



# A gentle introduction to Blockchain

*at the TechConnex Blockchain Peer Group*

By Marc Lijour

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# Who am I?

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



**COLLIDER-X**



**CONSENSYS**



# Team Experience

 CONSENSYS	 THE WORLD BANK	 TOYOTA	 NORTEL NETWORKS™
 Celestica™	 AMERICAN EXPRESS	 NATO OTAN	 BlueCross® BlueShield®
 McDonald's	 CISCO™	 NOKIA Bell Labs	 SLA SINGAPORE LAND AUTHORITY
 Educational Testing Service	 IES INSTITUTE OF EDUCATION SCIENCES	 RioTinto	 BirdLife SOUTH AFRICA Giving Conservation Wings



Access these slides

<https://bit.ly/2Tou0Jy>

or find in the folder 2019 TechConnex - Blockchain Peer Group at

<https://github.com/marclijour/presentations>



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1 What is Blockchain?

2 Hands-on Introduction to Crypto



# The Trust Machine



# Source of Trust

World Economic Forum: *What is Blockchain* Youtube Video

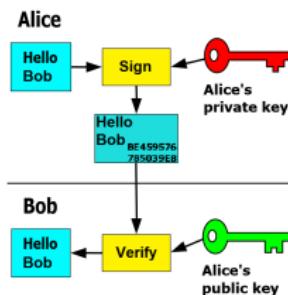


BLOCKCHAIN WILL BECOME A GLOBAL  
DECENTRALISED SOURCE OF TRUST



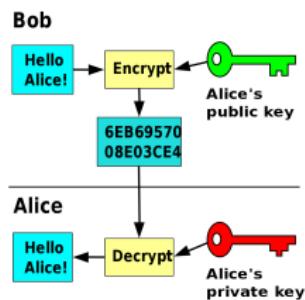
# Key Cryptographic Primitives

## Signing

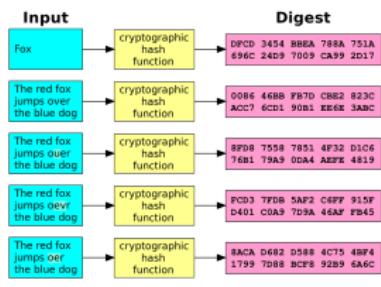


Credit: FlippyFlink

## Encrypting



## Hashing



# Where do we need more trust?

- payments



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



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

# 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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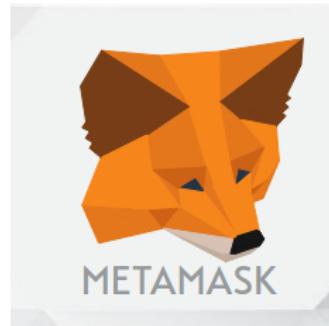
# Let's try things out!



# 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>

# Request Ether from the faucet (on the Ropsten network)

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



The screenshot shows the MetaMask Ether Faucet interface. At the top, there's a browser header with back, forward, and refresh buttons, and a URL field containing <https://faucet.metamask.io>. Below the header, the title "MetaMask Ether Faucet" is displayed. The main content area is divided into two sections: "faucet" and "user". The "faucet" section shows the faucet's address (0x81b7e08f65bdf5648606c89998a9cc8164397647) and balance (4094302.54 ether), with a green button labeled "request 1 ether from faucet". The "user" section shows the user's address (0x56e552eb5a9ab277d9eb841f92d473bf0cae7ebf), balance (1.00 ether), and a "donate to faucet" section with buttons for 1 ether, 10 ether, and 100 ether. At the bottom, there's a "transactions" section.

faucet

address: 0x81b7e08f65bdf5648606c89998a9cc8164397647  
balance: 4094302.54 ether

request 1 ether from faucet

user

address: 0x56e552eb5a9ab277d9eb841f92d473bf0cae7ebf  
balance: 1.00 ether  
donate to faucet:

1 ether

10 ether

100 ether

transactions



# Check the transaction on Metamask

Click on the transaction for a detailed view

The screenshot shows the Metamask interface on the Ropsten Test Network. At the top, it displays "0.9999 ETH" and "\$88.94 USD". Below this, a transaction history shows a single entry: "Sent Ether" from address #0 to address 0x81b7E08F65BdF5648606cB9998A9CC8164397647 at 3/16/2018 at 23:23. The status is "CONFIRMED". A "View on Etherscan" button is present. On the left, there's a sidebar for "Marc 1" with a balance of "0.9999 ETH" and "\$88.94 USD". It also includes a "Don't see your tokens?" section and an "ADD TOKEN" button.



