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DECENTRALIZATION OF WEB HOSTING USING BLOCK CHAIN

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Abstract

The decentralized solution for web hosting is based on interplanetary file system (IPFS) and Ethereum blockchain. Particularly, we use Ethereum smart contracts to manage the IPFS network and the web hosting service. IPFS platform is used to store data and to host websites. All storage miner nodes on the IPFS network offer the pinning service to ensure that source codes of the websites and users' data are retained long-term. Moreover, these nodes also enable the interplanetary name space (IPNS) service for creating and updating mutable links to IPFS contents.TXT record is also used in the domain name system (DNS) to map domain names to IPNS addresses for hosted websites. For privacy-preserving data storage, websites need to be deployed an encryption algorithm. The proposed model combines the IPFS and block chain networks to form a platform providing decentralized web hosting service. Experiment illustrates building and hosting a web application on the IPFS network. Experimental results show that, compared to the traditional web hosting model, the hosted web application on the proposed platform ensures confidentiality, integrity, and availability

I INTRODUCTION

The Internet and the emergence of the WWW put an end to sharing of information through physical mediums (like floppy disks, pen drives etc.) by providing a data transmission protocol – TCP/IP – that made the transfer of data faster and massively reduced the transaction costs of information exchange [4]. Ten years later, the Internet became more mature and programmable [4]. We saw the rise of the so- called “Web2” architecture, which brought us social media and e-commerce platforms. The Web2 revolutionized social interactions, bringing producers and consumers of information, goods, and services closer together, and allowed us to enjoy P2P (Peer to Peer) interactions on a global scale, but always with a middleman which a platform acting as a trusted intermediary between two people who do not know or trust

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each other, which mainly were giant MNCs and governments. Although these platforms have done an amazing job of developing a peer-to-peer (P2P) economy with a sophisticated content discovery and value settlement layer, they also own all user data and determine all transaction rules. [3]. In this context, block chain seems to be a driving force of the next-generation Internet, what some refer to as the "Web3". Block chain reinvents the way data is stored and managed. It offers a distinct collection of data that is controlled collectively (a universal state layer). For the first time, a value settlement layer for the Internet is made possible by this special state layer. It allows us to send files in a copy-protected way, enabling true P2P transactions without intermediaries, and it all started with the emergence of Bitcoin.Web2 brought with it a revolution in the frontend, it is the Web3 which now is trying to remap the wiring of the unseen stuff. While the surface of the Internet or Web as we call it will remain the same, it is the backend where all the revolution will take place.

II LITERATURE SURVEY

A new architecture of web applications-The Widget/Server architecture,

AUTHOR: Z. Xiao, S. Wen, H. Yu, Z. Wu, H. Chen, C. Zhang, and Y. Ji

In the past two decades, the demand for web applications has grown dramatically. The Client/Server architecture and the Browse/Server architecture are widely implemented into web applications. But some shortcomings are revealed in practical use, especially when many applications are run at mobile terminals nowadays. The information efficiency of B/S, which is indicated by the information quantity per bit, is low, while C/S applications are not flexible enough and often require annoying, unfriendly, time-consuming installation and update procedures. At the same time, widgets, as a light-weighted and flexible representation form, are providing excellent user experiences to more and more people. This paper is aimed to propose a new software architecture-the Widget/Server Architecture. It combines the merits of information efficiency and light-weighted flexibility. Widget platforms' job can be divided into two layers: the representation layer and the service interaction layer. Web servers' jobs can be divided into three layers: the service providing layer, the information processing layer and data convergence layer. Some interfaces are defined to make the communications among layers standardized. A prototype project was also imp lemented to show thevalidity of the W/S architecture

Blockchain- Based, Decentralized Access Control for IPFS

AUTHOR: M. Steichen, B. Fiz, R. Norvill, W. Shbair, and R. State

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Large files cannot be efficiently stored on block chains. On one hand side, the block chain becomes bloated with data that must be propagated within the block chain network. On the other hand, since the block chain is replicated on many nodes, a lot of storage space is required without serving an immediate purpose, especially if the node operator does not need to view every file that is stored on the block chain. It furthermore leads to an increase in the price of operating block chain nodes because more data needs to be processed, transferred, and stored. IPFS is a file sharing system that can be leveraged to store and share large files more efficiently. It relies on cryptographic hashes that can easily be stored on a block chain. Nonetheless, IPFS does not permit users to share files with selected parties. This is necessary if sensitive or personal data needs to be shared. Therefore, this paper presents a modified version of the Interplanetary File system (IPFS) that leverages Ethereum smart contracts to provide access-controlled file sharing. The smart contract is used to maintain the access control list, while the modified IPFS software enforces it.

