What is Blockchain

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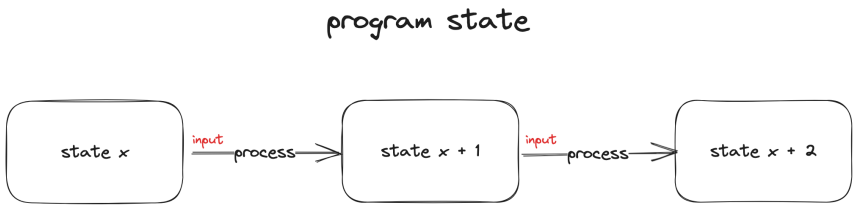
June 6, 2023

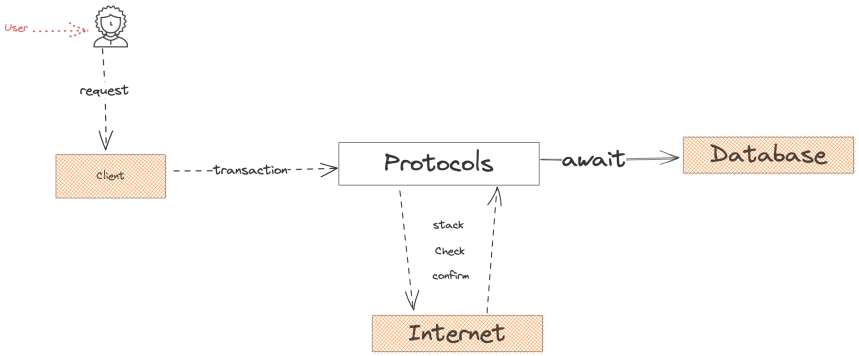
Contents

Blockchain can be understood in a simplistic manner as an intricate database or a data structure.

