Blockchain

FinTech

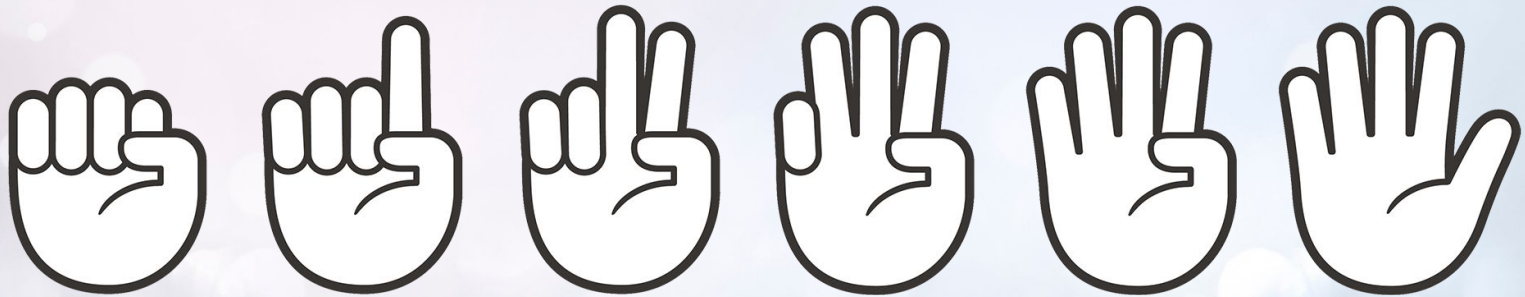
Have you heard?

How many of you have heard of blockchain before?

How many of you have heard of cryptocurrency before?

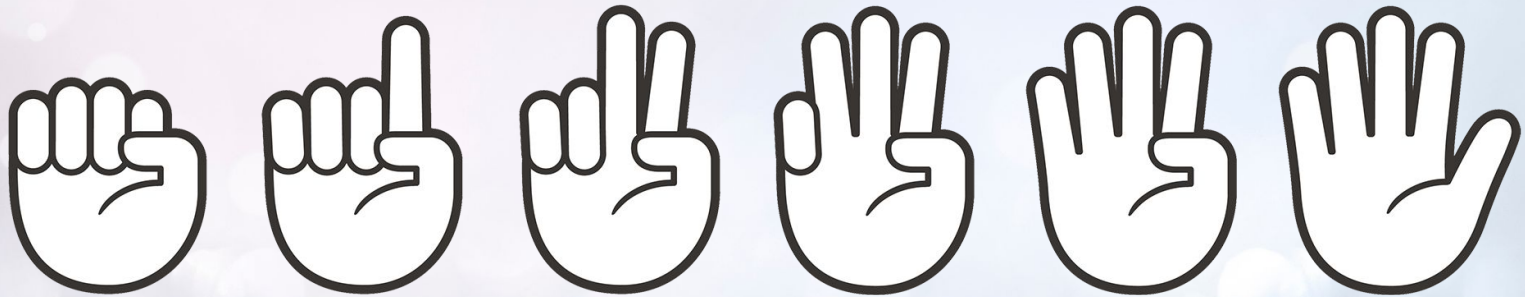
How many of you have ever used a blockchain?

How many of you have ever traded cryptocurrency?



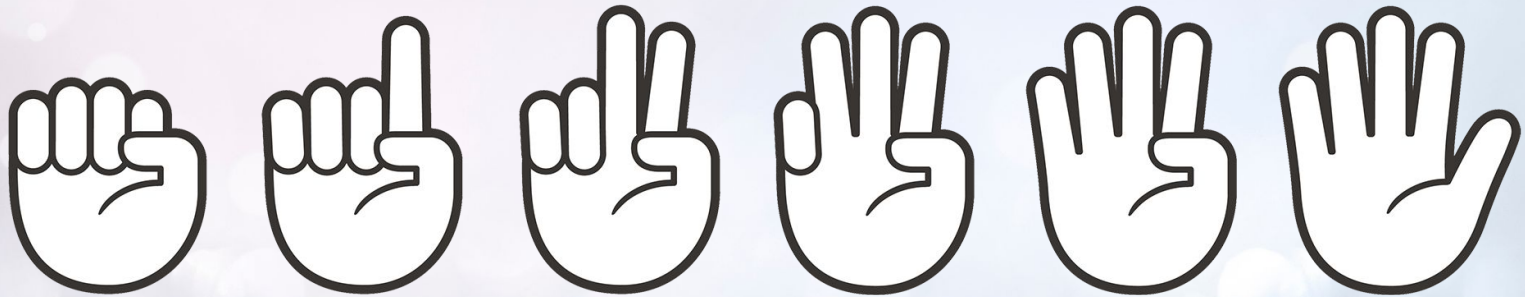
FIST TO FIVE:

How familiar are you with blockchain?



