

L2L Blockchain

Lec 1: Intro, Resources, BC current state

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Technical Instructor
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Berkeley **Learn2Launch**

2019

Alexander Fred-Ojala

- Research Director
Data Lab, SCET, UC Berkeley
- Co-creator of Data-X
UC Berkeley class: Applied Data Science w Venture Applications
- Co-founder
UC Berkeley / SCET's Blockchain lab
- Founding Team of 3 companies
InnoQuant (COO), Auranest (CMO),
Wheely's (YCombinator alumni)
- Degree in Mathematical Statistics
UC Berkeley & Lund University, Sweden



Co-founder Blockchain Lab



Pantas and Ting

Sutardja Center for Entrepreneurship & Technology

Berkeley Engineering

METRICS AT A GLANCE

Undergraduate:

- 14 - 15 Courses, 1600+ Undergraduates

X at Berkeley: Graduate, Labs and Professional

- 80+ Grad students
- 100+ Executives
- Labs: Data, Blockchain, Sustainable Food

Ecosystem:

- Global Partners
- 500+ Executives
- 50+ Investors

Meat substitutes are on the curriculum at UC Berkeley

By Jonathan Kauffman | January 24, 2017 | Updated: January 25, 2017 2:44pm

PHOTO: Scott Strazzante, The Chronicle

IMAGE 1 OF 4

Ricardo San Martin, a chemical engineering professor, leads the Challenge Lab researching meat substitutes.



Hamdi Allam

- Co-founder, Blockchain Engineer
FourthState Labs
- UC Berkeley Computer Science
- Secured Funding
Ethereum Foundation & Ethereum Community Fund
- Blockchain @ Berkeley developer
- Layer 2 developer, Plasma tech
Ethereum



Co-founder FourthState Labs

OUTLINE

- 1. Guide to resources**
- 2. Schedule, syllabus, expectations**
- 3. Current state of Blockchain tech**
- 4. Student presentations**



Guide to resources

L2L Blockchain website

bit.ly/learn2launch-blockchain

- Current Syllabus
- Readings
- Contact info

Github

Everyone should register for a Github account. Will be needed for project check-ins.

Do it at: education.github.com/

All lecture slides and code samples will be pushed to this repo:
github.com/afo/L2Lblockchain



Here are Github Setup instructions:

<https://github.com/afo/L2Lblockchain/blob/master/00-setup-install/github-setup.md>

Cloud Credits

AWS: \$100 sign up
+ package \$2k for 2 years



Google Cloud: \$300 sign up
+ 6 * \$50 in cloud credits



Email afo@berkeley.edu if you need them.

Berkeley Blockchain Xcelerator

Sourcing the best teams & projects at UC Berkeley, in Silicon Valley & beyond

Application Opens Soon! Watch for our announcement [here](#)



BLOCKCHAIN
AT BERKELEY



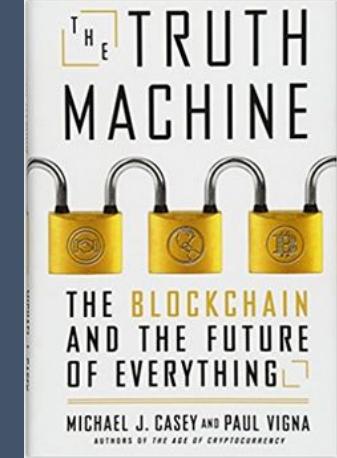
Pantas and Ting
Sutardja Center
for Entrepreneurship & Technology
Berkeley Engineering

Berkeley Haas

- In 2 weeks we will announce a new (highly competitive) Blockchain accelerator on campus.
- You can apply if you have UC Berkeley affiliation.
- \$200k+ in funding, mentoring, education, 3 months.
- Late spring and Fall cohorts.

Applied books

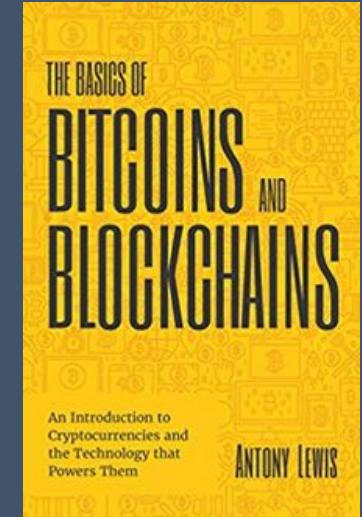
- **Truth Machine**
- **The Basics of Bitcoins and Blockchains**



Great books to think about Blockchain applications and use cases. 1 mandatory, 1 optional.

Get them here:

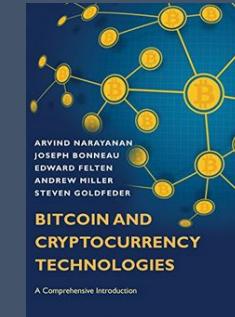
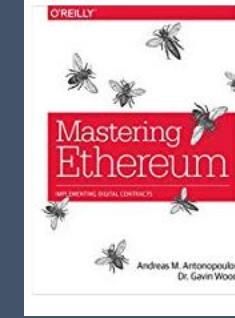
- <https://www.amazon.com/Truth-Machine-Blockchain-Future-Everything/dp/1250114578>
- <https://www.amazon.com/Basic-Bitcoins-Blockchains-Introduction-Cryptocurrencies/dp/1633538001#customerReviews>



Technical books

1. Mastering Ethereum (technical)
2. Mastering Bitcoin (technical)
3. Bitcoin and Cryptocurrency Technologies (technical) - Free

Great books. We'll make one mandatory and two optional. You choose. I prefer Mastering Ethereum.



Schedule & tentative plan

Major Milestones

- **March 4:** Lowtech demo (pitch your project)
- **March 18:** System architecture + UI / UX flow
- **April 8:** Technical white paper
- **April 22:** MVP / PoC (Demo or Die)

Grading rubric

- Lowtech demo (pitch your project) 15%
- System architecture + UI / UX flow 15%
- Technical whitepaper 20%
- MVP / PoC (Demo or Die) 20%
- Homeworks / reports 20%
- Participation / Attendance 10%

Guest Lecturers

- Ankit Bathia, Founder Sapien, How to run a Blockchain Startup and conduct an ICO, Feb 25th
- Ikhlaq Sidhu, Founder SCET, Deutsche Bank Blockchain case study, March 4th
- Max Fang, Ex-President / Founder, Blockchain @ Berkeley, Blockchain technical overview and use case analysis March & April
- Clemens Ley, Founder BitcoinDB, Turing Complete Bitcoin Scripting, April
- Eric Weingarten, General Counsel, Coinbase. Legal frameworks, regulations, policies, and assessment for Blockchain tech.

External Lectures

Blockchain Challenge Lab (Barrows 160, Mondays)

- Jay Chugh, Head of Oracle Blockchain Suite, Feb 4
- Simon Morris, Ex BitTorrent lead, Feb 11
- Gloria Zhao, President B@B, March 4
- Robert Kowalski, Blockchain startup, Apr 22

Register for Panel Discussions in CS294-144 ASAP!

berkeley-blockchain.github.io/cs294-144-s19/

- + **Attend Dawn Songs Lecture April 8 6-8PM in Chou N570**

Full Syllabus

bit.ly/learn2launch-blockchain

- + Time to register for the CS294 Panel sessions

Blockchain: Current State

BLOCKCHAIN: WHAT IS HAPPENING?

