Bitcoin si Blockchain

Lector Univ. Dr. Claudia Dinuca

Scurta istorie Bitcoin

In anul 2008, o persoana sau un grup de persone sub numele Satoshi Nakamoto au publicat un articol cu titlul "Bitcoin : A Peer-To-Peer Electronic Cash System".

Acest articol descrie o versiune peer-to-peer a sistemului electronic de plati care va permite platile online sa se execute direct fara intermediul unei institutii financiare.

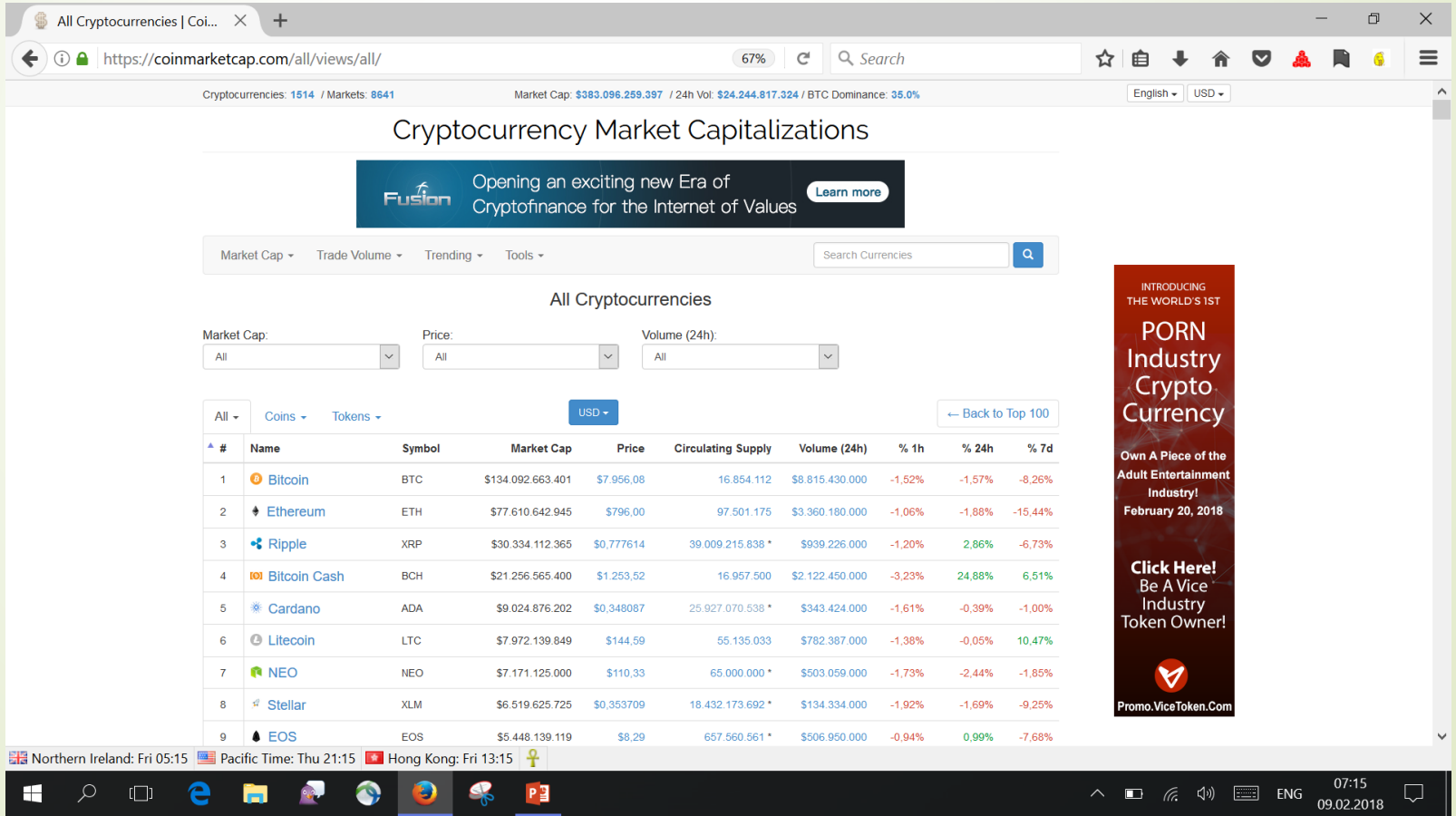
Bitcoin a fost prima realizare a acestui concept.

1.00 00 00 00 → 1 Bitcoin (BTC, XBT)
0.00 10 00 00 → 1 millibitcoin (mBTC)
0.00 00 01 00 → 1 bit | microbitcoin (µBTC)
0.00 00 00 01 → 1 satoshi

Criptomonede

In prezent, cryptocurrency (criptomoneda) este denumirea (eticheta) folosita pentru a descrie toate retelele sau mediile de schimb care foloses cryptografia pentru a securiza tranzactiile.

Listate pe bursa sunt peste 1500 monede.



Satoshi a înregistrat domeniul bitcoin.org in august 2008.

Domeniul Bitcoin.org

Codul Open Source Bitcoin
https://github.com/bitcoin/

Gmail | Consensus Algorithms, B | $8,220.77 - CoinDesk BPI | Bitcoin (BTC) $8190.35 (| Bitcoin · GitHub | Bitcoin - bani P2P open | Blockchain: The Informa

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Bitcoin

http://bitcoin.org/

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Evolutia BTC 2013 –08.02.2018

Bitcoin (BTC)

$7.892,43 USD (-2,27%)

1,00000000 BTC (0,00%)

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Website
Website 2
Explorer
Explorer 2
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Market Cap	Volume (24h)	Circulating Supply	Max Supply
$133.020.001.774 USD 16.854.125 BTC	$8.758.400.000 USD 1.126.620 BTC	16.854.125 BTC	21.000.000 BTC

https://coinmarketcap.com/currencies/bitcoin/

Cryptocurrencies: 9,192 Markets: 37,955 Market Cap: €1,724,492,784,580 24h Vol: €129,036,245,299 Dominance: BTC: 54.6% ETH: 12.0% ETH Gas: 66 Gwei

English EUR

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Bitcoin BTC

Rank #1 Coin On 926,525 watchlists

bitcoin.org Explorers Community Source code Whitepaper

Tags: Mineable PoW SHA-256 Store of Value View all

Bitcoin Price (BTC)

€50,366.34 1.29%

28.10 ETH 1.12%

Low: €49,126.62 High: €51,327.17 24h

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Market Cap	Fully Diluted Market Cap	Volume 24h	Circulating Supply
€940,813,364,017	€1,057,693,196,687	€43,784,355,424	18,679,406 BTC 89%
1.29%	1.29%	3.83%	

Volume / Market Cap: 0.0465

Max Supply: 21,000,000

Total Supply: 18,679,406

Overview Market Historical Data Wallets News Socials Ratings Analysis Share

Bitcoin Chart

Price Market Cap TradingView 1D 7D 1M 3M 1Y YTD ALL LOG

EUR BTC

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Good Bad

Deep Dive

Check our Bitcoin Analysis

Check it out

BTC Bitcoin

EUR Euro

BTC Price Statistics

Bitcoin Price Today

Bitcoin Price	€50,366.34
Price Change 24h	€-658.31 1.29%
24h Low / 24h High	€49,126.62 / €51,327.17
Trading Volume 24h	€43,773,557,029.10 3.70%
Volume / Market Cap	0.0465
Market Dominance	54.59%
Market Rank	#1

Bitcoin Market Cap

Market Cap	€941,447,555,760.69 1.20%
	€1,058,406,175,816.00

Bitcoin 2021

https://coinmarketcap.com/currencies/bitcoin/

Cryptocurrencies: 9,192 Markets: 37,955 Market Cap: €1,721,872,100,742 24h Vol: €129,435,454,022 Dominance: BTC: 54.6% ETH: 12.0% ETH Gas: 67 Gwei

English EUR

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Bitcoin BTC

Rank #1 Coin On 926,403 watchlists

bitcoin.org Explorers Community Source code Whitepaper

Tags: Mineable PoW SHA-256 Store of Value View all

Bitcoin Price (BTC)

€50,293.25 1.29%

28.01 ETH 0.54%

Low:€49,126.62 High:€51,327.17 24h

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Market Cap	Fully Diluted Market Cap	Volume 24h	Circulating Supply
€939,448,074,027	€1,056,158,292,965	€43,785,810,394	18,679,406 BTC 89%
1.29%	1.29%	1.66%	

Volume / Market Cap: 0.04733

Max Supply: 21,000,000

Total Supply: 18,679,406

Overview Market Historical Data Wallets News Socials Ratings Analysis Share

Bitcoin Chart

Price Market Cap TradingView

1D 7D 1M 3M 1Y YTD ALL LOG

EUR BTC

Want more data? Check out our API

How do you feel about Bitcoin today?

Vote to see community results

Good Bad

BTC Bitcoin

EUR Euro

BTC Price Statistics

Bitcoin Price Today

Bitcoin Price	€50,293.25
Price Change 24h	€-659.26 1.29%
24h Low / 24h High	€49,126.62 / €51,327.17
Trading Volume 24h	€44,543,768,785.36 3.82%
Volume / Market Cap	0.04733
Market Dominance	54.56%
Market Rank	#1

Bitcoin Market Cap

Market Cap	€941,137,579,516.76 0.89%

https://coinmarketcap.com/currencies/bitcoin/historical-data/ 67%

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Cryptocurrencies > Coins > Bitcoin > Historical Data

Bitcoin BTC

Rank #1 Coin On 959,487 watchlists

bitcoin.org Explorers Community

Source code Whitepaper

Tags:

Mineable PoW SHA-256 Store of Value View all

Bitcoin Price (BTC)

€53,072.66 0.21%

26.72 ETH 3.59%

Low:€52,233.19 High:€54,118.66 24h

Buy Exchange Gaming Earn Crypto

Sponsored

Market Cap	Fully Diluted Market Cap	Volume 24h	Circulating Supply
€991,530,942,117	€1,114,525,878,388	€61,669,958,901	18,682,518 BTC 89%
0.20%	0.21%	15.64%	
		Volume / Market Cap	Max Supply 21,000,000
		0.06235	Total Supply 18,682,518

Overview Market Historical Data Wallets News Socials Ratings Analysis Share

Historical Data for Bitcoin

Date Range

Date	Open*	High	Low	Close**	Volume	Market Cap
Apr 13, 2021	€49,969.36	€53,183.50	€49,952.62	€52,984.24	€58,390,835,114	€989,845,212,957
Apr 12, 2021	€50,207.92	€51,106.59	€49,718.93	€49,972.22	€43,243,369,924	€933,532,316,723
Apr 11, 2021	€49,932.82	€50,720.72	€49,468.56	€50,232.13	€38,614,021,301	€938,342,169,697
Apr 10, 2021	€48,604.16	€51,126.31	€48,424.71	€49,888.61	€48,591,384,360	€931,879,240,806
Apr 09, 2021	€48,664.89	€49,174.24	€48,232.11	€48,596.83	€38,926,866,561	€907,700,766,956

https://coinmarketcap.com 67%

Cryptocurrencies: 9,192 Markets: 37,955 Market Cap: €1,724,492,784,580 24h Vol: €129,036,245,299 Dominance: BTC: 54.6% ETH: 12.0% ETH Gas: 66 Gwei

