Blockchain
The future of Internet

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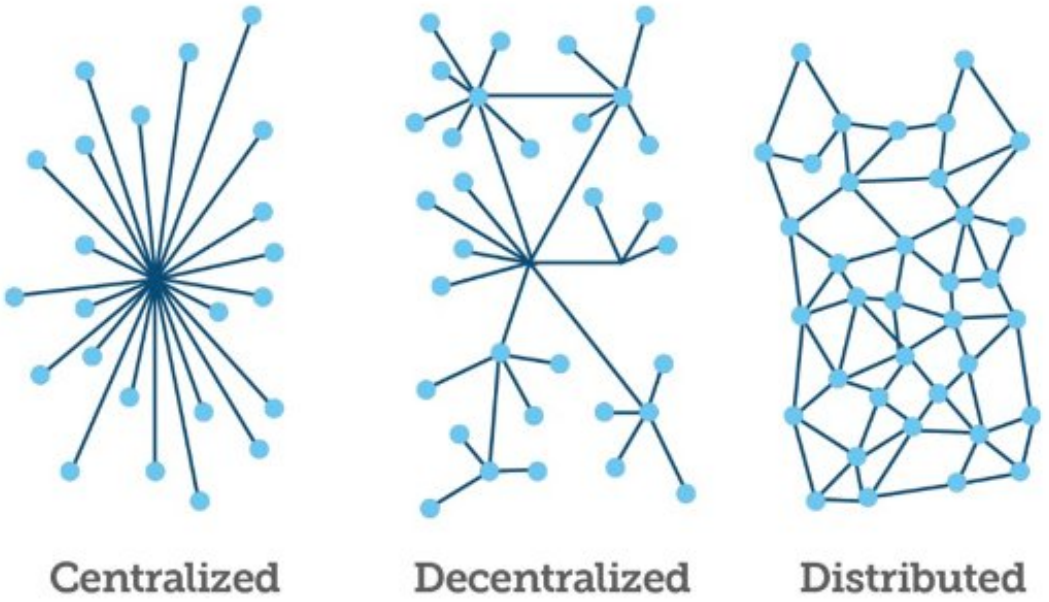
Blockchain != Bitcoin/Cryptocurrency

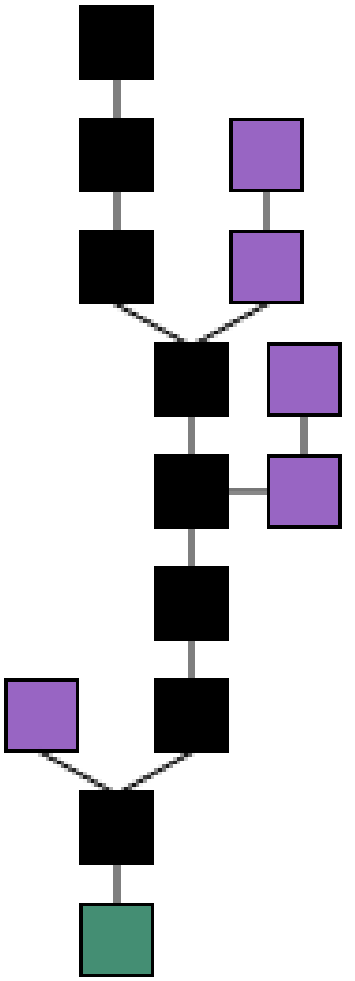
What is Blockchain?