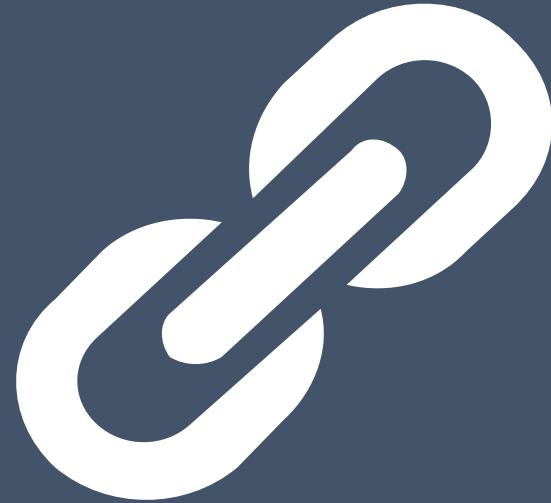
KNOWLEDGE@WHARTON

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TECHNOLOGY

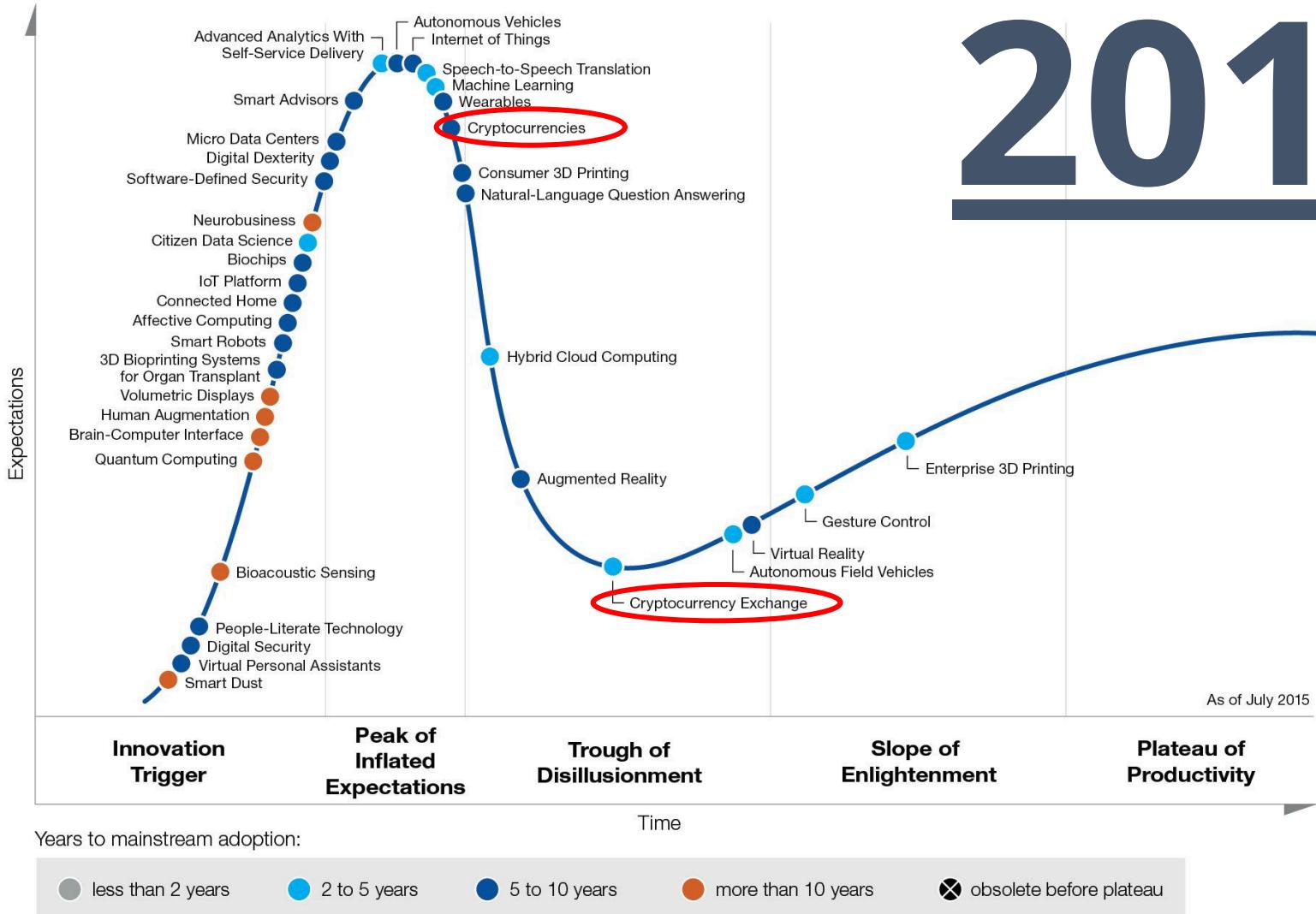
Is Blockchain the Next Great Hope – or Hype?



