

Introduction to Blockchain

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What Is Blockchain Technology?

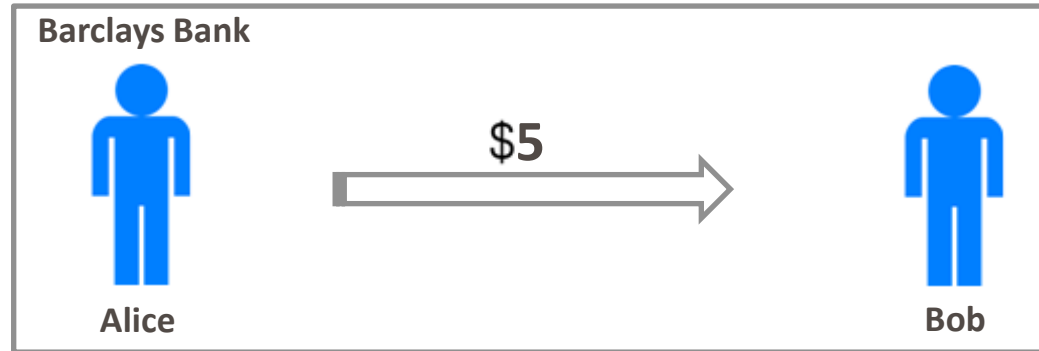
What is Blockchain?

What are Distributed ledgers?

What is Bitcoin?

Blockchain example

Current world scenario: Transaction within same bank:



Barclays Ledger before transaction :

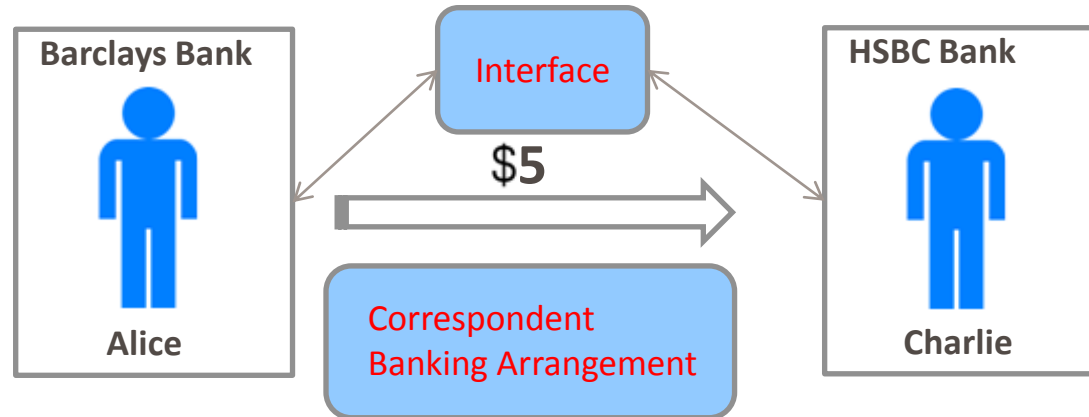
Id	Holder	Currency	Amount
1	Alice	USD	10
2	Bob	USD	5

Barclays Ledger after transaction :

Id	Holder	Currency	Amount
1	Alice	USD	5
2	Bob	USD	10

Blockchain example (contd..)

Current World Scenario: Transaction between different banks:



Barclays Ledger before transaction :

Id	Holder	Currency	Amount
1	Alice	USD	10
2	HSBC	USD	1000

HSBC Ledger before transaction :

Id	Holder	Currency	Amount
1	Charlie	USD	5
2	Barclays	USD	-1000

Barclays Ledger after transaction :

Id	Holder	Currency	Amount
1	Alice	USD	5
2	HSBC	USD	995

HSBC Ledger after transaction :

