Block Chain

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2. Introduction
   1. These days block chain is one of the most fascinating and excising technologies of the modern world
   2. Block chain is a decentralized database that keeps record of the transaction
   3. A record of new transactions is stored on a block and a chain of those blocks are created with the successful completion of a block
   4. The process of generating a block to add to the block chain, known as mining, can be performed by any node in the distributed network
3. Overview of Block Chain
   1. Distributed database ledger
      1. Every party can verify the transactions of its partners directly without needing the third-party software or organization
   2. Computational logic
      1. The block chain is based on digital ledger meaning that transactions can be tied to computational logical and can be programmed
   3. Peer-to-peer transaction
      1. This is a direct communication between peers instead of using a central node
   4. Transparency
      1. Each transaction and its associated values can be seen by anyone who has the access to the system
4. Block chain oriented SE
   1. Block chain architecture
      1. It consists of continuous sequence of blocks which contains the transactional data
      2. First block of the block chain is called genesis block and has no parent block
      3. Each block contains six type of information
         1. Block version
         2. Timestamp
         3. nBits
         4. Nonce
         5. Parent Block hash
         6. Merkle tree root hash
   2. Block chain merles tree data structure
      1. Block chain uses Merkle tree as underlying data structure that stores the hash value of all the transitions in the block
      2. Merkle tree provide the mean to prove the integrity and validity of data in the block transaction
      3. Merkle tree uses less disk space and provide fast and easy lookups
      4. For transaction proof, it requires only tiny amount of information to be transmitted on the net work
5. Use Case of Block Chain
   1. File storage
   2. Internet of things (IoT)
   3. Secured messaging app
   4. Supply chain software
   5. Identify management software