Drivechain and Blind Merged Mining

Paul Sztorc

Research Director, Tierion

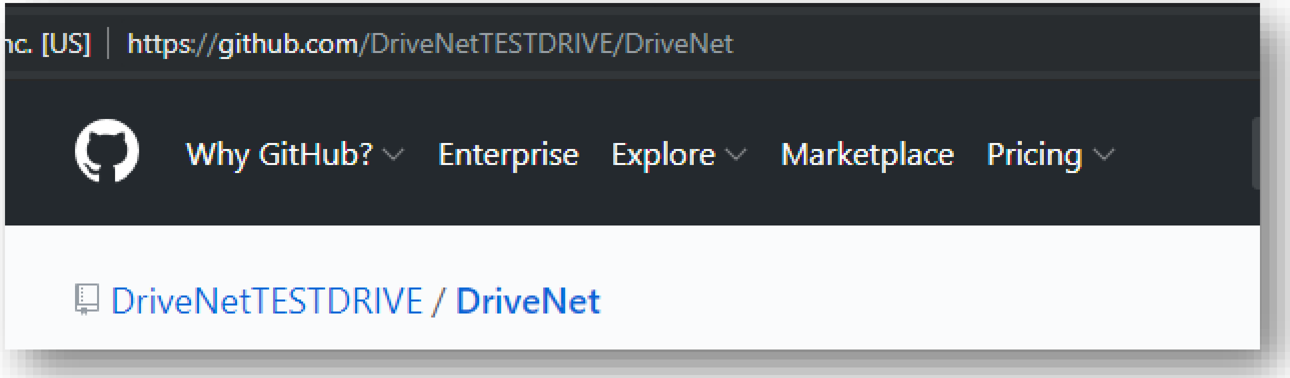
May 15th, 2019

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


nc. [US] | https://github.com/DriveNetTESTDRIVE/DriveNet
Why GitHub?
Enterprise
Explore
Marketplace
Pricing
DriveNetTESTDRIVE / DriveNet

GitHub

Drivechain - The Simple Two Way Peg

24 Nov 2015

> With sidechains, altcoins are obsolete, Bitcoin smart contracts are possible, Bitcoin Core and BitcoinXT can coexist, and all hard forks can become soft forks. Cool upgrades to Bitcoin are on the way!

Update: This project now has its own website! See the literature page for the latest

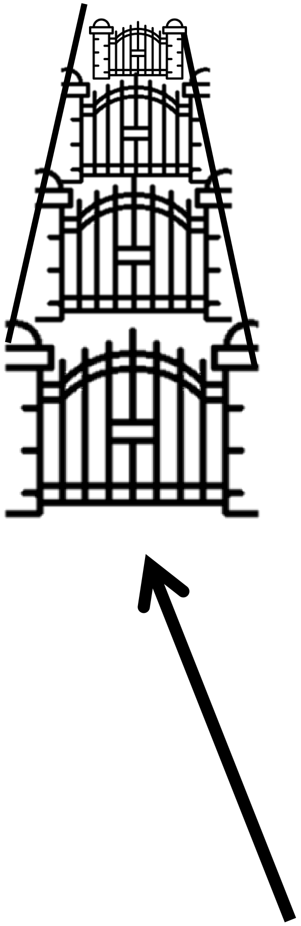
Original Nov 2015 Post

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).

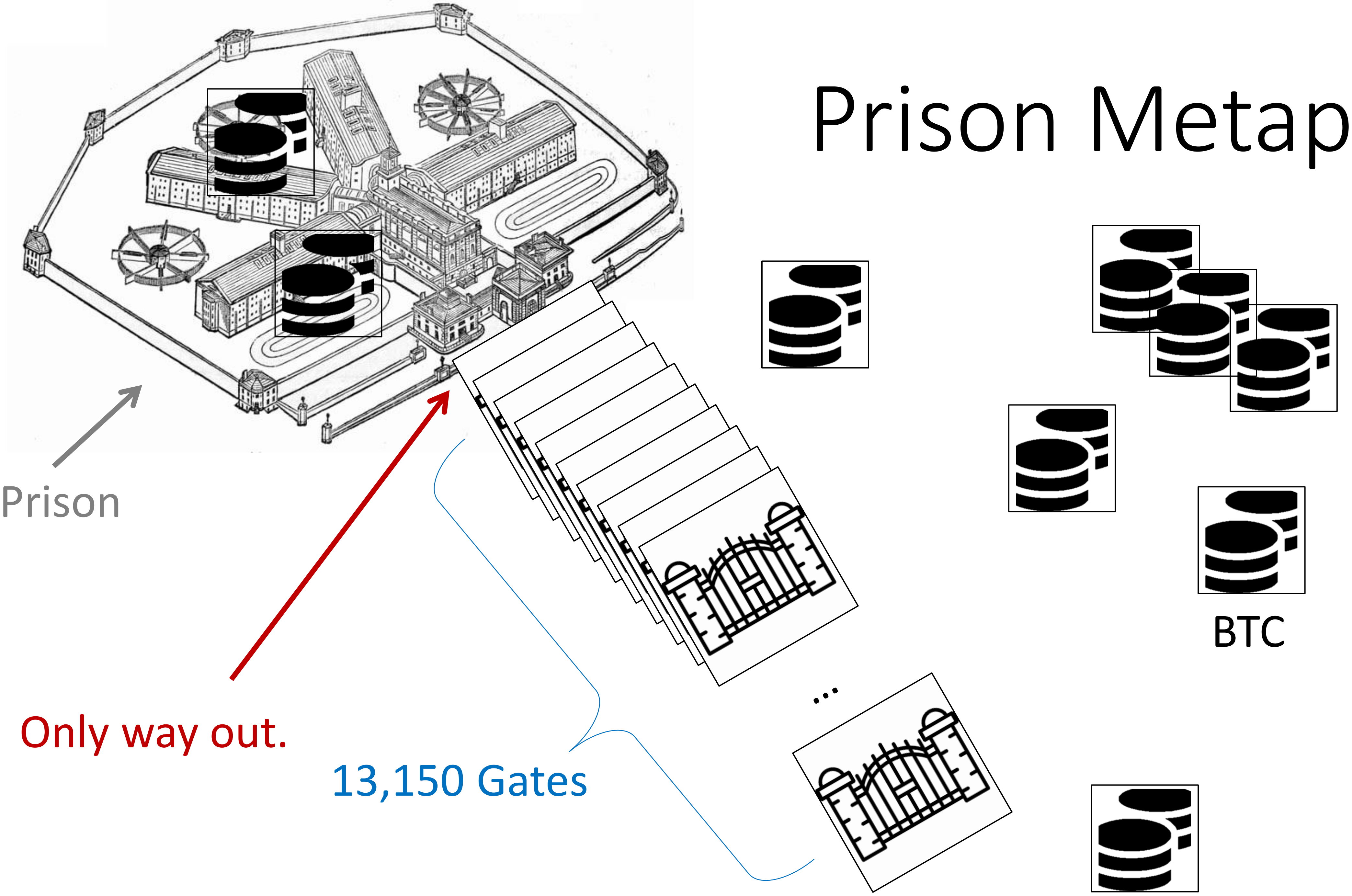
How it Works

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



Series of gates.

Prison Metaphor



Prison

Only way out.

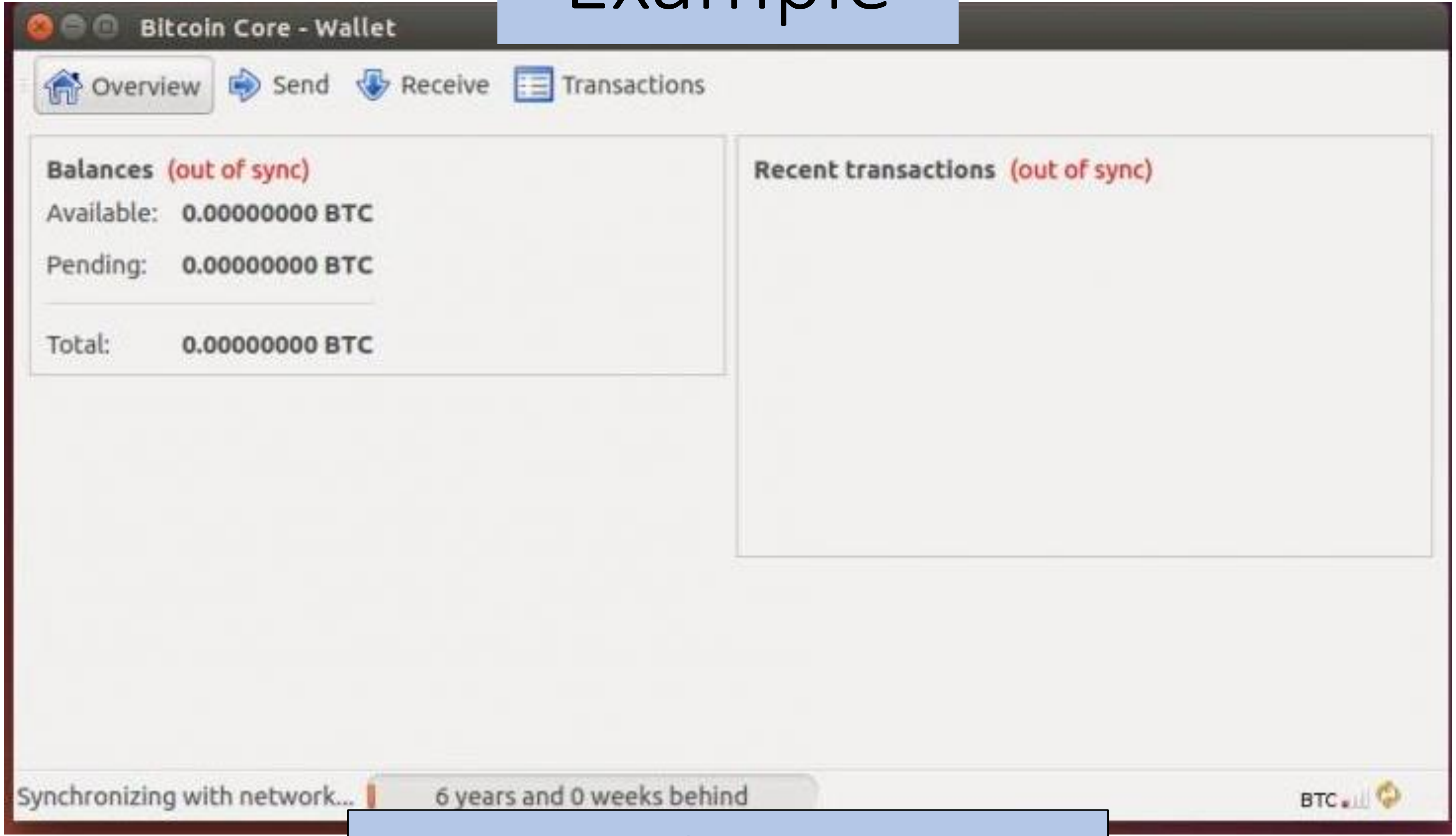
13,150 Gates

...

BTC

Example

Example



Balances (out of sync)

Available: 0.00000000 BTC

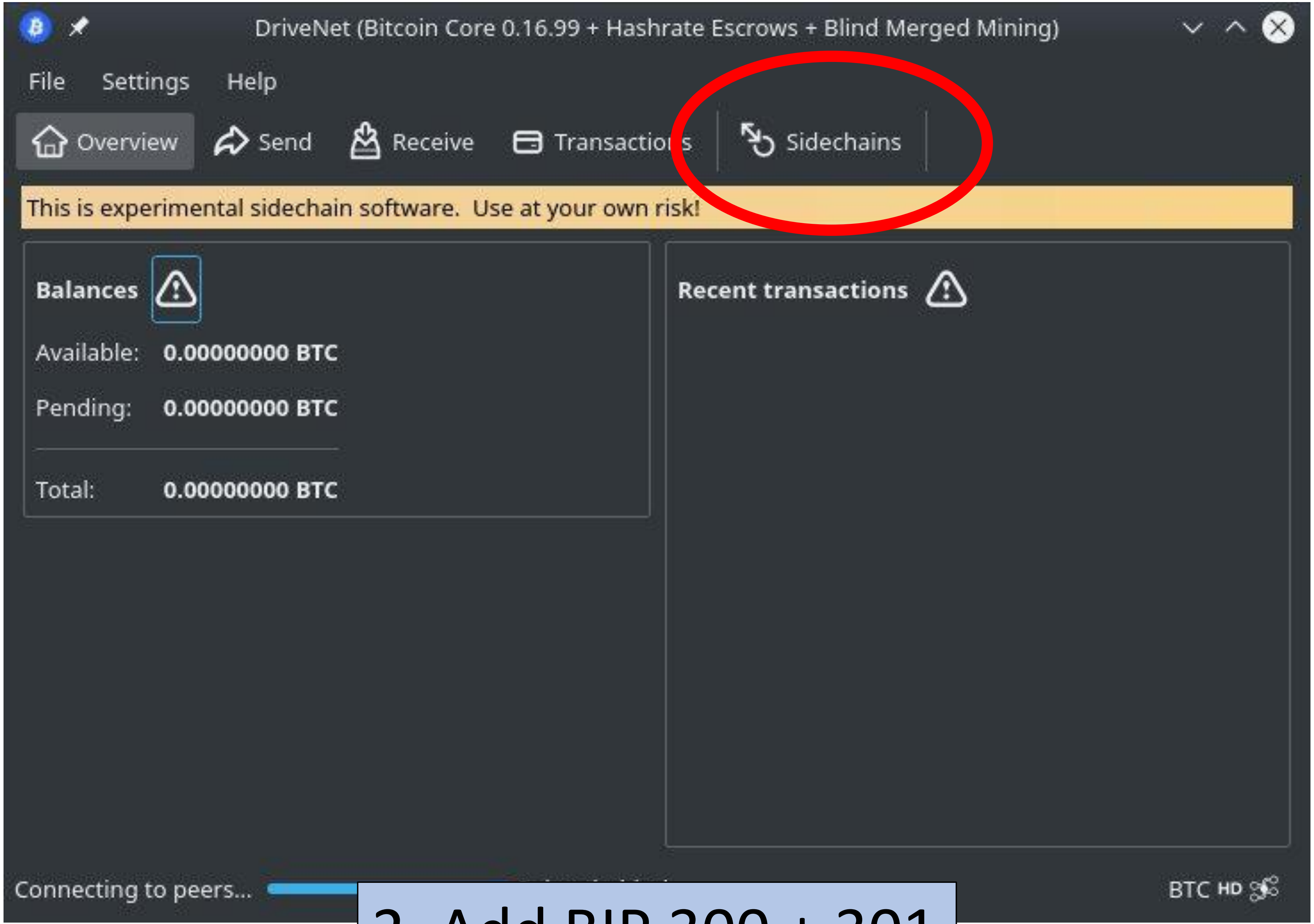
Pending: 0.00000000 BTC

Total: 0.00000000 BTC

Recent transactions (out of sync)

Synchronizing with network... 6 years and 0 weeks behind

1. Start with Bitcoin Core



DriveNet (Bitcoin Core 0.16.99 + Hashrate Escrows + Blind Merged Mining)
File
Settings
Help
Overview
Send
Receive
Transactions
Sidechains
BTC HD

This is experimental sidechain software. Use at your own risk!