English EUR

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The global crypto market cap is €1.72T, a ▼0.42% decrease over the last day. Read more

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#	Name	Price	24h %	7d %	Market Cap	Volume(24h)	Circulating Supply	Last 7 Days
1	Bitcoin BTC Buy	€50,384.18	▼1.24%	▲2.95%	€941,447,555,761	€43,773,557,029 868,518 BTC	18,679,406 BTC	
2	Ethereum ETH Buy	€1,790.94	▼2.32%	▲4.59%	€206,851,367,850	€18,316,027,527 10,220,081 ETH	115,420,096 ETH	
3	Binance Coin BNB Buy	€396.49	▲2.57%	▲40.21%	€61,026,190,835	€4,213,171,870 10,668,750 BNB	154,532,785 BNB	
4	XRP XRP	€1.22	▲37.97%	▲139.74%	€55,273,462,619	€25,885,595,353 21,263,555,006 XRP	45,404,028,640 XRP	
5	Tether USDT Buy	€0.8423	▲0.33%	▼0.59%	€37,420,314,573	€91,160,324,563 108,224,380,068 USDT	44,424,922,421 USDT	
6	Cardano ADA	€1.02	▼1.53%	▲2.16%	€32,595,780,508	€2,014,142,496 1,974,134,281 ADA	31,948,309,441 ADA	
7	Polkadot DOT	€33.92	▼4.42%	▼9.10%	€31,511,537,819	€1,273,217,191 37,495,827 DOT	928,004,400 DOT	
8	Litecoin LTC	€220.62	▲12.84%	▲30.79%	€14,717,071,063	€6,241,033,985 28,307,541 LTC	66,752,415 LTC	
9	Uniswap UNI	€24.81	▼3.26%	▼1.77%	€12,982,326,688	€323,296,000 13,031,829 UNI	523,308,261 UNI	
10	Stellar XLM	€0.5361	▲28.68%	▲49.46%	€12,196,710,418	€4,334,036,514 8,106,732,639 XLM	22,813,714,215 XLM	
11	Chainlink LINK	€27.21	▼1.23%	▲7.06%	€11,390,550,484	€816,143,194 30,022,412 LINK	419,009,556 LINK	
12	Bitcoin Cash BCH	€600.17	▲7.33%	▲29.05%	€11,231,371,899	€3,171,903,876 5,282,554 BCH	18,704,956 BCH	
13	THETA THETA	€10.17	▼3.02%	▲2.41%	€10,174,272,606	€251,237,175 24,693,380 THETA	1,000,000,000 THETA	

https://coinmarketcap.com 80%

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1	STEPN GMT	▲ 15.86%
2	Animal Concerts ANML	▲ 2.73%
3	EarthFund 1EARTH	▼ 10.80%

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1	Charactbit CHB	▲ 510.01%
2	Crotama CROTAMA	▲ 496.01%
3	Metaverse Exchange METACEX	▲ 190.38%

Recently Added

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1	Lend Flare Dao Token LFT	$0.0356
2	BlockBlend BBL	$0.07984
3	Zirve Coin ZIRVE	$0.444

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#	Name	Price	24h %	7d %	Market Cap	Volume(24h)	Circulating Supply	Last 7 Days
1	Bitcoin BTC Buy	$44,900.47	▼ 3.34%	▼ 4.80%	$853,304,025,688	$36,295,190,145 808,348 BTC	19,004,343 BTC	
2	Ethereum ETH Buy	$3,315.95	▼ 4.81%	▼ 2.16%	$398,798,274,681	$22,324,348,114 6,732,419 ETH	120,266,768 ETH	
3	Tether USDT	$1.00	▲ 0.00%	▼ 0.03%	$82,439,908,011	$87,212,027,847 87,195,125,531 USDT	82,423,930,566 USDT	
4	BNB BNB Buy	$435.04	▼ 4.26%	▲ 0.04%	$72,158,993,845	$2,296,732,400 5,255,464 BNB	165,116,761 BNB	

Aprilie 2023

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Bitcoin BTC

Rank #1 Coin On 3,949,007 watchlists

bitcoin.org Explorers Community

Source code Whitepaper

Tags:

Mineable PoW SHA-256 Store Of Value View all

Bitcoin Price (BTC)

$28,854.57 4.74%

14.79 ETH 2.16%

Low:$28,633.52 High:$30,314.08 24h

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Market Cap	$558,373,024,371
	4.74%
Fully Diluted Market Cap	$605,921,807,462
	4.74%
Volume 24h	$25,798,086,924
	34.89%
Circulating Supply	19,351,287 BTC 92%
24h Volume / Market Cap	0.0462
CEX Vol	$25,806,529,341
DEX Vol	$4,479,759
Max Supply	21,000,000
Total Supply	19,351,287

Price

Bitcoin to USD Chart
Price
Market Cap
TradingView
1D
7D
1M
3M
1Y
YTD
ALL
LOG
42.50K
41.37K
40.00K
37.50K
35.00K
32.50K
30.00K
27.50K
25.00K
22.50K
20.00K
17.50K
15.00K
12.50K
May
Jul
Sep
Nov
2023
Mar
2
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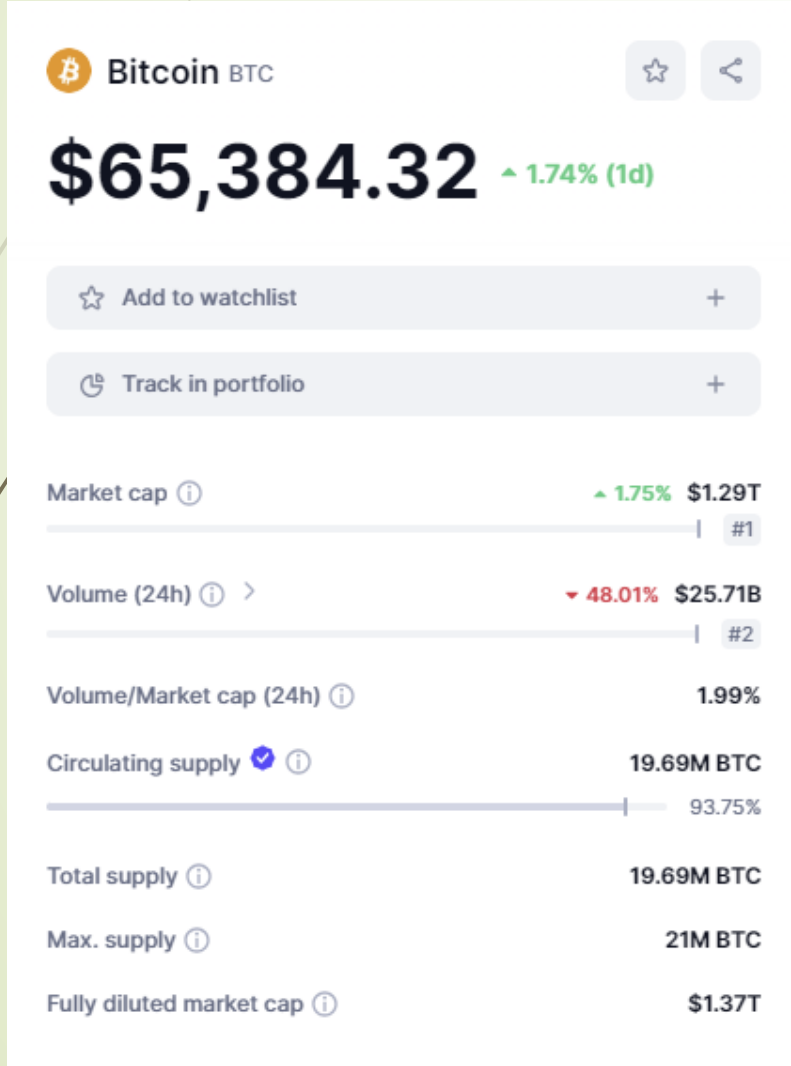
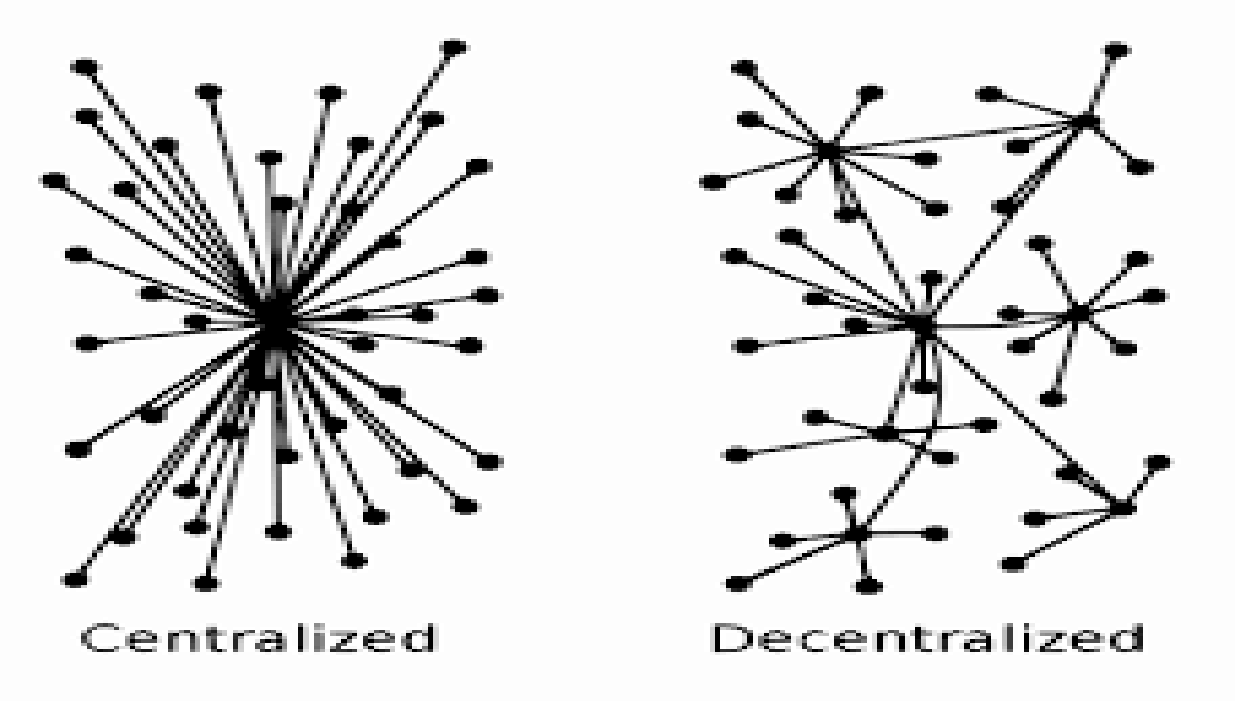


Cum atinge bitcoin decentralizarea?

- Descentralizarea nu este totul sau nimic; aproape nici un sistem nu este pur descentralizat sau pur centralizat. De exemplu, e-mailul din punct de vedere functional este un sistem descentralizat, dar pe piata exista un numar mic de provideri de servicii centralizate care au devenit dominante. In acelasi fel se intampla si cu bitcoin, in timp ce protocolul Bitcoin este descentralizat, servicii precum schimburile de Bitcoin unde se poate face tranzactia din Bitcoin in alte monede si softurile de portofele sau softurile care permit oamenilor sa-si pastreze Bitcoinii pot fi centralizate sau descentralizate.



Cum atinge bitcoin descentralizarea?

