

Distributed Ledger Technology (The Blockchain)

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I. Why the Blockchain?

- Under the Spotlights
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- Cryptocurrency market cap
- Cryptocurrency exchanges

Under the Spotlights



The Blockchain
A revolutionary decentralized trust system

EFFICIENCY

http://www3.weforum.org/docs/GAC16_Top10_Emerging_Technologies_2016_report.pdf



<https://www.imf.org/external/pubs/ft/sdn/2016/sdn1603.pdf>

Not Virtual Anymore

virtual 

adjective | vir·tu·al | \ˈvər-chə-wəl, -chəl; ˈvərch-wəl\

Simple Definition of VIRTUAL

Popularity: Top 20% of words

- : very close to being something without actually being it
- : existing or occurring on computers or on the Internet

Source: Merriam-Webster's Learner's Dictionary

<http://www.merriam-webster.com/dictionary/virtual>

Cryptocurrency Market Cap

649 Currencies / 60 Assets / 1989 Markets

Market Cap: **\$12,082,554,281** / 24h Vol: **\$293,759,909** / BTC Dominance: **84.0%**

Crypto-Currency Market Capitalizations



Register and pay by 7 September to save US \$600!
14 - 16 November | Singapore [REGISTER NOW >](#)

Market Cap ▾ Trade Volume ▾ Trending ▾ Tools ▾

Search Currencies



All ▾






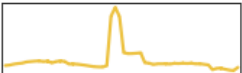





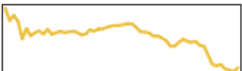
Currencies ▾

Assets ▾

USD ▾

Next 100 →

View All

| # | Name | Market Cap | Price | Available Supply | Volume (24h) | % Change (24h) | Price Graph (7d) |
|---|--|-------------------|-------------|----------------------|----------------|----------------|---|
| 1 |  Bitcoin | \$ 10,137,848,529 | \$ 643.91 | 15,744,250 BTC | \$ 256,481,000 | -4.99 % |  |
| 2 |  Ethereum | \$ 822,289,040 | \$ 10.06 | 81,770,173 ETH | \$ 14,932,800 | -2.90 % |  |
| 3 |  Ripple | \$ 232,935,257 | \$ 0.006590 | 35,345,971,933 XRP * | \$ 790,727 | -1.15 % |  |
| 4 |  Litecoin | \$ 191,965,120 | \$ 4.12 | 46,561,154 LTC | \$ 5,482,560 | -8.41 % |  |
| 5 |  The DAO | \$ 92,440,798 | \$ 0.080116 | 1,153,836,913 DAO * | \$ 1,259,940 | -3.55 % |  |
| 6 |  NEM | \$ 78,243,210 | \$ 0.008694 | 8,999,999,999 XEM * | \$ 1,927,680 | 3.34 % |  |

Cryptocurrency Exchanges

Cryptocurrency Exchanges / Markets List

Indexing 46 cryptocurrency exchanges with a total 24h volume of 410,664.12 BTC on 4156 trading pairs!

Exchanges List

Inactive Exchanges

Graphical Exchange Comparison

| Featured exchange of the month | Last Update | Trading Pairs | Total Volume | Logarithmic |
|---|-------------------------------|---------------|--------------|------------------------|
| Bitcoin Exchange Thailand | 9 min, 58 sec | 20 | 779.48 BTC | <div><div></div></div> |
| CCEDK | 36 days, 17 h, 28 min, 55 sec | 108 | 0.00 BTC | <div><div></div></div> |

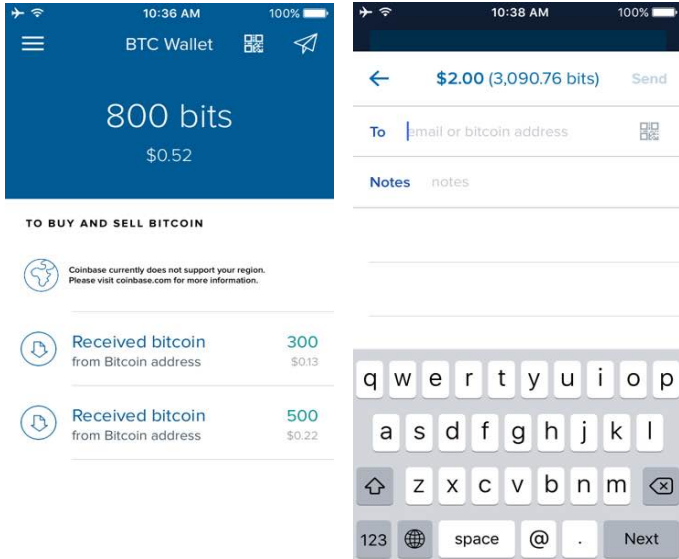
| Name | Last Update | Trading Pairs | Total Volume | Logarithmic |
|--------------------------|----------------|---------------|----------------|------------------------|
| Bitfinex | 13 min, 26 sec | 8 | 113,073.50 BTC | <div><div></div></div> |
| OKCoin | 3 min, 59 sec | 4 | 78,687.99 BTC | <div><div></div></div> |
| BTCC | 3 min, 27 sec | 2 | 53,542.99 BTC | <div><div></div></div> |
| BTC-e | 17 sec | 26 | 50,895.27 BTC | <div><div></div></div> |
| CEX.IO | 3 min, 55 sec | 31 | 40,948.51 BTC | <div><div></div></div> |
| Kraken | 1 sec | 34 | 33,713.61 BTC | <div><div></div></div> |
| Poloniex | 4 min, 17 sec | 343 | 14,212.31 BTC | <div><div></div></div> |
| Bitstamp | 31 sec | 1 | 12,813.13 BTC | <div><div></div></div> |
| BTC38 | 31 sec | 64 | 6,921.64 BTC | <div><div></div></div> |

II. The Bitcoin

- Components
- Under the Hood
 - Distributed ledgers
 - Mining
 - Chained blocks
 - Consensus
 - Transaction recording