Id	Holder	Currency	Amount
1	Charlie	USD	10
2	Barclays	USD	-995

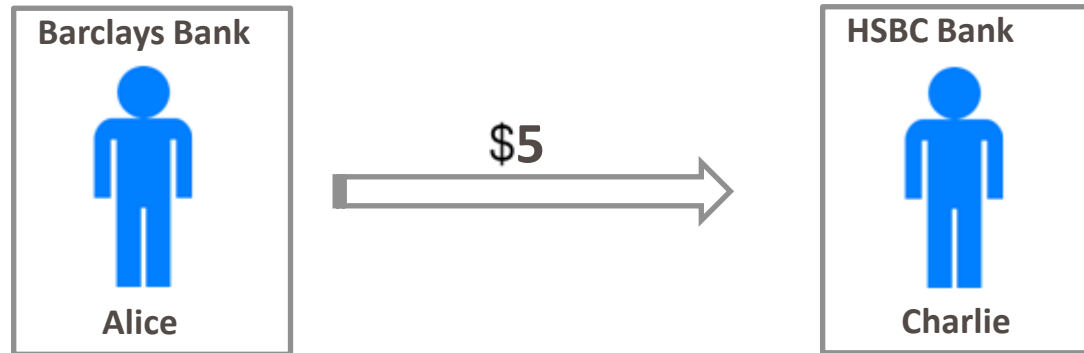
What are the issues with Current World Systems?

Key Issues with existing systems – *f*

- Need for an interface between the banks
- Need to maintain correspondent banking arrangement
- Reconciliation of data
- Duplication of data
- Different systems for Auditors
- Duplication of logic for processing the transactions
- Huge cost

Blockchain example (contd..)

Blockchain World Scenario: Transaction between different banks:



Distributed Ledger before transaction :

Id	Issuer	Holder	Currency	Amount
1	Barclays	Alice	USD	10
2	HSBC	Charlie	USD	5

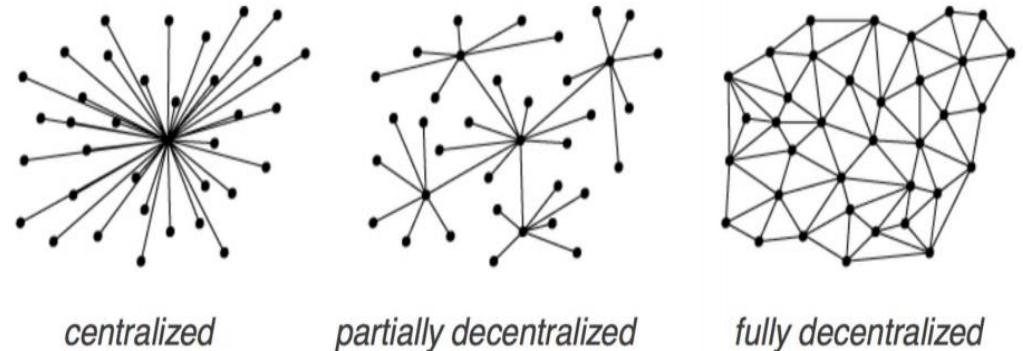
Distributed Ledger after transaction :

Id	Issuer	Holder	Currency	Amount
1	Barclays	Alice	USD	5
2	HSBC	Charlie	USD	10

What Is Blockchain Technology? Lets revisit again...

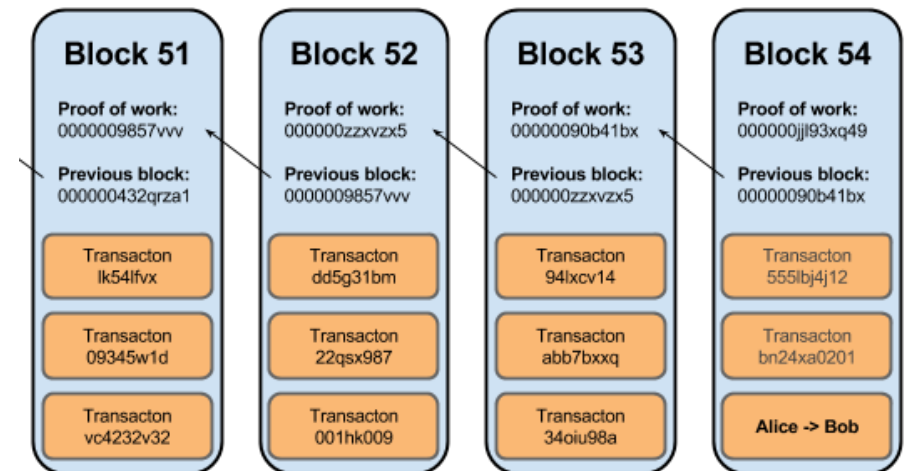
Distributed ledgers are systems that enabled parties