- **Sa vedem cum Bitcoin atinge descentralizarea :**
- Reteaua peer-to-peer pe care se bazeaza Bitcoin este pur descentralizata deoarece oricine poata rula un nod Bitcoin si este o bariera mica sa intri. Se poate merge online si descarca un client Bitcoin si sa se ruleze un nod pe laptop sau PC.
- Minarea dupa Bitcoin este de asemenenea o tehnologie care este deschisa tuturor, dar necesita costuri mari, de aceea s-a creat un inalt grad de centralizare si de concentrare a puterii in ecosistemul mineritului de Bitcoin.
- Bitcoin este un sistem descentralizat, nu are o autoritate centrala sau intermediari.
- Bitcoin nu se bazeaza pe o autoritate centrala, ci pe consensul automat dintre mai multi utilizatori ai retelei, consensus protocol, exista 30-40 reguli care trebuie respectate de toate nodurile retelei. Partea sa unica consta in faptul ca nu necesita ca utilizatorii sa creada unul in altul. Prin intermediul unei politici care aplica un algoritm propriu, orice incercare de a frauda sistemul este oprita

Conceptul de Blockchain Ledger

Number	Hash	Time	Transactions	Total BTC	Size (kB)
356987	141a6f95b2...	2015-05-18 13:28:14	1714	17353.00313324	749.227
356986	13cff723ec...	2015-05-18 13:11:53	2114	23805.24520712	749.204
356985	1128aa2601...	2015-05-18 12:27:49	594	6119.90095486	392.306
356984	140b0f27b9...	2015-05-18 12:20:14	1087	7849.33374079	544.102
356983	d1ea5bc1c7...	2015-05-18 12:08:01	830	7799.27270534	455.006
356982	76634b52be...	2015-05-18 11:58:42	221	1706.08443753	152.745
356981	ab5a643167...	2015-05-18 11:57:28	756	7245.57902445	372.38
356980	b780d34ab0...	2015-05-18 11:46:36	383	4623.1382688	430.319
356979	110a166e82...	2015-05-18 11:41:08	2276	19539.64880577	999.931

BLOCKEXPLORER

Blockchain ledger este o altă componentă cheie a Bitcoin.

Blockchain ledger este registrul public al tuturor tranzacțiilor Bitcoin care au fost executate vreodată. Este în continuă creștere, deoarece minerii adaugă noi blocuri (la fiecare 10 minute) pentru a înregistra cele mai recente tranzacții. Blocurile sunt adăugate la blocul de blocuri într-o ordine lineară, cronologică.

Blockchain Ledger conține informații complete despre adresele și balanțele din blocul de geneză (primele tranzacții care au fost executate vreodată) până la blocul cel mai recent finalizat.

De exemplu, pe https://blockchain.info/ puteți căuta propria adresă de portofel pentru a vedea tranzacția în care ați primit primul Bitcoin.

1DpZHXi5bEjNn6SriUKjh6wE4HwPFBPvfx - Adresa portofel

Conceptul de Blockchain Ledger

LATEST BLOCKS

SEE MORE →

Height	Age	Transactions	Total Sent	Relayed By	Size (kB)	Weight (kWU)
508337	7 minutes	159	1,801.79 BTC	ViaBTC	1,159.32	3,992.66
508336	8 minutes	900	1,798.73 BTC	BTC.com	1,006.3	3,992.81
508335	10 minutes	235	239.94 BTC	Unknown	1,007.73	3,992.48
508334	11 minutes	1443	13,027.13 BTC	AntPool	1,062.46	3,992.4

Bitcoin Address Addresses are identifiers which you use to send bitcoins to anot

Summary	
Address	1DpZHXi5bEjNn6SriUKjh6wE4HwPFBPvfx
Hash 160	8ca0027fc910dda2947baa1994c4953f25eb6af8
Tools	Related Tags - Unspent Outputs

Transactions	
No. Transactions	5
Total Received	0.005 BTC
Final Balance	0.0014 BTC

Request Payment Donation Button

www.Blockchain.info

Sponsored Content

Explorer > Bitcoin Explorer > Address

Search your transaction, an address or a block

USD

Address

USD BTC

This address has transacted 5 times on the Bitcoin blockchain. It has received a total of 0.01450000 BTC ($899.81) and has sent a total of 0.01310000 BTC ($812.94). The current value of this address is 0.00140000 BTC ($86.88).

Address	1DpZHXi5bEjNn6SriUKjh6wE4HwPFBPvfx
Format	BASE58 (P2PKH)
Transactions	5
Total Received	0.01450000 BTC
Total Sent	0.01310000 BTC
Final Balance	0.00140000 BTC

Payment Request | Donation Button

Transactions

Hash	5b6d780d3887404e35b15f99decaad73665cd31b958d727872b5e...				2014-10-27 03:27
	1DpZHXi5bEjNn6SriUKjh6wE4HwPFBPvfx	0.00250000 BTC	→	1HNNu7g35a6CQdMqVNVVWexgr19x3zb6mZ	0.00100000 BTC
				1DpZHXi5bEjNn6SriUKjh6wE4HwPFBPvfx	0.00140000 BTC
Fee	0.00010000 BTC (44.248 sat/B - 11.062 sat/WU - 226 bytes)				-0.00110000 BTC
Hash	26476454d37430a80de89e48fc438c584267b063dd3c8a9366bb...				2014-10-27 03:27
	1DpZHXi5bEjNn6SriUKjh6wE4HwPFBPvfx	0.00270000 BTC	→	1HNNu7g35a6CQdMqVNVVWexgr19x3zb6mZ	0.00010000 BTC
				1DpZHXi5bEjNn6SriUKjh6wE4HwPFBPvfx	0.00250000 BTC
Fee	0.00010000 BTC (44.444 sat/B - 11.111 sat/WU - 225 bytes)				-0.00020000 BTC
Hash	a3be653146da2f6b696ecd66cbf31852b98b38ae5dbf1e25ca76b1e...				2014-10-27 03:27

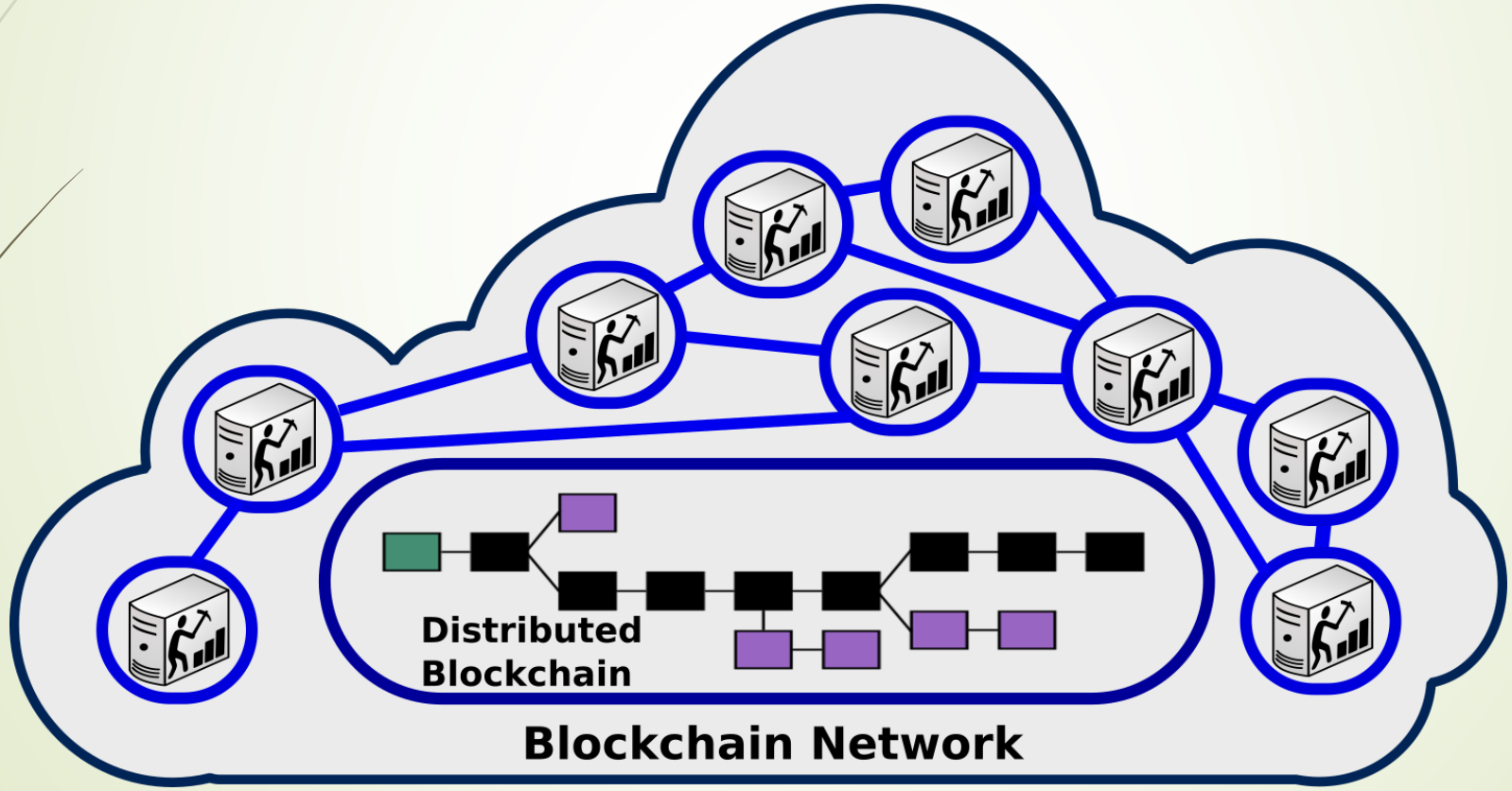
Blockchain Network

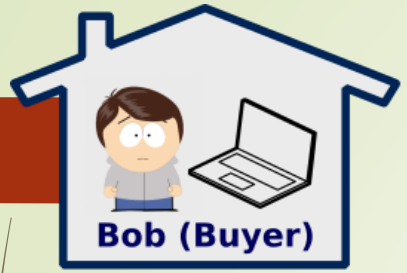
Aspectele cheie sunt:

→Rețeaua de blocuri este o rețea peer-to-peer de noduri independente care comunică împreună prin difuzarea de mesaje.

→Componenta cheie a rețelei este blocul de blocuri. Fiecare nod are propria sa copie a ledgerului.

→Un nod nu este neapărat conectat la fiecare alt nod, dar cel puțin la unele dintre noduri.