Balances

Available: 0.00000000 BTC

Pending: 0.00000000 BTC

Total: 0.00000000 BTC

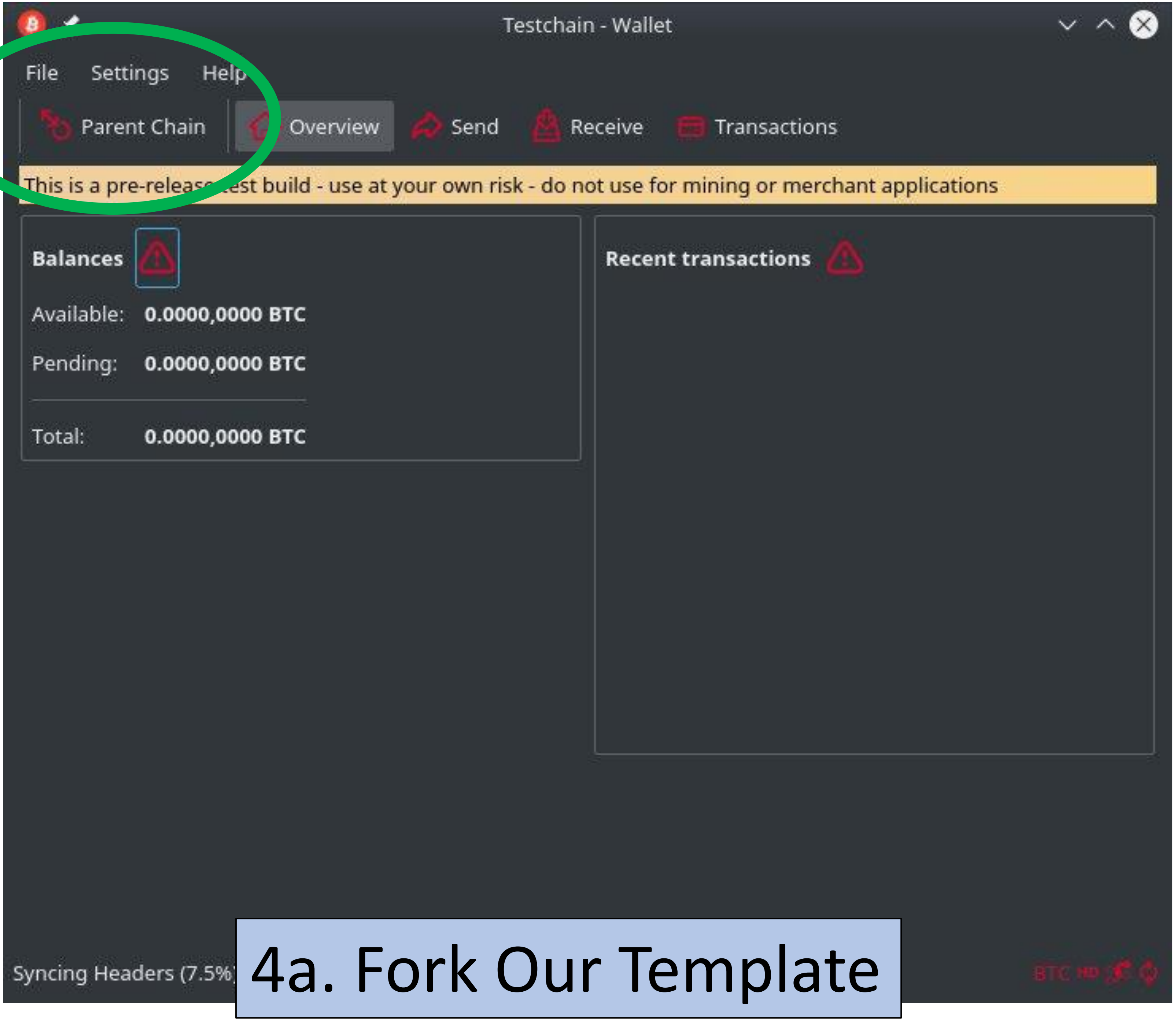
Recent transactions

Connecting to peers...

2. Add BIP 300 + 301

3. Meta-Consensus Problem

4a. Fork Our Template



This is a pre-release test build - use at your own risk - do not use for mining or merchant applications

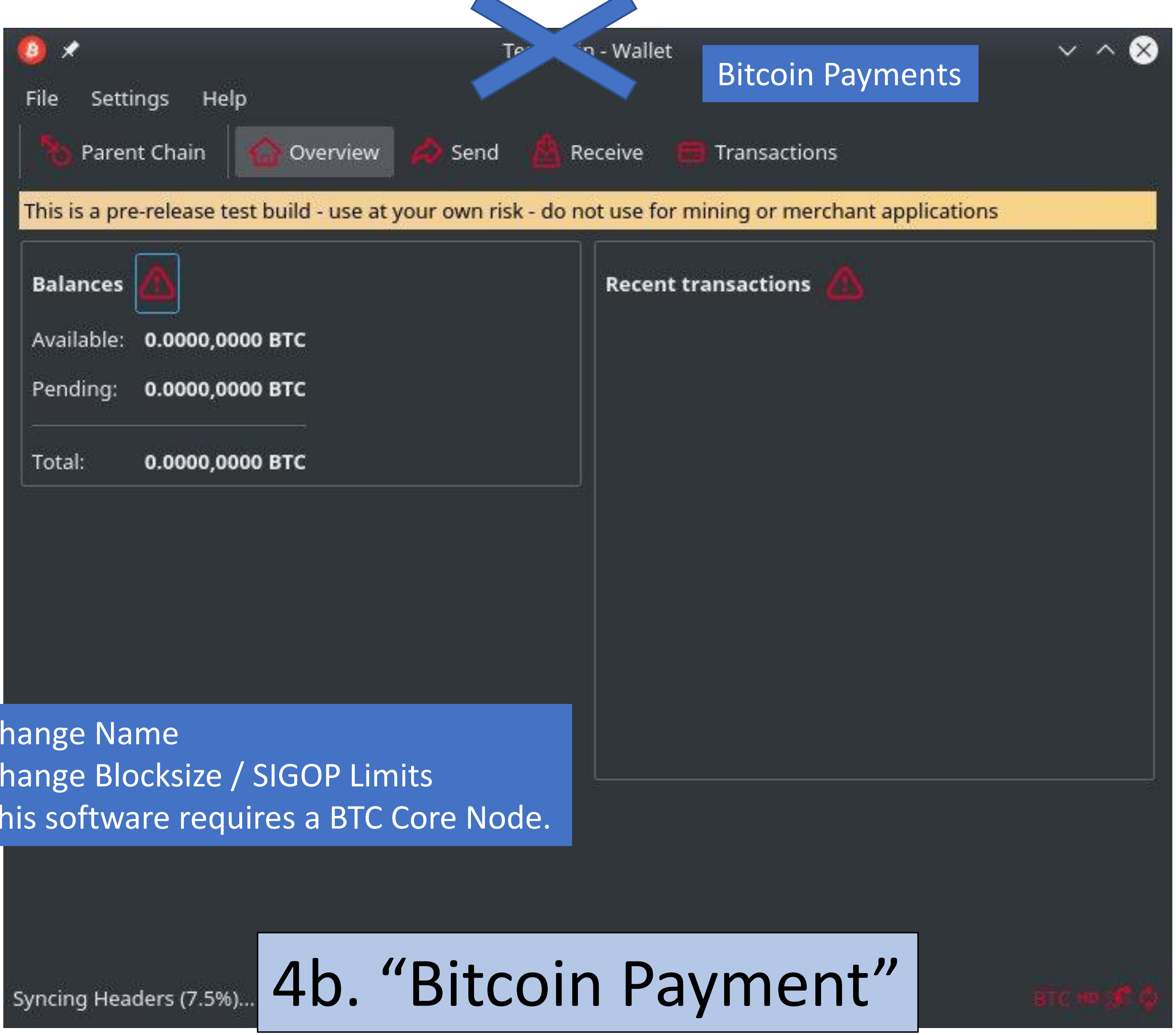
Available: 0.0000,0000 BTC

Pending: 0.0000,0000 BTC

Total: 0.0000,0000 BTC

Syncing Headers (7.5%)

4b. “Bitcoin Payment”



This is a pre-release test build - use at your own risk - do not use for mining or merchant applications

