Drivechain and Blind Merged Mining

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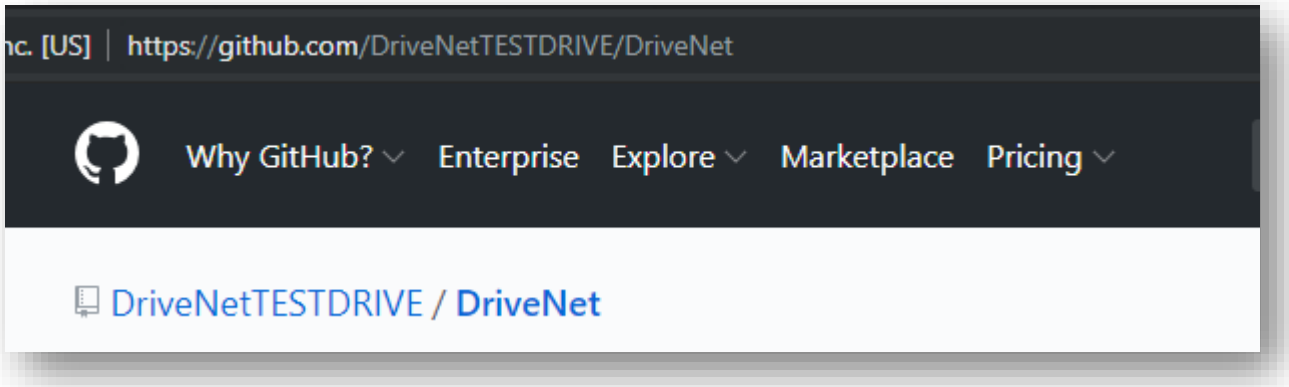
Research Director, Tierion
May 15th, 2019

About Me

- 2012 -- Bitcoiner
- 2014 -- Truthcoin.info Blog
- 2015-Present – Scaling Bitcoin 1,2,3,4; TabConf and BoB
- Currently: Research Director at Tierion
- Previously: Statistician at Yale Econ Department

Topic: Drivechain

- A Bitcoin Layer-2 (… or, a “Layer 1.5”)
- Scaling AND Interoperability
- Soft Fork -- BIPs 300 and 301
- www.drivechain.info



GitHub

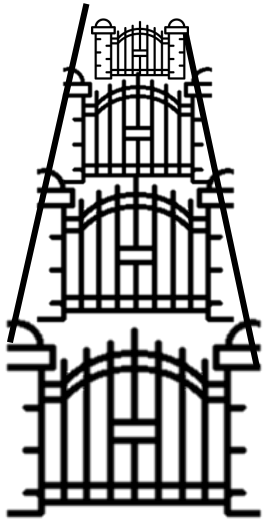
Original Nov 2015 Post

In One Slide

Problem	**Meta-Consensus** (Altcoins, Hard Forks, and Contentious Features)
Solution	**Interoperability** **(**One Token, traveling among many blockchains)
Goal	Don’t compete to win -- instead just play all the hands (so you can’t lose).

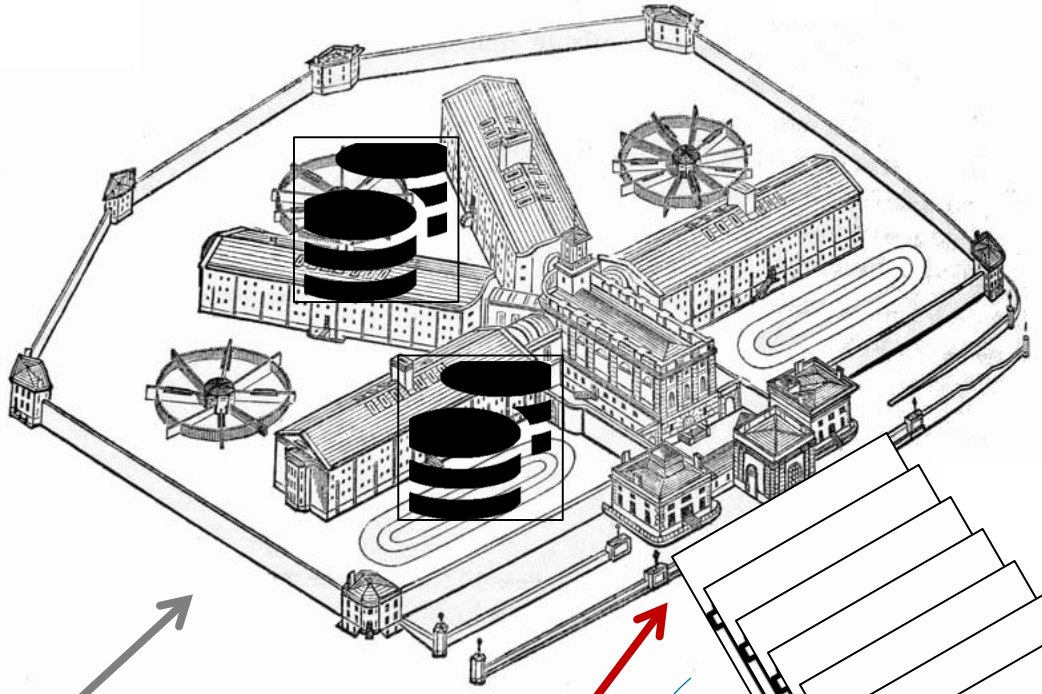
How it Works

- New Kind of Output: “Hashrate Escrow”
- Anyone can *<u>deposit to it</u>* at any time.
- But *<u>withdrawals</u>* are very slow.



Series of gates.

Prison Metaphor



Prison

Only way out.

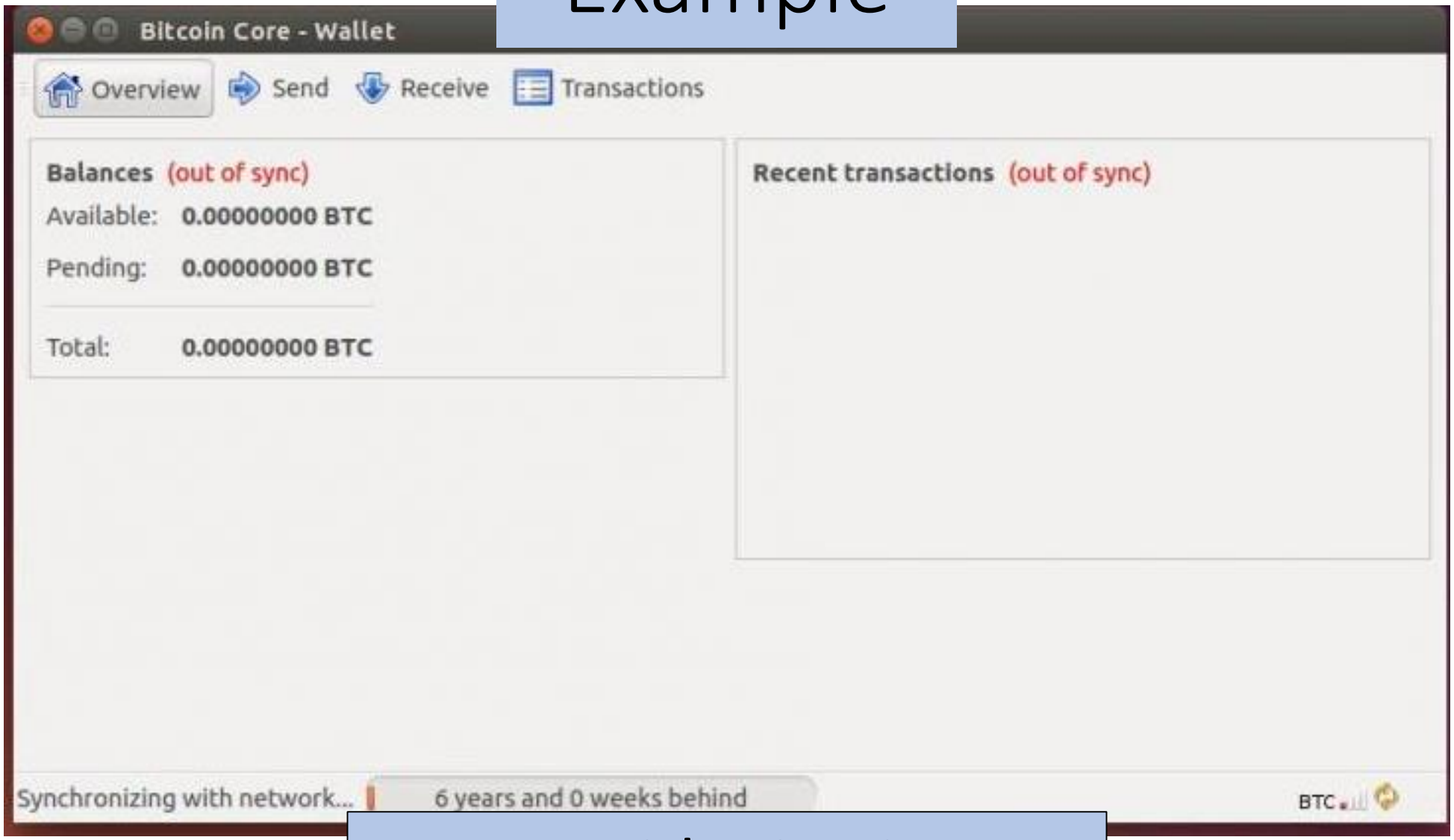
13,150 Gates

...