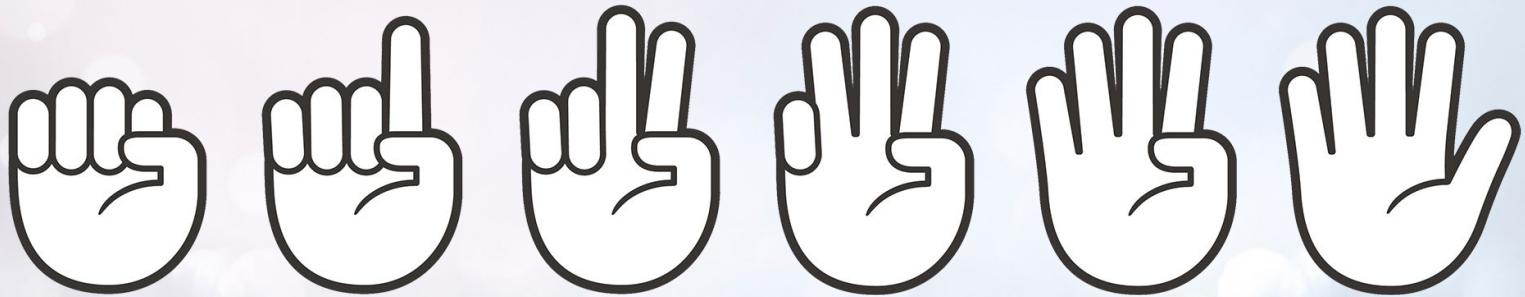
FIST TO FIVE:

How comfortable do you feel having a conversation about blockchain technology?



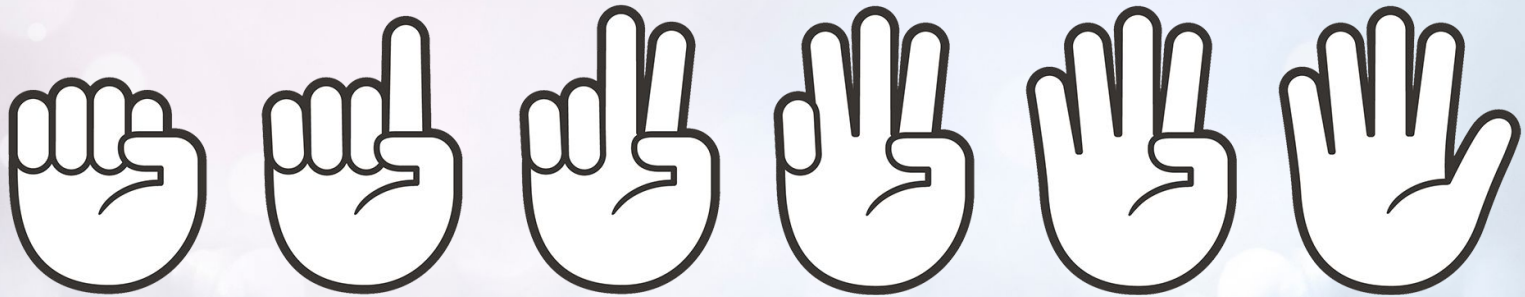
FIST TO FIVE:

How familiar are you with Ethereum?



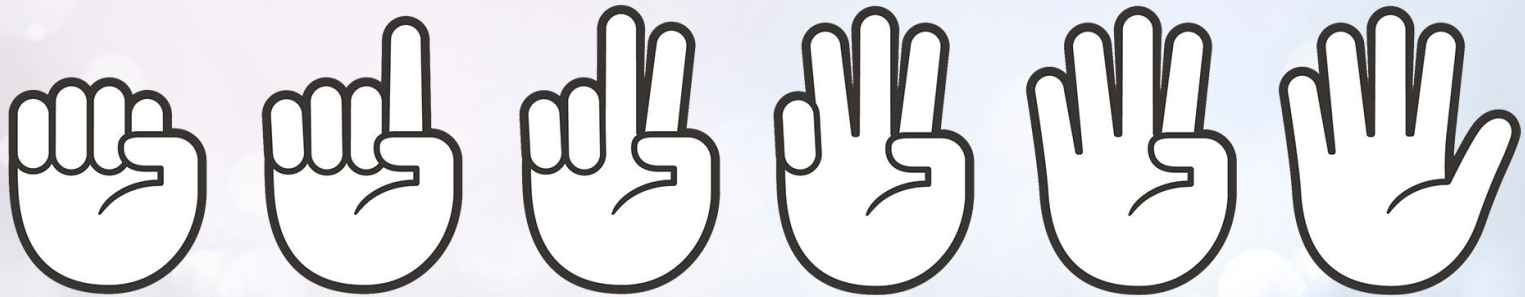
FIST TO FIVE:

How familiar were you with Python?



FIST TO FIVE:

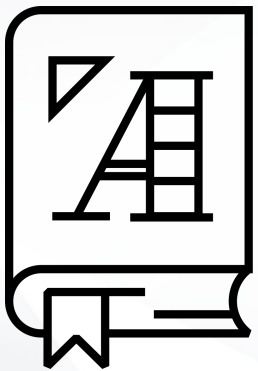
How comfortable were you having a conversation about machine learning?



FIST TO FIVE:

How familiar were you with financial analysis?