1. Bob's transaction is put in a new block

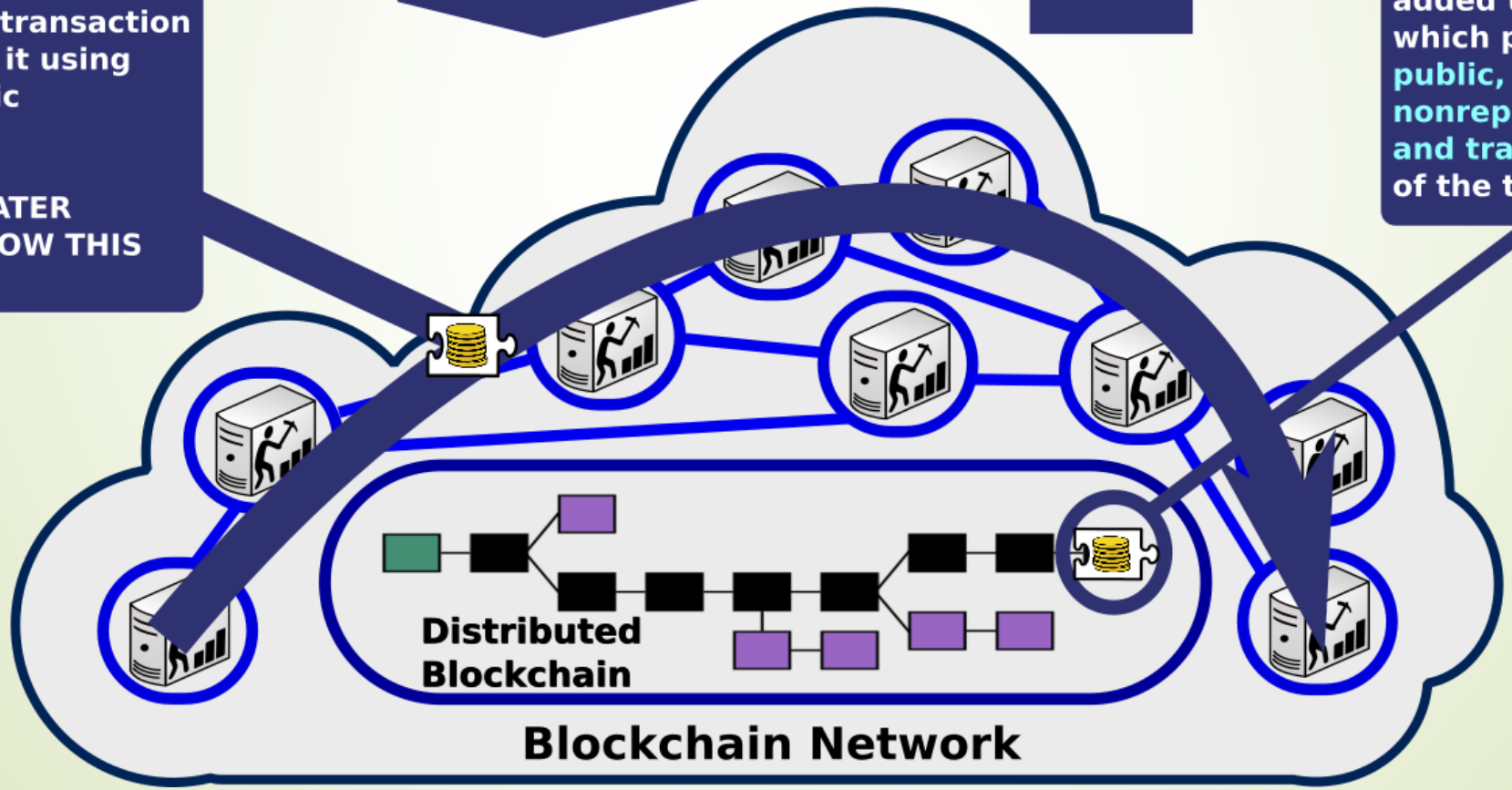
2. The new Block is broadcasted to the network for validation

3. The miners in the blockchain network work together to approve the transaction and validate it using cryptographic techniques.

WE'LL SEE LATER PRECISELY HOW THIS WORKS !

4. The Block is then added to the Chain which provides public, permanent, nonrepudiable, and transparent record of the transaction !

5. Sally receives the money (in Cryptocurrency) from Bob. She can now send Bob's ordered clothes.



Minerii si conceptul de "Proof of Work"

1. A Block is constituted by several "pending" transactions broadcasted to the global blockchain network.

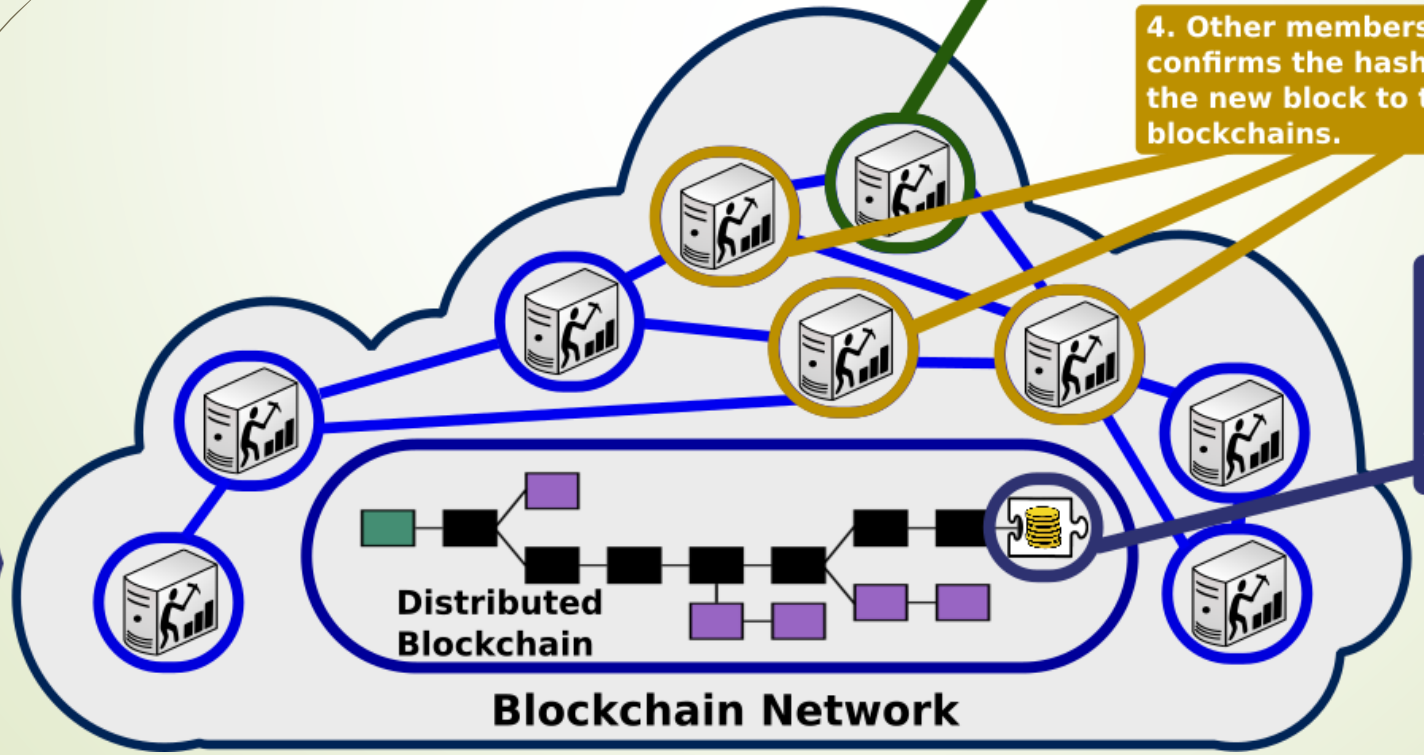
Every 10 minutes (or so) specialized computers - called "miners" - collect a few hundred transactions and combine them in a block

2. Miners will now process the new block in order to reach a "consensus" on what the "new" blockchain should look like.
At this stage, all miners start to work on solving the "Proof of Work" problem.

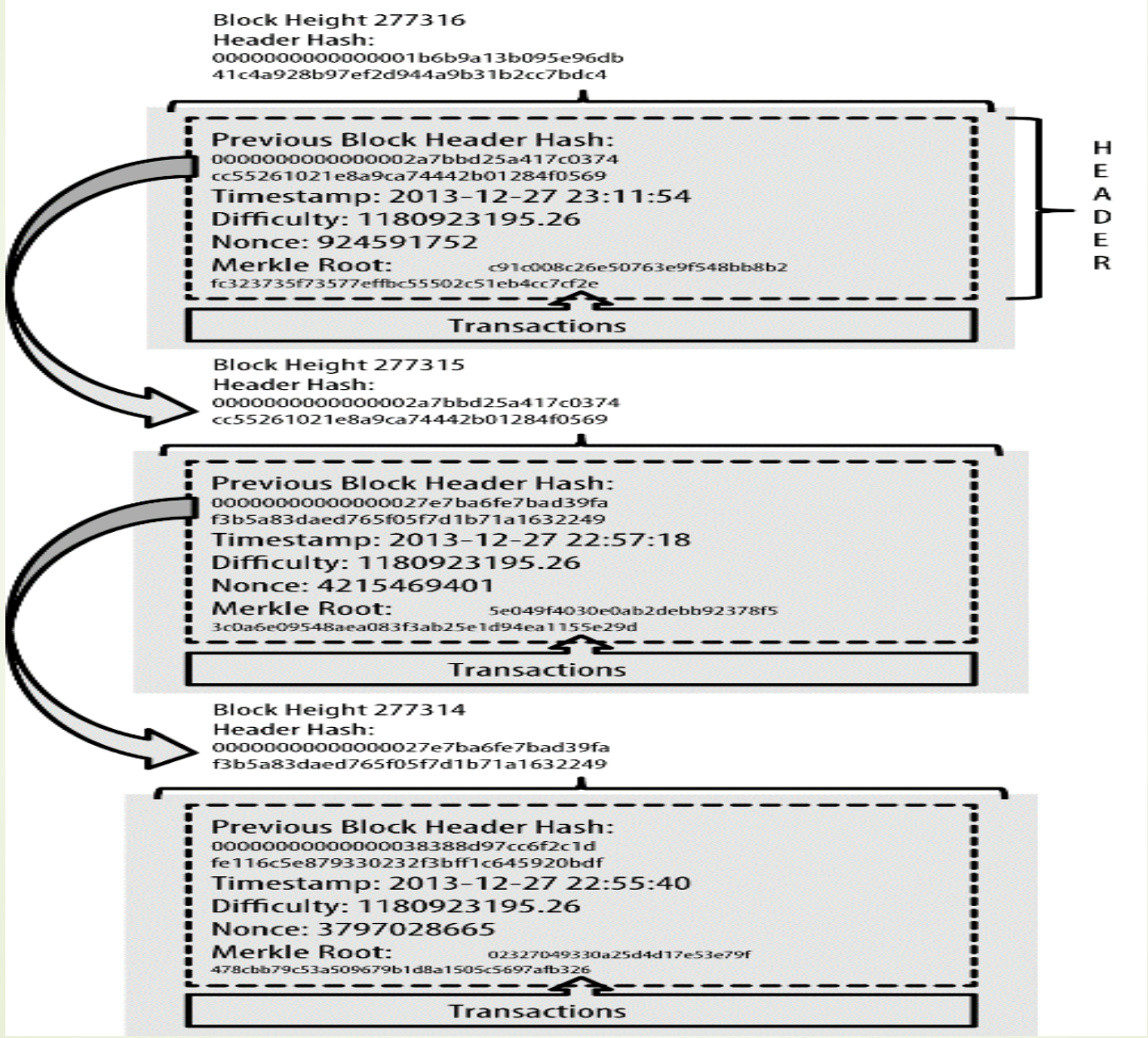
3. Let's imagine that this miner is the winner of the game, he solved the "Proof of Work" problem, i.e. he has been the first one to be able to find a hash value for the new block being below a certain treshold.
This proof or work is in its turn diffused to the network for acceptance by every member.

