TechConnex

MetaMesh

A gentle introduction to Blockchain

at the TechConnex Blockchain Peer Group

By Marc Lijour

February 28, 2019

Metamesh Group, your Trusted Advisors for Technology Transformation across the globe

The Blockchain Peer Group is brought to you by

Who am I?

https://www.linkedin.com/in/marclijour/

MetaMesh

Team Experience

MetaMesh

Access these slides

https://bit.ly/2RV6BzL

or find by date:

https://github.com/marclijour/presentations

MetaMesh

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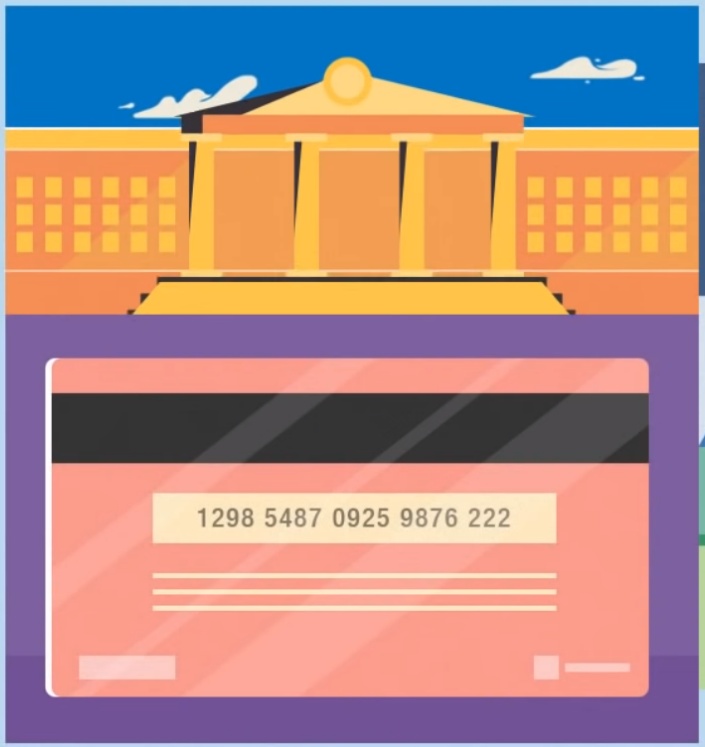
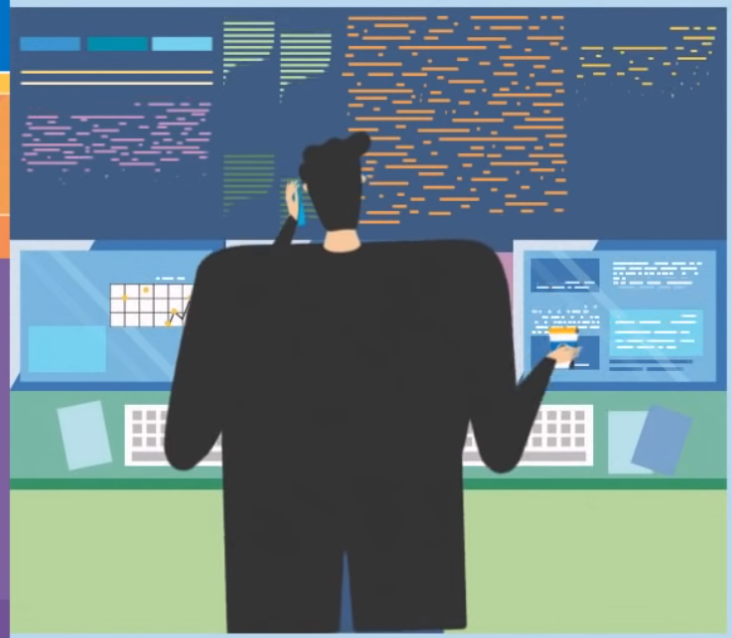
The Trust Machine

MetaMesh

Source of Trust

World Economic Forum: *What is Blockchain* Youtube Video

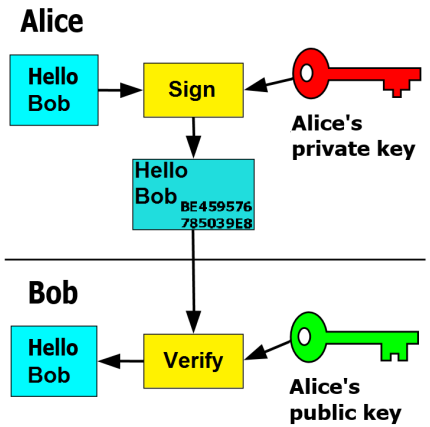




BLOCKCHAIN WILL BECOME A GLOBAL DECENTRALISED SOURCE OF TRUST

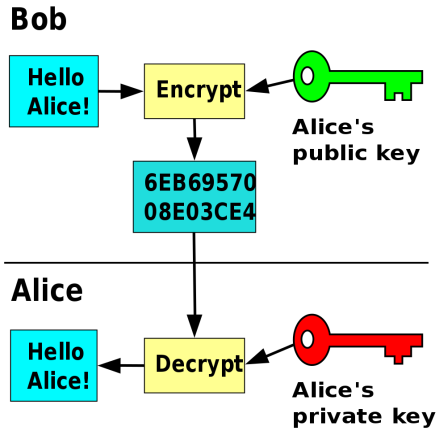
Key Cryptographic Primitives

Signing

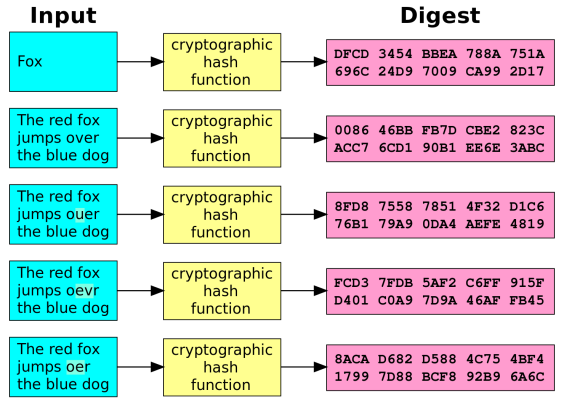


Credit: FlippyFlink

Encrypting



Hashing



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Where do we need more trust?

- payments

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- national identity

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- supply chain (e.g. food: Spanghero horse meat trial, Opioids, expensive cargos)

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- payments
- national identity
- supply chain (e.g. food: Spanghero horse meat trial, Opioids, expensive cargos)
- contracts
- *real* news & historical events (e.g. bombings)

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Where do we need more trust?

- payments
- national identity
- supply chain (e.g. food: Spanghero horse meat trial, Opioids, expensive cargos)
- contracts
- *real* news & historical events (e.g. bombings)
- collaborative data reporting
- ...

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Let's try things out!

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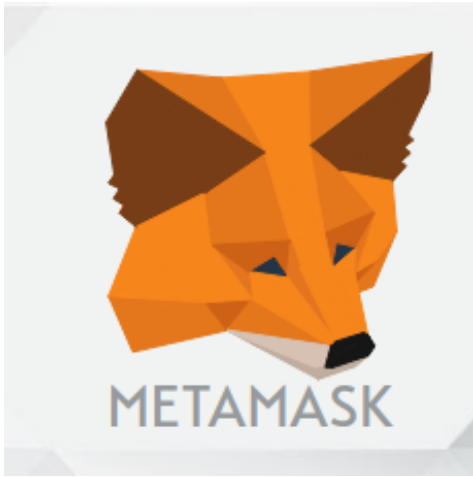
Install MetaMask

Follow step by step:

1. Install the Chrome/Chromium extension
2. Watch the intro on Youtube
3. Create an account
4. Switch to the Ropsten Testnet (top-right in MetaMask)
5. Fill your account with Ether from https://faucet.metamask.io



https://metamask.io

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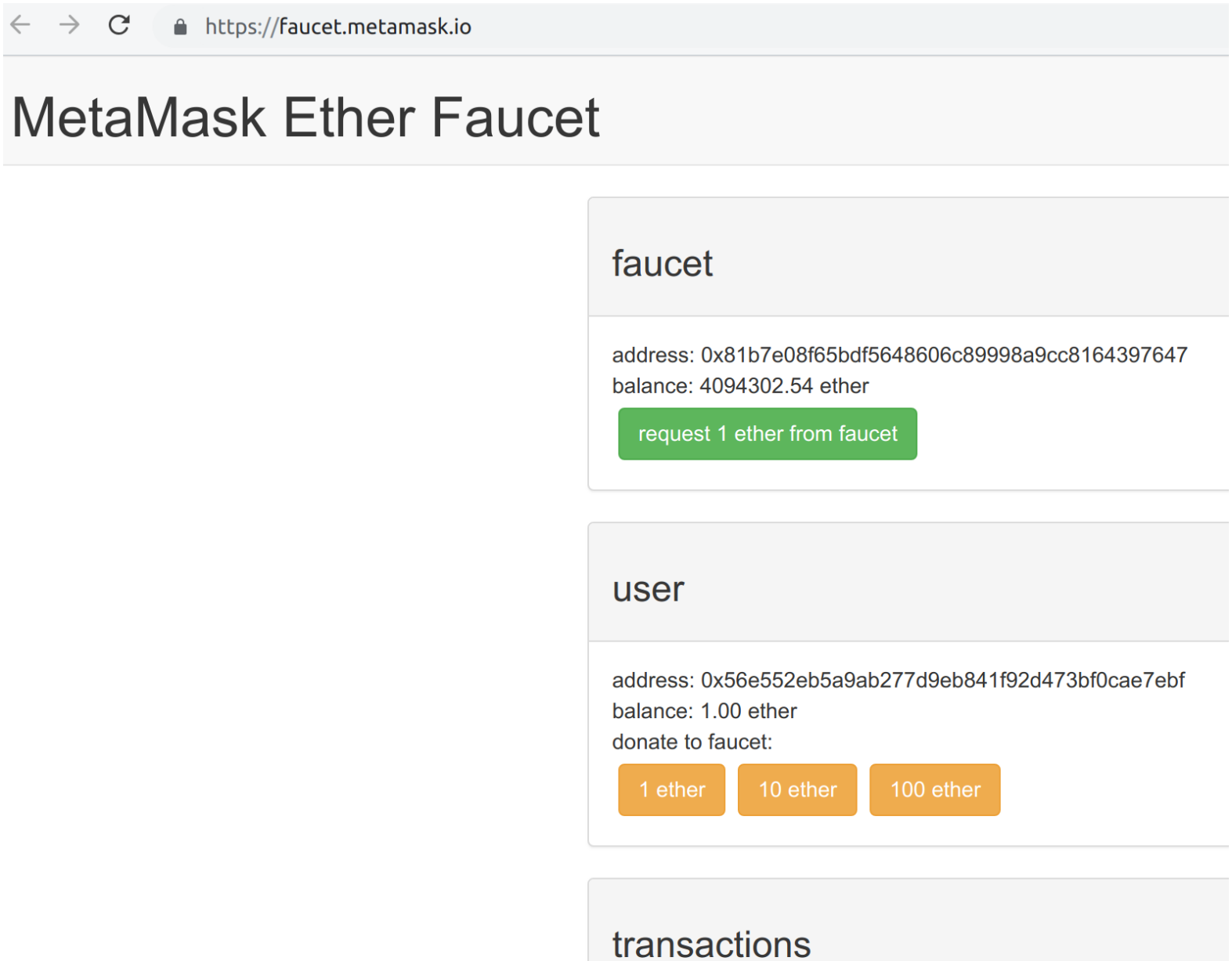
Request Ether from the faucet (on the Ropsten network)

