

Future of Networking and Cyber Security with Blockchain Technology

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Abstract

Blockchain Technology is characterized as a decentralized circulated record framework which is utilized to record information exchanges over various COMPUTERS. The motivation behind why this innovation has picked up fame is that you can put any advanced resource or exchange into the blockchain, the industry does not make a difference. By enabling advanced data to be appropriated yet not duplicated, blockchain innovation made the foundation of another kind of web. Initially formulated for the advanced money, Bitcoin, (Buy Bitcoin) the tech network has now discovered other potential uses for the innovation.

In this paper we discuss networking and cyber security through blockchain. We also describe the use of blockchain in different fields of computer science. There is no paper exist in networking with blockchain only some reports about this topic and also not much research papers on cyber security with blockchain.

Blockchain innovation can be utilized to avoid any sort of information breaks, character burglaries, digital assaults or injustice in exchanges. This guarantees the information stays private and secure. There is Potential utilization of Blockchain innovation for systems administration and we are hunting down evident systems administration uses of Blockchain innovation.

NASA chose to execute blockchain innovation so as to help digital security, and avert refusal of administration and different assaults on air traffic administrations. They will do this by utilizing the equivalent conveyed record innovation that is regularly connected with bit coin and other digital forms of money.

Keywords: Cyber Security; Networking; Blockchain; Use-Case of Blockchain; Decentralized Distributed Ledger System

Introduction

Theoretically, the blockchain is a disseminated database containing records of exchanges that are shared among taking part individuals. Every exchange is affirmed by the accord of a greater part of the individuals, making fake exchanges unfit to pass aggregate affirmation once a record is made and acknowledged by the blockchain, it can never be adjusted or vanish.

What essentially began as the innovation behind Bitcoin, has assumed control over the present reality. Blockchain innovation has saturated each circle of our lives from banking to social insurance and past. Digital security is an industry which has been fundamentally affected by this innovation with an extension for additional later on. In Alex Momot's words, 'By evacuating a great part of the human component from information stockpiling, Blockchains essentially moderate the danger of human mistake, which is the biggest reason for information breaks.' By enabling advanced data to be circulated however not replicated, blockchain innovation made the foundation of another sort of web. Initially contrived for the advanced cash, Bitcoin, (Buy Bitcoin) the tech network has now discovered other potential uses for the innovation.

From a digital security perspective, Blockchain innovation offers another approach to consider framework plan that disincentivizes digital assault. For instance: It resembles the contrast between a network putting away the entirety of their cash in a national bank, and every individual keeping their own cash in their homes. A bank has security frameworks, but on the other hand it's a conspicuous focus for burglars who need to make a major score.

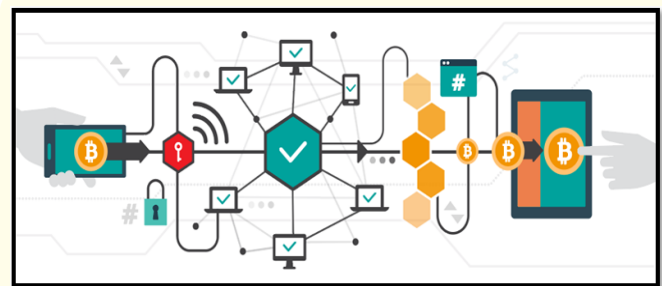


Figure 1: Blockchain security structure (RID).

Blockchain is intended to be ethical and on the grounds that it's a decentralized design, frameworks based on Blockchain are progressively hard to focus with hacking. Rather than having a whole framework worked in one area and having every one of the con-

tributions to that framework oversaw at a main issue, Blockchain biological systems are fundamentally de-unified. There's nobody place where a Blockchain stage dwells, so it's hard to assault it, contrasted with conventional information the board framework.

On a computer framework or system, information might be checked for a wide range of purposes. Information checking may distinguish issues, watch conditions or track measurements by logging the occasions of a given computer framework or system, the patent states. Verifying such information is basic for an organization. With that in mind, Big Blue notes that organizations may set up an arrangement of gadgets to screen endeavored interruptions on the conveyed system, utilizing hub agreement to signal any anomalies.

The sensors permit agreement by passing a similar data to more than one screen. At the point when screens are approving data, in the event that information for an occasion or exchange does not coordinate, at that point one screen may have been undermined. In such an occasion, this may caution the screen security program of conflicting information, which thusly cautions the framework overseers that there is an issue. Utilizing blockchain innovation to feature abnormalities along these lines would in this way make a less helpless system as per IBM.