III EXISTING SYSTEM

Centralized systems are easy to create and set up because it provides more direct control like all the permission and processing are managed by single central server. The server components provide services to one or many clients which make requests. Server classified based on service they offer, for example, a web server offers web page and a file server offer fill

DISADVANTAGES

Using an experimental setup, the impact of the access controlled IPFS is analyzed and discussed.

i. Less accuracy

ii. Low efficiency

IV PROBLEM STATEMENT

Centralized web hosting relies on a small number of servers and infrastructure points, making the entire system vulnerable to outages, attacks, or natural disasters. This results in downtime and disruptions for users. Maintaining and scaling centralized infrastructure involves significant costs. Additionally, the traditional web hosting model may lead to inefficiencies in resource allocation and utilization.

V PROPOSED SYSTEM

The ways to demonstrate the functioning of centralized and decentralized web hosting, keeping our focus on comparing centralized and decentralized systems with each other. The centralized and decentralized systems with some terms and technologies then we have explained the centralized architecture followed by a comparison table for centralized and

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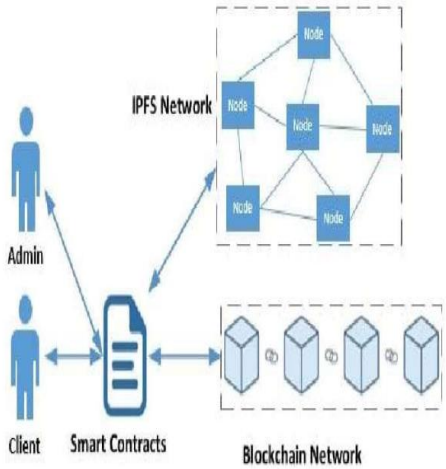
decentralized network. The decentralized networks and technologies associated with themsuch as IPFS, encryption.

ADVANTAGES:

- High accuracy
- High efficiency

VI ARCHITECTURE



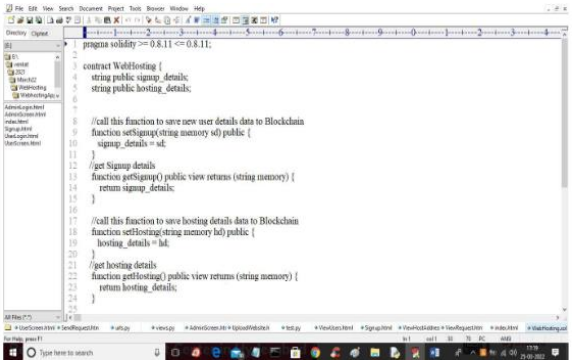
The architecture of Office Staff Management System shows that both the employee and admin can login to the office through their login credentials. After logging in successfully he can perform their respected tasks, such that employee can retrieve his personal data and he can also update the data that he has entered initially in the office.Admin can perform the tasks like, he can add the new employees into the office, he can update the employee's information, he can also retrieve the data of the employees and he can also delete the employees based on their performance in the office. The admin can also perform the operations like he can grant or reject the leaves which are applied by the employees; he can also mark the attendance to the employees. After performing the tasks, he can logout from the office.

VII IMPLEMENTATION

The implementation of the project is done via the following steps by using machine learning algorithms, the process starts by collecting dataset.

EXPLANATORY OF KEY FUNCTIONS

To store data in Blockchain we have designed the following Smart Contract using Solidity



```
pragma solidity >= 0.8.11 <= 0.8.11;

contract WebHosting {
  string public signup_details;
  string public hosting_details;

  //call this function to save new user details data to Blockchain
  function setSignup(string memory sd) public {
    signup_details = sd;
  }
  //get Signup details
  function getSignup() public view returns (string memory) {
    return signup_details;
  }

  //call this function to save hosting details data to Blockchain
  function setHosting(string memory hd) public {
    hosting_details = hd;
  }
  //get hosting details
  function getHosting() public view returns (string memory) {
    return hosting_details;
  }
```

In the above code you can see we have created two functions to store user signup

details and hosting details. To deploy the above contract in Blockchain we need to

follow the steps below.

1) Install NodeJS software given with this code folder.

2) Install below python packages.