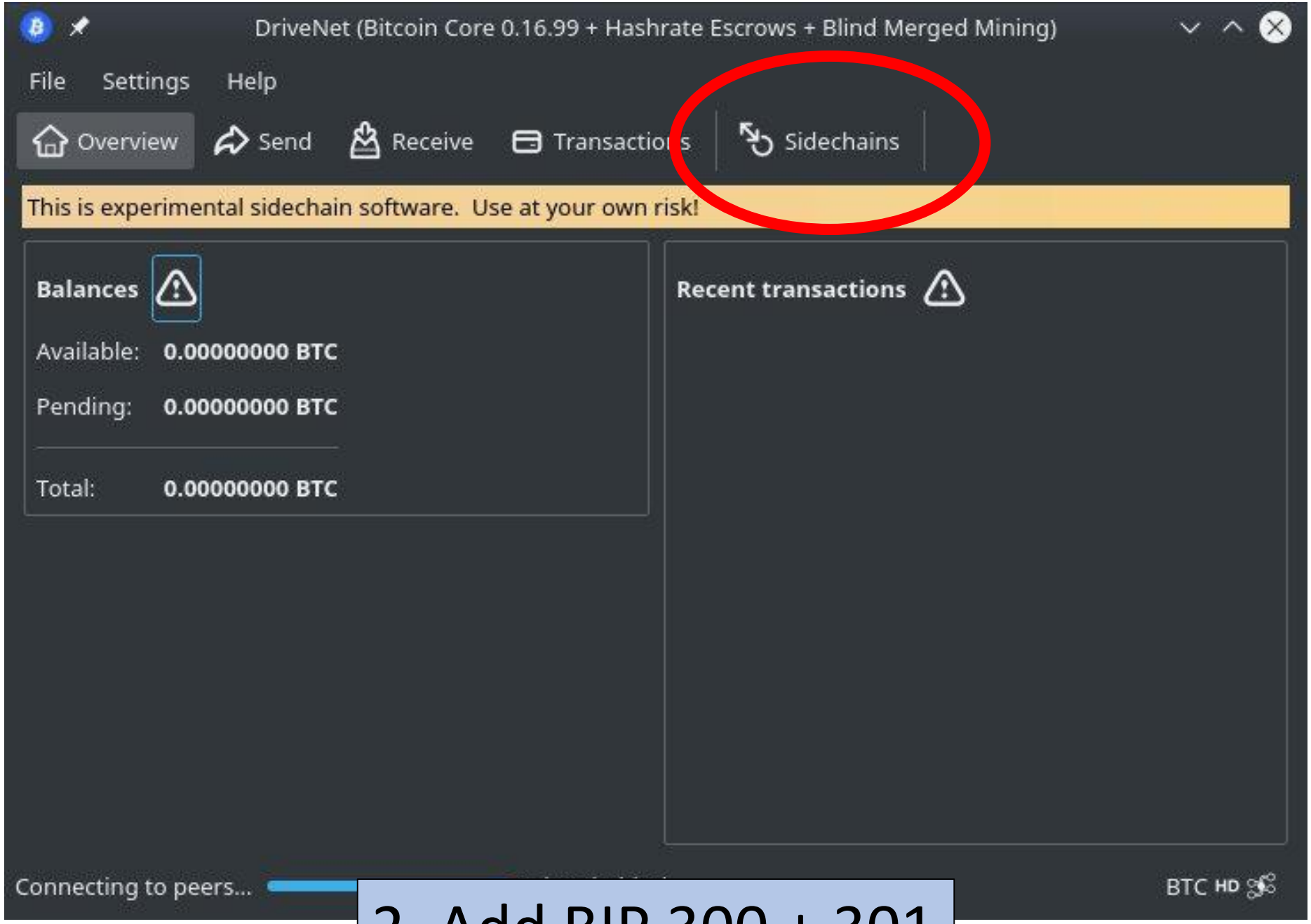
BTC

Example

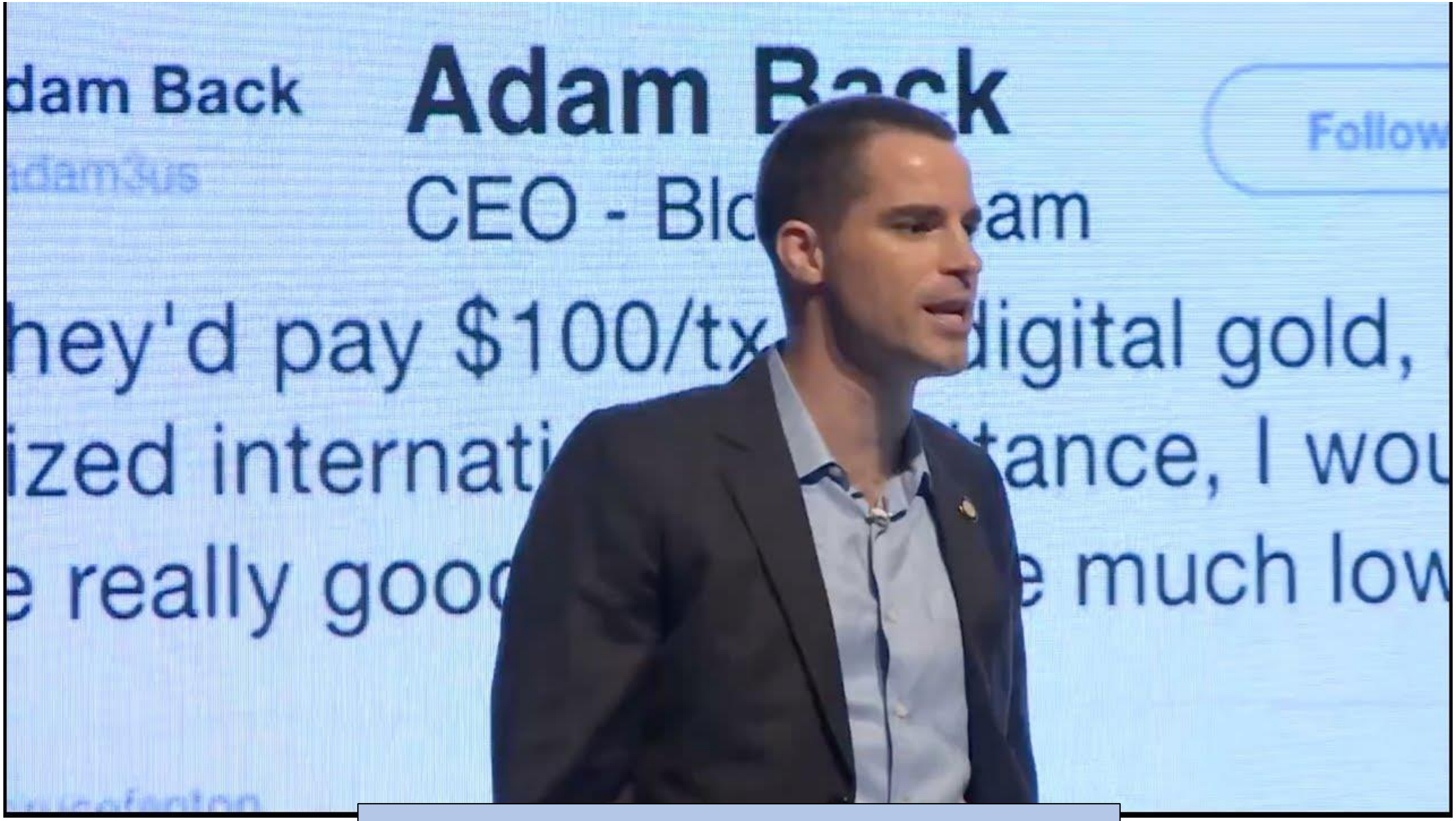
Example



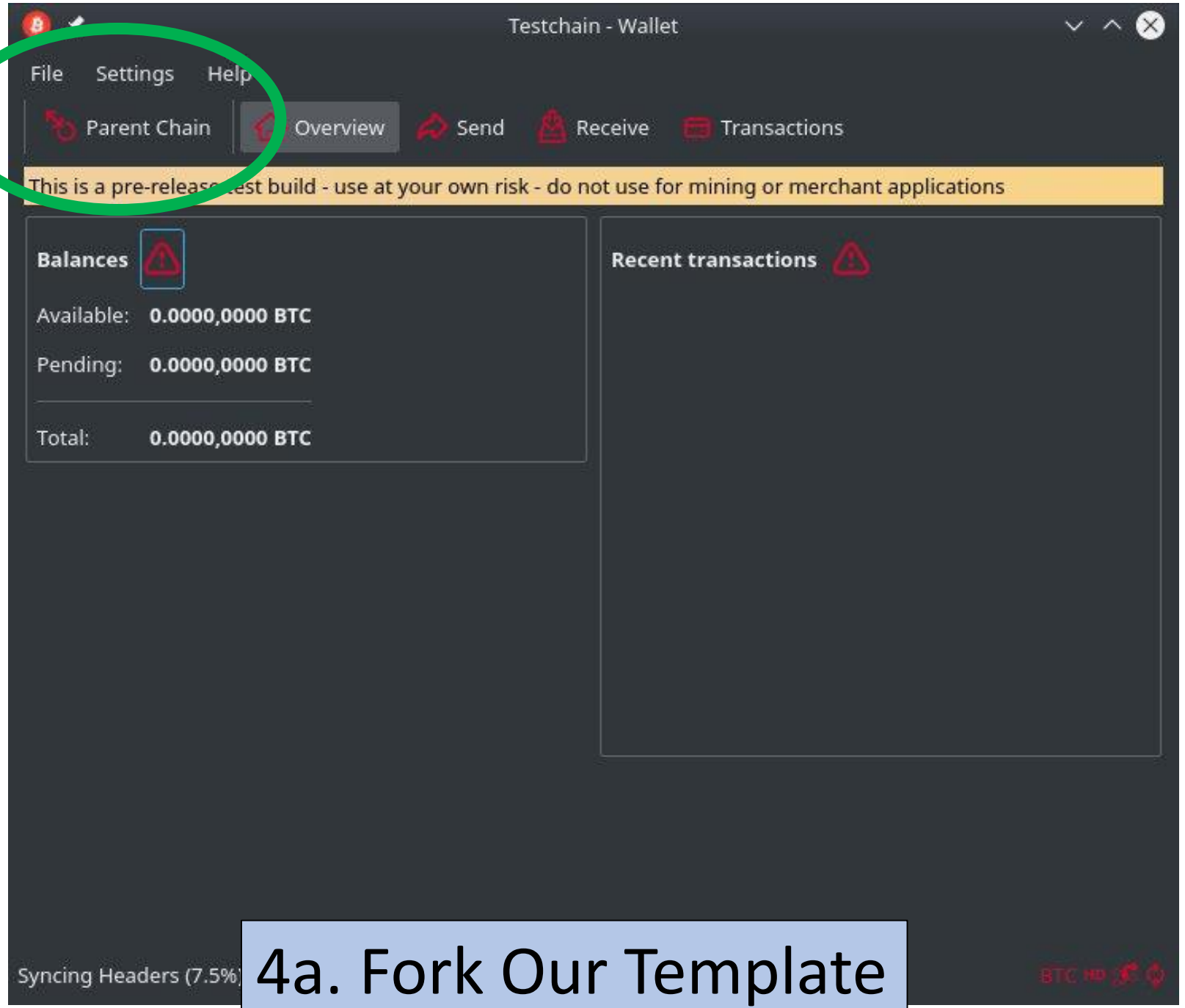
1. Start with Bitcoin Core



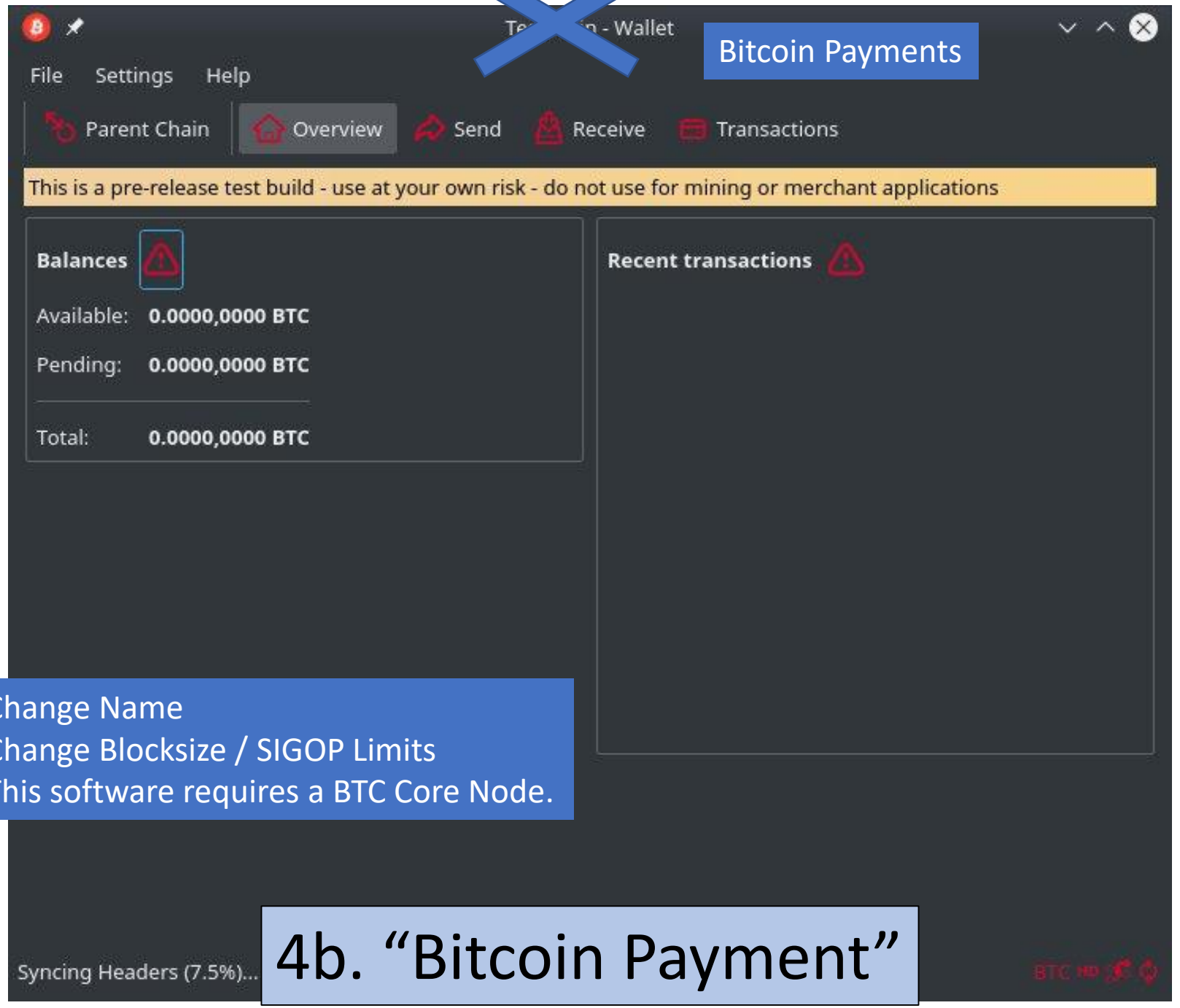
2. Add BIP 300 + 301



3. Meta-Consensus Problem



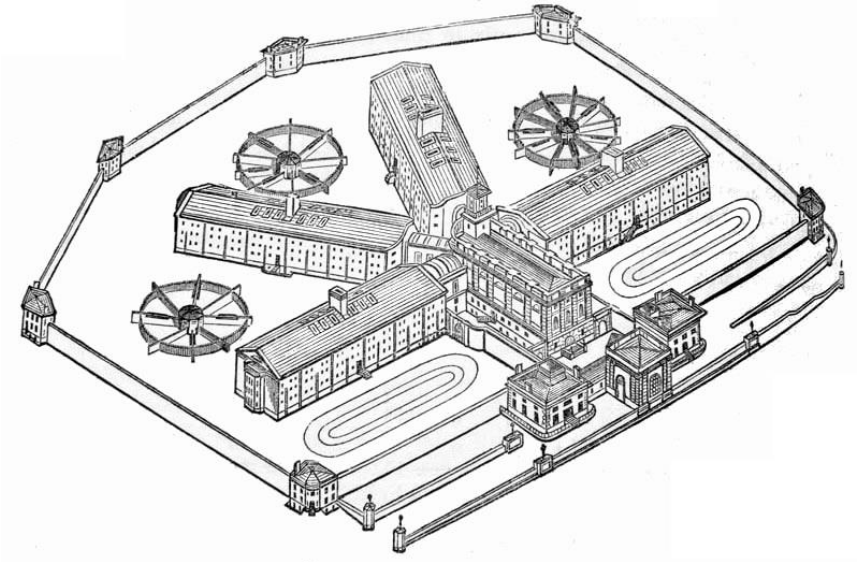
4a. Fork Our Template



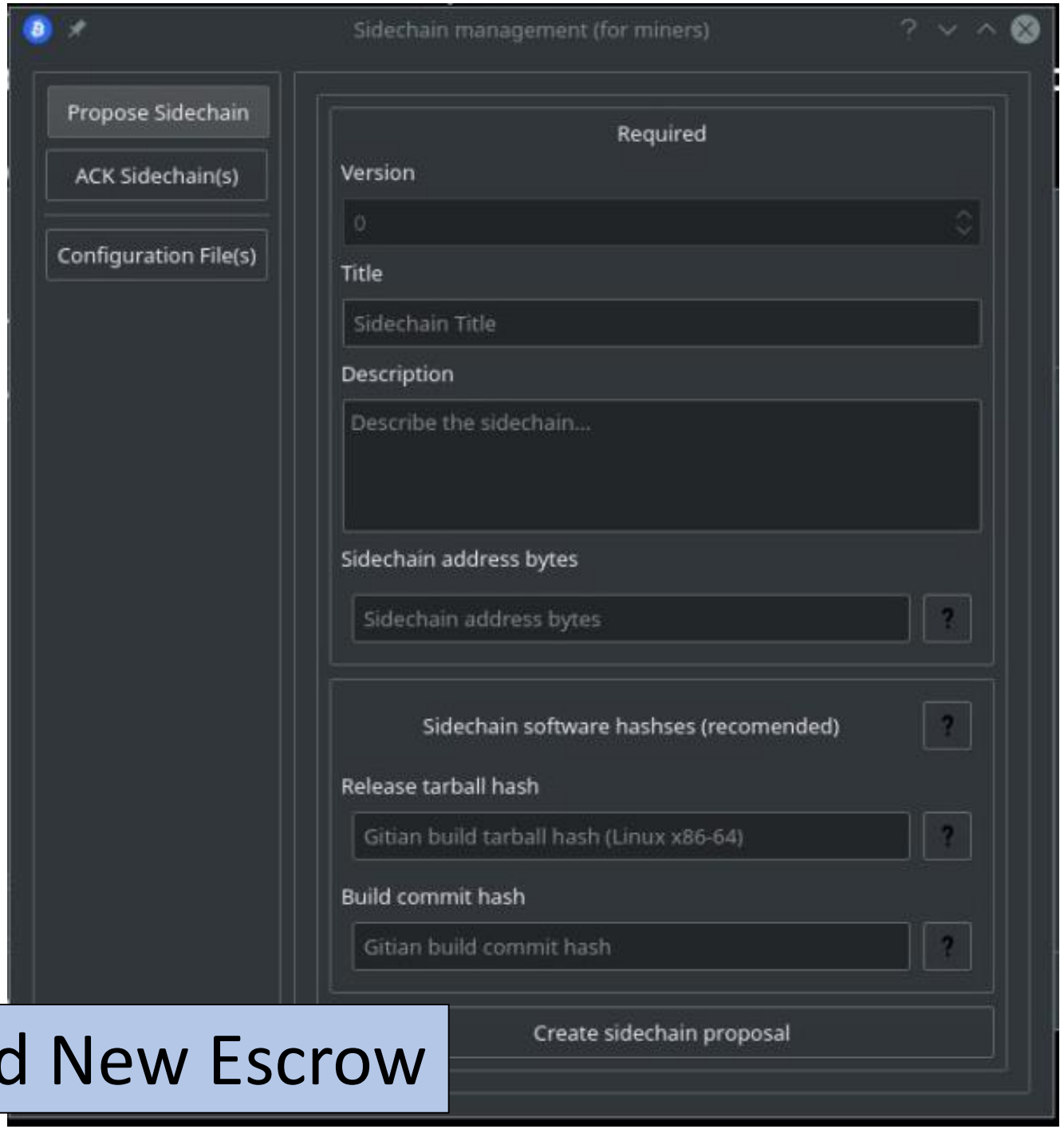
- Change Name
- Change Blocksize / SIGOP Limits