Blockchain and networking

The Financial Times (2016) characterizes Blockchain as a "system of computers, all of which must affirm an exchange has occurred before it is recorded, in a 'chain' of computer code. The subtleties of the exchange are recorded on an open record that anybody on the system can see".

There is Potential use of Blockchain technology for networking and we are searching for true networking applications of Blockchain technology. One potential use for distributed ledgers in networking has to do with addressing. All connectionless networks require network-unique addresses, and in all known networks the uniqueness is enforced by some centralized entity centralized entities aren't perfect, they are dictatorial can be compromised, and are usually slow. Is it possible to build an administrator-free purely distributed mechanism for address allocation based on Blockchain?

Layer 5	Quality of service
Layer 4	Decentralized application
Layer 3	Blockchain
Layer 2	Mining software
Layer 1	Network infrastructure

Table 1: Networking structure of blockchain.

Blockchain has been used to allocate identifiers for overlay networks enabling mapping arbitrary addresses to IP addresses. Thus, for example, we could replace the hierarchical DNS system

with a Blockchain that allows anyone to choose a URL, checks for uniqueness, and later can map the URL to the desired IP address.

However, this solution is limited to addresses that act only as identifiers – not locators. Can we use Blockchain for large stand-alone infrastructure networks? The problem lies in scaling. For small networks all we have to do is to store the location of each unique address (like the table in an Ethernet switch). Large IP networks rely on sub networking indicated by address prefixes, which at first glance seems to require at least some centralization of address allocation.

Of course, the Internet is already divided into autonomous systems, each representing some aggregation of CIDR addresses. So, a separate Blockchain per AS would maintain scalability, and could go hand-in-hand with a mobility scheme; and if these addresses are treated as ephemeral, then a ledger would be a natural way of supervising them. An alternative would be a single global Blockchain for suffixes (of course these could be arbitrary strings, not limited to bits) to which the user prepends a prefix according to location. Note that both of these alternatives might be vulnerable to DoS attacks on the address infrastructure.

Even if we could perform decentralized address allocation using Blockchain technology, that doesn't mean that proof-of-work-based Blockchain is the ideal solution to this problem. As we have mentioned, proof-of-work is notoriously wasteful and relies on finding sufficient financial incentives. It is not clear that a ledger (rather than a database) is required for this application. In addition, Blockchain technology is so new that many of the complex (legal, security, financial) policy problems that it raises have yet to be resolved.

Blockchain can also be applied to other uses of ledgers, perhaps with less waste and in a more stable manner. Is Blockchain the answer to any questions in networking? Only time will tell.

Blockchain-based network security system

On a computer framework or system, information might be checked for various purposes. Information checking may distinguish issues, watch conditions or track measurements by logging the occasions of a given computer framework or system, the patent states. Verifying such information is basic for an organization. With that in mind, Big Blue notes that organizations may set up an arrangement of gadgets to screen endeavored interruptions on the dispersed system, utilizing hub accord to signal any inconsistencies.

The sensors permit agreement by passing a similar data to more than one screen. At the point when screens are approving data, on the off chance that information for an occasion or exchange does not coordinate at that point one screen may have been undermined. In such an occasion, this may alarm the screen security program of conflicting information, which thusly cautions the framework over-

seers that there is an issue. Utilizing blockchain innovation to feature abnormalities along these lines would in this way make a less helpless system as indicated by IBM.

Cyber security with blockchain

Blockchain innovation can be utilized to counteract any sort of information ruptures, character robberies, digital assaults or treachery in exchanges. The expense of digital wrongdoing costs high from 2013 to 2015 anyway a substantial bit of cybercrime goes undetected. Gartner report says cost of digital wrongdoing is relied upon to reach \$2 trillion by 2019 [IBM's CEO, Ginni Rometty said that cybercrime is the best risk to each organization on the planet at IBM Security Summit. Around two years prior Standard Chartered lost around \$200 million out of extortion at China's Qindao port. Banking and money related organizations are utilizing Blockchain based innovation to diminish chance and counteract digital extortion.

Some use-cases of Blockchain in cyber security
Protected edge computing with authentication

Edge computing is beneficial for IT effectiveness, efficiency and power utilization however it speaks to a security challenge for CISOs, CIOs and the more broad business; along these lines Blockchain is giving an answer for secure IoT and Industrial IoT. It will help in the reinforcing of confirmation, improved information attribution and stream just as redesign record the board.