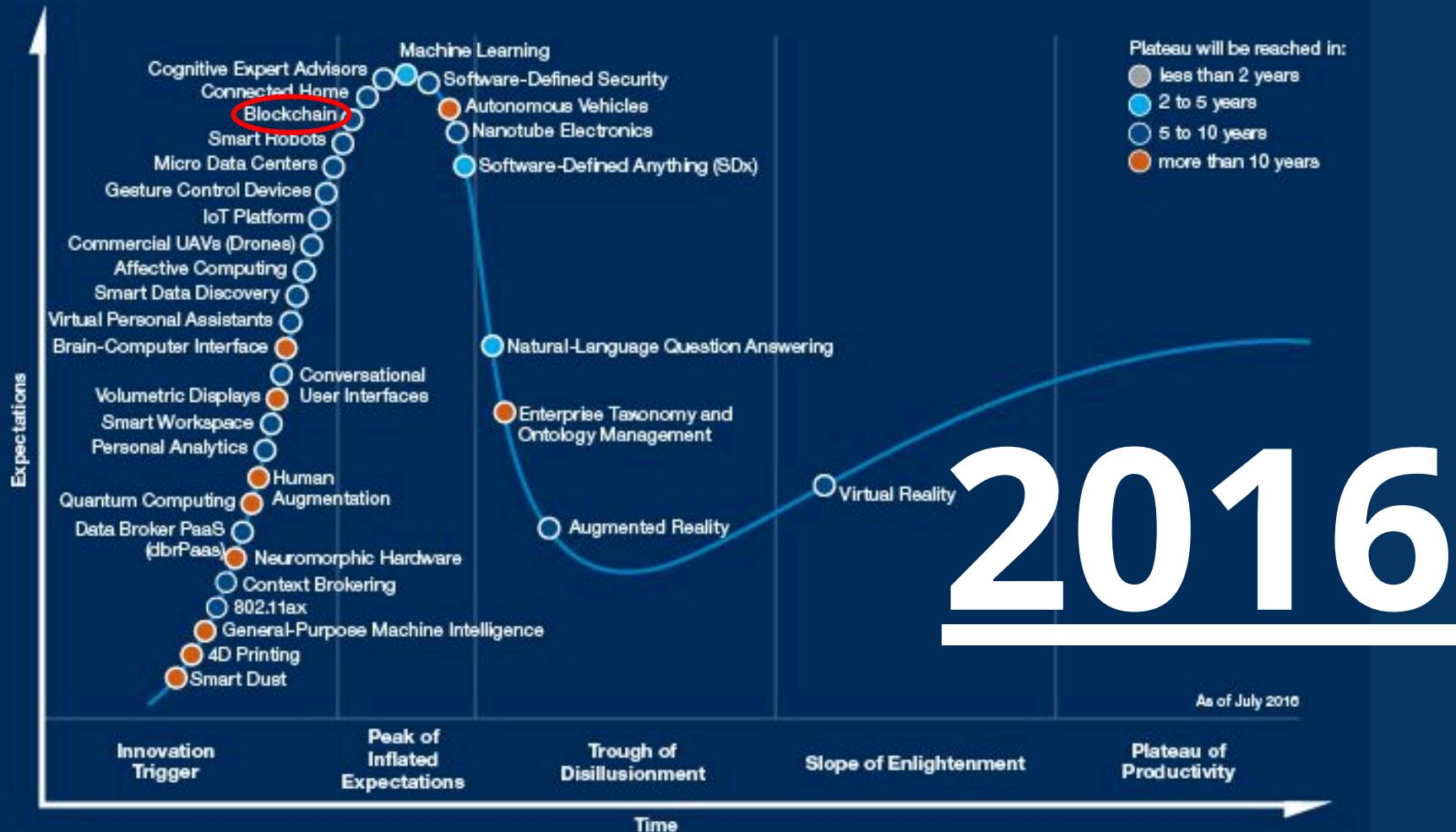
Blockchain Hype & History

Emerging Technology Hype Cycle

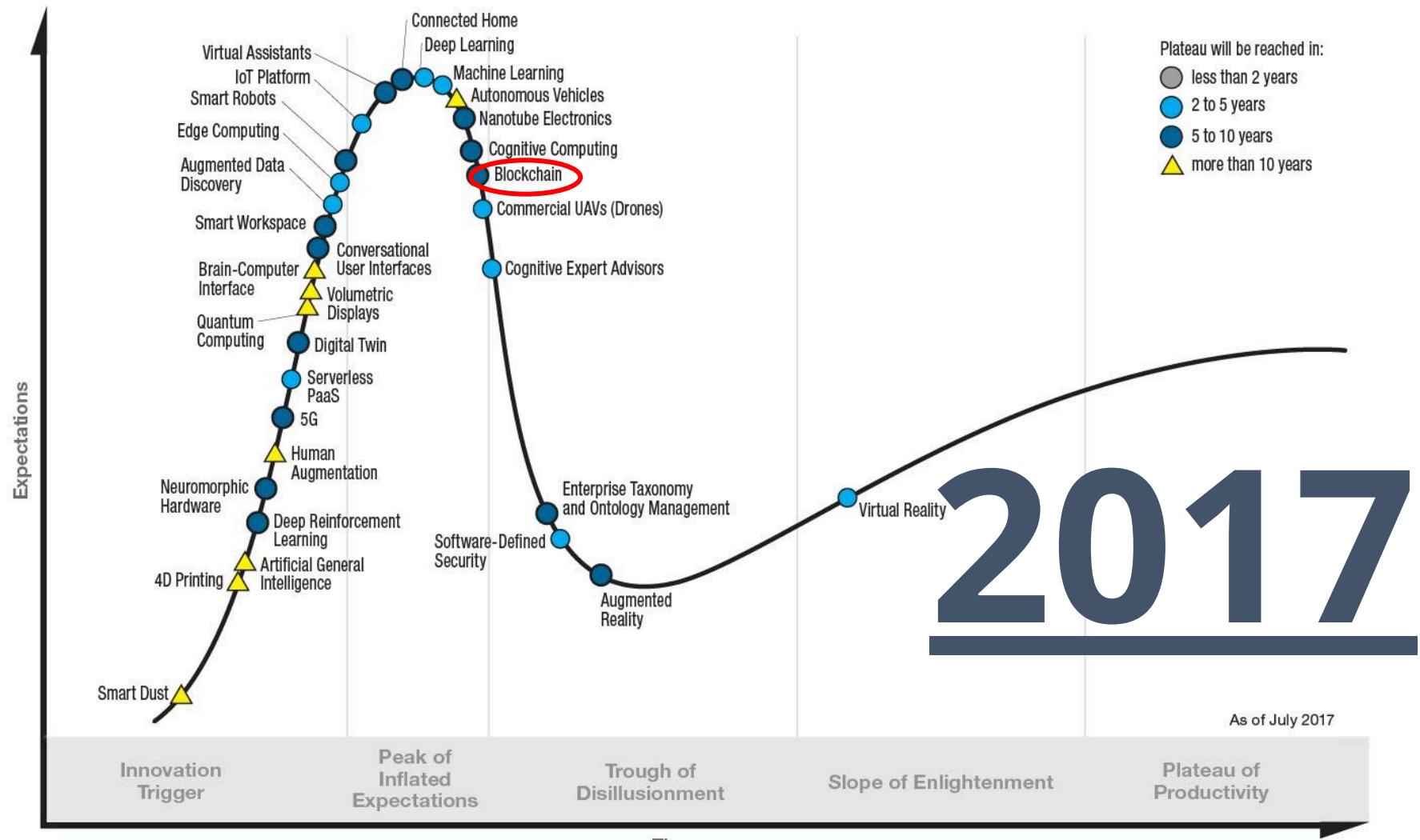
2015

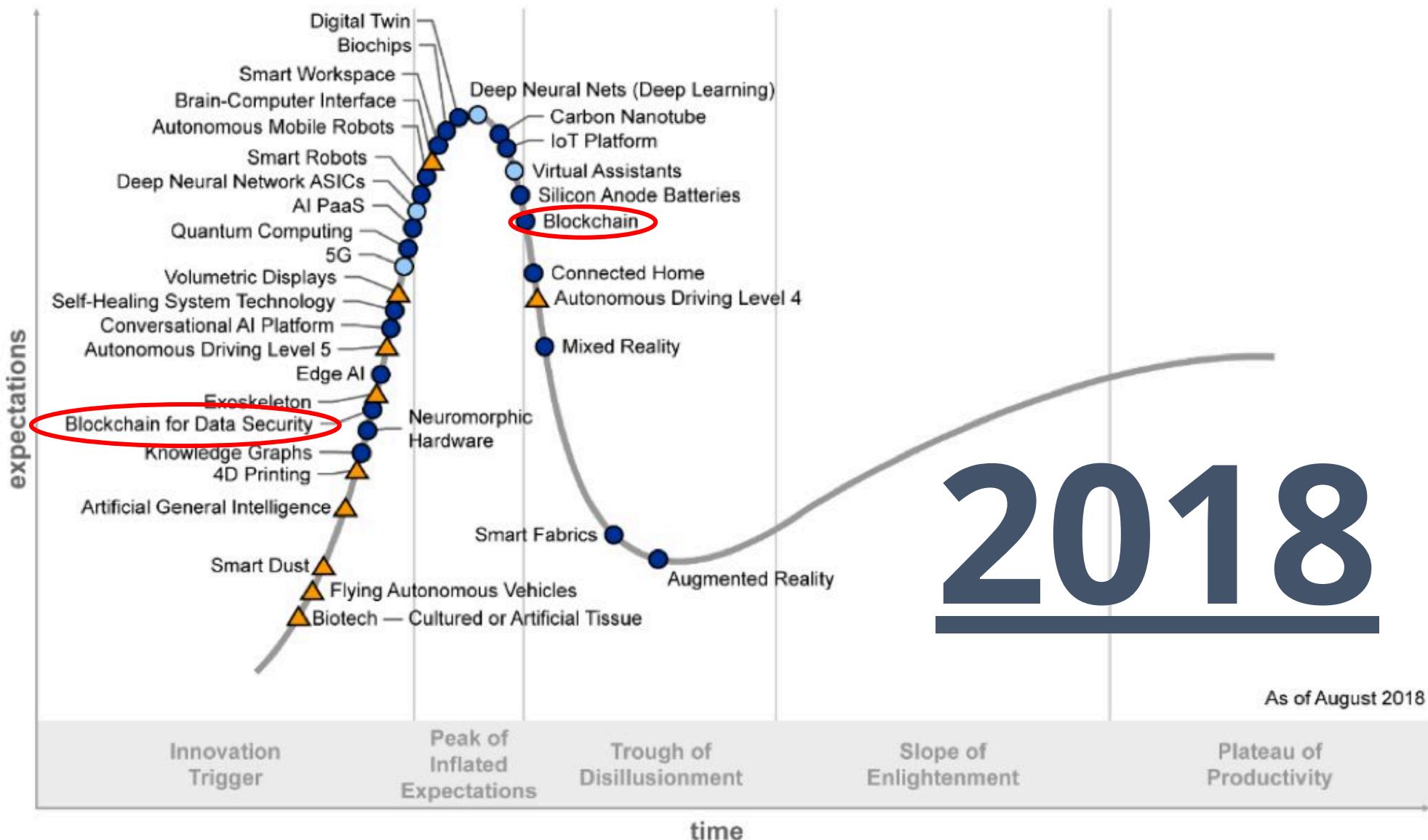


Gartner Hype Cycle for Emerging Technologies, 2016



Gartner Hype Cycle for Emerging Technologies, 2017





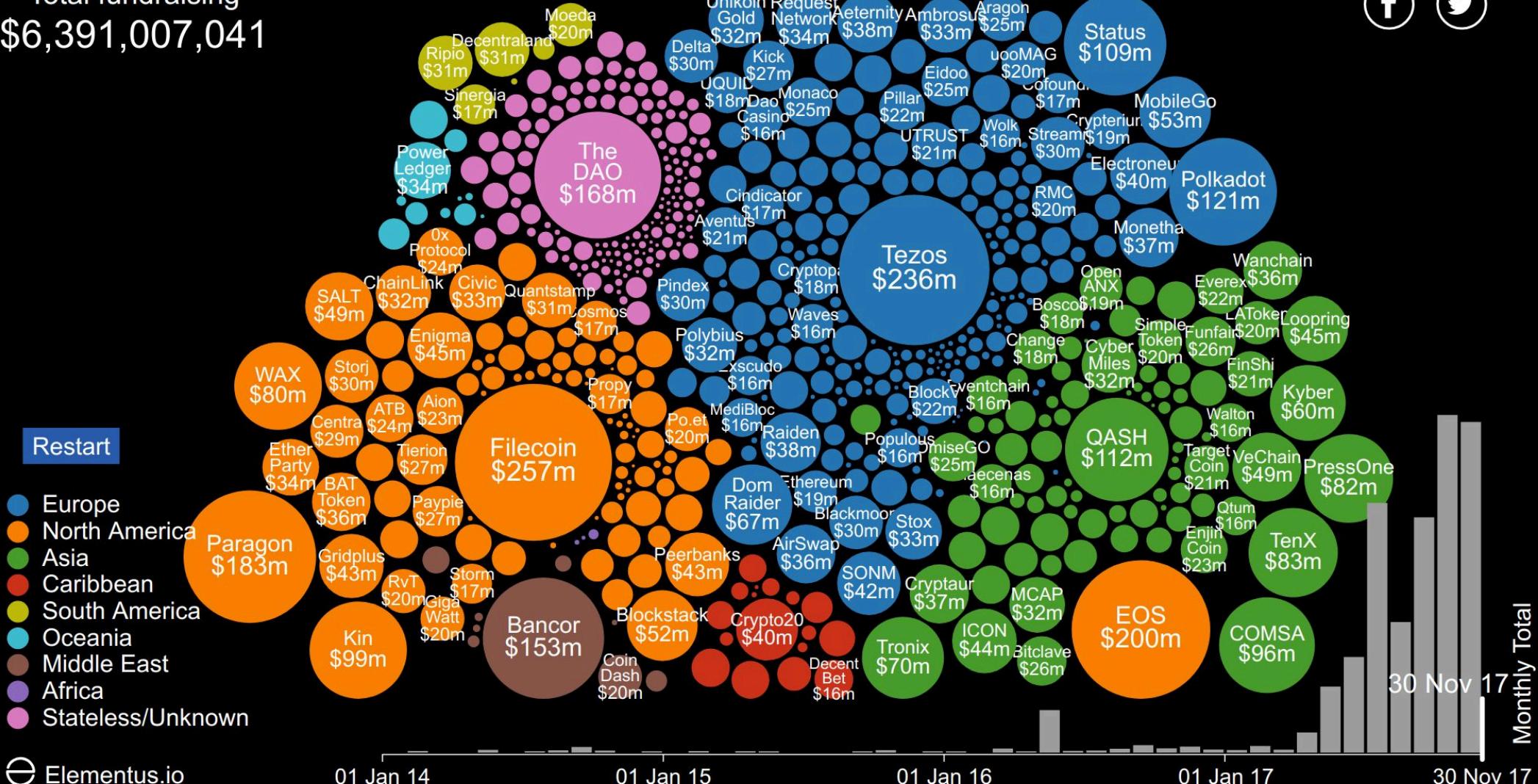
Four Years of Initial Coin Offerings

4

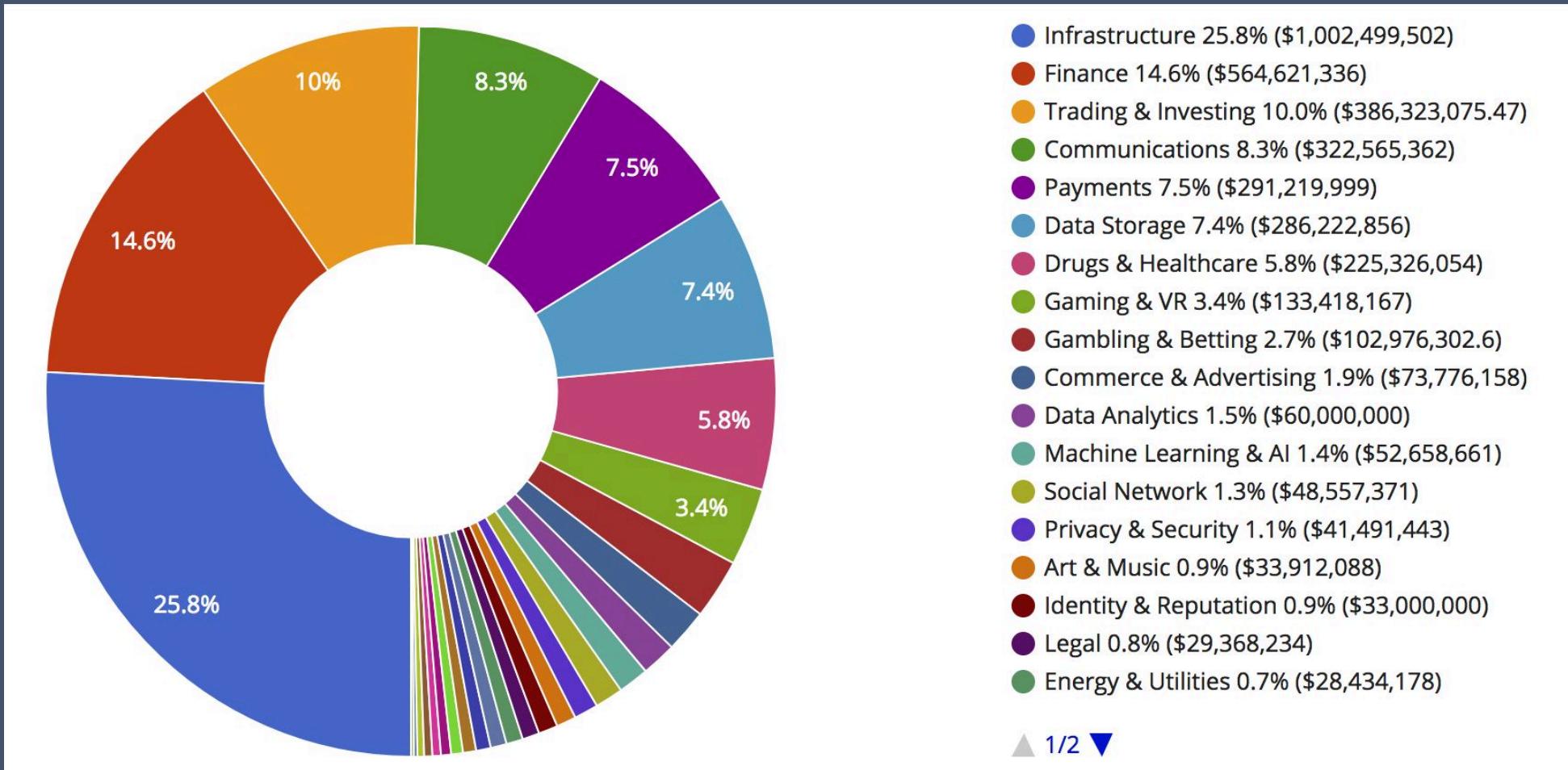


Total fundraising

\$6,391,007,041



Industry agnostic - ICOs by category in 2017

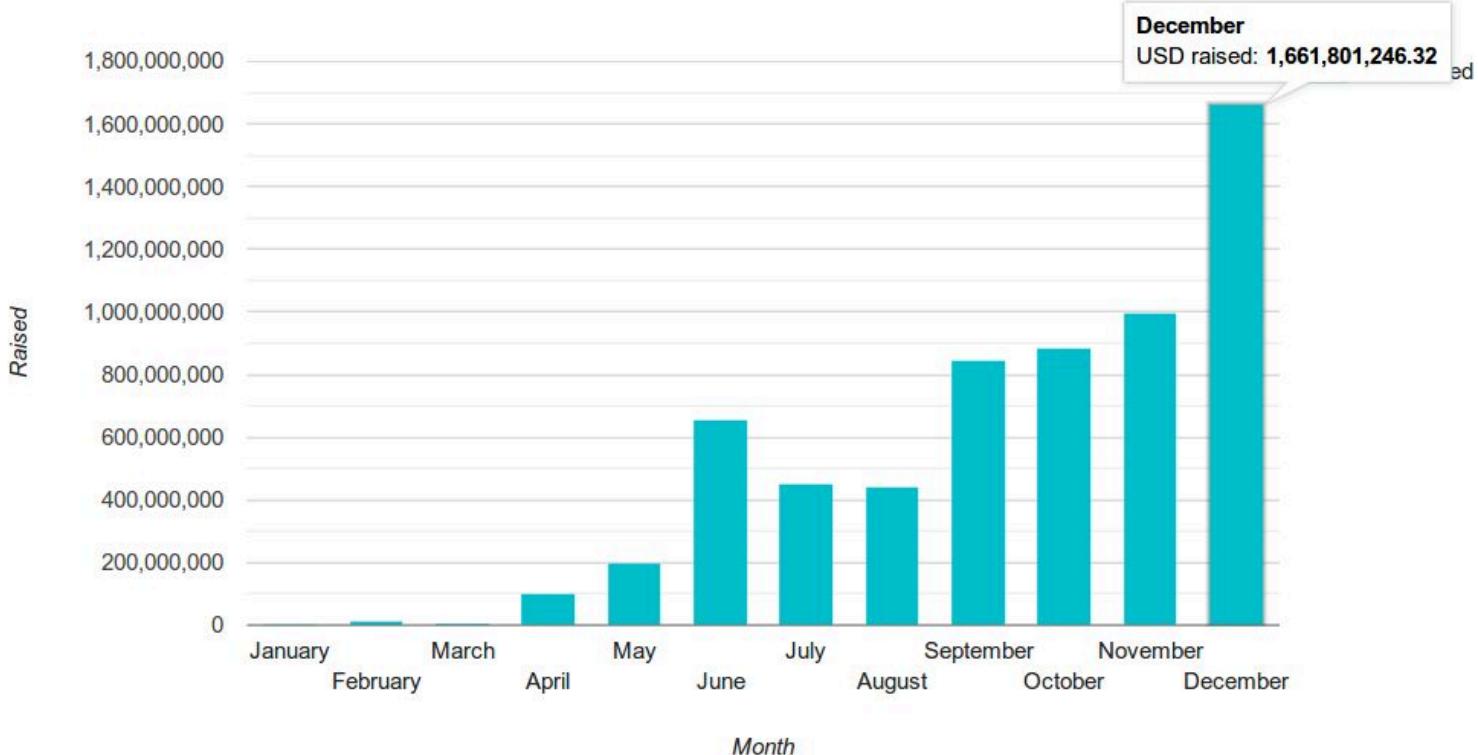


Funds raised in 2017

Total raised: \$6,226,689,449

Number of ICOS: 875

2014 2015 2016 2017 2018

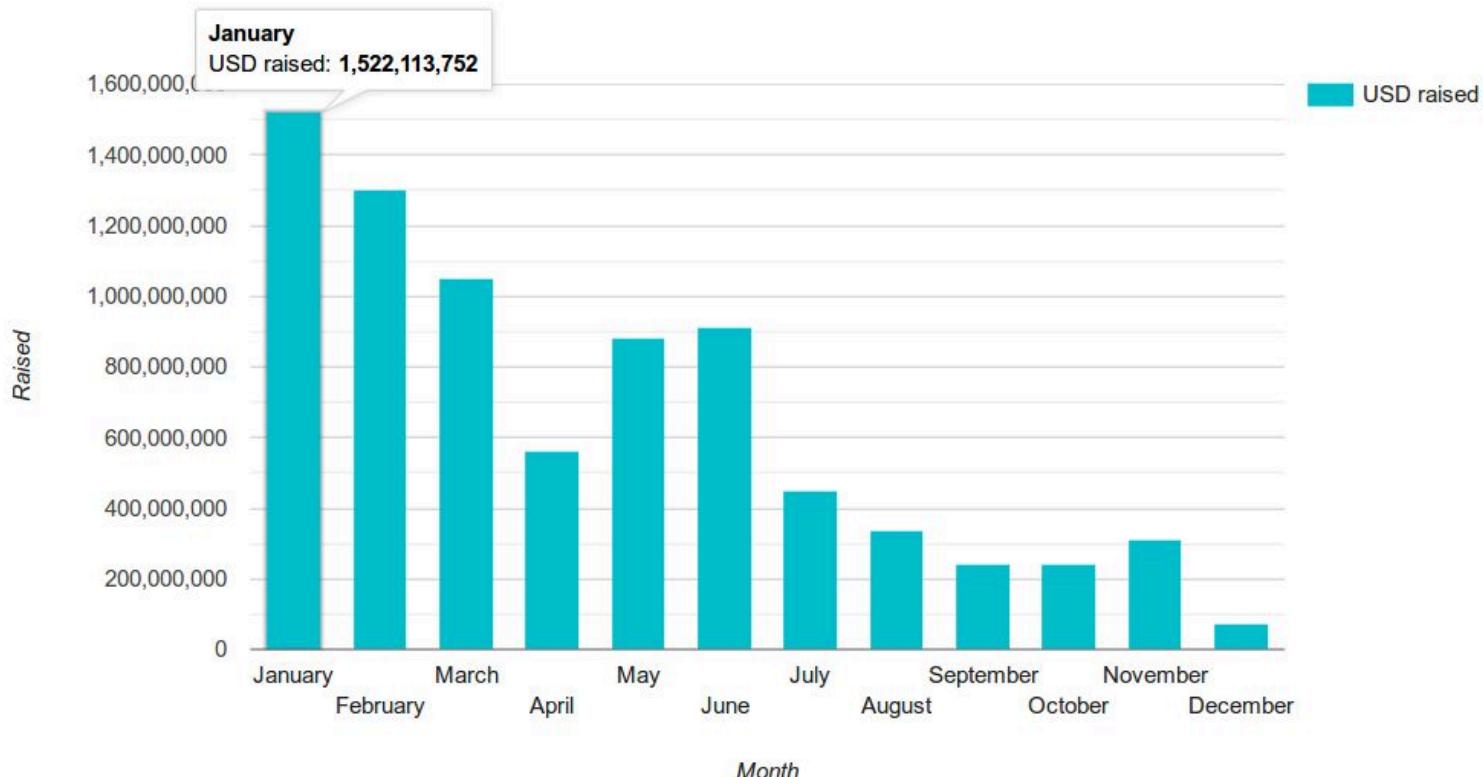


Funds raised in 2018

Total raised: \$7,852,477,043

Number of ICOS: 1257

2014 2015 2016 2017 2018



