

Von Blockchain über Ethereum zur DAO

Christoph Jentzsch

Blockchain

**YOU GET A BLOCKCHAIN!
AND YOU GET A BLOCKCHAIN!**



**EVERYBODY GETS A
BLOCKCHAIN!!!**

I'VE HIRED A CONSULTANT
TO HELP US EVOLVE OUR
PRODUCTS TO USE
BLOCKCHAIN TECHNOLOGY.



BLOCKCHAIN! BLOCKCHAIN!
BLOCKCHAIN! BLOCKCHAIN!
BLOCKCHAIN! BLOCKCHAIN!



IT'S AS IF YOU'RE A
TECHNOLOGIST AND
A PHILOSOPHER ALL
IN ONE!



BLOCKCHAIN.
SIDECHAINS.

The
Economist

OCTOBER 31ST - NOVEMBER 6TH 2015

Economist.com

Our guide to America's best colleges
Turkey votes to the sound of bombs
Those ever-creative accountants
America takes the fight to IS
Coywolves: the new superpredator

The trust machine

How the technology behind bitcoin
could change the world



Bloomberg
Markets

IT'S ALL
ABOUT THE

BLOCKCHAIN

THE
INNOVATORS

BRAD KATSUYAMA'S
NEXT CHAPTER

A BANK FOR PEOPLE
WHO HATE BANKS

WHO WANTS TO
START AN ETF?

A HUNDRED APPS
BLOOM IN CHINA

BLYTHE MASTERS
IS BETTING
THE DIGITAL LEDGER
BEHIND BITCOIN
WILL REVOLUTIONIZE
THE WAY WE
TRADE BONDS,
LOANS, DERIVATIVES,
AND MUCH ELSE.



“Virtual currencies and their underlying technologies can provide faster and cheaper financial services, and can become a powerful tool for deepening financial inclusion in the developing world. ... Virtual currencies' technologies hold promise of greater financial inclusion and lower remittances costs.”

- Christine Lagarde, IMF Managing Director



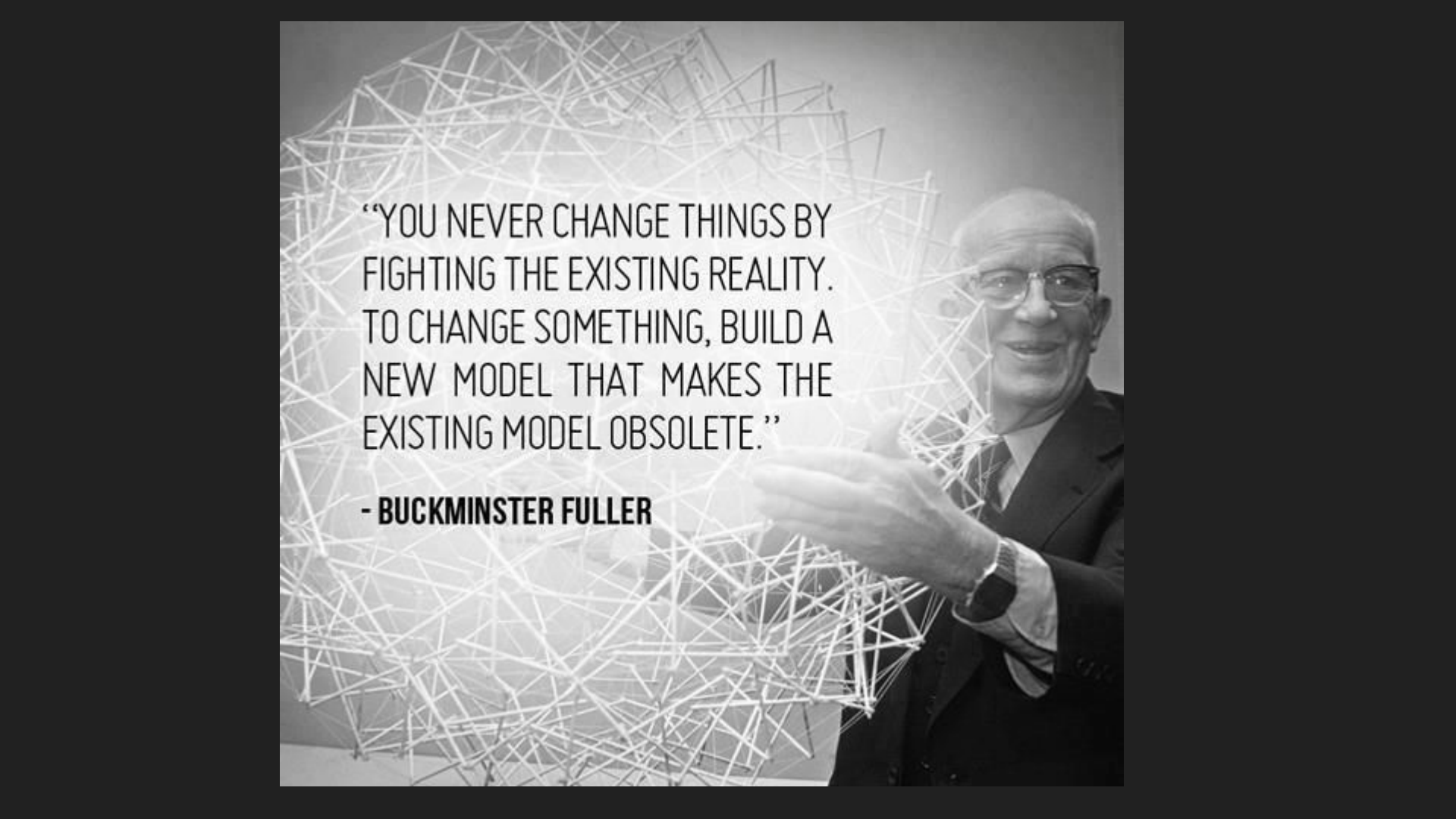
“Distributed ledger technology provides the framework for government to reduce fraud, corruption, error and the cost of paper-intensive processes. It has the potential to redefine the relationship between government and the citizen in terms of data sharing, transparency and trust. It has similar possibilities for the private sector.”

- Professor Sir Mark Walport, Chief Scientific Adviser to HM Government



“Blockchain is the technology that is capable to turn all the spheres upside-down: that of state regulation, functionality of the state in general, finance – every single one. ... Undoubtedly, this is a revolution.”

- Herman Gref, CEO and Chairman of the Executive Board of Sberbank

A black and white photograph of Buckminster Fuller. He is an older man with glasses, wearing a dark suit, white shirt, and tie. He is smiling and gesturing with his right hand towards a large, complex geodesic dome structure made of thin rods. The dome is the central focus of the image, with Fuller positioned to its right. The background is a plain, light color.

“YOU NEVER CHANGE THINGS BY
FIGHTING THE EXISTING REALITY.
TO CHANGE SOMETHING, BUILD A
NEW MODEL THAT MAKES THE
EXISTING MODEL OBSOLETE.”

- BUCKMINSTER FULLER

Grundlagen Blockchain-Technologie

1. Begriffsdefinitionen:

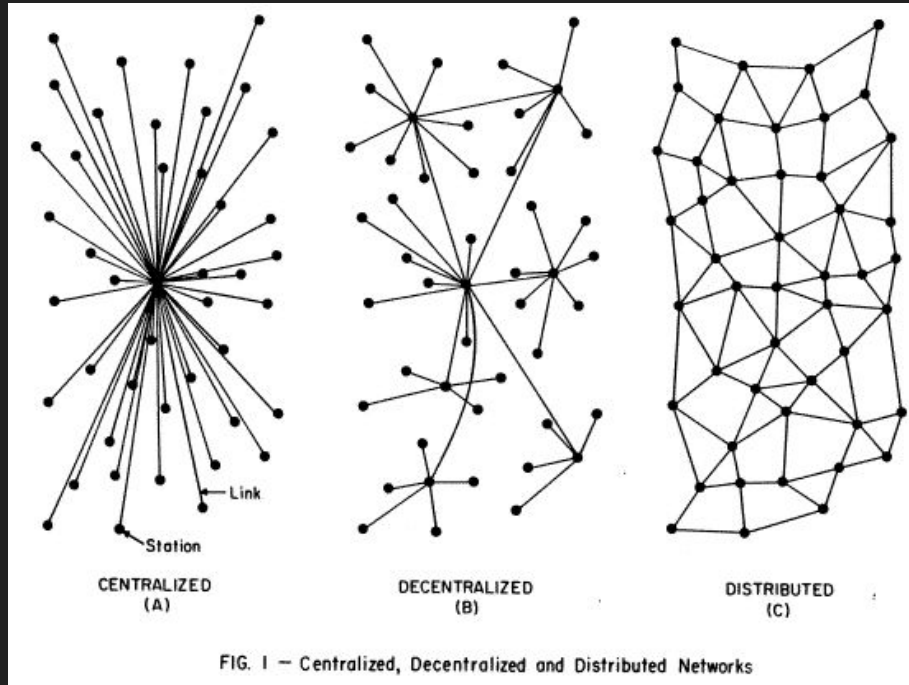
- a. p2p network
- b. public / private keys
- c. Hash
- d. Merkle Tree