Balances

Available: **0.0000,0000 BTC**

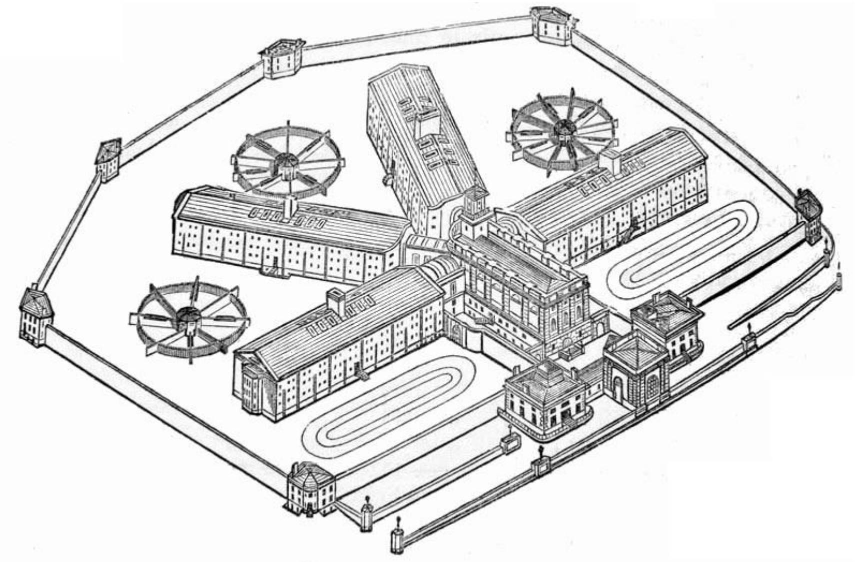
Pending: **0.0000,0000 BTC**

Total: **0.0000,0000 BTC**

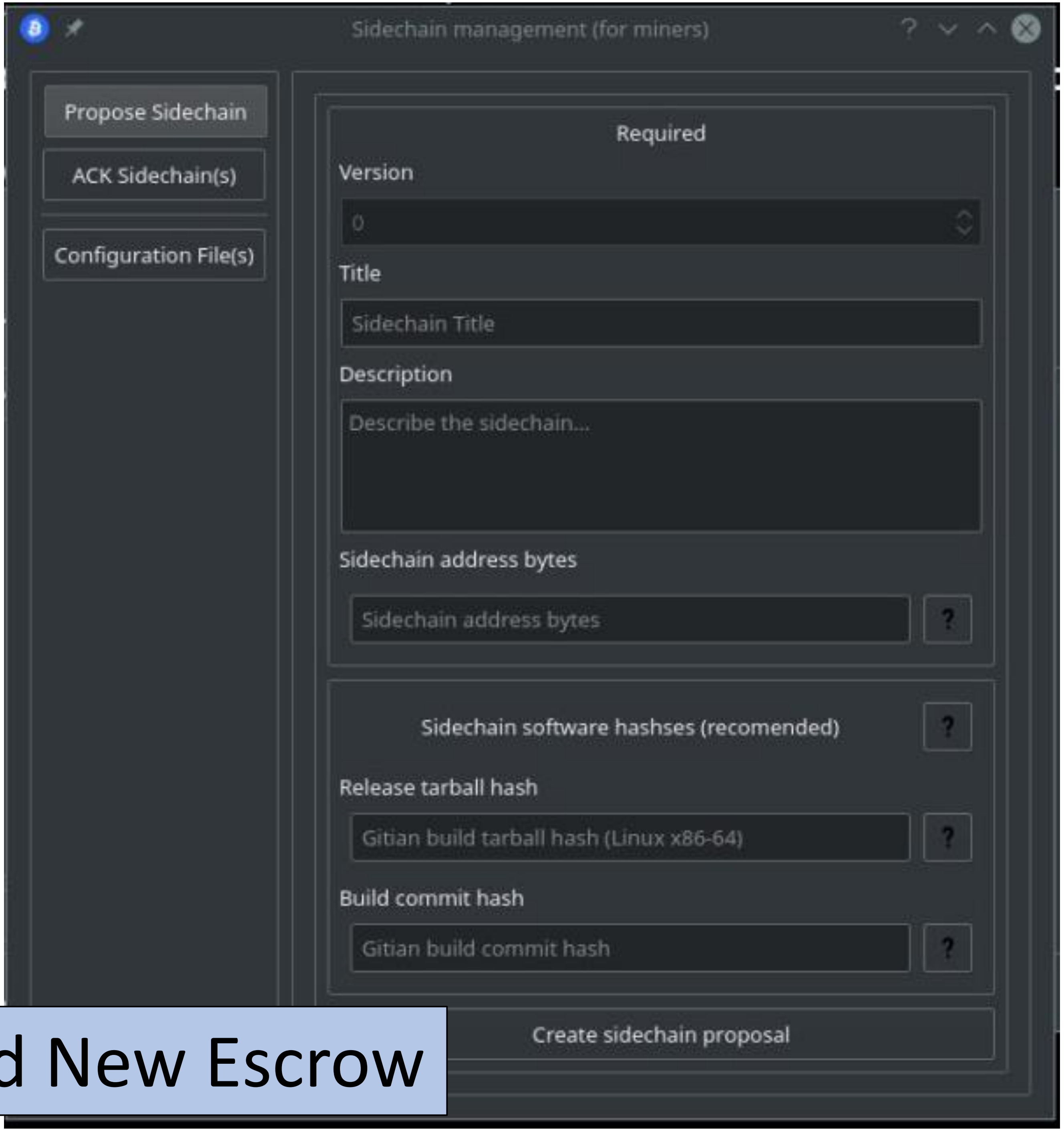
Bitcoin Payments

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

"Bitcoin Payments"



Now Open For Business



Sidechain management (for miners)

Required

Version: 0

Title: Sidechain Title

Description: Describe the sidechain...

Sidechain address bytes: Sidechain address bytes ?

Sidechain software hashses (recomended) ?

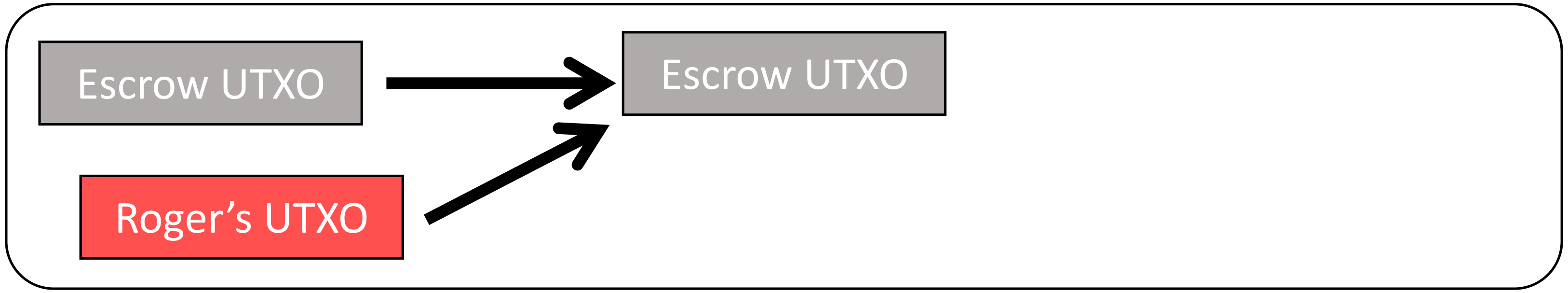
Release tarball hash: Gitian build tarball hash (Linux x86-64) ?

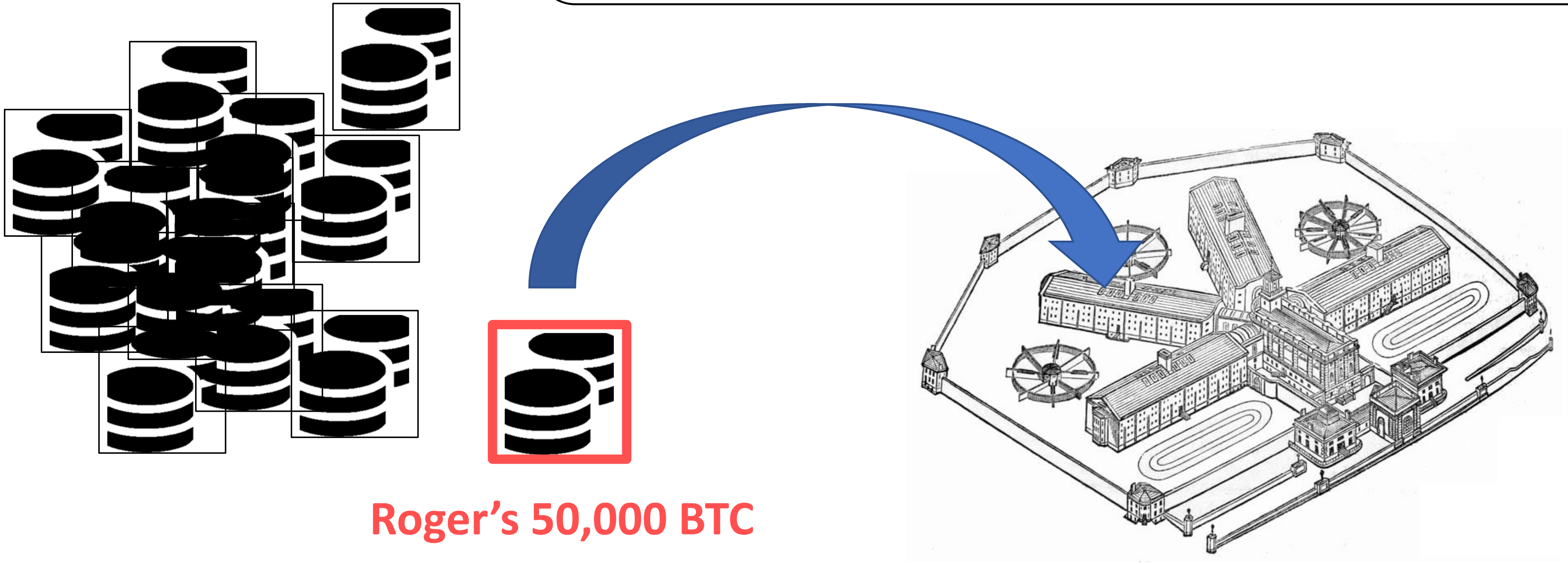
Build commit hash: Gitian build commit hash ?

5. Add New Escrow

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

On layer-1:



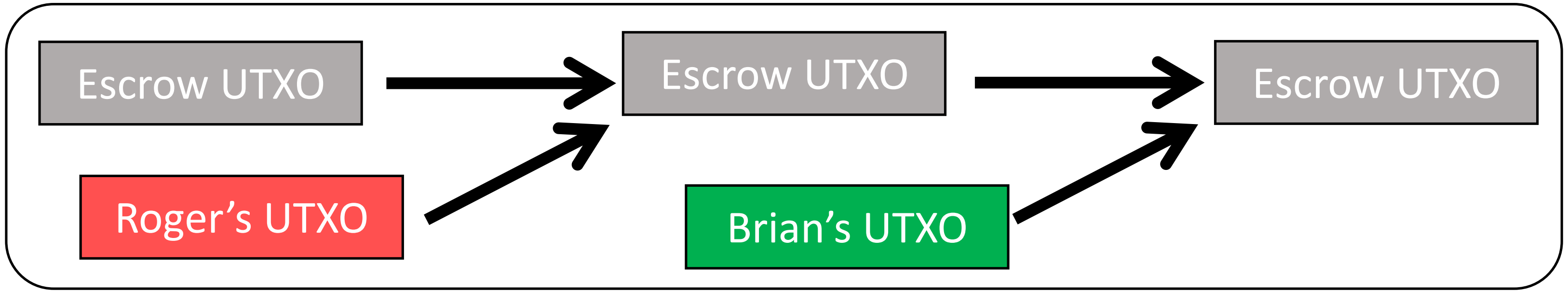


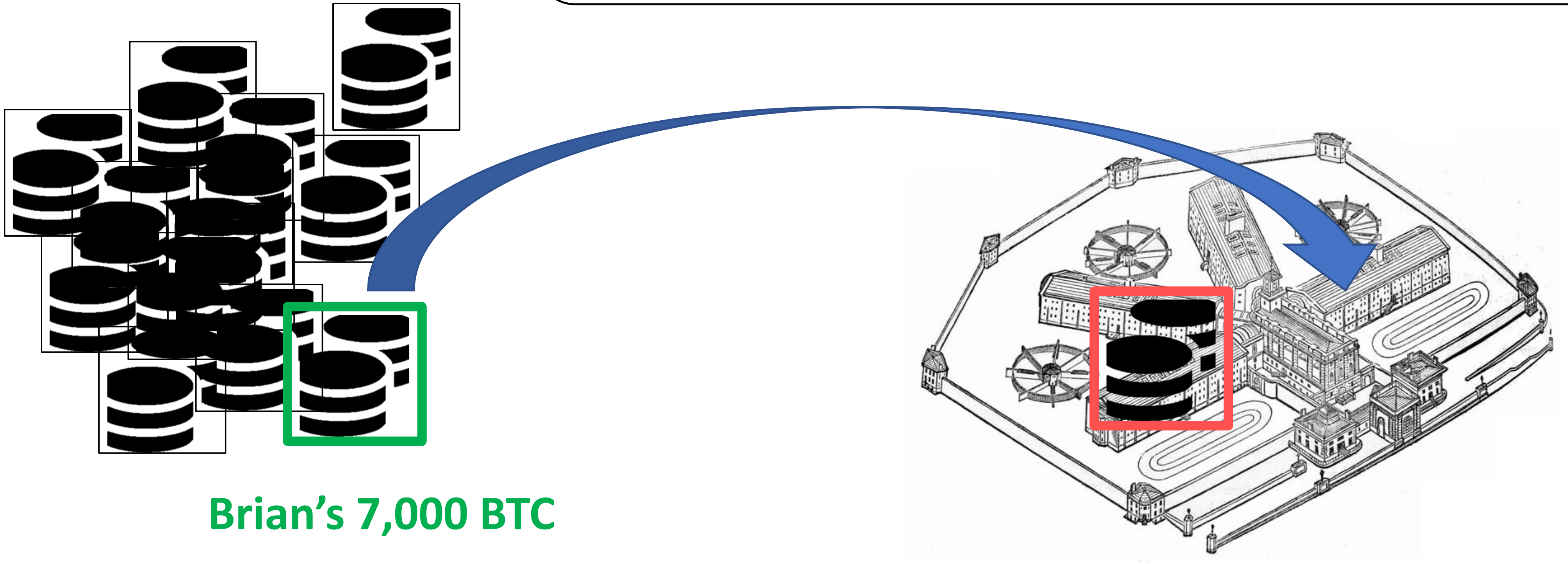
Roger's 50,000 BTC

"Bitcoin Payments"

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

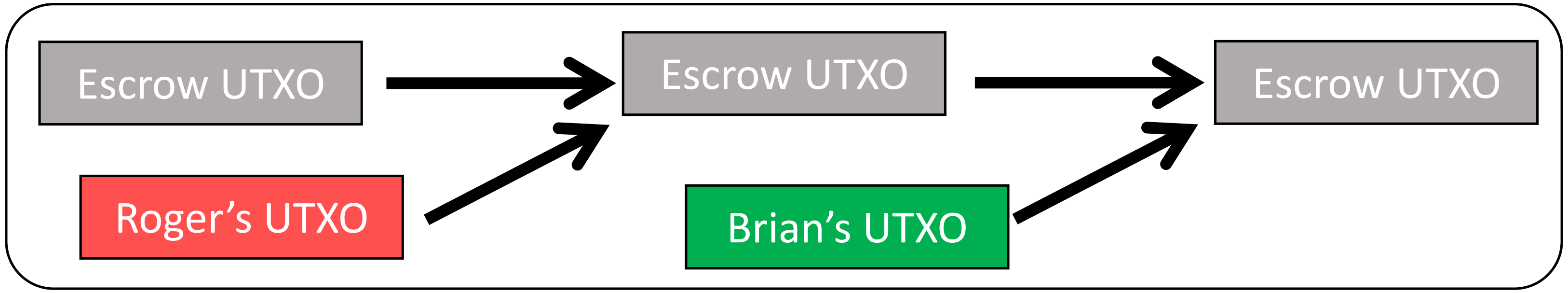
On layer-1:





"Bitcoin Payments"

On layer-1:



Bitcoin.com Wallet

A simple, secure way to send and receive bitcoin.