Defining Blockchain

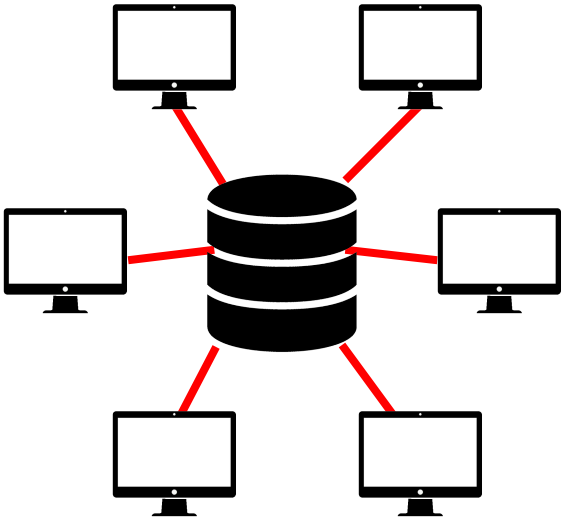


A **blockchain** is a distributed “immutable” database that is not controlled by a single, central authority.

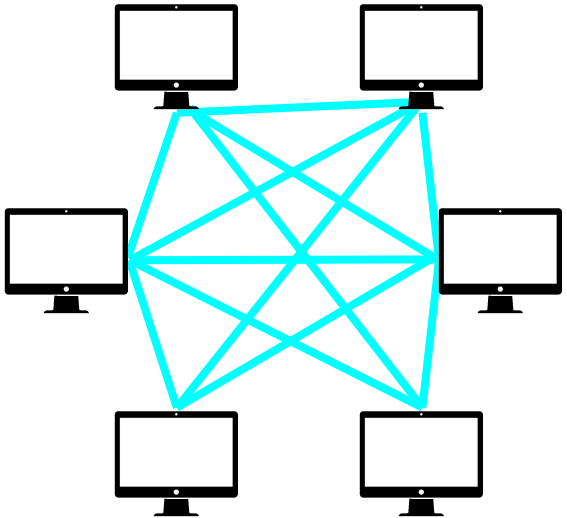
Blockchain

A blockchain is a distributed “immutable” database that is not controlled by a single, central authority.

Centralized Database

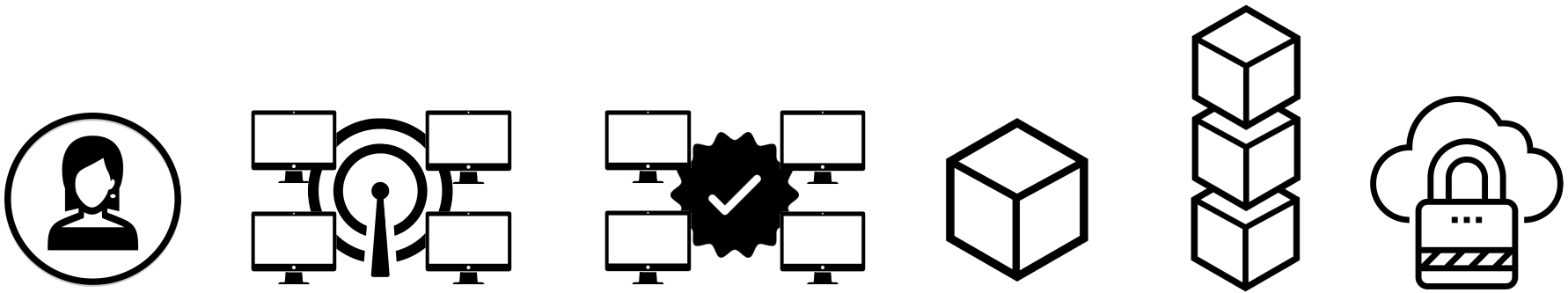


Decentralized Database



Blockchain

The database is synchronized across the network, with special rules in place to incentivize good actors and disincentivize bad actors.



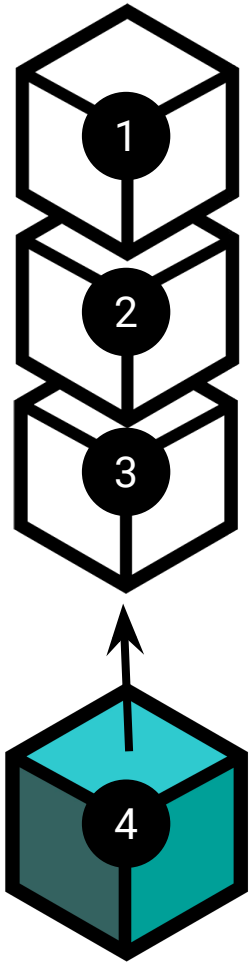
1. A transaction is initiated.
2. The transaction is broadcast to every node in the network.
3. The nodes form a consensus on whether the transaction is valid.
4. The nodes add valid transactions to a “block.”
5. The block is added to the blockchain.
6. Transaction complete.