Do it several times; then donate 1 ether to the faucet



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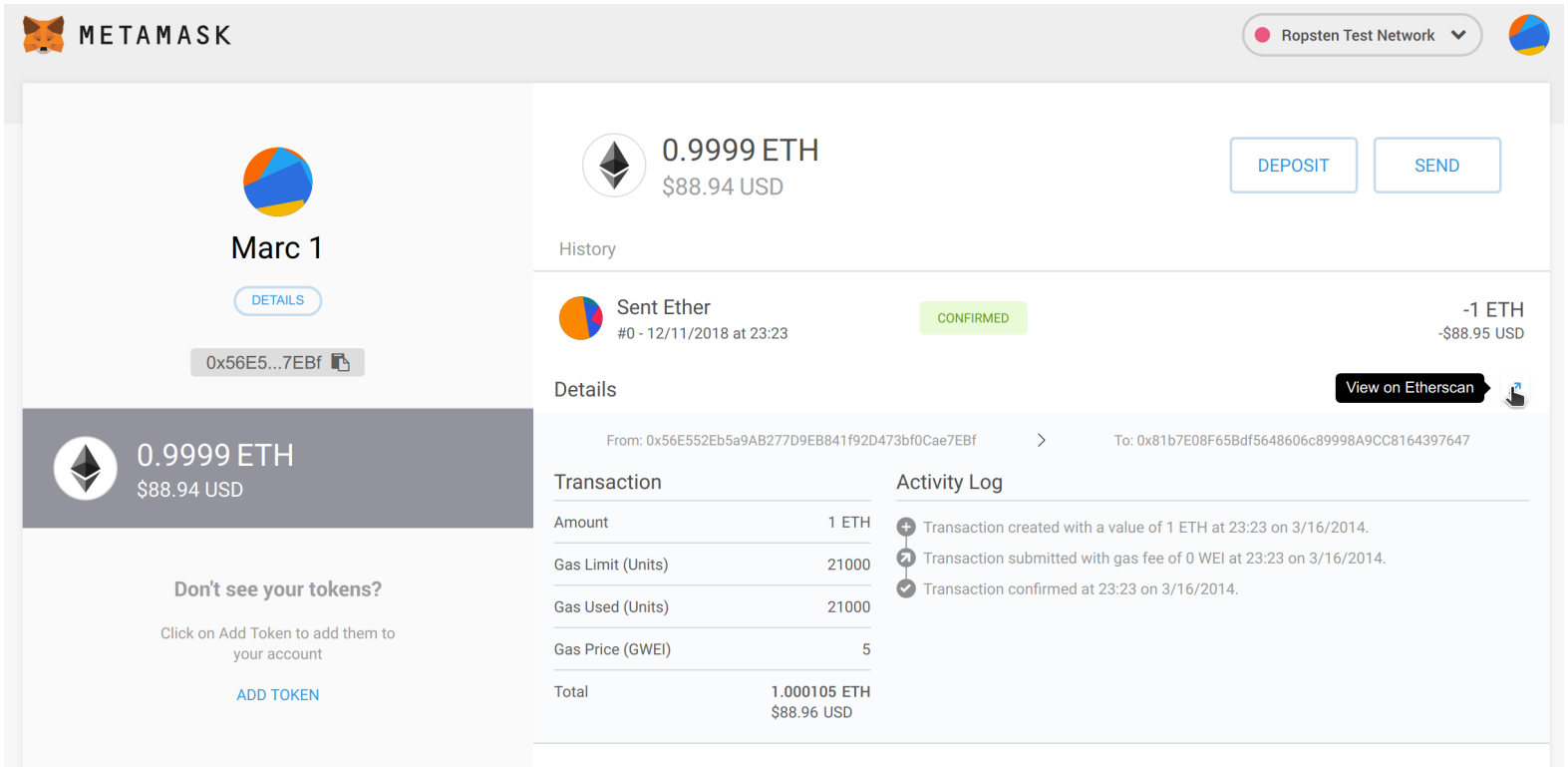
Check the transaction on Metamask

Click on the transaction for a detailed view



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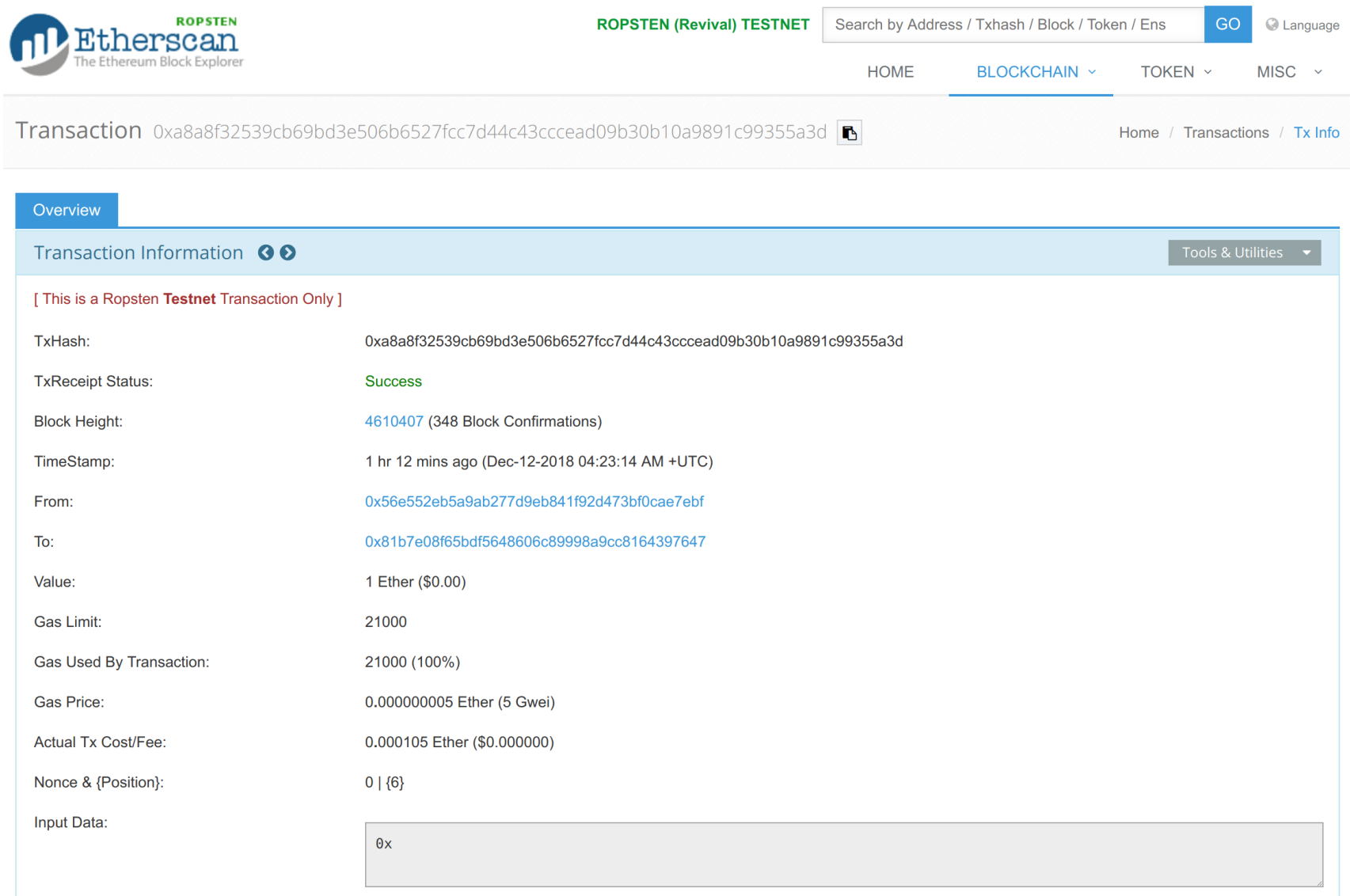
Check the transaction on Etherscan



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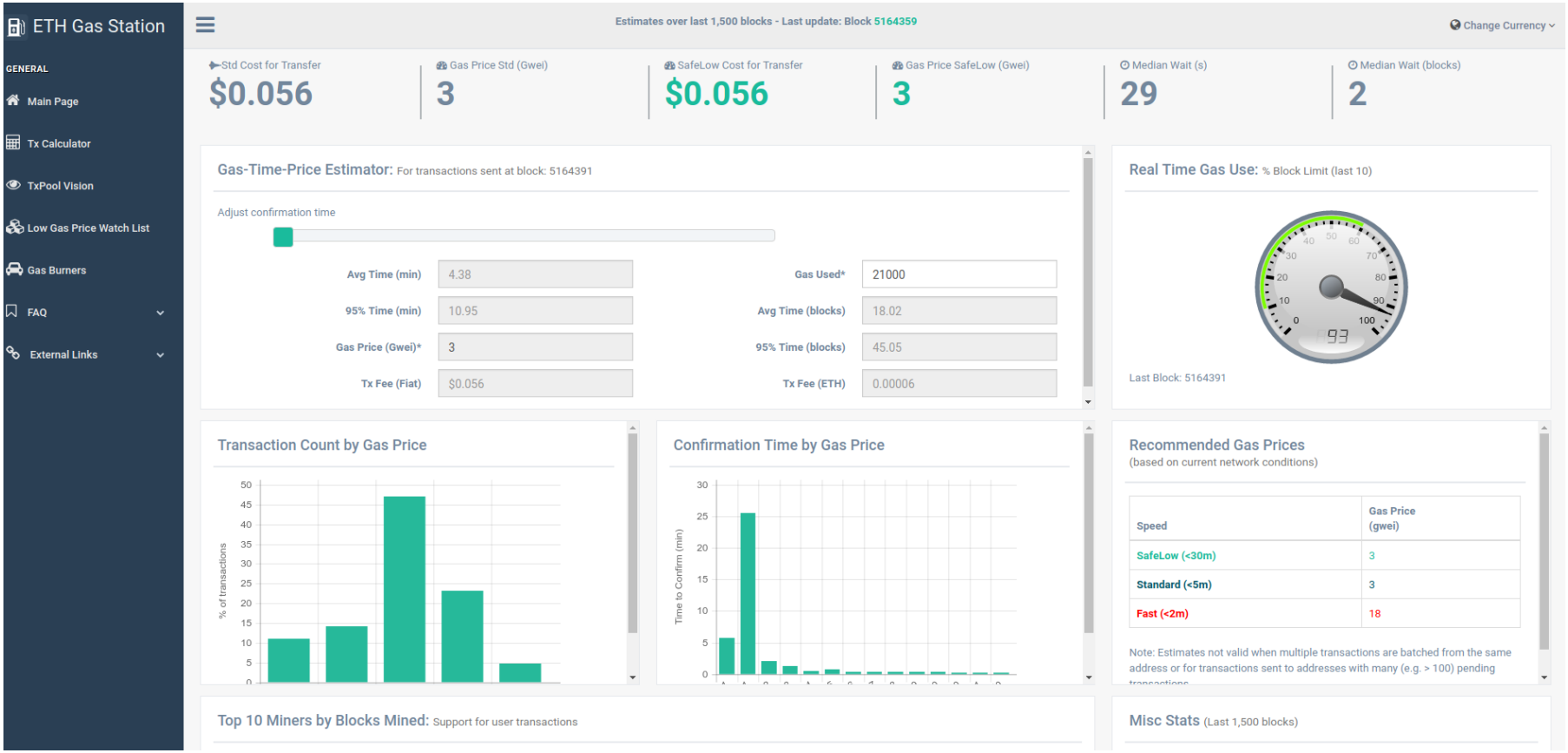
A note about gas price

https://ethgasstation.info



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Price of (real) ether: ETH

More information: https://www.tradingview.com/symbols/ETHUSD/

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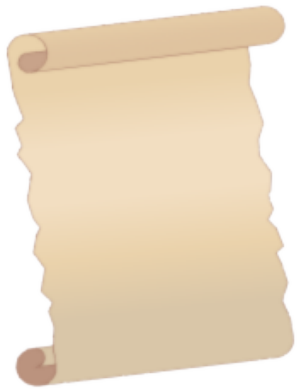
Wallets