- who don't fully trust each other
- to form and maintain consensus
- about the existence, status and evolution of a set of shared facts
- spread across multiple sites/countries/institutions (nodes)



A Blockchain is

- a type of distributed ledger
- comprised of unchangeable, digitally recorded data (transactions)
- bundled in packages called blocks
- these blocks are linked to each other to form a chain



What Is Blockchain Technology? Lets revisit again...

How is Distributed Ledgers different from distributed databases?

- Distributed databases don't have different nodes being run by different parties
- In Distributed databases, all nodes are under the control of a central party

What is difference between Bitcoin and Blockchain?

- Bitcoin is virtual crypto currency
- Blockchain is the backend system which stores Bitcoin on to the Distributed Ledger

Need for Distributed Ledgers... The Finance IT problem statement...

Problem Statement - In finance, parties don't fully trust each other but need to build consensus among them about shared facts – agreements, contracts, deals and so on.

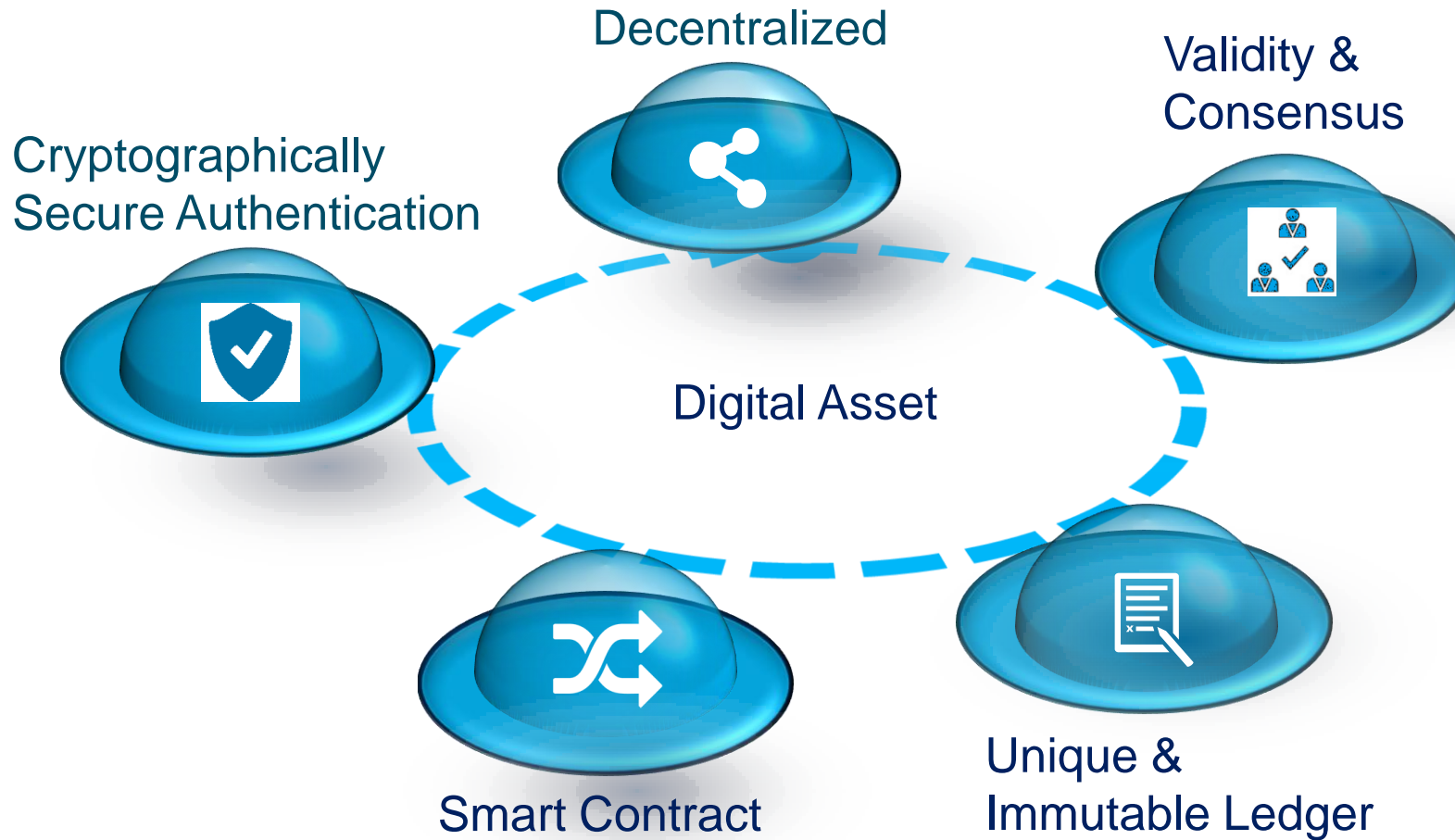
Key Issues with existing Finance IT systems – *f*

