

Group:13

BLOCKCHAIN AND DECENTRALIZED BLOCKCHAIN NETWORK

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Architecture/Framework: NodeJS

Methodology/Working of system:

setup NodeJS

1.Bulid A Blockchain:

- Create blocks
- Create transaction method
- Test created transaction method
- Sha256 hashing for hashing blocks
- Test hash method
- Proof of work method

2.Access Blockchain Through API:

- Build api with ExpressJS
- Build Get/blockchain endpoint
- Build Post/transactin endpoint
- Build Get/mine endpoint
- Test new endpoints

3.Create Decentralized Blockchain Netowrk:

- Create multiple nodes
- Test the nodes
- Add currunt nodes
- Create POST/register and broadcaste nodes
- Test register and broadcaste nodes
- Test all Network Endpoints

4.Synchronizing The Network:

- Build POST/transaction/broadcast endpoint
- Test transaction endpoints
- Update mining endpoints
- Build POST/receive-new-block endpoint

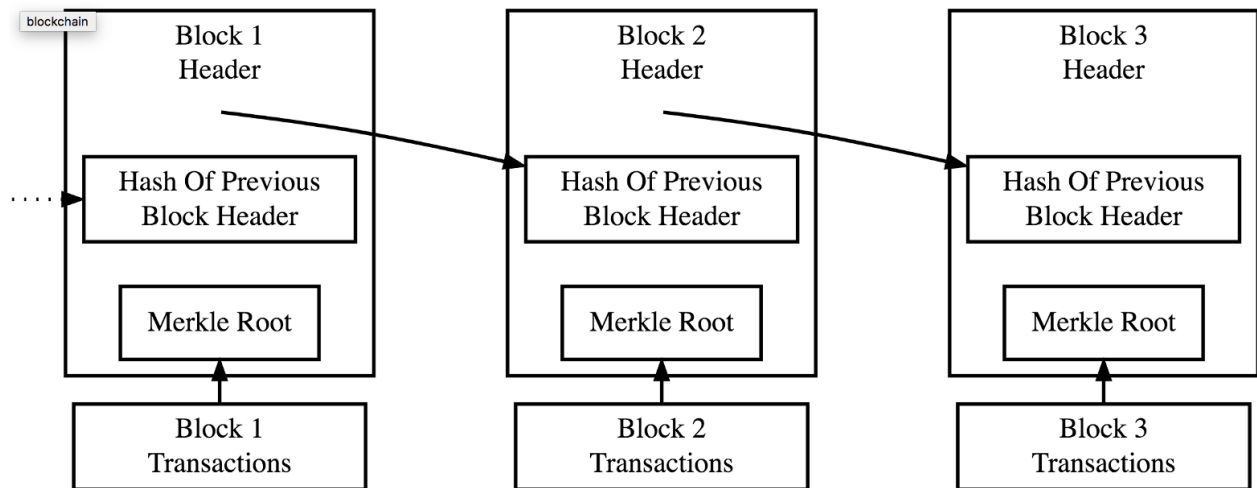
5.Consensus Algorithm:

- Valid Chain Testing
- Build GET/consensus endpoint
- Test GET/coonsensus endpoint