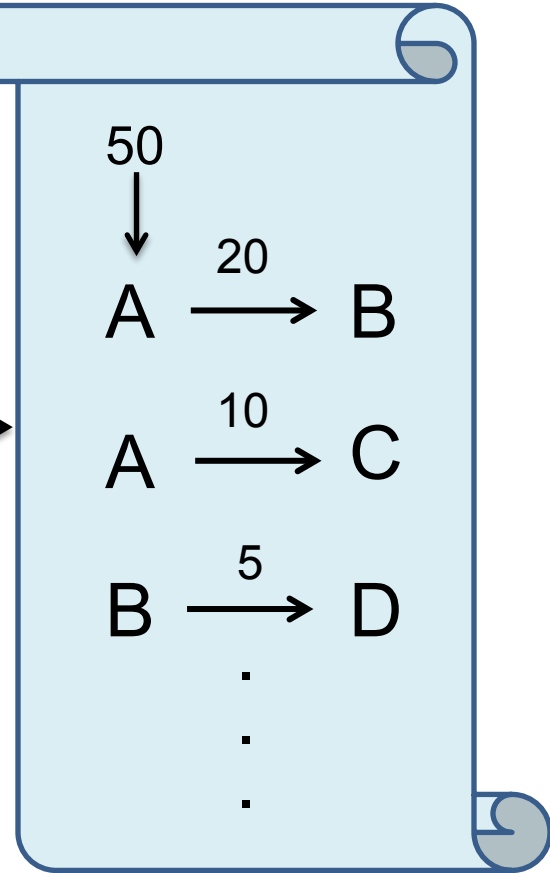
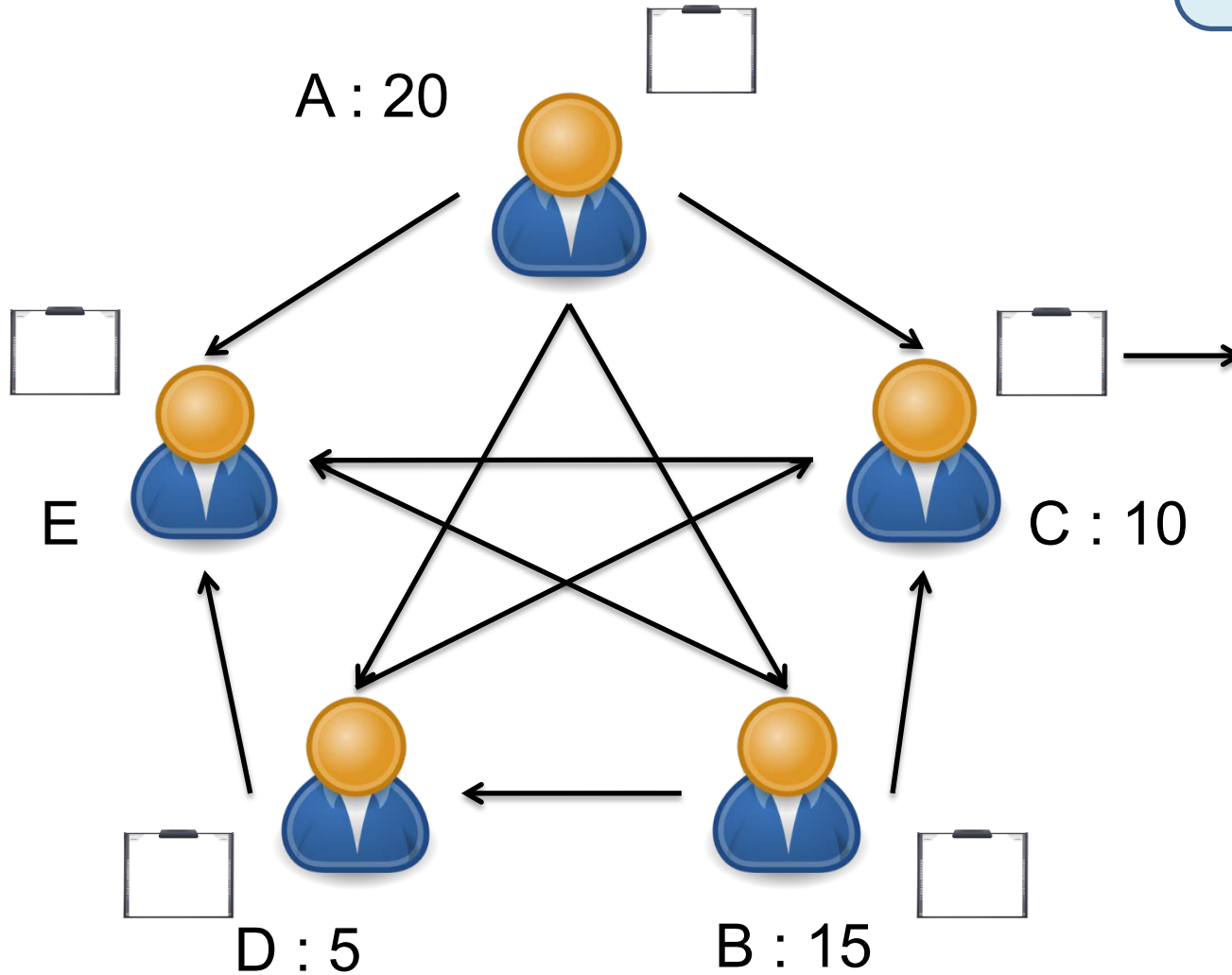
Components

