Blockchain & Storage Bridging the Gap

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Agenda

Blockchain and DLT – A refresher

Blockchain Trends and Storage

Blockchain in Storage

Q&A

Blockchain and DLT

- A **blockchain** is a decentralized, distributed ledger that is used to record transactions

- Blockchain Network comprises of digitally recorded data in packages called Blocks

- These digitally recorded "blocks" of data is stored in a linear "chain"

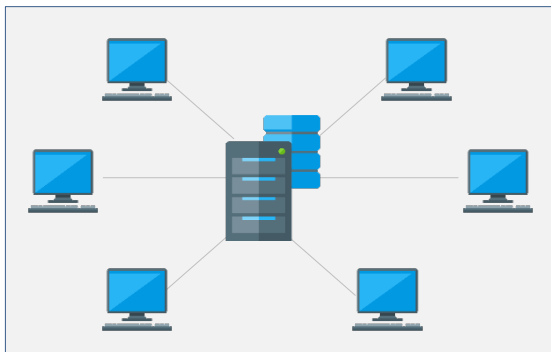- Each block in the chain contains transaction data which is cryptographically hashed

Access Privilege

Centralised Database
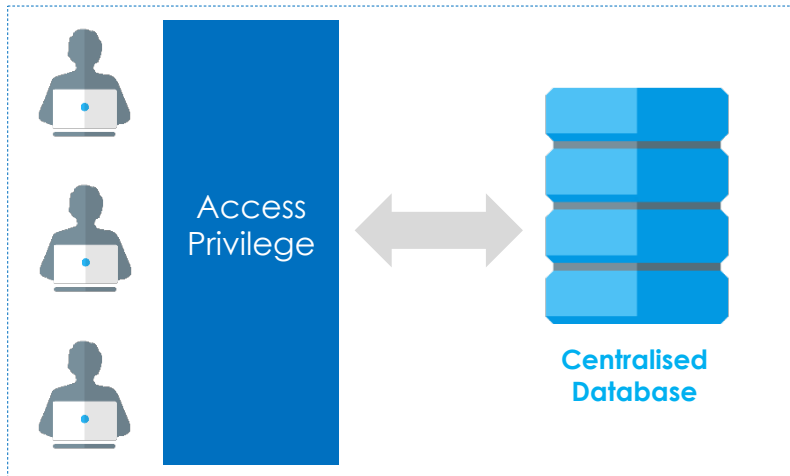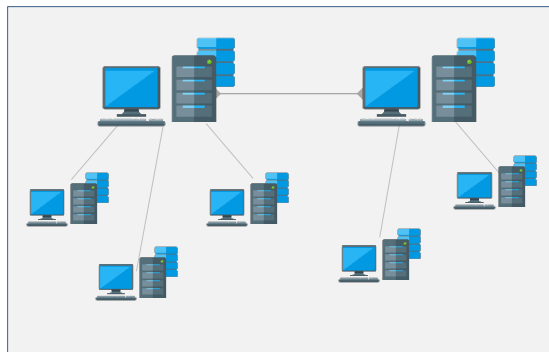
Traditional Database
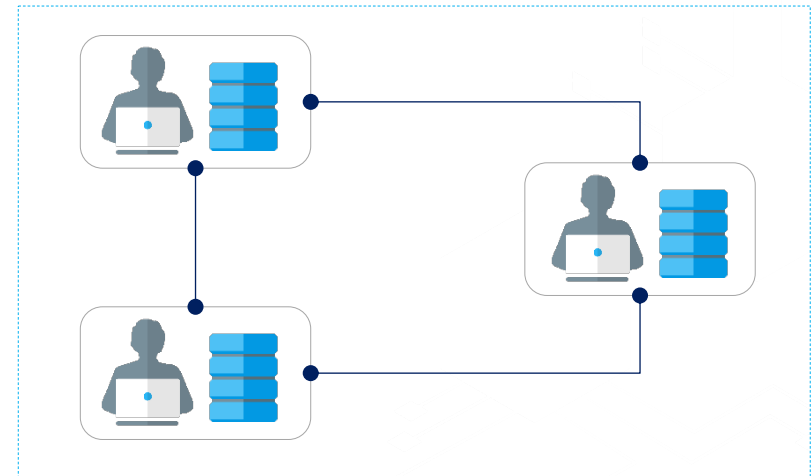
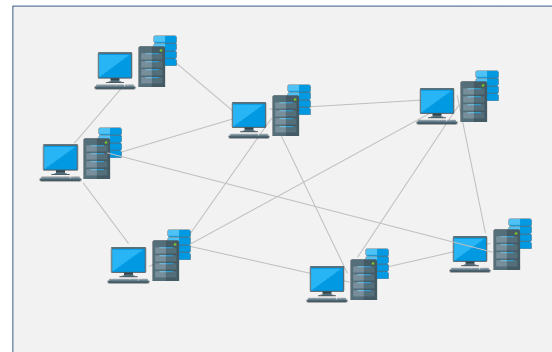**Distributed Ledger Technology**