Advanced confidentiality and data integrity

Inferable from its inclination of open dissemination, Blockchain was made with no specific access controls at first. Be that as it may, with time, as the innovation began giving answers for numerous businesses, blockchain usage presently has scope for information classification just as access control. The total encryption of the Blockchain guarantees that information overall or to some extent isn't available to any unfair individual or association while in travel.

Secured private messaging

A great deal of organizations is taking a looking at Blockchain to verify their own and private data traded over visits, informing applications and online life. They plan to make it into a protected stage with the assistance of Blockchain and invulnerable to remote assaults.

Improved PKI

PKI or Public Key Infrastructure continues informing applications, messages, sites and different types of correspondence secure. In any case, they all depend on outsider endorsement experts to issue, renounce or store key sets. These declaration specialists can turn into an obvious objective for programmers with satire characters endeavoring to infiltrate scrambled correspondences. Then again, when keys are distributed on a blockchain, it leaves no degree for a bogus key age or data fraud as the applications check the personality of the individual you're speaking with.

Intact domain name system (DNS)

The DNS is an obvious objective for malignant exercises as programmers can cut down the DNS specialist co-ops for significant sites like Twitter, Paypal and different administrations. A Blockchain way to deal with putting away these DNS sections can improve the security widely on the grounds that it expels that one single target which can be undermined.

Diminished DDoS attacks

A distributed denial-of-service (DDoS) assault is an assault where different traded off computer frameworks assault an objective, for example, a server, site or another system asset, and cause a disavowal of administration for clients of the focused on asset. This powers the framework to back off or even accident and shut down, in this way refusing assistance to real clients or frameworks. This issue can be fathomed by coordinating blockchain into decentralized arrangements which can give insurance against such assaults. We can create and receive different measures for security, but dangers create and adjust in like manner. Be that as it may, with blockchain, we have a huge extent of guaranteeing information is sheltered.

The benefits of blockchain

The advantages of blockchain are clear, expanded perceive ability and straightforwardness, diminished extortion, not so much administrative work but rather more proficiency prompting lower costs. Yet, the inventory network world is pondering how best to actualize this innovation in our current reality where the nuts and bolts are as yet developing.

Innovation of blockchain in different fields

Blockchain will mature in a number of areas as the body of research grows. Researchers are working to apply a number of use cases included smart contracts, supply chain, and healthcare, as this paper demonstrates.

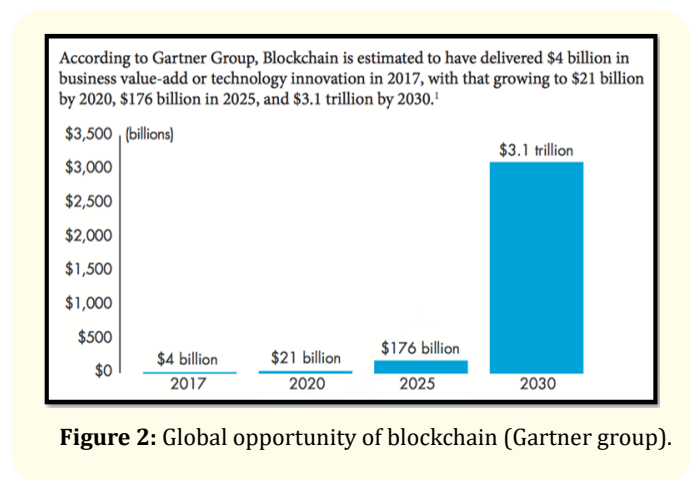


Figure 2: Global opportunity of blockchain (Gartner group).

Finance

Blockchain is a decentralized record used to securely exchange mechanized cash, perform courses of action and trades. Each person from the framework approaches the latest copy of mixed record

with the objective that they can support another trade. Blockchain record is a collection of all Bitcoin trades executed already. Basically, it's a dispersed database which keeps up a reliably growing deliberately planned data structure squares which holds groups of individual trades. The completed squares are incorporated an immediate and successive solicitation. Each square contains a time-stamp and information interface which centers to a past square. Bitcoin is disseminated approval less framework which empowers every customer to interface with the framework and send new trade to affirm and make new squares.

