HOLOCHAIN

Crypto Currencies, Blockchain, Decentralised Apps, Holochain & Holo

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HOLOCHAIN

Welcome to the Wild Wild West of the Internet

Disclaimer: This is how I understand things to be.

It’s a complicated beast!!

There’s a lot to get through so unless I get it wrong let’s do questions at the end.

I reckon it’s like the internet in 1993!!

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- Bitcoin
- Blockchain
- Mining - Proof of Work, Proof of Stake
- Open Source and Forks of coins
- Decentralised & Distributed Applications
- Ethereum - “Build unstoppable applications”
- Issues with Bitcoin and Ethereum
- Holochain - Think outside the Blocks
- How does Holochain differ from Blockchain & Ethereum
- Holo - Where the Crowd is the Cloud
- Our ICO In progress now!!

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Crypto Currencies - Nov 2017

- How to make a Bitcoin

f284bdc3c1c9e24a494e285cb387c69510f28de51c15bb93179d9c7f28705398

  - 00000xxxxxxxxxxxxxxxxx
  - 2^256
- How big is this?
  - Coin Market Cap
  - > $380 Billion
- What is a wallet?
  - Private Keys
- Trading
  - Exchanges
- What is an ICO?
  - Powerledger

1	Bitcoin	$182,546,645,875	$10,851.50	$9,450,530,000
2	Ethereum	$95,190,456,105	$979.63	$3,519,780,000
3	Ripple	$51,411,491,207	$1.33	$2,812,380,000
4	Bitcoin Cash	$27,209,912,472	$1,607.36	$545,743,000
5	Cardano	$14,439,589,322	$0.556931	$359,571,000
6	Litecoin	$9,753,608,617	$177.69	$441,841,000

Volatility of Crypto & State Currencies - April 9

1	Bitcoin	$116,276,263,272	$6,856.69	$4,941,490,000
2	Ethereum	$37,563,177,234	$380.90	$1,293,830,000
3	Ripple	$19,656,842,253	$0.502803	$440,019,000
4	Bitcoin Cash	$11,029,625,825	$646.69	$283,425,000
5	Litecoin	$6,597,350,417	$117.94	$380,232,000

Volatility of Crypto & State Currencies - April 18

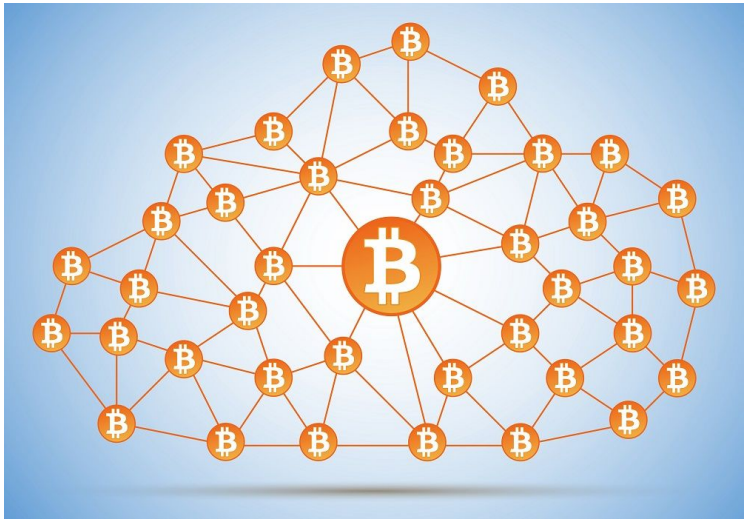
- Lost 50% in 3 months - $180 Billion
- FIAT - Breathed into being
- Gambling Chips
- In 10 years Bitcoin issuance and holding more centralised than state currencies.
- Crypto “Whales”
- Not value backed

All | Coins | Tokens | USD

#	Name	Market Cap	Price	Volume (24h)
1	Bitcoin	$135,042,791,831	$7,951.23	$6,915,460,000
2	Ethereum	$50,225,088,404	$507.90	$1,733,700,000
3	Ripple	$25,940,290,958	$0.663048	$436,585,000
4	Bitcoin Cash	$13,097,469,465	$766.87	$336,841,000
5	Litecoin	$7,585,940,049	$135.15	$515,969,000