2. Blockchain concept

- a. Proof of Work
- b. smart contracts

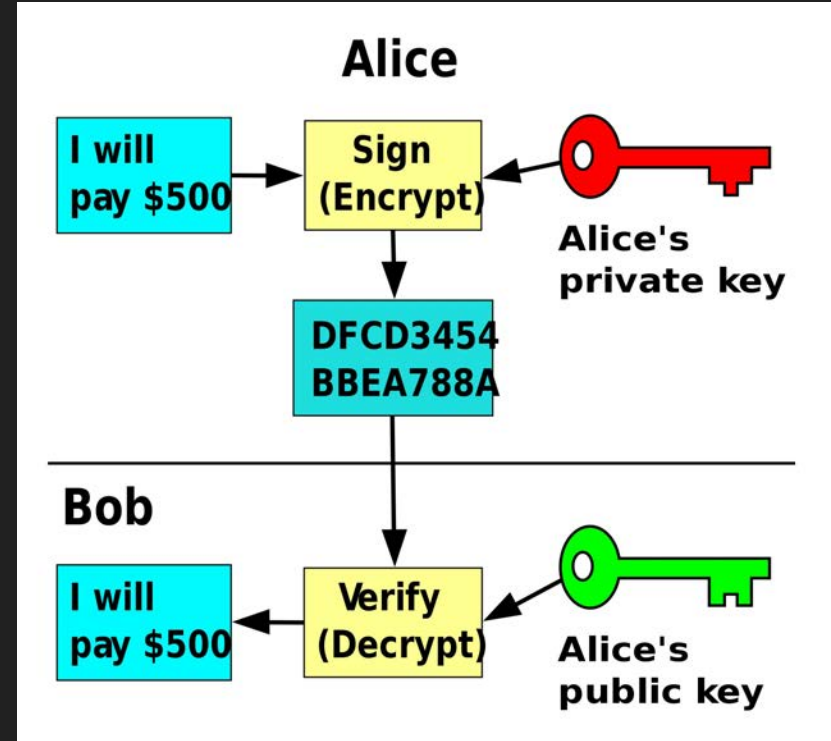
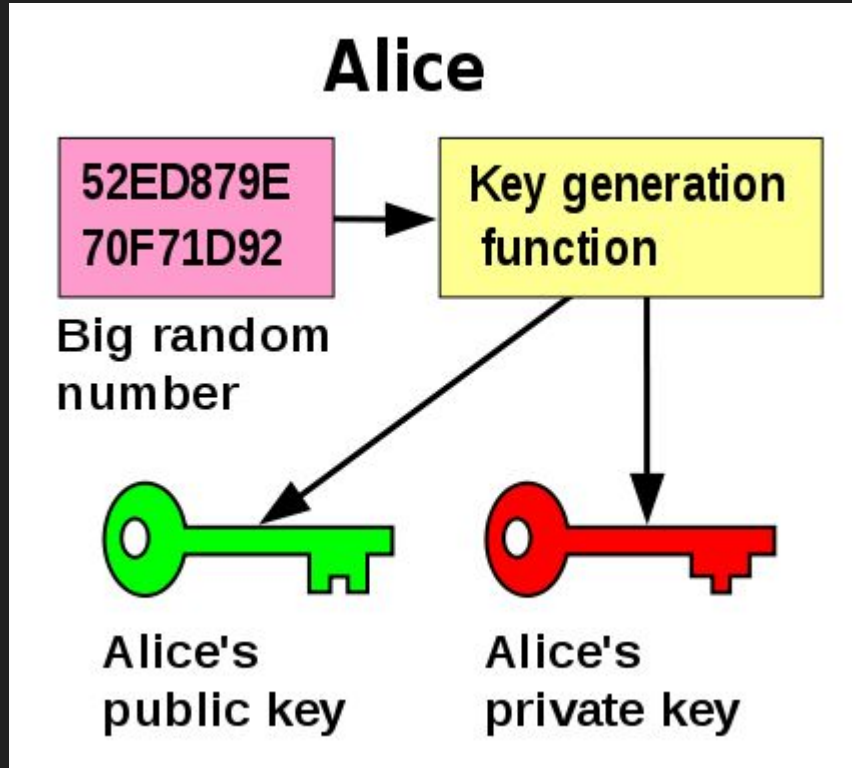
1. Begriffsdefinitionen

Peer to peer network (p2p)



- Robust (no “single point of failure”)
- Alle Teilnehmer (Nodes) haben dieselben Rechte
- Alle halten sich an Protokoll
- Kein “Ansprechpartner” -> nicht zensierbar (um es abzuschalten, muß man alle nodes abschalten)
- Nodes können von Menschen oder Maschinen gesteuert werden (IoT, M2M, ...)

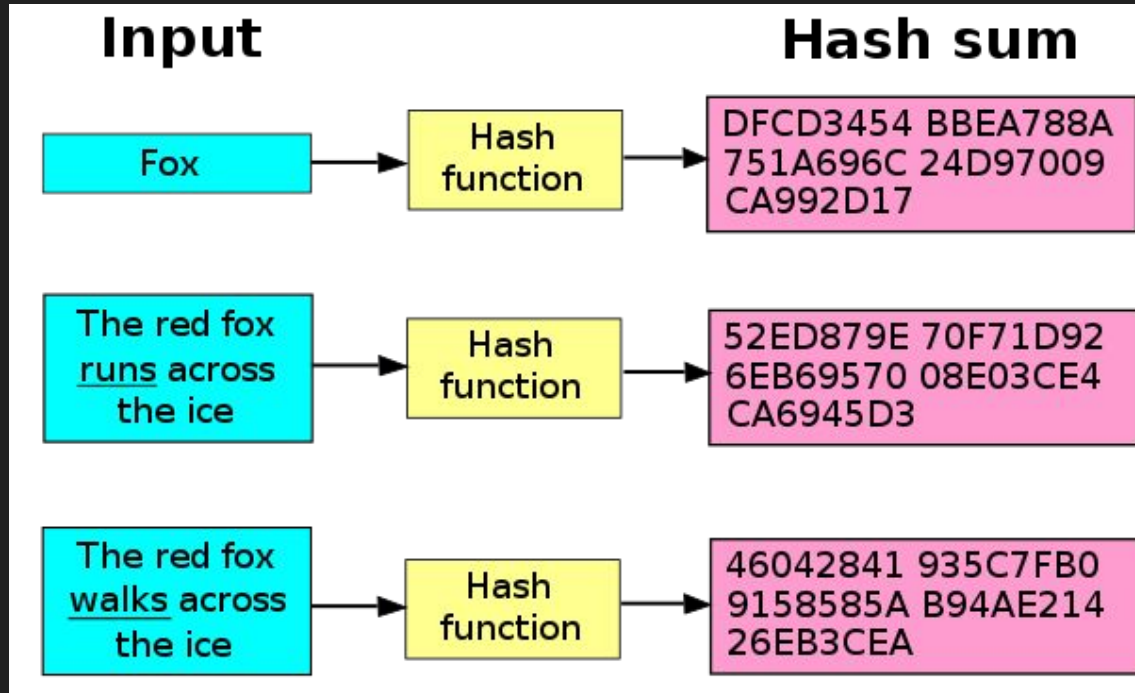
Kryptografie Grundlagen - Keys



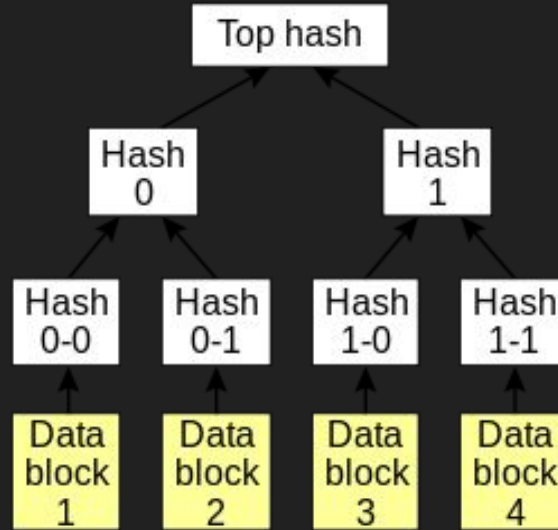
Kryptographie Grundlagen - Hash

Hash = Eindeutige ID von einem Datensatz

256 bit -> keine "Hash collisions" (es gibt jede hash sum nur einmal)