Health care

In a human services framework, smooth information sharing between social insurance arrangement suppliers can prompt precision in determination, successful medications, and savvy environment. The everyday development of patient information requires legitimate usage of assets so as to make the best use of the bits of knowledge found through blockchain. Blockchain for human services permits numerous elements of the social insurance environment to remain in a state of harmony and offer information on an ordinarily appropriated record. With such a framework set up, the members can share and monitor their information and different exercises occurring in the framework without paying special mind to extra alternatives for respectability and security.

Energy distribution

Blockchain may help take care of a few complex issues identified with verifying the honesty and reliability of fast, appropriated, complex vitality exchanges and information trades. The digital security of present day control frameworks has attracted expanding consideration both scholarly community and industry. Numerous location and barrier strategies for digital assaults have subsequently been proposed to upgrade vigor of present day control frameworks. Appropriated blockchain depends on insurance structure to upgrade the self-protective capacity of present day control frameworks against digital assaults. We present a complete discourse on how blockchain innovation can be utilized to upgrade the heartiness and security of the power matrix, by utilizing meters as hubs in a dispersed system which epitomizes meter estimations as squares.

Voting systems

Blockchain is putting forth new chances to grow new sorts of advanced administrations. While investigate on the point is as yet rising, it has for the most part centered around the specialized and lawful issues as opposed to exploiting this novel idea and making progressed advanced administrations. Blockchain is going to use the open source Blockchain innovation to propose a plan for another electronic casting a ballot framework that could be utilized in nearby or national races. The Blockchain-based framework will be secure, solid, and unknown, and will help increment the quantity of voters just as the trust of individuals in their administrations.

Cloud computing

Cloud information provenance is metadata that records the historical backdrop of the creation and tasks performed on a cloud information object. Secure information provenance is essential for information responsibility, legal sciences and protection. Blockchain give a decentralized and confided in cloud information provenance design utilizing blockchain innovation. Blockchain-based information provenance can give carefully designed records, empower the straightforwardness of information responsibility in the cloud, and help to upgrade the protection and accessibility of the provenance information. We utilize the distributed storage situation and pick.

IoT

The Internet of Things (IoT), a developmental innovation that raised and increased colossal extension in the science and designing applications taking care of issues without the mediation of human-human work power. It empowers generally savvy work power for example making collaboration between human to machine, machine to machine. The web of things (IoT) empowered a typical working picture over the different utilizations of advanced living. The IoT is accomplished through the headways found in remote sensor organize gadgets that had the option to impart through the system in this way trading data and performing different investigations. In IoT, the trading of data and information verification is just done through the focal server there by prompting the security and protection concerns. Odds of gadget satirizing, false validation, less unwavering quality in information sharing could occur. To address such security and protection concerns, a focal server idea is disposed of and blockchain innovation is presented as a piece of IoT. Through Blockchain explains the conceivable security and protection issues considering the segment association in IoT and concentrates how the dispersed record based blockchain innovation adds to it. Uses of blockchain as for centered divisions and class were obviously contemplated here. Different provokes explicit to IoT and IoT with blockchain were additionally talked about to comprehend blockchain innovation commitment.

Supply chain

The supply chain the executives business is gigantic and encountering twofold digit development quite a long time after year. As per Gartner, the Supply Chain Management (SCM) market will surpass \$19 billion in all out programming deals by 2021. The most concerning issues with the store network the executives business can be tended to by improving access to information for all partners in a trust-limited manner and issue tackled with blockchain. The inventory network industry is the first to embrace blockchain innovation on an important scale [1-13].

Reports

We use the results of different reports to strength our study.

- Report of European Union Agency for Network and Information Security. " Distributed Ledger Technology and Cy-

- ber security Improving information security in the financial sector” www.enisa.europa.eu
- Report of Harvard business reviews “the truth about blockchain” by Marco Iansiti and Karim R. Lakhani.
- Article of Disruptor Daily “Blockchain in cyber security: 10 possible use cases” by Sam Mire.
- Report of Microsoft “Advancing Blockchain Cyber security: Technical and Policy Considerations for the Financial Services Industry” by Erin English, Microsoft, Amy Davine Kim, Chamber of Digital Commerce, Michael Nonaka, Covington and Burling.
- Report of RAD “Blockchain and networking” by Yaakov Stein.

Conclusion

Blockchain is not the solution of every technology problem but possible solution of cyber security of most of the technology sectors. It is not also the future of secure networking and cyber security as well as possibly a new secure internet. Blockchain is not only sending and receiving data as well as store data and it is also work as data warehouse. In future we work on networking with blockchain as a service provider. Our next step is research in blockchain as a separate secure internet.

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