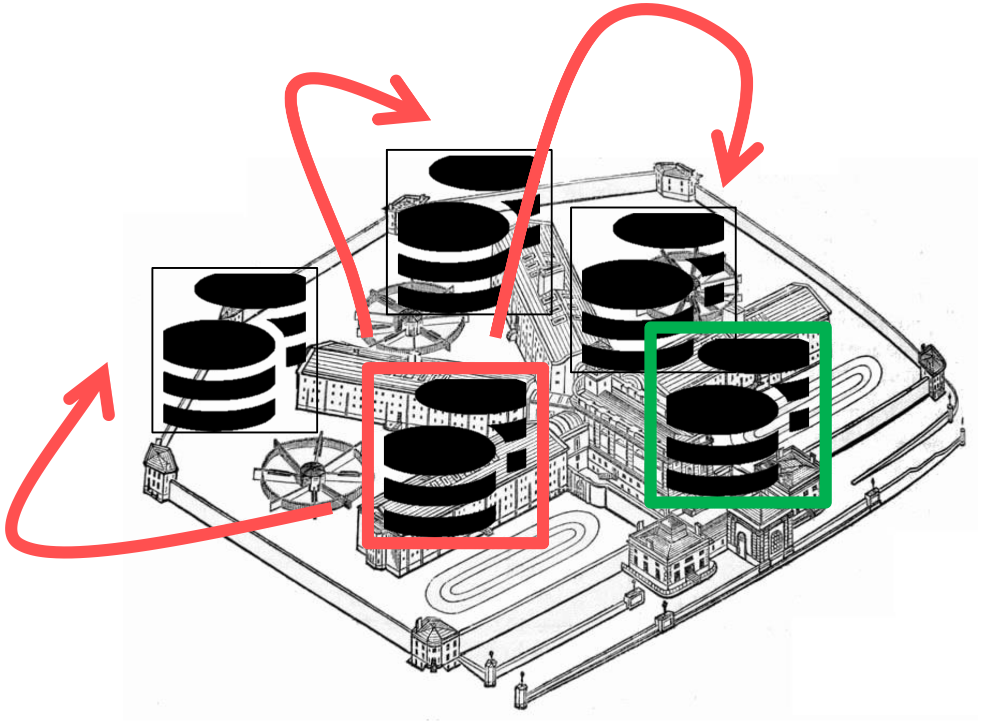
2,503,464 wallets created so far

Bitcoin Cash Wallets

My cash
0.000188 BCH

Multisig
0.008491 BCH 1-of-2

Make Multisig Great Again
0.004612 BCH 2-of-2

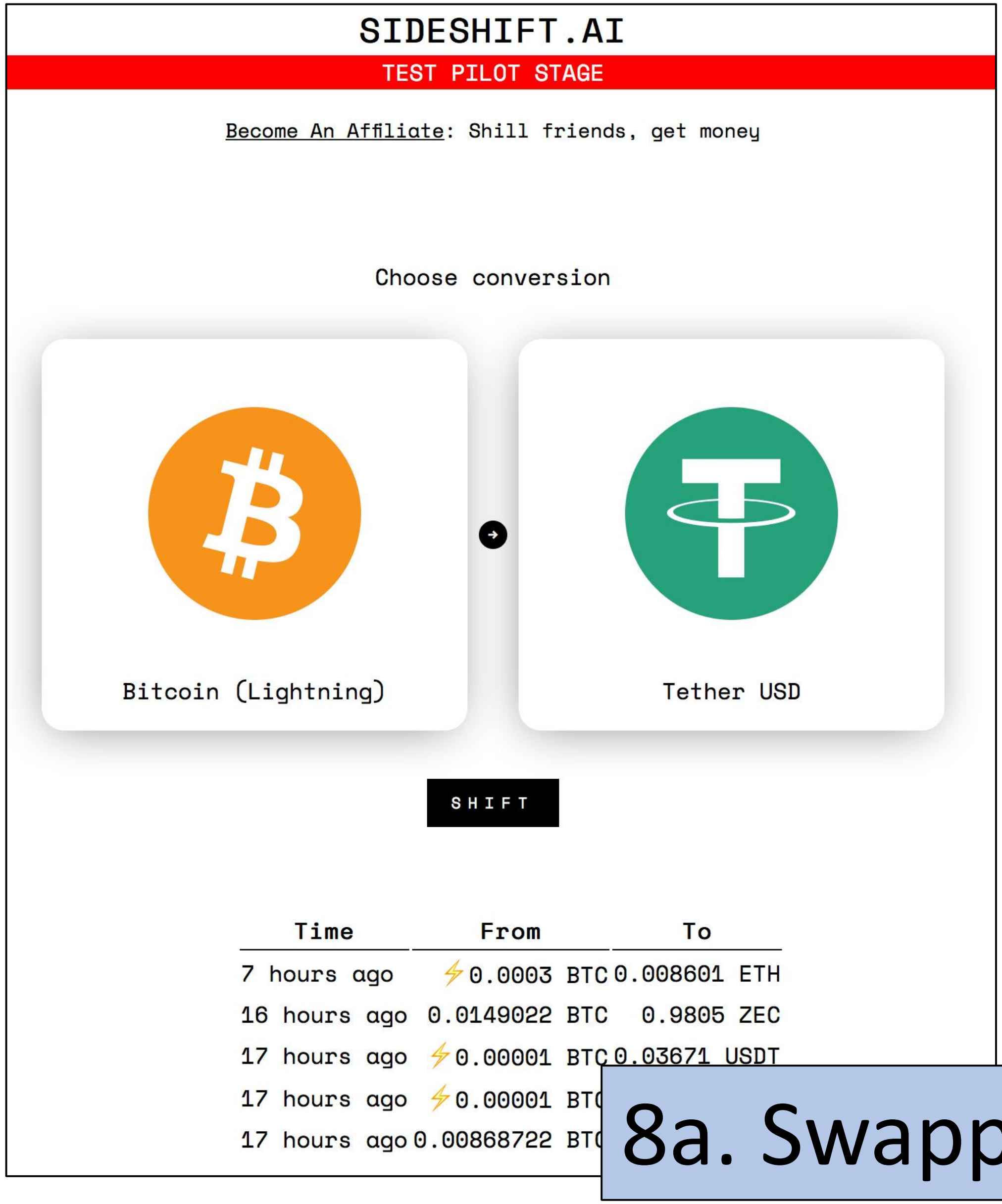


“Bitcoin Payments”

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

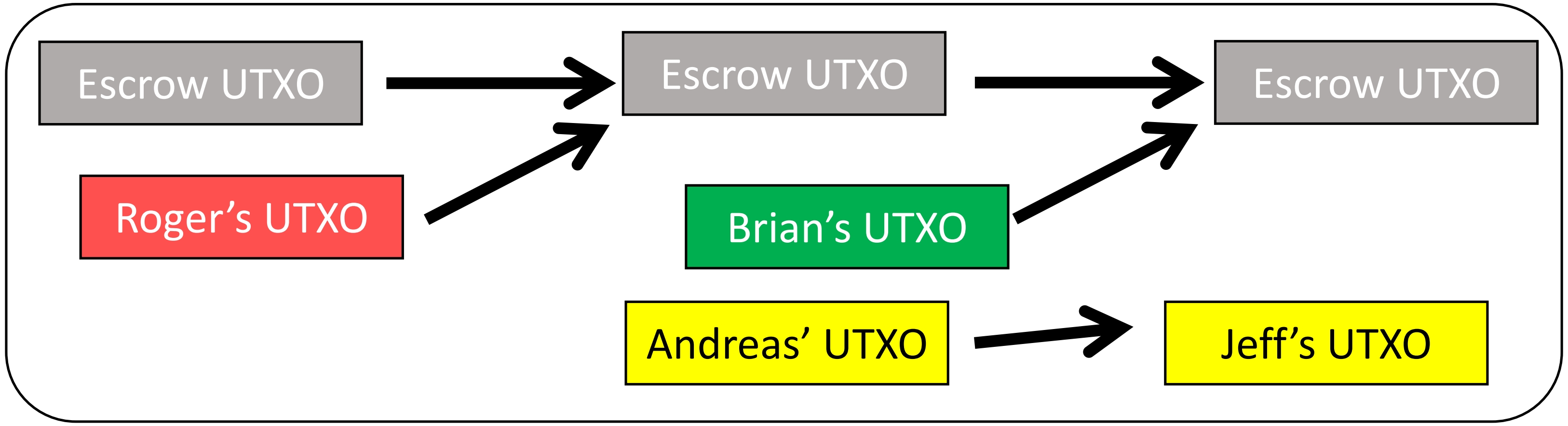
SHIFT

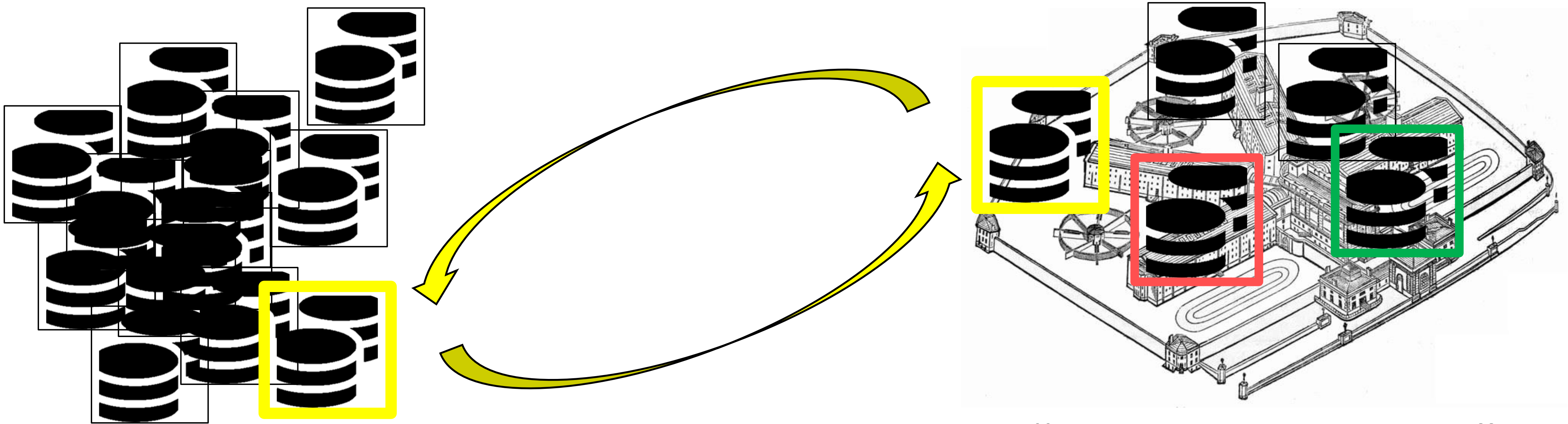
Time	From	To
7 hours ago	⚡0.0003 BTC	0.008601 ETH
16 hours ago	0.0149022 BTC	0.9805 ZEC
17 hours ago	⚡0.00001 BTC	0.03671 USDT
17 hours ago	⚡0.00001 BTC	
17 hours ago	0.00868722 BTC	

8a. Swapping to Instant Freedom

8b. Prisoner Exchange

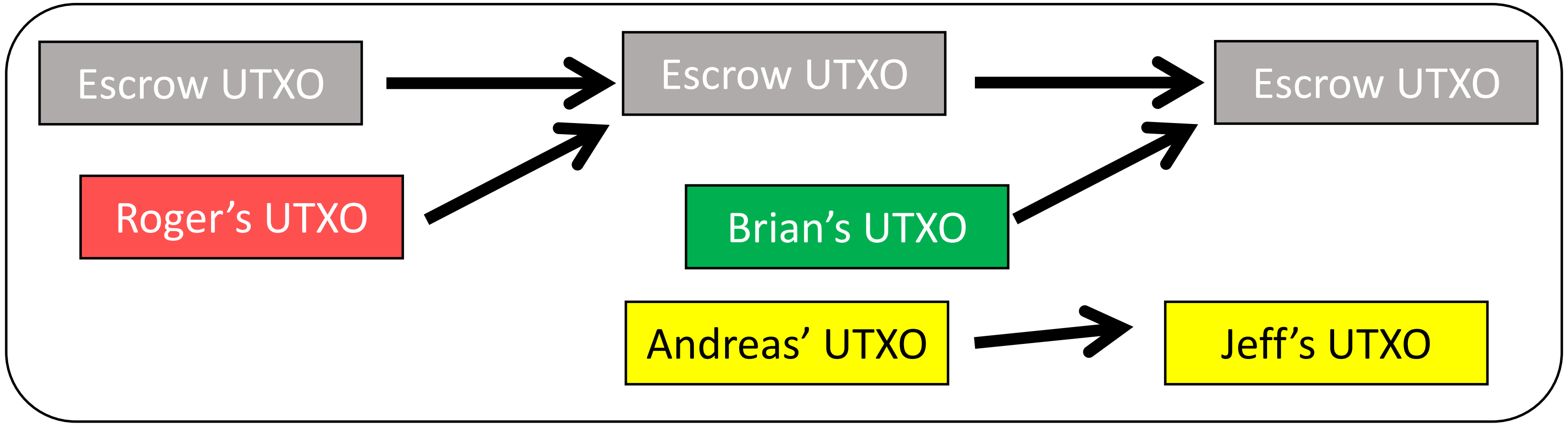
On layer-1:





“Bitcoin Payments”

On layer-1:

