
BLOCKSTACK

BLOCKCHAIN USE CASES

Cryptocurrency

DNS

PKI

LIMITATION

- Block size
- Block latency
- Bootstrap time

BLOCKCHAINS PROVIDE IMPORTANT INFRASTRUCTURE FOR BUILDING SECURE, DECENTRALIZED SERVICES

NAMING SYSTEM BASED ON NAMECOIN

- Names are human-readable and can be picked by humans
- Name-value pairs have a strong sense of ownership— that is, they can be owned by cryptographic keypairs
- There is no central trusted party or point of failure
- There is a cost associated with registering a new name.

NAME REGISTRATION

- A two-phase commit method
  - pre-orders a name hash
  - registers the name-value pair by revealing the actual name and the associated value

PKI SYSTEM ON THE NAMECOIN(BLOCKSTACK ID)

- Defined the format for publishing public keys
- Register the name on the user's behalf and then transfer the name to a cryptocurrency address owned by the user.

NAMECOIN ISSUES

- 51% attack(Security)
- Denialof-service attacks
- Chronic networking issues(Reliability)
  - Network Latency Spike
  - Network Throughput Drop
- Potential Selfish Mining
- Consensus-breaking Changes
- Failure of Merged Mining

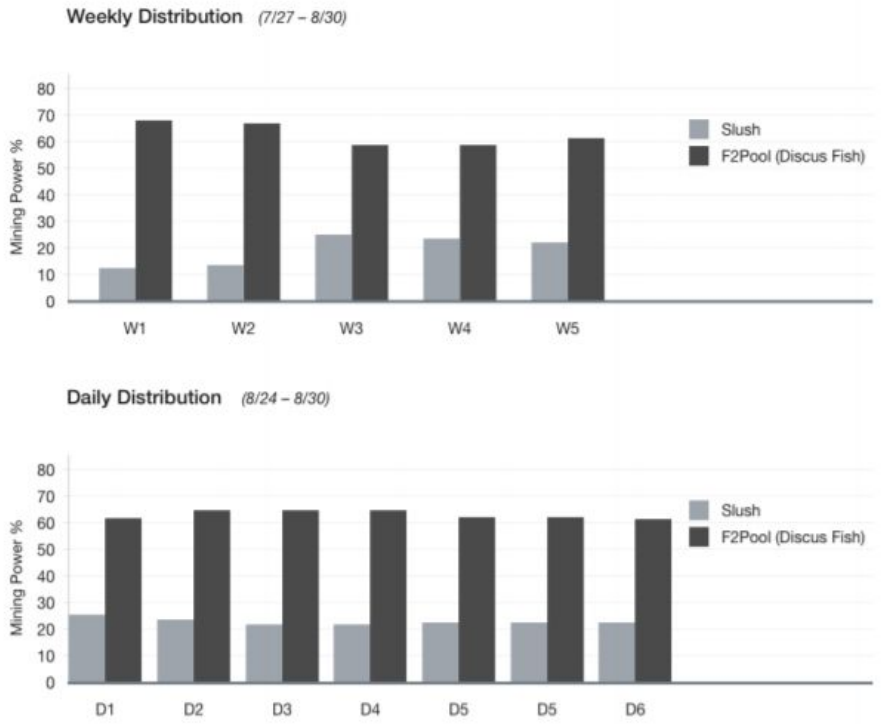

Figure 1: Weekly and daily mining distribution.