More information: https://blockgeeks.com/guides/cryptocurrency-wallet-guide/

Software	Hardware	Paper

Jaxx



mycelium
ad-hoc economy

MyEtherWallet

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Exchanges

1. Centralized Exchanges (Coinbase, Quadriga, ...)
2. Decentralized Exchanges

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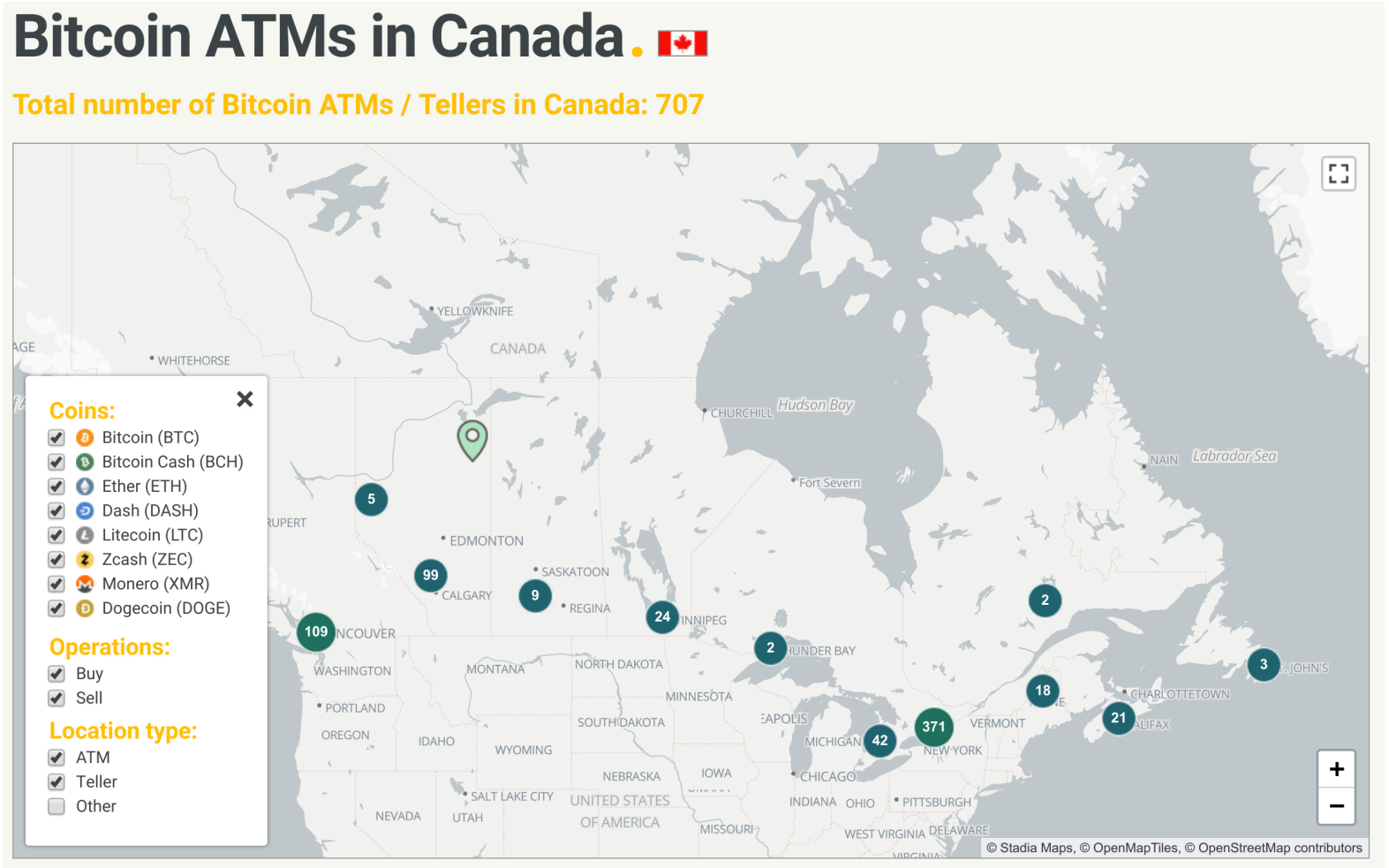
ATMs

More information: https://coinatmradar.com/country/38/bitcoin-atm-canada/



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ATMs

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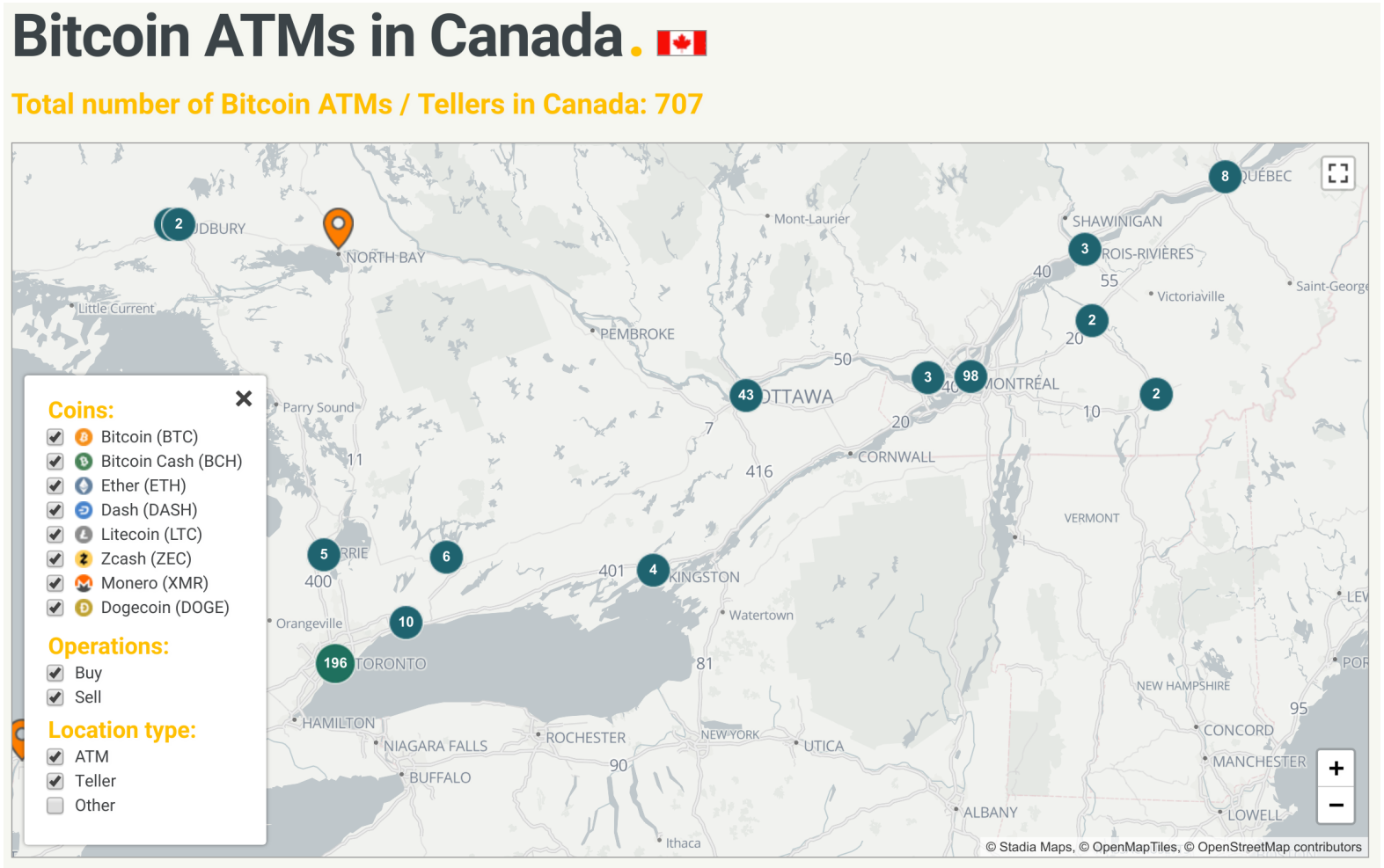

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Other crypto-assets

More information:
https://www.tradingview.com/markets/cryptocurrencies/prices-all/

Overview | Performance | Oscillators | Trend-Following | USD BTC

NAME (301 matches)	MKT CAP	FD MKT CAP	LAST	AVAIL COINS	TOTAL COINS	TRADED VOL	CHG %
Bitcoin	59.852B	72.158B	3436.1	17.419M	21M	4.712B	0.02%
XRP	12.167B	29.729B	0.29729	40.927B	100B	369.224M	0.17%
Ethereum	9.257B	9.257B	89.23	103.745M	103.745M	1.739B	0.10%
Stellar	2.165B	11.811B	0.11297826	19.165B	104.543B	197.41M	-0.34%
Tether	1.838B	2.554B	0.99000000	1.856B	2.58B	2.97B	-0.10%
Bitcoin Cash	1.729B	2.074B	98.760	17.506M	21M	71.709M	0.92%
EOS	1.692B	1.879B	1.8672	906.245M	1.006B	740.947M	0.44%
Bitcoin SV	1.548B	1.858B	88.45300000	17.505M	21M	59.813M	-2.60%
Litecoin	1.431B	2.02B	24.045	59.532M	84M	380.518M	1.14%
TRON	877.572M	1.314B	0.013247	66.247B	99.218B	72.465M	-0.88%
Cardano	772.388M	1.341B	0.029791	25.927B	45B	9.766M	-0.09%
Monero	722.858M	722.858M	43.445	16.638M	16.638M	11.502M	1.38%
NEM	642.663M	642.663M	0.07141	9B	9B	8.23M	-1.53%
Binance Coin	635.009M	926.299M	4.8548350	130.799M	190.799M	20.772M	-2.52%
IOTA	631.509M	631.509M	0.2272	2.78B	2.78B	4.203M	1.07%
Dash	554.925M	1.234B	65.28257000	8.5M	18.9M	160.684M	2.12%
Ethereum Classic	402.997M	402.997M	3.777	106.698M	106.698M	106.521M	0.68%
NEO	387.602M	596.31M	5.96	65M	100M	100.484M	1.51%

