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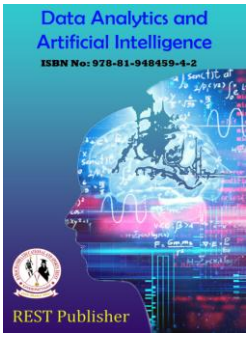

A Study On Decentralized Web Hosting Using Peer-To-Peer Architecture

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Abstract: *Traditionally, websites are hosted viacentralized network, where the web servers distribute the website files to the clients. However a server failure can prevent the web applications from being used until the server goes live again. Due to the fact that websites rely entirely on the integrity of a single organization, it enables larger companies or government to decide what content is shown, this put into question the freedom that the internet originally brought. The block chain hosting service, also known as decentralized web hosting, is not controlled by a single organization or a third party organization. The architecture relies on peer-to-peer communication rather than client-to-server communication. Due to the decentralized nature of this system, all clients do not rely on a single server for their data, but instead data is sent directly between the clients across the network. It is possible to achieve this with the help of IPFS and Block chain. IPFS is a protocol for distributed file storage that allows computers to store and serve files in a peer-to-peer network by distributing them across computers and with the block chain technology, it is possible to ensure both authenticity as well as confidentiality.*

Keywords: *Centralized, Decentralized, Ipfs, Block chain*

1. INTRODUCTION

A web hosting provider hosts websites for customers on the internet. This comprises hosting, serving, and preserving files on the internet. An individual can utilize it to publish their website online. It essentially offers some space on the actual server for the files and data that are necessary for the website to function effectively. A centralized web hosting system has often been used for web hosting and file storage on the server. The client-to-server architecture-based centralized web hosting systems are those in which one or more client nodes are directly linked to a central server. The entire network would crash if the central server node were to malfunction. Additionally, it allows a company or the government to control the data that is transmitted through the network, leading to data disclosure. Decentralized web hosting, which gives each client node in the network control over its data and the ability to make independent decisions without the need for a central server node, was developed to address all the aforementioned difficulties. The peer-to-peer architecture used by the decentralized web hosting system makes each node an equal participant in data exchange. In a peer-to-peer network, these nodes communicate with one another as necessary to exchange resources.

2. WHAT IS DECENTRALIZED WEB HOSTING?

The internet was aided in its development by centralized web hosting services. Client-server architecture is used. In the client-server architecture, all of the services that the clients request are hosted, delivered, and managed by a single central server. These requests and responses are all transmitted via the network. The person, group of individuals, or organization that controls the server node has complete control over all components of the network in this type of centralized web hosting. In other words, each service that's executed by the clients entails a server which has a dedicated owner. The system's operation and the kinds of data that should be shown are not up to the clients' discretion. All other nodes in the network are therefore served by a solitary central server. By doing this, it is certain that the intermediaries and authorities, who have the power to restrict and control what their clients may see, will not see the data being transmitted. This occurs because the existing DNS is dependent on registrars, who are required to act as domain custodians and who have the authority to cancel domains or take them down.A centralized web system has risks. For

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instance, if the central server node were to fail, the entire network would crash, making it unable to transmit or receive requests or responses until the server node was operational once more.

3. DECENTRALIZED WEB HOSTING

With the advent of block chain technology, almost any software may now be decentralized. Decentralizing websites is the next phase, which will end censorship and bring back the free and open internet. A method of hosting a website that prevents it from being abruptly forced down or adversely impacted by a particular vendor's service is known as decentralized web hosting (server). The peer-to-peer architecture is used in the decentralized web hosting system. In a peer-to-peer architecture, a collection of nodes work together to store and distribute files yet each node is still considered of as an individual peer. Instead of being in the hands of a single entity, the end users are in control here. Therefore, it is not feasible for a network to go down due to a single node failing before the entire network of connected nodes fails at once. When there are systems that are connected globally, this would be an uncommon possibility. Each node that's connected over the network acts as both client and server. Here each node that are connected usually stores a copy of the resources users can access, which is tolerant to the server crashes because when a node fails then the others can provide the data access to the users. The requested resources will be active until there's at least one node that consist the resource continues to operate. Since data may be obtained from adjacent nodes in addition to the central node, access to the resources is significantly faster than in a centralised network. Additionally, it is not possible to deliberately restrict, delete, or remove the website hosting components.

4. HOW DECENTRALIZED WEB HOSTING WORKS?

The internet was aided in its development by centralized web hosting services. Client-server architecture is used. In the client-server architecture, all of the services that the clients request are hosted, delivered, and managed by a single central server. These requests and responses are all transmitted via the network.