4. Other members validate and confirms the hash before adding the new block to their copy of the blockchains.

5. When a majority of miners have added the block to their own copy of the blockchain, the block is validated and considered definitive.
All the transactions in it have been validated and stored in the blockchain

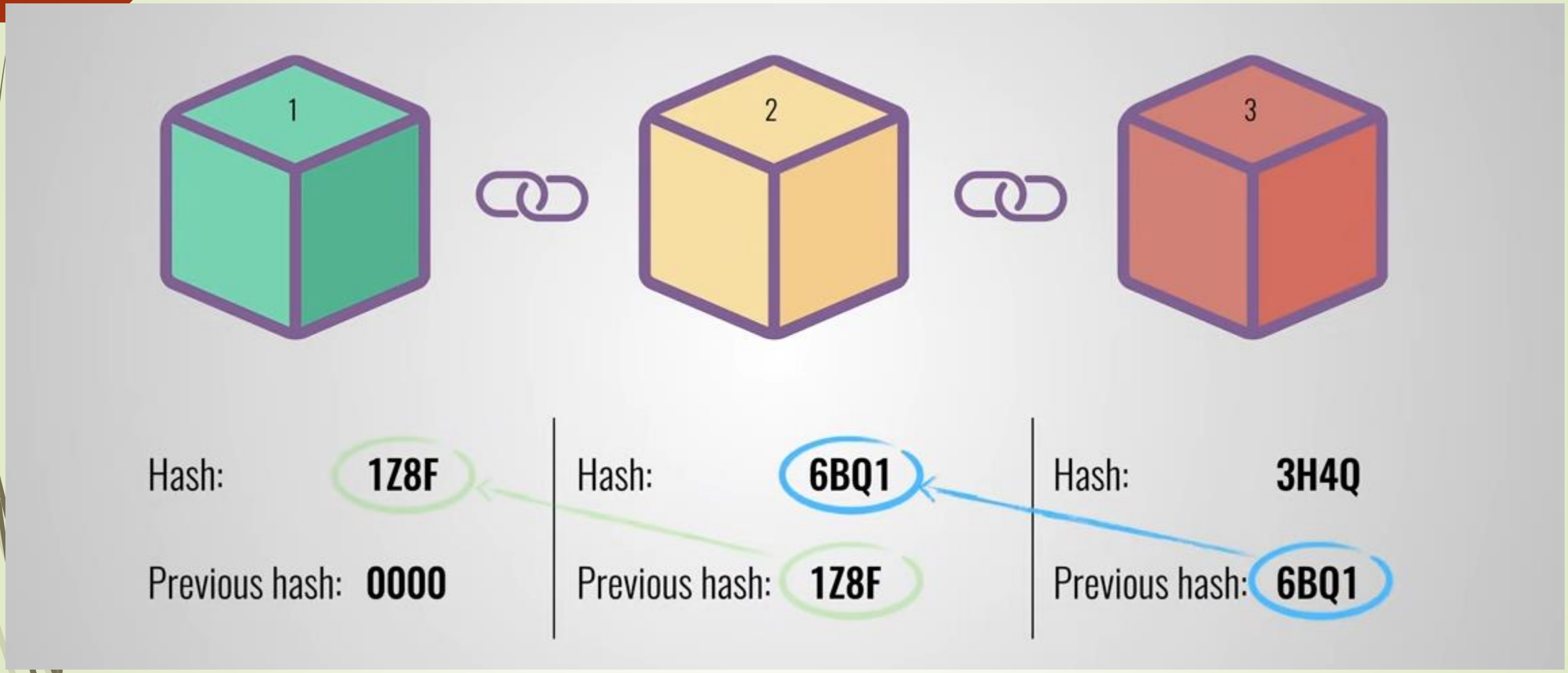


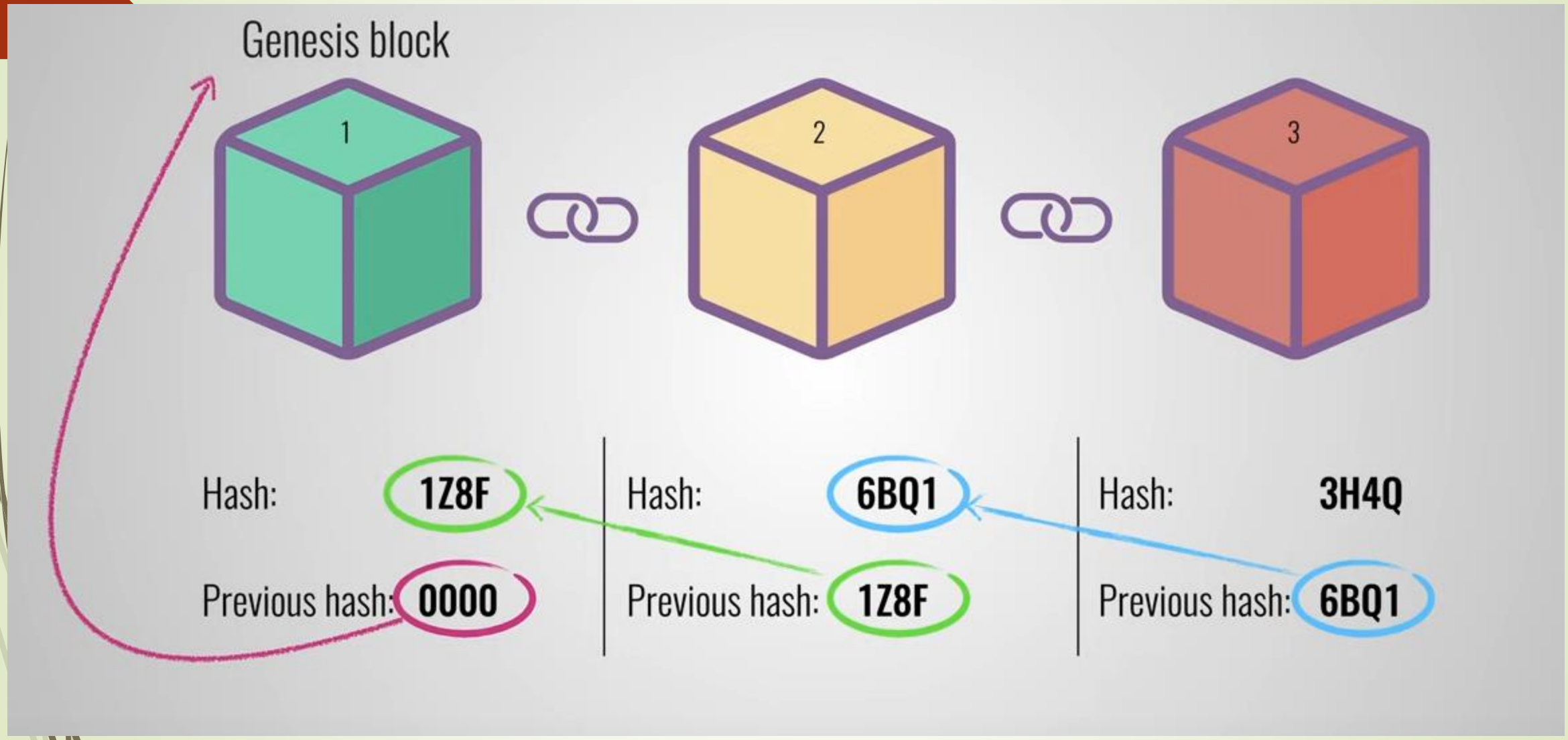
Structura unui block

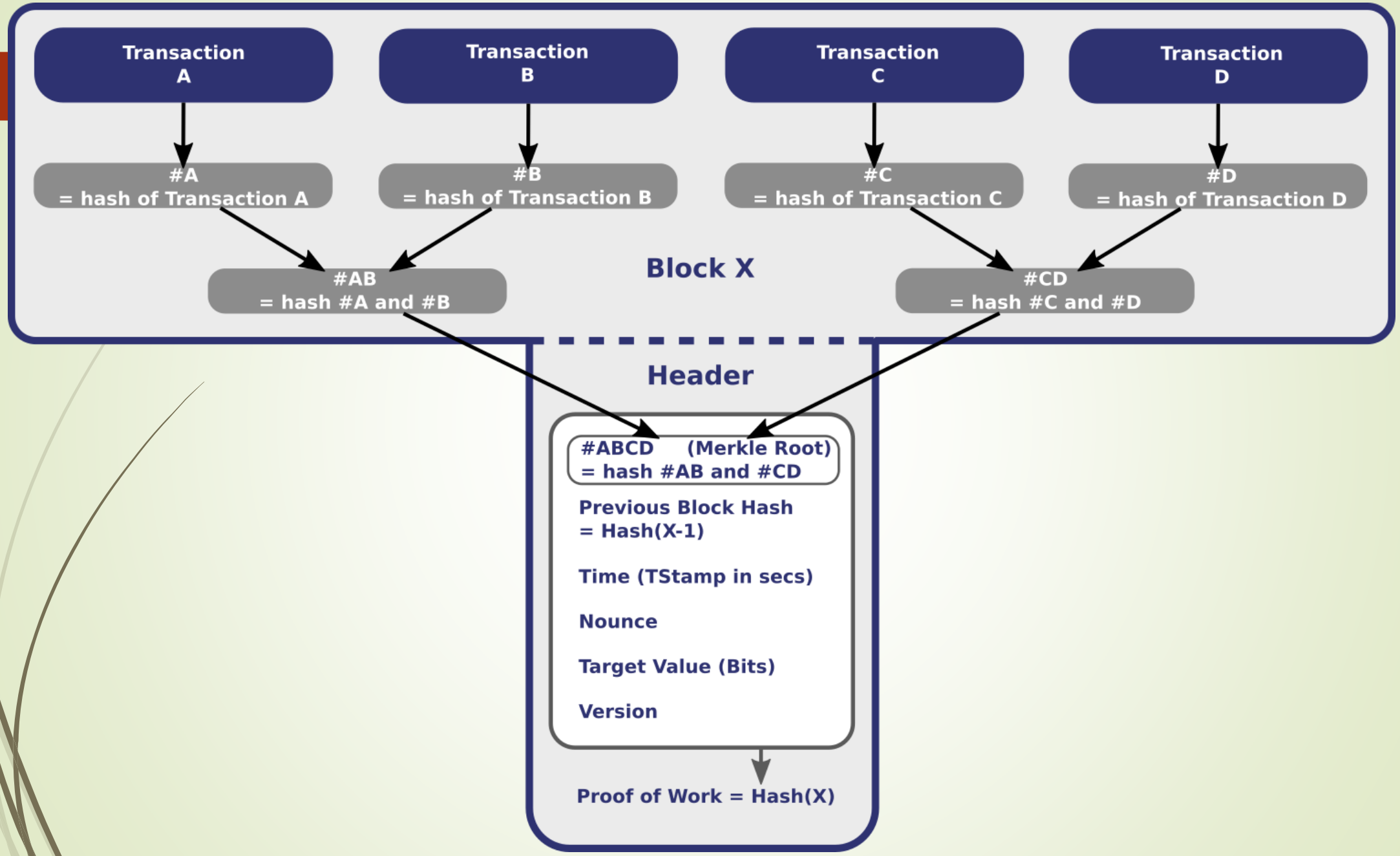


Remember that the root of the transaction merkle tree acts as an effective summary of every transaction in the block without having to look at each transaction.

The hash of the previous block before it allows the network to properly place the block in chronological order. This is where the term **blockchain** is derived from — each block is chained to a previous block.