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Ethereum, Alt-Coins, and ICOs

1. 94% of the top 100 tokens are built on top of Ethereum
2. $5.5 billion raised in 2017
3. $6.5 billion raised in the first quarter of 2018
4. Ethereum has the largest developer community
5. Close to 2,000 dapps (decentralized applications) counted on Ethereum

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Amount raised by ICOs

https://cointelegraph.com/news/

from-2-9-billion-in-a-month-to-hundreds-dead-trends-of-the-rollercoaster-ico-market-in-18-months

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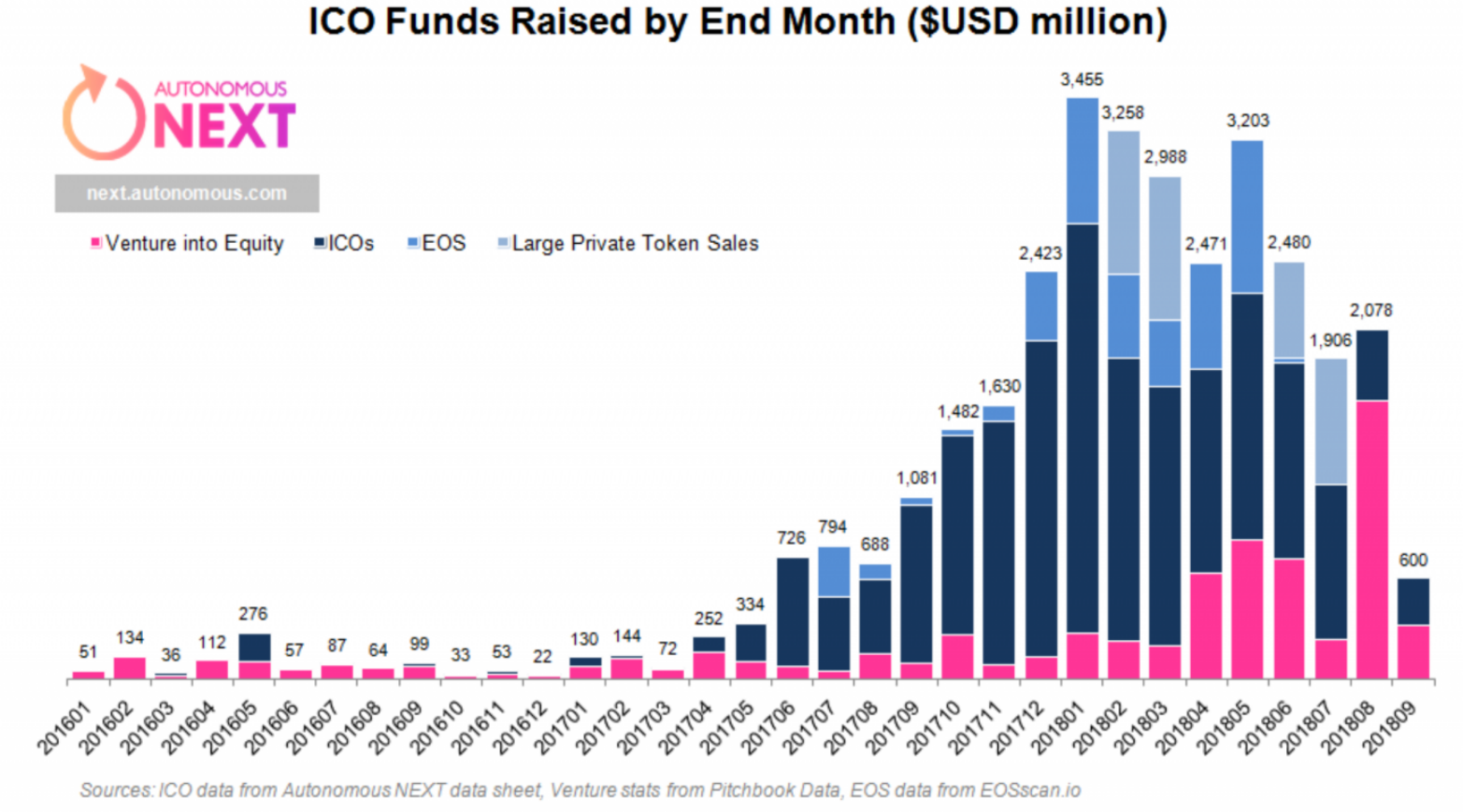
ICOs fell down 90% in 2018

https://www.investinblockchain.com/invest-in-icos/



see also https://www.coindesk.com/dont-throw-the-crypto-tokens-out-with-the-bathwater

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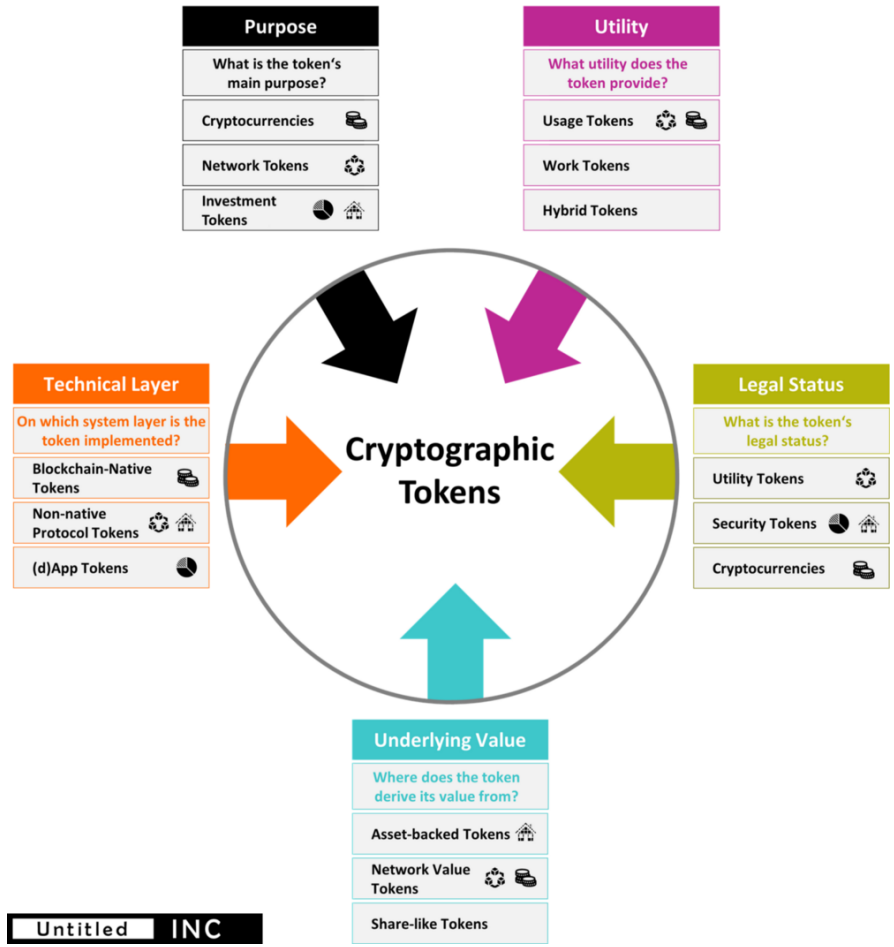
Token Types

http://www.untitled-inc.com/

the-token-classification-framework-a-multi-dimensional-tool-for-understanding-and-classifying-crypto-tokens/



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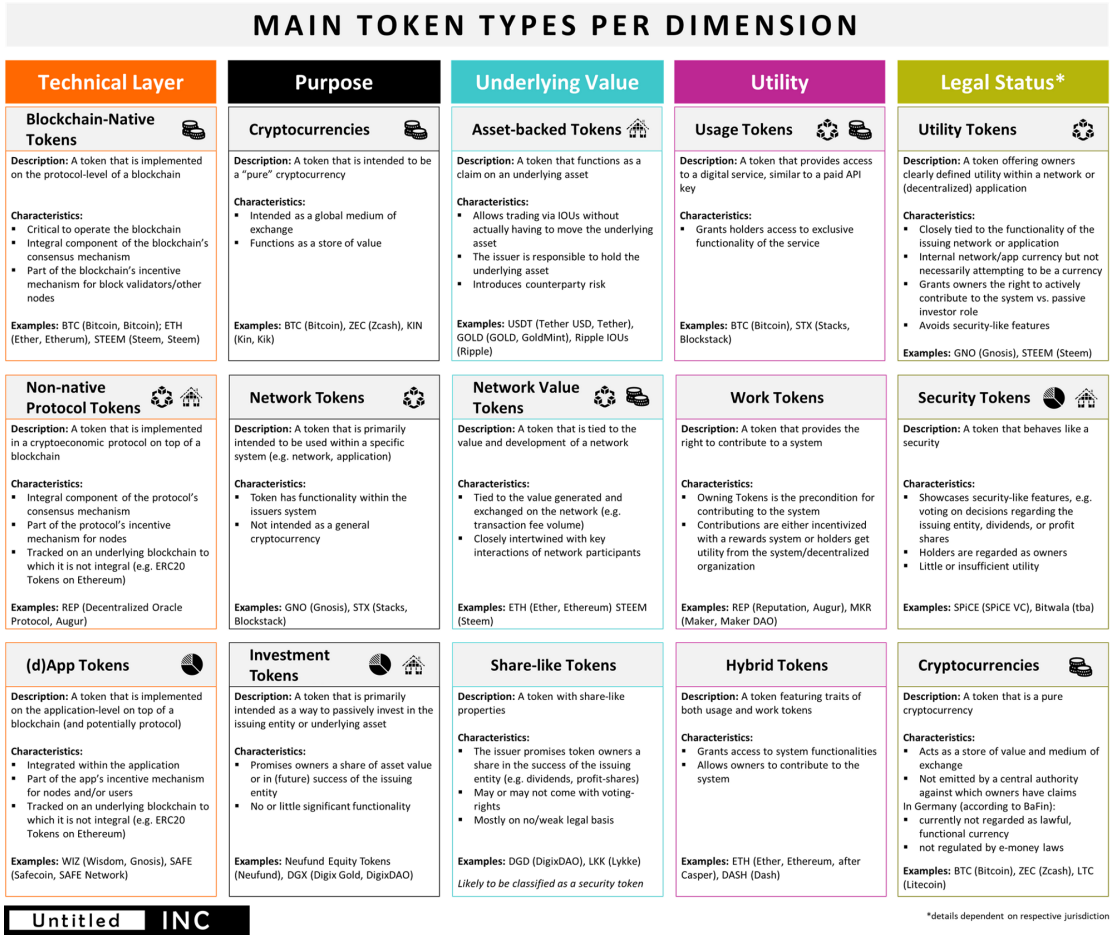