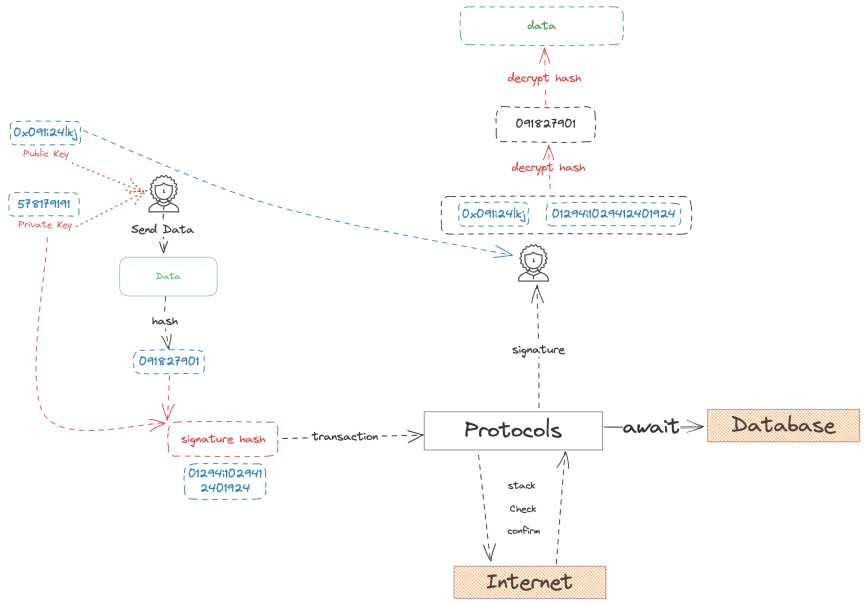
1 Program State



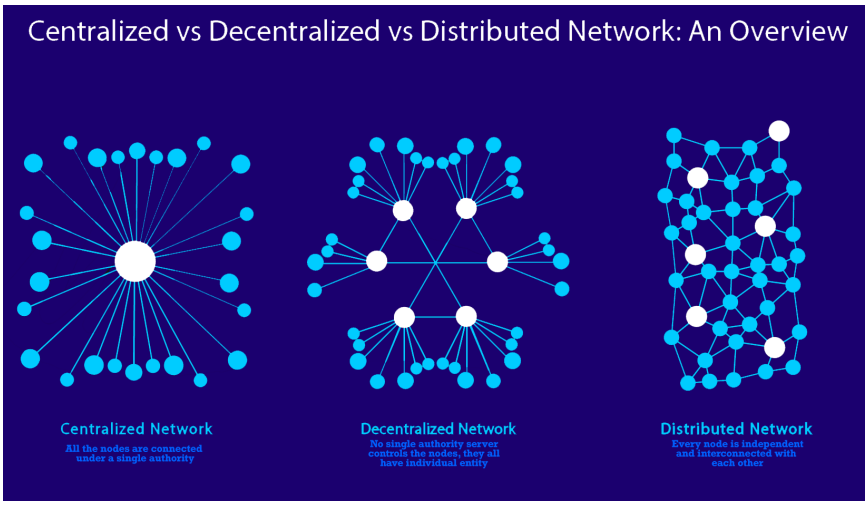
2 The Application/Web2 System



3 The Decentralized Application System



4 Networks



5 Decentralized Models

- Permissionless Blockchain - Public Blockchain
  - Anyone can access to write the data
  - Anyone can read the data
- Permissioned Blockchain - Private Blockchain
  - Participants need permission to accessing
  - Readers need permission
  - Ex: Hyperledger, Corda
- Consortium Blockchin
  - Participants need permission to accessing
  - Anyone can read the data
  - Ex: Ripple

6 Components of an Blockchain

6.1 Decentralized Models

- Permissionless
- Permissioned
- Consortium

6.2 Data Models

- State Models
- Blocks & Transactions
- Broadcast Data

6.3 Network Models

- Asynchronous
- Synchronous
- Partial Synchronous

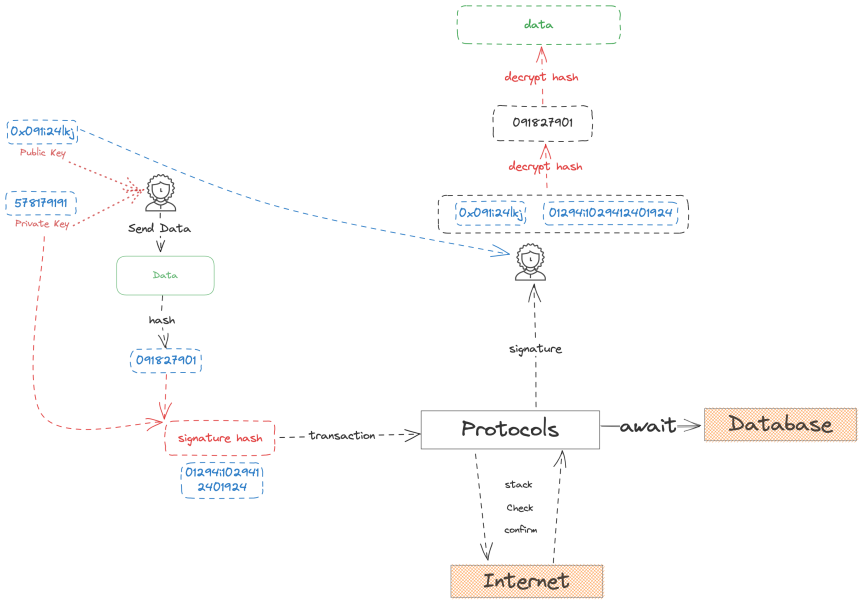
6.4 Consensus - (Proof-of-X)

- Proof of Work
- Proof of Stake
- DPoS
- More Consensus
  - Doomslug
  - HotStuff
  - TendermintBFT
  - Ouroboros
  - TowerBFT
  - Nominated PoS
  - AptosBFT
  - Bullshark & Narwhal