- This software requires a BTC Core Node.

4b. “Bitcoin Payment”

“Bitcoin Payments”

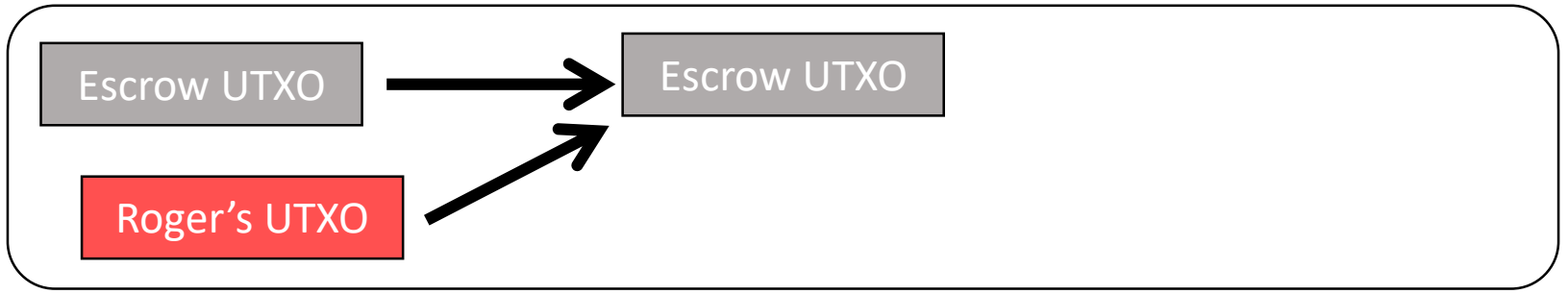


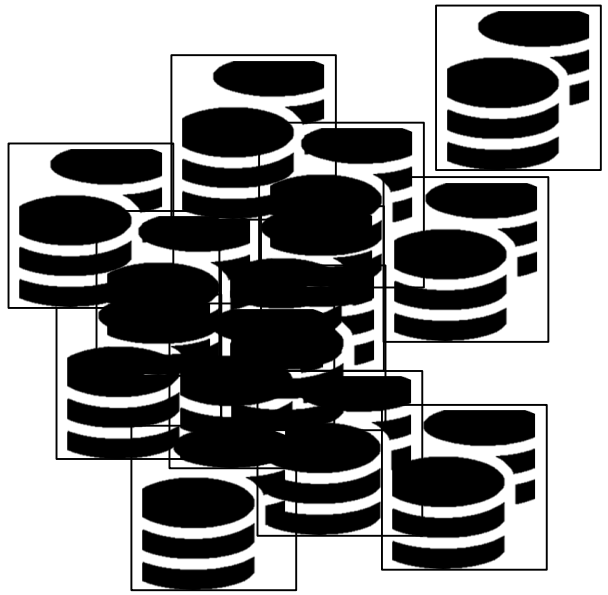
Now Open For Business

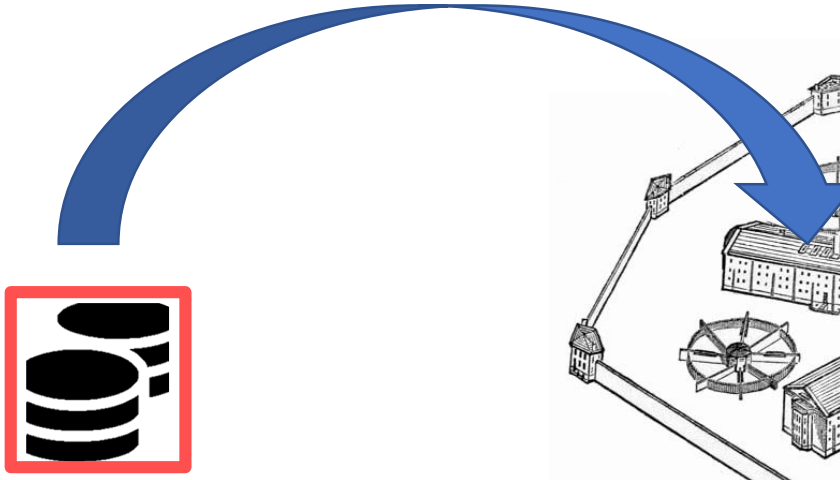


5. Add New Escrow

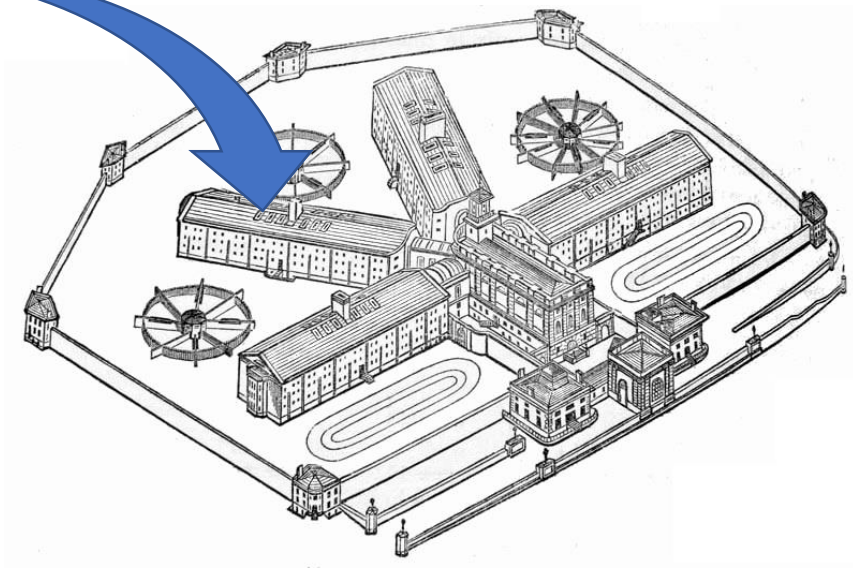
On layer-1:







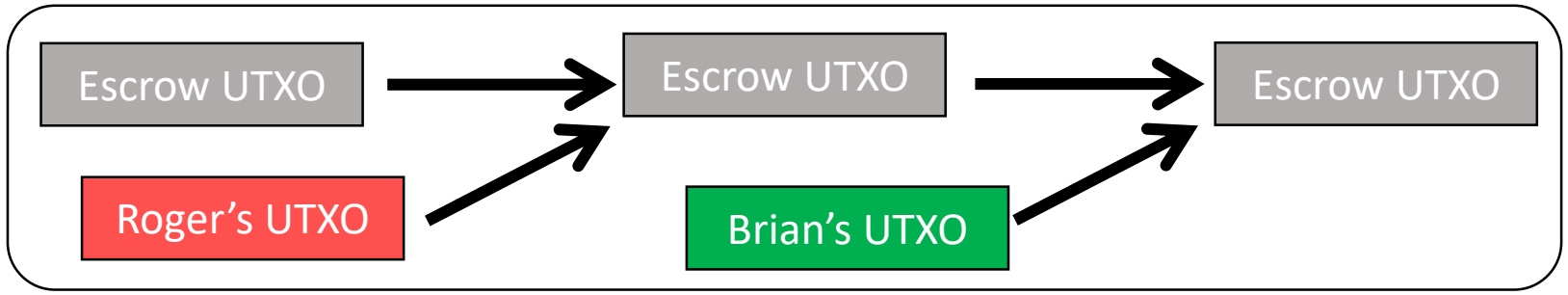
Roger's 50,000 BTC

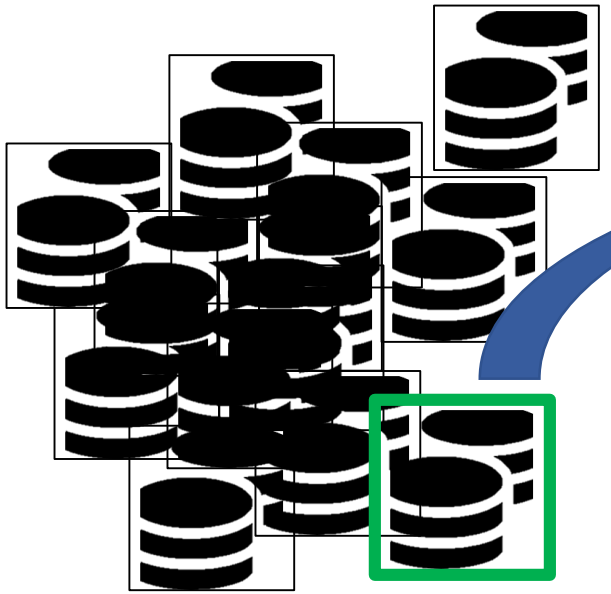


"Bitcoin Payments"

