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An IPFS-Based Web3.storage Application programming Interface Decentralised storage File-coin Network for IPFS

Karthik Kariappa[1] , Disha[2] , Arpita Shetty[3] , Sayyid Salman Faris[4] , Santosh Prabhakar[5]

Student, Information Science and Engineering, MITE, Moodabidri, India[1-4]

Senior Assistant Professor, Artificial Intelligence and Machine Learning, MITE, Moodabidri, India[5]

Abstract: Interplanetary File System is a decentralized storage architecture that provides web3 storage API. For sharing files to IPFS we need to put files in the operating directory for generating hash which will be offered by web3.storage resulting in storage of data in the file-coin network, and its unique economic model and over 15EiB of capacity allows us free storage

Keywords: Blockchain, IPFS, file-coin, CID

I. INTRODUCTION

IPFS is a decentralized storage system which works like Bit Torrent and it allows for retrieving content data. IPFS provides an environment, in which any user can distribute the file through its address and anyone can request content in the peer's network from every node present using a given distributed hash table. The aim of IPFS is to set up a single global network. In a single global network that when ant two users issue a block of data with the same hash Data will be exchanged between peers who download data from user 1 and those who download data from user 2. IPFS also aims to put back protocols used for static web pages and transport them using gateways that can be available by HTTPS. Users can also select a public gateway rather than install IPFS Client. Several lists of gateways are stored on the IPFS page. IPFS was introduced in the alpha version in February 2015. With web3.storage, Users can upload any data using API for free and it will end up on a decentralized set of IPFS and File Coin storage providers. Before uploading, our client-side libraries convert data into CAR files (which includes the CID of the file), which keeps things secure: the client can secretly verify that the CID is compatible with its file when storing and downloading. After uploading the 31GiB CAR file, it will get selected for performance and availability by a queue of geographically distributed storage providers, hence getting bid for proper storage of the deal by various providers. The data is made available on the IPFS public network so that anyone can access data from any broadcasting through its CID.

II. LITERATURE REVIEW

[1] This chapter aims at focusing on the application of data sharing platforms integrating IPFS Technology Sun Jianjun this article combines the decentralized characteristics of IPFS distributed storage technology it provides a new technology application environment for current data sharing.

[2] Developed an Encoding content-based Ryota Nagaoka similarity in IPFS pointer names the exchange content in IPFS which includes SHA- 256, cryptographic hash function in which humanity should be able to recognize content in an IPFS as in an existing file system.

[3] An improved P2P file system scheme based on IPFS and Blockchain yongle Chen Shenzhen Key Lab of Information Theory & Future Network Arch., Future Network PKU Lab of National Major Research Infrastructure, Arch., Future Network PKU Lab of National Major Research Infrastructure, Shenzhen Engineering Lab of Converged Networking Technology, PKU Inst. of Big Data Technology, Huawei & PKU Jointly Engineering Lab of Future.

III.BACKGROUND AND RELATED WORK

A. **Garbage Collection:**
Garbage Collection is a technique for resourse management where it is frequently used in the development of software. The memory which is occupied by the objects that are not in use is recollected by the Garbage Collector. It is used by the IPFS to empty the disk space by removing those data which are not in use.

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B. **Pinning in context:**
In IPFS, the node keeps data safe from Garbage Collection depending on user events. This works on all types of data and it can be done dynamically. Only when we add the file using some ipfs commands such as CLI commands to make IPFS nodes pin the file automatically. When we work on files and their directories we need to add the files to a mutable file system because it saves the data from a garbage collection in a similar way to local pinning.

C. **Section Headings:**
Pinning services are used to get surety that the data which is needed to be secured is retained there are some services that offer free storage for new users. It is helpful when disk space is less and you want your data to stick around. The system we use has intermittent connectivity to the network. one of the pros is we can access the data in IPFS from anywhere and anytime even upload it offline. And for backup or to know the data we uploaded is safe and secured and accessible from another system on the network if accidentally data gets declared.

D. **Long-term storage:**
It's simple to save data to a personal IPFS node. However, because you must maintain your own hardware, it is inconvenient to utilise. Because of this issue, the Pinning Service, also known as Paid Services, was created, which allows you to upload your files to a remote IPFS node and you can recover them whenever you wish. Pinning Service, on the other hand, involves payment for data storage; someone must cover the cost of data storage. If the sponsor ceases to pay for the Pinning Service, the data may be irretrievable. While IPFS ensures that any data on the network may be retrieved, it does not ensure that it will be available indefinitely, which is where file currency comes from

E. **Storing data with File-coin:**
A decentralised storage system in which storage provides a FileCoin rent with their storage space to clients. Client and Storage Providers agree on How much data will be stored, for how long and at what cost. This agreement is called a Deal. Once both the party agrees to the deal, the client sends the data to the storage providers who periodically verify that they are correctly storing the data. When a client needs the data back, they send the request to the storage providers. So, storage providers will send back the data to the client. The main advantage of Filecoin is, that it is dependable and provides a long-term storage solution. It also has some limitations. The retrieval process of Filecoin is not always as fast as an IPFS Pinning Service and the minimum file size can be several GiB. Also, this deal process for storing data may be complicated for new users who are not familiar with blockchain transactions.