3) Pip install Django==2.1.7, Pip install web3==4.7.2,

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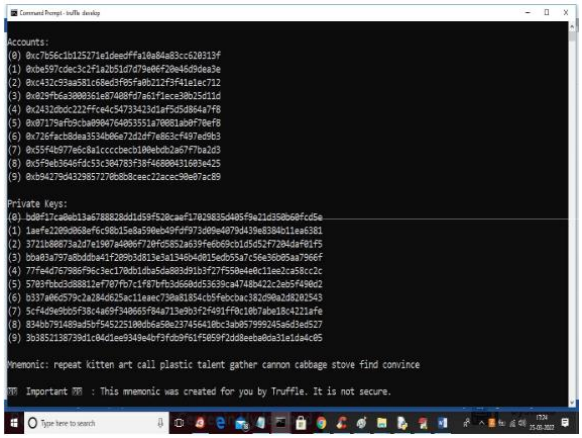
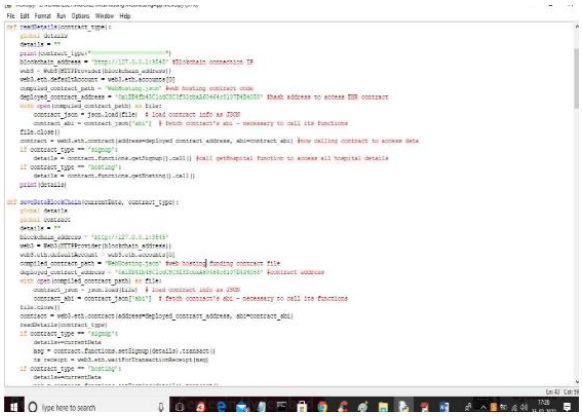
4) Now go inside hello-eth/node-modules/.bin folder and then double click on

5) runBlockchain.bat' file to start Blockchain Ethereum tool and you will get below screen

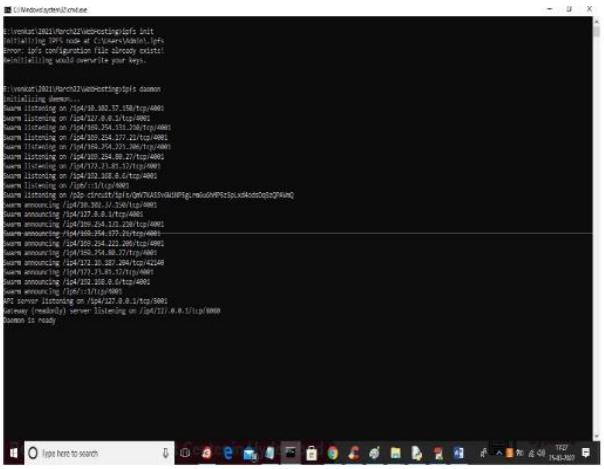


In the above screen Blockchain generated some default account and keys and in above screen just type 'truffle migrate' command to deploy contract to Blockchain and get below output

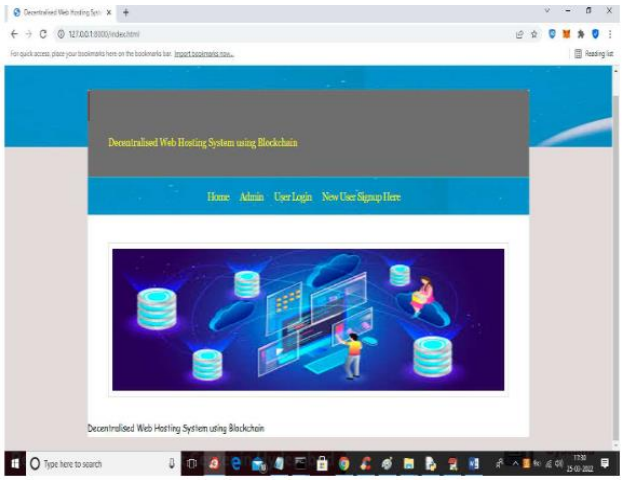
In the above screen in white color text you can see Webhosting contract deployed and we got one account address and that address we will specify in python program to access that Smart Contract to store signup and hosting details.



In the above screen read red color comments to know how to access smart contract of Blockchain.Now double click on 'Start_IPFS.bat' file to start IPFS server and to get below screen.



VIII RESULTS



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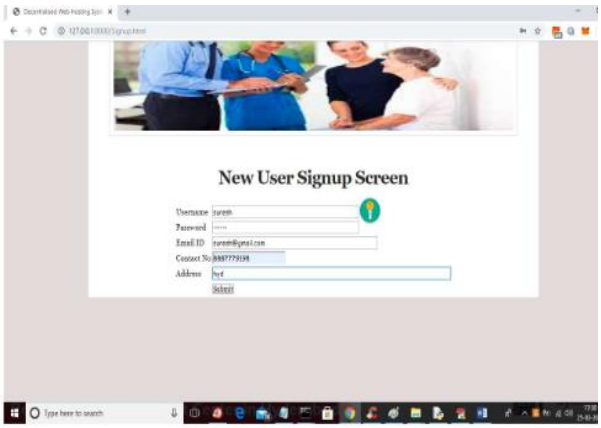