Merkle Tree



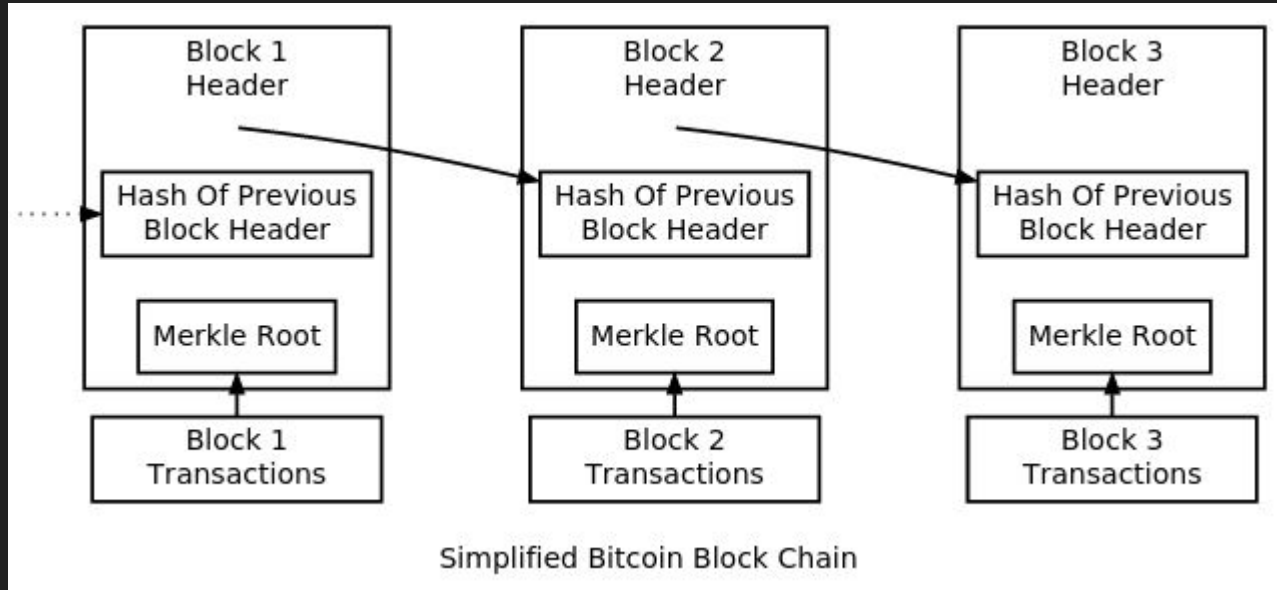
Top hash (root hash) beschreibt eindeutig eine baumartige Datenstruktur

Wenn ich einen Wert ändere, habe ich einen neuen root hash.

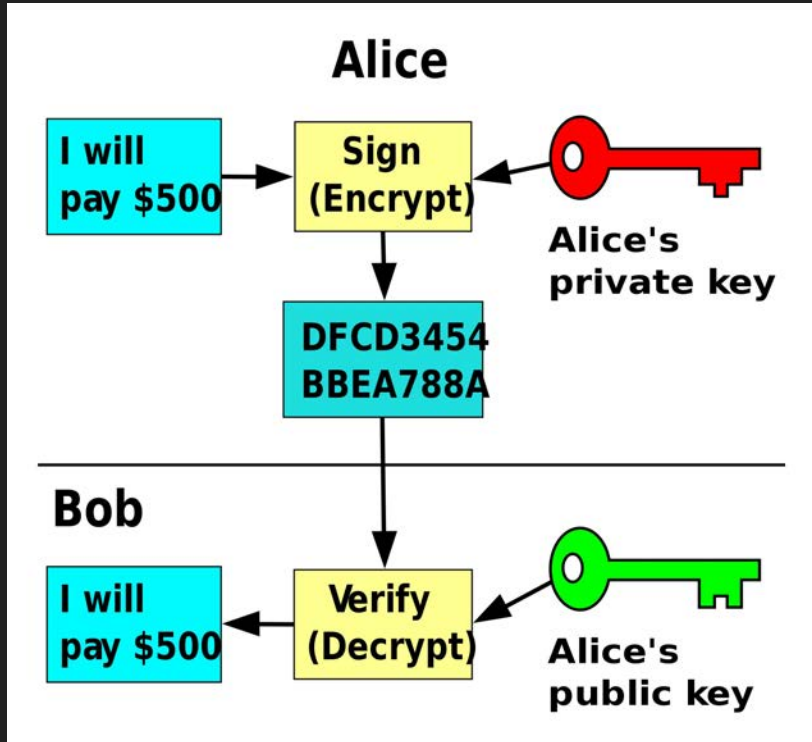
2. Blockchain concept

Blockchain Konzept

Eine "Kette von Blöcken"



Transaktionen



Transaktion:

- Absender
- Empfänger
- Anzahl an virtuellen coins (Bitcoin, Ether, ...)
- (Daten)

Proof of Work



GPU mining

Hash des Block Headers darf nicht größer sein als ein bestimmter Wert

$$\text{Hash} \leq \frac{2^{256}}{\text{difficulty}}$$

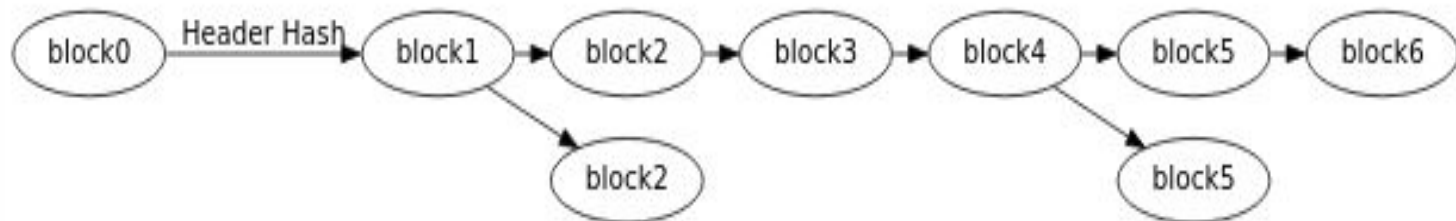


Mining farm in Island

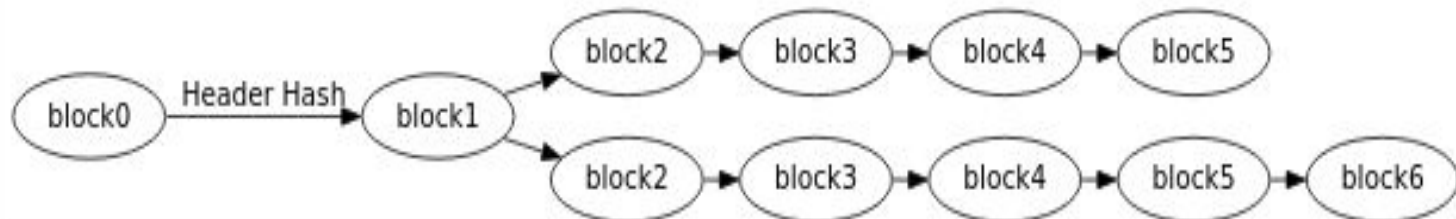
Difficulty wird dynamisch angepaßt um im Mittel die Zeit zwischen den Blöcken konstant zu halten

Forks

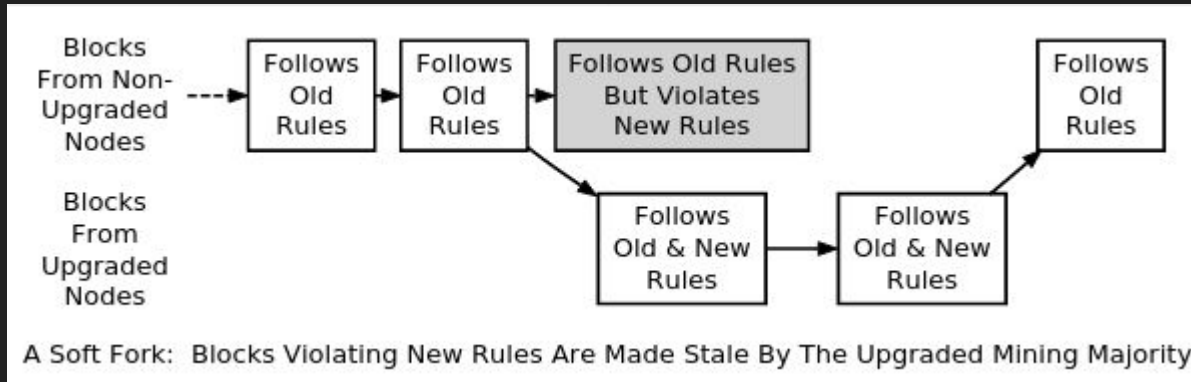
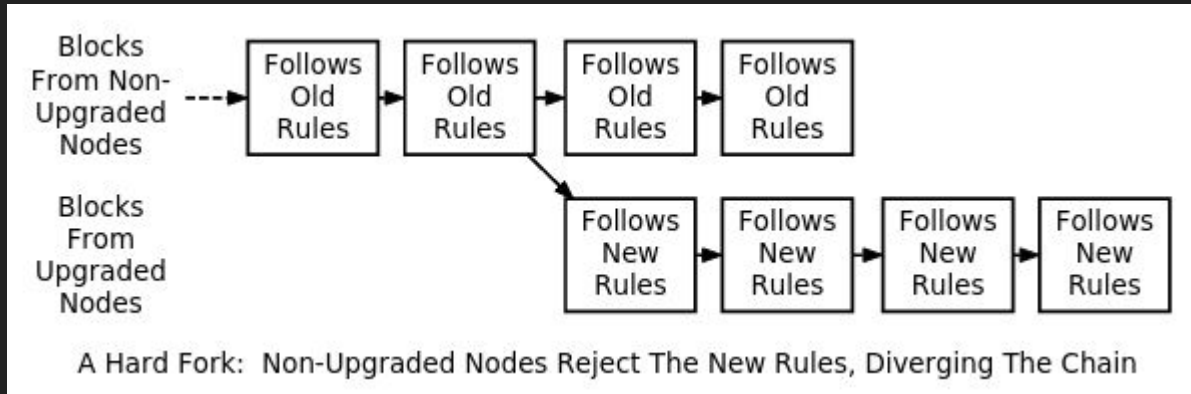
Normal Occasional Forking