IV. ANALYSIS OF PROPOSED FRAMEWORK

1. **Filecoin storage providers:** Implementing a storage provider involves professional labour and adherence to strict hardware requirements. By engaging in various sorts of agreements and adding additional blocks to the series, it is better to use the storage provider's network.
2. **Deals:** In Filecoin, there are two sorts of transactions: storage and retrieval. Clients and storage providers enter into arrangements to store some data in a network. Once a contract has been begun and the storage provider has retrieved the document of a deal to storing it must demonstrate to the graph of access that it is still storing the data in accordance with the agreement in order to receive rewards. The storage provider's budget would be lowered, and FIL will be lost progressively.
3. **Proofs:** They must keep all of the information provided by the client, and they must keep it for the duration of the transaction. Storage providers access it and they have retrieved the data and have encrypted it in a secure hash is unique to that storage provider using their physical storage in a way that other storage providers can reproduce using Proof Of Replication. When the transaction begins, this proof is delivered, and the sealing operation is completed. The storage provider will utilise that it is still storing the data associated with a deal once it is active and for the duration of its existence. In terms of PoSt, Providers of random storage must demonstrate bits of data to present. and other storage providers check genuine on a regular basis, providing the essential security and penalising storage providers who do not keep their promises.
4. **Gas Fees:** It is access contained by transactions or proofs in the chain to rigorous computation and storage, similar to cash. It is usually specified by the miners with which whatever currency they are comfortable. Meanwhile, the file can send the gas fee to the irrecoverable address to make it up for the network expenditure. It is determined by the dynamic base fee. Example: Ethereum E1d1559.
5. **Additional materials:** File coin is based on interesting projects such as the libp2p network. addressing, message distribution IPLD, content addressing data format, encoding and structure, IPFS access data transfer to multi-format.

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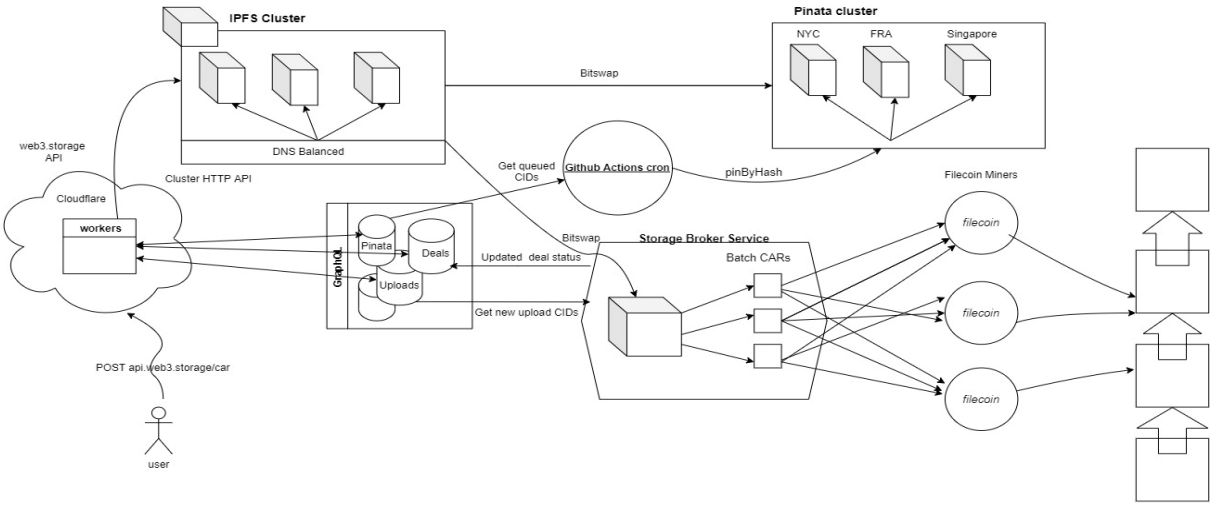

Fig. 1 The Flow of Proposed Frame-work

IV. CONCLUSION

Free storage by running web3.storage involves using some, infrastructure, protocol labs can provide the services free of cost to users as filecoin storage providers don't charge web3.storage to store user data because the filecoin plus mechanism is in a way that rewards the storage providers well when they store user data. Filecoin storage providers put their hard drive capacity to the network to earn block rewards for the same. This in turn gives Real-world profits to storage providers, which make them put additional hard disk space into the network. The storage providers get up to 10x block rewards for storing data from filecoin users. With such a big incentive, the storage providers are willing to offer free storage and retrieval services to gain multiple rewards. The web3.storage is an interesting and easy-to-use interface for interacting with Filecoin and IPFS. The features that are going to be included are, Support for DAGs, a fully documented HTTP API, and support for IPFS pinning As technology is evolving day to day basis, is important to keep up with the speed n need, whereas HTML is a 20-year-old technology. IPFS allows decreased latency, which helps us to use higher memory densities and a superior processing pace that keeps on developing. Web3.storage is going to be a big innovation in this new Internet world. Web3 is a more open, decentralized and secure internet with superior technologies like blockchain and machine learning. The vision and growth of these applications are vast in the entertainment industry. As Amazon Web Services made it cheap for independent web developers to build new apps, the outcome just gets bigger n beneficial for the technology demand. With IPFS, it will further boom the industry with its free and high- availability.

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