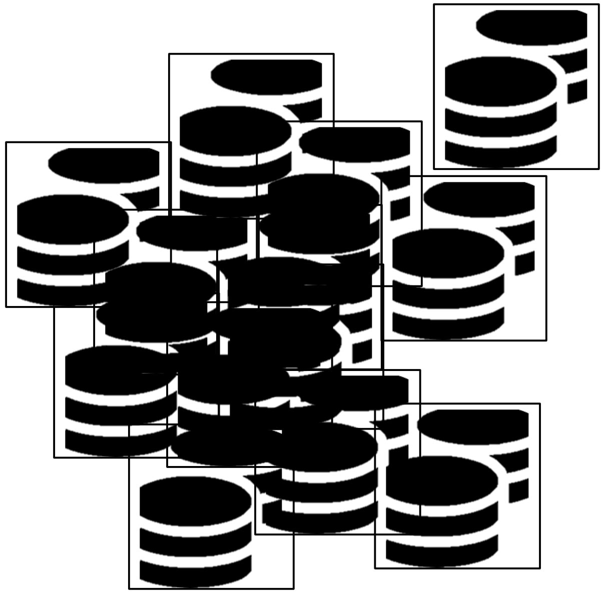


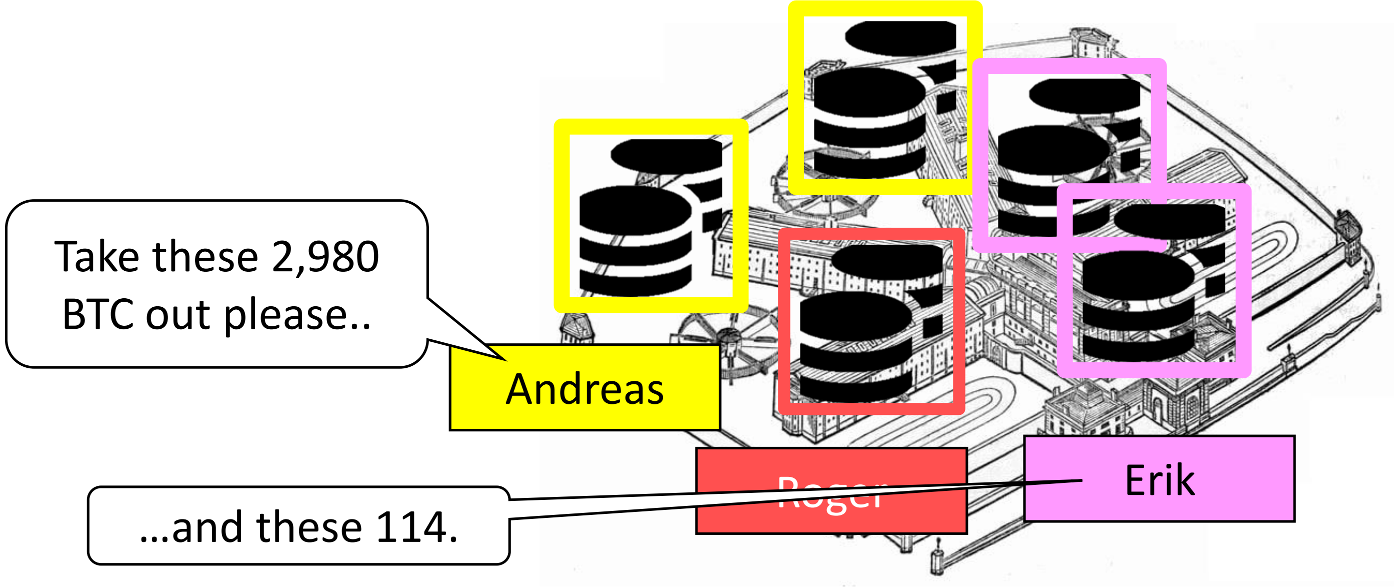
Escrow UTXO → Escrow UTXO → Escrow UTXO

Roger's UTXO → Escrow UTXO

Brian's UTXO → Escrow UTXO

Andreas' UTXO → Jeff's UTXO



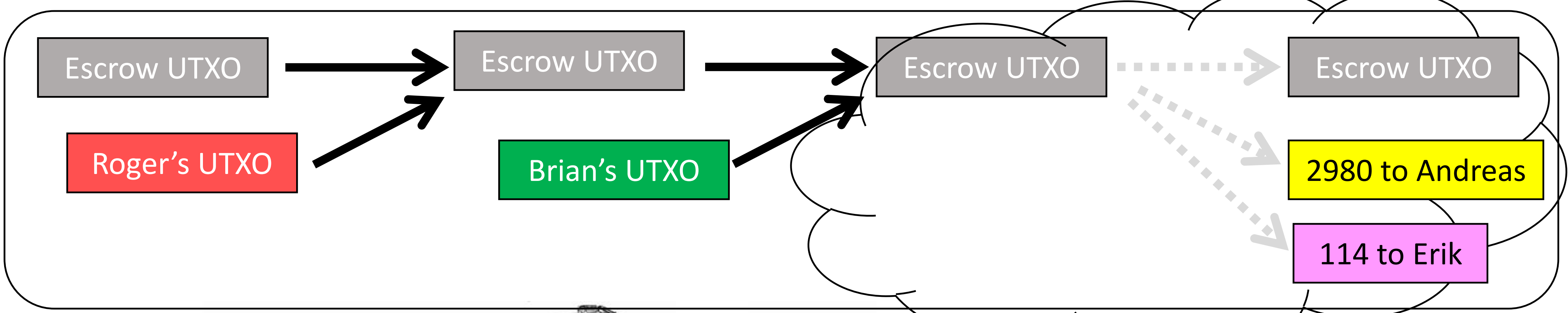


Take these 2,980 BTC out please..

…and these 114.

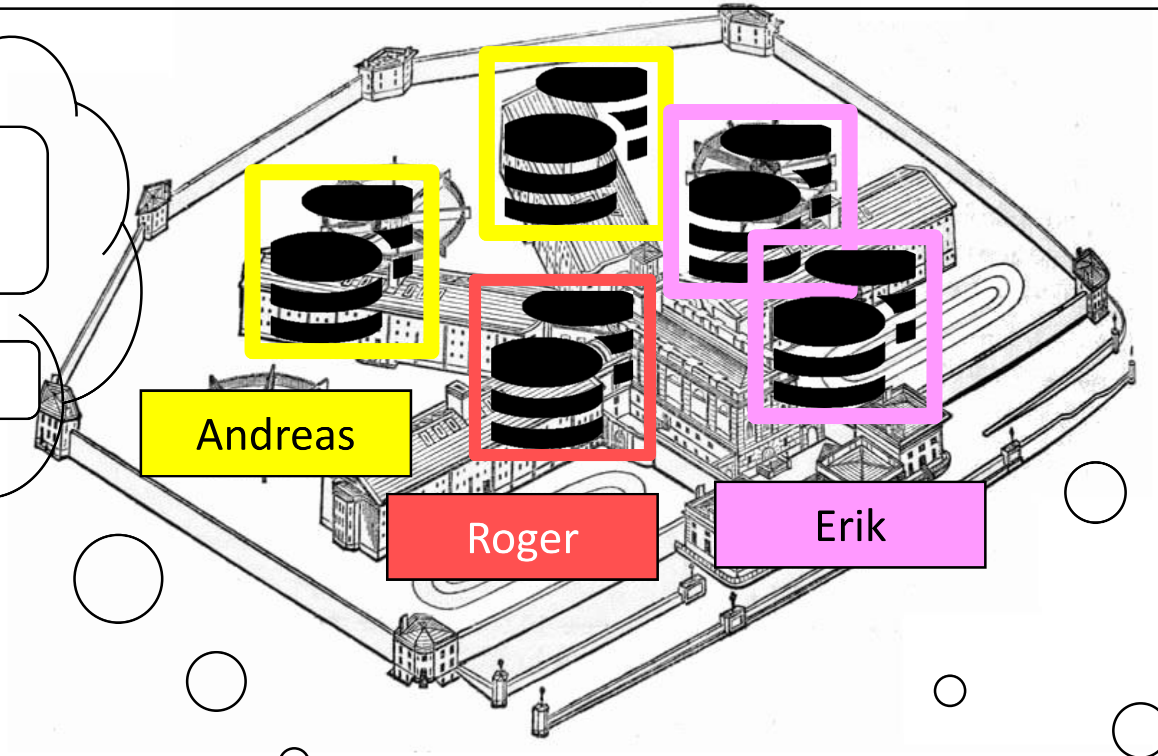
“Bitcoin Payments”

9. Leaving Prison



Take these 2,980 BTC out please..

...and these 114.



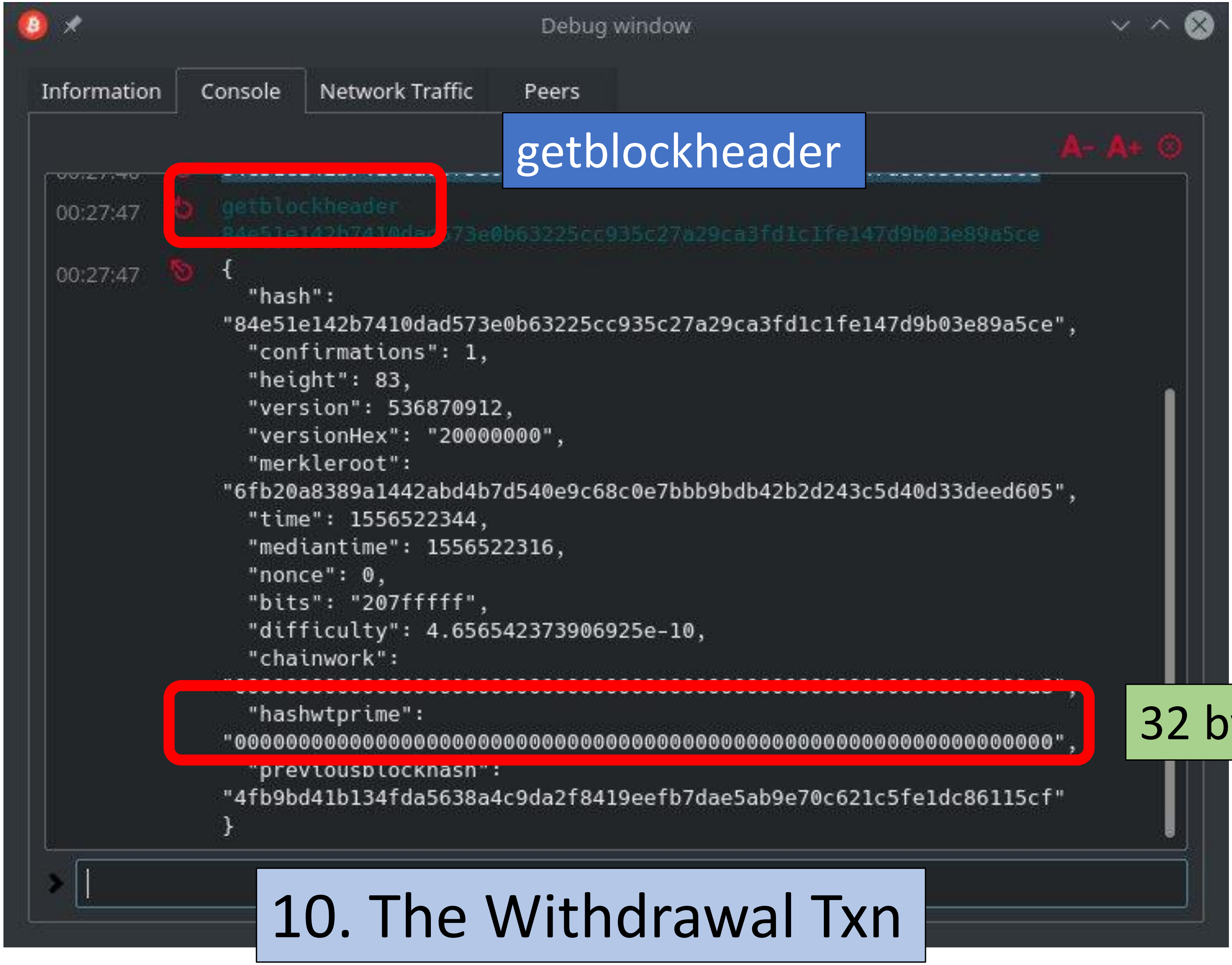
“Bitcoin Payments”

32 bytes

What do I need?