- A distributed Database
- Decentralized



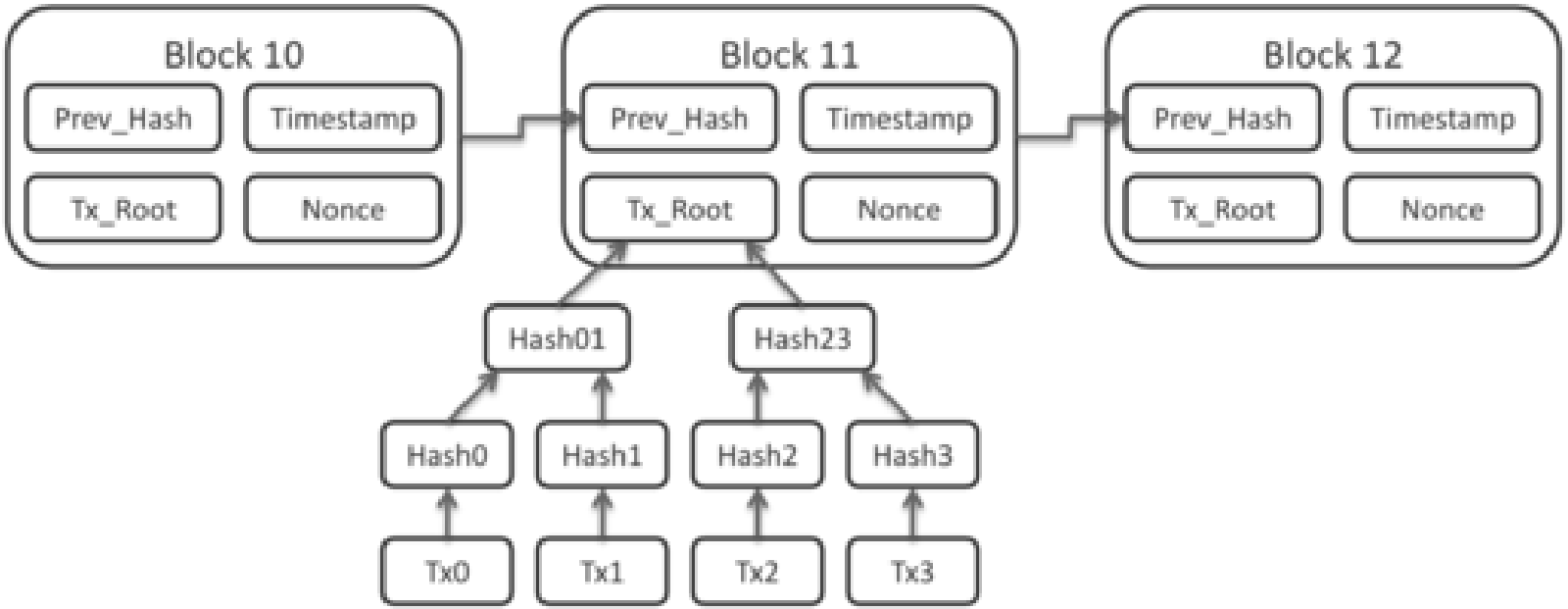
What is Blockchain? - Continued

- Mainly list of records
- Always growing



What is Blockchain? - Continued

- Tamper proof and Revision proof
- Open, permission less and public
- Byzantine Fault Tolerant



How Blockchain Works?

- A growing list of records called blocks
- Each block contains
  - A timestamp
  - A link to previous block
- Can be managed
  - Publicly or autonomously
    - Peer-to-peer network
    - Distributed Time-stamping
  - Privately

Uses of Blockchain

- Recording of events
- Medical Records
- Identity Management
- Transaction processing
- Documenting provenance
- Financial Transactions
- Marketplace
- Smart Contracts
- Digital Products Marketing
- Property Records
- Voting
- Cloud Storage

History of Blockchain

- 1991 – Stuart Haber & Scott Stornetta
- 1996 – Ross J. Anderson
- 1997 – Michael Doyle
- 1998 – Bruce Schneier
- 1998 – Nick Szabo – Bit Gold
- 2008 – Satoshi Nakamoto
- 2014 – Blockchain 2.0

Internet

- A 30 years old technology
- Based on IP routing and DNS
- Primary purpose was to share abundance of Data
- Now under mass surveillance
- Now censored by different governments to capitalize political benefits
- Always requires DNS information to make full communication

Internet

- Centralized by the so called ROOT DNS servers
- Secured by DNSSEC
- Web trust system is broken
- Under the control of around 1200+ CA
- Most of the https are weakly configured
- Prone to catastrophe, zombie apocalypse, alien invasion, Government shutdown

Words from ..

