Linux Academy

Course Title

Section Title

Video Title

Blockchain Explained

Blockchain The Meat and Potatoes:

Why Does Blockchain Exist? Where Did It Come From?

* In 2008, Satoshi Nakamoto created blockchain to serve as the public transaction ledger for the cryptocurrency Bitcoin
* Cryptocurrency is a virtual asset (money) secured by cryptography so that it is nearly impossible to counterfeit or double-spend (something that happens all too often with physical currency, checks, and credit cards)
* Most types of transactions occur within a database of some kind, run by private companies. We never get to see how a given company performs transactions or who has access to that data.
* The goals that blockchain meet are security, transparency, and decentralization
* Transparency
  + The blockchains transactions are recorded in such a way that they cannot be changed without the changes also being recorded
* Security
  + Every action that happens on a blockchain us encrypted and placed in the order the action occurred
* Decentralization
  + No single authority makes changes to the blockchain
  + Changes are examined and approved by multiple parties in the system

Blockchain What Is It?

* Can be loosely defined as a data structure that holds transactional records while ensuring transparency, security, and decentralization
* Also think of it as an unbroken chain of records stored in the form of blocks which are not controlled by a single entity
* The “block” is where the transaction data is placed
* The “chain” is the file or database where the blocks are stored
* Blocks store information about the transaction
  + Data
  + Time
  + Dollar amount
* Blocks store information about who participates in the transaction
  + Buyer
  + Seller
* Blocks store information that makes them unique
  + All blocks have unique identifier called a “hash”, created by an algorithm

1. The blockchain begins
   1. A purchase is made, an appointment is set, or something is shipped. That activity then gets verified. That data is then stored in a block.
2. The block is given an unique id
   1. Once all transactions in a block are verified and loaded, encryption gives the block a unique hash. For those who are curious, blockchain encryptions use SHA-256
3. The block is added to the chain
   1. The hash for the preceding block is added to the hash of the new block, and then the block is added to the chain

Where is Blockchain Data Stored?

* Centralized vs decentralized storage
* Centralized
  + The data is stored in one place, is controlled by one entity, or both
* Decentralized
  + Data is stored and synchronized between many physical locations by many entities

How is Blockchain Used?

* Cryptocurrency
  + Bitcoin, Etherium, Ripple
* Supply chain
  + IBM blockchain
    - Provides the status and transparent record of ownership and location of parts in real time
  + Food industry
    - Blockchain assists with tracking food-borne contamination anywhere in the path of ownership the food takes
* Healthcare
  + MedicalChain
    - Uses blockchain to store and use health records so that doctors can better facilitate a “telemedicine” experience for patients
* Charity
  + BitGive
    - Leverages bitcoin to offer transparency to donors by sharing real-time project information and financial data
    - The water project, save the children, medic mobile
* Entertainment
  + Spotify
    - Connects artists and licensing professionals with tracks on Spotify’s service
  + KickCity
    - Matches event organizers with influencers and provides ticketing
* Exotic Cars
  + BitCar
    - Uses blockchain to provide fractional ownership of high-priced exotic cars
* Financial Services
  + Companies like bitcoin atom, securrency, and ABRA use blockchain to facilitate cryptocurrency exchange

The Future of Blockchain:

* Copyright protection
  + Blockchain could provide more transparent usage tracking of copyrighted material
* Digital voting
  + Provide identity management and practically eliminate the concern of voting data becoming compromised
* Tax regulation and compliance
  + Provide clear records of financial and compliance adherence
* Equity trading
  + Change the stock market trading system as we know it
* Land and title transfer
  + Allow for real estate and other purchases to happen with less confusion
* Smart contracts
  + Use blockchain to keep track of what items or tasks are fulfilled in business contracts or wills
* Digital passports
  + Identity management, travel management, and providing expedited screening

Summary:

* Blockchain was invented to support bitcoin
* Blockchain is transactional data stored in a decentralized fashion, encrypted, and with a clear record of changes made
* Being decentralized means that many, many systems store and mediate blockchain transactions
* Blockchain is already used in many industries and is in development to support many more