10. The Withdrawal Txn

10. The Withdrawal Txn

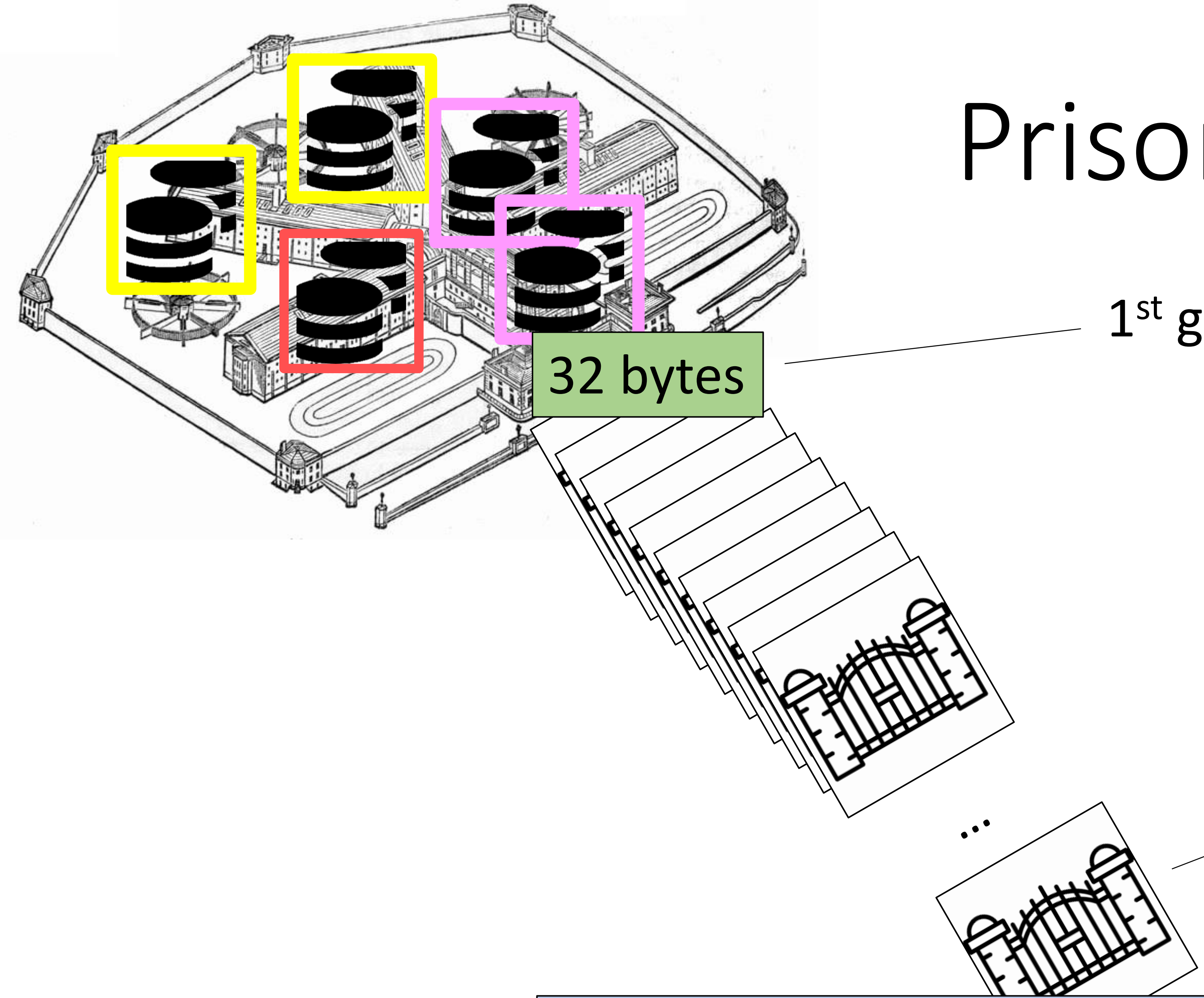


getblockheader

```
00:27:47   getblockheader 84e51e142b7410dad573e0b63225cc935c27a29ca3fd1c1fe147d9b03e89a5ce
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":
           "00000000000000000000000000000000000000000000000000000000000000a8",
             "hashwtprime":
           "0000000000000000000000000000000000000000000000000000000000000000",
             "previousblockhash":
           "4fb9bd41b134fda5638a4c9da2f8419eefb7dae5ab9e70c621c5fe1dc86115cf"
           }
```

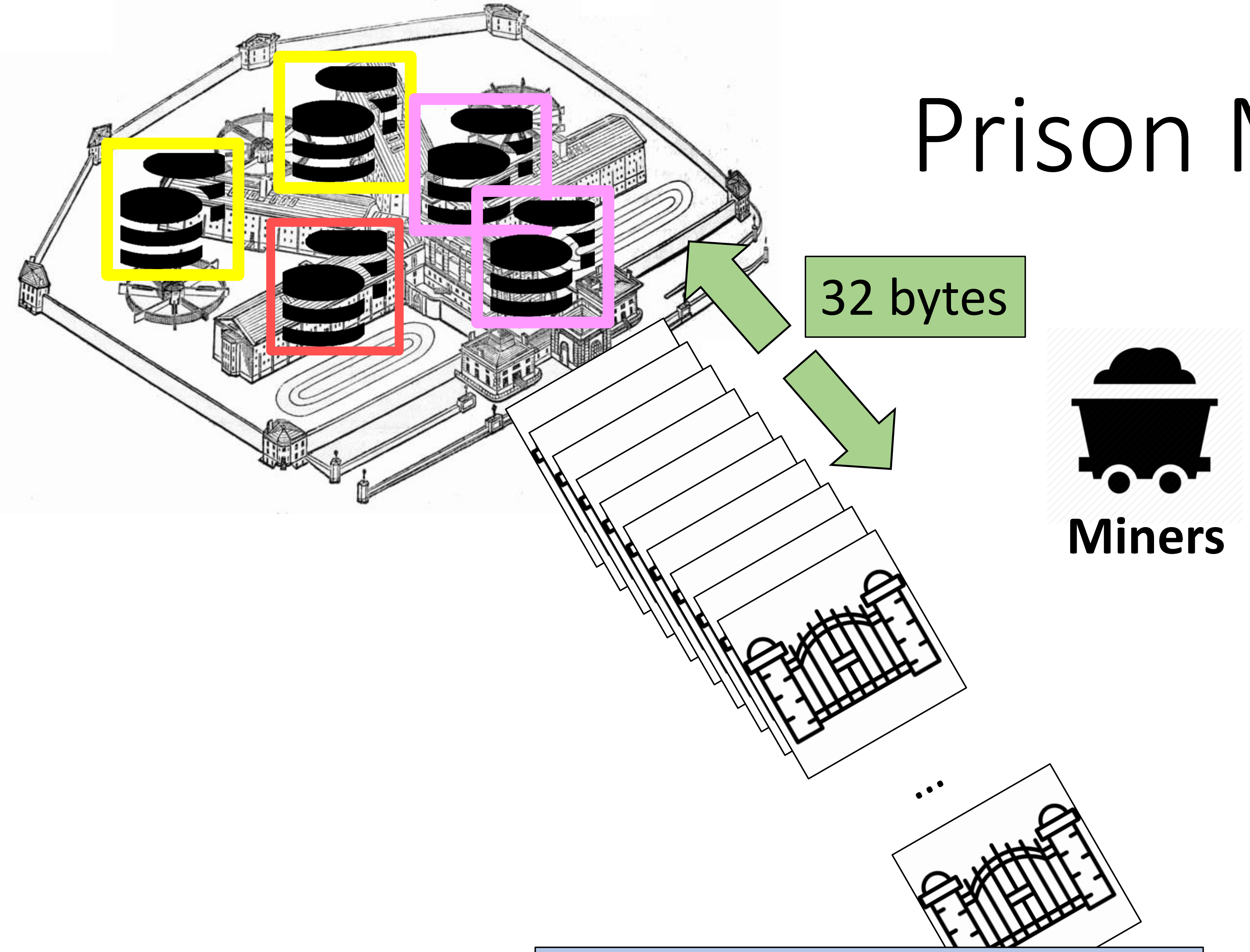
32 bytes

Prison Metaphor

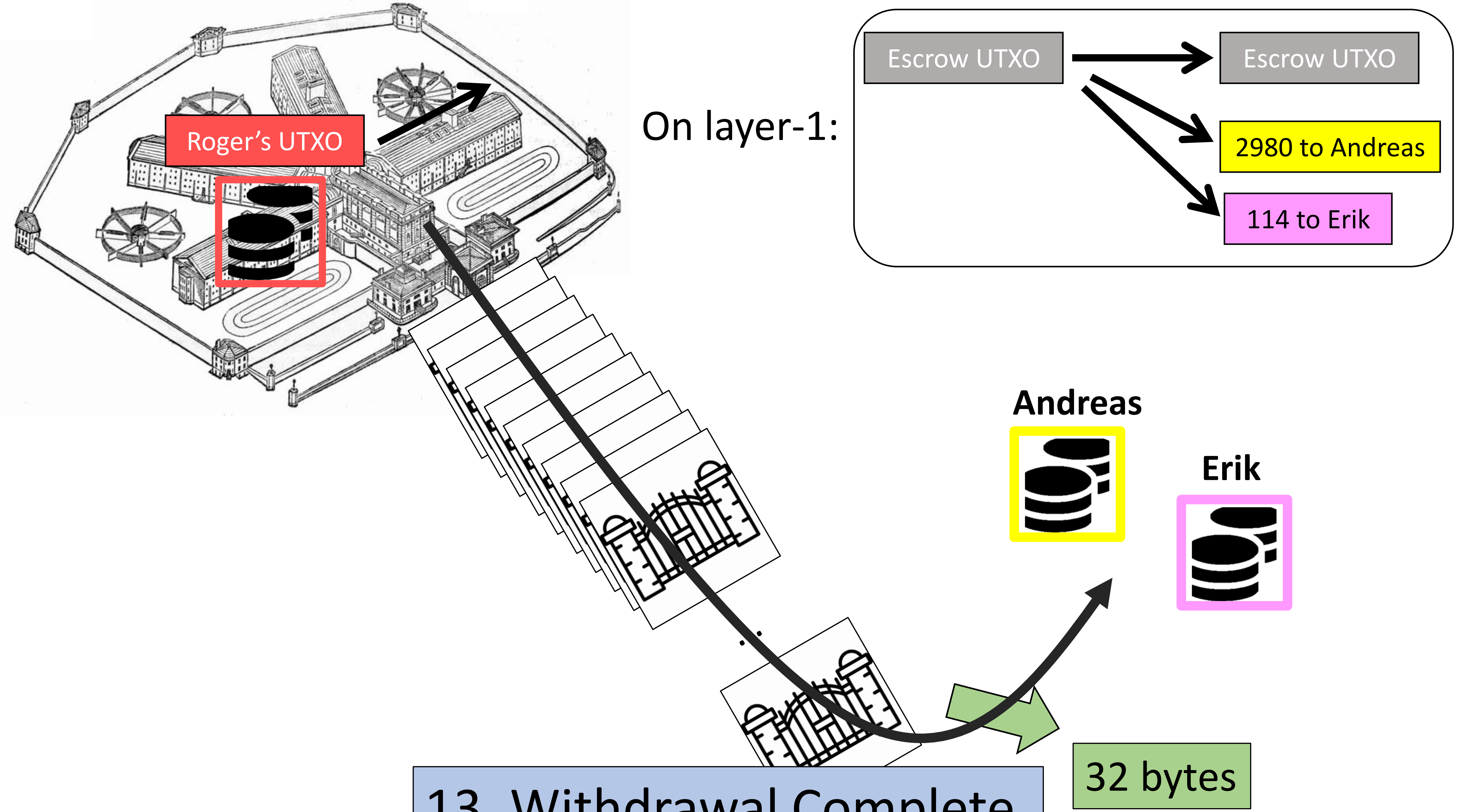


11. Starting Off…

Prison Metaphor



12. Making Progress…



Roger’s UTXO

On layer-1:

Escrow UTXO

Escrow UTXO

2980 to Andreas

114 to Erik

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.