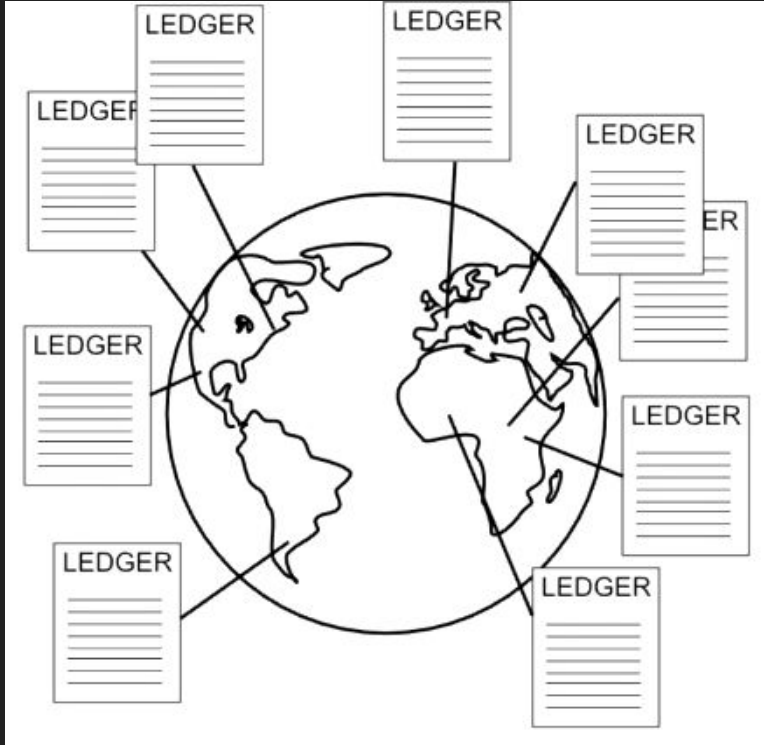
Rare Extended Forking



Forks um Protokoll zu erweitern / ändern (soft / hard)



Blockchain = Distributed permission ledger



Bitcoin: Ledger beinhaltet Kontostände

Ethereum: Ledger beinhaltet

- Kontostand
- Daten
- Logik / Bedingungen (code)

=> **smart contracts**

Blockchain explorer

<https://blockchain.info/de>

<https://etherchain.org/>

Intelligente Verträge (Smart Contracts)

```
contract Coin {
    // The keyword "public" makes those variables
    // readable from outside.
    address public minter;
    mapping (address => uint) public balances;

    // Events allow light clients to react on
    // changes efficiently.
    event Sent(address from, address to, uint amount);

    // This is the constructor whose code is
    // run only when the contract is created.
    function Coin() {
        minter = msg.sender;
    }
    function mint(address receiver, uint amount) {
        if (msg.sender != minter) return;
        balances[receiver] += amount;
    }
    function send(address receiver, uint amount) {
        if (balances[msg.sender] < amount) return;
        balances[msg.sender] -= amount;
        balances[receiver] += amount;
        Sent(msg.sender, receiver, amount);
    }
}
```

- Quasi Turing vollständig
- sichere Interaction durch signierte Transaktionen (public/private key)
- Verträge können:
 - auf anderen aufbauen
 - **Transaktionen senden**
 - Verträge erzeugen
 - Information der Blockchain benutzen (andere Verträge, Datum, ...)

Geschichte der Blockchain Technologie

vom Bitcoin zum Web 3.0 (Ethereum)

2008 White Paper - Satoshi Nakamoto

„Das Kernproblem konventioneller Währungen ist das Ausmaß an Vertrauen, das nötig ist, damit sie funktionieren. Der Zentralbank muss vertraut werden, dass sie die Währung nicht entwertet, doch die Geschichte des Fiatgeldes ist voll von Verrat an diesem Vertrauen. Banken muss vertraut werden, dass sie unser Geld aufbewahren und es elektronisch transferieren, doch sie verleihen es in Wellen von Kreditblasen mit einem kleinen Bruchteil an Deckung. Wir müssen den Banken unsere Privatsphäre anvertrauen, vertrauen, dass sie Identitätsdieben nicht die Möglichkeit geben, unsere Konten leerzuräumen. Ihre massiven Zusatzkosten machen Micropayments unmöglich.

Eine Generation früher hatten Nutzer von Time-Sharing-Computersystemen ein ähnliches Problem. Vor dem Aufkommen von starker Verschlüsselung mussten die User sich auf Passwortschutz für ihre Daten verlassen und dem Systemadministrator vertrauen, dass dieser ihre Informationen vertraulich hielt. Diese Privatsphäre konnte jederzeit aufgehoben werden, wenn der Administrator zu dem Schluss kam, dass sie weniger wog als andere Belange, oder auf Anweisung seiner Vorgesetzten. Dann aber wurde starke Verschlüsselung für die Masse der Nutzer verfügbar, und Vertrauen war nicht länger nötig. Daten konnten auf eine Weise gesichert werden, die einen Zugriff durch Dritte – egal aus welchem Grund, egal mit wie guten Entschuldigungen, egal was sonst – unmöglich machten.

Es ist Zeit, dass wir dasselbe mit Geld machen. Mit einer elektronischen Währung, die auf einem kryptografischen Beweis beruht und kein Vertrauen in Mittelsmänner benötigt, ist Geld sicher und kann mühelos transferiert werden.“

– Satoshi Nakamoto

Bitcoin

2008 - White Paper von Satoshi Nakamoto

2009 - quell-offene Software veröffentlicht

01.03.2009 18:15:05 - Genesis Block

22.05.2010 - 2 Pizzen zum Preis von 10.000 BTC verkauft

06.2010 - Preis steigt in 5 Tagen von \$0.008 auf \$0.08 (1000% Steigerung)

11.2013 - Preis steigt auf Allzeithoch von \$1250

Heute - Preis ~ 700\$, Marktkapitalisierung ~ \$11,000,000,000

Preisentwicklung

BitStamp (USD)

Jan 27, 2016 - Daily

■ Weighted Close: 393.8

bitstampUSD

UTC - <http://bitcoincharts.com>



Bitcoin Protokoll Merkmale

- Proof of Work (SHA256 hash => Asics)
- Kein “premine” (Bitcoins entstehen nur durch Mining)
- Aktuell 12.5 BTC pro Block als Belohnung
- Halbierung aller 4 Jahre
- sehr begrenzte smart contract Fähigkeiten
 - keine Turing vollständige VM
 - value blindness
 - lack of state
 - blockchain-blindness
- 10 min Blockzeit
- keine Accounts nur “unspend transaction objects” (UTXO)

“Altcoins”

Bessere Alternativen:

Litecoin (kürzere Blockzeit)

Primecoin (Primzahlen rechnen statt hashes)

Namecoin (Namenregister)

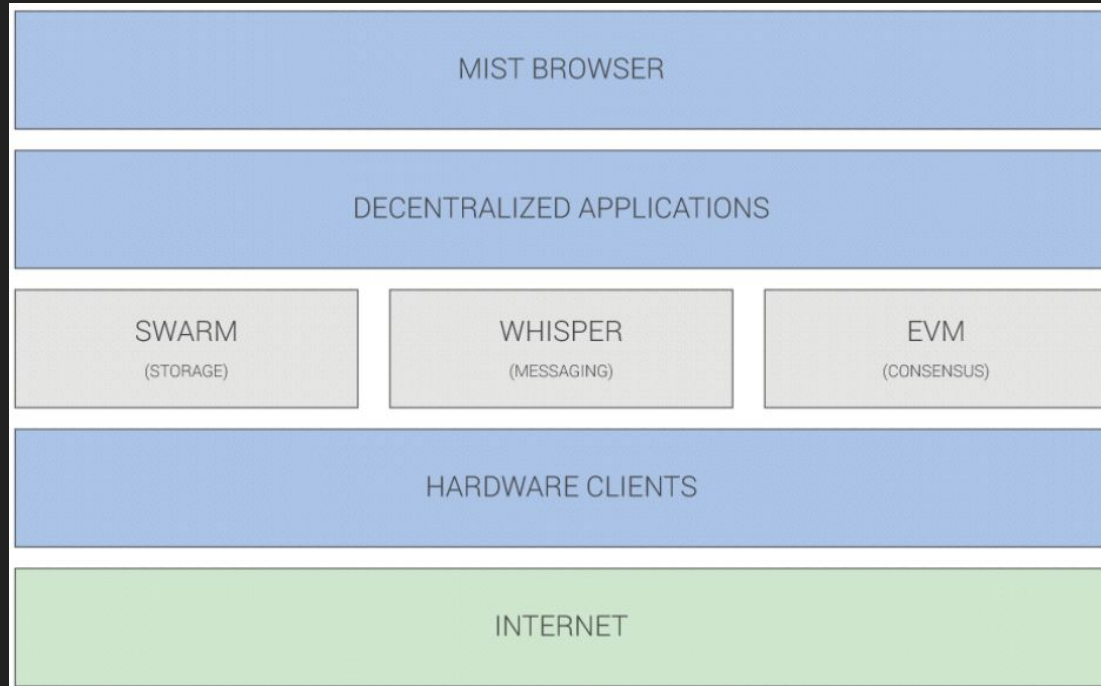
....

