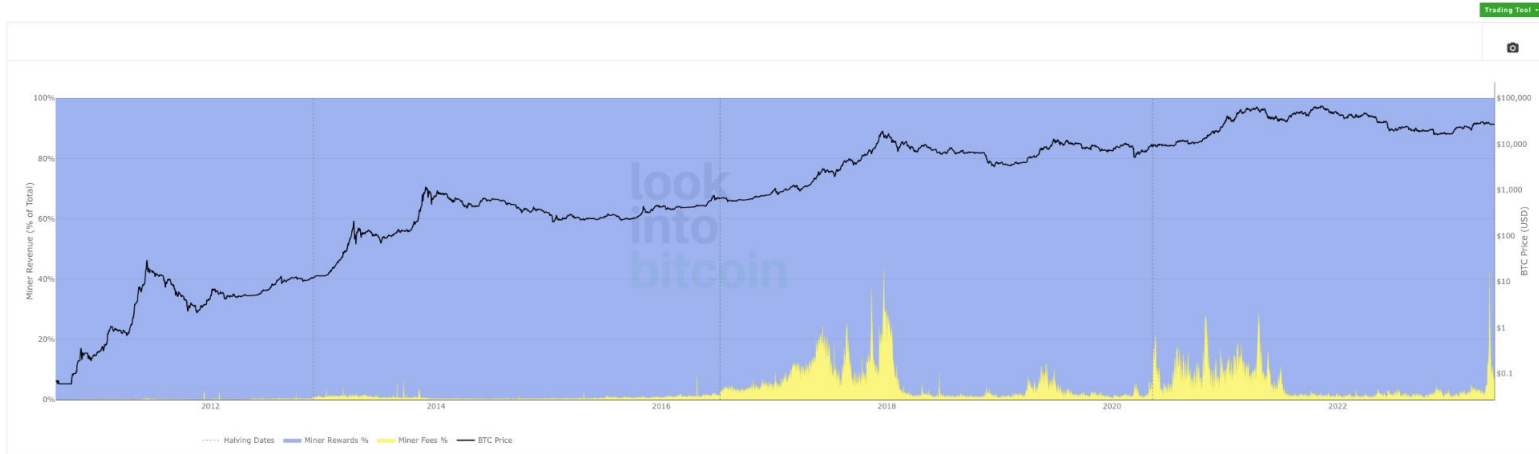
$$210000 \cdot \sum_{i=0}^{\infty} 50 \cdot 2^{-i} = 210000 \cdot 100 = 21000000$$

Bitcoin miner revenue is mostly block reward



Miner Revenue (Fees vs Rewards)

Source: lookintobitcoin.com



Bitcoin Transaction Fees Surpass Block Rewards for the First Time Since 2017

Higher transaction fees are a small step towards Bitcoin miners being able to sustain themselves without block subsidies.



By Alyssa Hertig

📅 May 8, 2023

🕒 3 min read

Premines

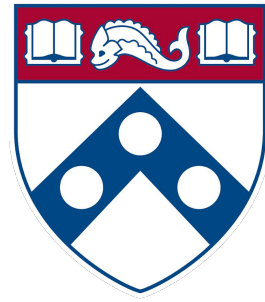
- Most other tokens were “premined”
 - Genesis block encodes an initial distribution
- Ethereum was premined:
 - 72 million Ether tokens allocated in genesis block
 - 60 million sold in a crowdsale
 - 12 million held by the Ethereum Foundation
 - Only about 120 million ETH in circulation today
 - This is a big source of controversy
- Ethereum still has block rewards to generate new tokens (and dilute the premine)

So how do you get tokens now?

- Mining blocks?
 - In PoW chains like Bitcoin, mining hardware is very expensive
 - Could use a [cloud miner](#) (pay with credit card, earn rewards in BTC)
 - In PoS chains like Ethereum, you need tokens to be a validator
- Purchasing existing coins
 - Exchanges like Coinbase run marketplaces that allow you to purchase tokens using USD
- Test networks have [“faucets”](#)
 - Tokens are premined and given away to anyone who asks

Getting tokens

- Wanted to buy XLM (Stellar's token)
- In 2017 it wasn't listed on Coinbase
- Here's the process
 - Signed up for a Coinbase account
 - Bought ETH (which I didn't want)
 - 7-day holding period (to prevent chargeback fraud)
 - Lost 20% while waiting for USD funds to clear
 - Signed up for a Binance account (when it was still legal)
 - Sent ETH to Binance
 - Had to copy-paste Binance address – one typo and tokens are gone
 - Traded ETH for XLM on Binance
 - Sent funds from Binance to my wallet
 - Had to copy-paste Wallet address - one typo and tokens are gone



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