# Check the transaction on Etherscan

Etherscan  
The Ethereum Block Explorer

ROPSTEN (Revival) TESTNET

Search by Address / Txhash / Block / Token / Ens  Language

HOME BLOCKCHAIN TOKEN MISC

Transaction 0xa8a8f32539cb69bd3e506b6527fcc7d44c43cccead09b30b10a9891c99355a3d

Home / Transactions / Tx Info

Overview

Transaction Information Tools & Utilities

[ This is a Ropsten Testnet Transaction Only ]

TxHash:	0xa8a8f32539cb69bd3e506b6527fcc7d44c43cccead09b30b10a9891c99355a3d
TxReceipt Status:	Success
Block Height:	4610407 (348 Block Confirmations)
TimeStamp:	1 hr 12 mins ago (Dec-12-2018 04:23:14 AM +UTC)
From:	0x56e552eb5a9ab277d9eb841f92d473bf0cae7ebf
To:	0xb1b7e08f65bdf5648606c89998a9cc8164397647
Value:	1 Ether (\$0.00)
Gas Limit:	21000
Gas Used By Transaction:	21000 (100%)
Gas Price:	0.000000005 Ether (5 Gwei)
Actual Tx Cost/Fee:	0.000105 Ether (\$0.000000)
Nonce & {Position}:	0   {6}
Input Data:	<input type="text" value="0x"/>

MetaMesh

# A note about gas price

<https://ethgasstation.info>

ETH Gas Station

Estimates over last 1,500 blocks - Last update: Block 5164391

Change Currency ▾

**Std Cost for Transfer** \$0.056

**Gas Price Std (wei)** 3

**SafeLow Cost for Transfer** \$0.056

**Gas Price SafeLow (wei)** 3

**Median Wait (s)** 29

**Median Wait (blocks)** 2

**Gas-Time-Price Estimator:** For transactions sent at block: 5164391

Adjust confirmation time

Avg Time (m/s)	4.38
95% Time (m/s)	10.95
Gas Price (Wei)*	3
Tx Fee (Flat)	\$0.056

Gas Used*	21000
Avg Time (blocks)	18.02
95% Time (blocks)	45.05
Tx Fee (ETH)	0.00005

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

Last Block: 5164391

**Transaction Count by Gas Price**

**Confirmation Time by Gas Price**

**Recommended Gas Prices** (based on current network conditions)

Speed	Gas Price (wei)
SafeLow (<30m)	3
Standard (<5m)	3
Fast (<2m)	18

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 nonce confirmations.