Blockchain

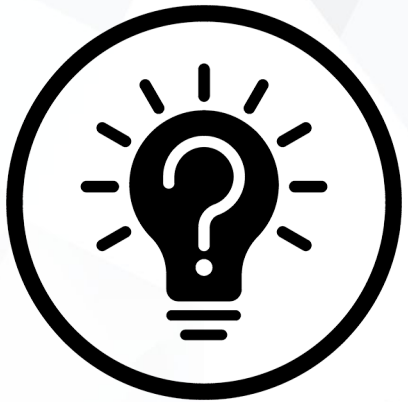
It is immutable, which means you can only add to the database: you cannot change the history.

This provides a powerful means of creating a trusted “source of truth” in a trustless environment.

Transactions are linked together in a chronological manner to form a continuous chain of blocks



The Importance of Blockchain



Why would a banker want to use a blockchain?

The Importance of Blockchain

Using a blockchain for interbank communication is faster, more secure, and cheaper than the systems in place now, Swift and ACH.

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MARKETS | TRANSACTION SERVICES

Swift hacks expose bank security weaknesses

Kimberley Long | Thursday, September 15, 2016

Security breaches that have allowed hackers to infiltrate Swift's messaging network have raised questions about the safety of the messaging network, but the problems might rest with the individual banks.

Why would an individual in an underbanked, developing, or authoritarian country want to use a blockchain?

The Importance of Blockchain

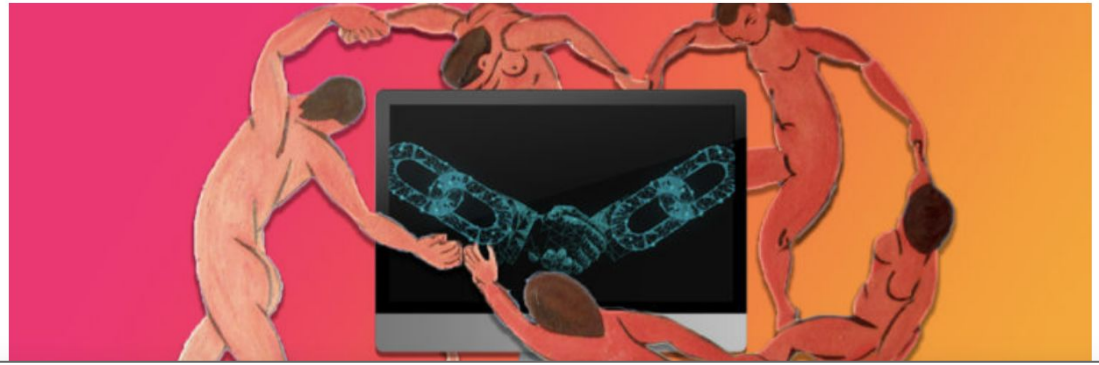
Transactions cannot be censored.

You only need a mobile device and internet connection, which is a common commodity, even in developing countries.

Blockchain Technology Could Prevent Internet Censorship

Christian Gundiuc — 6 months ago

Comments



Why would an individual in the US want to use a blockchain?

Importance of Blockchain

- Removes intermediaries like PayPal, Venmo, Cashapp, etc., and allows for peer-to-peer payments, thus lower fees.
- Custody over your funds, versus allowing a bank to have custody.
- Cheaper than domestic wire transfers.
- Brings financial services typically available to the upper class to everyone.

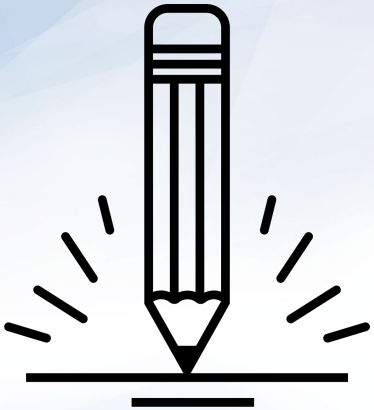
Why would anyone want to use blockchain?

Importance of Blockchain

Fast, global transactions that are not managed by a single authority.

Importance of Blockchain

Secure, modern infrastructure for the next generation of the internet. This is also known as Web 3.0.



Activity: Use Case Study

In this activity, you will complete a thought experiment in which you will get together in small groups and examine an example use case application for different cryptocurrency and blockchain projects.

Suggested Time:
10 Minutes

Time’s Up! Let’s Review.

Use Case Study

Some common features may be:

- Transparency
- Privacy (in the case of Monero)
- Smart contracts
- Neutrality
- Hedge against hyperinflated currencies
- Bridge of trust between parties that might not trust each other
- Cross-border nature
- Pseudonymous system (addresses are your alias, not necessarily attached to identity)

The Five Pillars of Open Blockchains

As we talk through each pillar, keep in mind what you uncovered during the previous exercise. Which feature would you put in each category?

Pillar 1: Open

Openness means that the system is designed to incentivize users to keep it open. The internet is an example of this, and it is built on open protocols that anyone can learn and contribute to.