Picture by Marko Ahtisaari

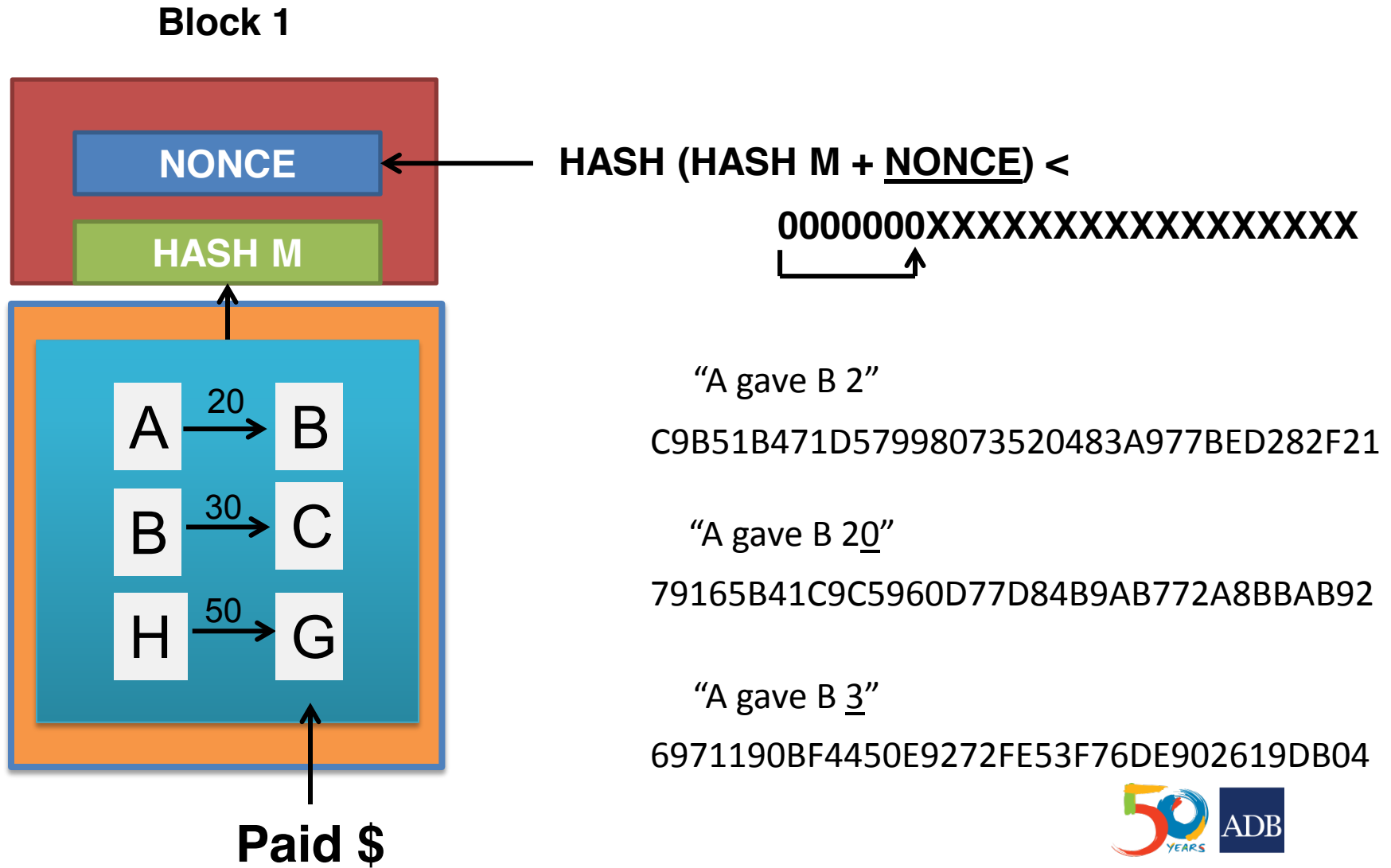


Picture by Kevin Hutchinson

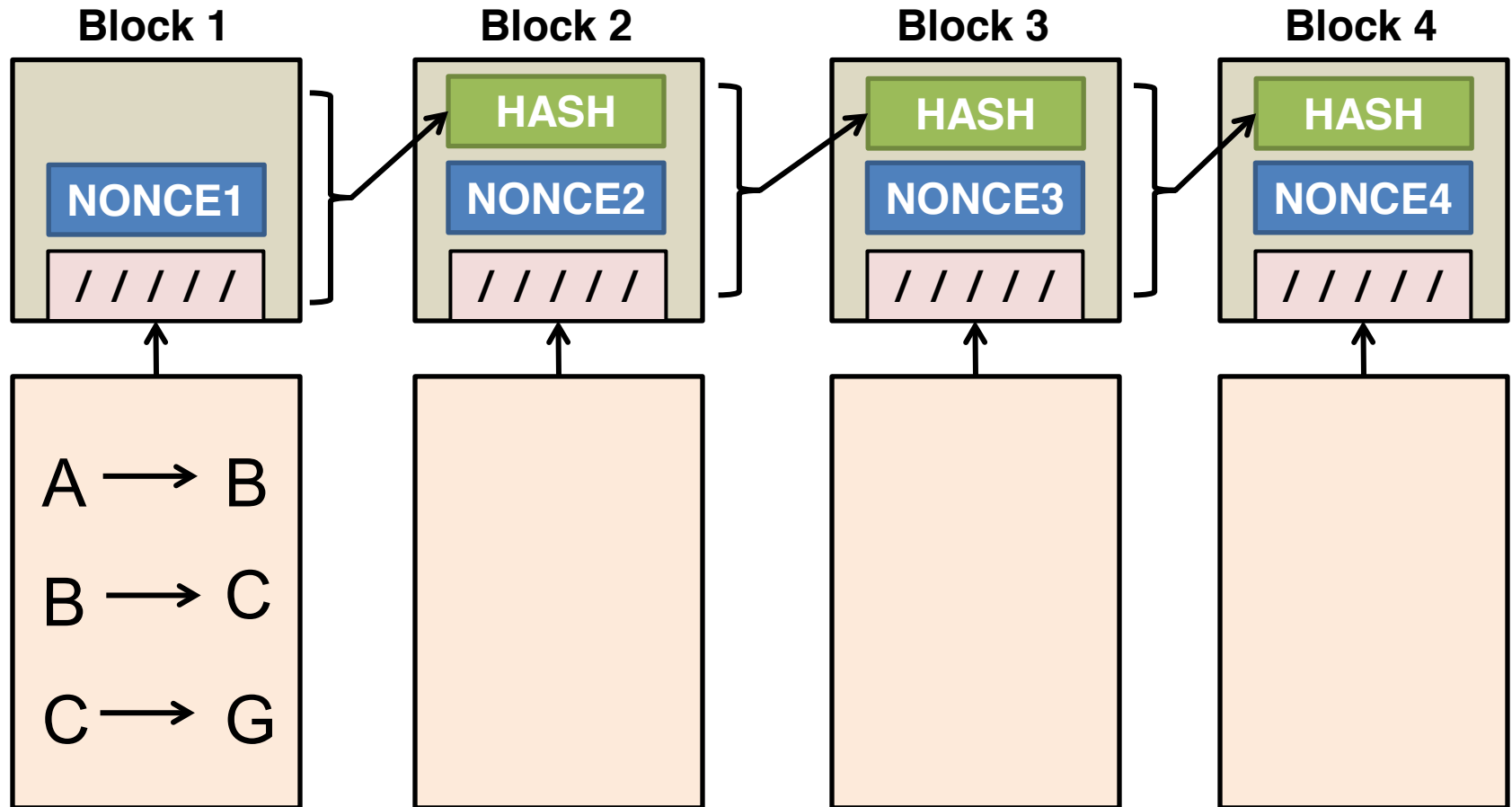
Distributed Ledgers



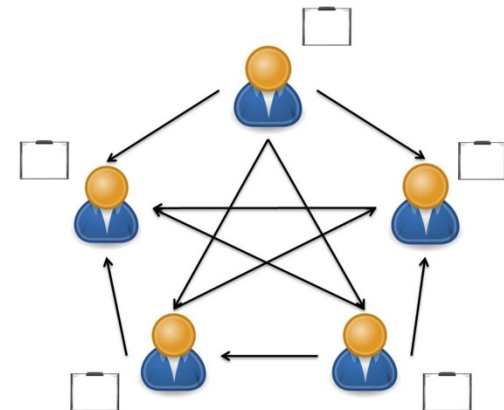
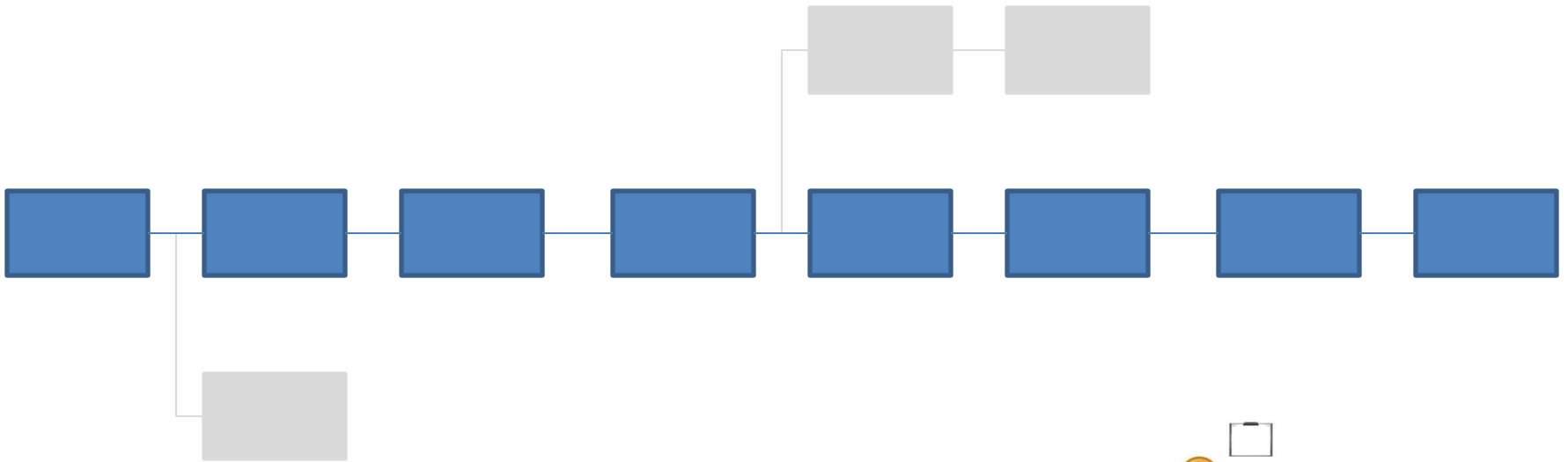
Mining