6.5 Cryptographic Schemes

- Hashing
- Merkle Tree
- Signature
- Zero-knowledge Proofs

7 How the Blockchain Work

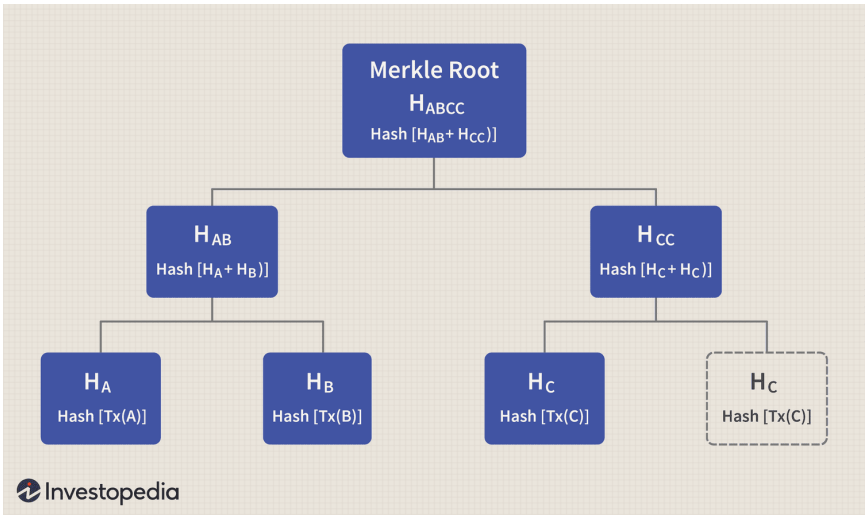


8 Body of the Block

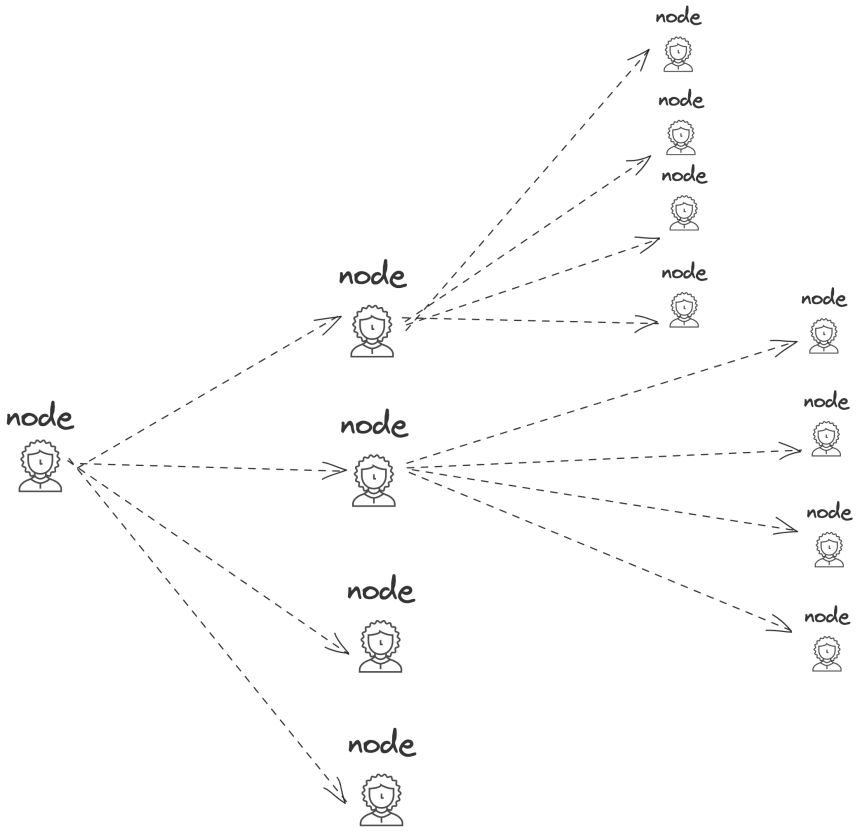
Details

Hash	00000-bbb4f	Depth	1
Capacity	198.38%	Size	2,080,165
Distance	6m 44s	Version	0×20a00000
BTC	876.9824	Merkle Root	97-57
Value	$23,808,984	Difficulty	51,234,338,863,442.89
Value Today	$23,808,204	Nonce	2,825,345,341
Average Value	0.2112701524 BTC	Bits	386,236,009
Median Value	0.00000546 BTC	Weight	3,993,088 WU
Input Value	877.18 BTC	Minted	6.25 BTC
Output Value	883.43 BTC	Reward	6.45062564 BTC
Transactions	4,151	Mined on	Jun 03, 2023, 4:43:05 PM
Witness Tx's	4,071	Height	792,672
Inputs	5,927	Confirmations	1
Outputs	7,760	Fee Range	0-164 sat/vByte
Fees	0.20062564 BTC	Average Fee	0.00004833
Fees Kb	0.0000964 BTC	Median Fee	0.00002444
Fees kWU	0.0000502 BTC	Miner	Binance Pool

9 Merkle Tree



10 Broadcast



11 Characteristic of Blockchain

- Global
- Append-only
- High Availability
- Irreversibility
- Sustainability

12 The vulnerabilities of Blockchain

- Slow
- Expensive
- Latency