Ethereum - anwendungsneutral durch Turing vollständige Programmiersprache

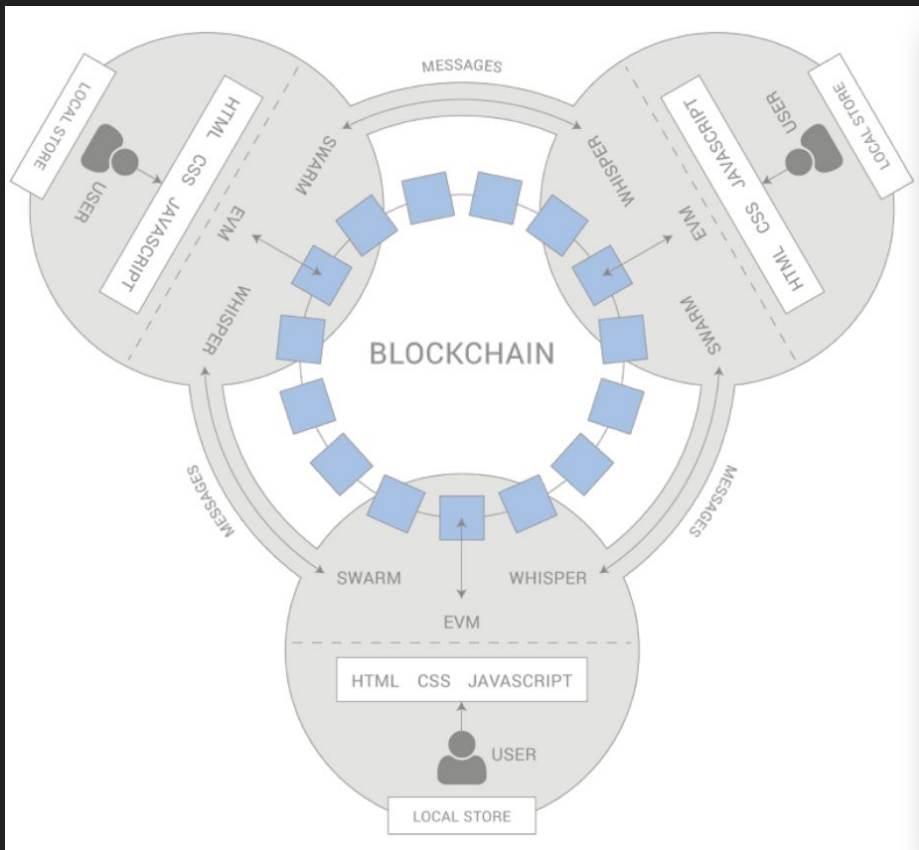
All Currencies									
All -	Currencies -	Assets -	USD -	-- Back to Top 100					
#	Name	Symbol	Market Cap	Price	Available Supply	Volume (24h)	% 1h	% 24h	% 7d
1	Bitcoin	BTC	\$ 6,317,206,179	\$ 413.06	15,293,825	\$ 74,994,200	0.03 %	-0.28 %	-4.74 %
2	Ethereum	ETH	\$ 776,508,687	\$ 10.01	77,609,735	\$ 28,232,500	1.08 %	3.14 %	33.01 %
3	Ripple	XRP	\$ 271,141,166	\$ 0.007953	34,090,841,338 *	\$ 662,759	-0.15 %	0.33 %	-0.42 %
4	Litecoin	LTC	\$ 145,360,745	\$ 3.24	44,825,551	\$ 918,699	-0.01 %	-0.64 %	-5.41 %
5	Dash	DASH	\$ 27,601,402	\$ 4.39	6,281,640	\$ 252,577	0.02 %	-1.78 %	11.61 %
6	Factom	FCT	\$ 24,841,519	\$ 2.84	8,753,363 *	\$ 3,006,840	5.26 %	35.23 %	195.57 %
7	Dogecoin	DOGE	\$ 23,025,224	\$ 0.000223	103,406,540,254	\$ 123,860	0.11 %	-4.05 %	-10.03 %
8	NEM	XEM	\$ 14,620,950	\$ 0.001625	8,999,999,999 *	\$ 276,156	-1.69 %	-0.96 %	156.48 %
9	Monero	XMR	\$ 12,968,977	\$ 1.15	11,243,933	\$ 351,527	3.68 %	10.81 %	37.27 %
10	BitShares	BTS	\$ 11,993,295	\$ 0.004711	2,546,028,270 *	\$ 263,553	-0.92 %	-2.05 %	19.19 %
11	Peercoin	PPC	\$ 11,185,470	\$ 0.485591	23,034,755	\$ 110,127	0.09 %	4.05 %	5.16 %
12	Stellar	XLM	\$ 10,678,320	\$ 0.002207	4,837,356,606 *	\$ 135,197	0.14 %	-9.51 %	14.92 %
13	Nxt	NXT	\$ 8,966,624	\$ 0.008967	999,997,096 *	\$ 71,425	2.35 %	21.16 %	28.05 %
14	Emercoin	EMC	\$ 7,777,889	\$ 0.208792	37,251,851	\$ 17,937	-6.71 %	7.23 %	-1.81 %
15	Namecoin	NMC	\$ 7,361,541	\$ 0.533532	13,797,750	\$ 610,472	-1.37 %	17.11 %	27.94 %
16	Bytecoin	BCN	\$ 5,825,883	\$ 0.000032	179,310,337,465	\$ 1,808	5.94 %	2.96 %	-0.79 %
17	YbCoin	YBC	\$ 5,505,618	\$ 1.83	3,006,661 *	\$ 101,091	-0.00 %	0.42 %	-6.77 %
18	FedoraCoin	TIPS	\$ 5,205,515	\$ 0.000019	280,846,322,360	\$ 63,949	-5.64 %	1.82 %	228.82 %
19	VPNCoin	VPN	\$ 4,235,034	\$ 0.010579	400,339,746 *	\$ 74,617	0.00 %	-2.87 %	-14.55 %
20	Rubycoin	RBY	\$ 2,918,260	\$ 0.128022	22,794,986 *	\$ 1,210	0.03 %	-2.48 %	-3.99 %
21	Bitcrystals	BCY	\$ 2,883,196	\$ 0.067792	42,530,221 *	\$ 28,932	1.31 %	23.78 %	21.03 %
22	GridCoin	GRC	\$ 2,698,918	\$ 0.007219	373,871,999	\$ 5,758	-4.01 %	20.01 %	12.17 %
23	BlackCoin	BLK	\$ 2,403,084	\$ 0.031909	75,309,844 *	\$ 16,968	2.04 %	0.80 %	9.42 %
24	Decred	DCR	\$ 2,357,579	\$ 2.21	1,065,264	\$ 30,442	-1.76 %	5.17 %	32.91 %
25	NuShares	NSR	\$ 2,339,986	\$ 0.002855	819,500,767 *	\$ 272	-2.33 %	-3.35 %	-0.08 %
26	Counterparty	XCP	\$ 2,066,959	\$ 0.786514	2,628,001 *	\$ 13,570	4.22 %	14.28 %	25.45 %

Was ist Ethereum?

Quell-offene Plattform für dezentrale Applikationen



Dapps - decentralized applications



The screenshot shows the Ethereum Wallet interface for a contract named 'DEMOCRACY 045D'. The wallet balance is 2,004.44 ETH. The contract address is 0xce7e89700ac40d563b92d1684. The contract has a balance of 10.00 ETH. The interface shows a list of contract variables and their values:

- proposals: 256 bits unsigned integer (value: 1234)
- sharesTokenAddress: 0x8e92dd257f94f288723c23f5605c4252b0c6a094
- numProposals: 0
- debatingPeriodInMinutes: 10
- minimumQuorum: 500

The 'WRITE TO CONTRACT' section shows the following options:

- Select Function: newProposal
- beneficiary - Address: 0xce7e89700ac40d563b92d1684
- etherAmount - 256 bits unsigned integer: 5
- JobDescription - String: My first payroll!
- transactionBytecode - Bytes: 0x1234af...

The 'Execute from' section shows the following options:

- Etherebase - 1,814.29 ETH
- Send ETH

Ethereum - die Blockchain

- Quasi Turing vollständige virtuelle Maschine - EVM ---> Smart contracts
- ~ 14s Blockzeit
- Light client freundlich (Events, Merkle Tree, ...)
- Accounts (Konten) statt UTXOs
 - Saldo
 - Zähler
 - Code
 - Speicher
- Dynamische Blockgröße
- Proof of work (Ethash) - GPU freundlich / Wechsel zu Proof of stake geplant
- Gestartet Juni 2015

<https://stats.ethdev.com/>

Ethereum - das Projekt

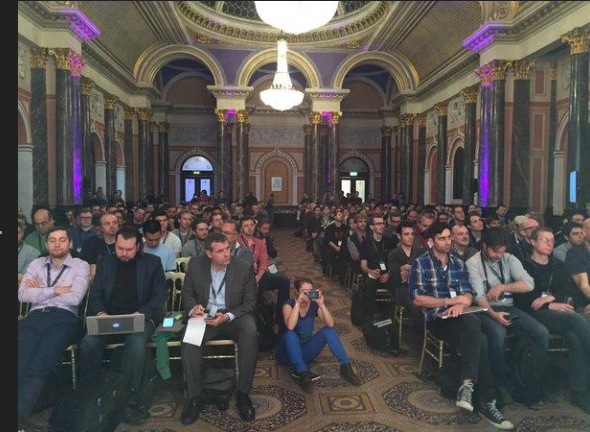
Crowdsale Sommer 2014 - \$18M

Project highlights:

- Formale Protokoll Spezifikation (yellow paper)
- 3 unabhängige Implementierungen (C++, Python, Go) und community clients (Java, Haskell, JS, Ruby, Rust)
- GUI wallet mit smart contract Benutzeroberfläche (web3 browser)
- Entwicklerwerkzeuge:
 - High level contract Programmiersprachen: Solidity, Serpent, LLL
 - Mix - IDE für Dapps
 - Dokumentation / Tutorials
 - In Arbeit: Whisper, Swarm, Light Client, Mist, **Dapps**



devcon0 - November 2014
devcon1 - November 2015



DAO

Was ist die DAO?

