NPTEL ONLINE CERTIFICATION COURSES

Blockchain and its applications

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Lecture 02: What is Blockchain

CONCEPTS COVERED

- Decentralization with a Blockchain
- Fundamental Properties of Blockchain
- Formal Definition of a Blockchain

KEYWORDS

- Decentralization
- Properties
- Definition

Requirements for a Successful Supply Chain

- Minimization of material procurement

Needs Strong Coordination among the Players

- Procurement would purchase the feedstock with not the best yields at lowest cost

Moving towards Decentralization ...

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Moving towards Decentralization ...

- 120432 barrels produced at Mumbai High on Dec 26, 2020

Moving towards Decentralization ...

- 120432 barrels produced at Mumbai High on Dec 26, 2020
- 16467 barrels transported from Mumbai High to HPCL Refinery on Dec 26, 2020 at 2:30 pm

Moving towards Decentralization …

The board has infinite space, you do not need to erase anything!

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Moving towards Decentralization ...

Everyone can see all the logs and verify

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Moving towards Decentralization …

Any change
in information
is visible
to everyone

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Moving towards Decentralization ...

The board is not erasable, no one can deny later

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Moving towards Decentralization ...

Simple one-step auditing

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Moving towards Decentralization …

Who will maintain this bulletin board?

Moving towards Decentralization ...

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- Buy Cloud from amazon

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- Buy Cloud from amazon

Who will manage it and provide the cost?

Moving towards Decentralization …

Who will maintain this bulletin board?

- One of the enterprises maintain a private cloud

Moving towards Decentralization ...

Who will maintain this bulletin board?

- One of the enterprises maintain a private cloud

What is the guarantee that it is not a fraud?

Moving towards Decentralization …

Who will maintain this bulletin board?

Let everyone maintain the same copy of the board individually and independently

Moving towards Decentralization ...

Who will maintain this bulletin board?

Let everyone maintain the same copy of the board individually and independently

BUT HOW?

Moving towards Decentralization ...

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No one is the sole-owner of the data, but everyone has a copy of the data - there is no central database

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Moving towards Decentralization ...

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Everyone holds exactly the same copy of the data at the same instance of the time

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What is a Blockchain?

An immutable append-only ever-growing chain of data. Data once added cannot be deleted or modified later

What is a Blockchain?

There is no central database to store the chain – everyone keeps a copy of the chain and process data locally

What is a Blockchain?

New information is added to the chain in the form of new blocks

What is a Blockchain?

Blockchain ensures that every party has the same view of the blockchain always

What is a Blockchain?

The Information is transparent to everyone – so everyone can verify and validate

Conclusion: Formally Defining a Blockchain

A decentralized immutable append-only public ledger

Conclusion

- We got a broad idea of a blockchain and its possible use cases (beyond cryptocurrencies)
- We next learn some fundamental cryptographic techniques used in the design of a blockchain …

Thank you