**Misc Stats (Last 1,500 blocks)**



# Price of (real) ether: ETH

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

ETHUSD Crypto Chart



# Wallets

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

Software



Hardware



Paper



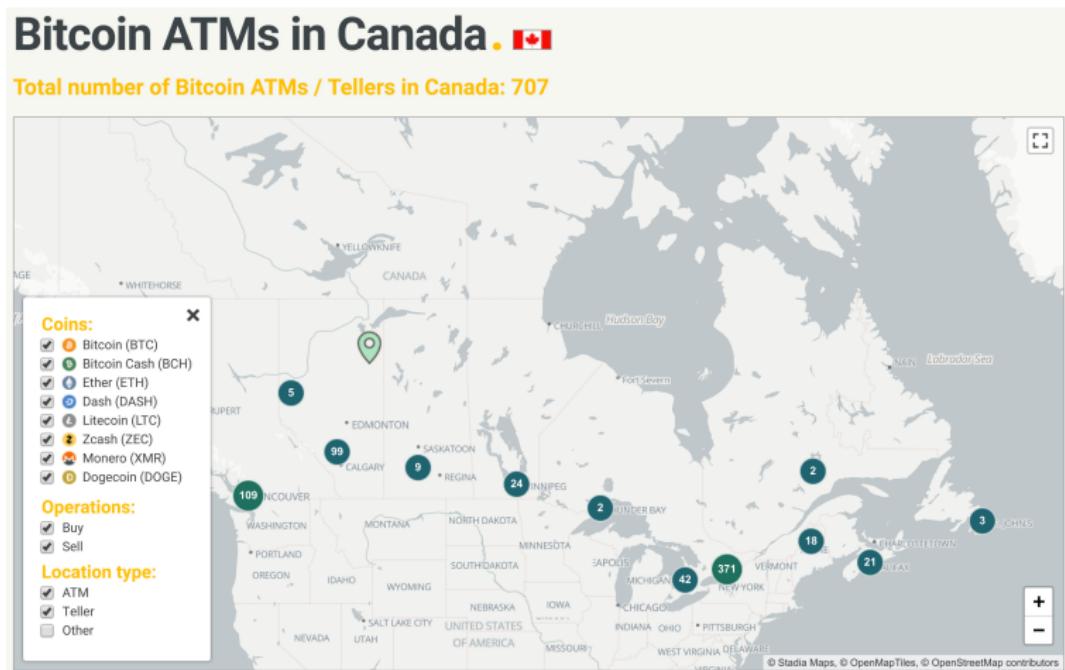
# Exchanges

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



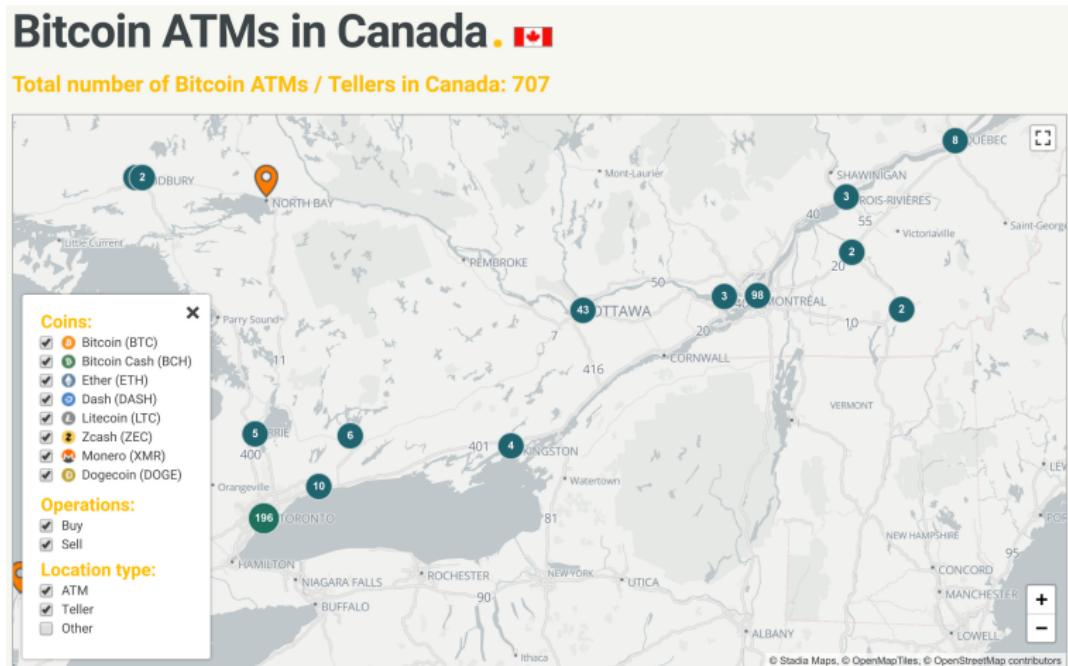
## ATMs

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



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# Other crypto-assets

More information:

<https://www.tradingview.com/markets/cryptocurrencies/prices-all/>

NAME 301 matches	SEARCH	WKT CAP	FD WKT 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	101.745M	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	2.028	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	-1.51%
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%



# Thank you!

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[www.metameshgroup.com](http://www.metameshgroup.com)



# References