- “We didn’t focus on how you could wreck this system intentionally,” - Vinton G. Cerf.
- "I invented the web. Here are three things we need to change to save it
  - We’ve lost control of our personal data
  - It’s too easy for misinformation to spread on the web
  - Political advertising online needs transparency and understanding” - Sir Tim Berners Lee

DNS

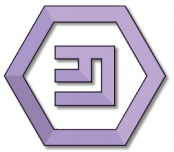
- A decentralized database maintained by root servers
- Secured implementation by DNSSEC(Hardly implemented by Domain owners)
- Web anchor of trust is based on CA(Run by large Companies, Controlled by Governments)

DNS in a Distributed Blockchain

- Censor-free
- Distributed, hard to knock down by a single attack or Government
- Supported by TOR or I2P
- Private

DNSchain - Implementation

- Namecoin – Bit DNS
- OKTurtle
- Emercoin – EMCDNS
- And more ..

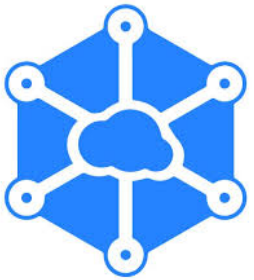


Data storage in Blockchain

- Privacy at stake for major Cloud Storage providers
- Personal information stored in clouds
- Accessible by Providers/Governments
  - With Warrant
  - With Subpoena
- Encrypted Storage
- Ransomware

Data storage in Blockchain - Implementation

- storj
- sia.tech



Traffic Routing

- Always goes through an ISP
- Running Deep Packet Inspection
- National Firewall
- DNS Cache Poisoning
- Plain traffic is intercept-able
- Caching Data poisoning
- Comes with Privacy Demolished

Blockchain in routing(BGP) – What if

- Voting capability to avoid bad routes
- Overlay Network with Path Performance Computation
- A DHT maintaining RemyCC (Remy Congestion Control)
- Prefixes are added/removed/modified by DPKI

SDN in Blockchain

- SDN – Cutting Edge Technology
- Uneducated wrong configured Infrastructures
- API/Programmability is vulnerable
- Flow Table can be modified remotely

SDN in Blockchain – What if ..

- Flowtable is maintained in a blockchain
- Modification of flowtable is authenticated against KSI(Keyless Signature Infrastructure or DPKI)
- Saving the events in a blockchain to track it down to its root
- Easier Log readability
- Authenticate agents, messages, control interfaces, devices, state of a service

IoT in Blockchain

- A trillion dollar Industry
- Billions of devices will be connected
- Interact in between them
- Going to be the most vulnerable systems from the prying eyes
- Decentralization is required, considering centralized infrastructure

IoT in Blockchain – What if

- Billions of ongoing transactions will be stored in blockchain
- Rather than centralizing the Data storage
- A single fail-proof network
- No MITM attack
- A single Tamper proof DHT(Distributed Hash Table)
- Blockchain is already a proven technology with billions of Dollar market for Cryptocurrencies

