Plan of Attack

What we will learn in this section:

- What is Ethereum?
- What is a Smart Contract?
- Decentralized Applications (Dapps)
- Ethereum Virtual Machine & Gas
- Decentralized Autonomous Organizations (DAOs)
- The DAO Attack
- Soft and Hard Forks (Part 1)
- Soft and Hard Forks (Part 2) (Advanced Tutorial)
- Initial Coin Offerings (ICOs)
- ICO Case Study
- Blockchain Startups: White Papers
- Blockchain and Web 3.0

What is Etherium?

What is Etherium

Vitalik Buterin

What is Etherium

TECHNOLOGY

Blockchain

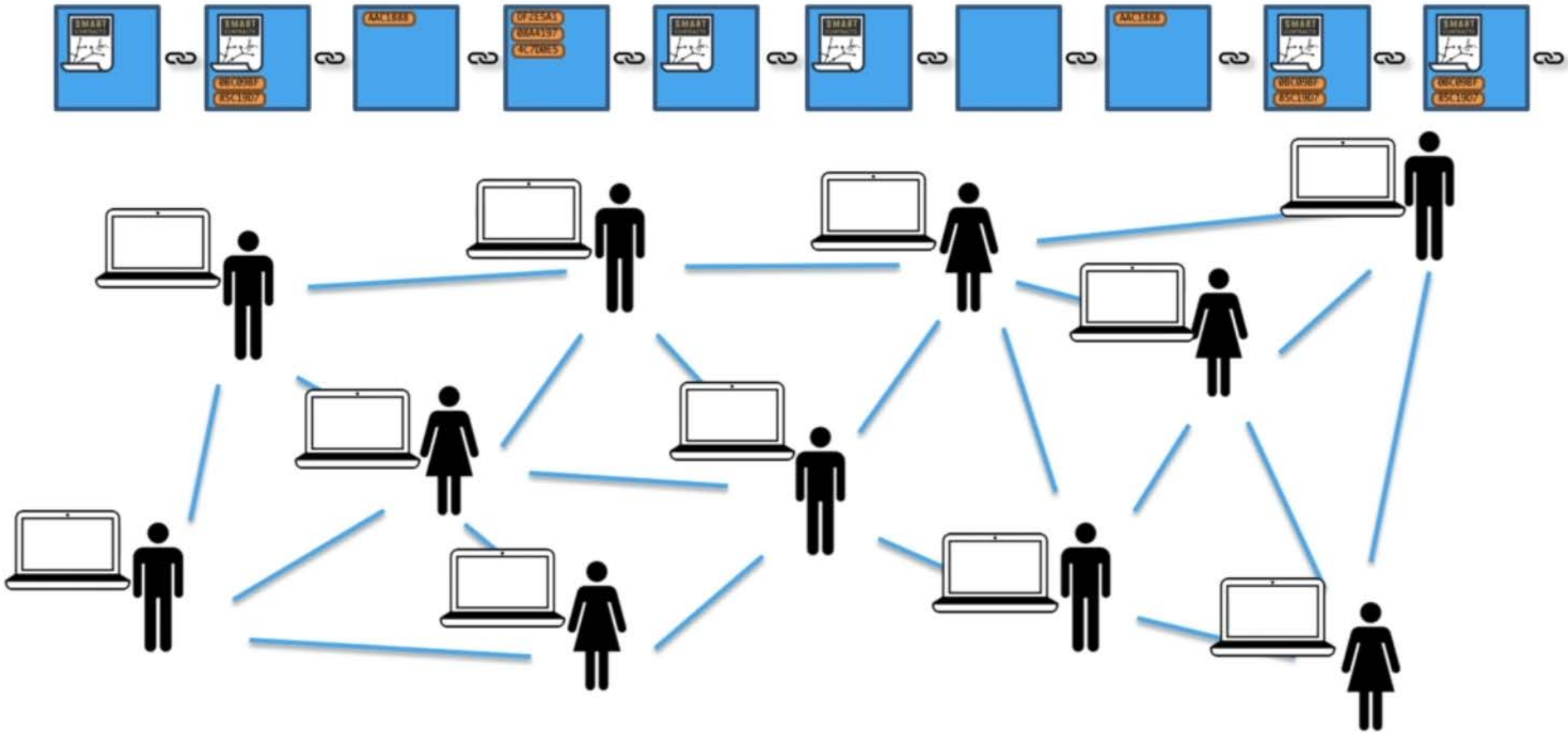
PROTOCOL / COIN /

Waves	Ethereum	Bitcoin	Neo	Ripple

TOKEN

Waves	Ethereum	Bitcoin	Neo	Ripple
WCT	TRX	AE	ACAT	TNC
B1	REP	SNT	DBC	RPX
WGR	RHOC	MKR	QLC	TKY
INTL	PPT	BNB	ONT	IAM

What is Etherium



What is a Smart Contract?

What is a Smart Contract?

What is a Smart Contract?

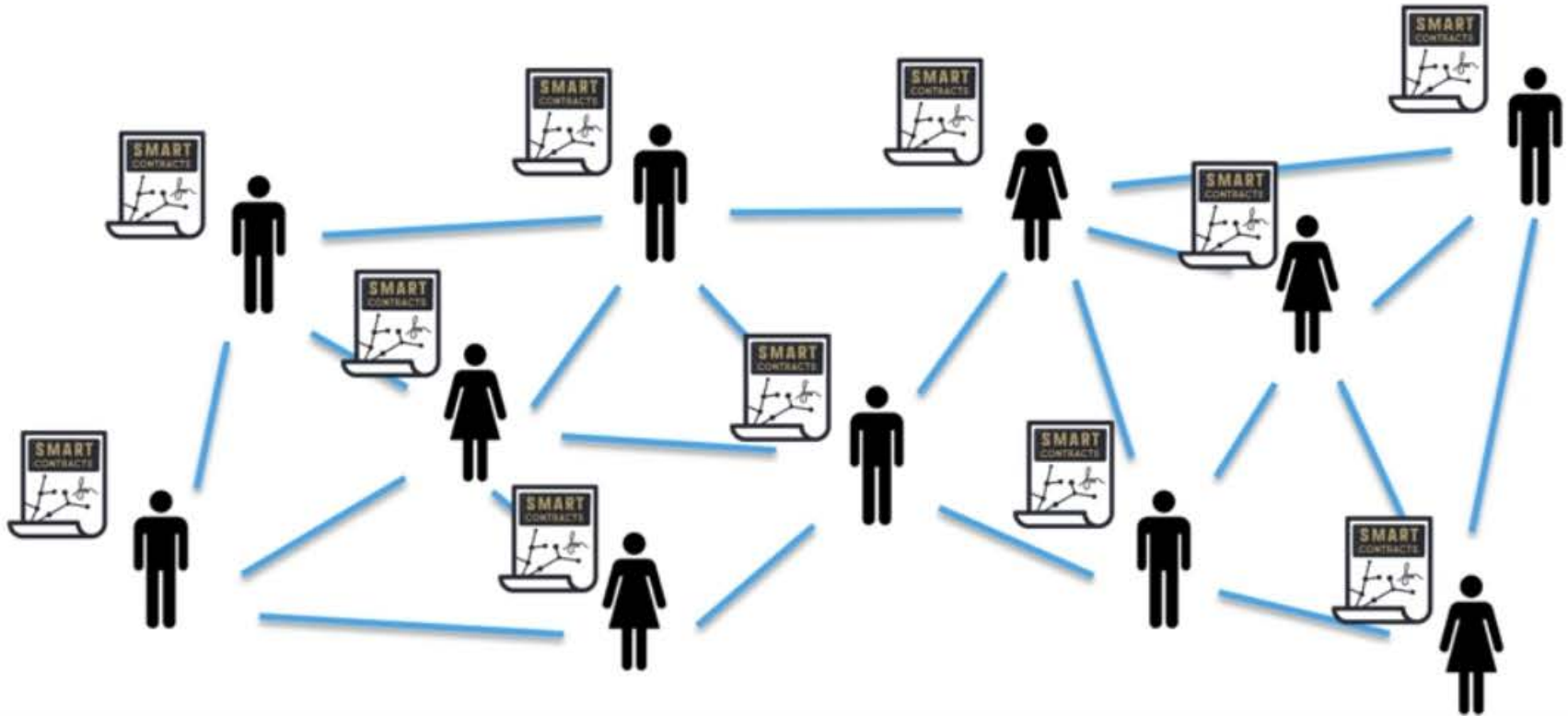
Turing-Complete?

No Yes

What is a Smart Contract?

Each Node has:

1. History of all smart contracts
2. History of all transactions
3. Current state of all smart contracts



Blockchain: the solution for transparency in product supply chains

Published 21 November 2015

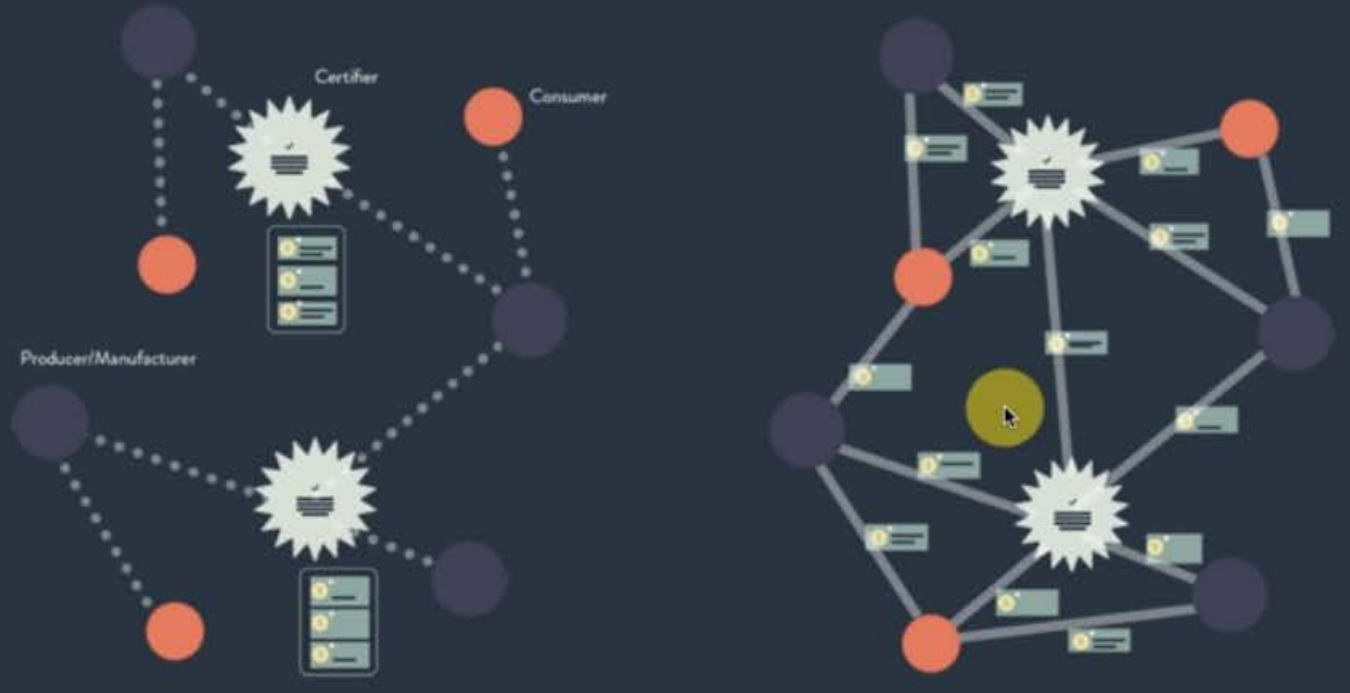
> "Now, in the hyper-connected and ever evolving world, transparency is the new power."
>
> *Benjamin Herzberg, Program Lead, Private Sector Engagement for Good Governance at the World Bank Institute*

This white paper is by social enterprise Project Provenance Ltd. and describes a prototype that uses blockchain technology to enable secure traceability of certifications and other salient information in supply chains. Provenance enables every physical product to come with a digital 'passport' that proves authenticity (Is this product what it claims to be?) and origin (Where does this product come from?), creating an auditable record of the journey behind all physical products. The potential benefits for businesses, as well as for society and the environment, are hard to overstate: preventing the selling of fake goods, as well as the problem of 'double spending' of certifications present in current systems. The Decentralized Application (Dapp) proposed in this paper is still in development and we welcome businesses and standards organizations to join our consortium and collaborate on this new approach to understanding our material world.