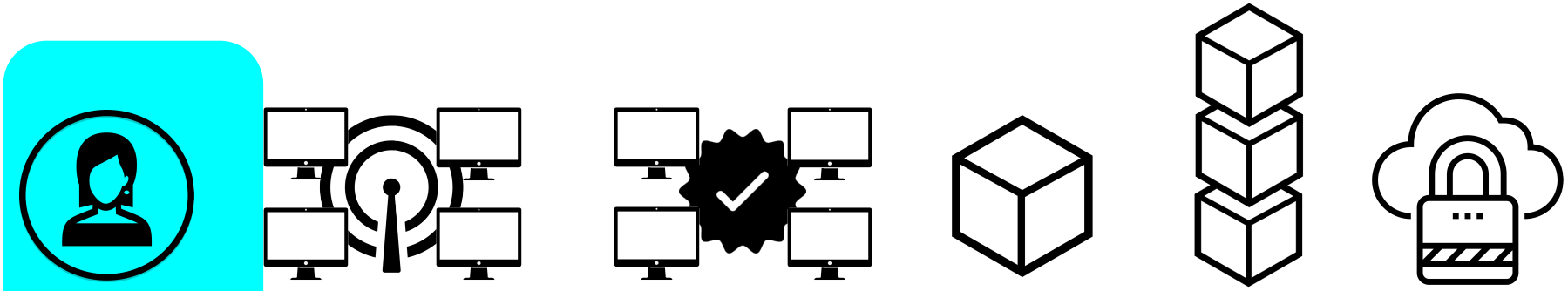
Pillar 1: Open

Anyone can access the source code and create a project from it, therefore developer access is high.

```
class Block {
    constructor(index, previousHash, timestamp, data, hash) {
        this.index = index;
        this.previousHash = previousHash.toString();
        this.timestamp = timestamp;
        this.data = data;
        this.hash = hash.toString();
    }
}
```

Pillar 1: Open

Anyone can access the chain and participate in the ecosystem.
Anyone can access the services the blockchain offers.



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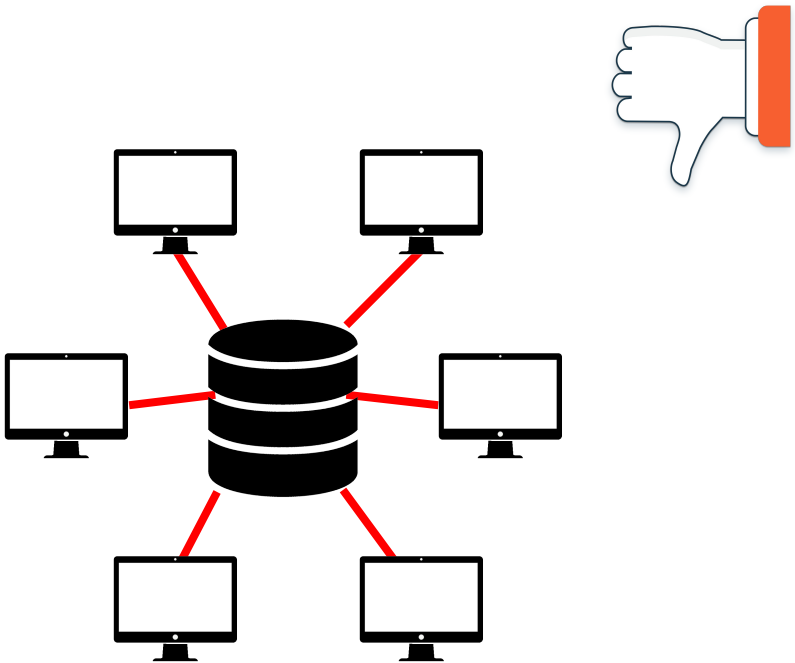
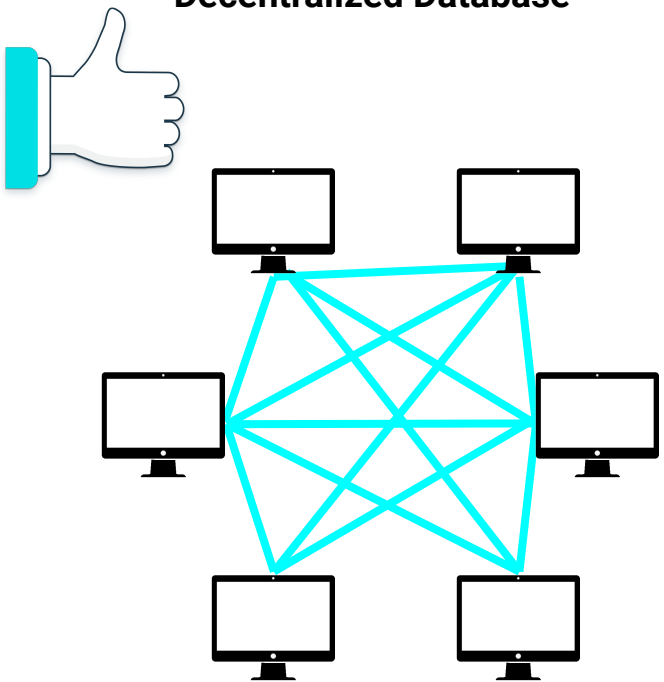
Pillar 2: Borderless

To be borderless, the network needs to be decentralized. This means that any central party does not hold control of the network.