- proliferation of systems that exists between financial institutions *f*
- the same information is recorded in multiple places by different parties in different systems all slightly different
- there is a huge amount of work through reconciliation, matching to bring their systems back into consensus
- the existing platforms or solutions are not designed to solve the problem statement

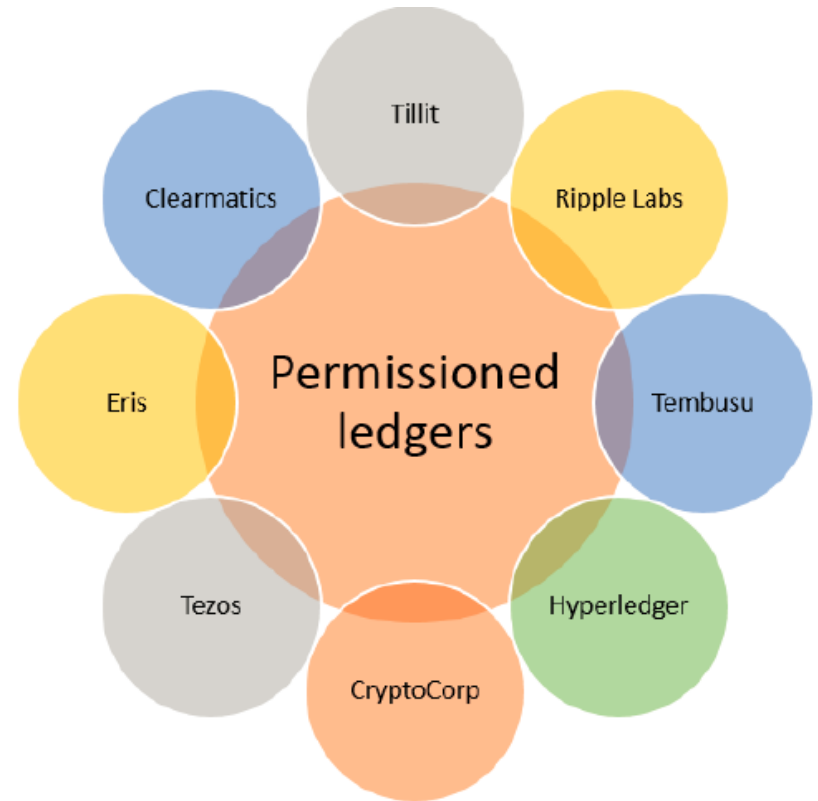
The Distributed Ledger Technology can bring in consensus and remove discrepancies, duplication and errors in the existing IT systems resulting in