Demand for transparency is increasing

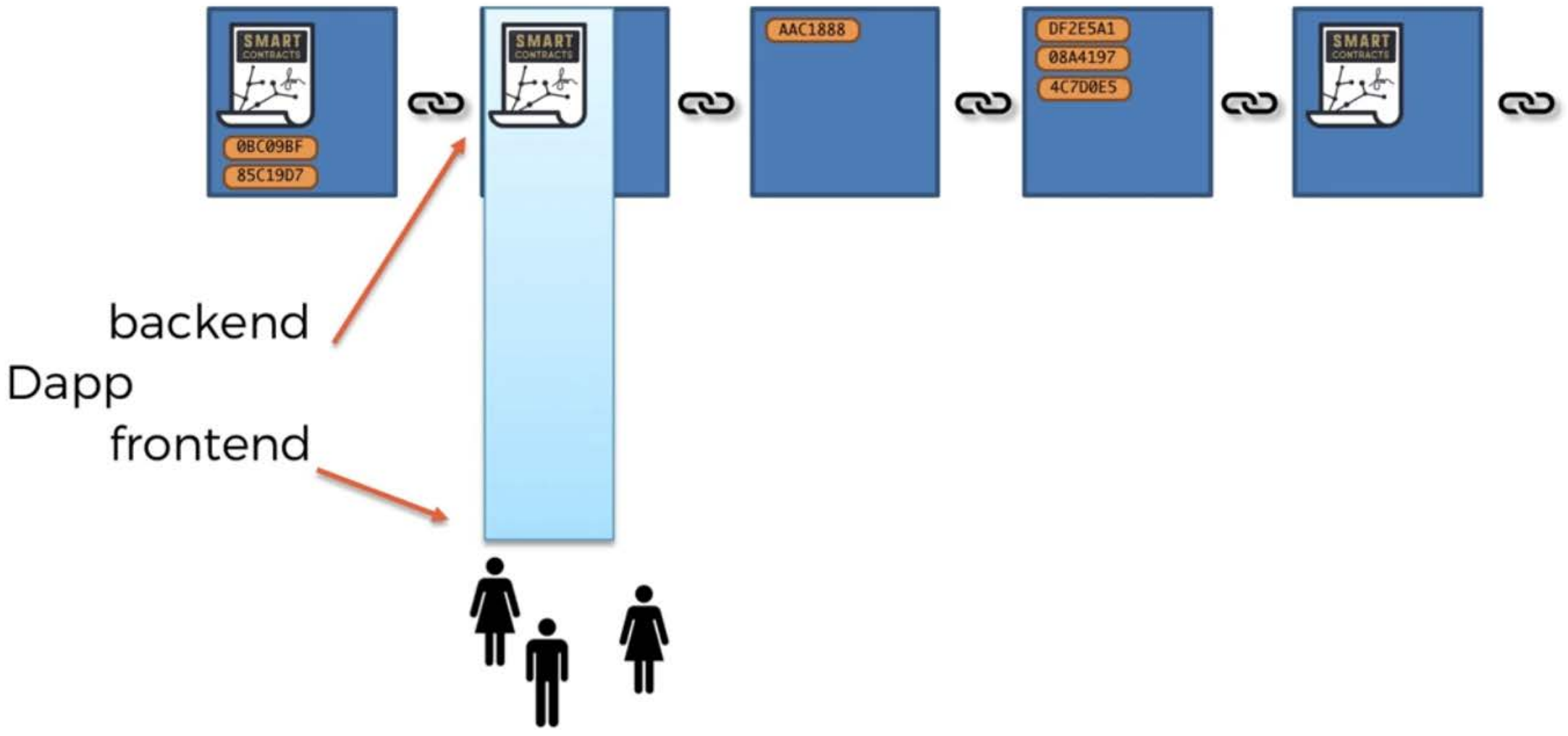
We know surprisingly little about most of the products we use every day. Even before reaching the end consumer, goods travel through an often vast network of retailers, distributors, transporters, storage facilities, and suppliers that participate in design, production, delivery, and sales, yet in almost every case these journeys remain an unseen dimension of our possessions.

that their "on-chain" persona accurately reflects reality.



With blockchains data can be accessed and verified by all actors, rather than solely by the original certifier.

Decentralized Applications (Dapps)



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Steem Visions: An Artist Discussion and Online Exhibit hosted with @stellabelle and @juliakponsfor…

I'm doing panel discussions weekly now. This Saturday is Steem Visions. We've been gathering up some h…

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Dear Steemit Friends: A more intimate exploration of the beautiful Cappadocia Everywhere you…

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New to Steemit?

Quick start guide
The blockchain
FAQs
Sign up

Ethereum Virtual Machine & Gas

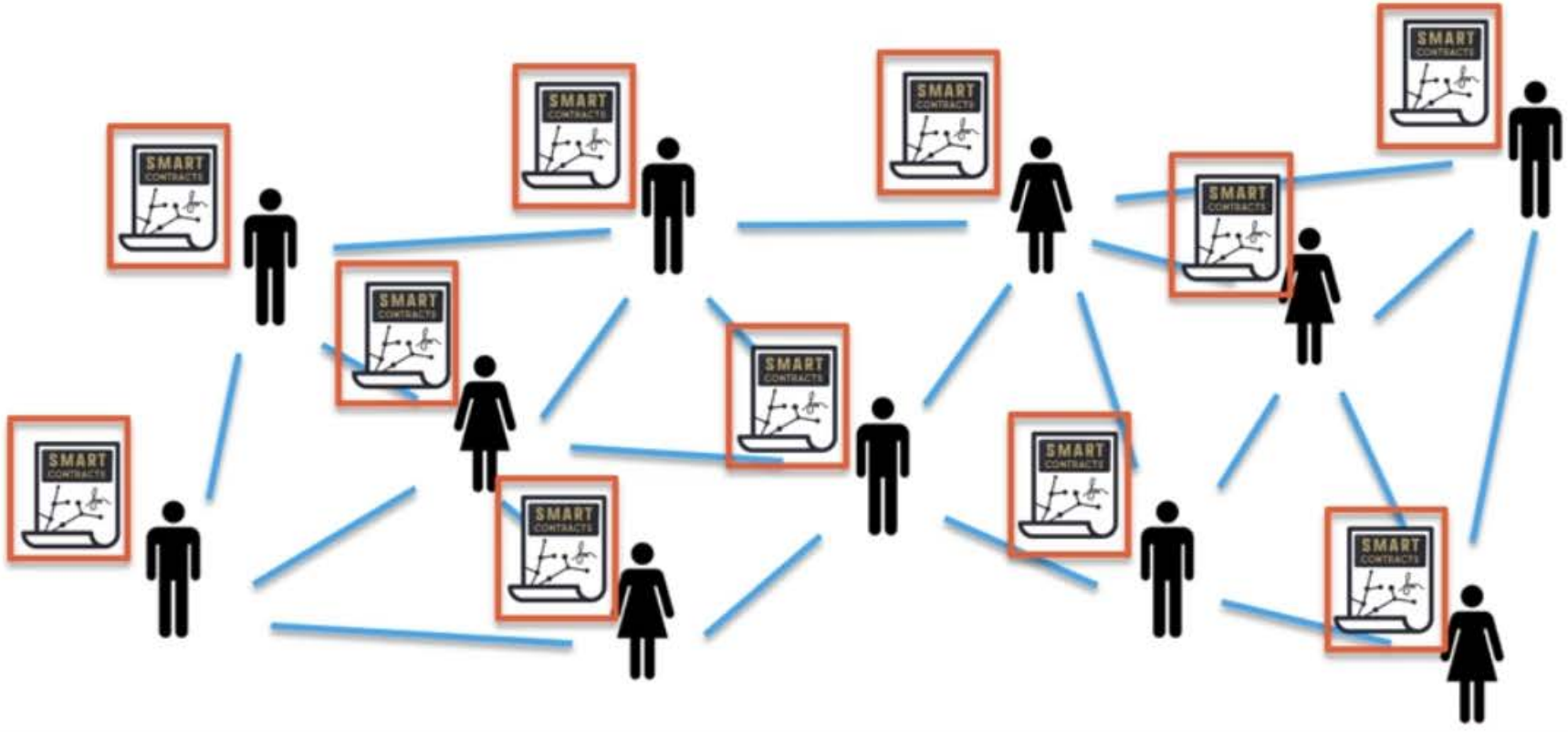
Security threats:

- Viruses and access to private files
- Infinite loops

Ethereum Virtual Machine & Gas

Each Node has:

1. History of all smart contracts
2. History of all transactions
3. Current state of all smart contracts



Ethereum Virtual Machine & Gas

Gas Costs from Yellow Paper -- EIP-150 Revision (1e18248 - 2017-04-12)

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100% View only

32000

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Value	Mnemonic	Gas Used	Subset	Removed from stack	Added to stack	Notes	Formula	Formula Notes							
2	0x00	STOP	0	zero	0	0	Halts execution.									
3	0x01	ADD	3	verylow	2	1	Addition operation									
4	0x02	MUL	5	low	2	1	Multiplication operation.									
5	0x03	SUB	3	verylow	2	1	Subtraction operation.									
6	0x04	DIV	5	low	2	1	Integer division operation.									
7	0x05	SDIV	5	low	2	1	Signed integer division operation (truncated).									
8	0x06	MOD	5	low	2	1	Modulo remainder operation									
9	0x07	SMOD	5	low	2	1	Signed modulo remainder operation.									
10	0x08	ADDMOD	8	mid	3	1	Modulo addition operation.									
11	0x09	MULMOD	8	mid	3	1	Modulo multiplication operation.									
12	0x0a	EXP	FORMULA		2	1	Exponential operation.	(exp == 0) ? 10 :	If exponent is 0, gas used is 10. If exponent is greater than 0, gas used is 10 plus 10 times a factor related to how large the log of the expo							
13	0x0b	SIGNEXTEND	5	low	2	1	Extend length of two's complement signed integer.									
14	0x10	LT	3	verylow	2	1	Less-than comparison.									
15	0x11	GT	3	verylow	2	1	Greater-than comparison.									
16	0x12	SLT	3	verylow	2	1	Signed less-than comparison.									
17	0x13	SGT	3	verylow	2	1	Signed greater-than comparison.									
18	0x14	EQ	3	verylow	2	1	Equality comparison.									
19	0x15	ISZERO	3	verylow	1	1	Simple not operator.									
20	0x16	AND	3	verylow	2	1	Bitwise AND operation.									
21	0x17	OR	3	verylow	2	1	Bitwise OR operation									
22	0x18	XOR	3	verylow	2	1	Bitwise XOR operation.									
23	0x19	NOT	3	verylow	1	1	Bitwise NOT operation.									
24	0x1a	BYTE	3	verylow	2	1	Retrieve single byte from word									
25	0x20	SHA3	FORMULA		2	1	Compute Keccak-256 hash.	30 + 6 * (size of i	30 is the paid for the operation plus 6 paid for each word (rounded up) for the input data.							
26	0x30	ADDRESS	2	base	0	1	Get address of currently executing account.									
27	0x31	BALANCE	400		1	1	Get balance of the given account.									
28	0x32	ORIGIN	2	base	0	1	Get execution origination address.									
29	0x33	CALLER	2	base	0	1	Get caller address.									
30	0x34	CALLVALUE	2	base	0	1	Get deposited value by the instruction/transaction responsible for this execution.									
31	0x35	CALLDATALOAD	3	verylow	1	1	Get input data of current environment.									
32	0x36	CALLDATASIZE	2	base	0	1	Get size of input data in current environment.									
33	0x37	CALLDATACOPY	FORMULA		3	0	Copy input data in current environment to me	2 + 3 * (number c	2 is paid for the operation plus 3 for each word copied (rounded up).							
34	0x38	CODESIZE	2	base	0	1	Get size of code running in current environment.									
35	0x39	CODECOPY	FORMULA		3	0	Copy code running in current environment to	2 + 3 * (number c	2 is paid for the operation plus 3 for each word copied (rounded up).							
36	0x3a	GASPRICE	2	base	0	1	Get price of gas in current environment.									
37	0x3b	EXTCODESIZE	700	extcode	1	1	Get size of an account's code.									
38	0x3c	EXTCODECOPY	FORMULA		4	0	Copy an account's code to memory.	700 + 3 * (numbe	700 is paid for the operation plus 3 for each word copied (rounded up).							