Dezentrale

Autonome

Organisation

Praktisch: Computer code auf der blockchain um eine Gruppe Menschen zu helfen sich selbst zu organisieren.

Was ist die DAO?

- Größte crowdfunding Projekt aller Zeiten (~150M\$)
- Befähigt Menschen mit Geld (Ether) die etwas verändern wollen unkompliziert sich mit denen zu verbinden die Zeit und die Fähigkeiten haben es umzusetzen
- The DAO ersetzt mittleres Management, Beamte, Banken, Anwälte, and Sekretäre mit computer code.
- The DAO ist nur der Anfang - viele DAOs werden folgen

**New Front Line
 In Culture War:
 The Bathroom**

**How a Transgender
 Fight Went National**

The struggle is in Miami over the fate of a transgender woman, and now it's spreading. The people of Florida, Ill., a middle-class suburb of Chicago, have to decide whether to allow transgender people to use public restrooms that match their gender identity. The issue is a test case for the transgender rights movement, and it's also a test case for the culture war. In a town of 10,000 people, the issue has become a high school debate, as parents and school officials have taken sides. In Florida, a bill to ban transgender people from using public restrooms is being debated in the state legislature.



**DONORS' AVERSION
 TO TRUMP CLOUDS
 HIS FUTURE**

After Friday's program of a mosque in Padang, Sumatra. The issue, a mosque in the city of Padang.

ZEITUNG ONLINE

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Blockchain

Die erste Firma ohne Menschen

Dezentral, autonom, menschenlos: Die Investmentfirma DAO existiert nur als Code. 140 Millionen US-Dollar hat sie gesammelt. Zwei Deutsche haben sie programmiert.

Von **Hannes Grassegger**

26. Mai 2016, 16:57 Uhr / 124 Kommentare

Making Kosovo Fertile

Saudi Aid Transforms a Tolerant So...
 In the heart of the Balkans, a small town in Kosovo is being transformed. Saudi aid is helping to build a new town, with modern infrastructure and a focus on education and healthcare. The town is being built on the ruins of an old town that was destroyed during the war. The new town is being built with a focus on creating jobs and improving the quality of life for the people of the town.

A Venture Fund With Capital, but No Capitalist

By **CHRISTOPHER HAYES**
 In a world where venture capitalists are often seen as the saviors of startups, a new type of venture fund is emerging. This fund is focused on supporting startups that are committed to social and environmental goals. The fund is being run by a group of people who are passionate about these issues and who want to see startups succeed in a way that is sustainable and ethical.



WIRED

BUSSINESS

Tech Business Gadgets Life Science Design

Ein Startup ohne Chef will die Art revolutionieren, wie Firmen Verträge abschließen

Christina Kyriasioglou, Gründerszene

27.05.2016



**Sau...
 Mitmachen
 und
 iPhone 7
 gewinnen**

WIRED

"Historically we've automated the workers, now we're automating the bosses" - Stephan Tual



The blockchain eliminates bosses
Tom Sibley/Gallerystock

DAO contract - <https://github.com/slockit/DAO>

Token

- transfer
- approve

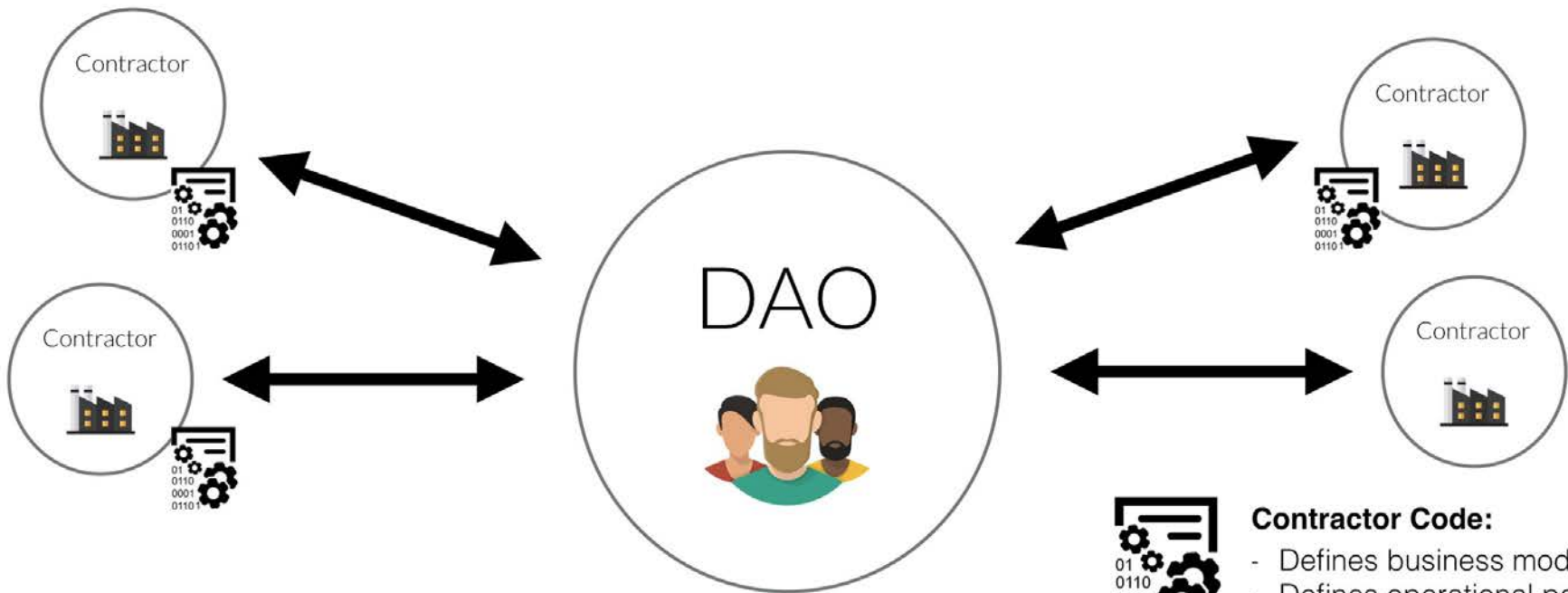
Token Creation

- createTokenProxy
- refund

DAO contract - <https://github.com/slockit/DAO>

DAO

- new proposal
- vote
- execute proposal
- split DAO
- get my reward
- whitelist



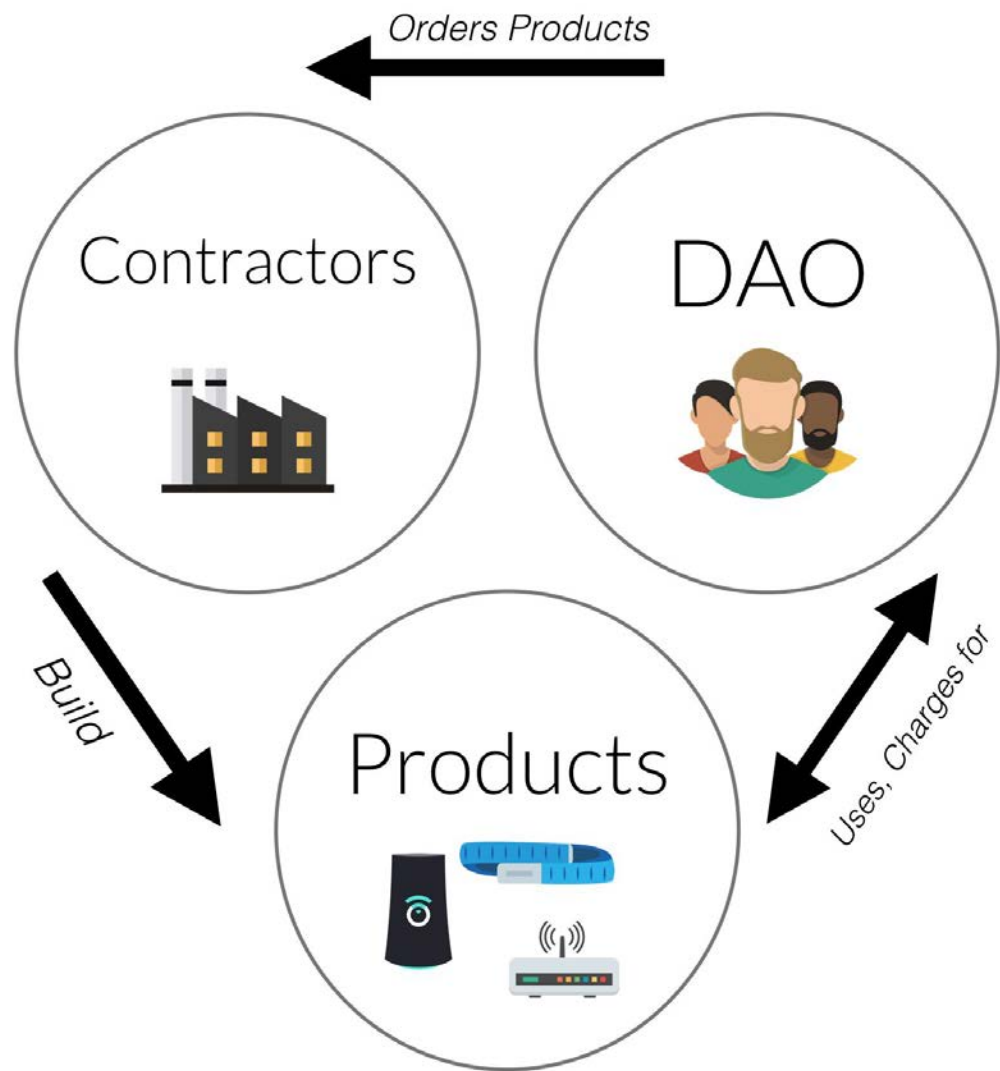
DAO Code:

- Securely holds ETH
- Tracks DAO token ownership
- Defines governance
- Manages voting process



Contractor Code:

- Defines business model (if any)
- Defines operational parameters
- Defines payment terms



1 Proposal

A proposal can be submitted at anytime by any DAO Token Holder. The proposal defines how much ether will be paid to a Service Provider in exchange of the development of products or services. It's expected of a DAO to engage on several proposals over time.

2 Vote

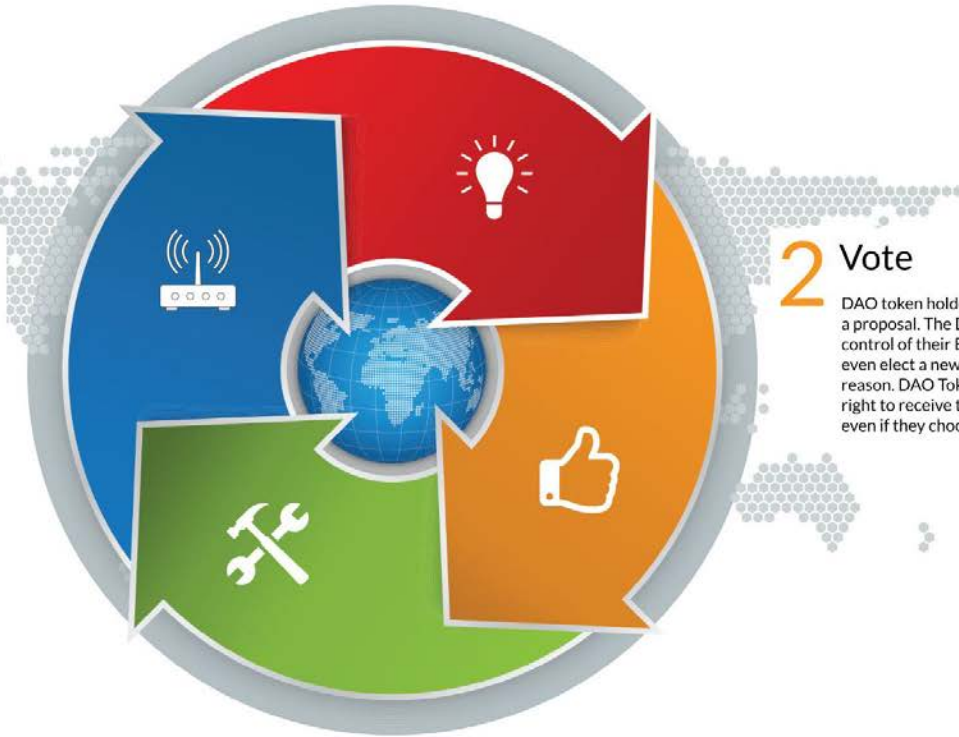
DAO token holders debate and then vote on a proposal. The DAO Token Holders stay in control of their ETH at all times. They can even elect a new Service Provider, for any reason. DAO Token Holders maintain their right to receive the rewards from the DAO even if they choose to leave the DAO.

3 Development

If the proposal is accepted, work starts. The Service Provider is bound by irrefutable smart contract code to deliver on a series of objectives. Because the proposal is paid for in predefined installments instead of a lump sum, the Service Provider and the DAO's enjoy a mutualistic relationship.

4 Deployment

The DAO can charge anyone outside the DAO Token Holders for using the products or services created as part of a Proposal. This potential revenue is then sent directly to the DAO in the form of ether. The DAO then has the option to accumulate this ETH to support its growth, or redistribute it to the DAO Token Holders as a reward.

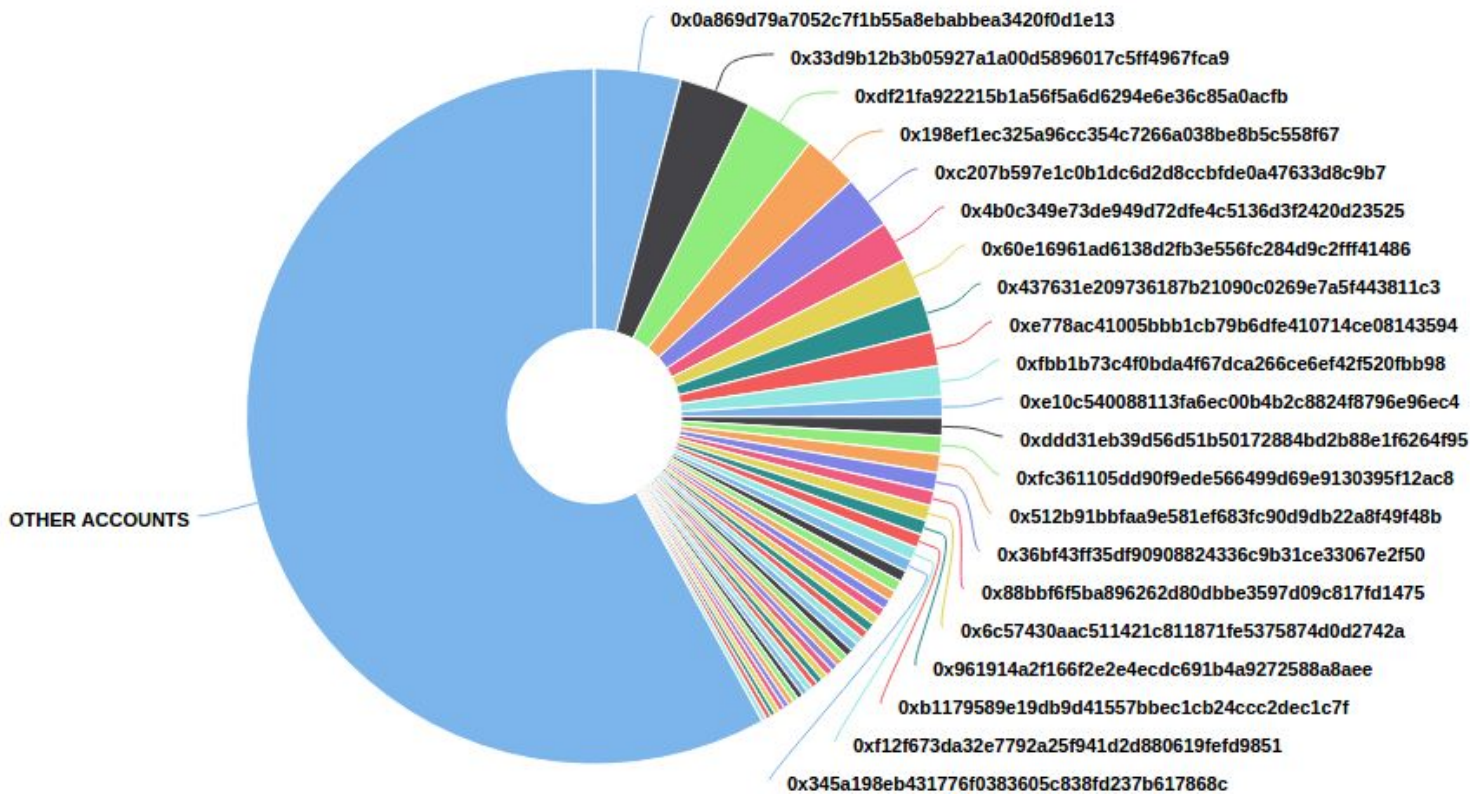


📍 The Top 50 holders collectively own 42.00% (492,506,315.00 Tokens) of TheDAO

💡 Tokens Total Supply: 1,172,764,082.26 Tokens | Total Token Holders: 23499

TheDAO Top 50 Token Holders

Source: Etherscan.io



Cyber-Kriminalität

Der 50-Millionen-Raub

Ein digitaler Bankräuber hat 50 Millionen Dollar erbeutet – und fühlt sich dabei noch im Recht. Wie groß ist die Chance, das Geld zurückzuholen?

05.07.2016, von BETTINA WEIGUNY

Teilen Twittern Teilen E-mailen



SHARE



KLINT FINLEY BUSINESS 06.10.16 4:30 AM

A \$50 MILLION HACK JUST SHOWED THAT THE DAO WAS ALL TOO HUMAN

The New York Times



Goldman Sachs Selects 84 New Partners



Morning Agenda: After Trump's Election, What Next?