MAIN TOKEN TYPES PER DIMENSION

Technical Layer	Purpose	Underlying Value	Utility	Legal Status*
Blockchain-Native Tokens **Description:** A token that is implemented on the protocol-level of a blockchain **Characteristics:** ▪ Critical to operate the blockchain ▪ Integral component of the blockchain's consensus mechanism ▪ Part of the blockchain's incentive mechanism for block validators/other nodes **Examples:** BTC (Bitcoin, Bitcoin); ETH (Ether, Etherum), STEEM (Steem, Steem)	**Cryptocurrencies** **Description:** A token that is intended to be a "pure" cryptocurrency **Characteristics:** ▪ Intended as a global medium of exchange ▪ Functions as a store of value **Examples:** BTC (Bitcoin), ZEC (Zcash), KIN (Kin, Kik)	**Asset-backed Tokens** **Description:** A token that functions as a claim on an underlying asset **Characteristics:** ▪ Allows trading via IOUs without actually having to move the underlying asset ▪ The issuer is responsible to hold the underlying asset ▪ Introduces counterparty risk **Examples:** USDT (Tether USD, Tether), GOLD (GOLD, GoldMint), Ripple IOUs (Ripple)	**Usage Tokens** **Description:** A token that provides access to a digital service, similar to a paid API key **Characteristics:** ▪ Grants holders access to exclusive functionality of the service **Examples:** BTC (Bitcoin), STX (Stacks, Blockstack)	**Utility Tokens** **Description:** A token offering owners clearly defined utility within a network or (decentralized) application **Characteristics:** ▪ Closely tied to the functionality of the issuing network or application ▪ Internal network/app currency but not necessarily attempting to be a currency ▪ Grants owners the right to actively contribute to the system vs. passive investor role ▪ Avoids security-like features **Examples:** GNO (Gnosis), STEEM (Steem)
Non-native Protocol Tokens **Description:** A token that is implemented in a cryptoeconomic protocol on top of a blockchain **Characteristics:** ▪ Integral component of the protocol's consensus mechanism ▪ Part of the protocol's incentive mechanism for nodes ▪ Tracked on an underlying blockchain to which it is not integral (e.g. ERC20 Tokens on Ethereum) **Examples:** REP (Decentralized Oracle Protocol, Augur)	**Network Tokens** **Description:** A token that is primarily intended to be used within a specific system (e.g. network, application) **Characteristics:** ▪ Token has functionality within the issuers system ▪ Not intended as a general cryptocurrency **Examples:** GNO (Gnosis), STX (Stacks, Blockstack)	**Network Value Tokens** **Description:** A token that is tied to the value and development of a network **Characteristics:** ▪ Tied to the value generated and exchanged on the network (e.g. transaction fee volume) ▪ Closely intertwined with key interactions of network participants **Examples:** ETH (Ether, Ethereum) STEEM (Steem)	**Work Tokens** **Description:** A token that provides the right to contribute to a system **Characteristics:** ▪ Owning Tokens is the precondition for contributing to the system ▪ Contributions are either incentivized with a rewards system or holders get utility from the system/decentralized organization **Examples:** REP (Reputation, Augur), MKR (Maker, Maker DAO)	**Security Tokens** **Description:** A token that behaves like a security **Characteristics:** ▪ Showcases security-like features, e.g. voting on decisions regarding the issuing entity, dividends, or profit shares ▪ Holders are regarded as owners ▪ Little or insufficient utility **Examples:** SPiCE (SPiCE VC), Bitwala (tba)
(d)App Tokens **Description:** A token that is implemented on the application-level on top of a blockchain (and potentially protocol) **Characteristics:** ▪ Integrated within the application ▪ Part of the app's incentive mechanism for nodes and/or users ▪ Tracked on an underlying blockchain to which it is not integral (e.g. ERC20 Tokens on Ethereum) **Examples:** WIZ (Wisdom, Gnosis), SAFE (Safecoin, SAFE Network)	**Investment Tokens** **Description:** A token that is primarily intended as a way to passively invest in the issuing entity or underlying asset **Characteristics:** ▪ Promises owners a share of asset value or in (future) success of the issuing entity ▪ No or little significant functionality **Examples:** Neufund Equity Tokens (Neufund), DGX (Digix Gold, DigixDAO)	**Share-like Tokens** **Description:** A token with share-like properties **Characteristics:** ▪ The issuer promises token owners a share in the success of the issuing entity (e.g. dividends, profit-shares) ▪ May or may not come with voting-rights ▪ Mostly on no/weak legal basis **Examples:** DGD (DigixDAO), LKK (Lykke) *Likely to be classified as a security token*	**Hybrid Tokens** **Description:** A token featuring traits of both usage and work tokens **Characteristics:** ▪ Grants access to system functionalities ▪ Allows owners to contribute to the system **Examples:** ETH (Ether, Ethereum, after Casper), DASH (Dash)	**Cryptocurrencies** **Description:** A token that is a pure cryptocurrency **Characteristics:** ▪ Acts as a store of value and medium of exchange ▪ Not emitted by a central authority against which owners have claims In Germany (according to BaFin): ▪ currently not regarded as lawful, functional currency ▪ not regulated by e-money laws **Examples:** BTC (Bitcoin), ZEC (Zcash), LTC (Litecoin)

Untitled INC

*details dependent on respective jurisdiction

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Crypto as seen by the Regulator (and the taxman)

1. Cryptocurrency
2. Utility Token
3. Security Token

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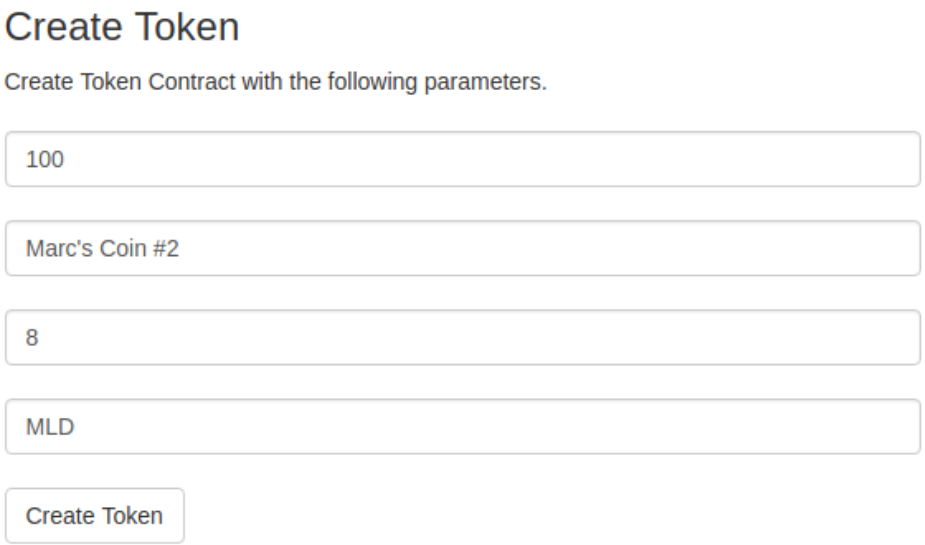
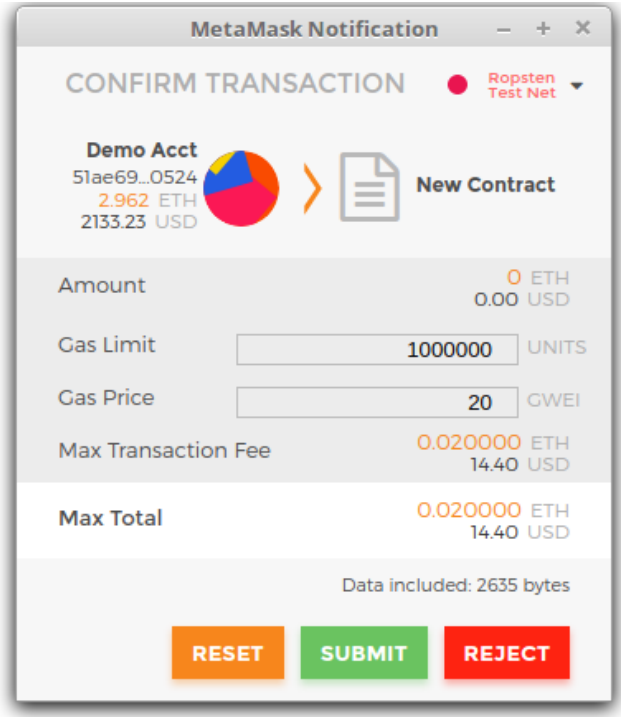
Create your own (ERC-20) token





1. Use the Token Factory Dapp at https://tokenfactory.surge.sh/#/factory
2. MetaMask will pop up (see picture above)
3. Submit the transaction (on the Ropsten Testnet)
4. Check your transaction on https://ropsten.etherscan.io

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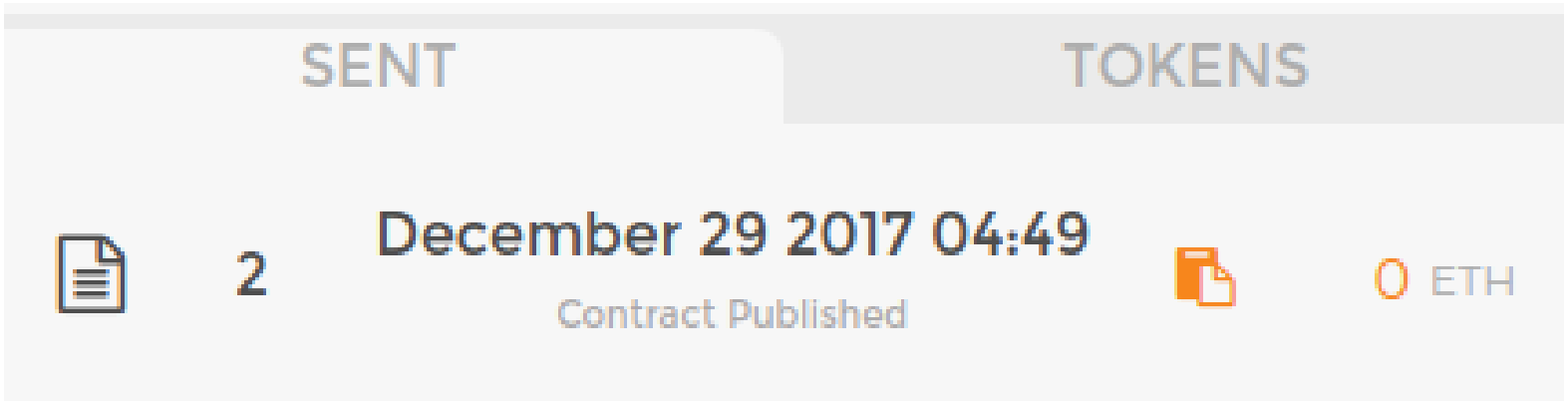
Check your Smart Contract



1. Select the "Sent" tab
2. Check the orange Copy icon (Tx Hash)
3. Click on "Contract Published"
4. That should bring you to Etherscan (see next page)