Gas Costs from Yellow Paper | ETH Gas Station | Consumer | Calculating Costs in Ethereum

Secure | https://ethgasstation.info/index.php

ETH Gas Station

Estimates over last 1,500 blocks - Last update: Block 5179725

Change Currency

GENERAL

- Main Page
- Tx Calculator
- TxPool Vision
- Low Gas Price Watch List
- Gas Burners
- FAQ
- External Links

Std Cost for Transfer	Gas Price Std (Gwei)	SafeLow Cost for Transfer	Gas Price SafeLow (Gwei)	Median Wait (s)	Median Wait (blocks)
$0.037	2	$0.037	2	30	2

Gas-Time-Price Estimator: For transactions sent at block: 5179754

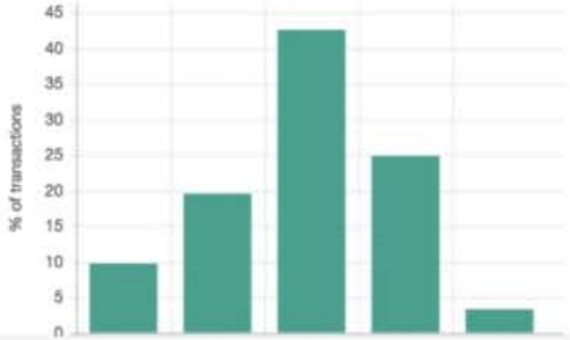
Adjust confirmation time

Avg Time (min)	4.8	Gas Used*	21000
95% Time (min)	12	Avg Time (blocks)	19.53
Gas Price (Gwei)*	2	95% Time (blocks)	48.825
Tx Fee (Fiat)	$0.037	Tx Fee (ETH)	0.00004

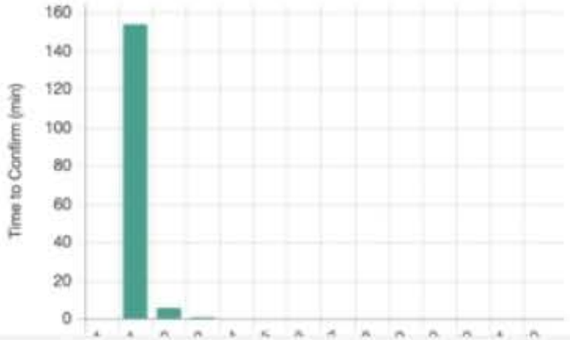
Real Time Gas Use: % Block Limit (last 10)

Last Block: 5179754

Transaction Count by Gas Price



Confirmation Time by Gas Price



Recommended Gas Prices

(based on current network conditions)

Speed	Gas Price (gwei)
SafeLow (<30m)	2
Standard (<5m)	2
Fast (<2m)	13

Note: Estimates not valid when multiple transactions are batched from the same address or for transactions sent to addresses with many (e.g. > 100) pending

Top 10 Miners by Blocks Mined: Support for user transactions

Miner	Lowest gas price (gwei)	Weighted avg gas price (gwei)	% of total blocks
0x4a071eee72bc8664c81b62836932ed0d246da82b	1	13	1

Misc Stats (Last 1,500 blocks)

Category	Value
Cheapest Gas Price (gwei)	0

Task	Gas Required	Cost (ETH)	Cost (USD)	Ops per ETH	Ops per USD	Ops per Block	Blocks to complete Op
Add or subtract two integers	3	0.00000009	0.00002655	11111111.11	37664.78343	1566666.667	0.0000006382978723
Add or subtract two integers 1 million times	3000000	0.09	26.55	11.11111111	0.03766478343	1.566666667	0.6382978723

Danny Ryan Follow
Thinking, coding, and explaining Ethereum and blockchain technologies.
Jun 29, 2017 · 7 min read

Calculating Costs in Ethereum Contracts

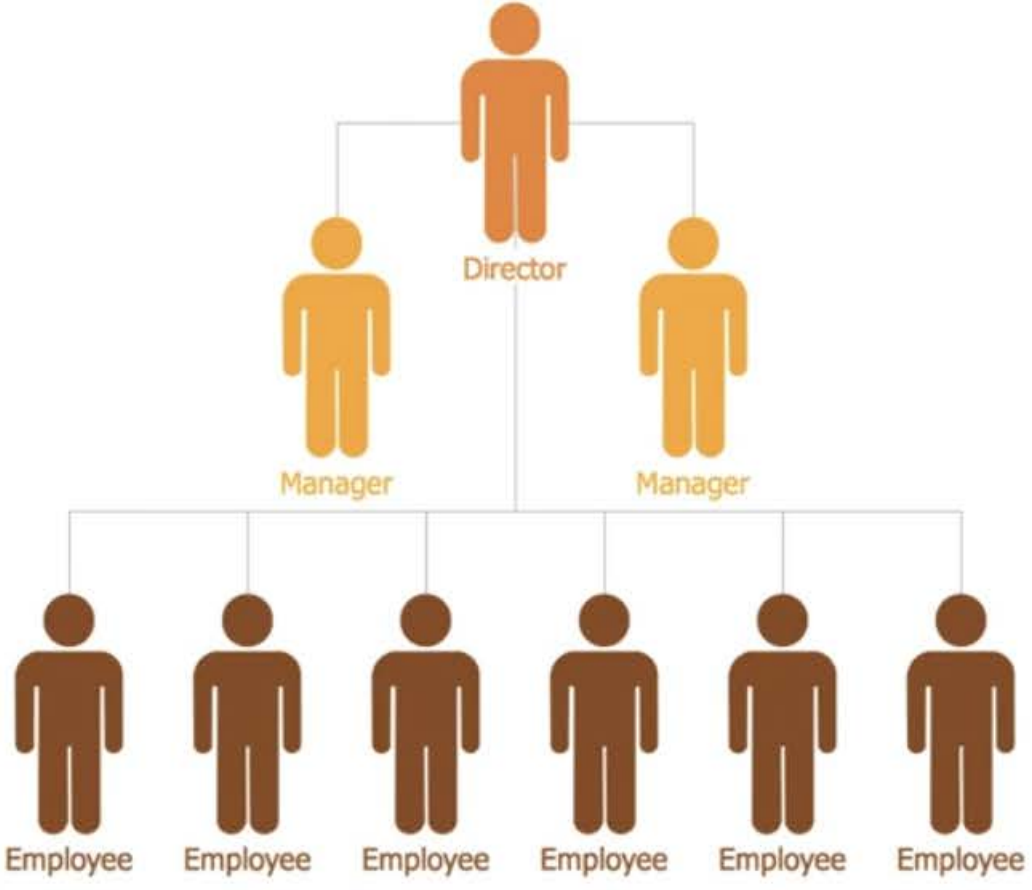
GAS PRICE PSA (2017–08–23): The median gas price at the time of writing this article was 28 Gwei, and continues to be in the realm of 20 Gwei. This is far greater than the typical average and safe-low found on EthGasStation (4 and 0.5 Gwei respectively). The median is so high because of bad gas-price defaults found in many wallets. I ***highly recommend*** *using EthGasStation's average gas-price or lower in order to not pay high fees and to help drive down the market rate for gas-price.*

UPDATE *(2017–09–6): I ported the Google Spreadsheet of OPCODES to a github repo. This repo will be maintained and updated as the yellow paper evolves.*

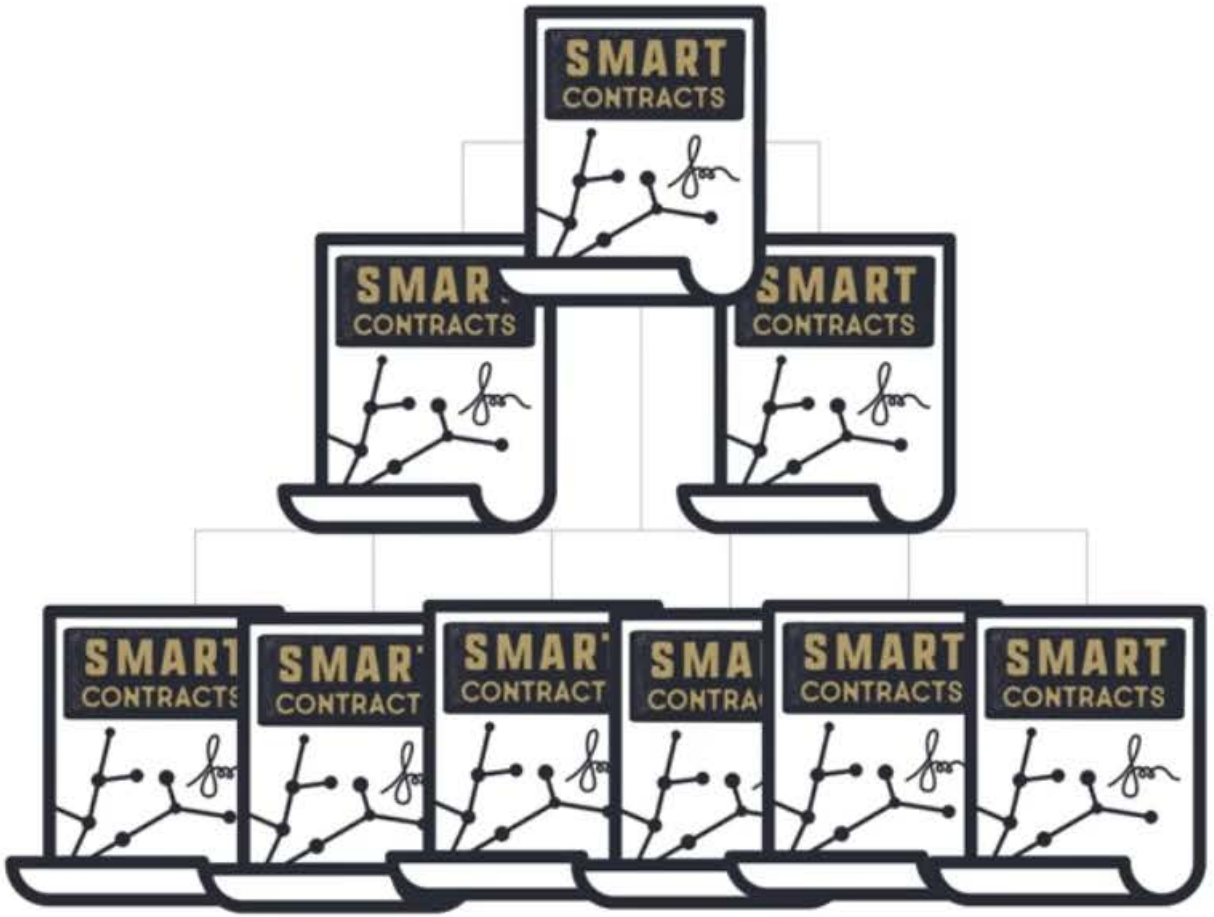
What are users storing when they hold Ether? In one sense, they are storing the ability to perform computation on the Ethereum network. This computation is done in a decentralized fashion:

> *A miner executes the computation associated with each transaction being included in a block, resulting in an updated state. Upon successfully mining a block, a miner broadcasts the block to the network. Each of the other miners and non-mining nodes verify the validity of the transactional computation and resulting state change before accepting the block as valid, incorporating the block*

Decentralized Autonomous Organizations (DAOs)



Decentralized Autonomous Organizations (DAOs)



Decentralized Autonomous Organizations (DAOs)

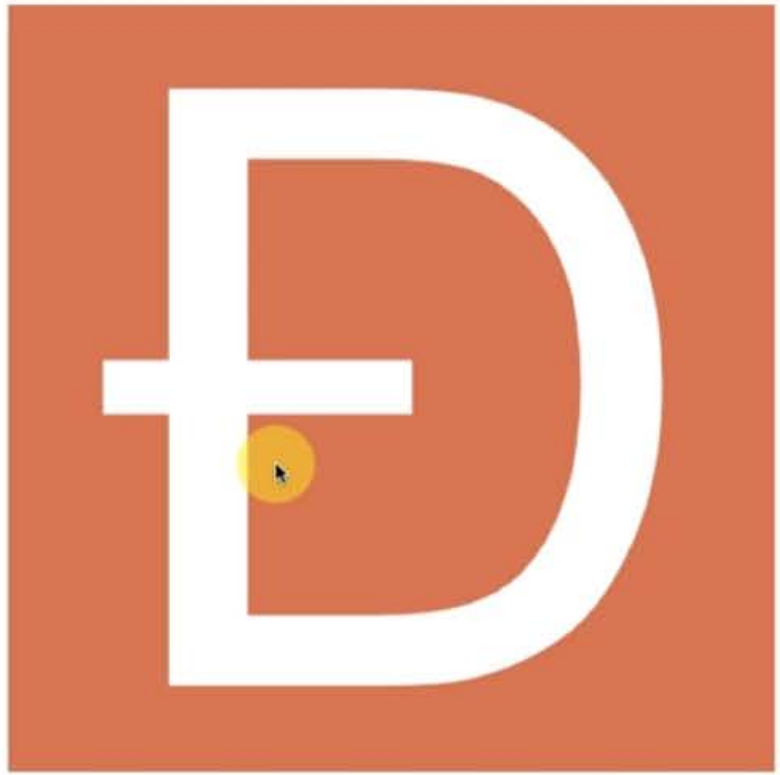
Decentralized Autonomous Organizations (DAOs)





The DAO Attack

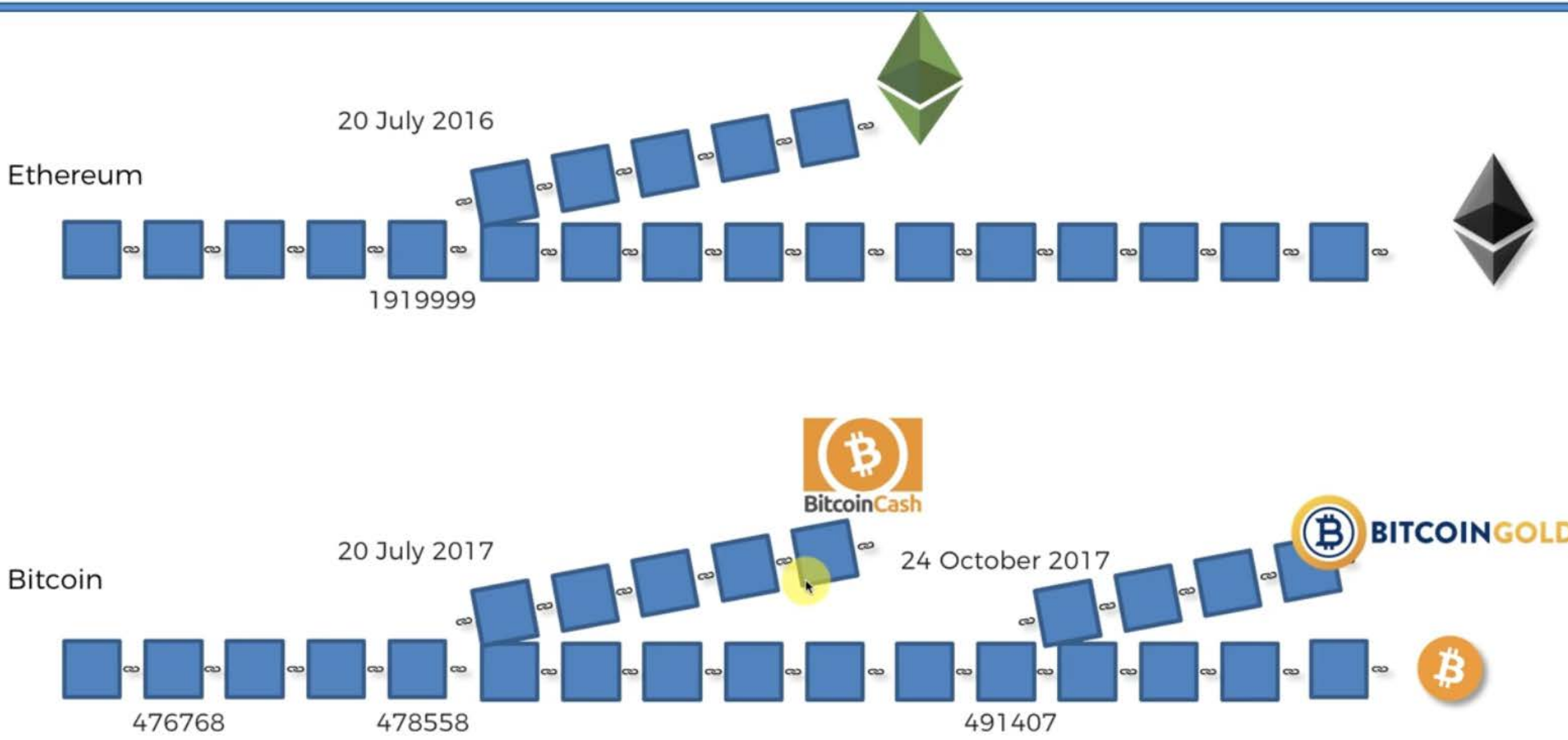
2016
On Ethereum
Investor-directed venture capital fund
Stateless
May 2016 Crowdfunded ~$150,000,000
June 2016 Hacked for ~$50,000,000
Dilemma: *"Code Is Law?"*
Hard fork
Ethereum split into ETH and ETC
Hacker walked away with ~$67,000,000 in ETC
Problem in DAO code not Ethereum



The Ether Thief

BY MATTHEW LEISING
JUNE 13, 2017

Soft & Hard Forks



Soft & Hard Forks

Hard Forks = Loosen Rules

Soft Forks = Tighten Rules

Initial Coin Offerings (ICOs)