Centralized Database

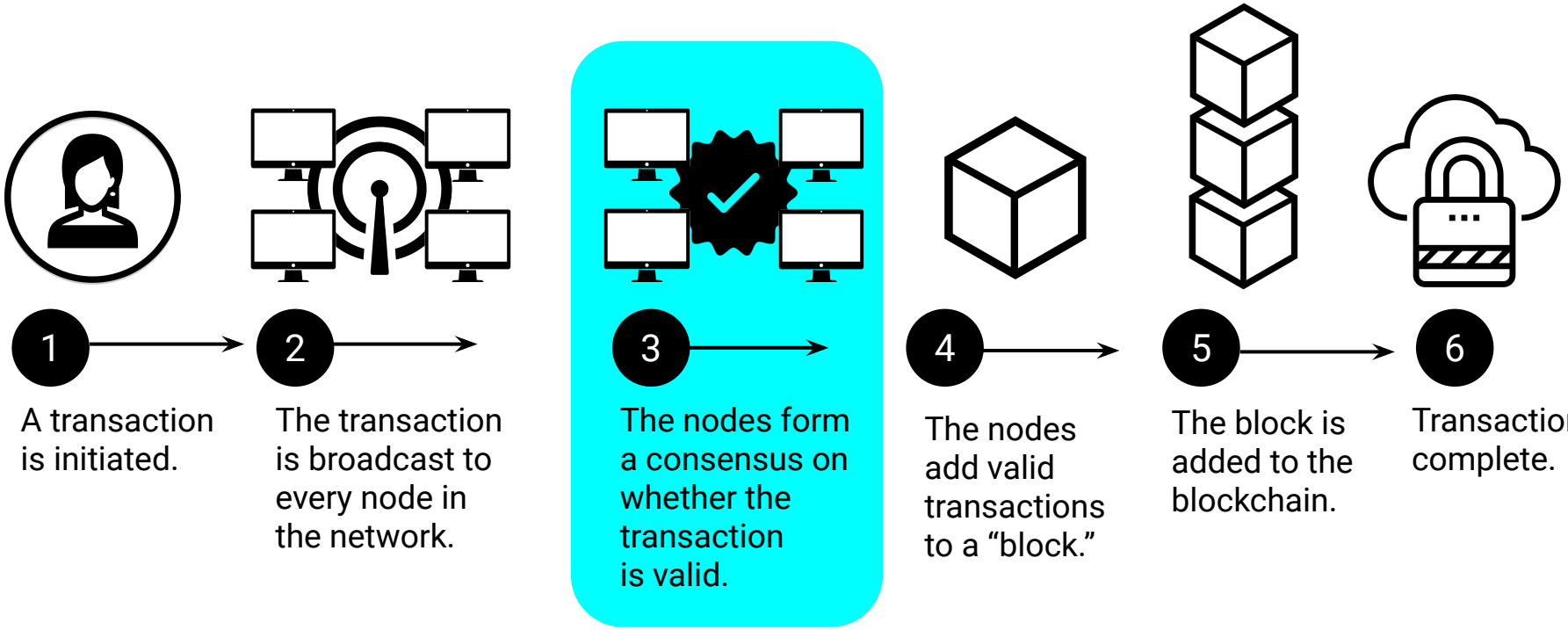


Decentralized Database



Pillar 2: Borderless

Since the blockchain is synchronized onto every device that helps maintain it (called nodes), it lives everywhere.



Are you moving money across a border when you bring a credit card across customs?

Much like the money is not on the card itself, a crypto wallet does not hold the crypto itself, just the access.

The blockchain is already synchronized to a device in the country you are traveling to, so accessing it is the same as if you were to swipe a Visa card internationally, only without Visa getting involved.

You can also use a satellite connection to connect to blockchain networks and broadcast transactions, therefore it is truly global.

Pillar 3: Neutral

Neutral means that the protocol does not discriminate against any user.

01

The blockchain is agnostic to the users, regardless of political or social status, or geographic location.

02

A wealthy banker or government leader uses the protocol in the exact same way anyone else would.

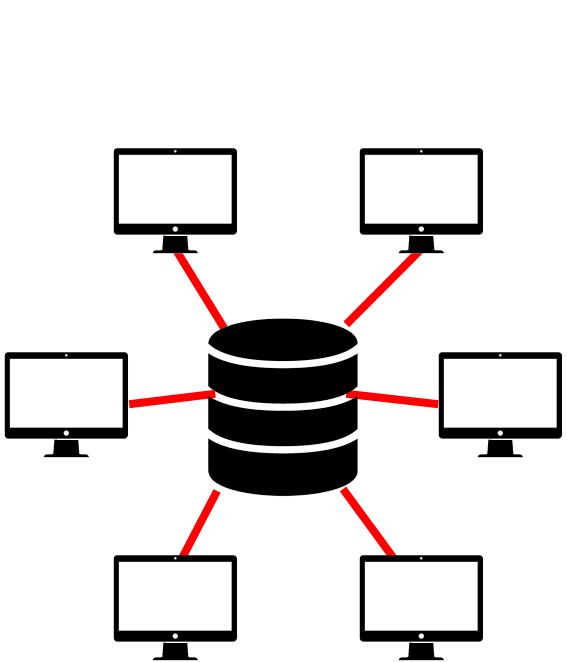
03

Open blockchain networks are also governed in a neutral fashion, with many using the blockchain itself for voting on the next network upgrades.