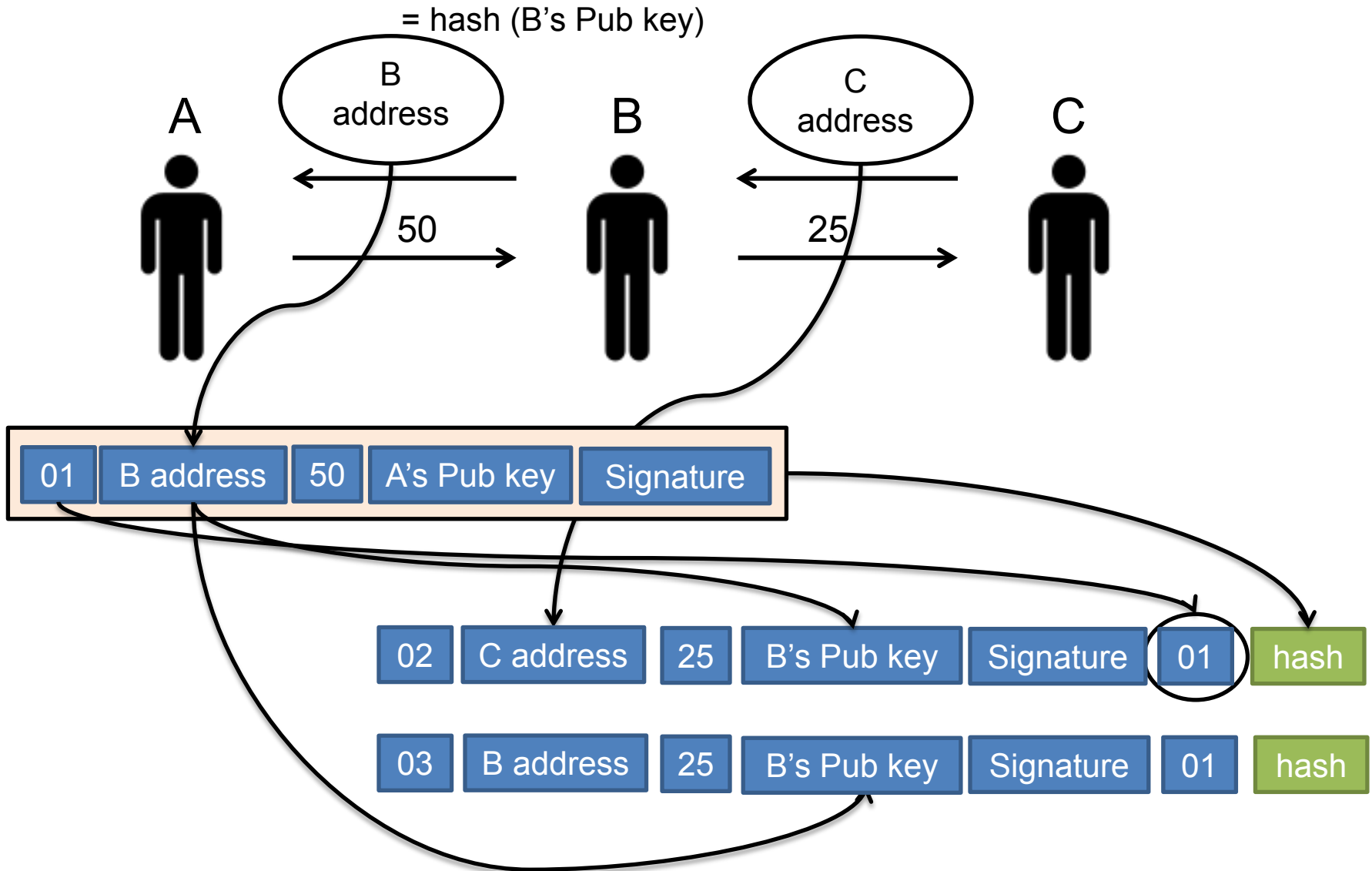
Chained Blocks



Consensus



Transaction Recording



III. Technology Applications

- Colored coins: NASDAQ linq
- Smart contracts: Ethereum, R3 CEV
- Distributed storage: Storj
- Distributed Autonomous Organization: Ethereum/DAO

...

Colored Coins

Certificates

 CERTIFICATES VERIFIED BY NASDAQ
VIEW WALLET & TRANSACTIONS

Search by participant

SERIES

- ☒ Seed
- ☒ Series A
- ☒ Series B

CLASSES

- ☒ Class B
- ☒ Common Class
- ☒ Class A

SORT: MOST RECENT LEAST RECENT MOST SHARES LEAST SHARES NAME (A-Z)

| ISSUER | MORN | ISSUER | EZRI DAX |
|-------------------|-----------------|-----------------------|--------------------|
| 4,997,864 SEED | 199,525 SEED | 9,044,370 SERIES B | 17,388 SERIES B |
| Common Class | Common Class | Class B | Class B |
| 1/12/15 | 1/12/15 | 10/21/14 | 10/21/14 |

| JADZIA DAX |
|--------------------|
| 14,577 SERIES B |
| Class B |
| 10/22/14 |

Dukat

Investor

2.6m Shares
2 Certificates

| DUKAT | DUKAT |
|----------------|-----------------------|
| 94,629 SEED | 9,555,094 SERIES B |
| Common Class | Class B |
| 10/31/12 | 8/2/14 |