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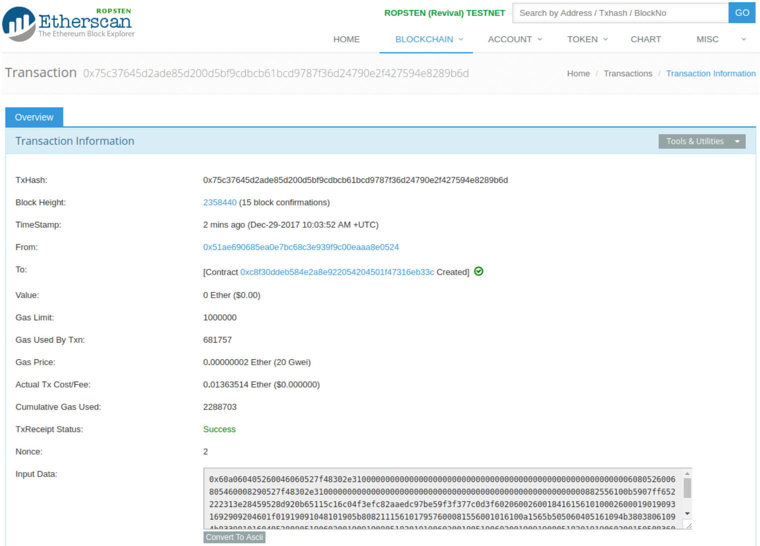
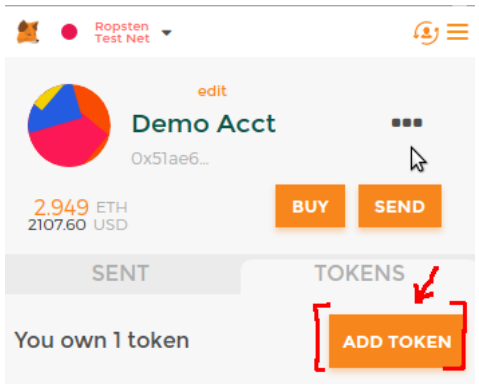
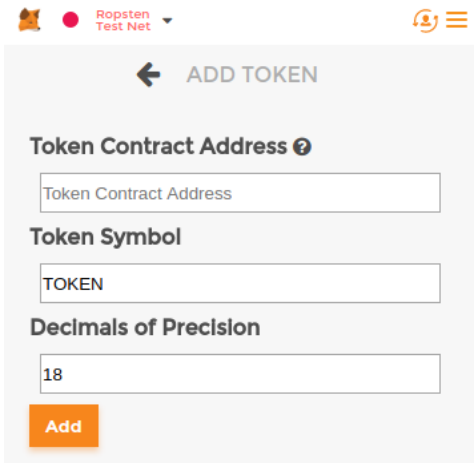
Verify the status of your transaction on Etherscan



Transaction Information: note the “To” line with your contract address

Watch your Token





1. Click on the "Add Token" button
2. Wait for the next window (picture on the right)
3. Copy your contract address (from Etherscan)
4. Go back to your Token Factory tab, which should show an UI to interact with your contract or go to the URL: https://tokenfactory.surge.sh/#/token/0x... (replace 0x... by your contract address)
5. Move coins around
6. In MetaMask, click on your token to check the tx on Etherscan

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Want to sell to token (ICO)? Consult your lawyer now...

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Remember: Ethereum

Ethereum is a **decentralized platform that runs smart contracts**: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third party interference.
— https://ethereum.org

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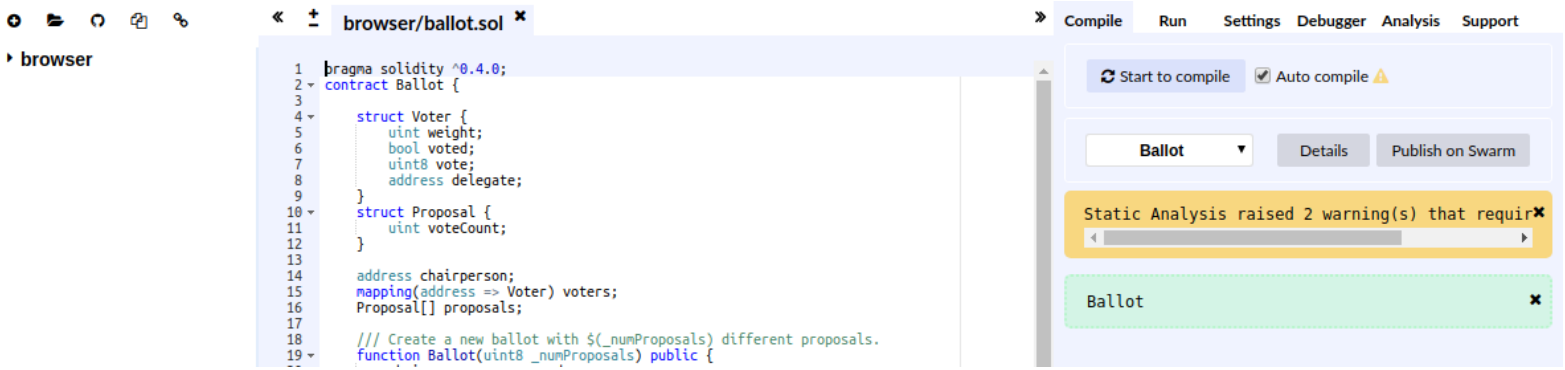
Coding your first ERC-20 Smart Contract



1. Open the Remix IDE at https://remix.ethereum.org
2. Close the ballot file
3. Create a new file named TokenRecipient.sol
4. Copy the code from https://ethereum.org/token (second white box, under "The Code", starting with "pragma")
5. Switch to the "Run" tab (top-right bar, after Compile)

Reference:
ERC-20 Token Standard

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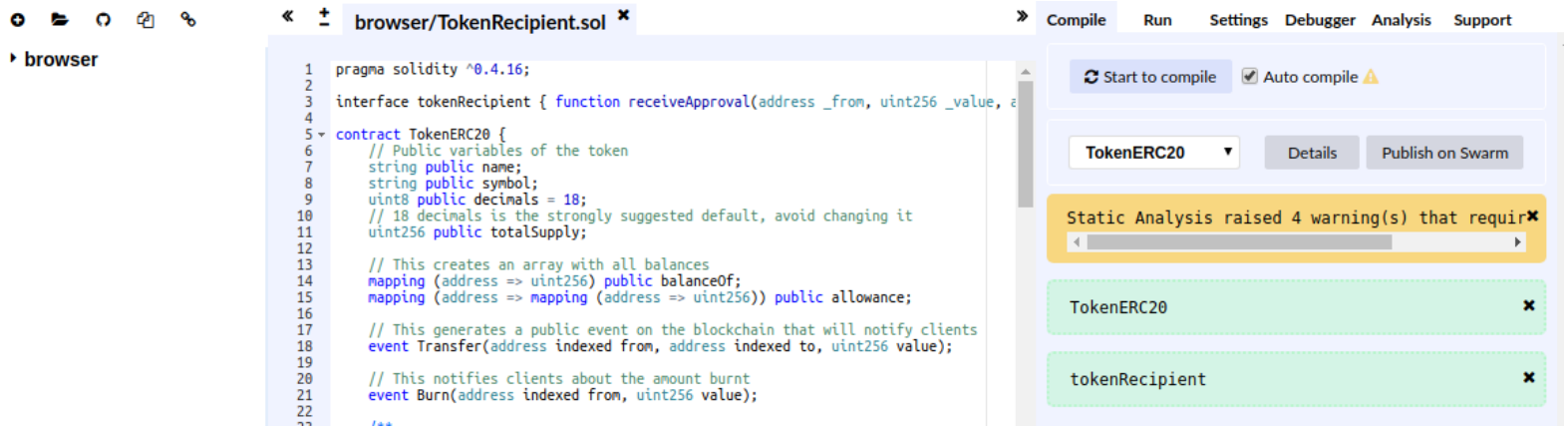
Compiling Successfully



1. Two green boxes should show on the right
2. TokenERC20 is the name of the contract (class)
3. tokenRecipient is the name of the interface
4. Switch to the "Run" tab (top right)

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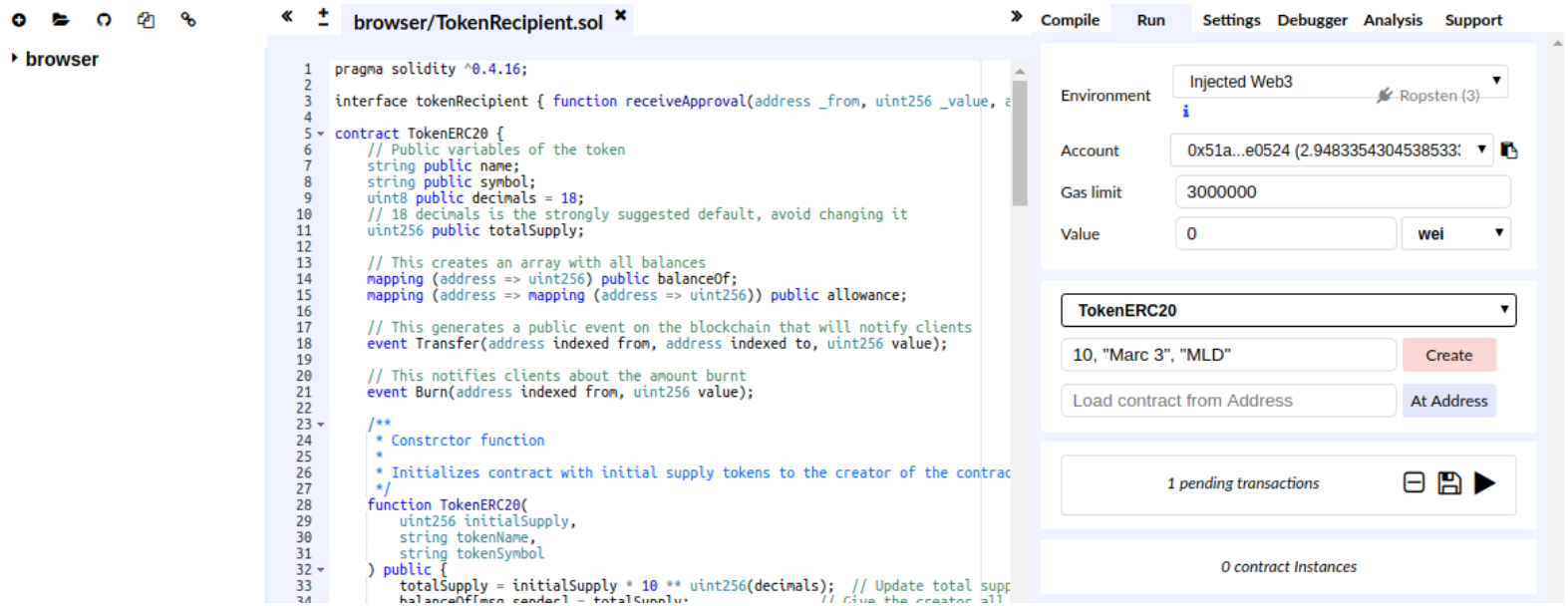
Submitting the Smart Contract



1. Under the dropdown showing "TokenERC20", add a number (total amount of tokens to issue) and two strings (the latter is the token symbol)
2. Add enough gas (top right, try 30)
3. Click Create and check whether MetaMask needs confirmation

