Decentralized File Sharing System Using- IPFS

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ABSTRACT

Storing and Retrieving large amounts of data, especially media on centralized servers leads to a huge expense in terms of storage and maintenance. High traffic on these centralized systems can cause bottlenecks and crashes. The usage of the proposed networking protocol namely, the IPFS which is "The Inter-Planetary File System" is a peer-to-peer distributed file system which connects all computing devices with same system of files. The conclusion is that, in order to overcome the centralization in current working systems, the proposed IPFS model achieves it since it has no single point of failure, and nodes do not need to trust each other.

1. INTRODUCTION

A Decentralized file sharing system. The decentralized sharing and storage network is built using the IPFS infrastructure. Using this architecture, chunks of the media file can be stored in multiple nodes on the network. When a user requests for a certain media file, be it text , an image or a video, all these chunks of data can be retrieved from these nodes in parallel thereby reducing the retrival time drastically. A progressive Web App (PWA) is built that enables a cross platform interface for uploading and listing the user's files. In simple terms, it's a universal decentralized cloud files storage and sharing platform.

The working of IPFS is a main stream, that enables the model we built to function the way a decentralized network should, Al-though there have been many distributed file system in use and,

Among the academic attempts, AFS [6] has succeeded widely and still in use today and to name a few, However these applications were not designed as infrastructure to be built upon and no general file-system has emerged that offers global low-latency, and decentralized distribution. Along with the cross platform Progressive Web App (PWA), we have also built a cross platform mobile app, which serves the features of efficient uploading and downloading of data between any number of nodes connected on the network with an add on feature of firebase user Authentication which provides a sense of security to the mobile app, which was seen lacking in the Progressive Web App (PWA).

1.1. OBJECTIVE

The main objective of our proposed system is to provide the end user with an decentralized file sharing system that also acts as a storage platform, which is achieved by using the IPFS as an infrastructure for the model to work.

1.2. PROPOSED SYSTEM

The model being developed enables the end user with the flexibility of using the features of IPFS both on desktop and mobile, and bringing through a file sharing system where-in nodes connected to the network can readily access and share the data among themselves forming a swarm of interconnected networks for communication.

2. METHODS

The proposed model that takes in IPFS infrastructure as a core in its working is been divided into two sets for implementation of it, that is namely, the Web-UI and Mobile-UI

2.1. THE WEB-UI

The Web-UI acts as an interface to the end user from the comfort for their desktops or laptops, the interface built is a simple one that enables the end user to access the file that are readily available on the connected IPFS network from different set of nodes that are connected in the system.

The end user can also upload any files that he/she wants to share among connected peers and communicate readily by accessing the content which is symbolized as an hash key, that acts as an finger-print for the data being transferred.

2.2. MODULES

- **Status:** The status module of the Web App presents the end user with an application of looking into the status of he's/her system once it gets connected to the ipfs network by running in 'ipfs daemon' command from the terminal. It also let's the user to look into he's/her Node Info such as, the ID assigned to the system, the version of ipfs currently being run and also the number of peers being connected, It is also possible for the user to visualize the Network traffic of the connected network, The peers distribution over the network and Bandwidth usage over time during any data processings.

- **Files:** This module enables the user to communicate with other peers that are connected over the network and make a transaction of data with the feature of either adding files (images, videos, text…, etc) or downloading them.

- **Explore:** The module Explore in the Web App presents the user with an opportunity to get to know about the data
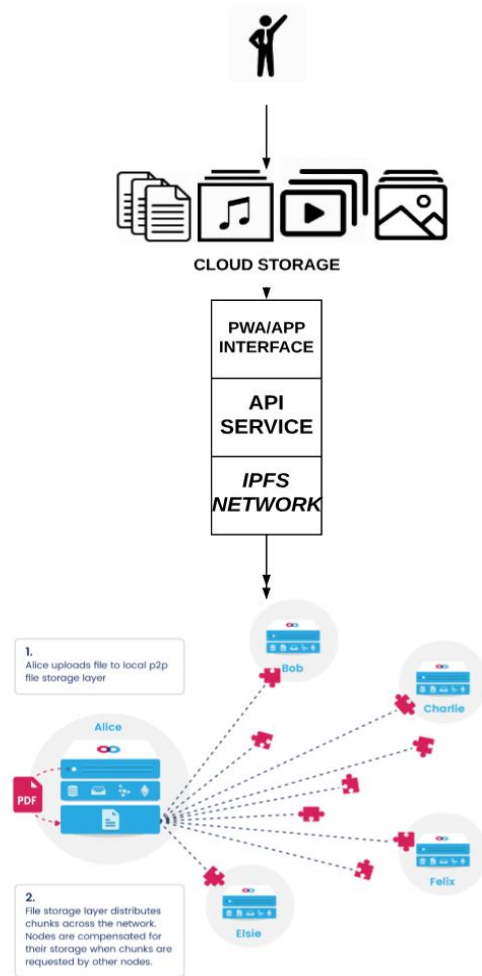
that is uploaded or downloaded in a more sensible way, that is, From the explore window the user can know in brief how the data being uploaded is divided into chunks and each chunk of data provided with an access link by just entering the hash key, which is generated at the time of file being uploaded from the Files module.

- **Peers:** The peers module gives the user an opportunity to get to know the different peers or system's that are connected on the ipfs network, and also provides the user with the opportunity to establish connection with those peers for communication.

2.3 MOBILEAPPLICATION.

IPFS is a peer to peer hypermedia protocol that will permit for a greater everlasting allotted web. What we've got attempted to create is a portal into the sector of IPFS from your phone within the desire that we will divulge greater humans to this modern undertaking in an aesthetically attractive and easy fashion. IPFS Mobile currently allows you to search the IPFS community for content. We built IPFS Mobile via the use of Android studio and an IPFS-Java-api. Where any user can send and view the images and videos shared in public. There is a provision for the user to share data i,e. images and videos in private. Where the other users will not be able to view the data what is posted in private by user.

2.4 Use case:

3.CONCLUSION

We have created both web application and mobile application where we can use IPFS network for file sharing using decentralized file storage system. In which IPFS can provide security and quick download and upload speed. Therefore all these advantages together makes user more flexible and reliable to use .

4.REFERENCES

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- The entire media storage of files, images, music etc. will have a faster and more reliable way to upload and retrieve, this solves the bandwidth bottleneck problem
- Use data and tracking is prevented due to the decentralized network
- Storing of redundant data is prevented which will save storage space as well as maintenance cost. This is and advantage in IPFS system.
- Energy consumption is reduced as the need to maintain big server systems is drastically reduced.