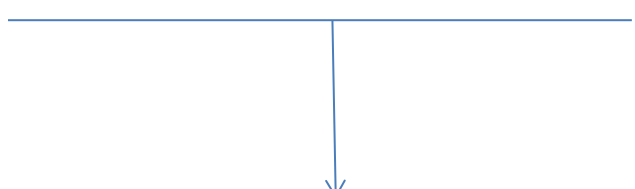
| CLASS | SHARES | AMT. INVESTED |
|-----------------|-----------|---------------|
| CO COMMON CLASS | 94,629 | \$0.00 |
| B CLASS B | 9,555,109 | \$70,978.36 |
| TOTAL | 2,649,738 | \$70,978.36 |

Dukat's transactions

| 10/31/12 | | NASDAQ VERIFIED TRANSFER | | CHAIN OF CUSTODY > | |
|----------|---------------------|--------------------------|-------|---------------------|--|
| LESTA | 500,000 SEED SHARES | > | LESTA | 468,457 SEED SHARES | |
| GARAK | 500,000 SEED SHARES | | DUKAT | 94,629 SEED SHARES | |
| | | | GARAK | 436,914 SEED SHARES | |

<http://www.coindesk.com/hands-on-with-linq-nasdaq-private-markets-blockchain-project/>

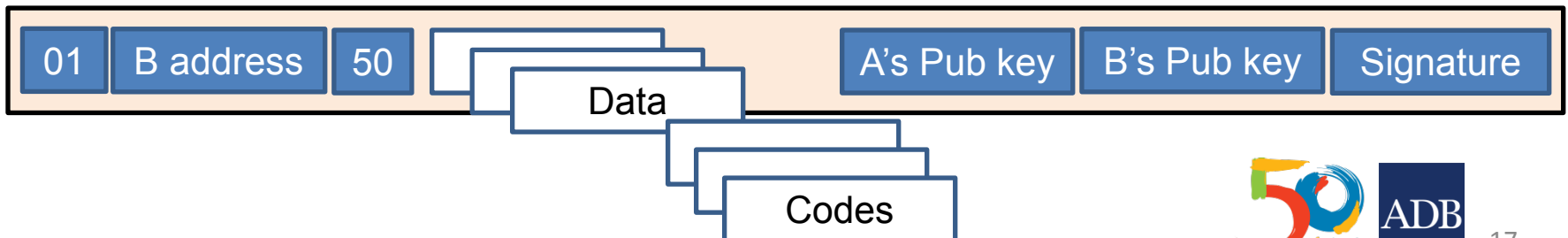
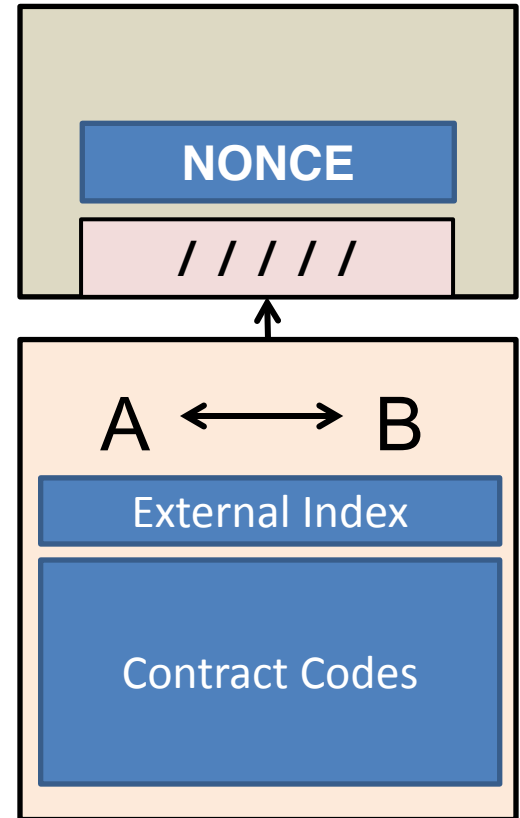
Smart Contracts