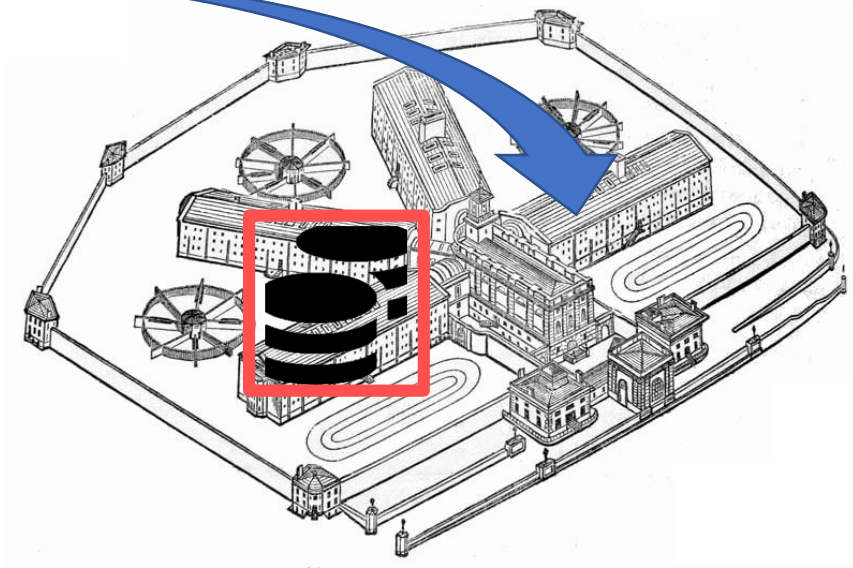
6a. Spend from Layer-1 to Layer-1.5

On layer-1:





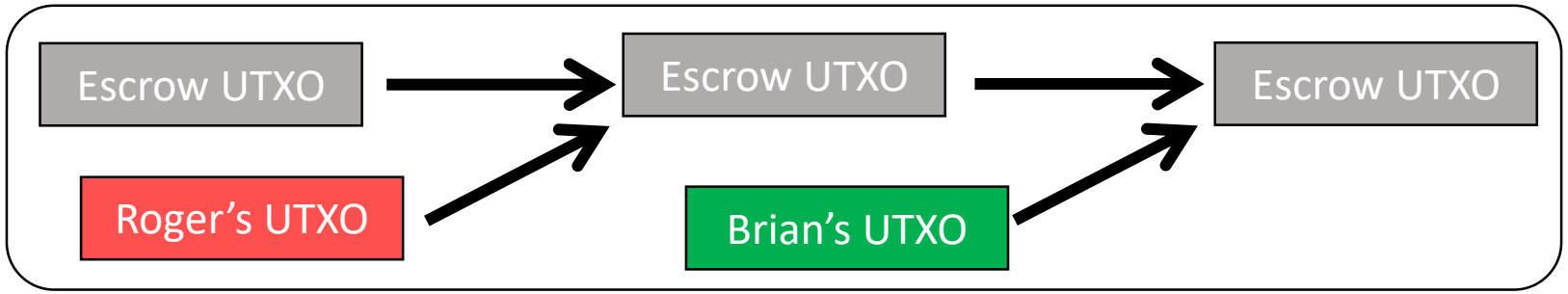
Brian's 7,000 BTC

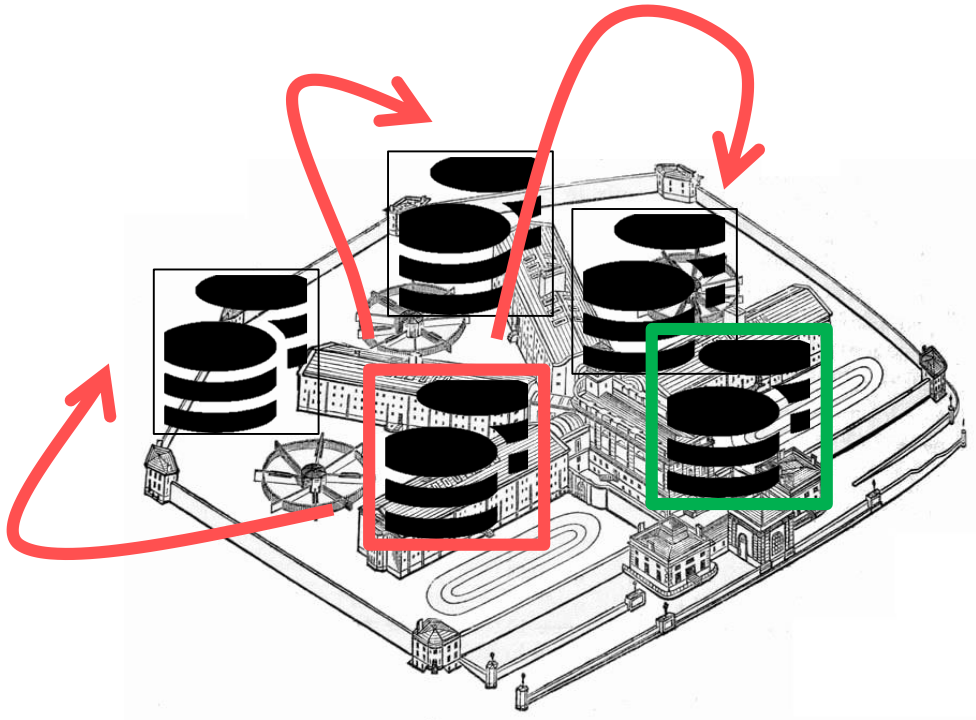


"Bitcoin Payments"

6b. Spend from Layer-1 to Layer-1.5

On layer-1:





"Bitcoin Payments"

7. Spend within the Escrow

Generates txn fee revenues for miners

Sideshift, Shapeshift, Atomic Swaps, Etc

SIDESHIFT.AI

TEST PILOT STAGE

Become An Affiliate: Shill friends, get money

Choose conversion

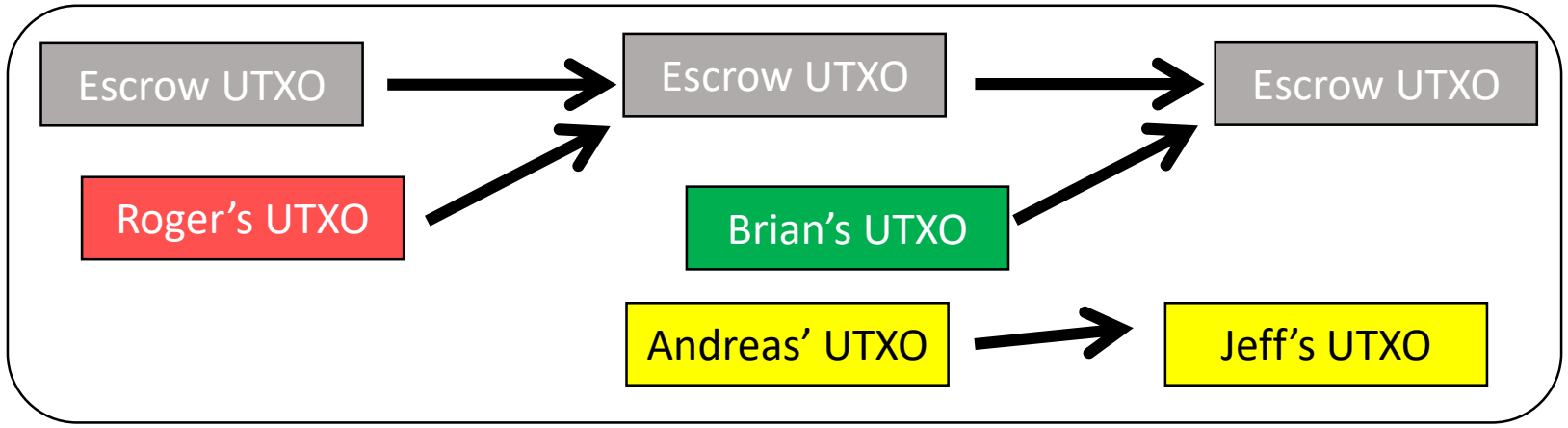
Bitcoin (Lightning) → Tether USD

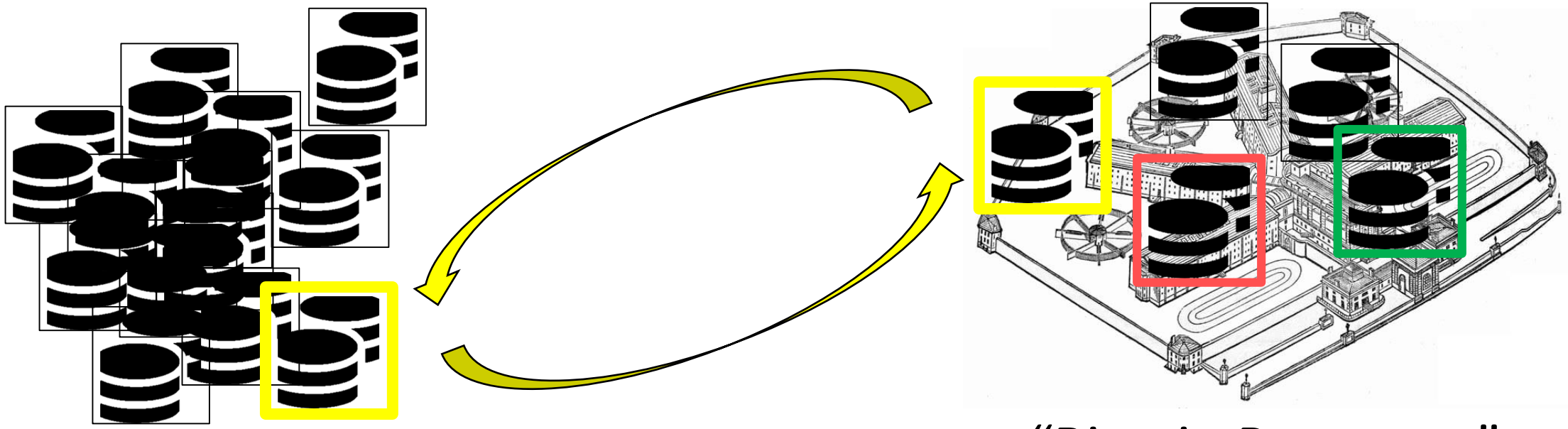
SHIFT

Time	From	To
7 hours ago	⚡0.0003 BTC	0.008601 ETH
16 hours ago	0.0149022 BTC	0.9805 ZEC
17 hours ago	⚡0.00001 BTC	0.03671 USDT
17 hours ago	⚡0.00001 BTC	
17 hours ago	0.00868722 BTC	

8a. Swapping to Instant Freedom

On layer-1:

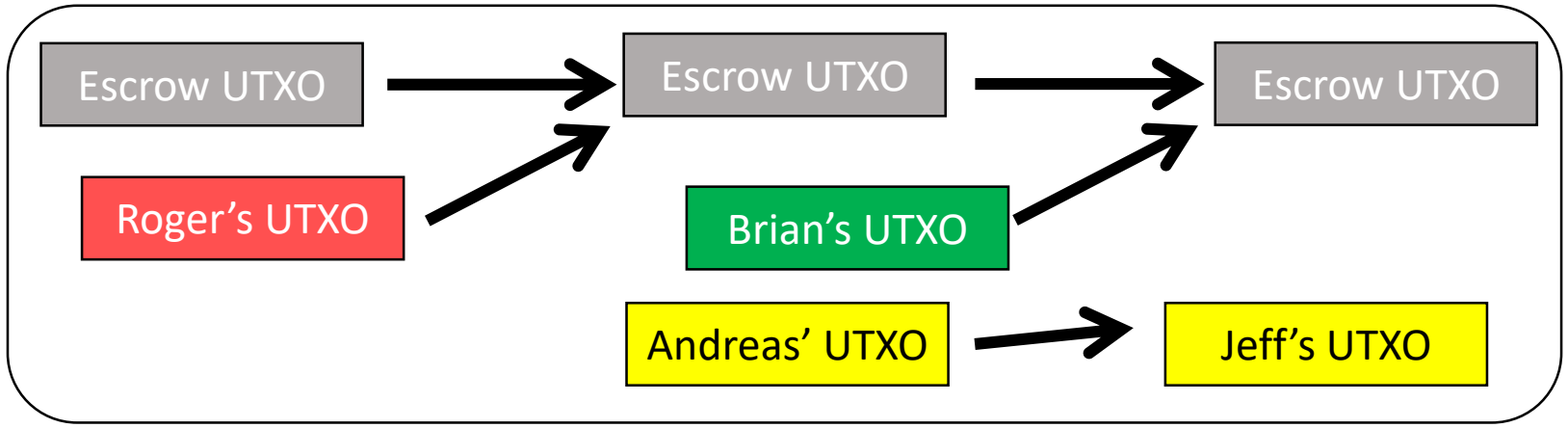


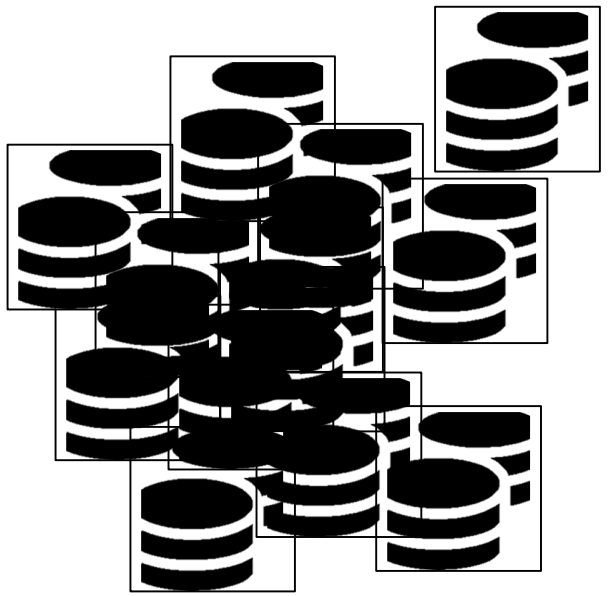


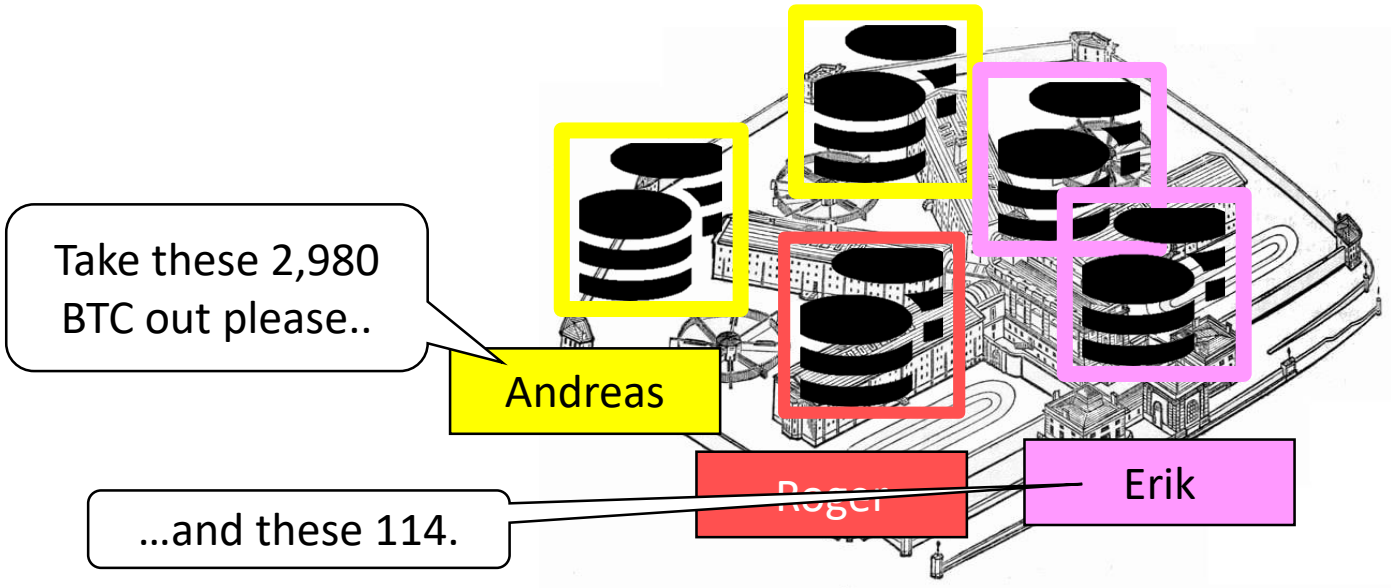
"Bitcoin Payments"

8b. Prisoner Exchange

On layer-1:

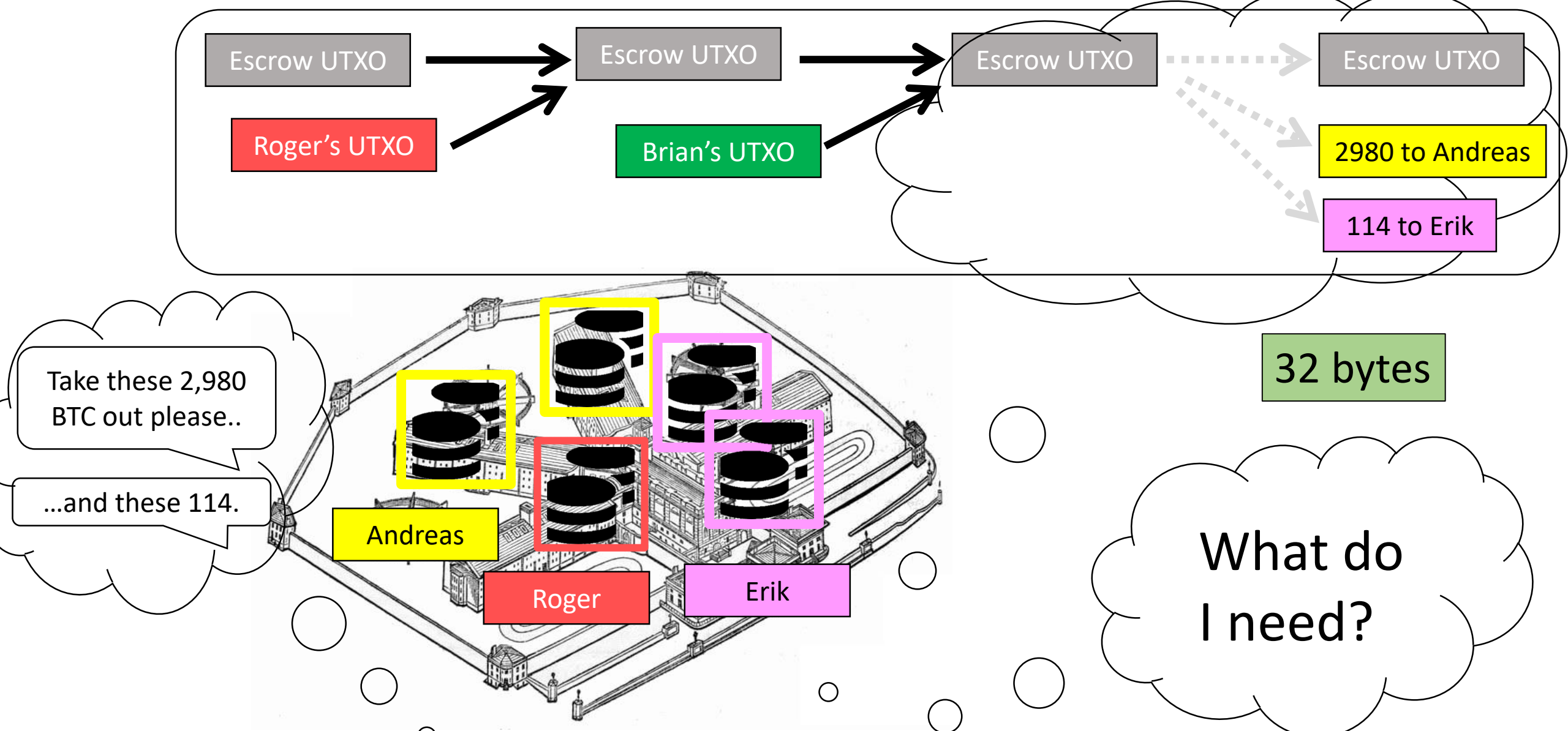






"Bitcoin Payments"

9. Leaving Prison

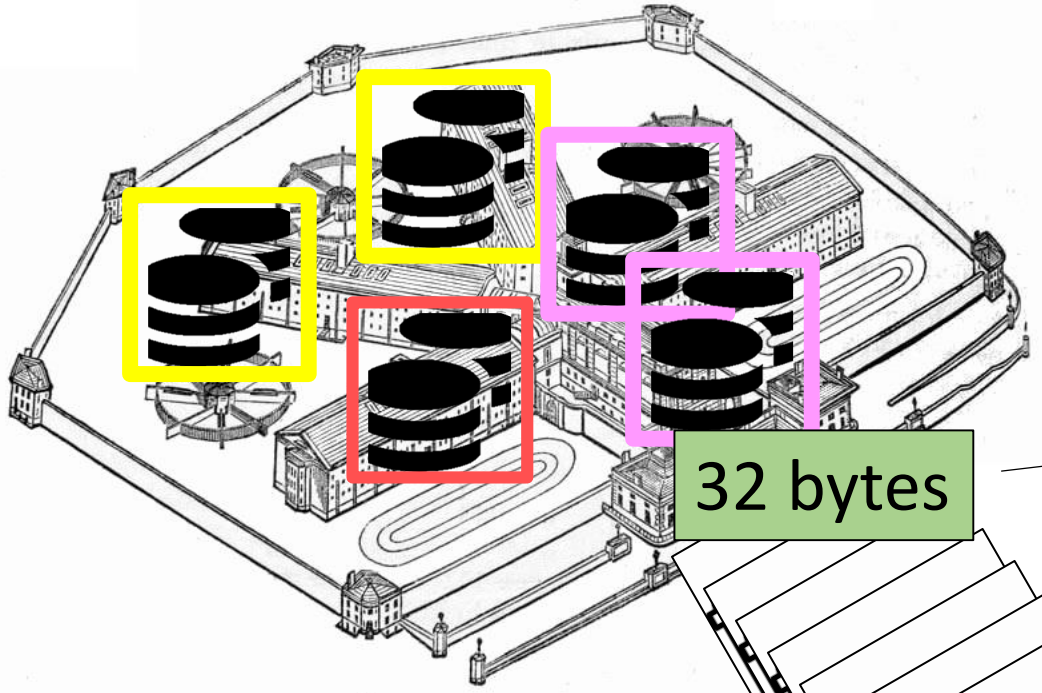


@"Bitcoin Payments"

10. The Withdrawal Txn

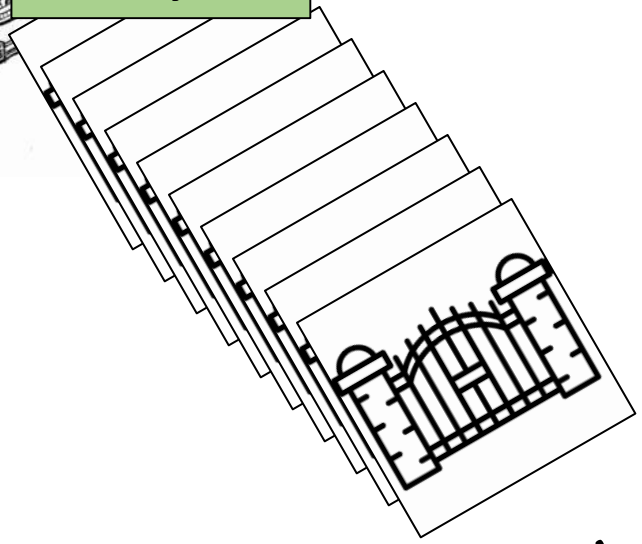
Debug window
Information
Console
Network Traffic
Peers
getblockheader
00:27:47
getblockheader
00:27:47
{
"hash":
"84e51e142b7410dad573e0b63225cc935c27a29ca3fd1c1fe147d9b03e89a5ce",
"confirmations": 1,
"height": 83,
"version": 536870912,
"versionHex": "20000000",
"merkleroot":
"6fb20a8389a1442abd4b7d540e9c68c0e7bbb9bdb42b2d243c5d40d33deed605",
"time": 1556522344,
"mediantime": 1556522316,
"nonce": 0,
"bits": "207fffff",
"difficulty": 4.656542373906925e-10,
"chainwork":
"hashwtprime":
"0000000000000000000000000000000000000000000000000000000000000000",
"previousblockhash":
"4fb9bd41b134fda5638a4c9da2f8419eefb7dae5ab9e70c621c5fe1dc86115cf"
}
32 bytes
10. The Withdrawal Txn

Prison Metaphor



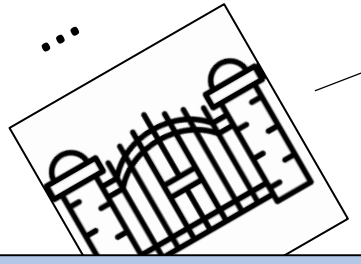
32 bytes

1st gate



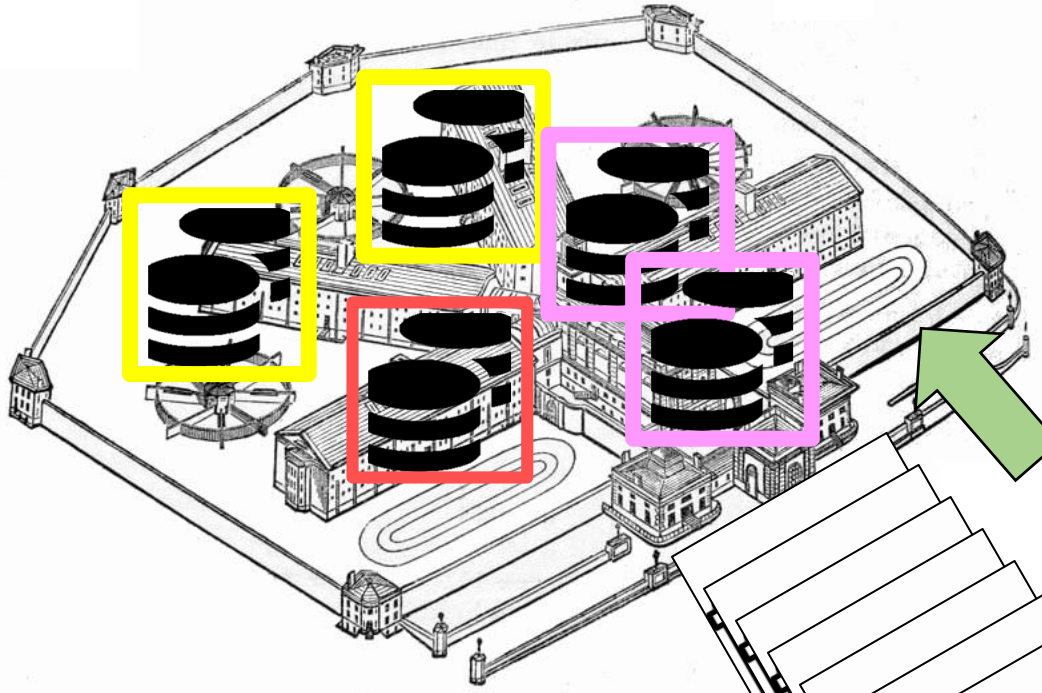
...