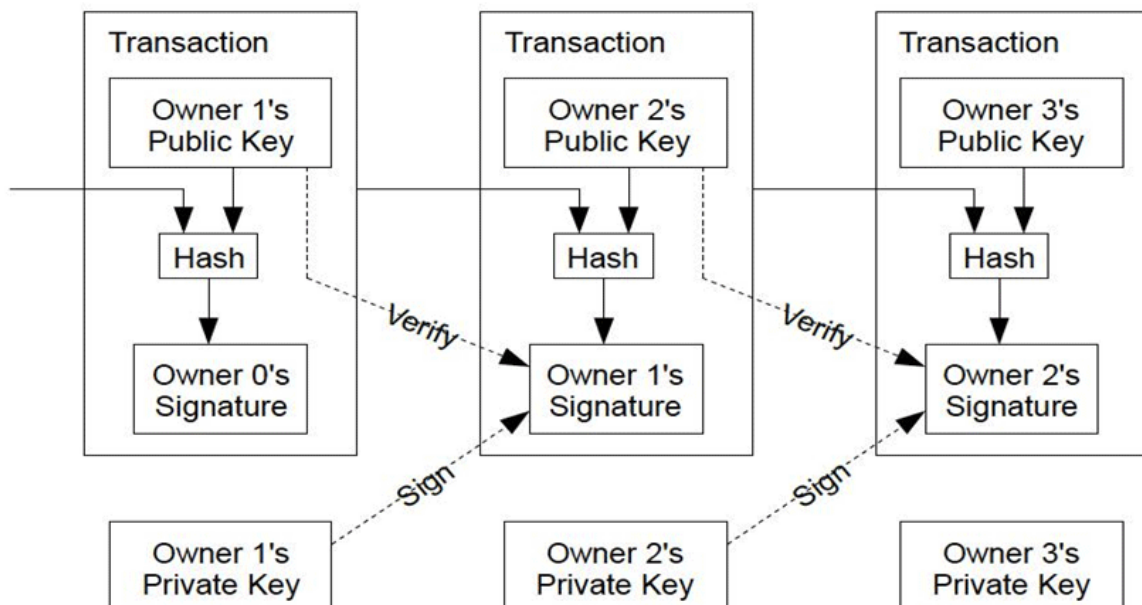
6. Block Explorer: User Interface

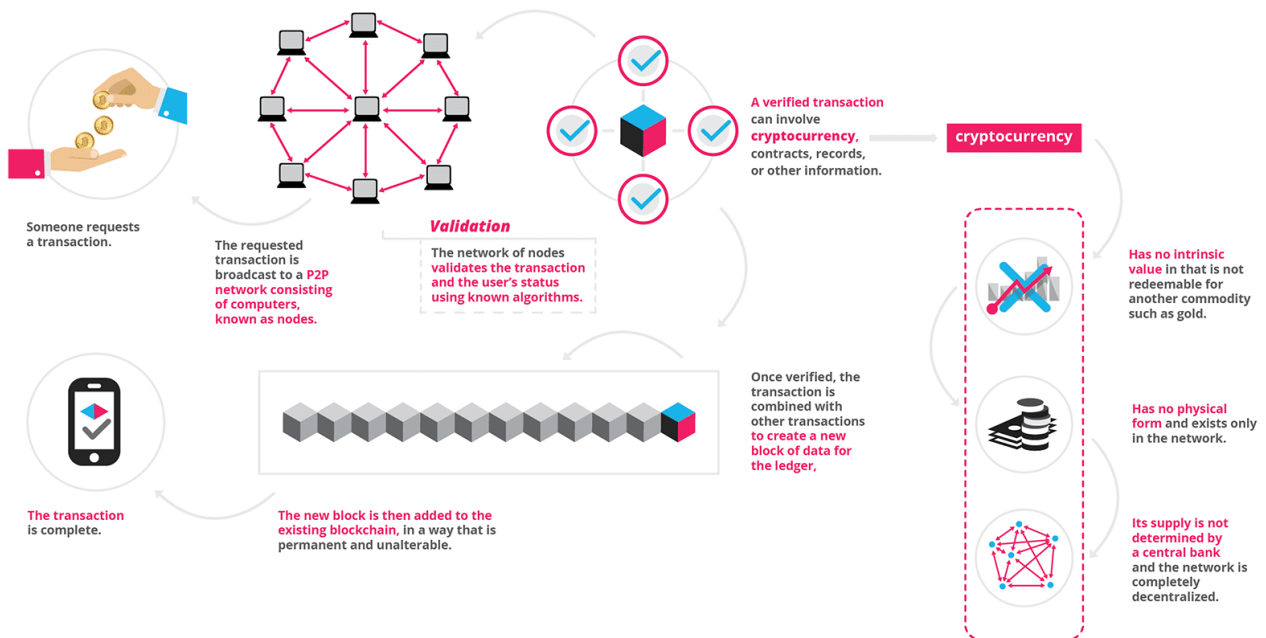
- Get block method
 - Get transaction method
 - Build GET/transaction endpoint
 - Get Address Data Method
- Test Block Explorer

Flowchart:

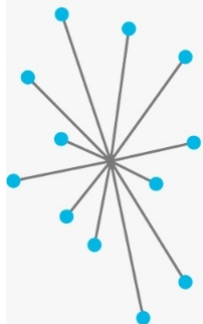


Simplified Bitcoin Block Chain

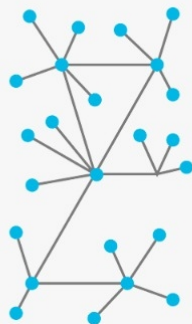




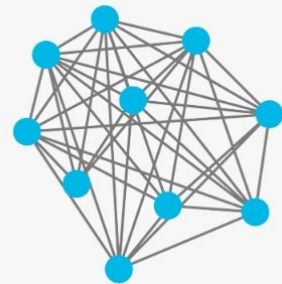
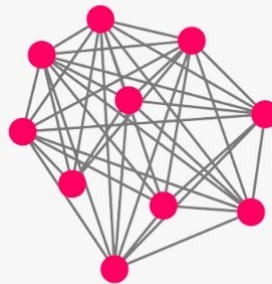
Centralized



Decentralized



Distributed Ledgers



The New Networks

Distributed ledgers can be public or private and vary in their structure and size.

Public blockchains

Require computer processing power to confirm transactions ("mining")

- Users (●) are anonymous

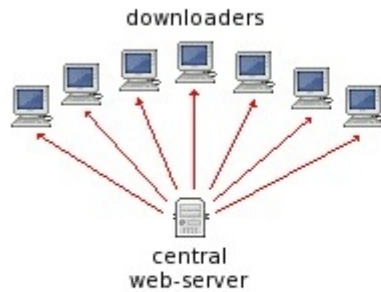
- Each user has a copy of the ledger and participates in confirming transactions independently

- Users (●) are not anonymous

- Permission is required for users to have a copy of the ledger and participate in confirming transactions

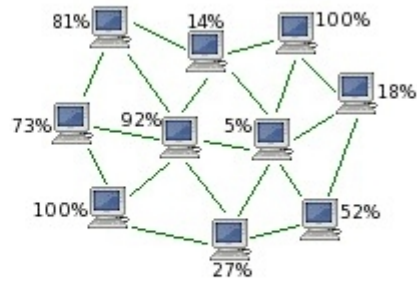


Traditional Centralized Downloading



- Slow
- Single point of failure
- High bandwidth usage for server

Decentralized Peer-to-Peer Downloading



- Fast
- No single point of failure
- All downloaders are also uploaders

Proposed Algorithms:

- SHA256 Hashin Algorithm :
to secure the network.
- Proof Of Work:
to secure the data within the blockchain
- Consensus Algorithm:
to verify that the network nodes have valid data and are synchronized.