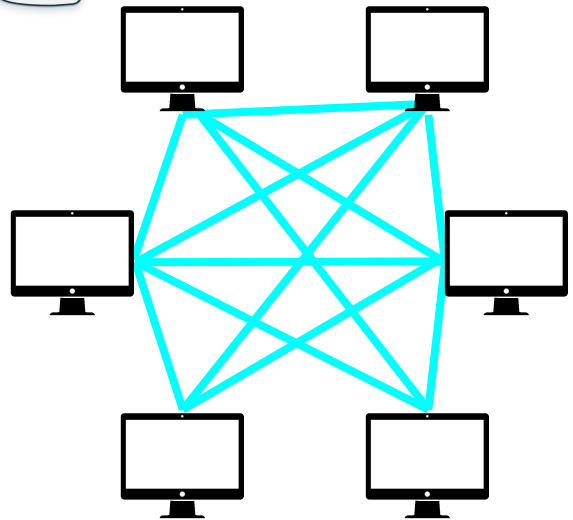
Pillar 4: Censor Resistant

Blockchains that are properly decentralized are highly resistant to censorship and authoritarian control.

Centralized Database



Decentralized Database



Pillar 4: Censor Resistant

This means that people suffering in nations that have high censorship can still find a way to use these systems to reach out and to bypass the oppression.

Money is often compared to a form of speech. These are systems where this form of expression cannot be censored.

Pillar 5: Public

Open blockchains are separate from the state.
Public blockchain networks are suited for public affairs.

This separation of state and money is a first in history. It is similar to the separation of church and state to allow for religious freedom; only this allows for monetary freedom.

Intro to Ethereum

Intro to Ethereum

What would it be like to have money built into your programming language, as a first data type like string or number?

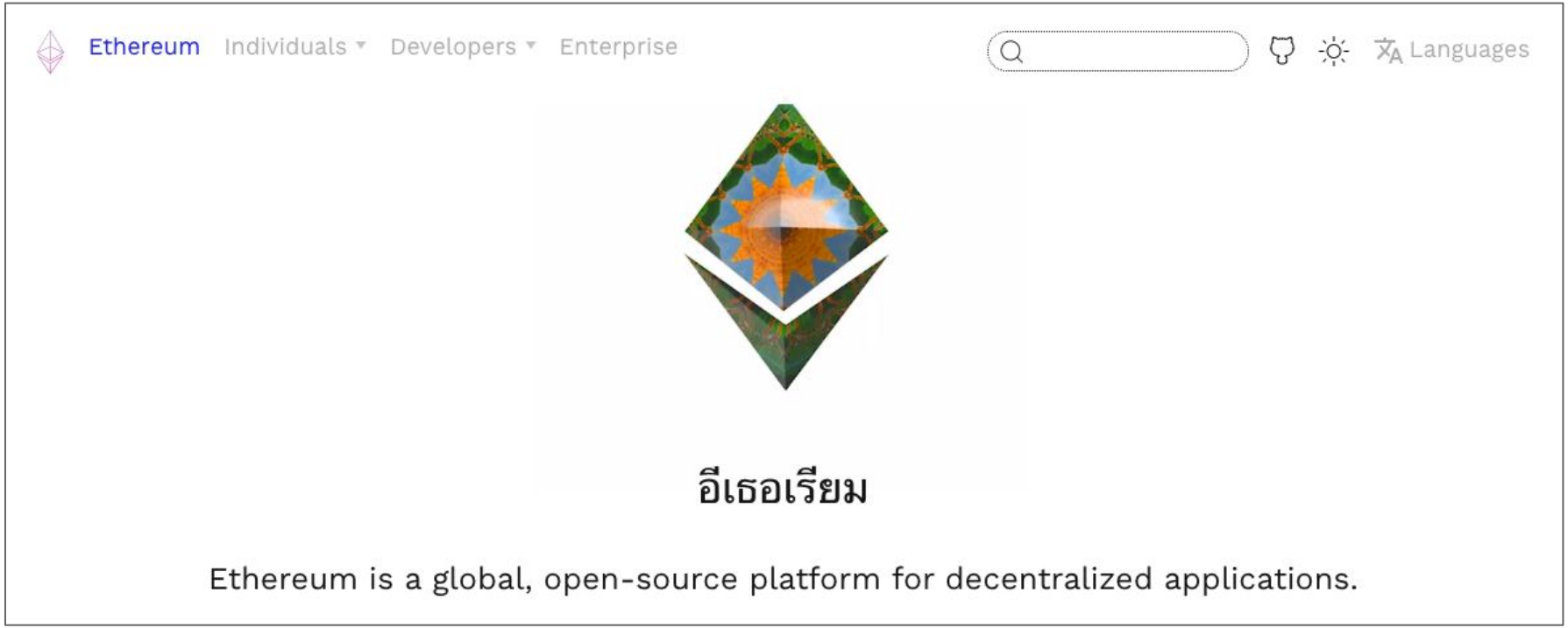
```
amount = $10 dollars
recipient = "JaneDoe123"
wallet.send_transaction(amount, recipient)
```