- same data “view” across all shared parties
- reduction in cost and duplication out of IT systems
- same data processing logic across all shared parties to process the data (smart contract)

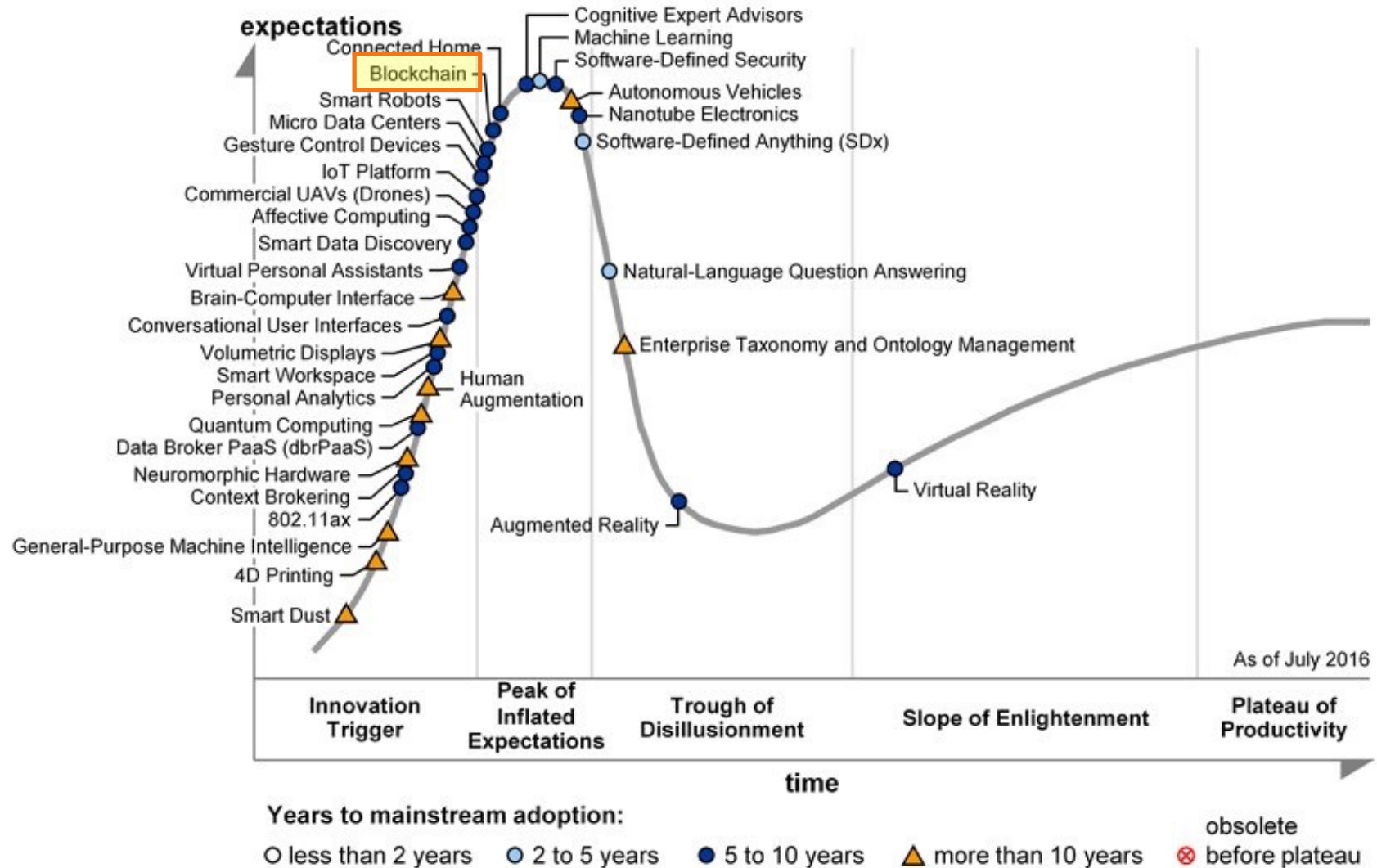
What are the major Blockchain Components ?