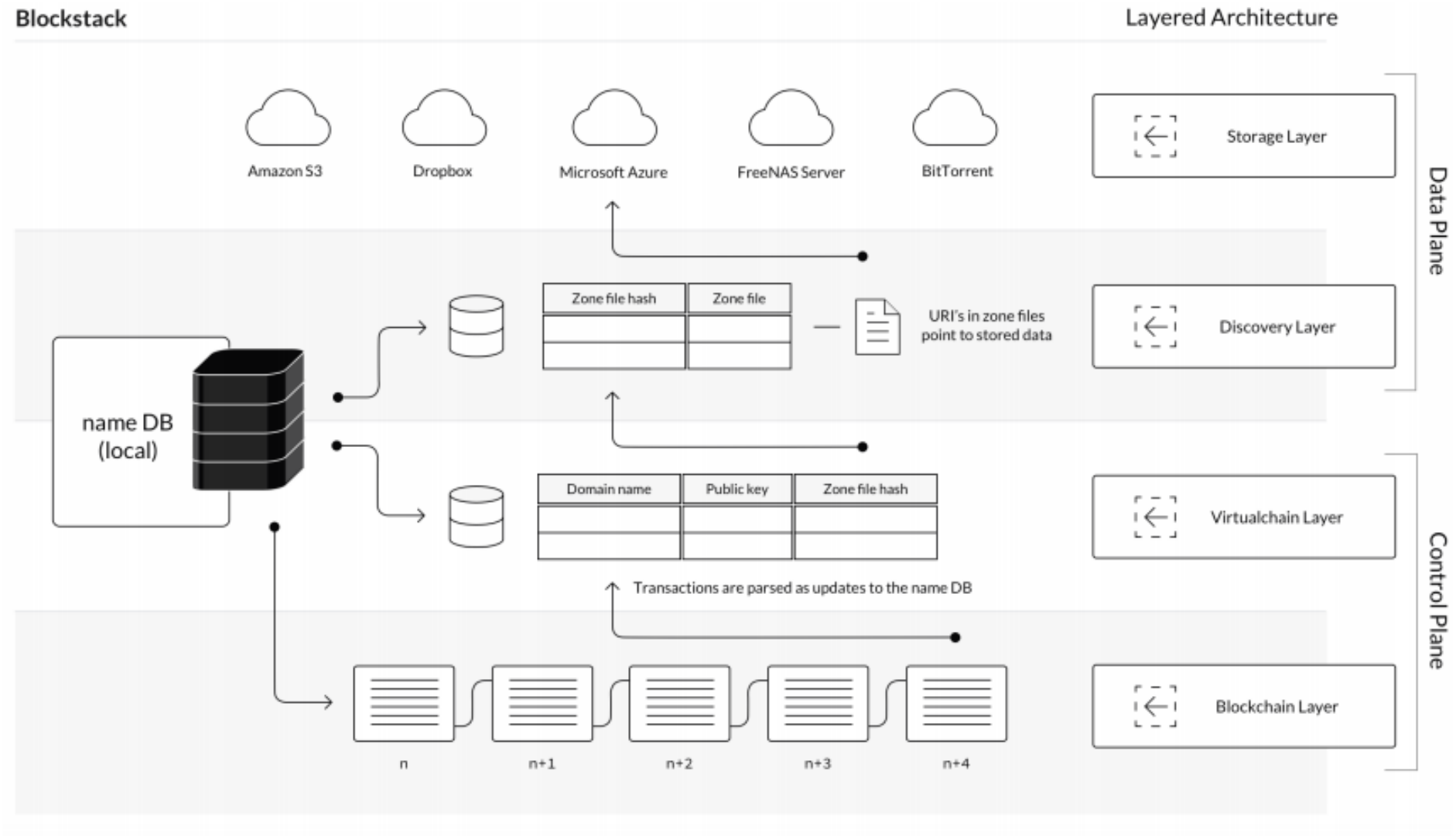
BlockStack

- Decentralized Internet
- A Full Stack of Apps
  - Identity
  - Storage
  - Payments
- With the possibility of
  - Decentralized Social Network
  - P2P Marketplace
  - Community Run Voting
- Blockchain

BlockStack - Details

- Blockchain Layer
- Virtual chain Layer
- Discovery Layer
- Storage Layer
  - Any Cloud Storage Provider
  - Personal Storage at your bunker
- BNS
- ATLAS Network

BlockStack - Architecture



End Goal

- A Censorship free Internet
- Freedom of Speech
- Privacy in the Digital Age

Questions ..

Thank you ..