Linear Log

1h 6h 12h 1d 1w 1m 3m 6m 1y **all**

07/18/2010 to 01/27/2019



\$15,000

\$10,000

\$5,000

2014

2016

2018



\$17,394.97

December 11, 2017

00:00:00 PST



Linear Log 1h 6h 12h 1d 1w 1m 3m 6m 1y all 07/18/2010 to 01/27/2019 



\$1,250

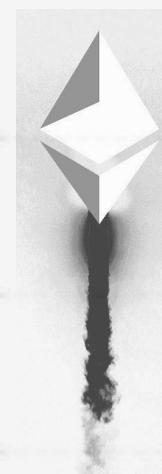
\$1,000

\$750

\$500

\$250

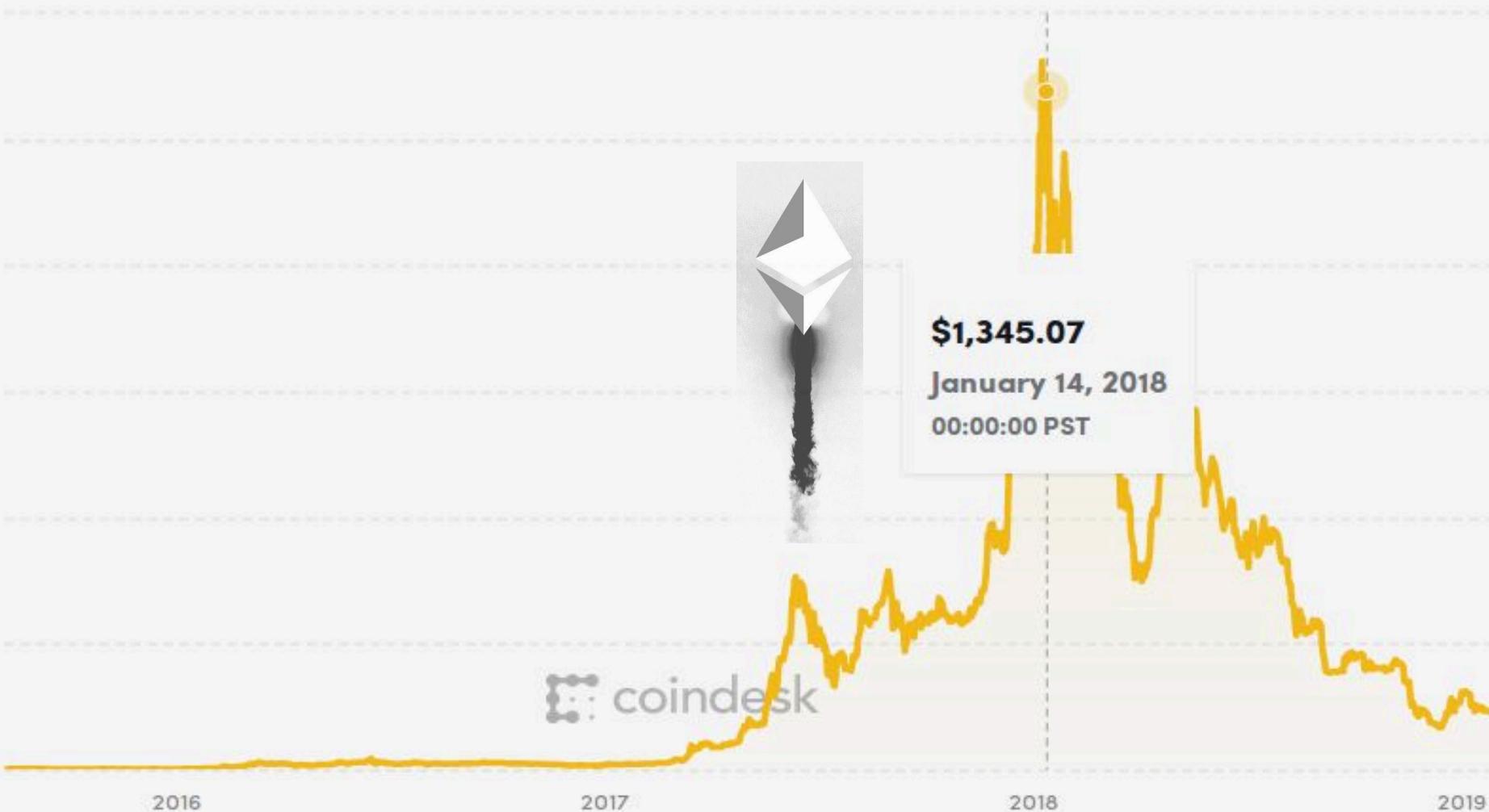
 coindesk



\$1,345.07

January 14, 2018

00:00:00 PST



Blockchain Hard numbers

1. Global **Market Cap**:
Blockchain tokens

\$820Bn (Jan 2018)
0.9% of World GDP
\$120Bn (Jan 2019)



2. # of **Blockchain users**
~ 30 million users.



3. **Price** Jan 27, 2019

\$3540 / BTC
\$110 / ETH

4. Blockchain **Disk Space**

- Bitcoin (full node): **197Gb**
- Ethereum (geth fast full): **142Gb**