Blockchain and DLT

Centralized

Decentralized – Based on Hubs

Distributed

A **distributed ledger** is a type of data structure which resides across multiple computer devices, generally spread across locations or regions.

Distributed ledger technology generally consists of 3 main components :

A **data model** that captures the current state of the ledger

A **language of transactions** that changes the ledger state

A **protocol** used to build consensus among participants around which transactions will be accepted, and in what order, by the ledger
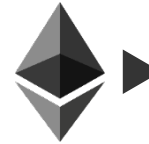
Cryptocurrencies - Blockchain

First Cryptocurrency
Launched in **2009**
1 BTC = approx. **USD7900**

Cryptocurrency and Platform
Launched in **2015**
1 ETH = approx. **USD 250**

#	CRYPTO NAME AND PRICE			CAP MARKET	VOLUME TODAY'S	24H CHANGE
1	**BTC** BITCOIN	$7,895.70	▼	$139.86B	$22.81B	-1.32%
2	**ETH** ETHEREUM	$249.44	▼	$26.48B	$10.98B	-1.28%
3	**XRP** RIPPLE	$0.391212	▲	$16.48B	$1.99B	-2.63%
4	**BCH** BITCOIN CASH	$405.47	▼	$7.21B	$2.66B	-0.57%
5	**EOS** EOS	$6.17	▼	$5.63B	$2.35B	-2.17%
6	**LTC** LITECOIN	$90.08	▲	$5.57B	$3.44B	-2.16%

Storage & Blockchain

Blockchain Terminologies

Genesis Block

Node

Mining

Consensus

Finality

the first block of
a block chain.

Blocks of data are stored
on nodes
Nodes form the infrastructure
of a blockchain. All nodes on
a blockchain are connected to
each other
A full node is a device that
contains a full copy of the
transaction history of the
blockchain.

A process by which
transactions are verified
and added to the public
ledger

Protocols that make sure all
nodes are synchronized with
each other and agree on which
transactions are legitimate and
are added to the blockchain.

affirmation that all well-
formed blocks will not be
revoked once committed to
the blockchain.

Mining Rig - Bitcoin

Blockchain Trends

Size of the Bitcoin blockchain from 2010 to 2019, by quarter (in megabytes)

Blockchain size in megabytes

250 000
200 000
150 000
100 000
50 000
0

Q3 '10 Q1 '11 Q3 '11 Q1 '12 Q3 '12 Q1 '13 Q3 '13 Q1 '14 Q3 '14 Q1 '15 Q3 '15 Q1 '16 Q3 '16 Q1 '17 Q3 '17 Q1 '18 Q3 '18 Q1 '19
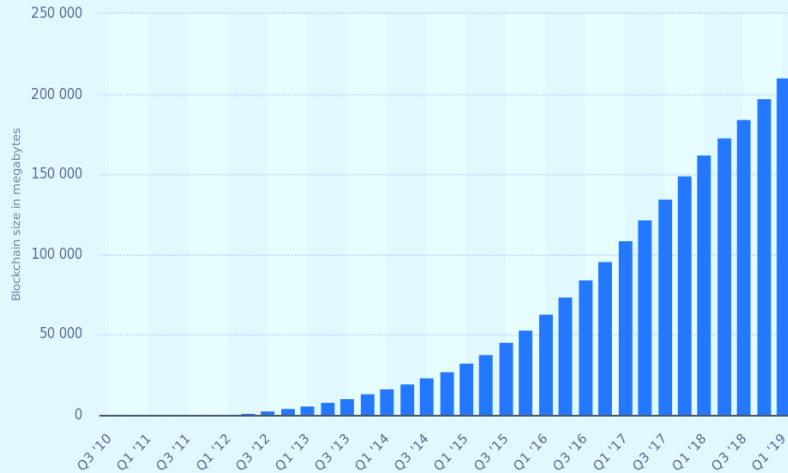
Source
Blockchain
© Statista 2019