1
2
3
Hash: 1Z8F
Previous hash: 0000
Hash: 6BQ1
Previous hash: 1Z8F
Hash: 3H4Q
Previous hash: 6BQ1


Genesis block
1
2
3
Hash: 1Z8F
Previous hash: 0000
Hash: 6BQ1
Previous hash: 1Z8F
Hash: 3H4Q
Previous hash: 6BQ1


Transaction A
Transaction B
Transaction C
Transaction D
#A = hash of Transaction A
#B = hash of Transaction B
#C = hash of Transaction C
#D = hash of Transaction D
#AB = hash #A and #B
Block X
#CD = hash #C and #D
Header
#ABCD (Merkle Root) = hash #AB and #CD
Previous Block Hash = Hash(X-1)
Time (TStamp in secs)
Nounce
Target Value (Bits)
Version
Proof of Work = Hash(X)

Bitcoin Mining

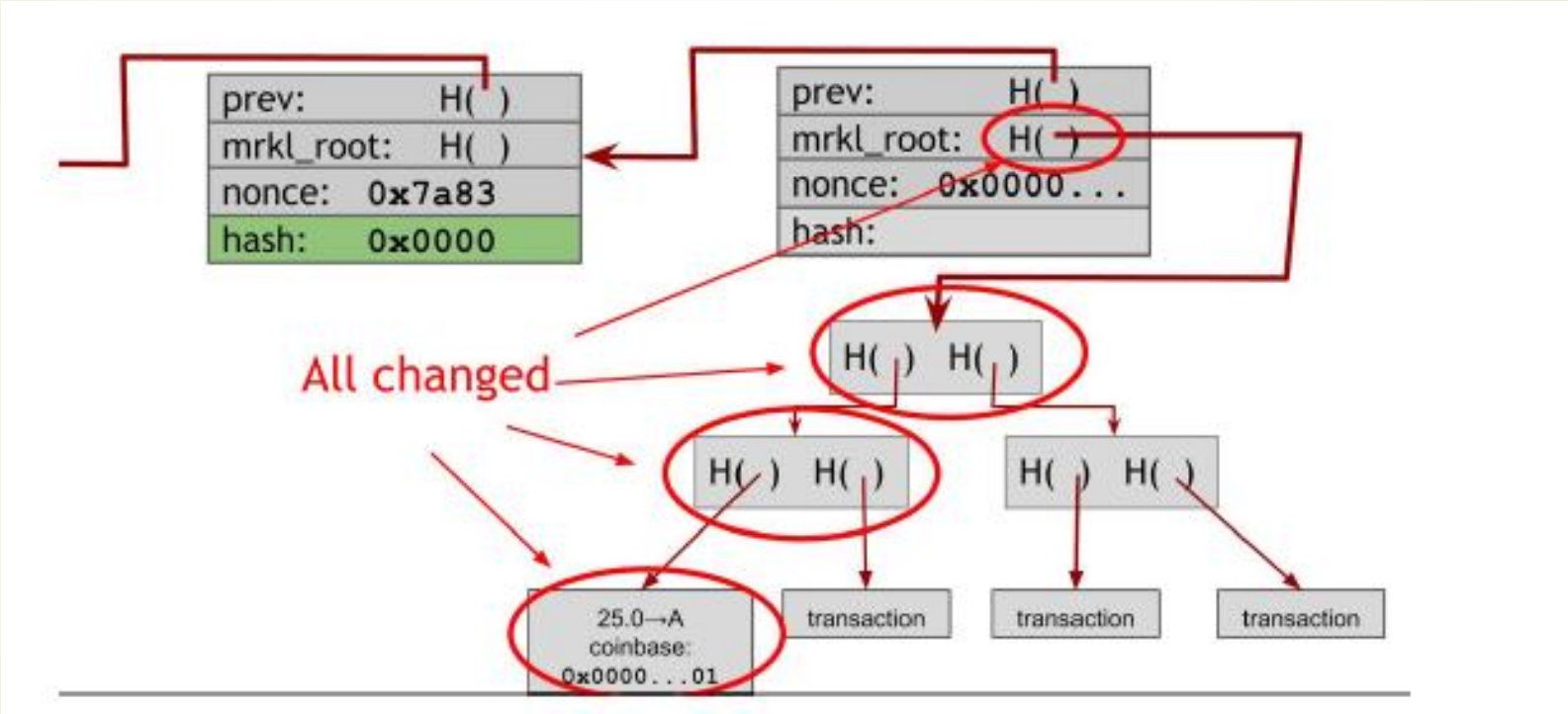
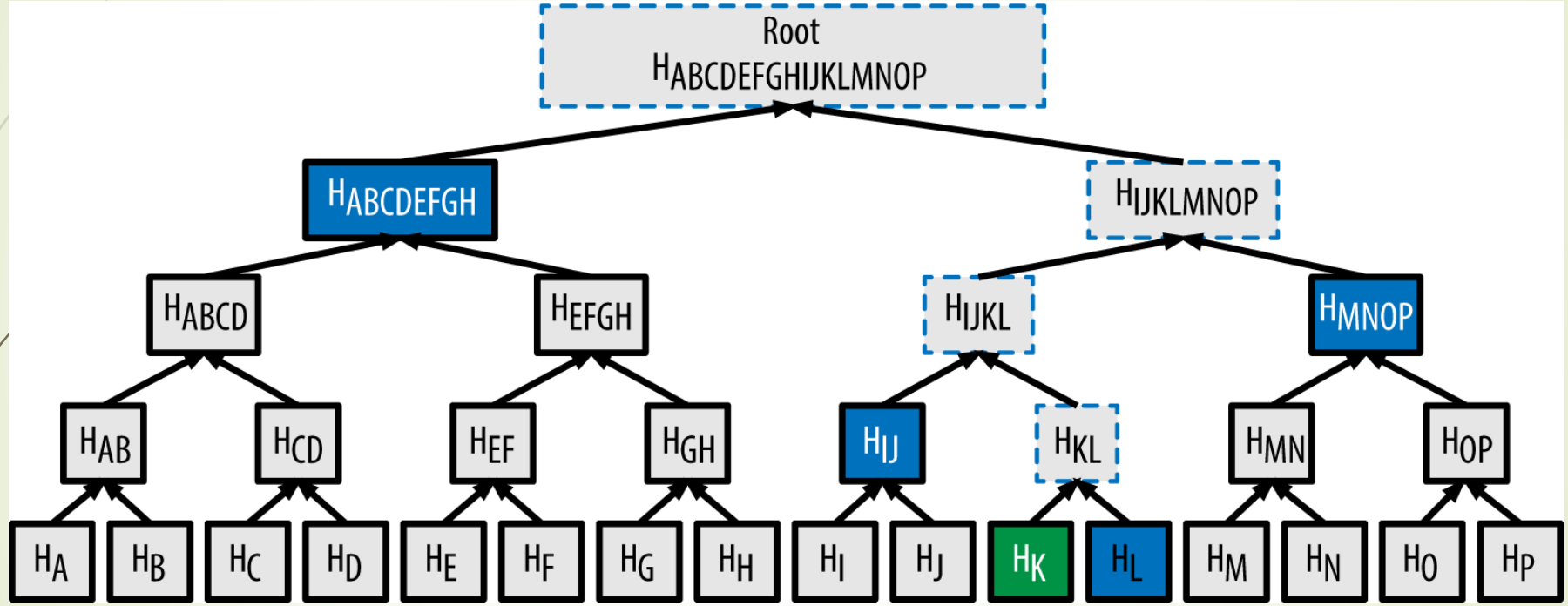


Fig . Schimbarea unui nonce in tranzactia coinbase se propaga in tot arborele Merkle

Merkle tree

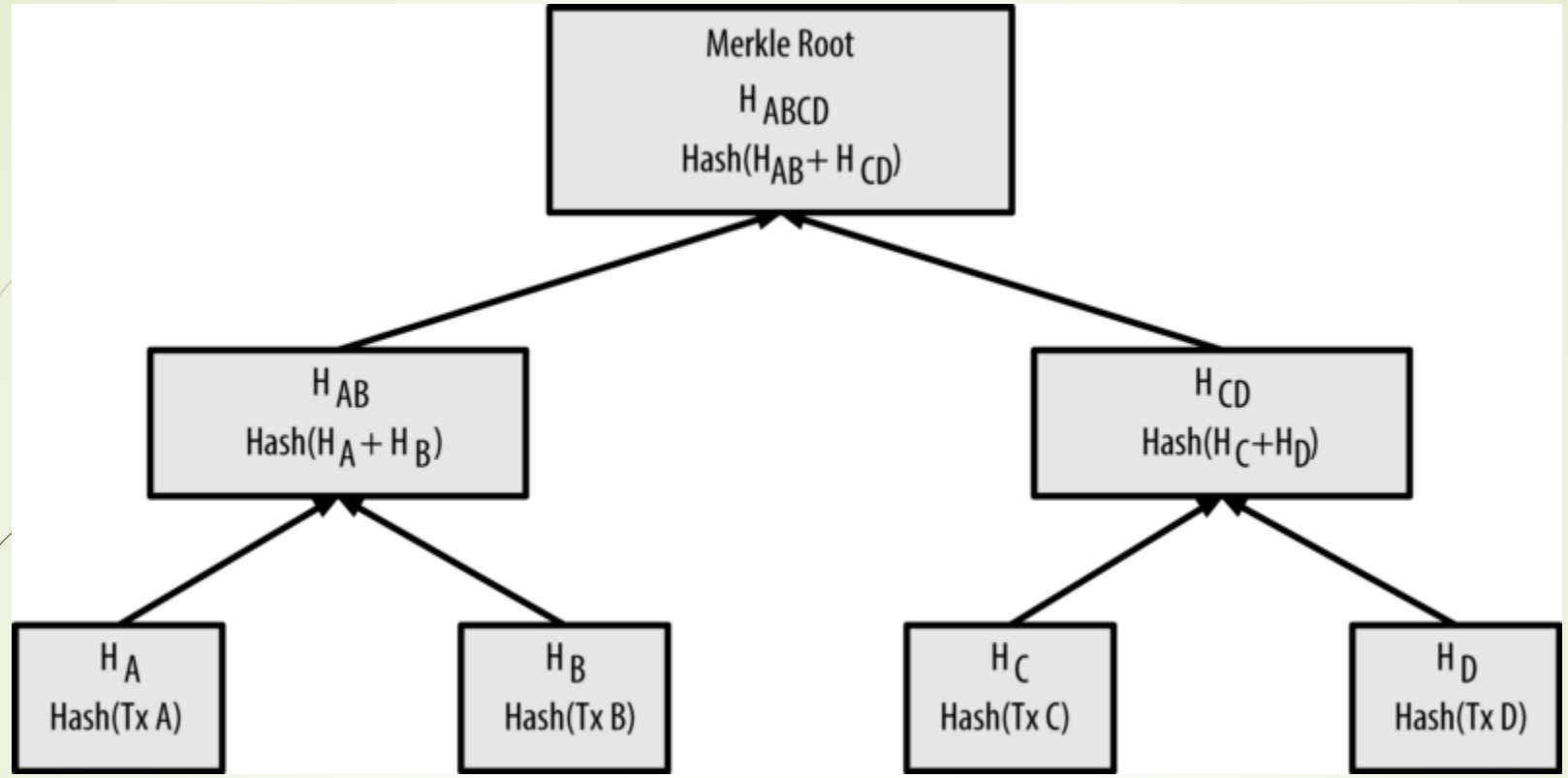


Calea merkle folosita pentru a verifica o tranzactie, (log2(N) pasi)
Ex : HABCDEFGH, HMNOP, HIJ , HL pentru a gasi tranzactia K.