BLOCKSTACK CHALLENGES

- Limits on Data Storage
- Slow Writes
- Limited Bandwidth
- Endless Ledger

BLOCKSTACK ARCHITECTURE

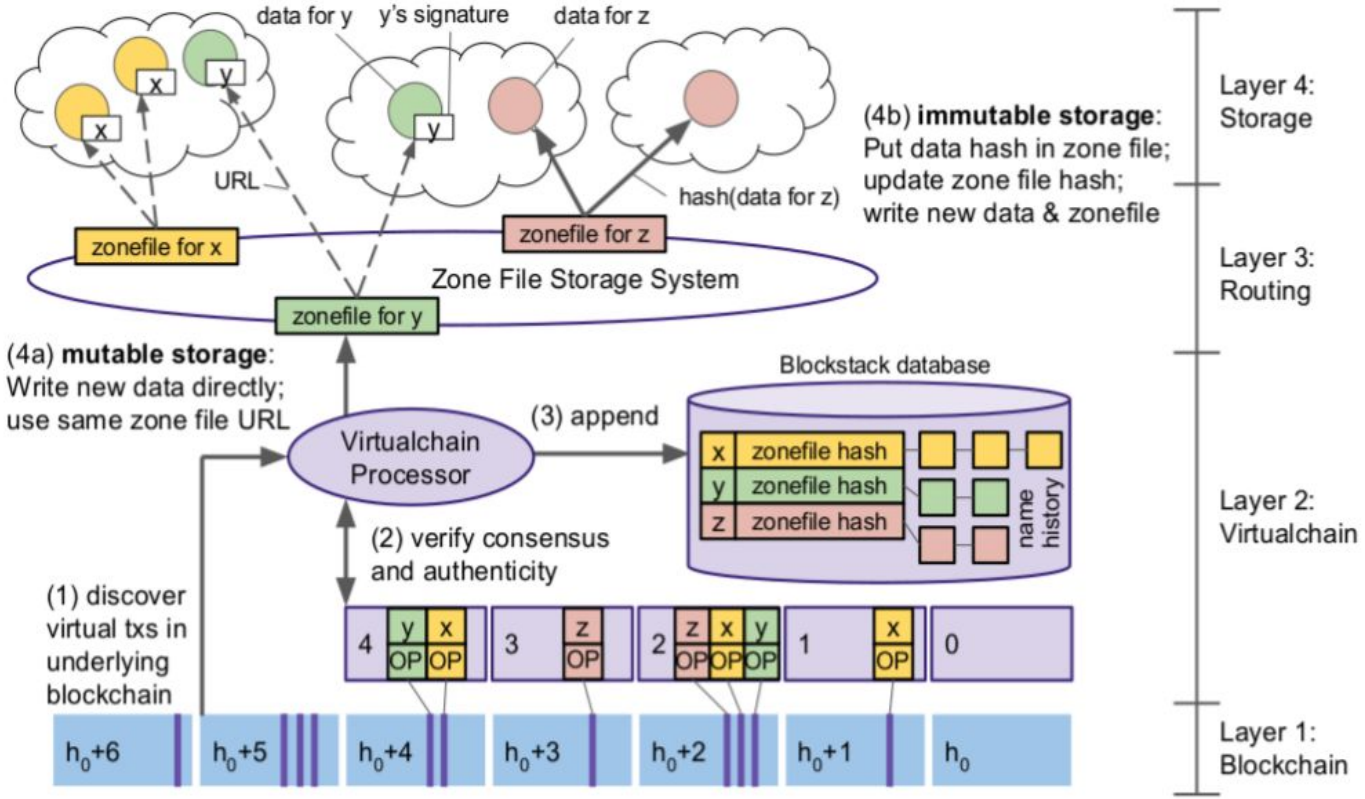

Figure 4: *Overview of Blockstack's architecture. Blockchain records give (name, hash) mappings. Hashes are looked up in routing layer to discover routes to data. Data, signed by name owner's public-key, is stored in cloud storage.*

BLOCKSTACK CHARACTERISTICS

- Separation of the Control and Data Plane
- Agnostic of the Underlying Blockchain
- Ability to Construct State Machines

BLOCKSTACK LAYERS

- Layer 1: Blockchain Layer
- Layer 2: Virtualchain Layer
- Layer 3: Routing Layer
- Layer 4: Storage Layer
  - Mutable Storage
  - Immutable Storage

PRICING FUNCTIONS FOR NAMESPACES

- the price of a name drops with an increase in name length
- introducing non-alphabetic characters in names also drops the price

THANK YOU