TECHNOLOGY

Blockchain

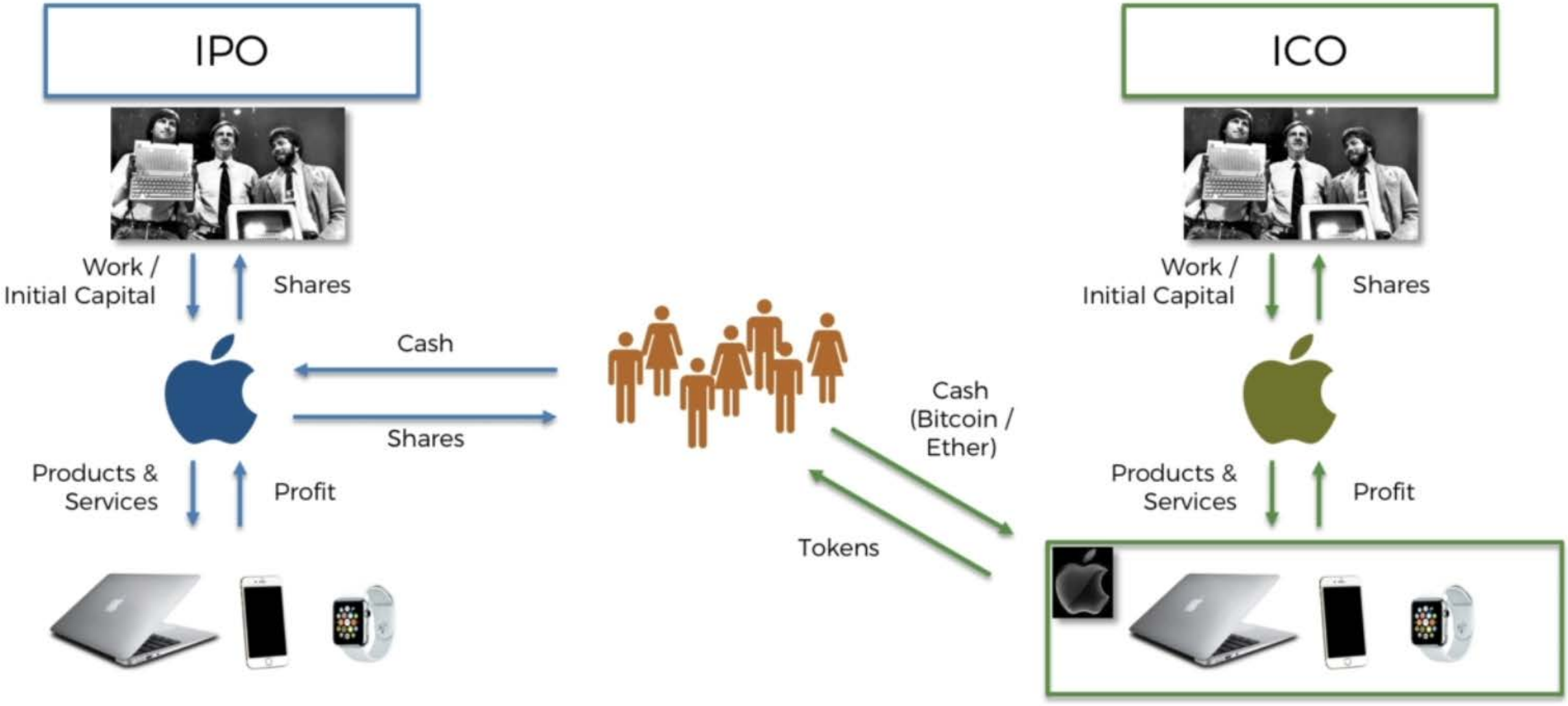
PROTOCOL / COIN /

Waves | Ethereum | Bitcoin | Neo | Ripple

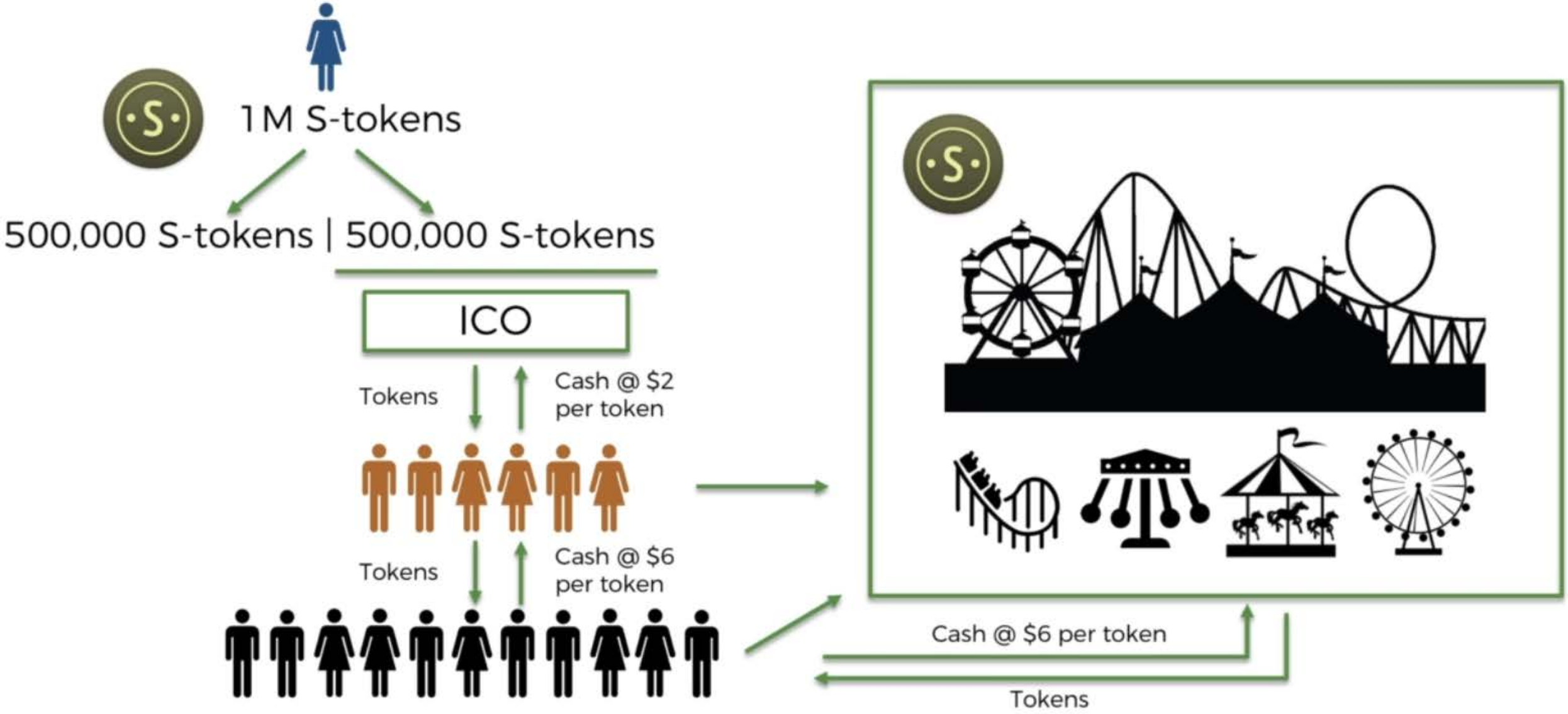
TOKEN

Waves	Ethereum	Bitcoin	Neo	Ripple
WCT	TRX		ACAT	
B1	AE		TNC	
WGR	REP		DBC	
INTL	SNT		RPX	
	RHOC		QLC	
	MKR		TKY	
	PPT		ONT	
	BNB		IAM	

Initial Coin Offerings (ICOs)



ICO Case Study



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Secure | https://coinmarketcap.com

Cryptocurrencies: 1567 / Markets: 10265 Market Cap: $322,113,797,012 / 24h Vol: $22,287,721,196 / BTC Dominance: 42.4% English USD

Cryptocurrency Market Capitalizations

Market Cap Trade Volume Trending Tools Search

Top 100 Cryptocurrencies by Market Capitalization

All Coins Tokens USD Next 100 → View All

#	Name	Market Cap	Price	Volume (24h)	Circulating Supply	Change (24h)	Price Graph (7d)
1	Bitcoin	$136,635,033,242	$8,048.54	$7,745,840,000	16,976,375 BTC	2.97%	
2	Ethereum	$50,345,390,715	$509.54	$2,390,920,000	98,805,183 ETH	4.41%	
3	Ripple	$25,542,373,010	$0.652877	$1,223,550,000	39,122,794,968 XRP *	5.91%	
4	Bitcoin Cash	$12,843,878,456	$752.34	$376,059,000	17,071,975 BCH	2.47%	
5	Litecoin	$7,165,184,840	$127.79	$442,412,000	56,071,313 LTC	1.69%	
6	EOS	$7,030,642,143	$8.88	$827,702,000	791,334,401 EOS *	-0.49%	
7	Cardano	$5,319,042,229	$0.205154	$210,548,000	25,927,070,538 ADA *	-0.96%	
8	Stellar	$4,746,617,604	$0.255749	$111,854,000	18,559,672,193 XLM *	8.51%	
9	NEO	$4,196,393,500	$64.56	$165,666,000	65,000,000 NEO *	-0.91%	
10	IOTA	$3,709,700,092	$1.33	$88,560,100	2,779,530,283 MIOTA *	0.43%	
11	Monero	$3,083,928,182	$193.62	$55,309,800	15,926,913 XMR	2.65%	

Token Market Cap | Sia | sia.pdf | PowerLedger Token | Untitled | Every product has | Kodak announces | kodak market cap | 'Worthless': Resea | Useless Ethereum | uetoken.com on re

Secure | https://coinmarketcap.com/tokens/

Cryptocurrencies: 1567 / Markets: 10265 Market Cap: $322,217,435,480 / 24h Vol: $22,236,095,768 / BTC Dominance: 42.4% English USD

Cryptocurrency Market Capitalizations

Market Cap Trade Volume Trending Tools Search

Top 100 Tokens by Market Capitalization

All Coins Tokens USD Next 100 → View All

#▲	Name	Platform	Market Cap	Price	Volume (24h)	Circulating Supply	Change (24h)	Price Graph (7d)
1	EOS	Ethereum	$7,035,999,477	$8.89	$813,971,000	791,334,401	-0.53%	
2	TRON	Ethereum	$2,588,582,053	$0.039371	$481,244,000	65,748,111,645	2.40%	
3	Tether	Omni	$2,283,531,705	$0.998422	$3,153,910,000	2,287,140,814	0.12%	
4	VeChain	Ethereum	$1,764,719,246	$3.36	$87,067,000	524,770,505	3.46%	
5	Binance Coin	Ethereum	$1,567,055,283	$13.48	$145,287,000	116,261,604	4.06%	
6	OmiseGO	Ethereum	$1,381,962,279	$13.54	$268,941,000	102,042,552	-0.95%	
7	Ontology	NEO	$1,058,022,064	$4.39	$102,708,000	241,236,451	-10.33%	
8	ICON	Ethereum	$988,226,044	$2.55	$60,263,900	387,231,358	-0.73%	
9	Bytom	Ethereum	$968,166,066	$0.980918	$139,179,000	987,000,000	18.00%	
10	Populous	Ethereum	$578,265,629	$15.63	$3,613,370	37,004,027	12.04%	

Token Market Cap | Sia | sia.pdf | PowerLedger Token | Untitled | Every product has | Kodak announces | kodak market cap | 'Worthless': Reset | Useless Ethereum | uetoken.com on m

Secure | https://sia.tech

Nebulous is currently conducting a Tokenized Securities Offering of Siafunds to fund Sia development. Learn more at Siafunds.tech

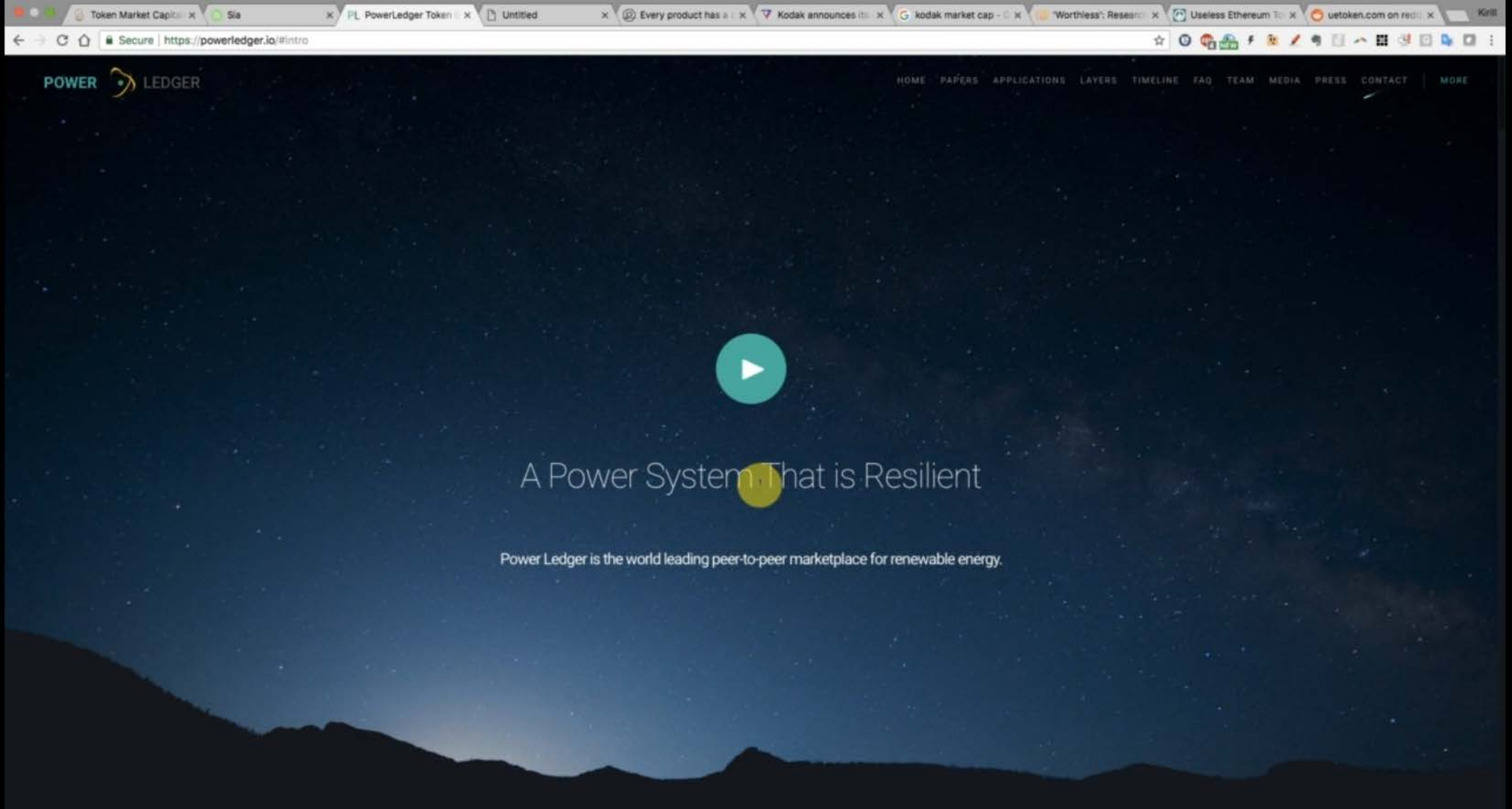
sia

About Technology Learn Roadmap Get Started

Cloud storage is about to change. Are you ready?