Blockchain

- Blocks and chains?
- Global Ledger
- This technology is disrupting all trust based systems
- Miners
  - Hashing (Find the nonce)
  - Mining Pools - shared reward and resources
  - ASIC - Application Specific Integrated Circuit
  - 17.5 TH/s!!!! (17,500,000,000,000 / second!!!)
  - 0.1% of the earth’s electricity - wasted
  - Pareto Effect - mining is controlled by a few HUGE miners!
  - PoW and PoS are centralising algorithms



Blockchain - Jihan Wu’s BTC Mining Farm

What is a Fork or Alt Coin?

Github Demo

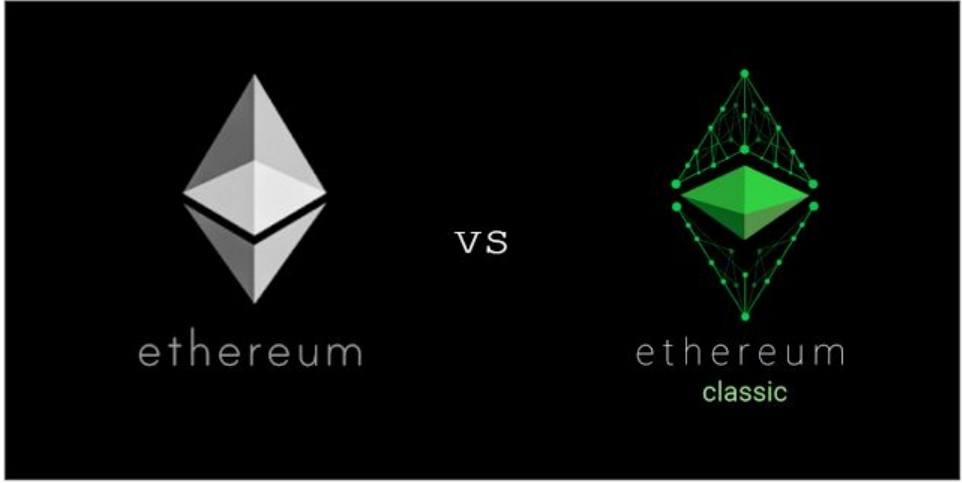
Distributed Applications

- Trustless - Thanks to the NSA!
- Ethereum - World Computer
- Smart Contracts
  - Solidity
  - Truffle
  - Gas
  - Ether

ETHEREUM

- DAOs (Decentralised Autonomous Organisations)
- Commonwealth Bank
  - 25 POC’s, now have a marketable product
- Commercial Banks
  - Liquidity Cost savings

Issues with Ethereum



- Size of the blockchain
  - No longer published!
  - 4-5 weeks to synch
- Gas limits
- Cost of execution
- Slowness of transactions and scaling
  - Vitalik: Ethereum Apps Are Being 'Screwed' By Scaling
- Difficult to fix mistakes
  - Someone locked up 300 Million $ worth of Ether!!
- Programming Smart Contracts
- Everyone’s programs and data are shared to everyone