- Ethereum (Parity full archive): **1.1Tb**

1. <https://coinmarketcap.com/charts/>

2. https://www.reddit.com/r/Ripple/comments/80hd4j/ripple_xrp_price_and_the_total_number_of/

3. <https://coinmarketcap.com/>

4. <https://blockchain.info/charts/blocks-size> (Bitcoin) <https://etherscan.io/chart2/chaindatasizefast> (Ethereum)

Current State of Blockchain: Something is Happening

💡 Highest increase of **355726** New Addresses was recorded on Thursday, January 4, 2018

❗ Lowest increase of **41** New Addresses was recorded on Thursday, August 6, 2015

Ethereum Unique Address Growth Chart

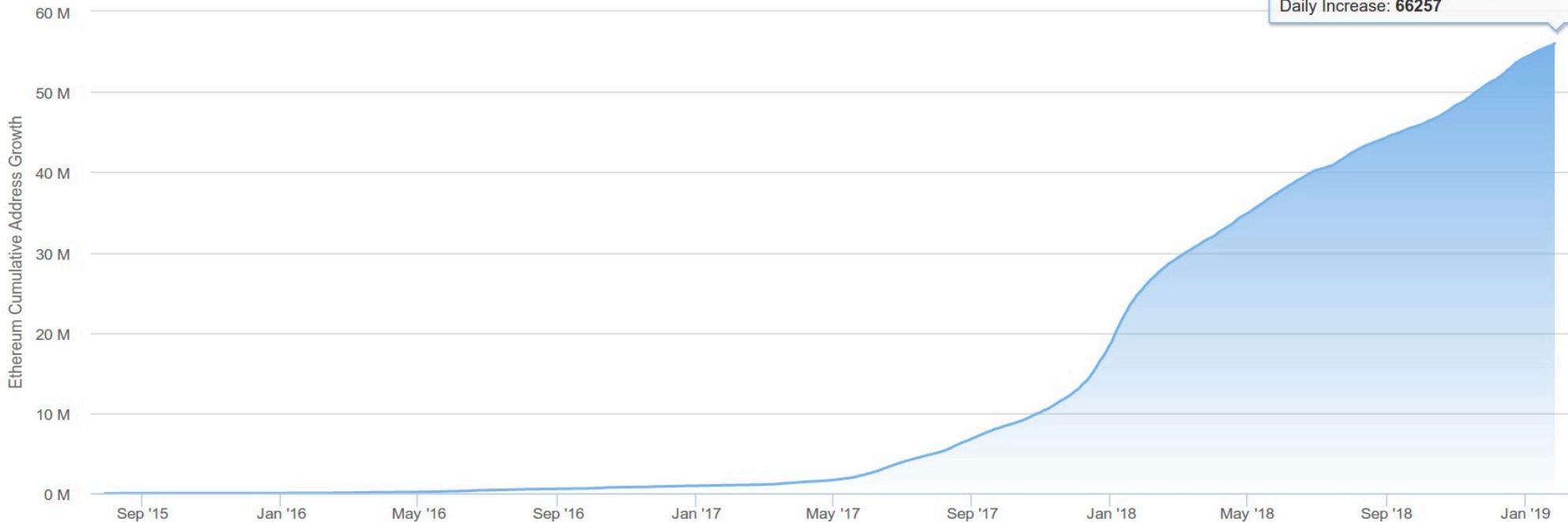
Source: Etherscan.io

Click and drag in the plot area to zoom in

Sunday, January 27, 2019

[Total Distinct Addresses : **56015893**]

Daily Increase: **66257**



