

Components of a Blockchain Network

Welcome to our exploration of blockchain technology! Today, we will delve into the building blocks of blockchain networks, examining nodes, blocks, and transactions. Get ready to understand the fundamental principles that make this groundbreaking technology possible.

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Recap: Blockchain Basics

Decentralized

No single entity controls the network.
Transactions are verified and recorded across multiple computers.

Secure

Cryptographic techniques protect data integrity and prevent tampering.
This makes blockchain tamper-proof.

Transparent

All transactions are recorded on a public ledger, providing transparency and auditability.

Guess the Topic: What is Blockchain?





Nodes: The Building Blocks of Blockchain



Full Nodes

Download and verify the entire blockchain, contributing to network security.



Lightweight Nodes

Focus on specific tasks, like verifying transactions, without storing the full blockchain.



Mining Nodes

Solve complex mathematical problems to validate transactions and add new blocks to the chain.



Blocks: Storing Transactions in the Network

Data

Each block stores a set of transactions, including timestamps and other relevant information.

Hash

A unique code generated from the block's data, ensuring its integrity and linking it to the previous block.

Timestamp

Records the time when the block was created, maintaining a chronological order of transactions.

Transactions: The Heart of Blockchain



1 Initiation

A sender creates a transaction request, specifying the recipient and the amount to be transferred.

2 Verification

The transaction is broadcast to the network, where it is verified by multiple nodes before being added to a block.

3 Confirmation

Once added to a block, the transaction is considered irreversible and permanently recorded on the blockchain.



Real-Life Blockchain Use Cases

1

Cryptocurrencies

Bitcoin, Ethereum, and other cryptocurrencies rely on blockchain for secure and transparent transactions.

2

Supply Chain Management

Track goods from origin to destination, enhancing transparency, traceability, and efficiency in supply chains.

3

Digital Identity

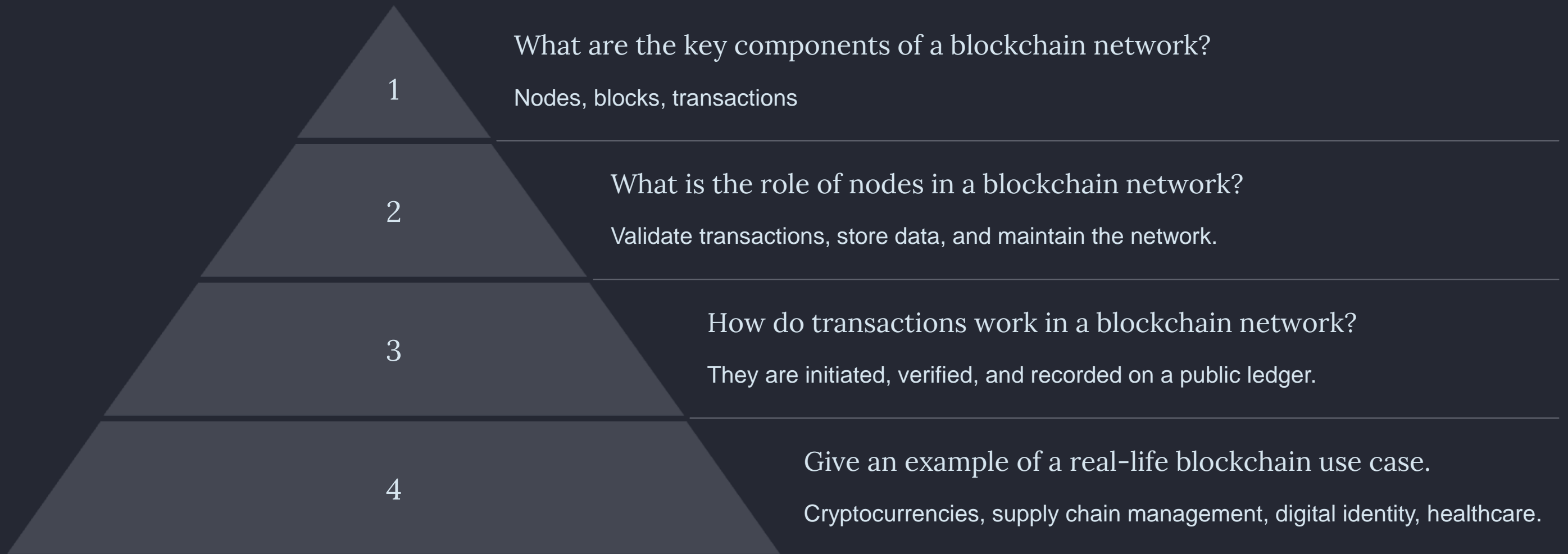
Secure and verifiable digital identities can be managed using blockchain, protecting user data and reducing fraud.

4

Healthcare

Securely store and share medical records, enabling faster access to patient information and improved data management.

Student Learning Assessment



Summary and Key Takeaways

1

Decentralized

No single entity controls the network.

2

Secure

Cryptographic techniques protect data integrity.

3

Transparent

All transactions are recorded on a public ledger.

4

Versatile

Blockchain has applications across multiple industries.



References and Further Reading

1

Blockchain

A revolutionary technology transforming industries.

2

Cryptocurrencies

Decentralized digital currencies powered by blockchain.

3

Smart Contracts

Self-executing contracts based on blockchain technology.

4

NFTs

Non-fungible tokens represent ownership of unique digital assets.