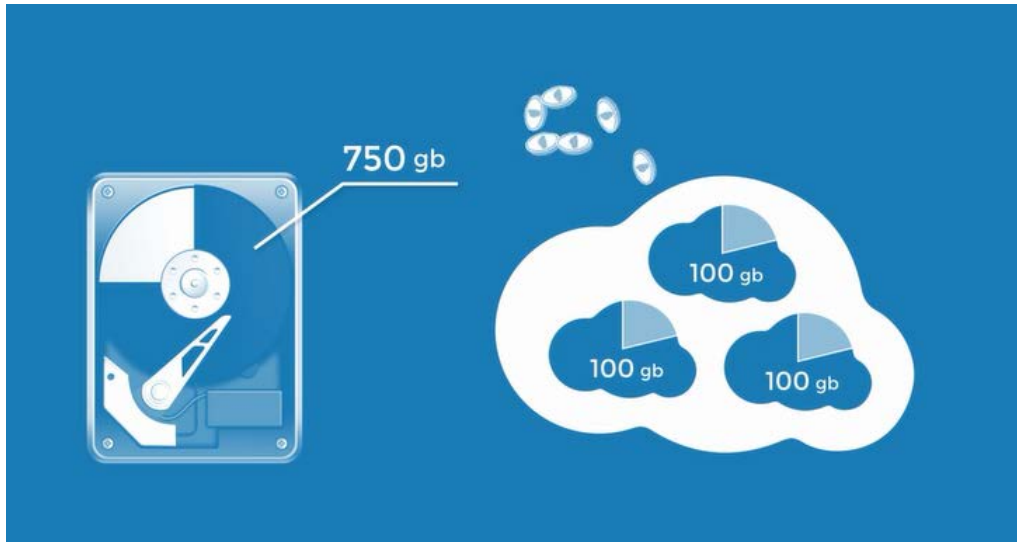
M



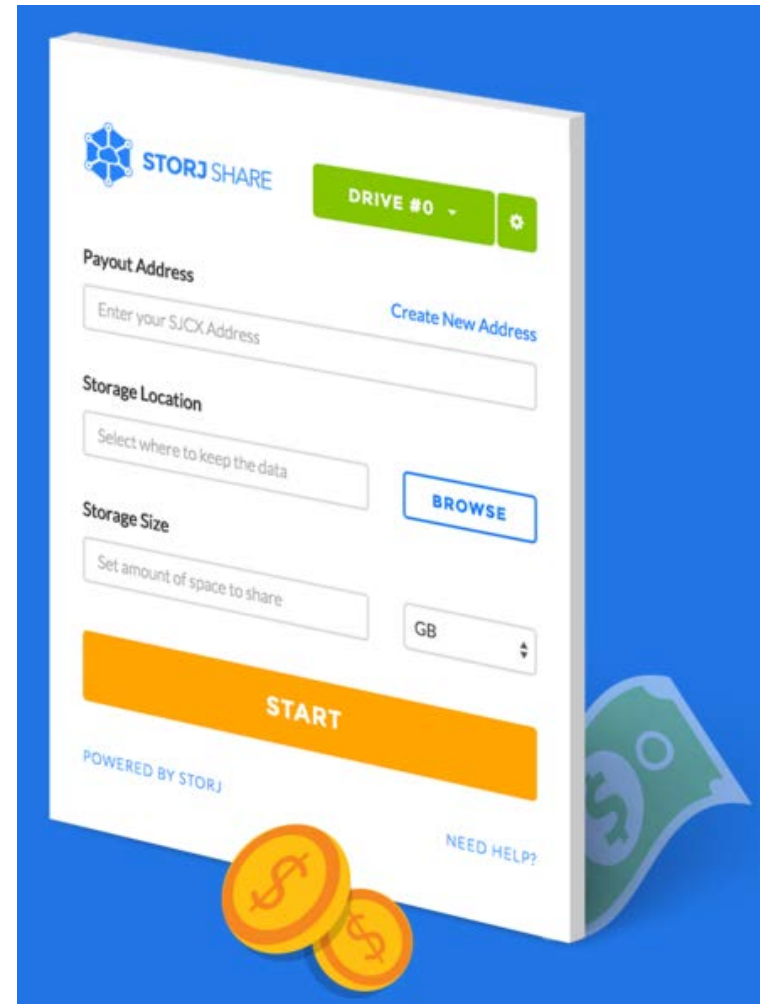
Block



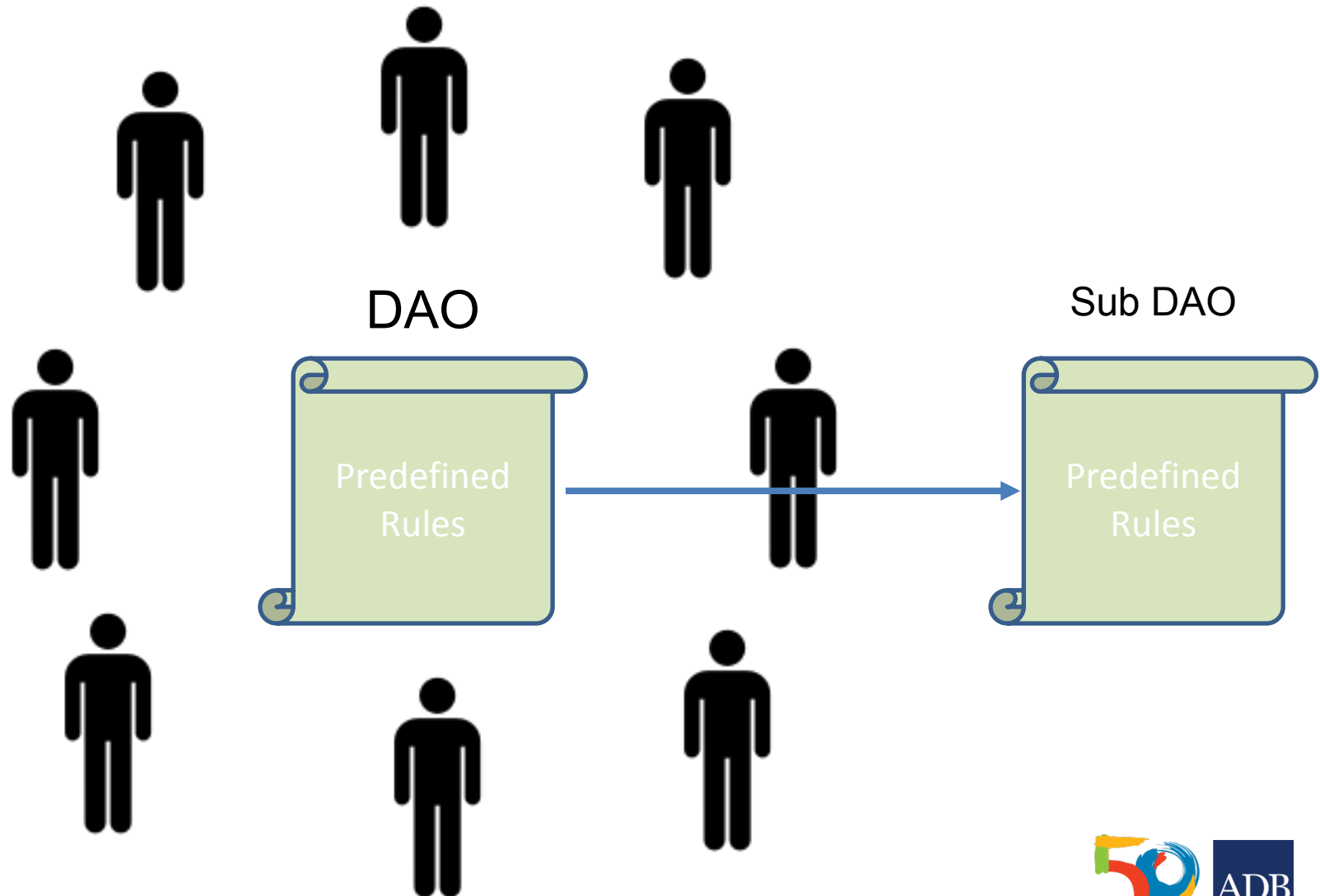
Distributed Storage



<https://storj.io/>



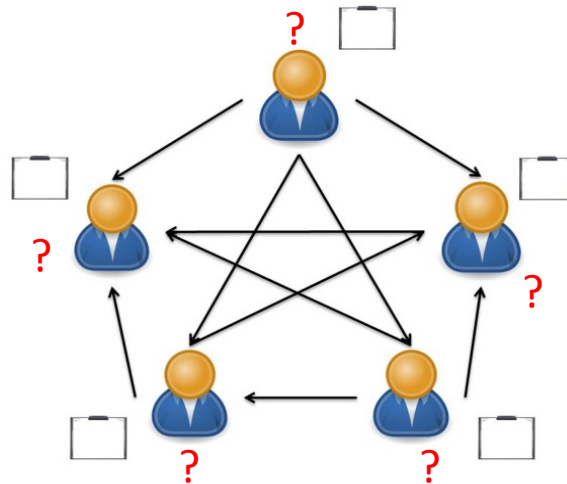
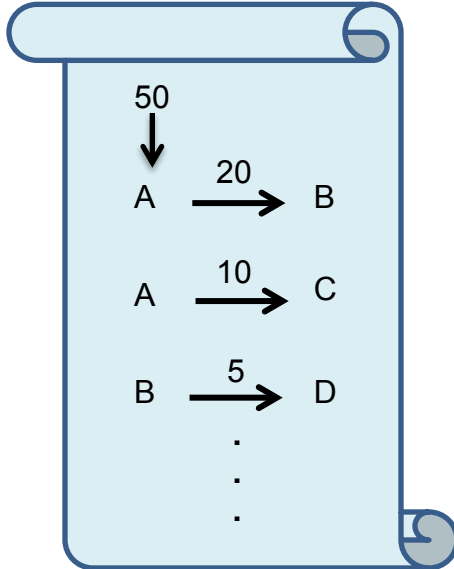
Distributed Autonomous Organization