According to Etherscan.io 56Mn unique addresses existed on the Ethereum blockchain yesterday. Daily increase of 66k.

Total	8761 (100%)
United States	3506 (40.02%)
China	1479 (16.88%)
Canada	618 (7.05%)
Germany	377 (4.30%)
Russian Federation	278 (3.17%)
United Kingdom	269 (3.07%)
Netherlands	189 (2.16%)
Korea, Republic of	188 (2.15%)
Ukraine	157 (1.79%)
France	148 (1.69%)

[View all](#)



EVOLUTION



Ethernodes reports
8.7k Ethereum
nodes globally,
across six
continents



World map of nodes according to

https://team.carto.com/viz/e70677d5-1111-40a8-9e19-f27da227a55c/public_map

TRUFFLE



Lifetime Downloads

1,364,946

<https://truffleframework.com/dashboard>

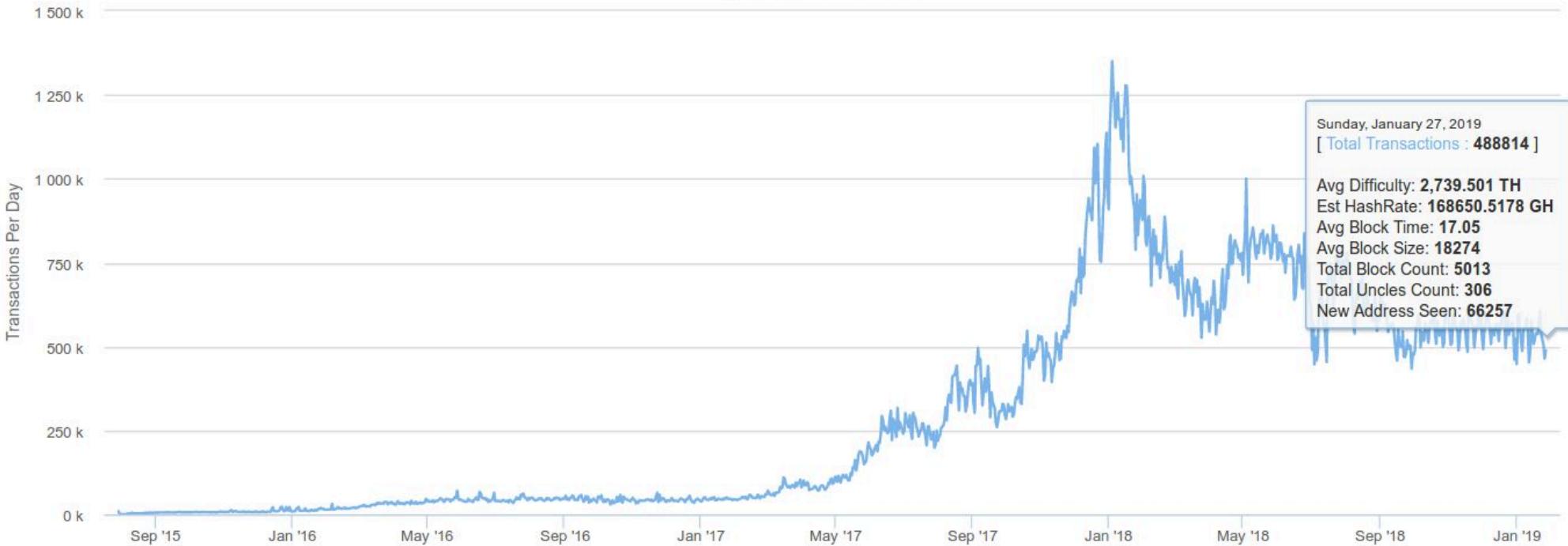
💡 Highest number of **1349890** Transactions On Thursday, January 4, 2018