This is what Ethereum brings to the table, just replace inputs fields:

```
amount = 0.05 Ether
recipient = "0xc3879B456DAA348a16B6524CBC558d2CC984722c"
wallet.send_transaction(amount, recipient)
```

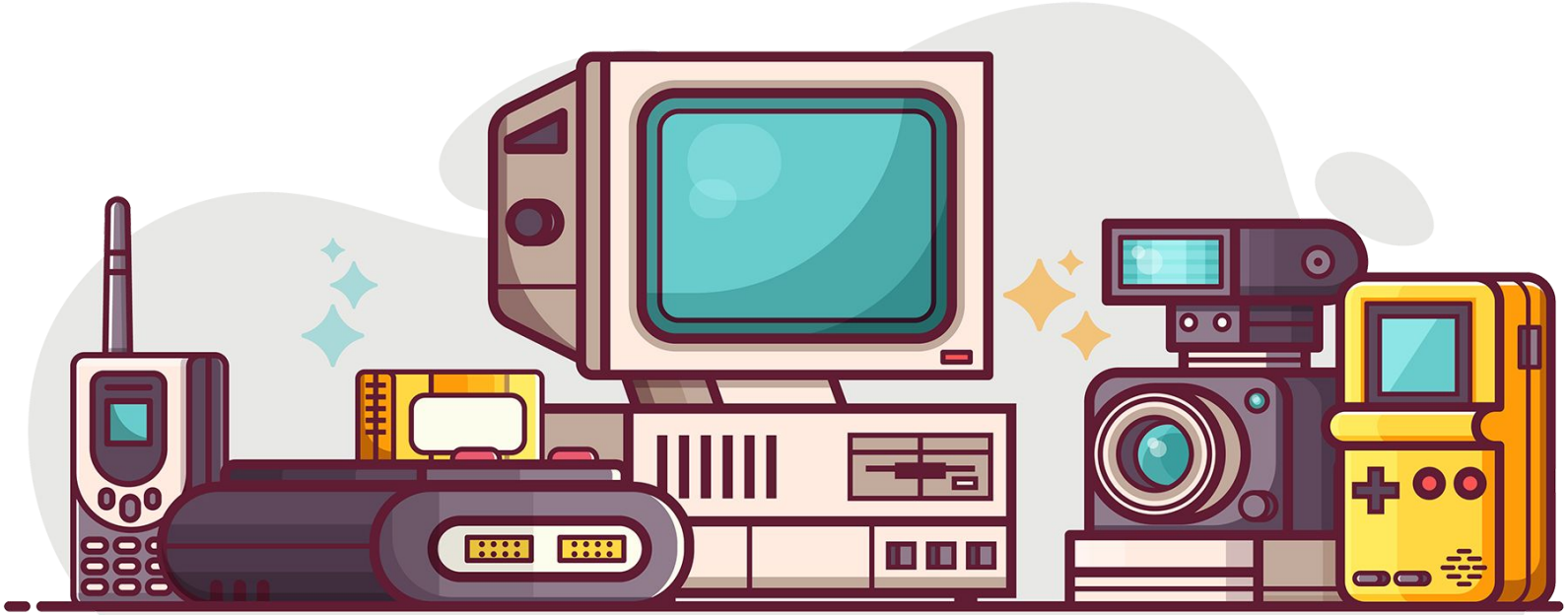
Intro to Ethereum

Ethereum secures over $20 billion in assets without a central authority. It powers a huge ecosystem of decentralized applications and financial ecosystems.



Intro to Ethereum

First generation blockchains were much like the days of carrying a cell phone, iPod, and calculator with you. Each solved a specific problem.



Intro to Ethereum

Ethereum brought to blockchains what the iPhone brought to personal computing, a general purpose platform where apps take the place of separate devices.

Intro to Ethereum

Now, you can build fully fledged applications on top of the blockchain with Ethereum.

Intro to Ethereum

These are the types of financial services that you can build with Ethereum:

Payments	Remittances	Loans	Deposit taking	Notary services
Peer-to-Peer, Business-to-Business, Business-to-Customer, Machine-to-Machine.	Movement of funds across borders into a bank account.	Using crypto-currency as collateral for loans to reduce costs of transactions.	Storing crypto in wallets to use as interest-earning assets.	Blockchain based notary services that authenticate documents.
Brokerage services	**Foreign exchange**	**Decentralized crypto exchange**	**Tokenizing assets**	
Trading tokens and other digital assets on the blockchain.	Using crypto as a bridge between fiat/government currencies to reduce the cost of foreign currency fees.	Using the blockchain as a backend to support a crypto-trading exchange.	Representing things from the US Dollar, Gold, Securities, to unique video game assets on the blockchain.	