13150th gate



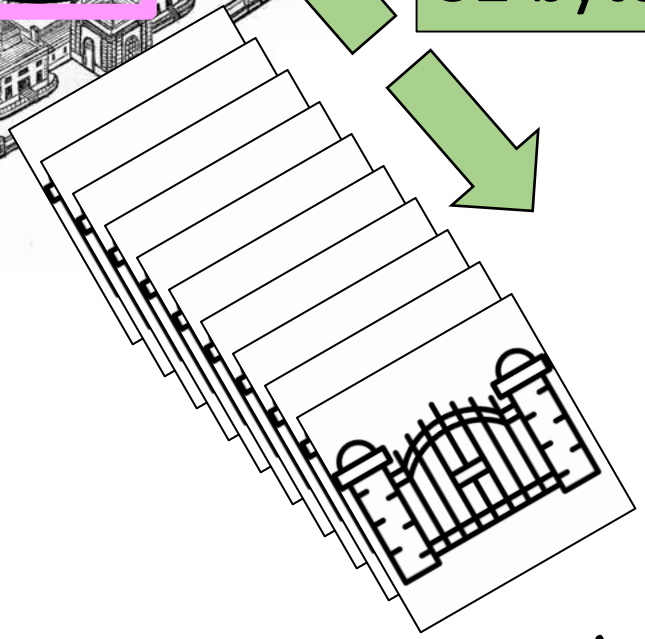
11. Starting Off…

Prison Metaphor

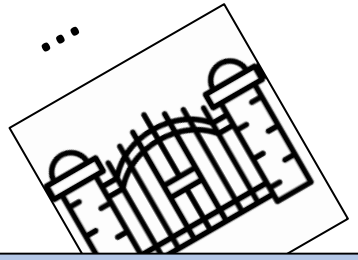


32 bytes

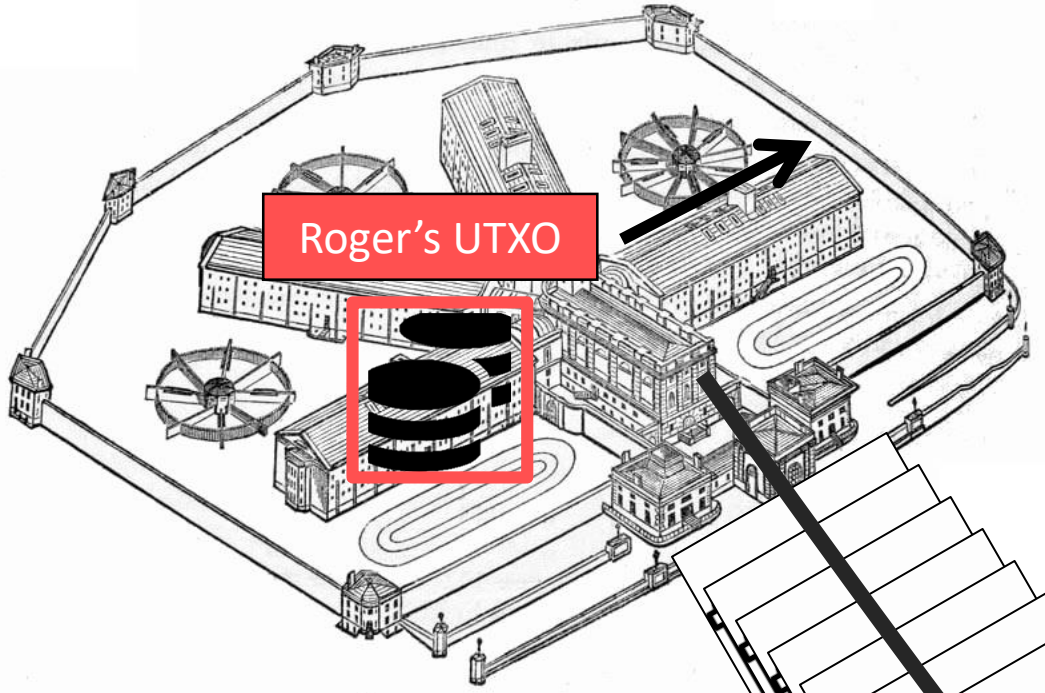
Miners



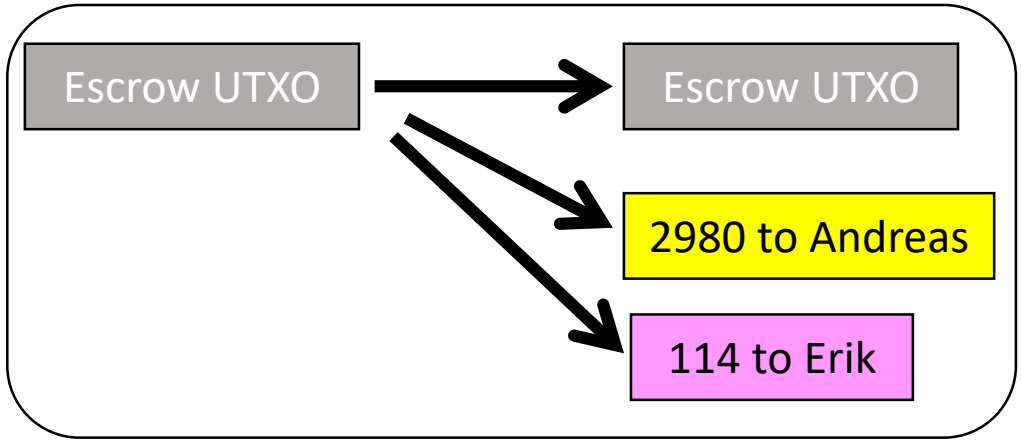
...

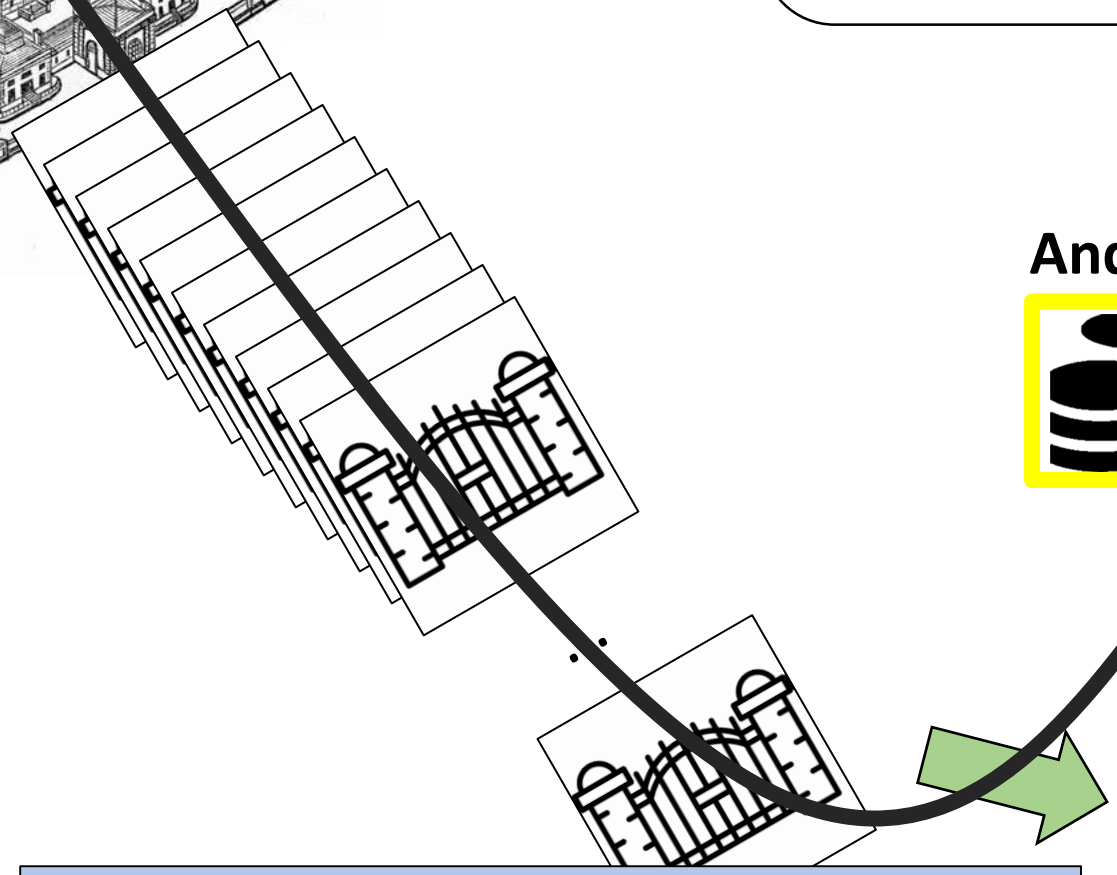


12. Making Progress…



On layer-1:





Andreas

Erik

32 bytes

13. Withdrawal Complete

Costs and Risks

Using any escrows?	No	Yes
Costs	A soft fork.	A soft fork + ***New security considerations*** for the layer-1.5 coins.

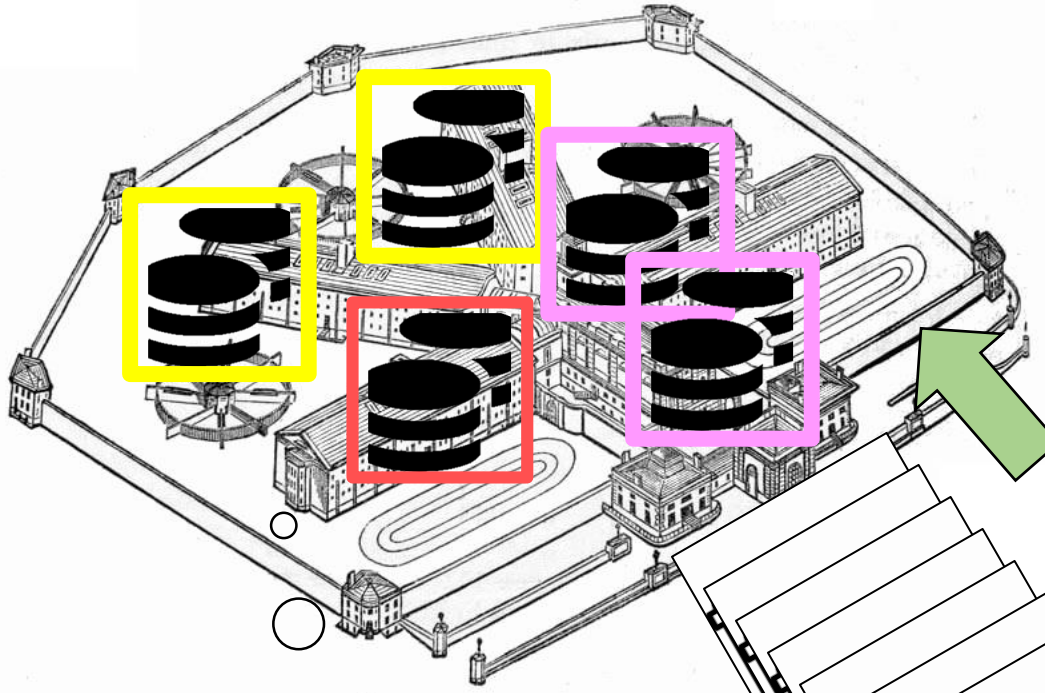
Upper Layers = Different Threat Models

Upper Layer:	Lightning Network	Hashrate Escrow
New Security Considerations	• Notice fraud in time. • Emergency Broadcast to Layer-1 • Shrug off custodial period.	…

Upper Layers = Different Threat Models

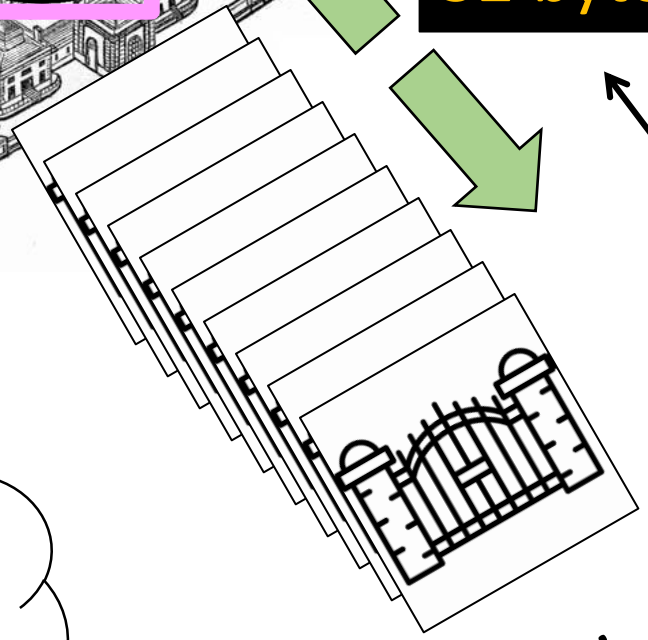
Upper Layer:	Lightning Network	Hashrate Escrow
New Security Considerations	• Notice fraud in time. • Emergency Broadcast to Layer-1 • Shrug off custodial period.	Are these escrows making miners wealthier? Are they ***popular***?