https://github.com/holochain/benchmarks

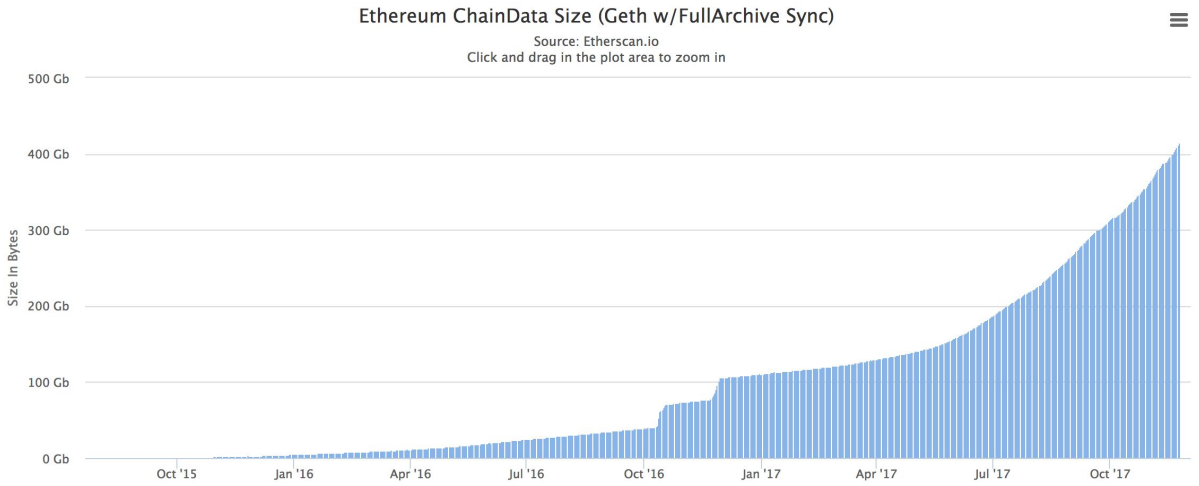
Size of Ethereum Blockchain November 17 410GB

Charts Ethereum ChainData Size Growth (FULL Sync)