Ethereum Naming Service (Ens): The Ethereum Block chain serves as the foundation for the Ethereum Naming Service, a domain naming service system. A Standard domain name must be mapped into a machine-readable identifier in order for ENS to function properly. In relative to standard terms, the ENS links complex identifiers made up of letters and numbers to comprehensible domain names. Since the Ethereum Naming Service and the Domain Naming Service have identical goals and employ the same dot-separated domains architecture. Smart contracts are used to govern the .crypto and.eth block chain domains. These smart contracts control how users are apportioned sub-domains when specific criteria are satisfied. As a result, the user will have total control over the sub-domain. When the parties meet the specified circumstances, these smart contracts, which are actually computer programme recorded in the block chain—automatically carry out their predetermined actions. For example, if a person owns the domain "AISEN.ETH," he may use a smart contract to establish a sub-domain called "GADY.AISEN.ETH" and customize it as he desires. These ENS registries include smart contracts as well as data on the following subjects. The first is, DOMAIN OWNERS, which may be an external account or a smart contract. The second is, DOMAIN RESOLVER, The resolver has the ability to convert a domain name into an address. Here, we deliver records for the particular type as an identifier type using IPFS hashes. A resolver can be any smart contract that implements the necessary requirements. The last one is, CACHING TIME OF ALL RECORDS UNDER THE DOMAIN. So, we need to be aware of two things in order to use ENS. One is DAO and the other is ENS tokens. The ENS governance tokens were hosted on ethereum block chains, as implied by their name. Therefore, by possessing ENS governance tokens, we will join the ENS DAO, or Decentralized Autonomous Organization. We may access the ENS community by actively participating in the ENS DAO. This is crucial for obtaining an ENS domain. The first is to have a crypto wallet, to store the ether that we use to pay for the domain. Second, in order to pay for our domain, we must obtain Ether through a centralized exchange. The selection of our ENS domain is the very last and last step toward domain ownership. All transactions can indeed be secure and reliable with the use of block chains, and decentralization can be made possible using IPFS. Users just need to pay for block chain transactions, then. The block chain domains are NFT's that function as universal addresses for the websites and crypto wallets. Block chain is used to hold these domains. As a result, we now have our own ENS domain. If there was no means to store the data in a decentralized manner, then the decentralized internet could never be achieved. The IPFS protocol comes into play here. Domain registries are on a block chain in a decentralized network, which substitutes ENS for DNS. In order to fully govern their website, the user first signs a transaction with their private key and records their IPFS hash on their block chain.

IPFS: As we previously indicated, developing a website to store data in a decentralized manner is a prerequisite for developing a decentralized website. Here, IPFS enters the picture. The term "caching network" is used by those in the data management industry to indicate this shared memory space, IPFS. When we need specific information from the web, we'll use URLs to tell the computer exactly where to find it. Location-based addressing is the basis for these URLs or web addresses. Since it is the IP address, which determines the location of the information, is used to search the content.

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There's a good chance that someone else downloaded the same data before us. However, LOCATION BASED ADDRESSING prevents us from obtaining a specific file from that individual. Therefore, we adopted IPFS. A protocol for serving and storing files is IPFS. The identifiers that are used to identify an online resource are the URLs, or Web addresses. It is made up of several components, including as protocols and domain names. These URLs are the addresses we ask a centralized web for data. These URLs are mostly determined by the location of the storage of the requested data.The client computer would respond to us with the desired data that is present there while the file that we want depends on a machine that is hundreds of miles distant. However, IPFS makes use of CONTENT BASED ADDRESSING, where the key for locating a particular piece of information is determined from the content itself rather than from its location. The algorithm used to create these keys produces the same keys for the same material. This stops data manipulation. The term "content identifier" refers to this kind of key. As a result, rather of retrieving data from the system where it was initially saved, we may get data with a certain CID from a machine that already has that information. Instead of retrieving the material from the computer that is hundreds of miles distant, content addressing allows the content to be retrieved from the nodes that have a copy of the content.

Peer-To-Peer Architecture: Unlike centralized web, the decentralized web uses peer-to-peer architecture. Nodes in the peer-to-peer computer architecture participate equally in transmitting data. Each node receives an equal share of all the tasks. The nodes exchange information and resources with one another as required. Because each user in a peer-to-peer system has the ability to be server and the client, the more users that visit the decentralized website, the more potential to accommodate new users.Peer-to-peer (P2P) services are decentralised platforms that enable two peer to communicate with each other without the use of a intermediaries**.**

5. BUILDING DECENTRALIZE WEBSITE USING PEER-TO-PEER NETWORK

Therefore, in order to build a website in a decentralized manner, we must first register an ENS domain by paying them with Ether and claiming our domain in our wallet. We will copy the IPFS hash, which represents the root object and additional objects may be located in its path, once we have created our website using the ENS domain. We will then sign in with our private key and upload a file using IPFSThis means that anyone on the network can now view the files that were uploaded via IFPS. Once we know the hash of the file we want, we ask the peers on the network for the information that is contained at this hash. The IPFS stores data in a distributed hash table. Data is kept in a distributed hash table by the IPFS.

6. ADVANTAGES

Data Ownership: Decentralized webs have the main advantage of allowing users to own their data. Rather than having their data controlled by a third party, the end users will be fully in charge of their data.

Data Security & Privacy: Considering that it is a distributed network, the entire website would have to go down individually if it was to be taken down if each node in the network went down at the same time.

Censorship: External censorship protection is one of the most important aspects.

No Intermediaries: The process of sharing or receiving data will be simplified because there will be fewer intermediaries.

Rapid Response: In comparison to centralized web, the content can be downloaded from nearby devices instead of having to wait for it to be retrieved from thousands of miles away.

7. DISADVANTAGES

Machine Requirements: It cannot be handled by less capable devices. To utilize decentralize website users will require a device with higher than average performance

Hard To Grasp: Beginners can find it hard to grasp.

Coordination Issues: There will be a coordination dilemma.

Fluctuates: When performance is not adequately tuned, it fluctuates.

8. CONCLUSION

The internet is still decentralized. However, the activities we perform on it on a regular basis are centralized and are under the authority of a small number of global tech corporations. On the other hand, traditional web infrastructure is dependent on centralized services, which might occasionally threaten user data and privacy. Without a question, a

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decentralized website has the ability to remedy the shortcomings of the current web. A decentralized web is also a pragmatic choice that might potentially offer its users more power.

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