Transactions, in the form of a merkle tree

Mining computers collect enough transactions to fill a block and bundle them into a merkle tree.

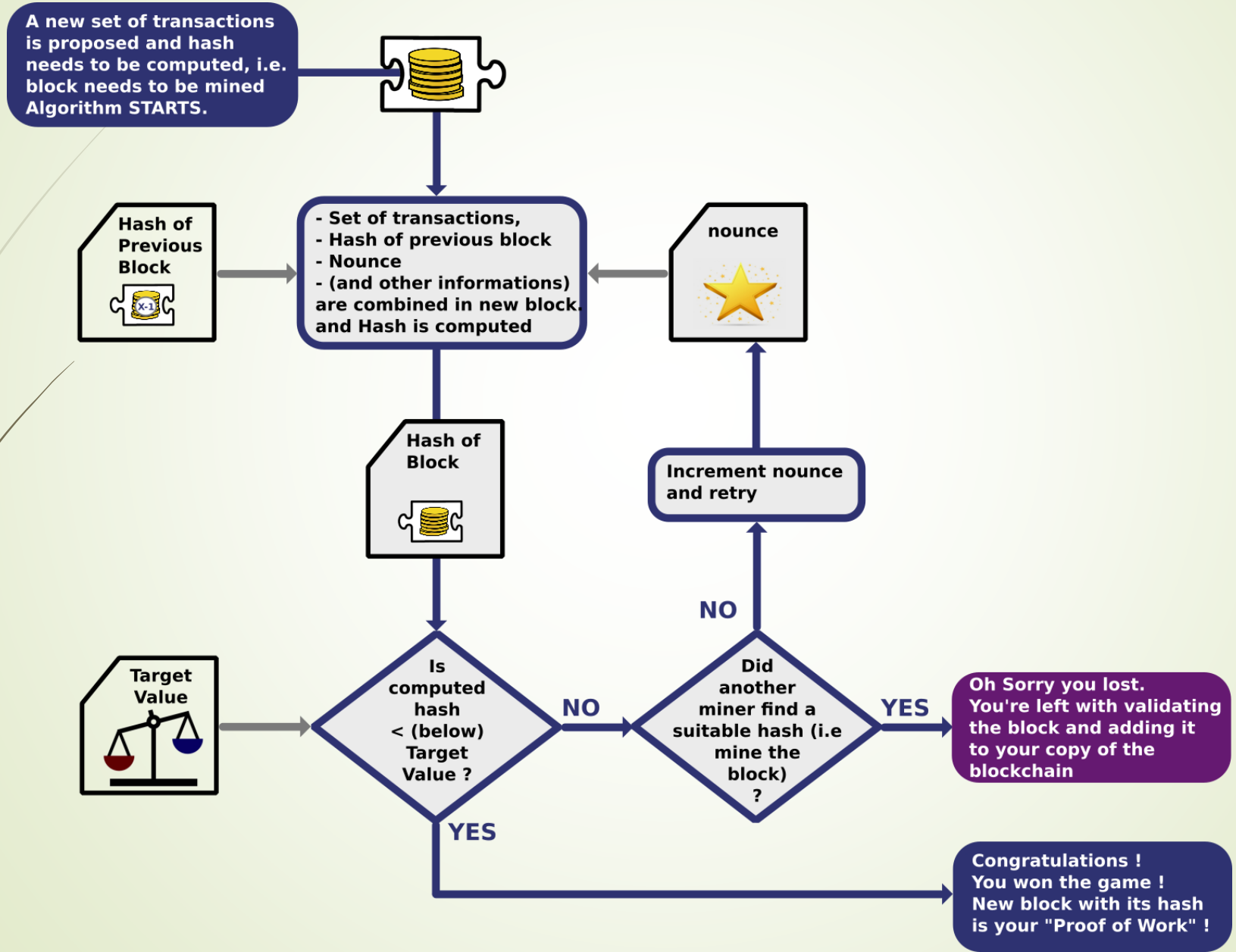
A merkle tree is a relatively simple concept: transactions lie at the bottom of the tree as leaves and are hashed using the SHA-256 function. The combination of two leaf transactions are hashed again using the SHA-256 function to form a parent of the leaves. This parent is continuously hashed upwards in combination with other parents of hashed transactions, until a single **root** is created. The hash of this root is effectively a unique representation of the transactions that are underneath it.



A visualization of how a merkle tree is built — the leaves at the very bottom of the tree are transactions

https://www.freecodecamp.org/news/how-bitcoin-mining-really-works-38563ec38c87/

Schema algoritm de minare



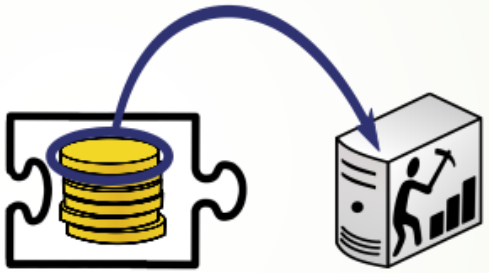
Recompensare minerilor

Miners work for money !

Everytime a miner "mines" a new block, he is rewarded by a certain amount of the cryptocurrency !

Before trying to "mine" a new block, a miner adds a special transaction to it representing his reward.

This special transaction is called the "Generation Transaction"



If he successfuly mines the block, that special transaction will be validated, granting him the reward !

Bitcoins Creation

!! That very mechanism is the single and only way new BitCoins are created !!!

Block rewards

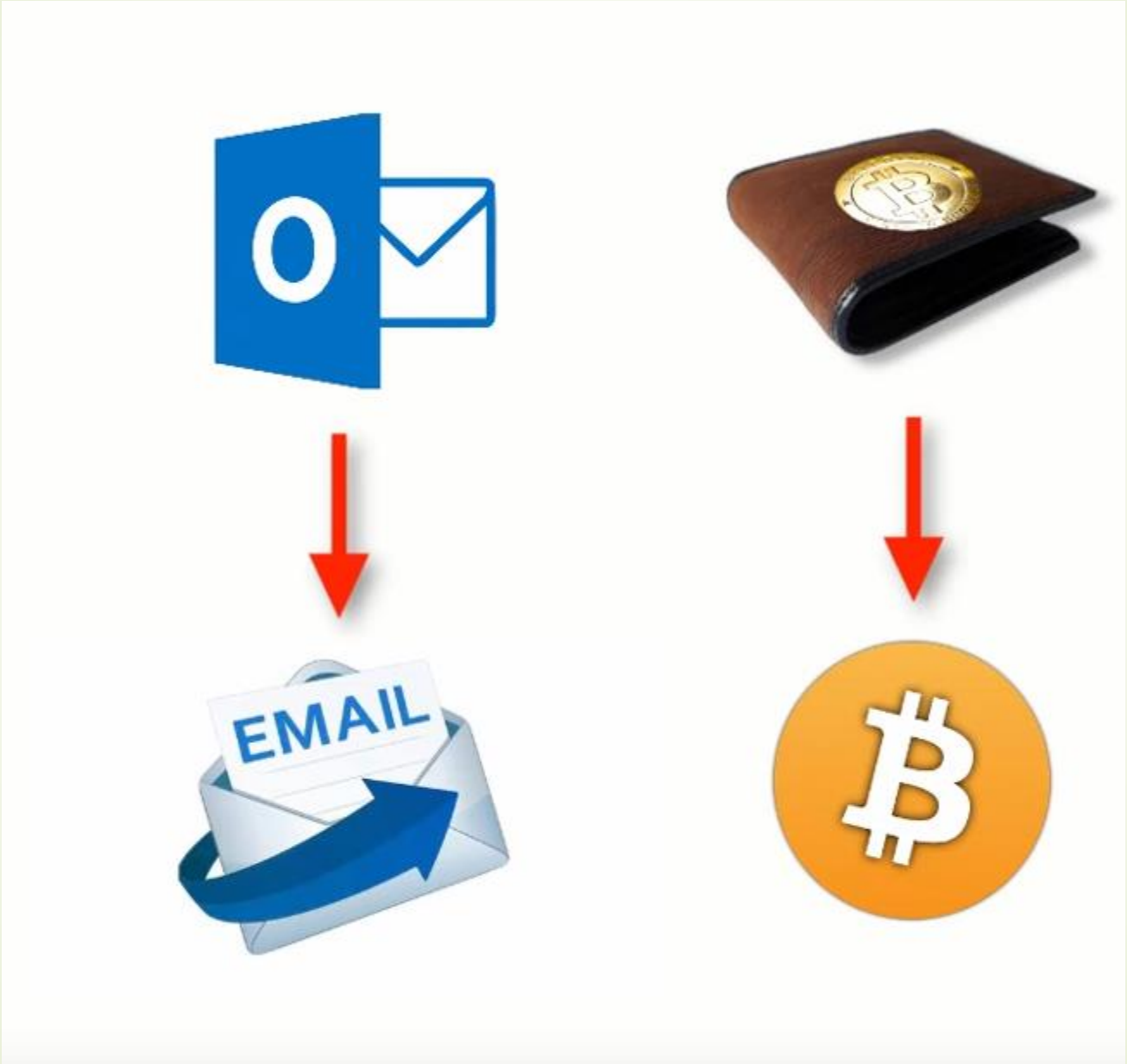
Jan 2009 - Nov 2012: 50 BTC

Nov 2012 - Jul 2016: 25 BTC

Jul 2016 - Feb 2020*: 12.5 BTC

Feb 2020* - Sep 2023*: 6.25 BTC

Evolutia tehnologiilor hardware de minerit


EMAIL

Wallets

We show you the providers so you can make an informed wallet choice to store your bitcoin, ether or crypto currency of your choice.