Miner Theft



(Evil 32 Bytes)

32 bytes



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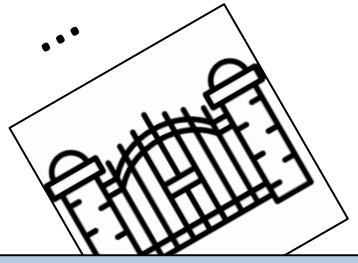


Escrow UTXO → Escrow UTXO

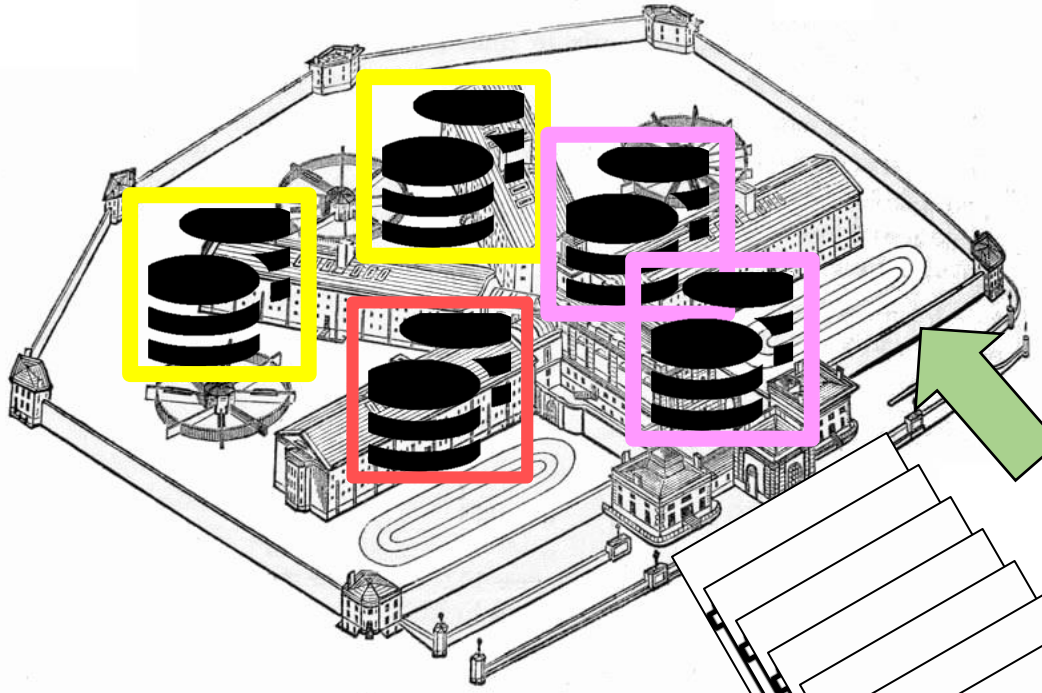
50,000 to Jihan Wu

32 bytes

Oh no…

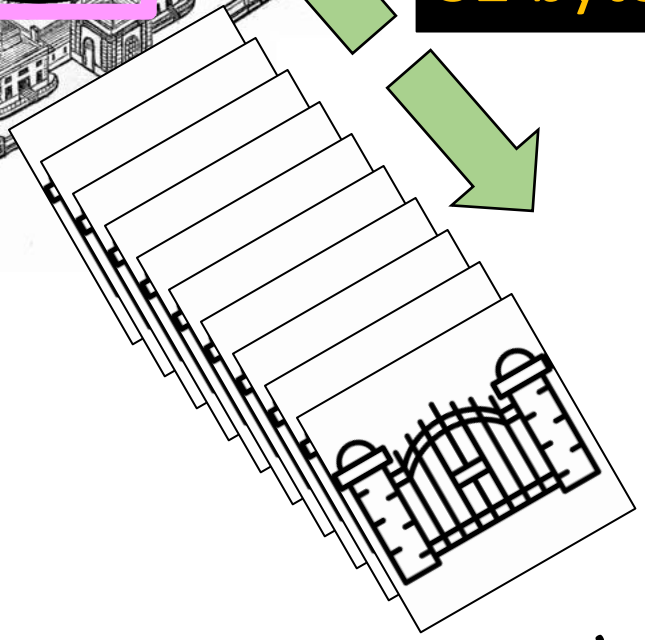
11. Starting Off…

3 Awkward Months…



32 bytes

Miners



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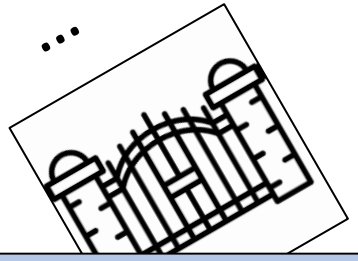
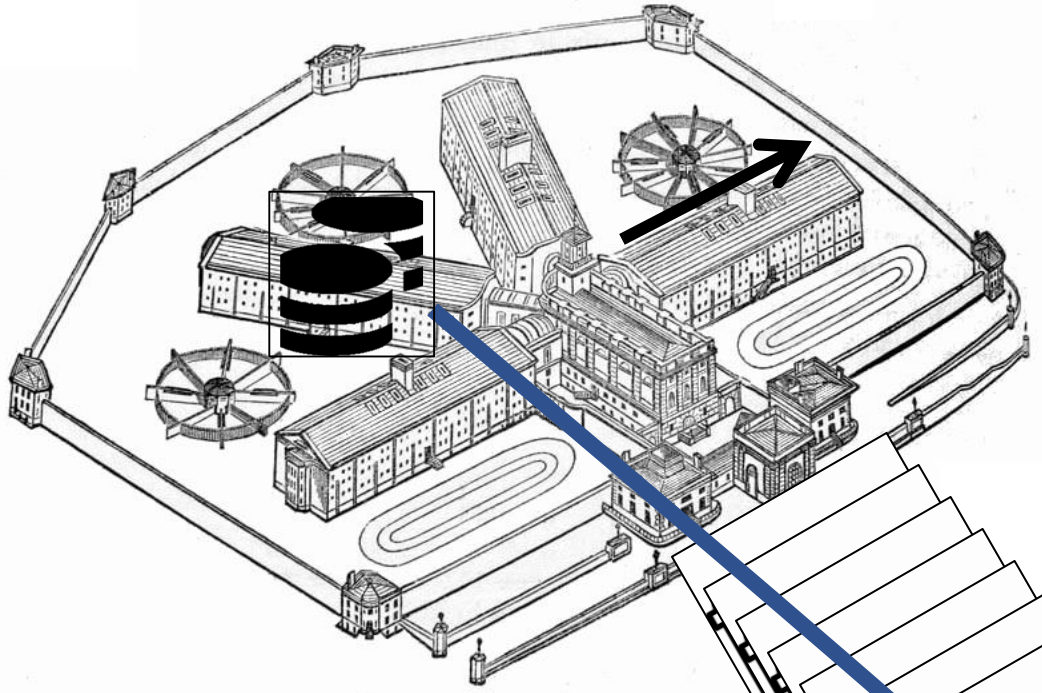
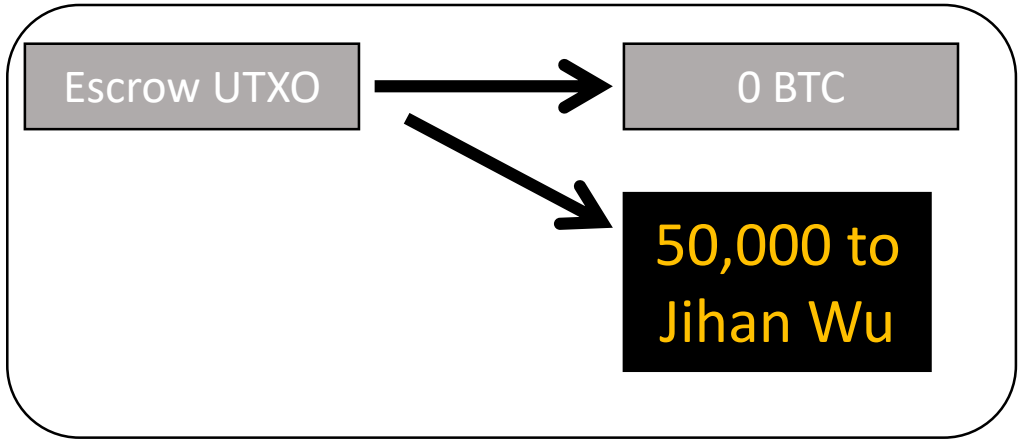
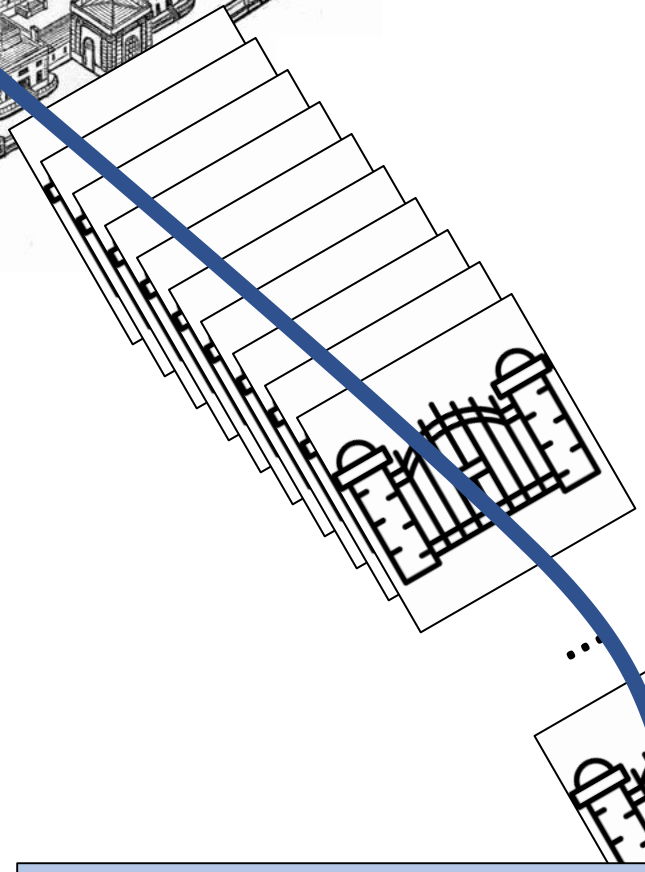


12. Making Progress…



On layer-1:



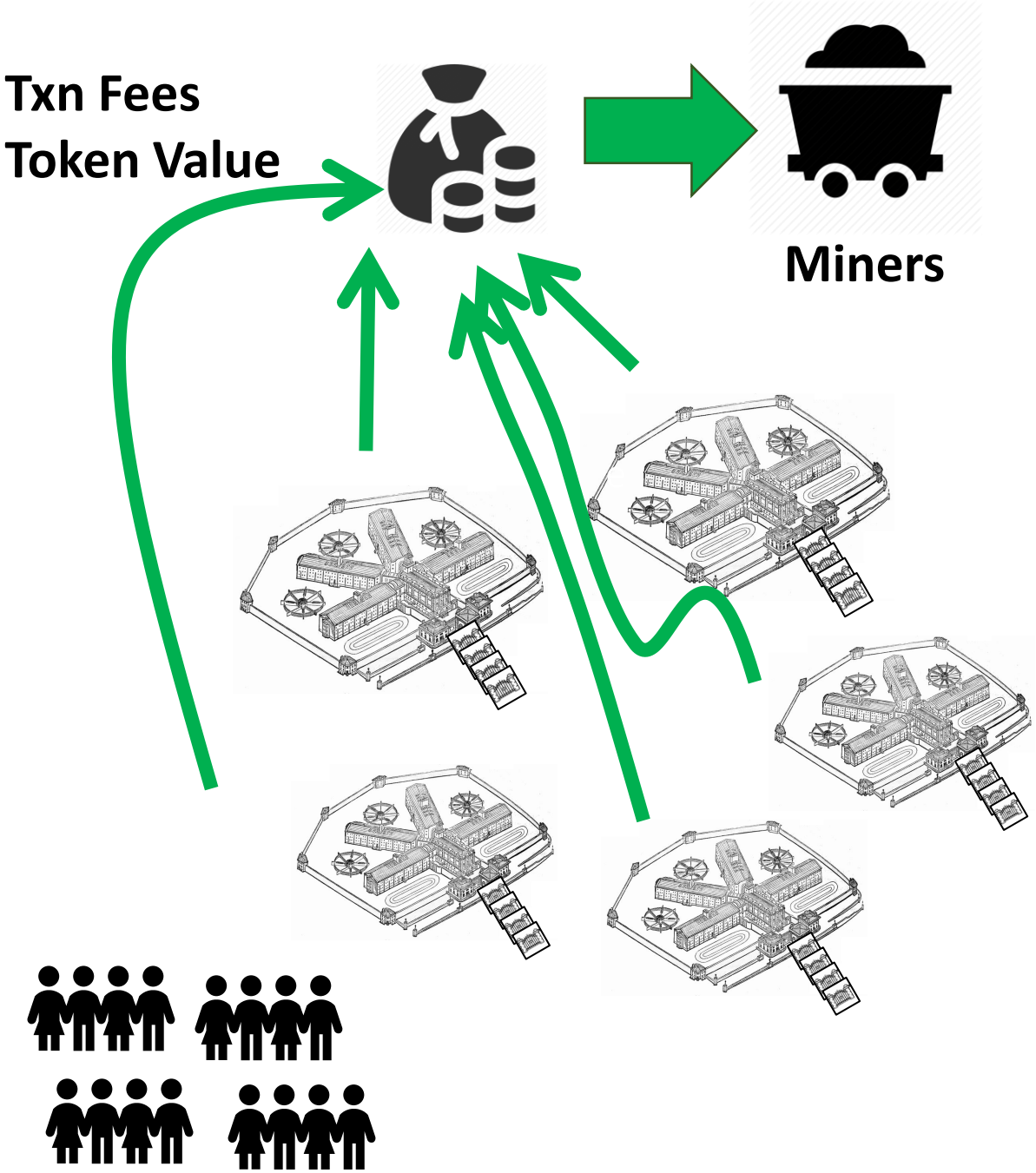


32 bytes

13. Withdrawal Complete

Summary

1. New source of miner-profits.
2. Miners choice: claim this revenue, or destroy it.
3. High-Auditability:
   a) Reducing “all txns” down to “net transfers”.
   b) Crunching all xfers down to 32 bytes.
   c) One transfer at a time.
   d) Transfers take 3 months to settle.



Good News: 100% Optional

- Layer-1 Full nodes: track coins as they enter/exit prisons.
- “Vanilla” Layer-1 contains everything that is needed…
  - …to validate Drivechain txns.
  - …to maximize mining-revenues.

Retail Payments – Comparing the Process
1) Onboard; 2) Make n payments; 3) Settle

You know it. You love it.

Aka “Largeblock Sidechain”
(a **hashrate escrow**; a **prison**)

	Lightning Network	“Bitcoin Payments”
Extra Software	LN Node	SC Node (SPV option)
Onboard a User	Layer-1 txn	Layer-1.5 txn
Preparation	1 channel-open txn	--
N Payments	..on LN	..on L-1.5
Settle to Layer-1	1 channel-close txn	1 “sideshift” out

Total Transaction Fees

	L.N.	B.P.
%-based (LN or SS)	n	1
Layer-1 (larger)	3	1
Layer-1.5 (smaller)	0	n

So, LN is only cheaper when there are many low-value payments. Ie, LN is cheaper than BP, for ***micropayments***.

User Experience

* I assume that an automated hot-wallet is out of the question!

If you are willing to swallow the new security consideration…

	Lightning N.	BTC Payment
Onboard without Layer-1	No	Yes
Receive Payments while Offline*	No	Yes
Recover Wallet From Seed	No	Yes
Immune to Greif-ing / Routing	No	Yes
Option to use SPV Mode	No	Yes
Reckless	Yes	Yes
Txn Settles Instantly	Yes	No

…then we see that the primary advantage of LN is **fast settlement**, especially when both buyer and seller are online. So, LN probably best for in-person retail; SC better for online shopping, perhaps.

Goals

1. Neutralize Meta-Consensus Threats – Altcoins, Hard Forks
2. Boost Hashrate Security In the Long Run
3. Bring Cool New Features to BTC
    1. Payments Sidechain (Just Explained)
    2. New, Risky Crypto (Liquid / MimbleWimble / zCash)
    3. BitAssets (see truthcoin.info/blog/BitAssets)
    4. Identity (see truthcoin.info/blog/codex-identity-sidechain)
    5. Prediction Markets (BitcoinHivemind.com)

Hivemind Endorsements

Please watch my other (short) talks:
BitcoinHivemind.com

Endorsements

"Hivemind may be the most important invention since Bitcoin itself."

- **Roger Ver** (Jun 2015), Bitcoin evangelist and seed investor (Blockchain.info, The Bitcoin Foundation, Ripple, BitPay, ShapeShift, Purse.io)

"I'd give it a low chance of success, but at least it's clever crazy rather than stupid crazy. :)"

- **Peter Todd** (Oct 2015), Bitcoin core developer, notable skeptic (Coinkite "Chief Naysayer"), inventor of Treechains

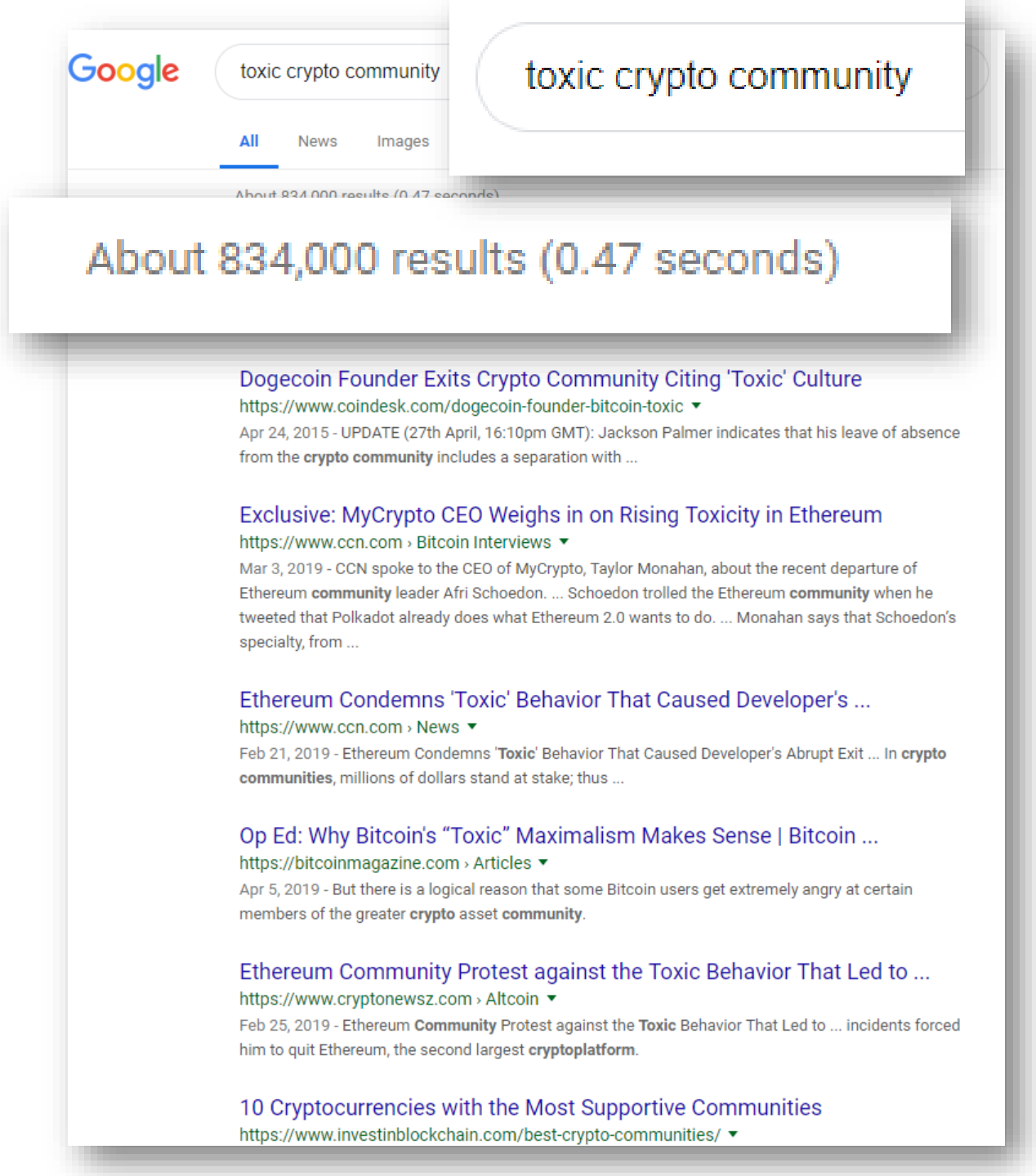
"Hivemind is a real project with interesting use cases. It's great to see them using sidechains - anyone with Bitcoin can participate in their markets."

- **Dr. Adam Back** (Dec 2015), Notable Cypherpunk, inventor of Hashcash Proof-of-Work, Blockstream Co-Founder and President

"I'm very optimistic about the feasibility of this project."

- **Andrew Poelstra** (May 2015), author of A Treatise on Altcoins, On Stake and Consensus, co-author of the Sidechains Whitepaper

“Toxicity”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Dogecoin Founder Exits Crypto Community Citing 'Toxic' Culture
https://www.coindesk.com/dogecoin-founder-bitcoin-toxic
Apr 24, 2015 - UPDATE (27th April, 16:10pm GMT): Jackson Palmer indicates that his leave of absence from the crypto community includes a separation with ...
Exclusive: MyCrypto CEO Weighs in on Rising Toxicity in Ethereum
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Feb 21, 2019 - Ethereum Condemns 'Toxic' Behavior That Caused Developer's Abrupt Exit ... In crypto communities, millions of dollars stand at stake; thus ...
Op Ed: Why Bitcoin's “Toxic” Maximalism Makes Sense | Bitcoin ...
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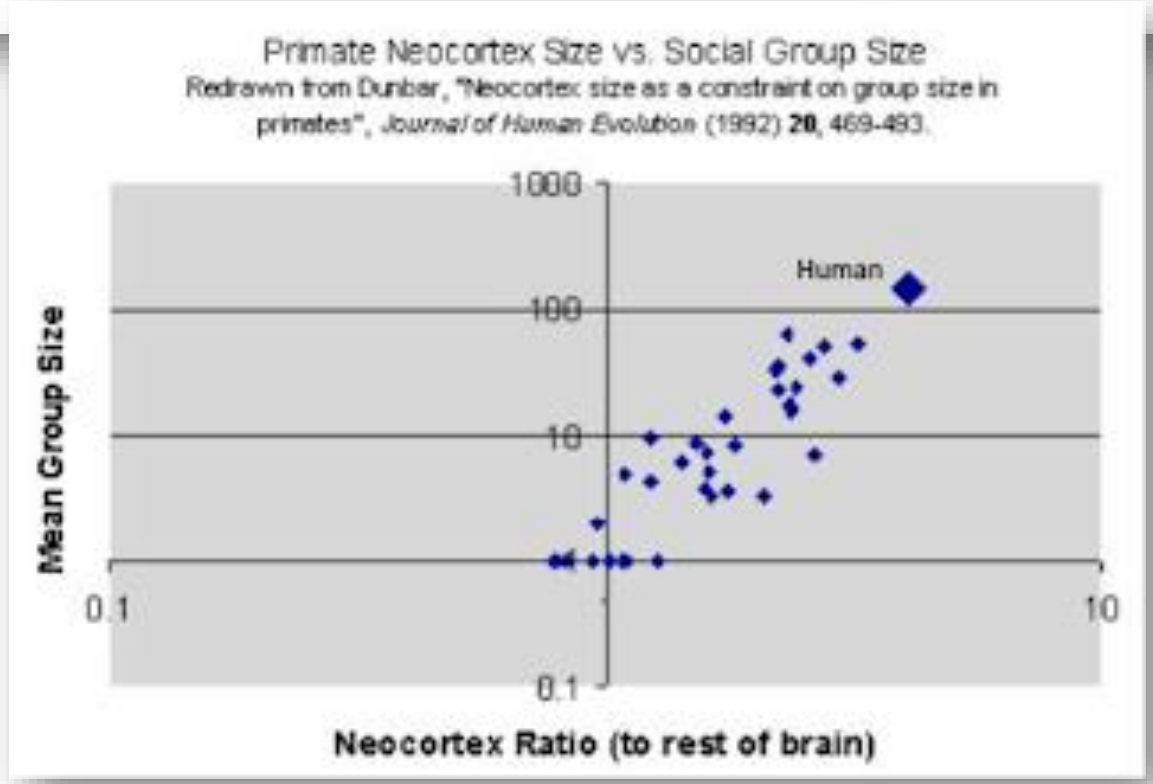
Apr 5, 2019 - But there is a logical reason that some Bitcoin users get extremely angry at certain members of the greater crypto asset community.
Ethereum Community Protest against the Toxic Behavior That Led to ...
https://www.cryptonewsz.com › Altcoin
Feb 25, 2019 - Ethereum Community Protest against the Toxic Behavior That Led to ... incidents forced him to quit Ethereum, the second largest cryptoplatform.
10 Cryptocurrencies with the Most Supportive Communities
https://www.investinblockchain.com/best-crypto-communities/

Thursday, February 09, 2017

Money, blockchains, and social scalability



Thank You