💡 Lowest number of **1329** Transactions On Sunday, August 9, 2015

Ethereum Transaction Chart

Source: Etherscan.io

Click and drag in the plot area to zoom in



Daily transactions according to Etherscan.io. 489k transactions on the Ethereum blockchain yesterday.

Value of top 3 currencies

January 27th 2019

#	Name	Market Cap	Price	Volume (24h)	Circulating Supply
1	Bitcoin	\$62,586,706,340	\$3,575.32	\$5,570,121,461	17,505,187 BTC
2	XRP	\$12,644,551,899	\$0.307179	\$361,099,753	41,163,466,448 XRP *
3	Ethereum	\$11,791,470,263	\$112.73	\$2,765,363,594	104,596,490 ETH

Market Cap for all cryptocurrencies

Peak: \$817Bn (today \$118Bn)

Zoom 1d 7d 1m 3m 1y YTD ALL

From Apr 28, 2013 To Jan 27, 2019

Market Cap

\$750B
\$500B
\$250B
\$0

24h Vol

Oct '13 Jul '14 Apr '15 Jan '16 Oct '16 Jul '17 Apr '18 Jan '19



— Market Cap ● 24h Vol

BLOCKCHAIN: WHAT IS HAPPENING?

Research study of 43 Blockchain startups find zero of value

BURST BUBBLE

Out of 43 Blockchain Startups, Zero Have Delivered Products

Ambitious white papers and press releases don't matter if your tech doesn't do anything.

Dan Robitzski

| November 30th 2018

BLOCKCHAIN: WHAT IS HAPPENING?

ConsenSys cuts 50% of its staff

More Staff Cuts Are Coming at Ethereum Studio ConsenSys



Zack Seward , Brady Dale ,

⌚ Dec 20, 2018 at 17:40 UTC • Updated Dec 20, 2018 at 22:32 UTC

NEWS

BLOCKCHAIN: WHAT IS HAPPENING?



FRANZiska Barczyk

Connectivity

Will people ditch cash for cryptocurrency? Japan is about to find out

The world's largest experiment in using blockchain-based networks to pay for things is about to begin.

by Mike Orcutt January 22, 2019

BLOCKCHAIN: WHAT IS HAPPENING?

Facebook could be building a cryptocurrency for WhatsApp

Rob Price Dec. 20, 2018, 8:30 PM



Walmart implements IBM's blockchain for food traceability

The aim is to track food from farm to store in near real time using blockchain's distributed ledger system.



By Natalie Gagliordi for Between the Lines | September 24, 2018 -- 19:00 GMT (12:00 PDT) | Topic: Blockchain

BLOCKCHAIN: WHAT IS HAPPENING?

Sourcing The Dinner Party's Beef

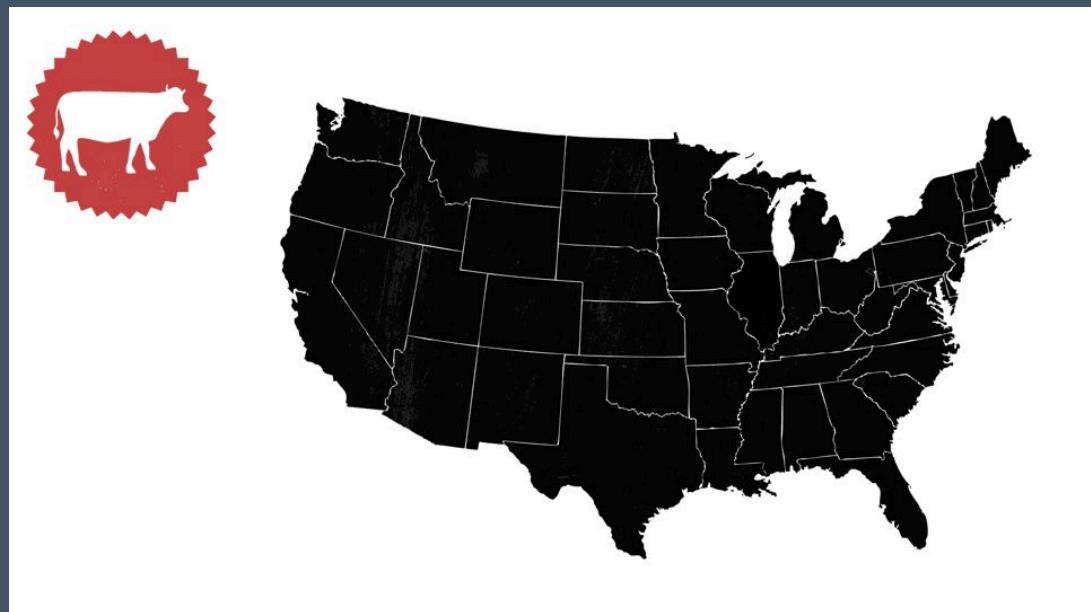
EDITOR'S PICK | 12,434 views | Jan 8, 2019, 10:43am

Blockchain's Movable Feast: How The Tech Is Changing Food Supply Chains



Michael del Castillo Forbes Staff
Crypto & Blockchain
I cover enterprise adoption of blockchain and cryptocurrency.

f t in



BLOCKCHAIN: WHAT IS HAPPENING?