Sia is a decentralized storage platform secured by blockchain technology. The Sia Storage Platform leverages underutilized hard drive capacity around the world to create a data storage marketplace that is more reliable and lower cost than traditional cloud storage providers.

Get Started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Every product has a
Kodak announces its
kodak market cap -
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Useless Ethereum To
uetoken.com on redd
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PROVENANCE

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We enable great businesses to build trust in their goods and supply chain.
Provenance powered data helps shoppers choose your product.

Enter your email... JOIN FOR FREE

Find out more

Made in Murrumbateman, Australia by Four Winds Vineyard

Empowering the whole supply chain

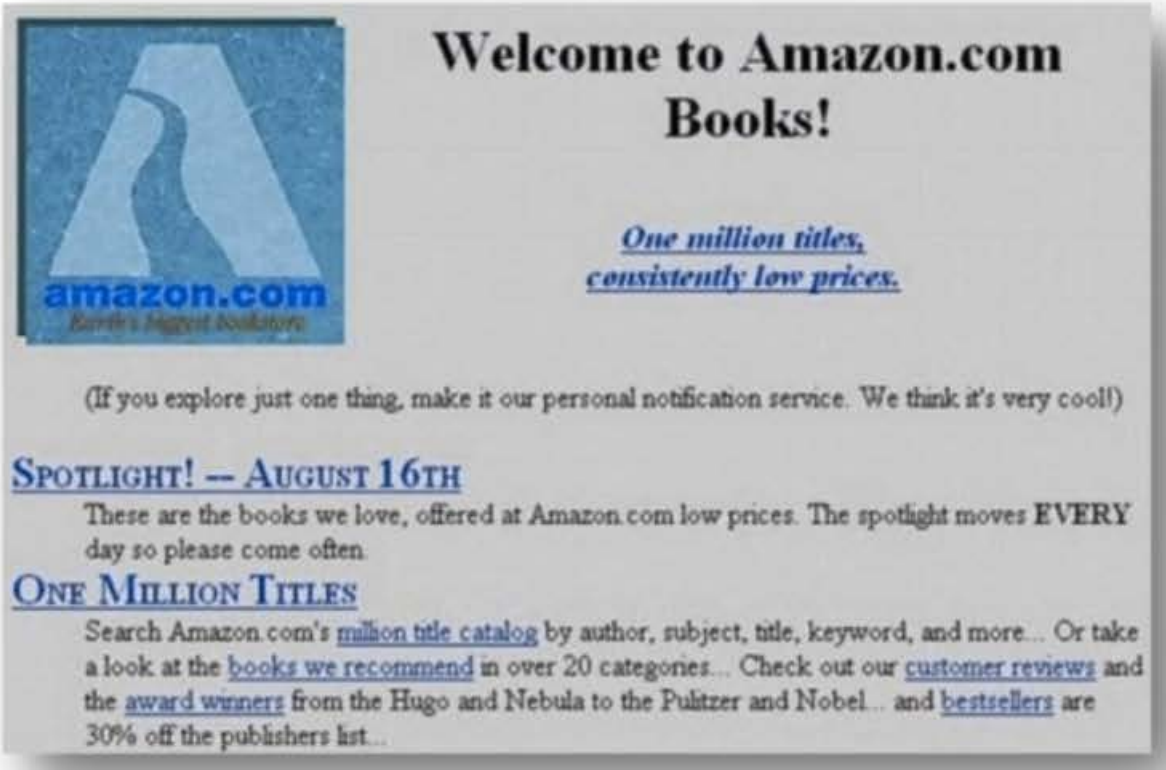
FOR RETAILERS

Engage shoppers at the point of sale with information gathered collaboratively from suppliers all along the supply chain. Substantiate product claims with trustworthy, real-time data.

FOR PRODUCERS

Grow your business by competing on the things that matter. Provenance supports high-quality authentic products made with concern for people, places and process.

Blockchain and Web 3.0



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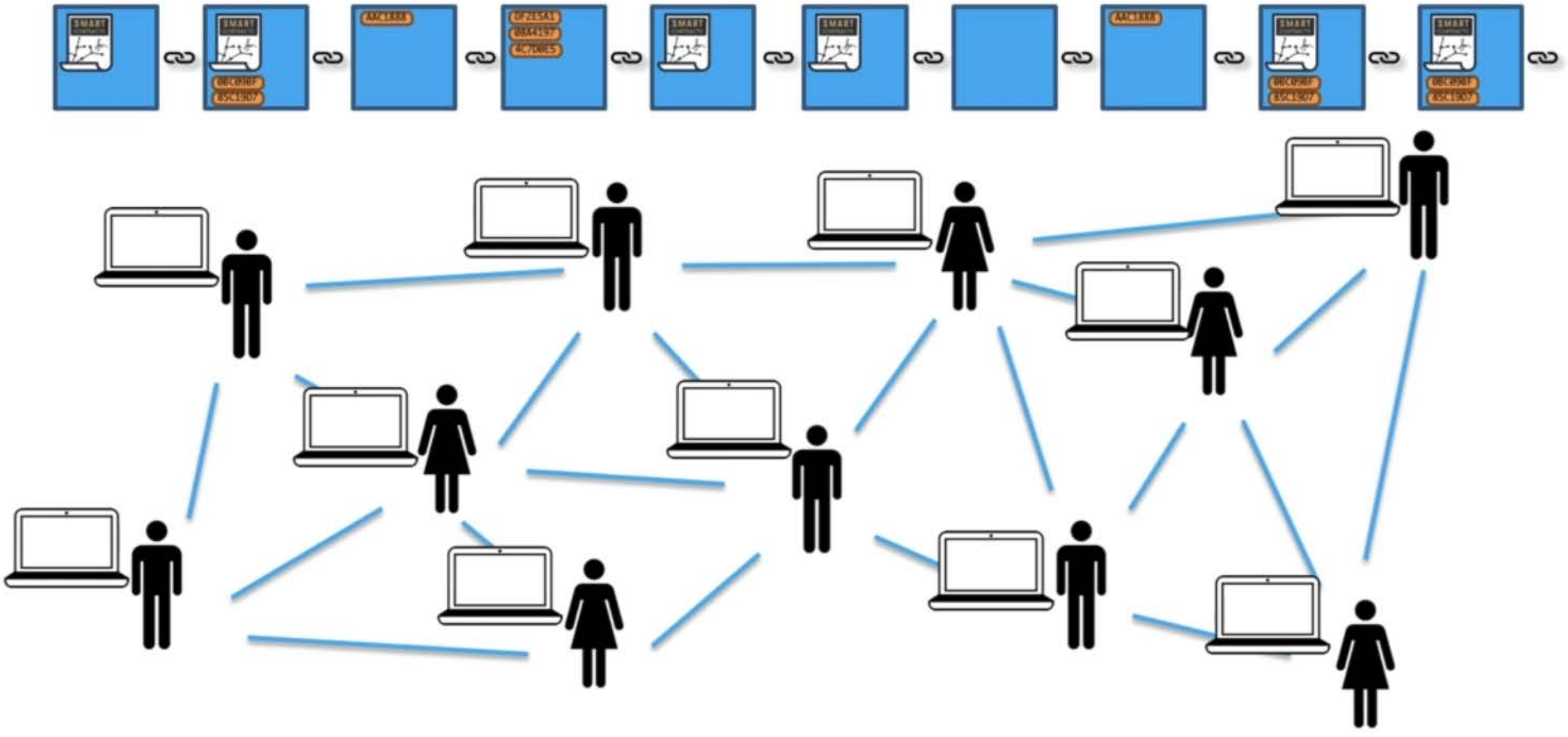
Blockchain and Web 3.0

Image source: Wikipedia

Blockchain and Web 3.0



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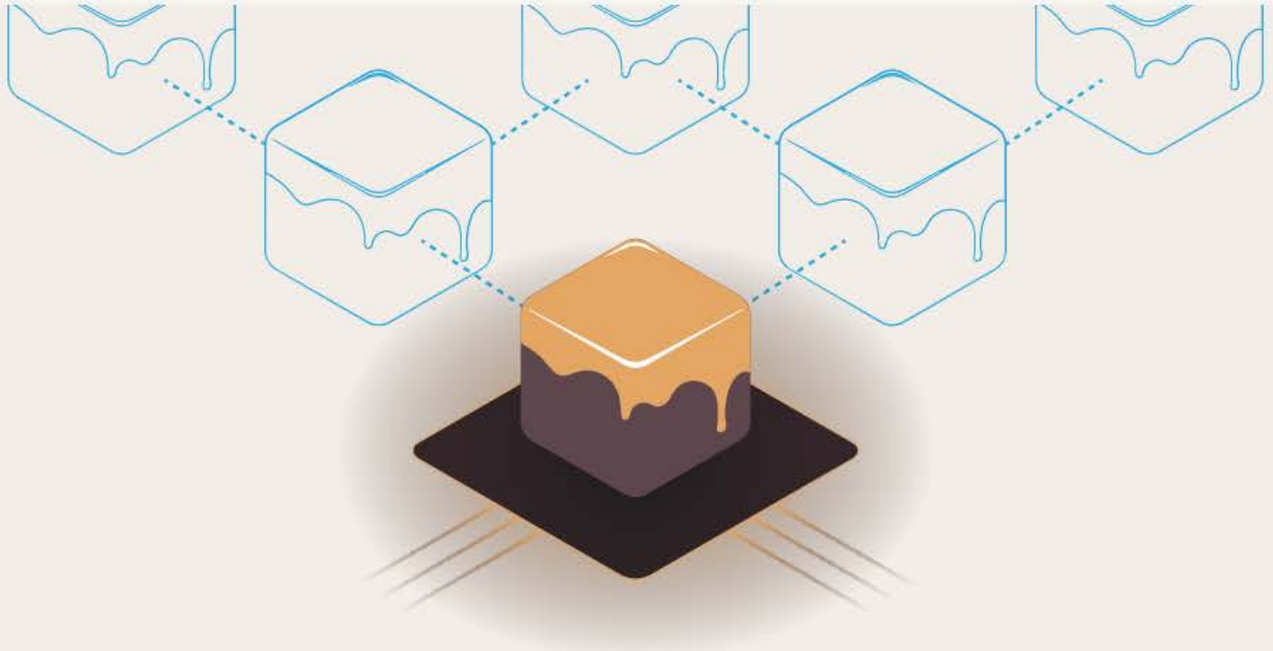


Ganache

ONE CLICK BLOCKCHAIN

GITHUB REPO DOCS

Quickly fire up a personal Ethereum blockchain which you can use to run tests, execute commands, and inspect state while controlling how the chain operates.

DOWNLOAD (WINDOWS)

Need another OS download?

Ganache

ACCOUNTS | BLOCKS | TRANSACTIONS | CONTRACTS | EVENTS | LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK	GAS PRICE	GAS LIMIT	HARDFORK	NETWORK ID	RPC SERVER	MINING STATUS	WORKSPACE		
0	20000000000	6721975	MUIRGLACIER	5777	HTTP://127.0.0.1:7545	AUTOMINING	QUICKSTART	SAVE	SWITCH

MNEMONIC

stereo burger inch border barely flower hunt deny crumble cupboard pupil climb

HD PATH

m/44'/60'/0'/0/account_index

ADDRESS	BALANCE	TX COUNT	INDEX
0×970a12a30F94212D6963491E9560bd5907aE894c	100.00 ETH	0	0
0×146E9BB154111A7EF406ea15c2cAa2C42A22F3b2	100.00 ETH	0	1
0×498aeC4190083eD1EC20F863B571F9b181278764	100.00 ETH	0	2
0×37F9D43db32a1757855645098F094a4E14529A91	100.00 ETH	0	3
0×d03653Bd36F6F8e6e41403BAe1B7479c79013C1c	100.00 ETH	0	4
0×9e6bCF96dC56F0503CEE1965790a4e02274b3cad	100.00 ETH	0	5
0×8e0d19a1cb361E35dd8B2c37D70334884EcdFd6d	100.00 ETH	0	6

File | C:/Users/Pulkit/Downloads/etherwallet-v3.40.0/index.html

Try our new version here: https://www.myetherwallet.com/
Read more about it in our Medium post

MyEtherWallet

3.40.0 English

Gas Price: 41 Gwei

Network ETH (myetherwallet.com)

The network is really full right now. Check **Eth Gas Station** for gas price to use.