Additional Information:
Worldwide; Blockchain; 2010 to 2019

Number of Blockchain wallet users worldwide from 1st quarter 2016 to 1st quarter 2019

Number of blockchain wallet users

40 000 000
30 000 000
20 000 000
10 000 000
0

Q1 '16 Q2 '16 Q3 '16 Q4 '16 Q1 '17 Q2 '17 Q3 '17 Q4 '17 Q1 '18 Q2 '18 Q3 '18 Q4 '18 Q1 '19
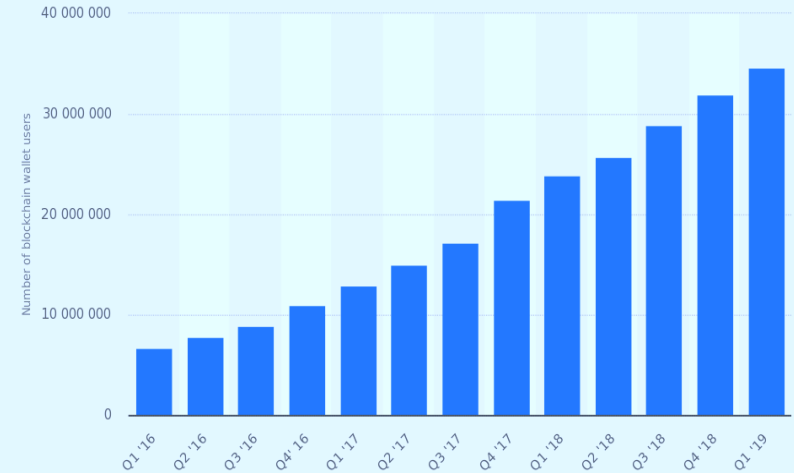
Source
Blockchain
© Statista 2019

Additional Information:
Worldwide; Blockchain; Q1 2016 to Q1 2019

Blockchain Trends

Ethereum Full Node Sync Default Chart
Source: Etherscan.io
Click and drag in the plot area to zoom in

Ethereum Full Node Sync Archive Chart
Source: Etherscan.io
Click and drag in the plot area to zoom in
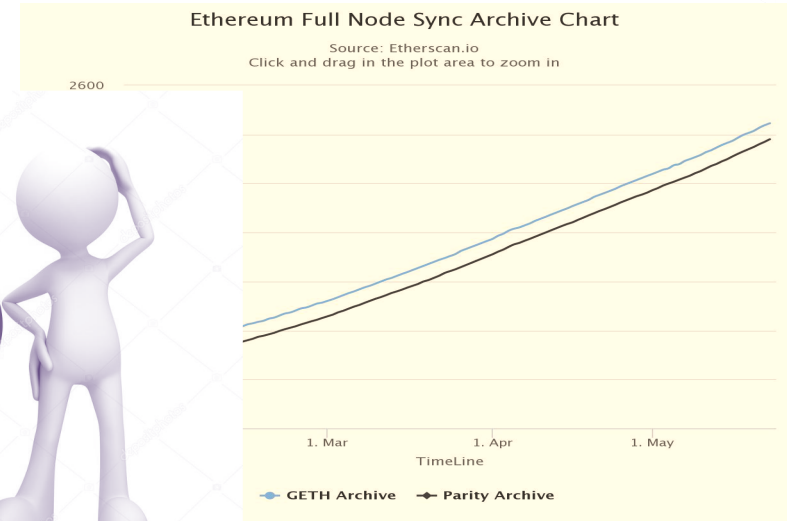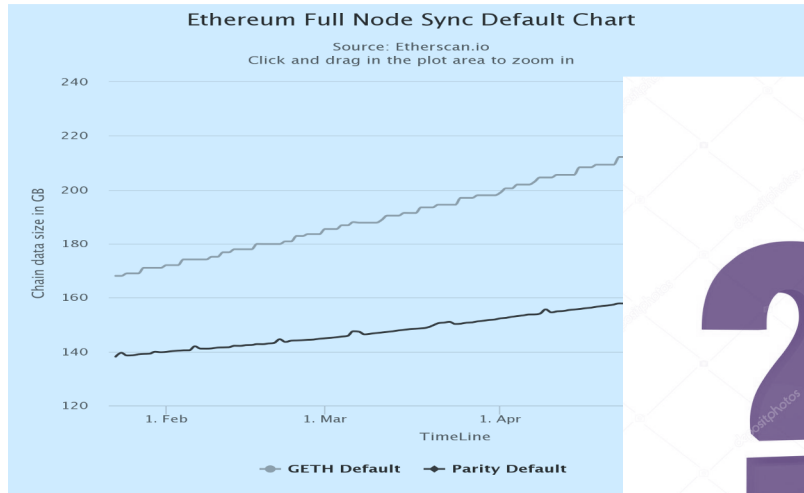
	Bitcoin	Ethereum
First Block	2009-01-09	2015-07-30
Blockchain Size	257.49 GB	240.63 GB