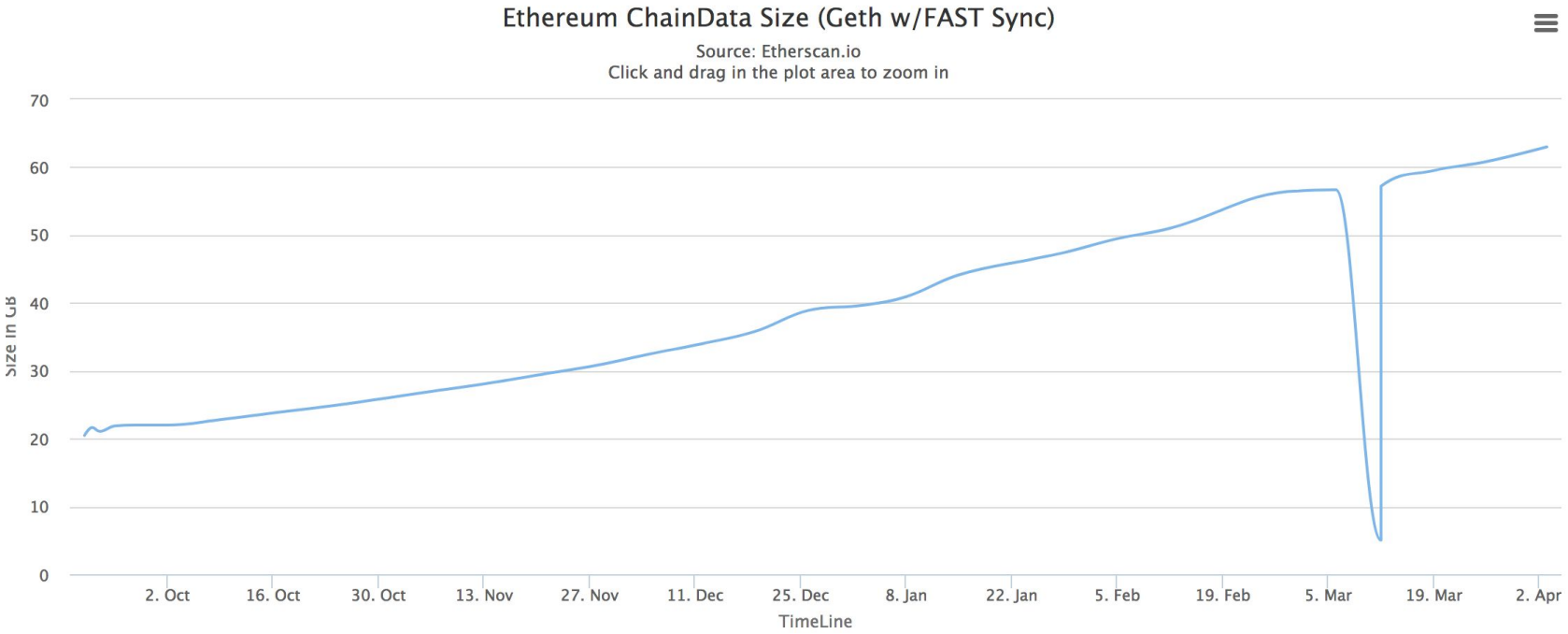
Home / List Of Charts / Chart & Stats

The GETH client has 3 Blockchain sync modes (fast, full or light). The '**full**' mode which we have used to produce the data chart below takes up the most amount of space as it stores all previous states. For the average user, running Geth with the synchmode 'fast' (the default option) will produce a ChainData folder size (around 12-15% the size of the full synch) that is significantly smaller and lighter. This dataset was produced using Geth 1.6.7 stable.