New Wallet | Send Ether & Tokens | Swap | Send Offline | Contracts | ENS | DomainSale | Check TX Status | View Wallet Info | Help

Create New Wallet

Enter a password

Do NOT forget to save this!

Create New Wallet

This password *encrypts* your private key. This does not act as a seed to generate your keys. **You will need this password + your private key to unlock your wallet.**

How to Create a Wallet · Getting Started

Already have a wallet somewhere?

- **Ledger / TREZOR / BitBox / Secalot** : Use your hardware wallet . Your device *is* your wallet.
- **MetaMask** Connect via your MetaMask Extension . So easy! Keys stay in MetaMask, not on a phishing site! Try it today.
- **Jaxx / imToken** Use your Mnemonic Phrase to access your account.
- **Mist / Geth / Parity:** Use your Keystore File (UTC / JSON) to access your account.

File | C:/Users/Pulkit/Downloads/etherwallet-v3.40.0/index.html

Try our new version here: https://www.myetherwallet.com/

MyEtherWallet

New Wallet | Send Ether & Tokens

Network ETH (myetherwallet.com)

UBQ (ubiqscan.io)
POA (core.poa.network)
TOMO (tomochain.com)
ELLA (ellaism.org)
ETSC (ethereumsocial.kr)
EGEM (egem.io)
CLO (0xinfra.com)
MUSIC (musicoin.org)
GO (gochain.io)
EOSC (EOS Classic)
AKA (remote.akroma.io)
AKA (rpc.akroma.io)
ESN (ethersocial.org)
PIRL (pirl.io)
ETHO (ether1.org)
ATH (wallet.atheios.com)
ILT (net.iolite.io)
WEB (node1.webchain.network)
MIX (mix-blockchain.org)
REOSC (REOSC Ecosystem)
THUNDERCORE (thundercore.com)
Add Custom Network / Node

Do NOT forge

This password *encrypts* your private ke

How to Create a Wallet · Getting Started

Set Up Your Custom Node

Instructions can be found here

Your node must be HTTPS in order to connect to it via MyEtherWallet.com. You can download the MyEtherWallet repo & run it locally to connect to any node. Or, get free SSL certificate via LetsEncrypt

Node Name

dataencrypt_coin_ico

URL

http://127.0.0.1

Port

7545

☐ **HTTP Basic access authentication**

◉ ETH ○ ETC ○ Ropsten ○ Kovan ○ Rinkeby ○ Custom

Cancel

Save & Use Custom Node

Secure https://remix.ethereum.org/#optimize=false&version=soljson-v0.4.19+commit.c4cbbb05.js

browser/hadcoins_ico.sol

```
1  // Hadcoins ICO
2
3  // Version of compiler
4  pragma solidity ^0.4.11;
5
6  contract hadcoin_ico {
7
8      // Introducing the maximum nu
9      uint public max_hadcoins = 10
10
11     // Introducing the USD to Had
12     uint public usd_to_hadcoins =
13
14     // Introducing the total numb
15     uint public total_hadcoins_bo
16
17     // Mapping from the investor
18     mapping(address => uint) equi
19     mapping(address => uint) equi
20
21     // Checking if an investor ca
22     modifier can_buy_hadcoins(uin
23         require (usd_invested * u
24         _;
25     }
26
27     // Getting the equity in Hadc
28     function equity_in_hadcoins(a
29         return equity_hadcoins[in
30     }
31
32     // Getting the equity in USD
33     function equity_in_usd(addres
34         return equity_usd[investo
35     }
36
37     // Buying Hadcoins
38     function buy_hadcoins(address
39     can_buy_hadcoins(usd_invested
40         uint hadcoins_bought = us
41         equity_hadcoins[investor]
42         equity_usd[investor] = eq
43         total_hadcoins_bought +=
44     }
45
46     // Selling Hadcoins
47     function sell_hadcoins(addres
48         equity_hadcoins[investor]
49         equity_usd[investor] = eq
50         total_hadcoins_bought -=
51     }
52
53 }
```

hadcoin_ico

NAME

```
hadcoin_ico
```

METADATA

- compiler:
  language: Solidity
- output:
- settings:
- sources:
  version: 1

BYTECODE

```
{
    "linkReferences": {},
    "object": "6060604052620f4240600055603e8600155600060025534156100215760008080fd5b6104f88061003060003960000f300606060405260043610610(
    "opcodes": "PUSH1 0x60 PUSH1 0x40 MSTORE PUSH3 0xF4240 PUSH1 0x0 SSTORE PUSH2 0x3E8 PUSH1 0x1 SSTORE PUSH1 0x0 PUSH1 0x2 SSTORE (
    "sourceMap": "66:1774:0:-;;;194:7;167:34;;297:4;267:34;;435:1;399:37;;66:1774;;;;;;;;;;;;;;"
}
```

ABI

- 0:
- 1:
- 2:
- 3:
- 4:
- 5:
- 6:

WEB3DEPLOY

Compile Run Settings Analysis Debugger Support

Start to compile Auto compile

hadcoin_ico Details Publish on Swar

Static Analysis raised 1 warning(s) that requi

hadcoin_ico

file:///Users/Hadelin/Desktop/Blockchain%20A-Z/Module%203%20-%20Create%20a%20Smart%20Contract/etherwallet-v3.11.2.4/index.html#contracts

DON'T GET PHISHED, please! Thank you!
1. BOOKMARK MYETHERWALLET.COM 2. INSTALL EAL or MetaMask or Cryptonite

MyEtherWallet

3.11.2.4 English Gas Price: 41 Gwei Network Hadcoin ICO:eth (Custom)

The network is really full right now. Check Eth Gas Station for gas price to use.

New Wallet | Send Ether & Tokens | Swap | Send Offline | Contracts | ENS | DomainSale | Check TX Status | View Wallet Info | Help

Interact with Contract or Deploy Contract

Byte Code

```
60200190815260200160002060008282540192505081905550610 3e8600360008673ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff
168152602001908152602001600020548115156 1032c57fe5b04600460008673ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff1681
526020019081526020016000208190555081600260008282540192505081905550505050565b60015481565b60006003600083 73ffffffffffffffffffffffffffffffffffffffff1673ff
ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020549050919050565b60005481565b806003600008473ffffffffffffffffffffffffffffffffffffffff16
73ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020600082825403925050819055506103e8600360008473ffffffffffffffffffffffffffffffffffffffff
ffff1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020548115156 1047457fe5b04600460008473ffffffffffffffffffffffffffffffffffffffff
1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020819055508060026000828254039250508190555050505600a165627a7a7230582031310d27c5b0
e601a095e6463565a33e32e0c0455783a31b678b3ecac578e2990029
```

Gas Limit

437155

How would you like to access your wallet?

- MetaMask / Mist
- Ledger Wallet
- TREZOR
- Digital Bitbox
- Keystore / JSON File
- Mnemonic Phrase
- Private Key
- Parity Phrase

Paste Your Private Key

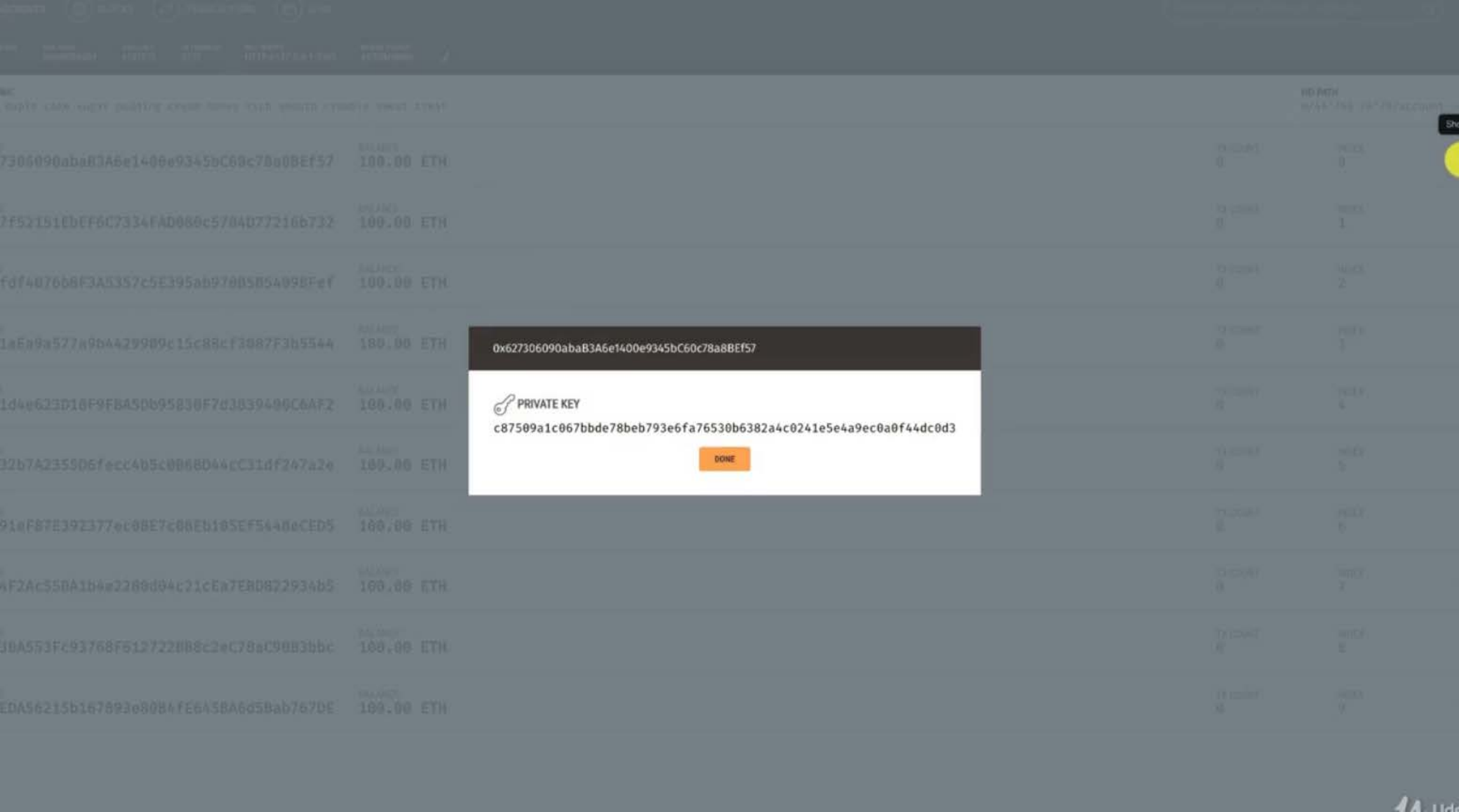
This is not a recommended way to access your wallet.

Entering your private key on a website dangerous. If our website is compromised or you accidentally visit a different website, your funds will be stolen. Please consider:

- MetaMask or A Hardware Wallet or Running MEW Offline & Locally
- Learning How to Protect Yourself and Your Funds

If you must, please double-check the URL & SSL cert. It should say `https://www.myetherwallet.com` & `MYETHERWALLET LLC [US]` in your URL bar.