IV. Risks and Governance

- Anonymity
- Volatility (Mt. GOX, The DAO Hacking)
- Derivatives and leverages
- Impact on environment
- Questions to ask

Anonymity



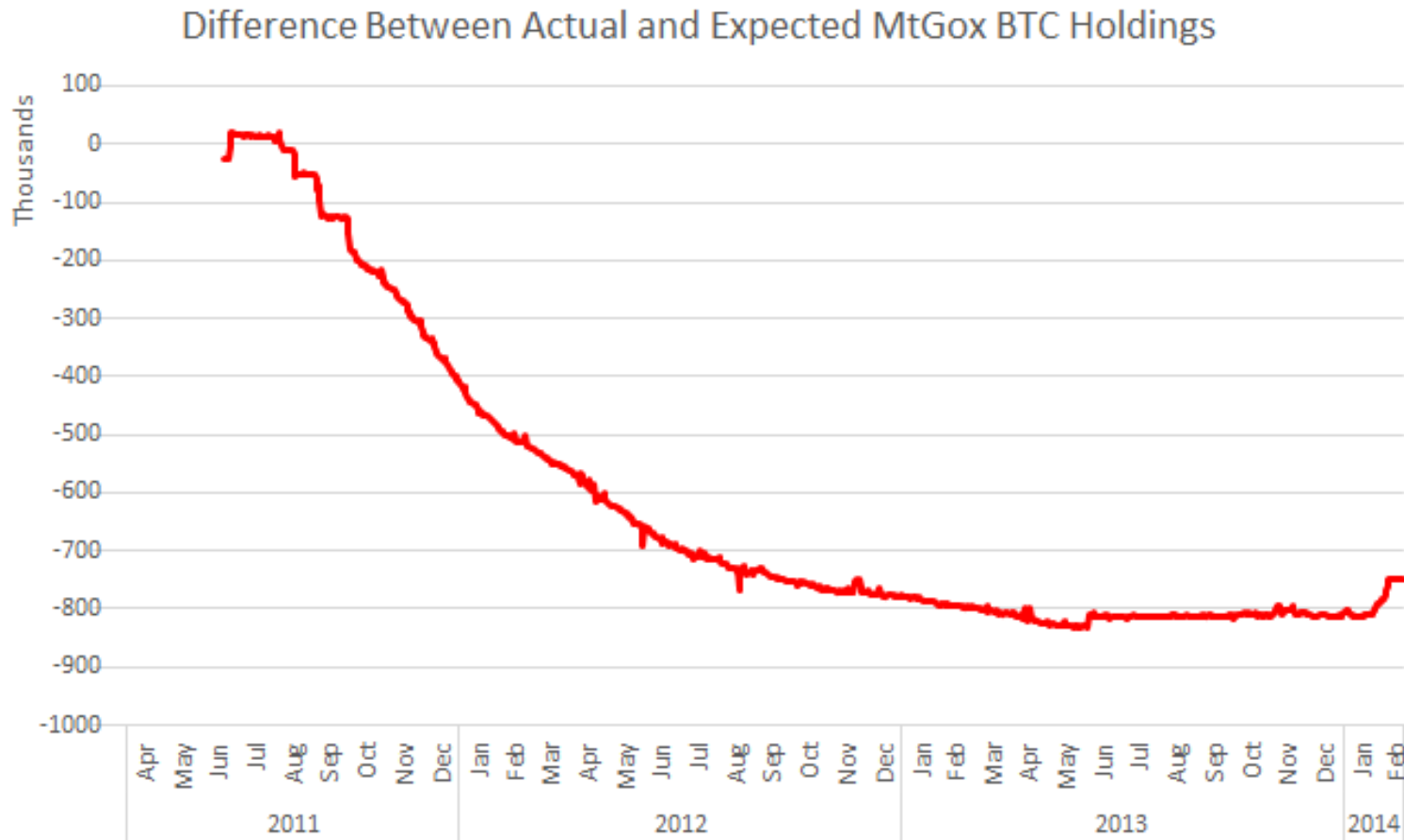
- Money laundering
- Funding terrorists
- Tax evasion
- Illegal trades
- Illegal capital flights
- Ransom



<http://www.newsweek.com/2015/02/27/silk-road-hell-307732.html>

By Nina Burleigh

Volatility – Mt. GOX Hacking



<http://blog.wizsec.jp/2015/04/themissingmtgoxbitcoins.html>

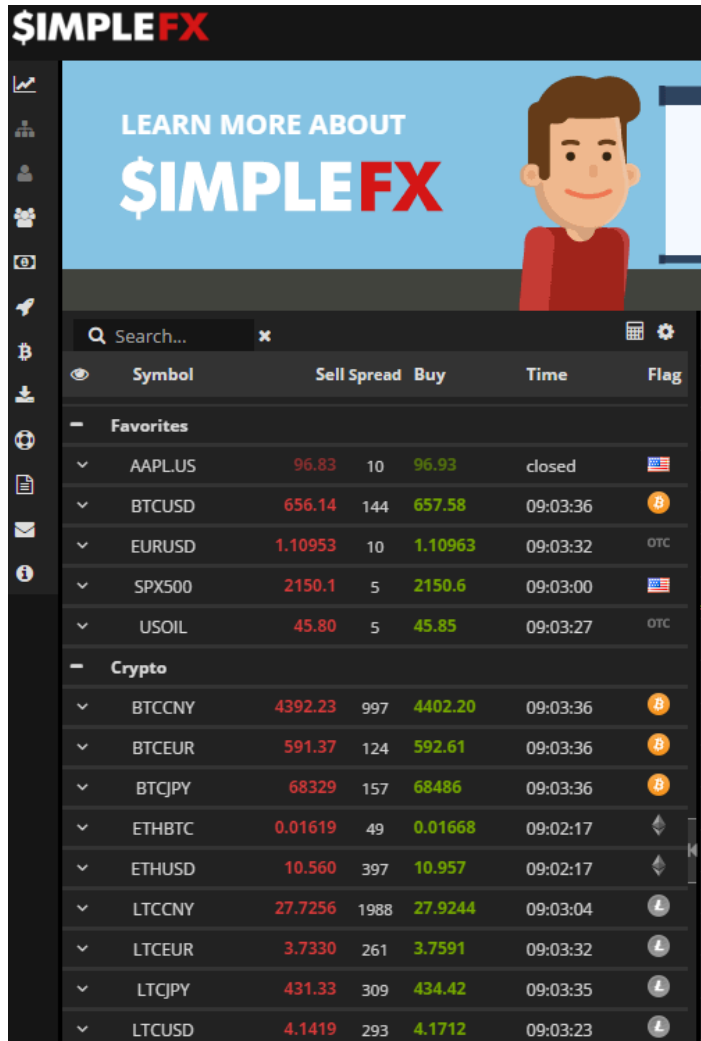
posted by Kim Nilsson

Volatility – The DAO Hacking



<http://coinmarketcap.com/currencies/ethereum/>

Derivatives and Leverages



The screenshot shows the SimpleFX website interface. At the top, there's a banner with the text "LEARN MORE ABOUT SIMPLEFX" and a cartoon character. Below the banner is a search bar and a table of derivatives contracts. The table has columns for Symbol, Sell Spread, Buy, Time, and Flag. It lists various contracts under "Favorites" and "Crypto" categories.