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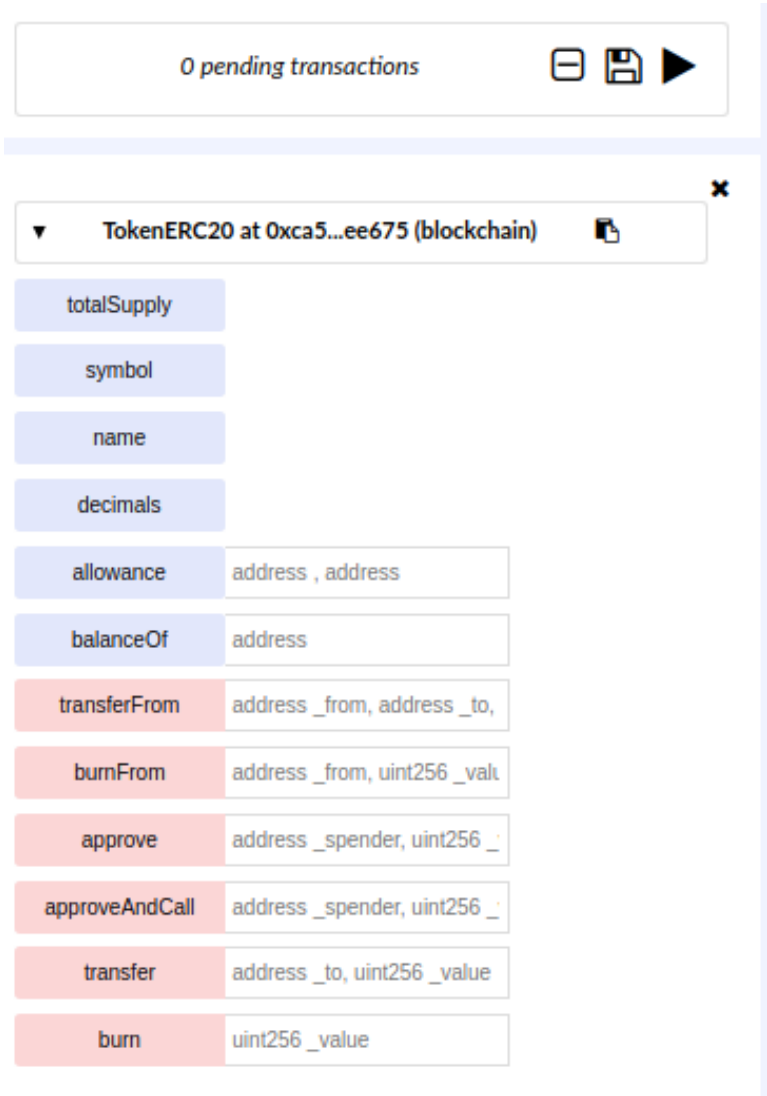
Interacting with the contract

1. A new interface will pop up on the bottom right corner of the IDE



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Tools for Developers

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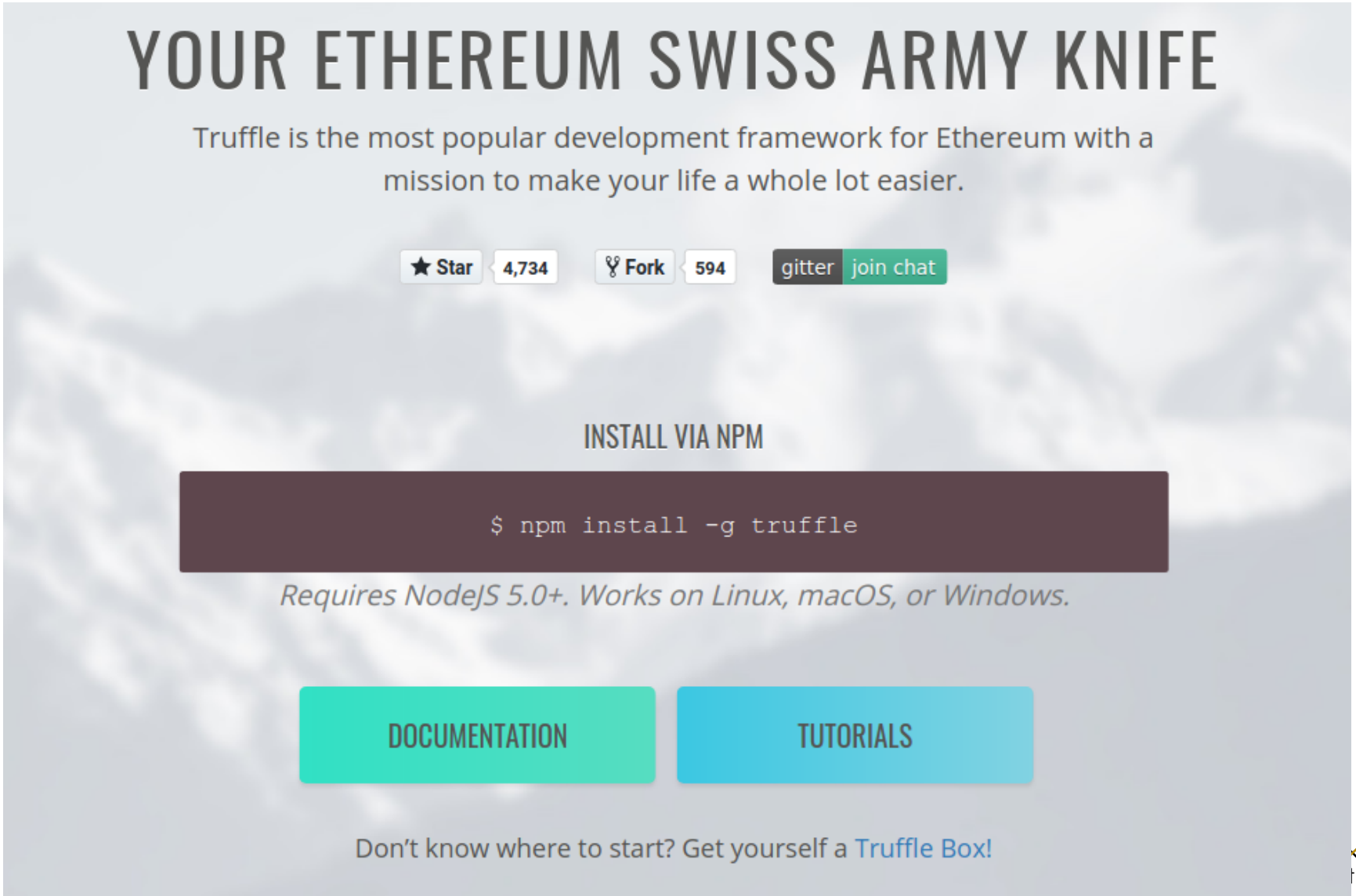
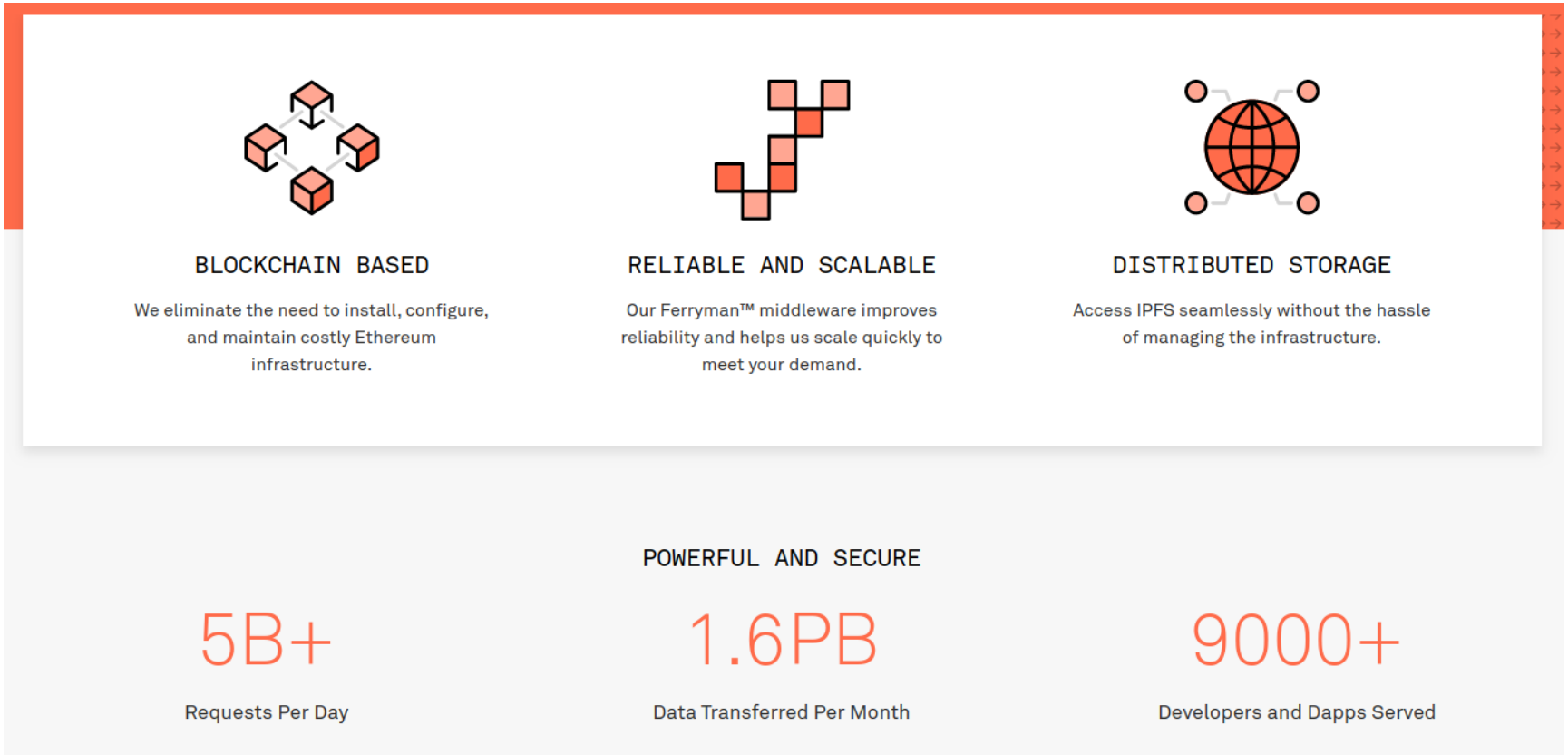
Truffle Framework

http://truffleframework.com



Infura

http://infura.io



MetaMesh

Mythril

https://github.com/ConsenSys/mythril

Mythril is a security analysis tool for smart contracts.
It comes as a Python package that requires a solidity compiler and a C++ compiler.