Sharding

- Split the state and history of the network into multiple partitions or shards.

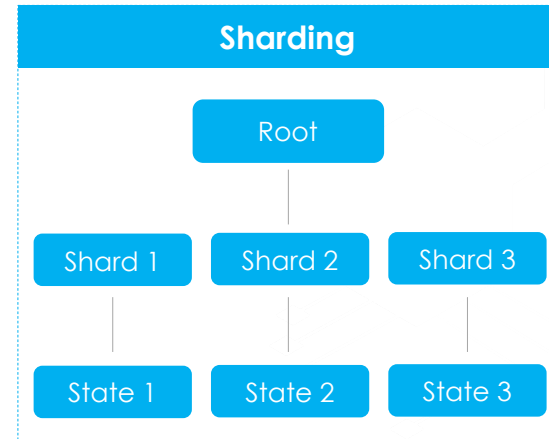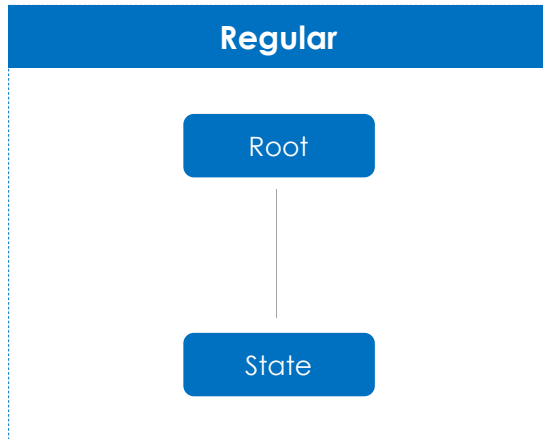- Each new transaction on each individual shard would change the state of that shard only.

- Every shard processes its own portion of the state of the network, which allows the system to process many transactions in parallel, thus significantly increasing throughput

Regular
Root
State

Sharding
Root
Shard 1   Shard 2   Shard 3
State 1   State 2   State 3

Blockchain in Storage

Storage - DeCentralization
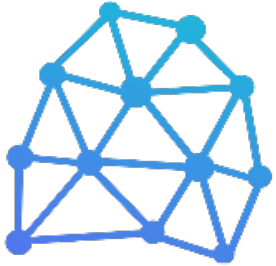
Decentralized Storage

- Data is stored on multiple computers that are hosted by the participants on the network.
- It is a P2P (peer-to-peer) decentralized storage solution.
- Files are protected with the help of cryptography.
- In decentralized network anyone can participate and become the member.
- Participants can be incentivized in cryptocurrency by sharing their unused disk space.

STORJ.IO

Storj is an open source, decentralized file storage solution that uses encryption, file sharding, and a blockchain-based hash table to store files on a peer-to-peer network.

SIA

Sia is a decentralized storage platform secured by blockchain technology. The Sia Storage Platform leverages underutilized hard drive capacity around the world

Filecoin

Filecoin is an open-source, public, cryptocurrency and digital payment system. A blockchain-based cooperative digital storage and data retrieval method

MaidSafe

MaidSafeCoin (MAID) is the decentralized currency for the SAFE Network, a autonomous and decentralized data network that boasts extra hard disk space..

Questions

References and Further read

- https://medium.com/edchain/what-is-sharding-in-blockchain-8afd9ed4cff0

- https://github.com/ethereum/wiki/wiki/Sharding-FAQ#what-is-the-basic-idea-behind-sharding

- https://bitinfocharts.com/

- https://dataconomy.com/2018/01/blockchain-data-storage-decentralized-future/

- https://medium.com/mechanism-labs/finality-in-blockchain-consensus-d1f83c120a9a

- https://www.quora.com/What-infrastructure-is-required-for-Bitcoin-mining-How-do-I-configure-it

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