Amazon Plays Its Own Game With Enterprise Blockchain



Anna Baydakova

Dec 18, 2018 at 12:00 UTC • Updated Dec 18, 2018 at 17:39 UTC

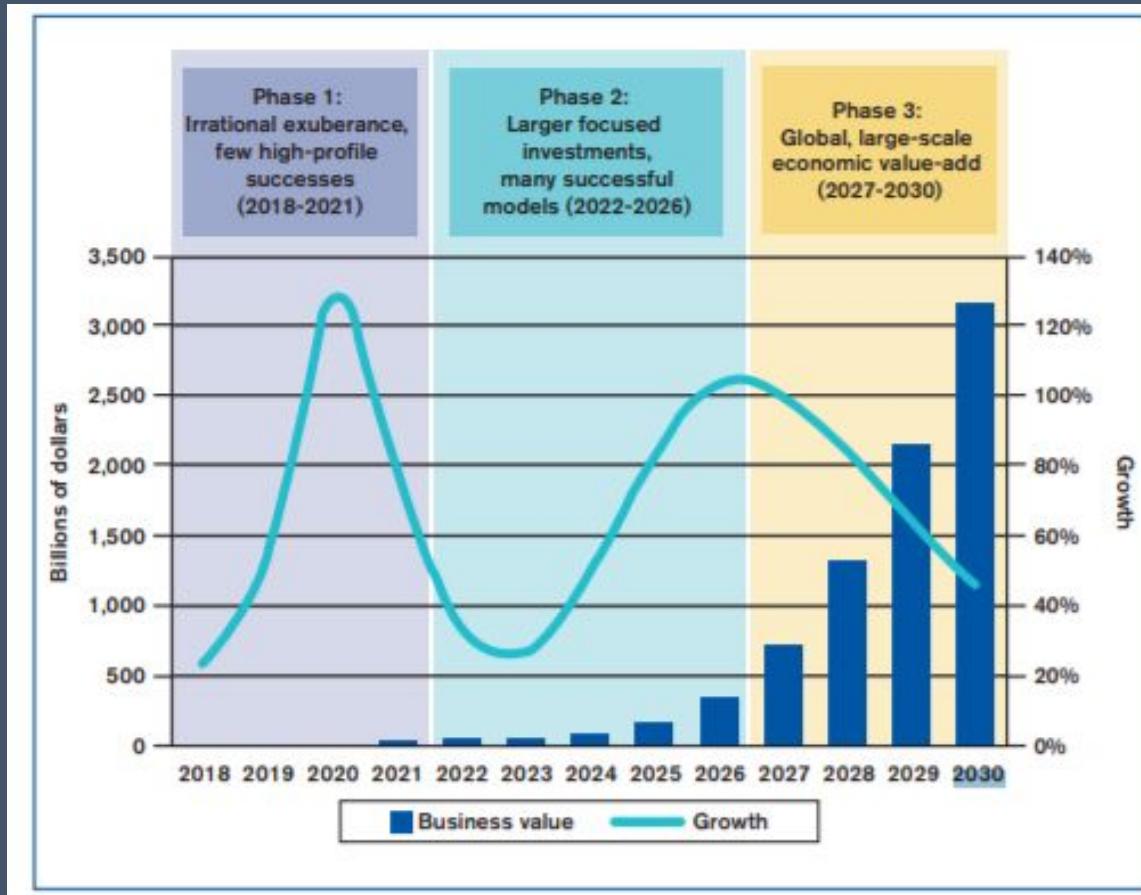
FEATURE

Oasis Labs raises \$45 million for 'privacy first' cloud on blockchain

DEAN TAKAHASHI @DEANTAK JULY 9, 2018 3:00 AM



Report: Blockchain Deployment Could Add \$3 Trillion in International Trade by 2030



Two Essential Questions to Answer

(in order to understand the value of the technology)

What is a Blockchain?

What is a Blockchain?

Blockchain is comprised of 4 basic components

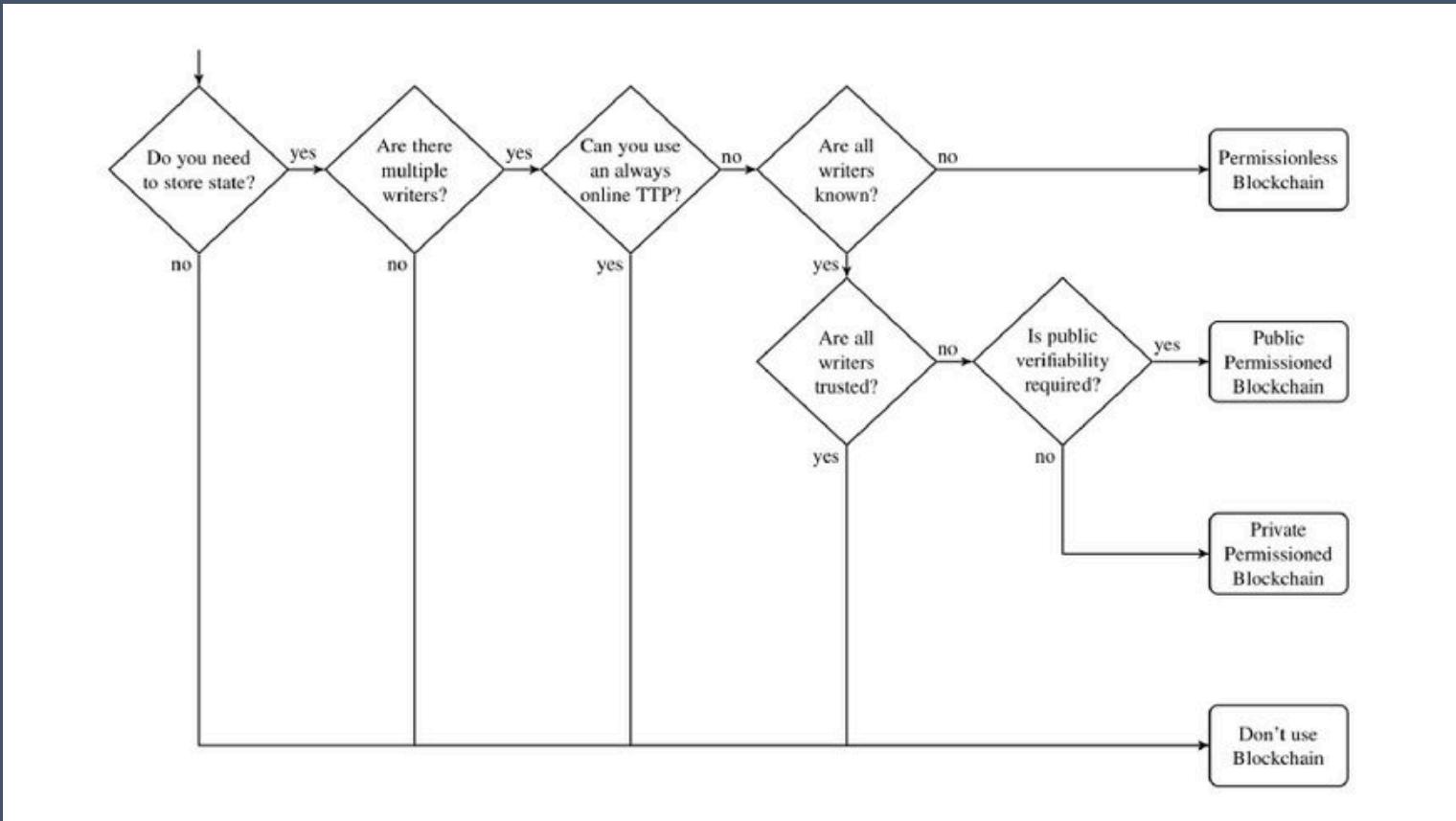
The diagram consists of four circular icons, each representing a component of a blockchain. From left to right: 1. Digital Ledger: An icon of three server racks with a checkmark. 2. Consensus Mechanism: An icon of three people with a checkmark. 3. Digital Asset: An icon of a Bitcoin symbol. 4. Network Participants: An icon of a network graph with nodes and connections.

Digital Ledger A continually updated, network hosted 'database' of all transactions on a blockchain. Comprised of blocks of transactions (with metadata) chained together by cryptography	Consensus Mechanism Programmed into each blockchain protocol, and responsible for verifying and updating transactions on the network's digital ledger; not necessary in private blockchains	Digital Asset The good transacted on a blockchain; cryptocurrency provided the initial proof of concept, with the industry now looking to "color tokens" – i.e. any other form of digital asset	Network Participants Computing nodes with access to the blockchain, able to manipulate the ledger and view past transactions; may be pre-approved or verified by a consensus mechanism
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Think of blockchain as a transformative way to establish trust, transparency, and efficiency within P2P systems

Do you need a blockchain?

Do you need a blockchain (Framework)



BLOCKCHAIN: WHAT IS HAPPENING?

“We are entering a much more realistic phase where people look at this technology and think seriously about where it makes sense to apply it and where it doesn’t. We are leaving the hype behind, especially for people who inappropriately applied this technology hoping it would solve all their problems.”

- Symbiont’s CEO Mark Smith at WEF annual meeting in Davos

Promise vs Existing Limitations

- ✗ Infrastructure is being developed
- ✗ Funds are being raised
- ✗ Several real-world trials
- ✗ Scalability is possible
- ✗ More transparency
- ✗ Auditable, tamper resistant records
- ✗ User-owned data
- ✗ Private financial transactions
- ✗ True, decentralized services
- ✗ Global, financial inclusion
- ✗ Architecture is not resource efficient
- ✗ Global financial transactions not at scale and distributed yet.
- ✗ Trilemma: Security, Scale, Decentralization
- ✗ Smart contracts break down at the interface of the blockchain to non blockchain world (oracle problem)
- ✗ Regulation, tax implication, policies and legal frameworks not in place - FUD
- ✗ Many projects haven't delivered on promises

Student Presentations

Assignment Lec1: Interact with a smart contract

1. Install Metamask or Cipher or both
2. Get some Ropsten test ether from a Faucet
3. Direct your web3 browser to: bit.ly/afo-smart-contract
4. Create a new proposal and *the proposal text should only be your first name.*
5. Save the proposal and confirm the transaction
6. Find the proposal and vote “Approve”

PS. I'll check that the proposals were submitted from unique Ropsten addresses ;)

Install instructions for Metamask + Cipher and how to get Ropsten test ether plus these assignment instructions can be found in the class Github folder: github.com/afo/L2Lblockchain/

End