Private Key


0x627306090abaB3A6e1400e9345bC60c78a8BEf57
PRIVATE KEY
c87509a1c067bbde78beb793e6fa76530b6382a4c0241e5e4a9ec0a0f44dc0d3
DONE

Interact with Contract or Deploy Contract

Byte Code


```
6020019081526020016000206000828254019250508190555061 03e8600360008673ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff
168152602001908152602001600020548115156 1032c57fe5b04600460008673ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff1681
526020019081526020016000208190555081600260008282540192 5 0819055505050505565b60015481565b6000600360008373ffffffffffffffffffffffffffffffffffffffff1673ff
ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020549050919050565b60005481565b806003600084 73ffffffffffffffffffffffffffffffffffffffff1673
ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020600082825403925050819055506103e8600360008473ffffffffffffffffffffffffffffffffffffffff
ffff1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020548115156 1047457fe5b04600460008473ffffffffffffffffffffffffffffffffffffffff
1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020819055508060026000828254039250508190555050505600a165627a7a7230582031310d27c5b0
e601a095e6463565a33e32e0c0455783a31b678b3ecac578e2990029
```


Gas Limit

437155

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c87509a1c067bbde78beb793e6fa76530b6382a4c0241e5e4a9ec0a0f44dc0d3

Unlock

Interact with Contract or Deploy Contract

Byte Code

0x6060604052620f42406000556103e8600155600060025534156100215760008 0fd5b6104f88061003060003960000f300606060405260043610610083576000357c0100000000000000000000000000000000000000000000000000000000900463ffffffff16806310c51c1b14610088578063739208877014610 0fe57806393e2e22614610140578063d2d35f8214610169578063df7fedf7146101b6578063e9052574146101df575b600080fd5b34156100935760006000fd5b6100bf600480803573ffffffffffffffffffffffffffffffffffffffff1690602001909190505061022156 5b604051808281526020019150506040518091039 0f35b34156100e057600080fd5b6100e861026a565b604051808281526020019150506040518091039 0f35b341561010957600080fd5b61013e600480803573ffffffffffffffffffffffffffffffffffffffff169060200190919080359060200190919050506102705 65b005b341561014b57600080fd5b610153610386565b604051808281526020019150506040518091039 0f35b34156101745760006000fd5b6101a0600480803573ffffffffffffffffffffffffffffffffffffffff1690602001909190505061038c565b604051808281526020019150506040518091039 0f35b34156101c157600080fd5b6101c96103d5565b604051808281526020019150506040518091039 0f35b34156101e557600080fd5b61021f600480803573ffffffffffffffffffffffffffffffffffffffff169060200190919080359060200190919050506103db565b005b600060460008373ffffffffffffffffffffffffffffffffffffffff

Gas Limit

437155

Sign Transaction

Raw Transaction

{"nonce":"0x00","gasPrice":"0x098bca5a00","gasLimit":"0x06aba3","to":"",
"value":"0x00","data":"0x6060604052620f42406000556103e860015560006002553
41561002157600080fd5b6104f88061003060003960000f300606060405260043610610083
3576000357c0100000000000000000000000000000000000000000000000000000000900

Signed Transaction

0xf9057b8085098bca5a008306aba38080b90528606060405262 0f42406000556103e860
01556000600255341561002157600080fd5b6104f88061003060003960000f30060606040
526004361061008357600035 7c0100000000000000000000000000000000000000000000000000000000
00000000000900463ffffffff16806310c51c1b14610088578637336971e146100d557

Deploy Contract

Ganache

ACCOUNTS BLOCKS TRANSACTIONS LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK	GAS PRICE	GAS LIMIT	NETWORK ID	RPC SERVER	MINING STATUS
1	20000000000	6721975	5777	HTTP://127.0.0.1:7545	AUTOMINING

MNEMONIC
candy maple cake sugar pudding cream honey rich smooth crumble sweet treat

HD PATH
m/44'/60'/0'/0/account_index

ADDRESS	BALANCE	TX COUNT	INDEX
0x627306090abaB3A6e1400e9345bC60c78a8BEf57	99.98 ETH	1	0
0xf17f52151EbEF6C7334FAD080c5704D77216b732	100.00 ETH	0	1
0xC5fdf4076b8F3A5357c5E395ab970B5B54098Fef	100.00 ETH	0	2
0x821aEa9a577a9b44299B9c15c88cf3087F3b5544	100.00 ETH	0	3
0x0d1d4e623D10F9FBA5Db95830F7d3839406C6AF2	100.00 ETH	0	4
0x2932b7A2355D6fecc4b5c0B6BD44cC31df247a2e	100.00 ETH	0	5
0x2191eF87E392377ec08E7c08Eb105Ef5448eCED5	100.00 ETH	0	6
0x0F4F2Ac550A1b4e2280d04c21cEa7EBD822934b5	100.00 ETH	0	7
0x6330A553Fc93768F612722BB8c2eC78aC90B3bbc	100.00 ETH	0	8
0x5AEDA56215b167893e80B4fE645BA6d5Bab767DE	100.00 ETH	0	9

Ganache

ACCOUNTS | BLOCKS | TRANSACTIONS | LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK	GAS PRICE	GAS LIMIT	NETWORK ID	RPC SERVER	MINING STATUS
1	20000000000	6721975	5777	HTTP://127.0.0.1:7545	AUTOMINING

BLOCK 1	MINED ON 2018-02-12 02:19:56	GAS USED 437155	1 TRANSACTION
BLOCK 0	MINED ON 2018-02-12 02:17:17	GAS USED 0	NO TRANSACTIONS


ACCOUNTS
BLOCKS
TRANSACTIONS
LOGS
SEARCH FOR BLOCK NUMBERS OR TX HASHES
CURRENT BLOCK
1
GAS PRICE
20000000000
GAS LIMIT
6721975
NETWORK ID
5777
RPC SERVER
HTTP://127.0.0.1:7545
MINING STATUS
AUTOMINING
BACK
BLOCK 1
GAS USED
437155
MINED ON
2018-02-12 02:02:00
BLOCK HASH
0x1d7409f79f631c414429166a642eda9d22464d007ff87dc556f06a4ff9b5f0fc
TX HASH
0xe75dd364b1066ef1d4aac3143486a5052ea0787369bfe0073deca144c4f0af7f
CONTRACT CREATION
FROM ADDRESS
0x627306090abab3a6e1400e9345bc60c78a8bef57
CREATED CONTRACT ADDRESS
0x8cdaf0cd259887258bc13a92c0a6da92698644c0
GAS USED
437155
VALUE
0

← BACK

TX 0×e75dd364b1066ef1d4aac3143486a5052ea0787369bfe0073deca144c4f0af7f

SENDER ADDRESS
0×627306090abab3a6e1400e9345bc60c78a8bef57

CREATED CONTRACT ADDRESS
0×8cdaf0cd259887258bc13a92c0a6da92698644c0

CONTRACT CREATION

VALUE	GAS USED	GAS PRICE	GAS LIMIT	MINED IN BLOCK
0.00 ETH	437155	41000000000	437155	1

TX DATA

0×6060604052620f42406000556103e86001556000600255341561002157600080fd5b6104f88061003060003960006000f300606060405260043610610083576000357c0100000000000000000000000000000000000000000000000000000000900463ffffffff16806310c51c1b1461008857806373369971e146100d557806392088770146100fe57806393e2e2261461014057806d2d35f8214610169578063df7fedf7146101b6578063e9052574146101df575b600080fd5b341561009357600080fd5b6100bf600480803573ffffffffffffffffffffffffffffffffffffffff169060200190919050506102215605b60405180828152602001915050604051809103906f35b34156100e057600080fd5b6100e861026a565b60405180828152602001915050604051809103906f35b34156101095760006040518082815260200191505060405180910390f35b341561011457600080fd5b61013e600480803573ffffffffffffffffffffffffffffffffffffffff169060200190919080359060200190919050506102705b005b341561014b57600080fd5b610153610386565b60405180828152602001915050604051809103906f35b34156101745760006040518082815260200191505060405180910390f35b34156101a0600480803573ffffffffffffffffffffffffffffffffffffffff169060200190919050506103bc565b60405180828152602001915050604051809103906f35b34156101c157600080fd5b6101c96103d5565b60405180828152602001915050604051809103906f35b34156101ea57600080fd5b61021f600480803573ffffffffffffffffffffffffffffffffffffffff169060200190919080359060200190919050506103db565b005b6000600460008373ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020549050919050565b60025481565b600081600054600254600154830201111515156102 8c57600080fd5b600154830291508160036000867 3ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020548115156102 32c57fe5b046004600086 73ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020819055508160026000828254019250508190555050505050565b60015481565b6000600360008373ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020549050919050565b60005481565b806003600086 73ffffffffffffffffffffffffffffffffffffffff1673ffffffffffffffffffffffffffffffffffffffff168152602001908152602001600020819055508060026000828254039250508190555050505600a165627a7a7230582031310d27c5b0e601a095e6463565a33e32e0c0455783a31b678b3ecac578e2990029

DON'T GET PHISHED, please! Thank you!
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MyEtherWallet 3.11.2.4 English Gas Price: 41 Gwei Network Hadcoin ICO:eth (Custom)
The network is really full right now. Check Eth Gas Station for gas price to use.

New Wallet | Send Ether & Tokens | Swap | Send Offline | Contracts | ENS | DomainSale | Check TX Status | View Wallet Info | Help

Interact with Contract or Deploy Contract

Contract Address

0x8cdaf0cd259887258bc13a92c0a6da92698644c0

Select Existing Contract

Select a contract...

ABI / JSON Interface

```
            "outputs": [],
            "payable": false,
            "stateMutability": "nonpayable",
            "type": "function"
        }
]
```

Access

MyEtherWallet.com does not hold your keys for you. We cannot access accounts, recover keys, reset passwords, nor reverse transactions. Protect your keys & always check that you

MyEtherWallet

Interact with Contract or Deploy Contract

Contract Address

0x8cdaf0cd259887258bc13a92c0a6da92698644c0

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ABI / JSON Interface

```
                "outputs": [],
                "payable": false,
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                "type": "function"
        }
]
```

Access

Read / Write Contract

0x8cdaf0cd259887258bc13a92c0a6da92698644c0

Select a function

- equity_in_usd
- total_hadcoins_bought
- buy_hadcoins
- usd_to_hadcoins
- eq... _hadcoins
- max_hadcoins
- sell_hadcoins

Interact with Contract or Deploy Contract

Contract Address

0x8cdaf0cd259887258bc13a92c0a6da92698644c0

Select Existing Contract

Select a contract...

ABI / JSON Interface

```
                "outputs": [],
                "payable": false,
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                "type": "function"
        }
]
```

Access

Read / Write Contract

0x8cdaf0cd259887258bc13a92c0a6da92698644c0

buy_hadcoins

investor address

0x627306090abaB3A6e1400e9345bC60c78a8BEf57

usd_invested uint256

10

WRITE


ACCOUNTS
BLOCKS
TRANSACTIONS
LOGS
SEARCH FOR BLOCK NUMBERS OR TX HASHES
CURRENT BLOCK
2
GAS PRICE
20000000000
GAS LIMIT
6721975
NETWORK ID
5777
RPC SERVER
HTTP://127.0.0.1:7545
MINING STATUS
AUTOMINING
BLOCK
2
MINED ON
2018-02-12 02:38:23
GAS USED
84965
ACTION
BLOCK
1
MINED ON
2018-02-12 02:19:56
GAS USED
437155
1 TRANSACTION
BLOCK
0
MINED ON
2018-02-12 02:17:17
GAS USED
0
NO TRANSACTIONS