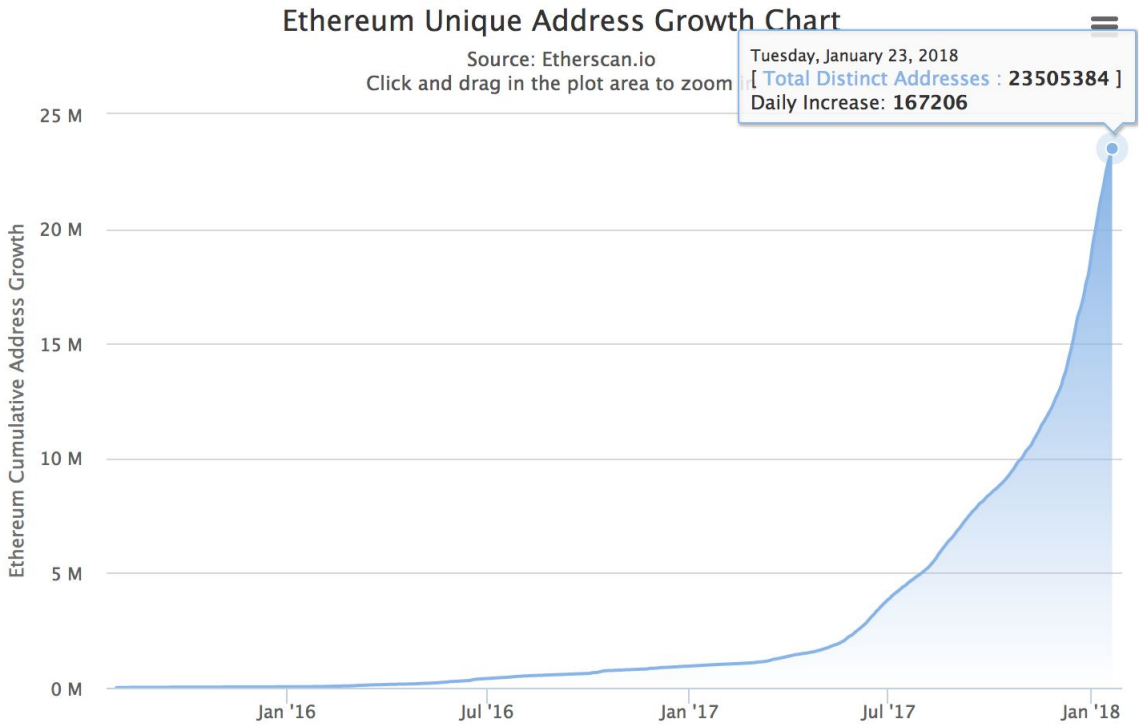
Tip: Check out the **FAST Sync Chart!**



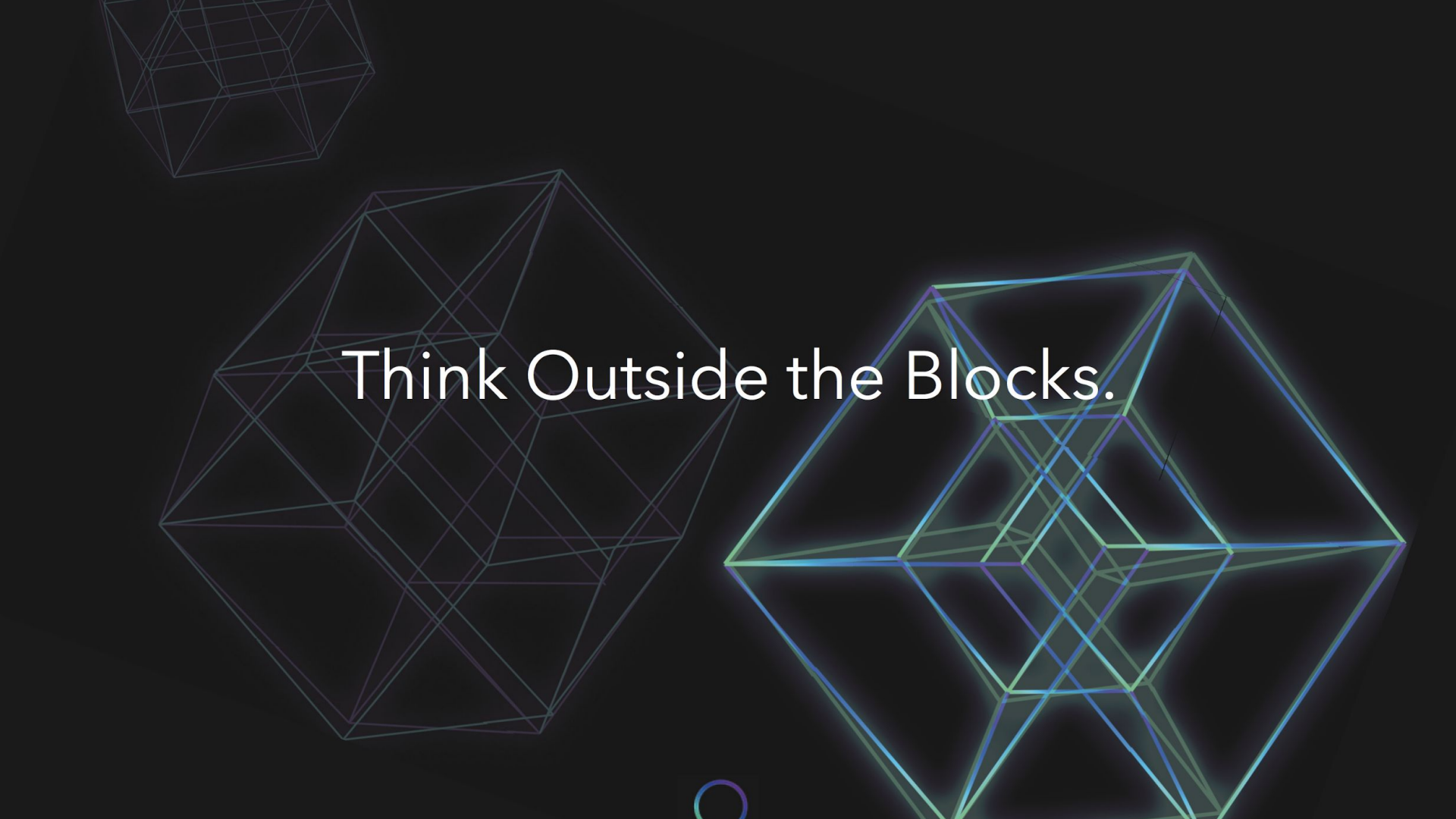
Size of Ethereum Blockchain April 2018 - Fast



Users of Ethereum Blockchain



https://etherscan.io/chart/address


Think Outside the Blocks.

HOLOCHAIN

How is Holochain different?

First white paper was published before Bitcoin paper!

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HOLOCHAIN

1. Agent Centric - No global ledger
2. Distributed Hash Table - Like Bit Torrent
3. Self Healing, Validating & Private DHTs
4. No mining, PoW, PoS & No Wasted Power - Sharded DHT Validation
5. Inversely Scalable - Super Fast Transactions (HOLO will do Billions per sec)
6. Works offline natively
7. Built in Testing Framework for Synchronous and Multinode Scenarios
8. Build your own Test Network with Docker
9. Use existing web development skills and patterns
10. Bio-mimicry

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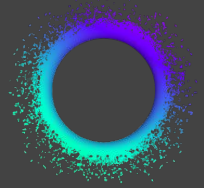

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Let’s build an app

Belinda built this app in less than a day!