| | Symbol | Sell Spread | Buy | Time | Flag |
|------------------|--------|-------------|--------------|----------|------|
| Favorites | | | | | |
| ▼ | AAPLUS | 96.83 | 10 96.93 | closed | US |
| ▼ | BTCUSD | 656.14 | 144 657.58 | 09:03:36 | B |
| ▼ | EURUSD | 1.10953 | 10 1.10963 | 09:03:32 | OTC |
| ▼ | SPX500 | 2150.1 | 5 2150.6 | 09:03:00 | US |
| ▼ | USOIL | 45.80 | 5 45.85 | 09:03:27 | OTC |
| Crypto | | | | | |
| ▼ | BTCNY | 4392.23 | 997 4402.20 | 09:03:36 | B |
| ▼ | BTCEUR | 591.37 | 124 592.61 | 09:03:36 | B |
| ▼ | BTCJPY | 68329 | 157 68486 | 09:03:36 | B |
| ▼ | ETHBTC | 0.01619 | 49 0.01668 | 09:02:17 | |
| ▼ | ETHUSD | 10.560 | 397 10.957 | 09:02:17 | |
| ▼ | LTCCNY | 27.7256 | 1988 27.9244 | 09:03:04 | L |
| ▼ | LTCEUR | 3.7330 | 261 3.7591 | 09:03:32 | L |
| ▼ | LTCJPY | 431.33 | 309 434.42 | 09:03:35 | L |
| ▼ | LTCUSD | 4.1419 | 293 4.1712 | 09:03:23 | L |

<https://simplefx.com/>

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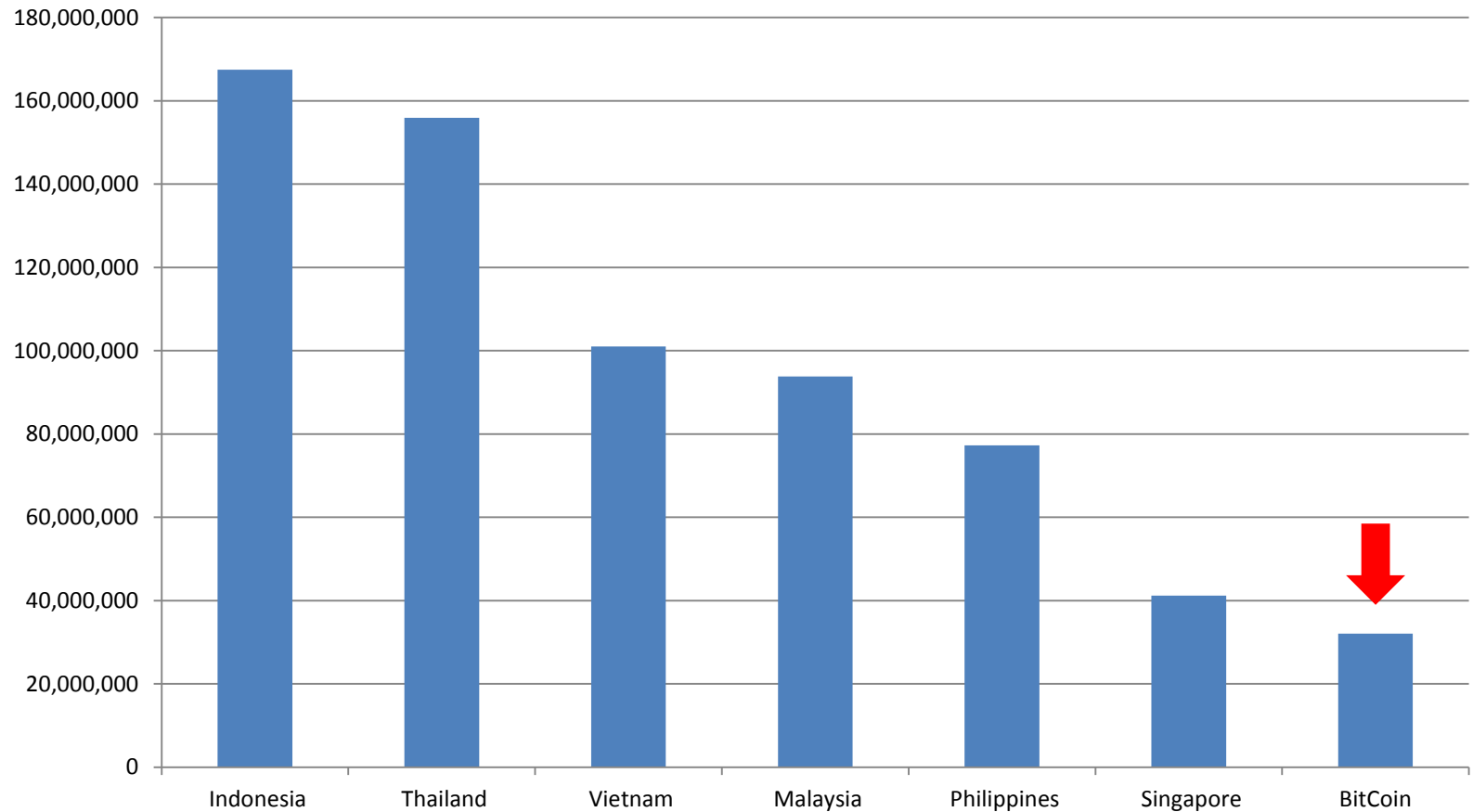
1. **Getting Started** - Terms and definitions
2. **Get a Bitcoin Futures Account** - Where bitcoin derivatives can be traded
3. **Basic Futures Contract Example** - Simple illustration
4. **Compare Features of Bitcoin Futures Exchanges**
5. **How Leverage Works in Bitcoin Derivatives**
6. **Fixed Margin vs. Cross Margin**
7. **Making Your First Bitcoin Futures Trade** - Practice makes perfect
8. **Settlement Procedure**
9. **Futures Contract Length**
10. **Socialised Losses**
11. **Communities for Bitcoin Traders**

<http://www.bitcoinfuturesguide.com/futures-guide.html>

CFTC Asserts Jurisdiction Over Bitcoin Derivatives

<http://www.sidley.com/news/10-15-2015-derivatives-update>

Impact on Environment



Electricity Consumption
(MW, 1 Year)

Questions to ask

- Do we understand the new technology and its benefits and risks?
- Did we proactively start gathering and accumulating data on this ?

Further Recommended Reading

- [State of Bitcoin and Blockchain 2016](#)
- [State of Blockchain Q1 2016](#)