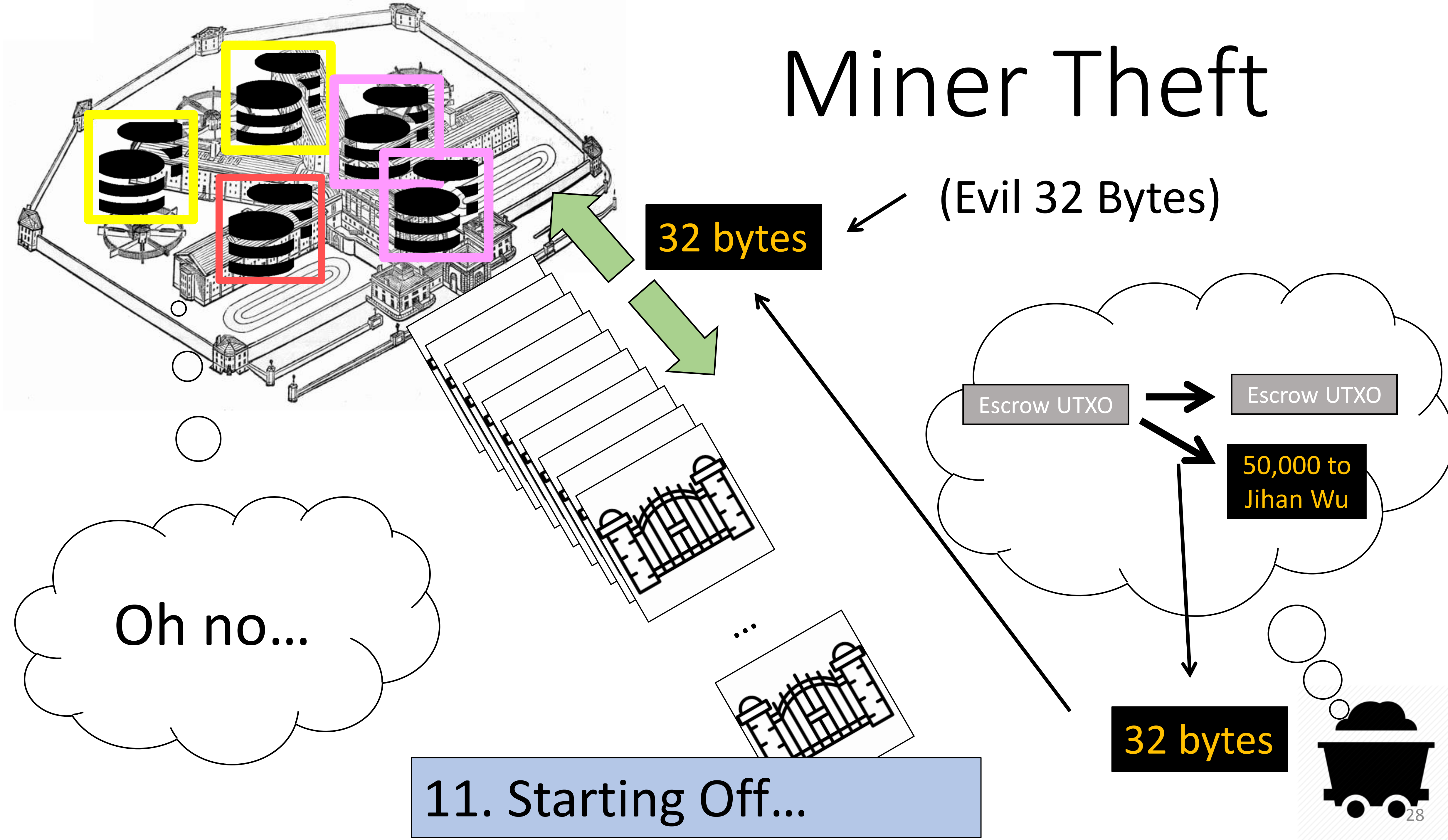
Upper Layers = Different Threat Models

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

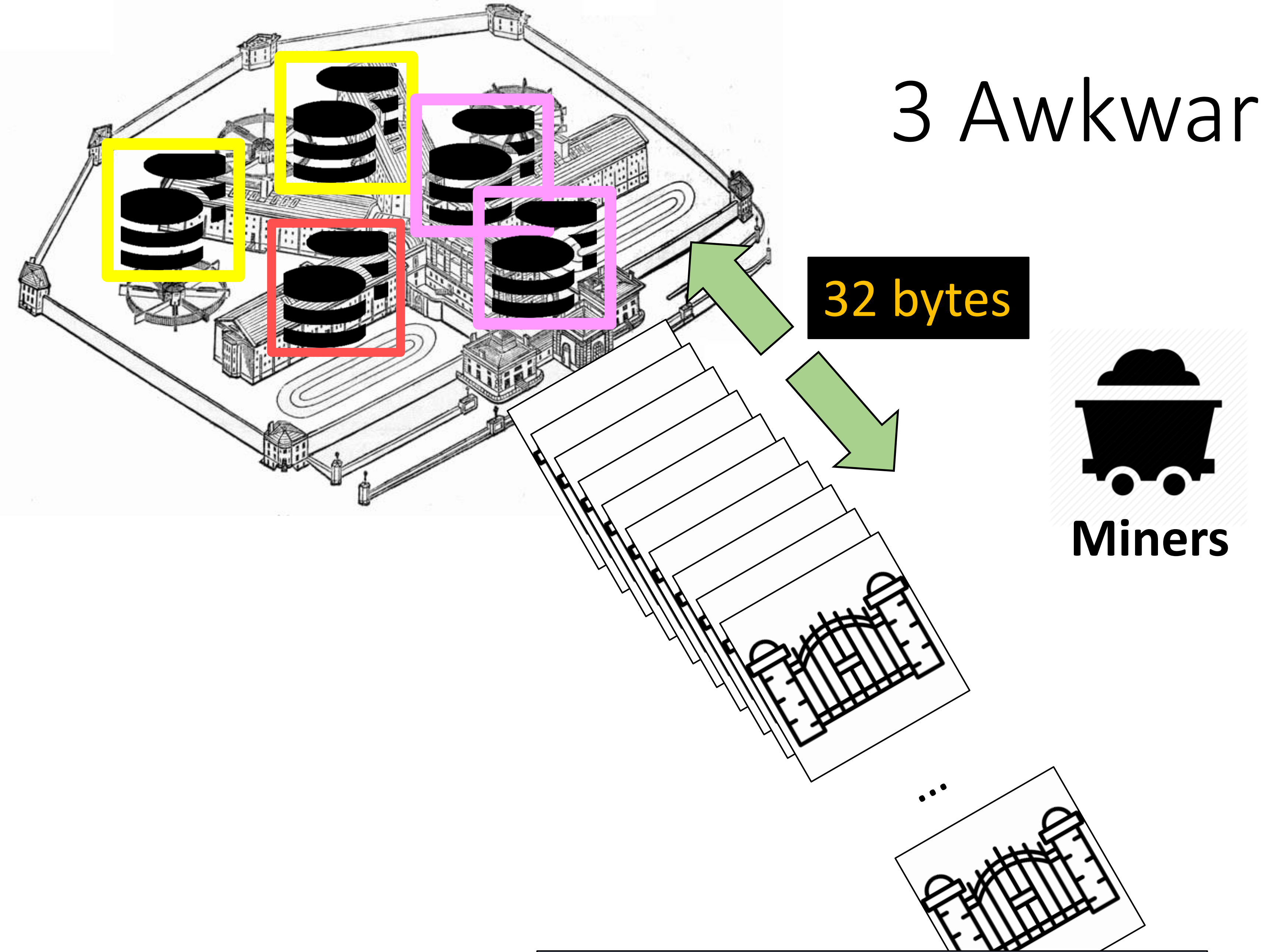
Upper Layer:	Lightning Network	Hashrate Escrow
New Security Considerations	• Notice fraud in time. • Emergency Broadcast to Layer-1 • Shrug off custodial period.	Are these escrows making miners wealthier? Are they ***popular***?

Miner Theft

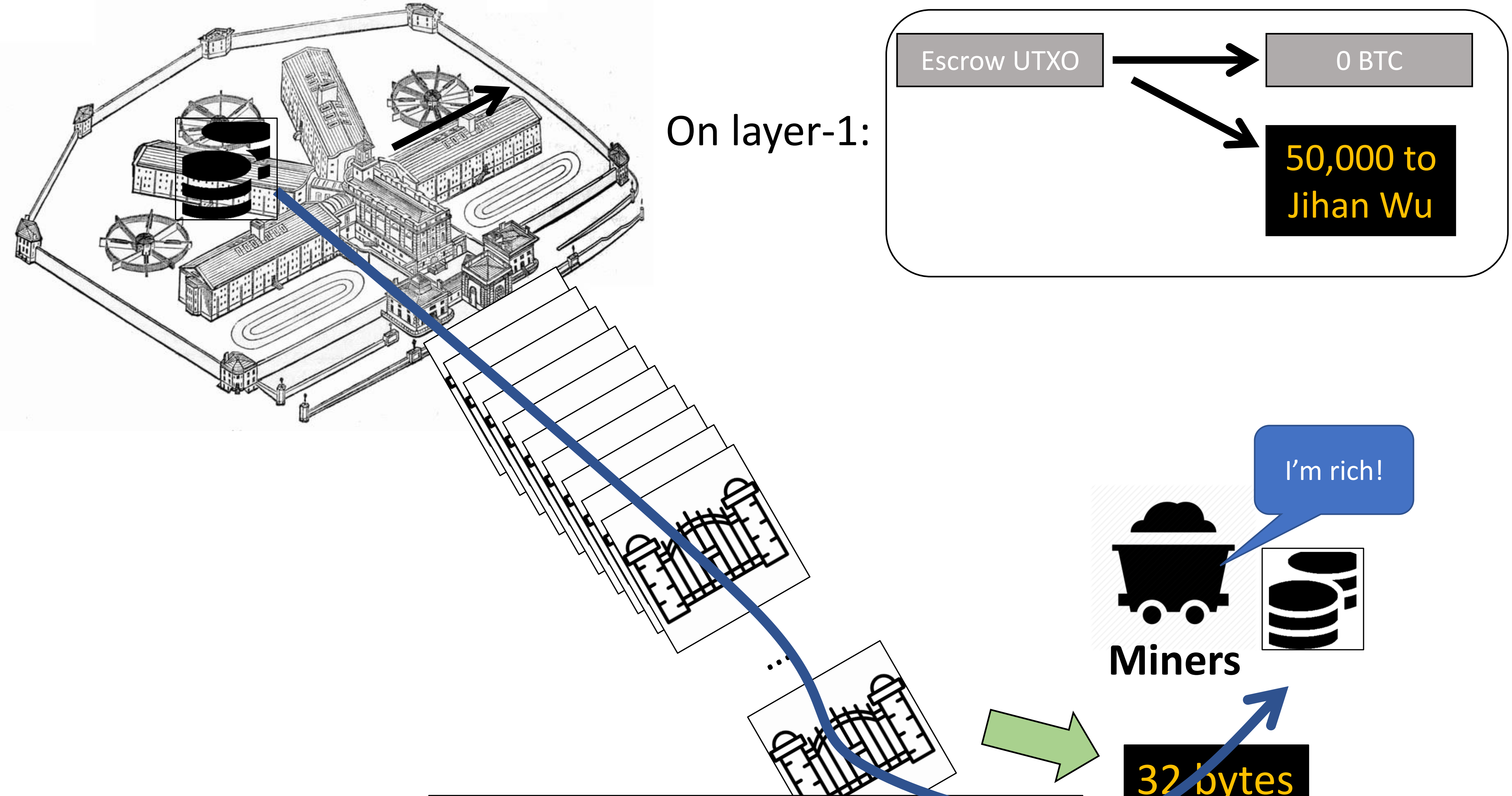


11. Starting Off…

3 Awkward Months…



12. Making Progress…



On layer-1:

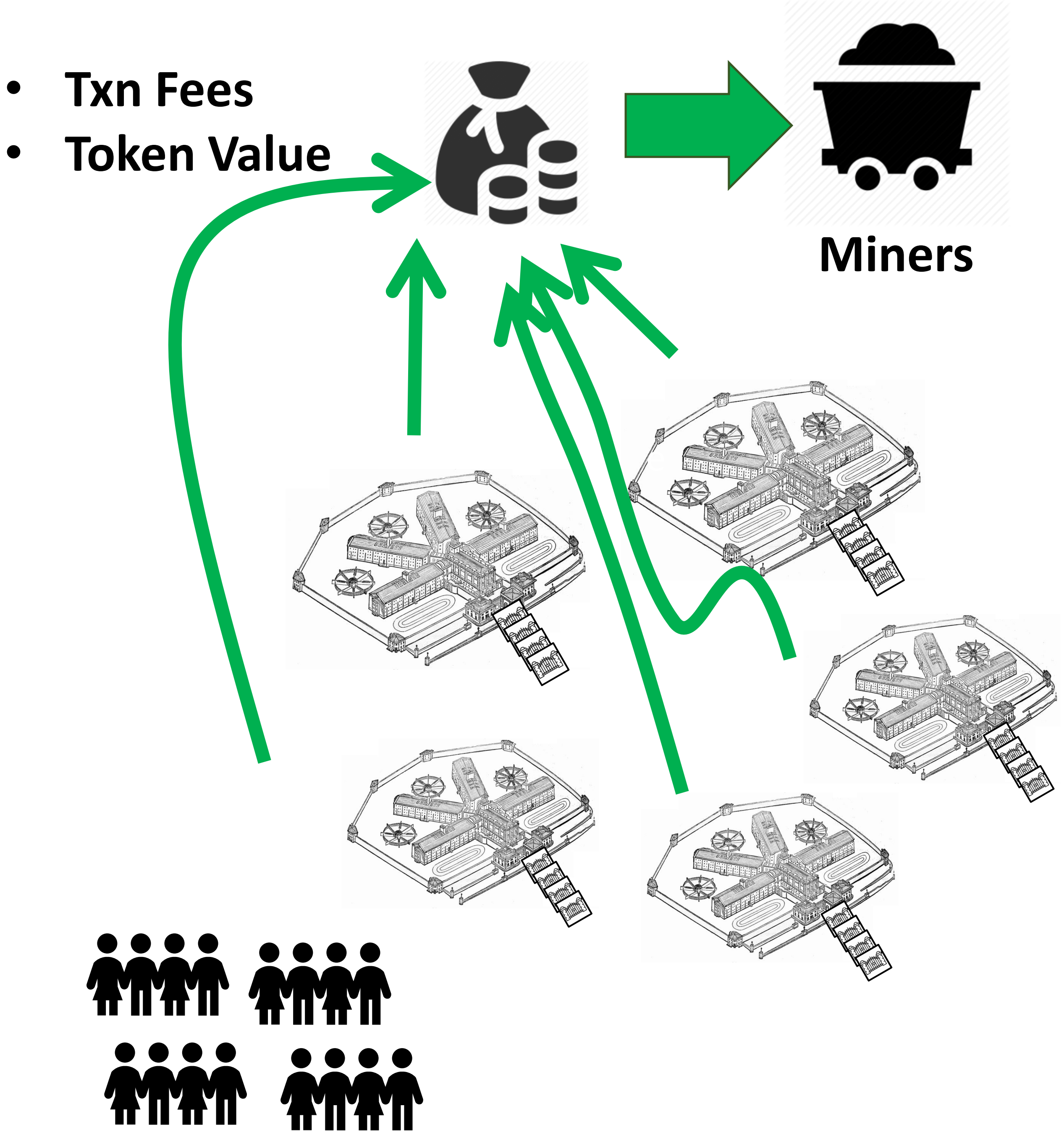
Escrow UTXO → 0 BTC

Escrow UTXO → 50,000 to Jihan Wu

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

If you are willing to swallow the new security consideration…

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

	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

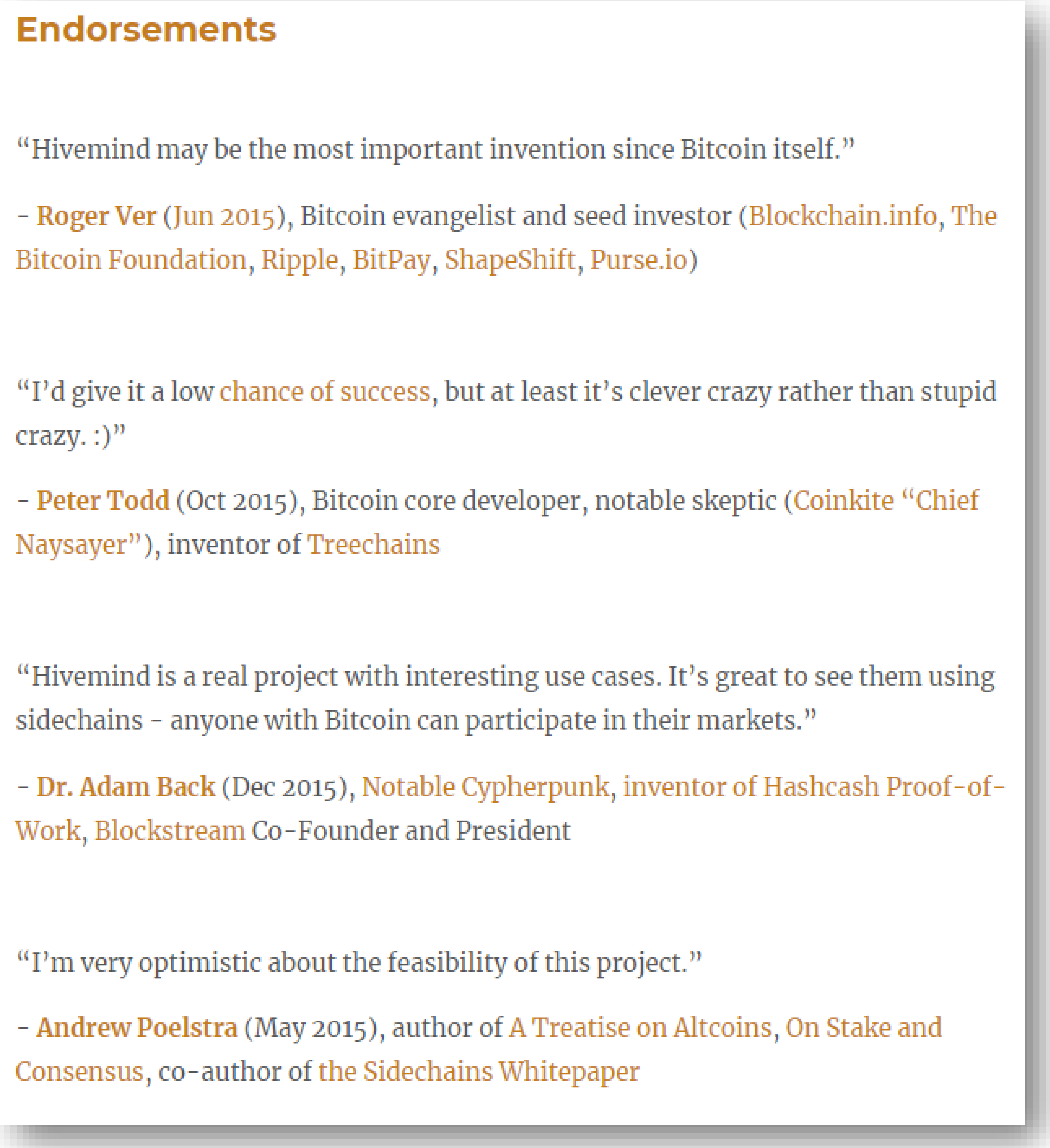
…then we see that the primary advantage of LN is **fast settlement**, especially when both buyer and seller are online. So, LN probably best for in-person retail; SC better for online shopping, perhaps.

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

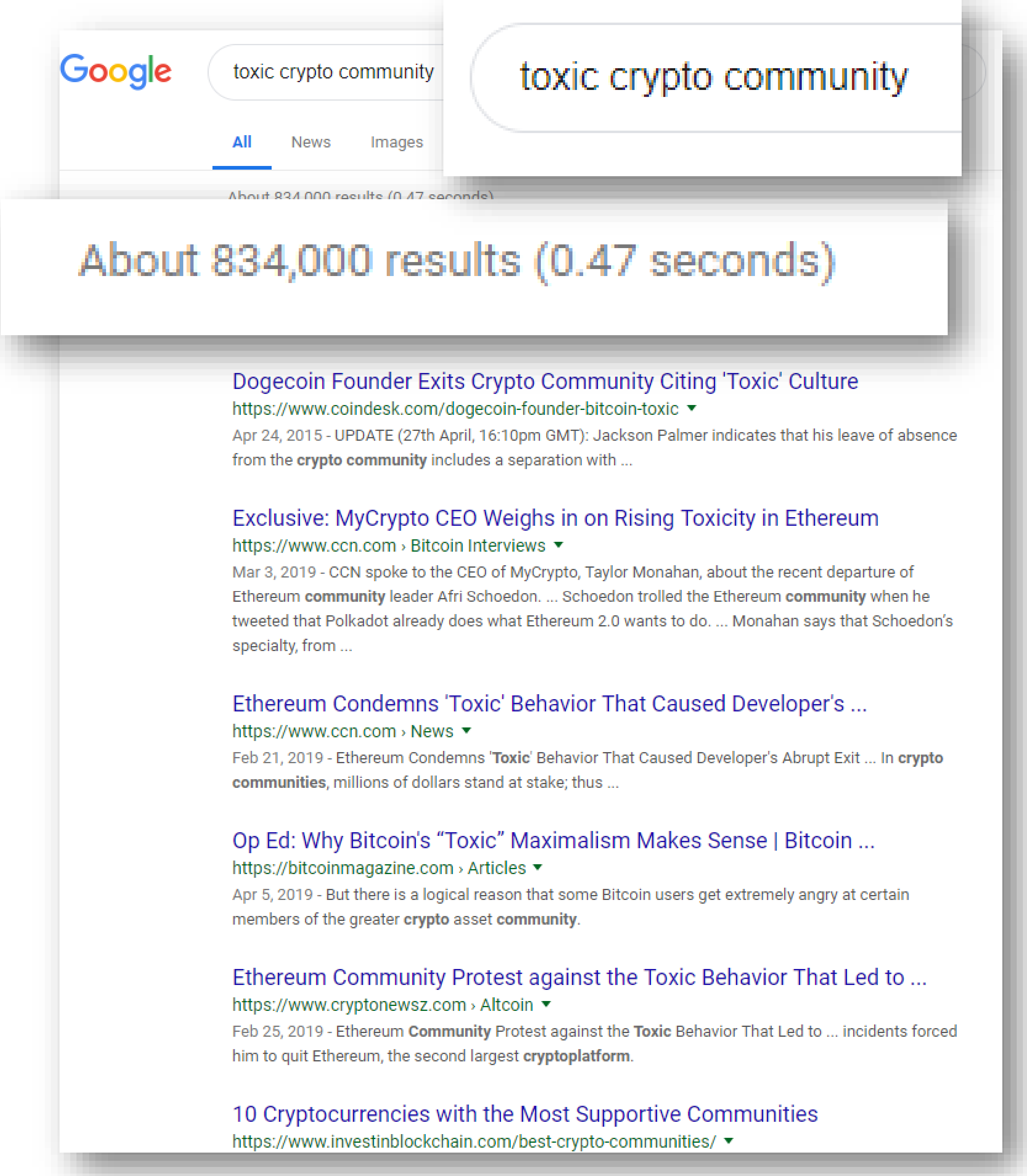
"Hivemind is a real project with interesting use cases. It's great to see them using sidechains - anyone with Bitcoin can participate in their markets."

- **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”



toxic crypto community

toxic crypto community

About 834,000 results (0.47 seconds)

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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 ...

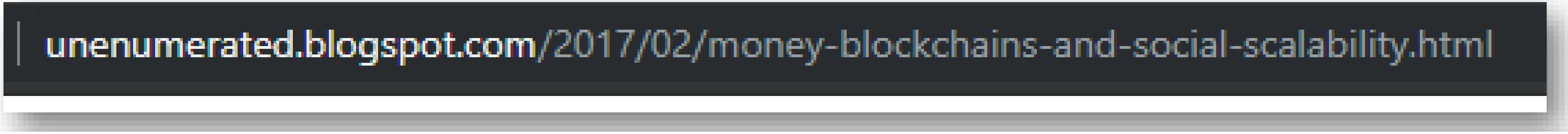
Exclusive: MyCrypto CEO Weighs in on Rising Toxicity in Ethereum
https://www.ccn.com › Bitcoin Interviews ▾
Mar 3, 2019 - CCN spoke to the CEO of MyCrypto, Taylor Monahan, about the recent departure of Ethereum **community** leader Afri Schoedon. ... Schoedon trolled the Ethereum **community** when he tweeted that Polkadot already does what Ethereum 2.0 wants to do. ... Monahan says that Schoedon's specialty, from ...

Ethereum Condemns 'Toxic' Behavior That Caused Developer's ...
https://www.ccn.com › News ▾
Feb 21, 2019 - Ethereum Condemns '**Toxic**' Behavior That Caused Developer's Abrupt Exit ... In **crypto communities**, millions of dollars stand at stake; thus ...

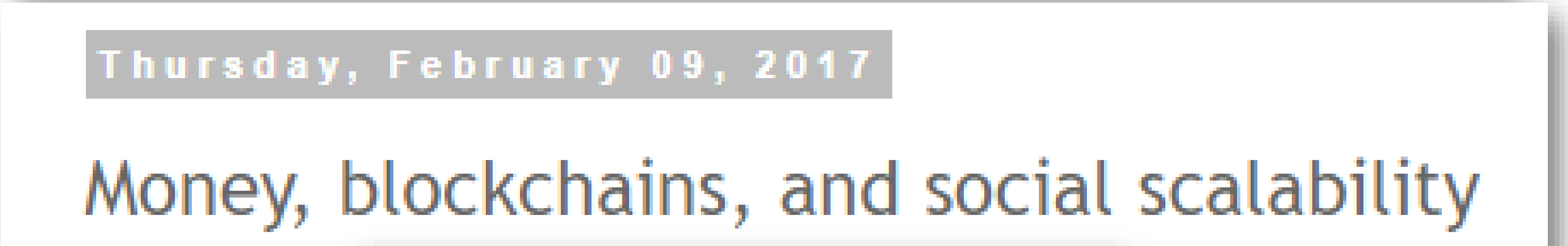
Op Ed: Why Bitcoin's “Toxic” Maximalism Makes Sense | Bitcoin ...
https://bitcoinmagazine.com › Articles ▾
Apr 5, 2019 - But there is a logical reason that some Bitcoin users get extremely angry at certain members of the greater **crypto** asset **community**.

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/ ▾

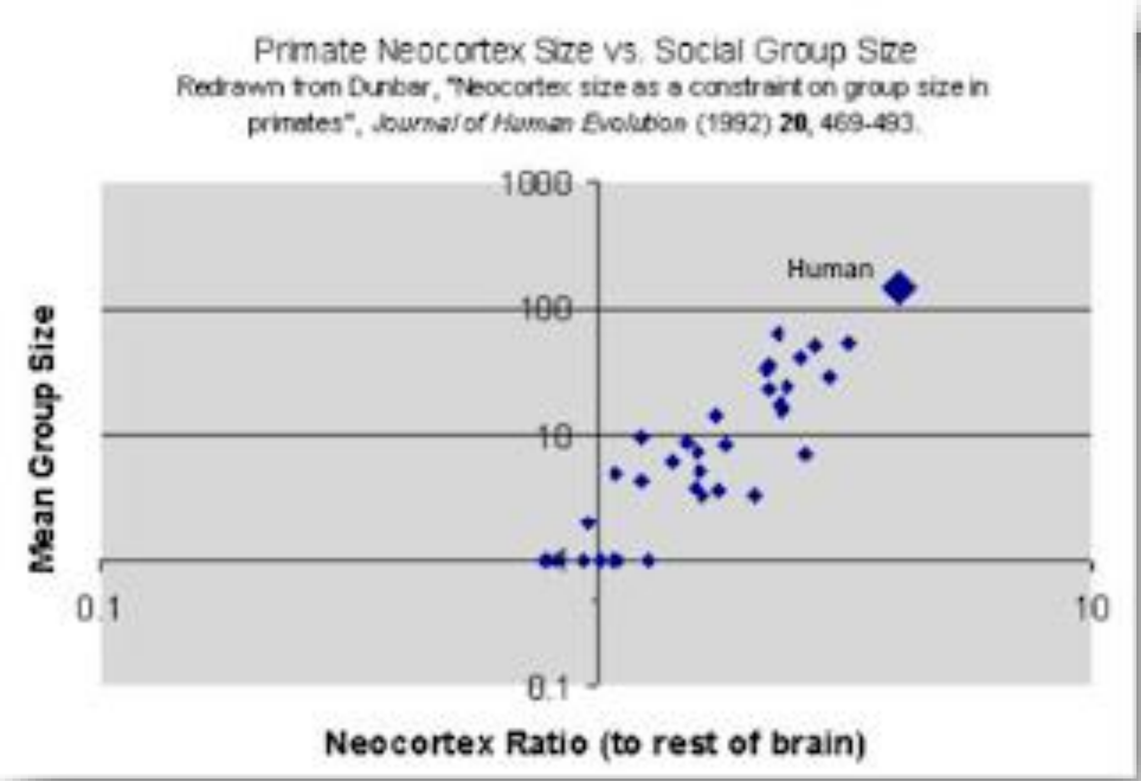


unenumerated.blogspot.com/2017/02/money-blockchains-and-social-scalability.html



Thursday, February 09, 2017

Money, blockchains, and social scalability



Primate Neocortex Size vs. Social Group Size

Redrawn from Dunbar, "Neocortex size as a constraint on group size in primates", *Journal of Human Evolution* (1992) **20**, 469-493.

Thank You