Ledger
https://www.ledger.com/
Visit Website

Trezor
https://www.trezor.io/
Visit Website

Math Wallet
http://www.mathwallet.org/cn/
Visit Website

Trust Wallet
https://www.trustwallet.com/
Visit Website

BTC Wallet
https://wallet.btc.com/#/setup/login
Visit Website

Electrum
https://electrum.org/
Visit Website

Coinbase
https://wallet.coinbase.com/
Visit Website

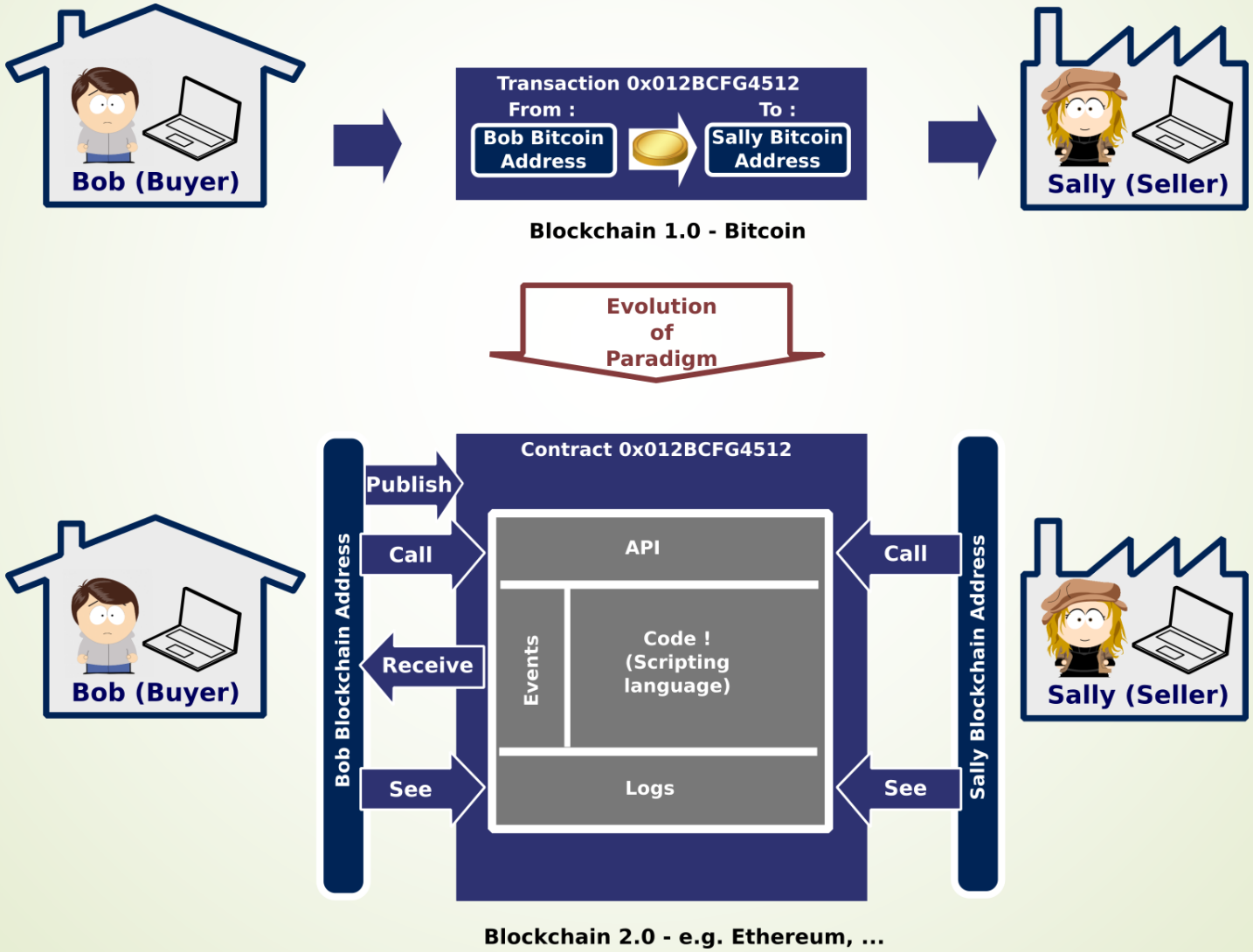
Cobo
https://cobo.com/
Visit Website

Safepal
https://www.safepal.io/

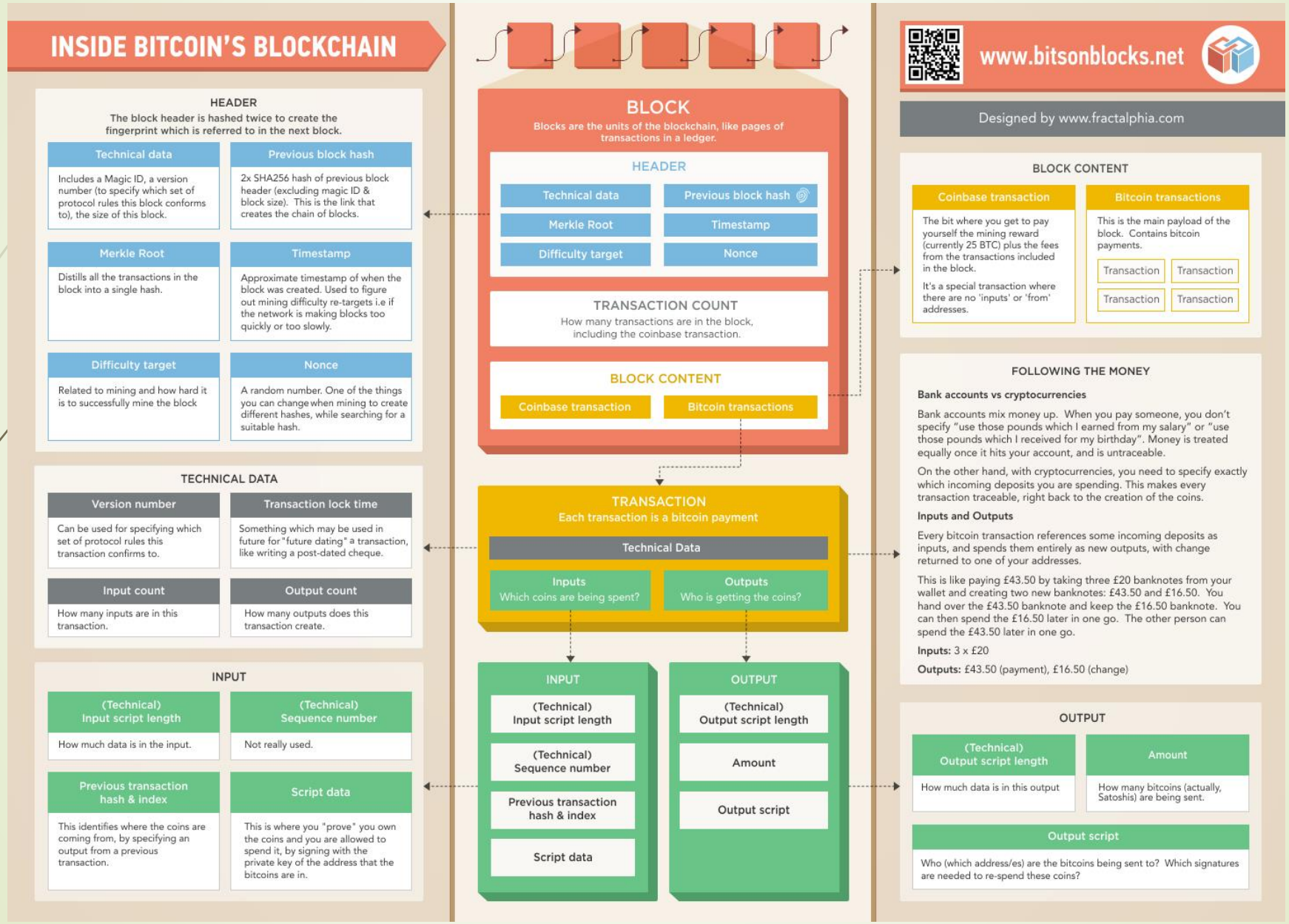
Edge
https://edge.app

Smart Contract

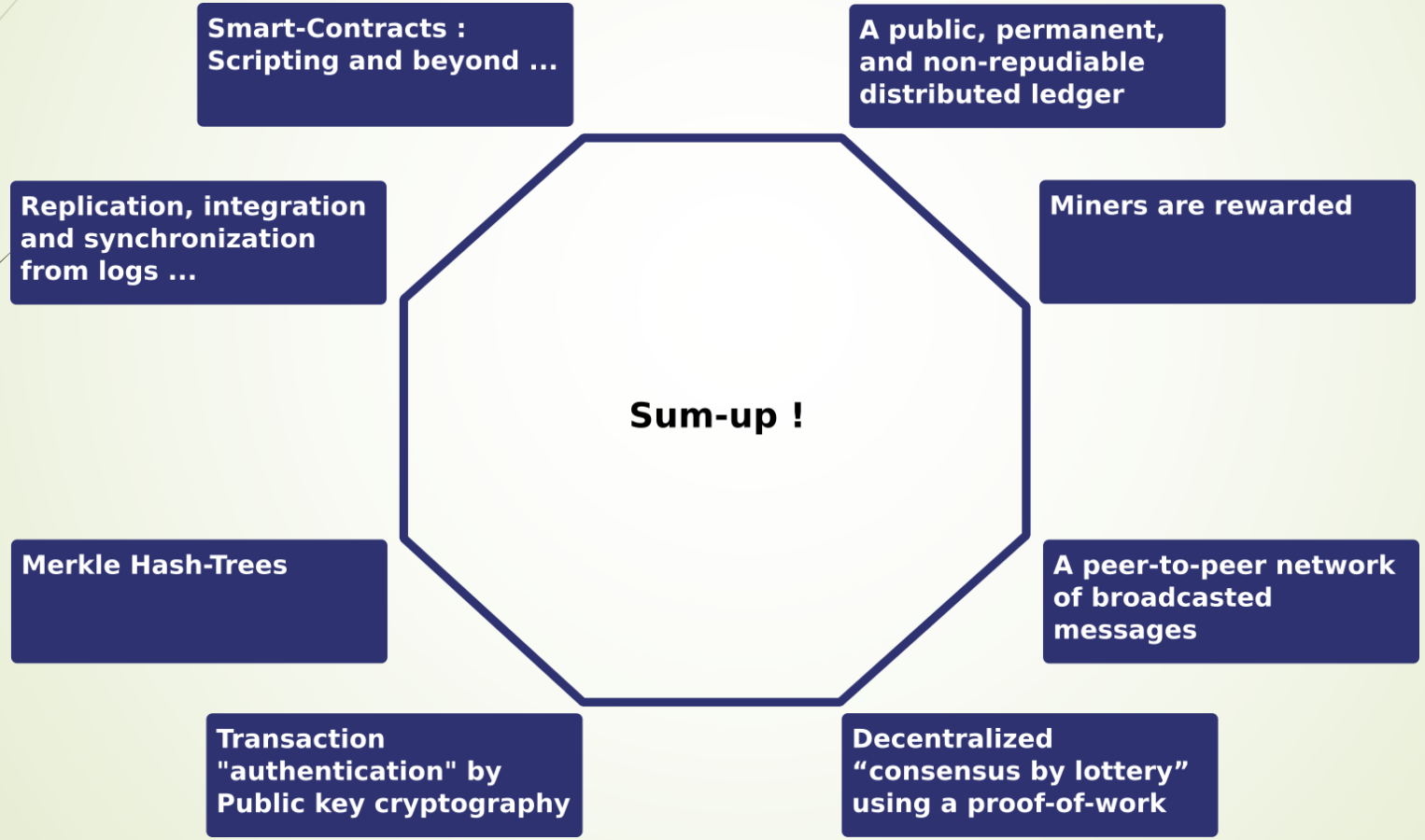
-protocol de tranzactii care executa clauzele unui contract



Bitcoin Blockchain - Concluzii



Sumarizare conceptelor prezentate



https://coinmarketcap.com/currencies/bitcoin/

https://wallet.btc.com/#/setup/register

www.Blockchain.info

https://www.simplilearn.com/tutorials/blockchain-tutorial/blockchain-industries

-blockchain in diverse industrii, exemple si modul de implementarea. Avantaje aduse [Blockchain Use Cases and Applications by Industry (consensys.io)]

-Dati exemple de alte cryptomonede si verificati modul de functionare

-cautati algoritmului Bitcoin si implementarea lui https://www.freecodecamp.org/news/how-bitcoin-mining-really-works-38563ec38c87/

-analizati Merkle Trees - https://www.simplilearn.com/tutorials/blockchain-tutorial/merkle-tree-in-blockchain

https://www.javatpoint.com/blockchain-merkle-tree

Va multumesc !