This app is a next generation peer 2 peer distributed crypto app

Easily supporting billions of transactions per second!!

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Bio-mimicry

Nature runs a pretty amazing distributed application

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Zomes

Short for Chromosone

A set of functions and entry types

Evolves as code changes

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DNA

Complex instruction set

An evolving set of Zomes

Evolves as Zomes evolve

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Cells

DNA supplied with energy and food

People supply energy and digital content

Evolves as DNA, content and people in group evolves

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Brain Tissue

A group of cells with a selective membrane

Manages who can do what with the cells

Evolves as cells evolve

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HOLOCHAIN

Your Multi Dimensional Holo Brain

Built from Brain Tissue

Each piece of Brain Tissue is part of other Brains

Evolves as Brain Tissues evolves

Cross Brain Communication

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Ethereum vs Holochain Benchmarks

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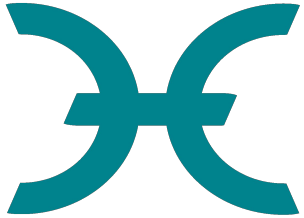
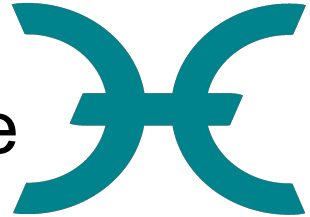
Demo - Clutter (a group of cats) our Twitter Clone



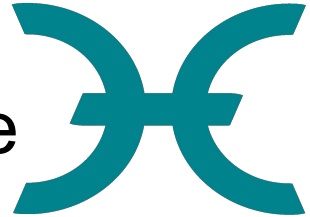
1. Phil writes a meow
    a. The first time the app is used a new chain is created and the code of the app is hashed and added to the “Genesis” entry.
    b. The content of the post is added to Phil’s local chain (chain.db)
    c. Its public so it’s shared to the DHT via Gossip (dht.db)
2. The “Gossip” protocol shares the meow to “near” nodes in the DHT (Bit Torrent)
    a. Each person has their genesis entry checked to see if they should talk to another node
    b. The content is validated to ensure it hasn’t been tampered with
    c. The app then retrieves the “meow” from the DHT
    d. The “meow” shows up in the UI for each person following Phil

Developing Holochain Apps - Show Me Code



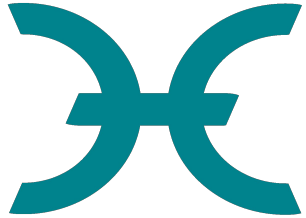
1. Use your existing web developer skills and patterns
2. Use ES5-->6 to build REST endpoints that call the Holochain API - DNA
    a. Event bus coming soon - Event Driven Microservice Architecture
3. Write tests TDD to build your DNA
    a. Synchronous tests
    b. Scenario tests make it easy to test multiple nodes interacting
    c. Lots of variables to access to make it easy to test
4. Build your UI as you like. We are using React-Redux-MaterialUI
    a. TDD again, we use Storybook, Specs and Cypress
5. Bridge other DNA into your DNA - Keys, Personal Info, Private DHTs
6. Use DNA Zomes as well
7. Deploy with Holochain App Store
8. Small & Frequent Changes, upgrade triggers clean up.

Developing Holochain Apps - Show Me Code



1. View the contents of the local Chain and DHT
    a. Dump Chain & DHT to JSON, or DOT - Demo
2. Great debug info to trace issues
3. Use services like Travis and Github

Holochain Initial Community Offering



1. New asset class - HoloFuel, value backed, peer created value
2. Holochain, HOLO and HoloPorts
3. Works now, alpha, ready to build apps on - not just a white paper
4. Sharded DHT validation, no PoW, PoS
5. Earn income with a HoloPort
6. Privacy, Data Integrity, Agency
7. Forking as a tool
8. Abundance not Scarcity
9. https://holo.host
10. 1/10,000th cost of Ethereum Hosting