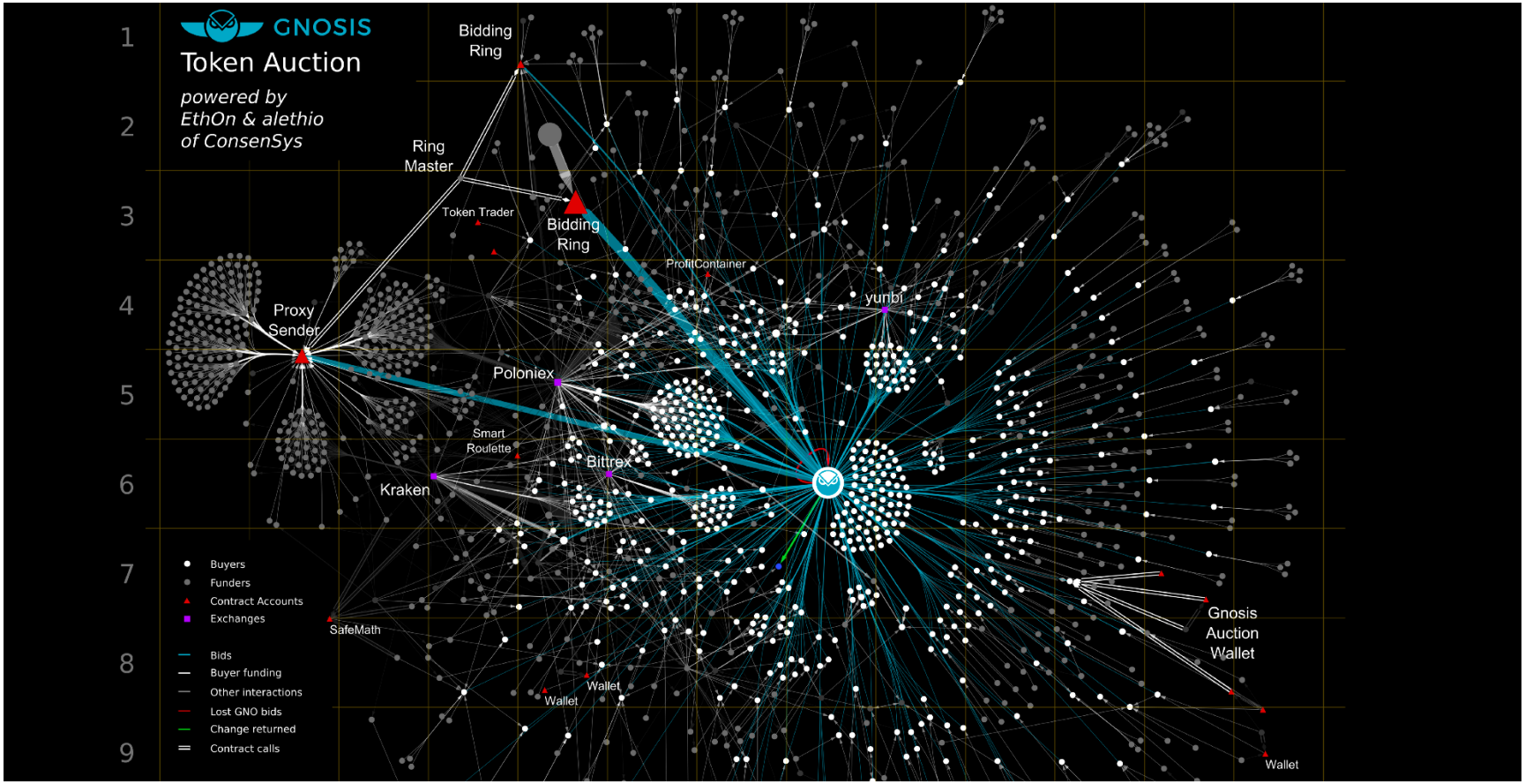
```
$ sudo apt install libssl-dev
$ sudo apt install gcc g++
$ sudo add-apt-repository ppa:ethereum/ethereum
$ sudo apt install solc
$ sudo pip3 install mythril
$ myth -x contracts/higherbidder.sol
```

See also https://hackernoon.com/introducing-mythril-a-framework-for-bug-hunting-on-the-ethereum-blockchain-9dc5588

MetaMesh

Big Data and Analytics on Ethereum

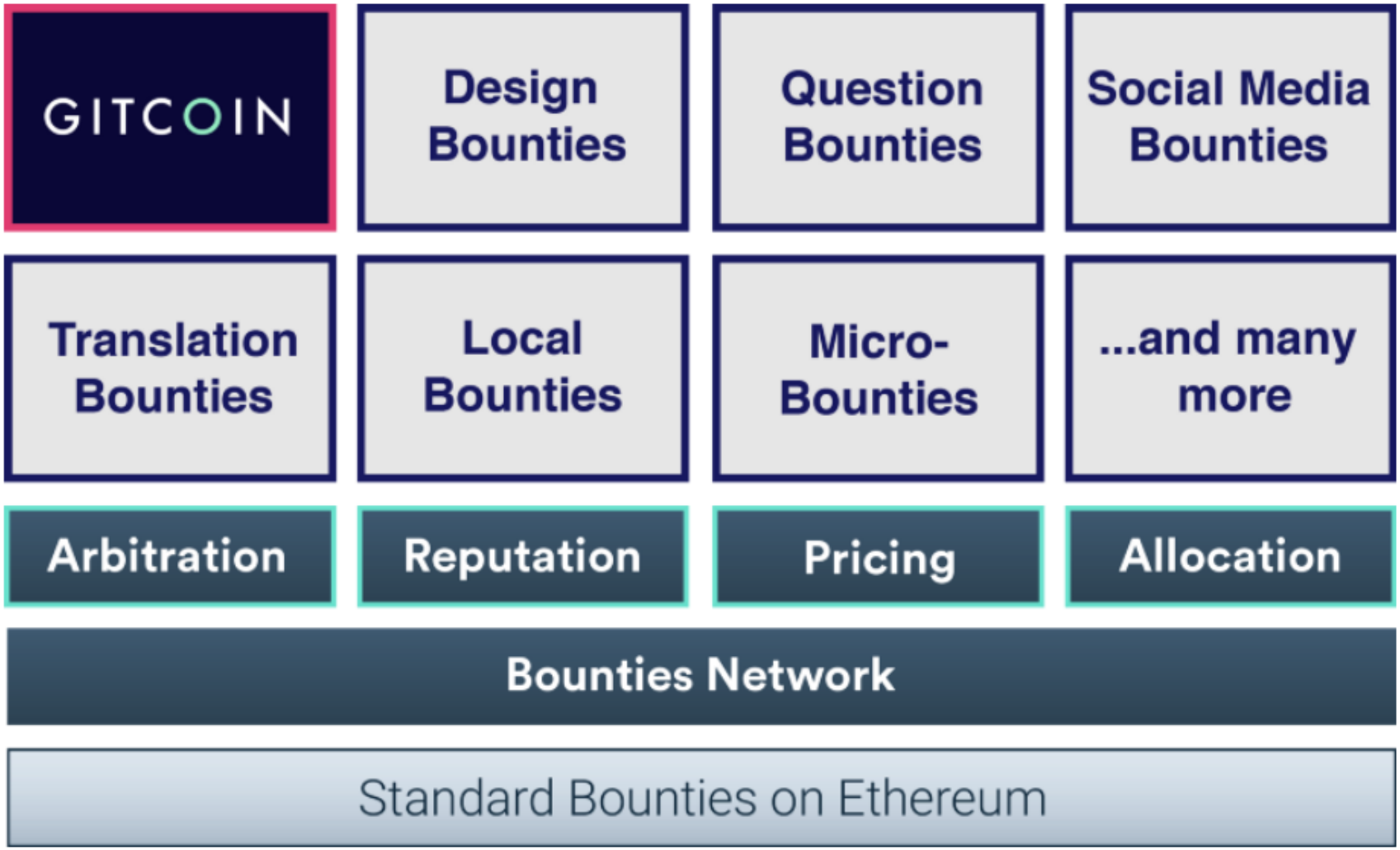
https://aleth.io



MetaMesh

Getting paid for your work: The Bounties Network

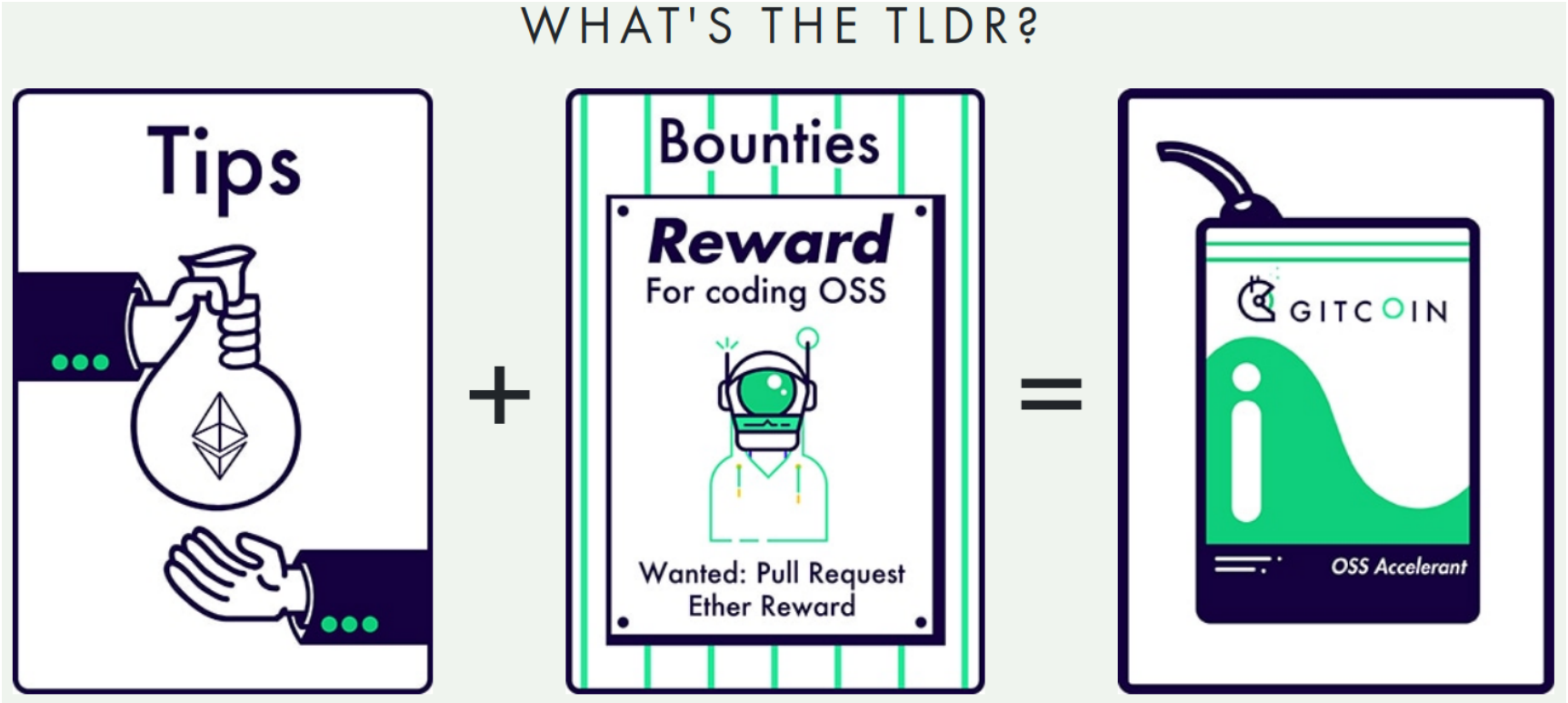
https://bounties.network



Gitcoin (depth-first) and Bounties Network (breadth-first) have integrated!

Gitcoin

https://gitcoin.co



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Thank you!

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References

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