Types of Distributed Ledgers



Gartner Emerging Technology Hype Cycle July 2016



Benefits of Blockchain Implementation



Reduce Cost

- Removes cost of intermediaries
- Smart contracts reduce manual processing, re-work and processing errors

75 %

Potential savings projected by a leading insurer with implementing a Catastrophe Bond on a blockchain.

\$20B

Blockchain technologies could reduce banks' infrastructural costs by \$15-20bn a year by 2022.



Increase Revenue

- New Products and Services

\$10B

UBS donated blockchain-based trading platform to be used to raise \$10B selling social impact bonds.

2M

Grammy nominated artist Imogen Heap launched her single 'Tiny Human' on a blockchain based platform Ujo Music to her 2M Twitter followers.



Reduce Risk

- No single point of failure or attack
- Non-repudiability reduces risk of fraud
- Immutability and provenance preserves audit trail

360°

A leading insurer is looking to implement a KYC solution to build a 360° Customer view on a blockchain.

\$10B

Global spend on Anti-Money Laundering compliance alone is estimated at \$10B.



Increase Speed and Customer Satisfaction

- Allows T+0 settlement
- Simplifies supply chain removing intermediaries
- Guarantees supply chain provenance

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Several trading houses are looking to leverage blockchain technologies to allow T+0 trade settlements.

What use cases are suited for Blockchain?

- ❑ **Lightweight financial systems:**

A Financial system which will allow a group of financial entities to transact and exchange assets between them

e.g.: loyalty points, banking applications

- ❑ **Provenance tracking:**

Tracking the origin and movement of high value assets across a supply chain

e.g.: movement of high value items across supply chain, land registry

- ❑ **Interorganizational record keeping:**

Blockchain can provide a mechanism for collectively recording and notarizing any type of data, whose meaning can be financial or otherwise

e.g.: KYC

- ❑ **Multiparty aggregation:**

This usecase is technically same as above but the motivation is different - to overcome the infrastructural difficulty of combining information from a large number of separate sources

e.g.: reciprocal sharing arrangement for common customer set across banks

Issues/Concerns of Blockchain

- ❑ Blockchains are not suited for **high frequency transaction volumes**. A Bitcoin transaction, by design, will get one confirmation after an average of 10 minutes.
- ❑ **Irreversible transactions** (e.g. the DAO Hack)
- ❑ **Shift from centralized authority to and autonomous**, digital and decentralized network for trusted P2P transactions challenges societal and economic norms
- ❑ **High Deployment cost** as the size of decentralized ledger will be bigger than the centralized ledger

Blockchain Technologies

- ❑ **Eris (Monax):** Platform to connect to various blockchains in a standardized way without the need to learn new commands when switching from one blockchain to another.
- ❑ **Ethereum:** Public blockchain platform that can run smart contracts. Has its own cryptocurrency – Ether
- ❑ **Hyperledger:** Hyperledger is a permissioned, shared ledger developed as part of Linux Foundation. There are currently two incubator projects under the Hyperledger umbrella: “Fabric” and “Sawtooth Lake.”
- ❑ **Corda:** R3 Corda is a distributed ledger platform designed from the ground up to record, manage and synchronise financial agreements between regulated financial institutions.
- ❑ **BigchainDB:** BigchainDB is “a scalable blockchain database” capable of one million writes per second. It is built upon a big data distributed database (RethinkDB) and is capable of blockchain characteristics - decentralized control, immutability, creation and movement of digital assets

Q & A

References

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