Future of Big Mergers Under Trump? Like Much Else, It's Unclear



For Hedge Fund Investors, Calm Uncertainty Over Trump's Direction

PAID POST: PHI Next Stop for Things: The B

A Hacking of More Than \$50 Million Dashes Hopes in the World of Virtual Currency

By NATHANIEL POPPER JUNE 17, 2016



A hacker on Friday siphoned more than \$50 million of digital money away from an [experimental virtual currency project](#) that had been billed as the most successful crowdfunding venture ever — taking with him not just a third of the venture's money but also the hopes and dreams of thousands of participants who wanted to prove the safety and security of digital currency.

The attack most likely puts an end to the project, known as the Decentralized Autonomous Organization, which had raised \$160 million in the form of Ether, an alternative to the digital currency Bitcoin. While the computer scientists involved

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The Heist

On 17th of June an attacker tried to rob ~3.5M ETH using the reentry exploit published by Christian Reitwiessner:

```
// THIS CONTRACT CONTAINS A BUG - DO NOT USE
contract Fund {
    /// Mapping of ether shares of the contract.
    mapping(address => uint) shares;
    /// Withdraw your share.
    function withdraw() {
        if (msg.sender.call.value(shares[msg.sender]) ())
            shares[msg.sender] = 0;
    }
}
```

```
contract Recipient {
    uint counter;
    function() {
        if (counter < 10) {
            Fund(msg.sender).withdraw();
            counter+=1;
        }
    }
}
```

The Heist

```
function splitDAO(...
    ...
    withdrawRewardFor(msg.sender); // be nice, and get his rewards
    totalSupply -= balances[msg.sender];
    balances[msg.sender] = 0;
    paidOut[msg.sender] = 0;
    return true;
}
```

The Hard Fork

Moved all ETH from the DAO ecosystem to a simple withdraw contract:

```
contract WithdrawDAO {
    DAO constant public mainDAO = DAO(0xbb9bc244d798123fde783fcc1c72d3bb8c189413);
    address public trustee = 0xda4a4626d3e16e094de3225a751aab7128e96526;

    function withdraw() {
        uint balance = mainDAO.balanceOf(msg.sender);
        if (!mainDAO.transferFrom(msg.sender, this, balance) || !msg.sender.send(balance))
            throw;
    }

    function trusteeWithdraw() {
        trustee.send((this.balance + mainDAO.balanceOf(this)) - mainDAO.totalSupply());
    }
}
```

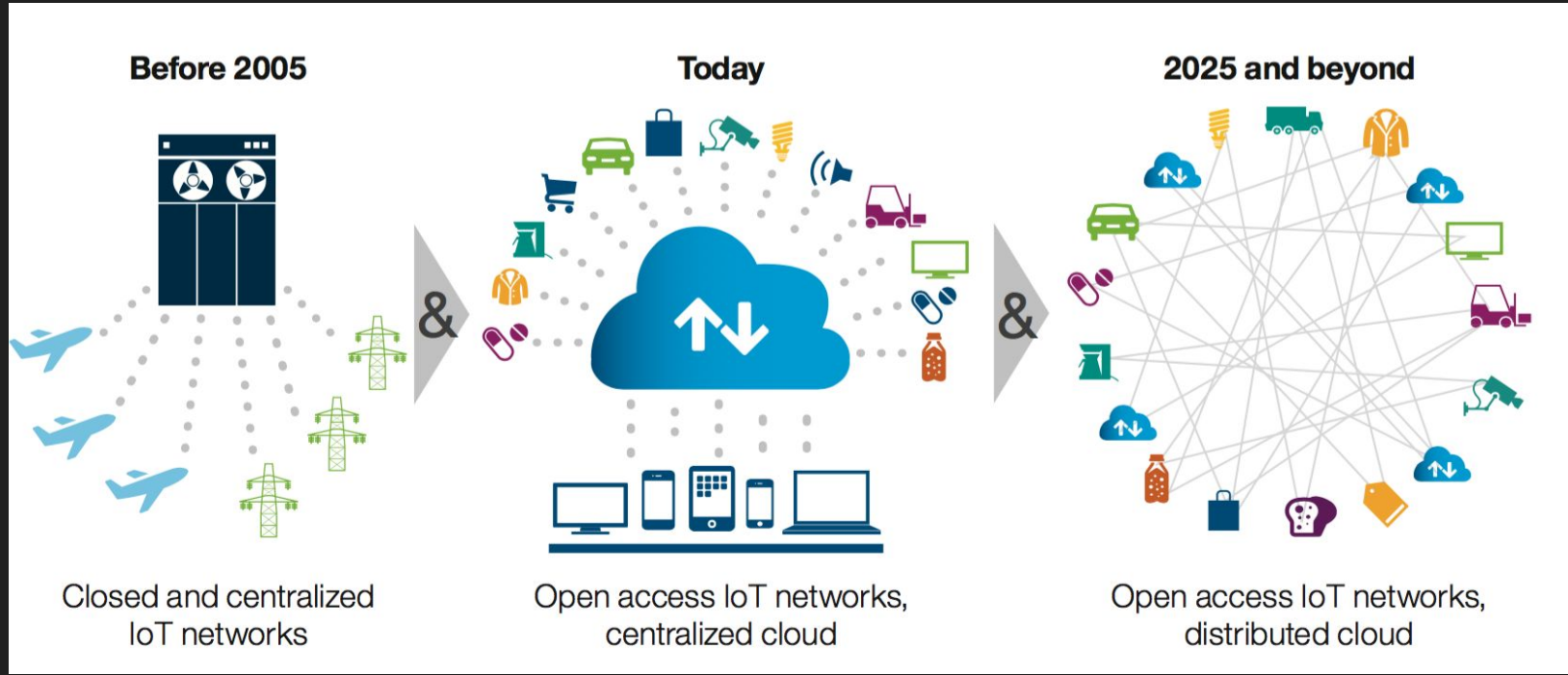


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@slockitproject
presented by Christoph Jentzsch



Internet of Things (Blockchain)



Source: IBM Institute for Business Value

IoT + Blockchain = Slock.it

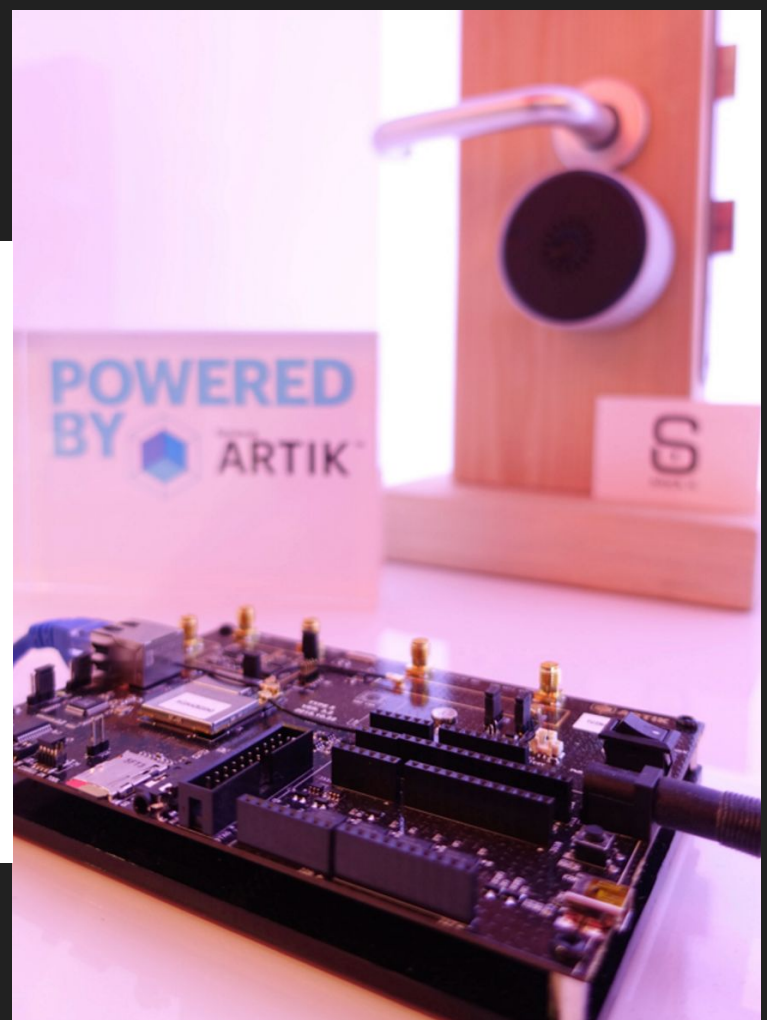
Befähigt Dinge:

- autonom Zahlungen entgegenzunehmen und zu tätigen
- komplexe Verträge einzugehen
- Herstellerunabhängig miteinander zu interagieren und Werte (nicht nur Informationen!) auszutauschen

Bsp.: Einfache Schlößer



Noke.com



Prototype of the Ethereum Computer as shown at MWC16

Ladestation



Bsp.: Einfache Schlößer



Vorteile

- Vereinfachte Abrechnung
- kein Bilanzbetrug möglich
- kein “single point of failure”
- Open API (smart contract)
- Verifikation im Gerät selber (ersetzt teure hochsichere Serverinfrastruktur)
- Herstellerunabhängig
- Keine übersteuerten Gebühren
- International zugänglich
- Keine Ausfallzeit
- Kein Anmeldung nötig
- ...

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