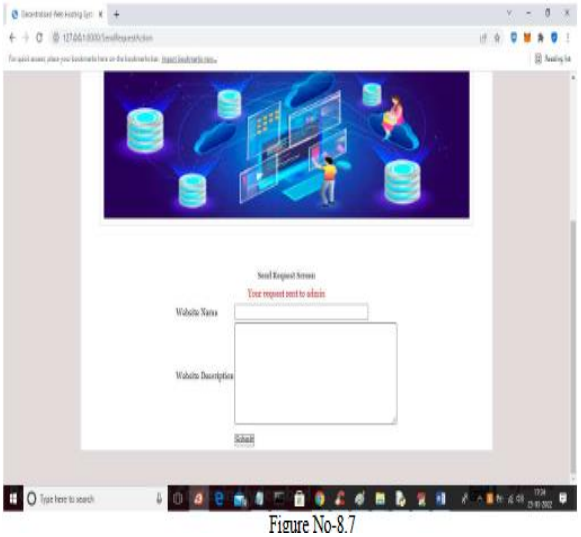
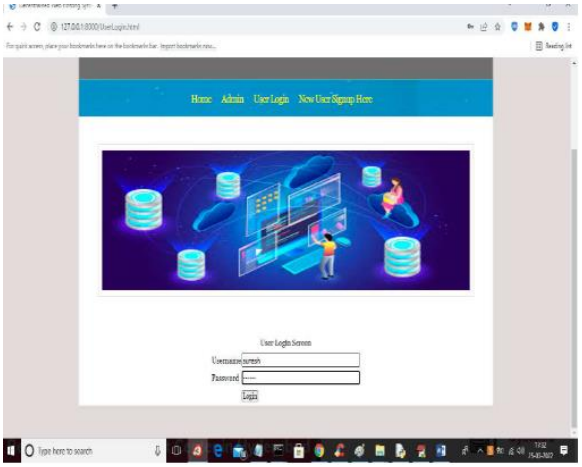
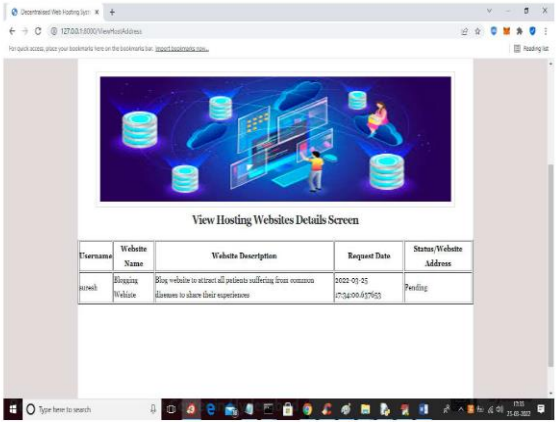
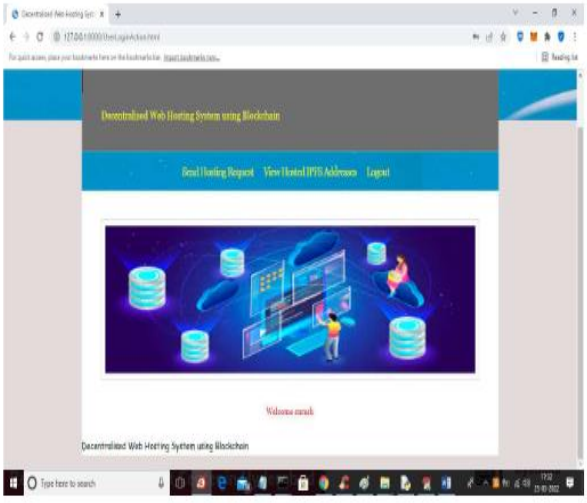
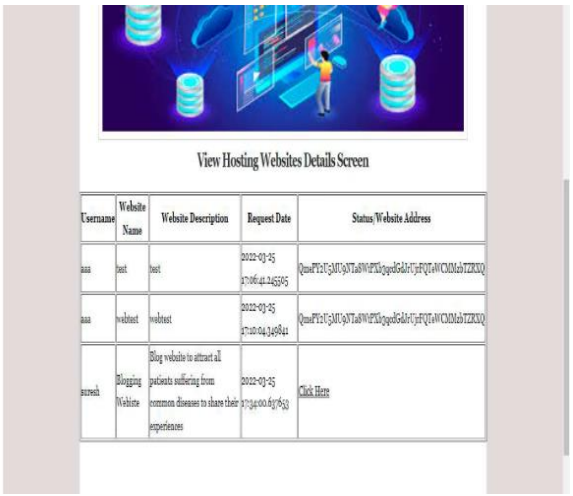


Figure No-8.7









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IX CONCLUSION

The proposed system takes advantage of block chain technology, IPFS, and encryption. That allows clients to host websites without using any central system from service providers. We have also proposed the combination model between IPFS and block chain and build the workflows for managing the decentralized web hosting service and the IPFS network. Experiment results show that hosted websites on the IPFS network have High availability, ensure data security and privacy. In our future work, we will build smart contracts to provide access control features and optimize protocols to make the functions more efficiency Decentralization empowers individuals and organizations to host websites and applications without reliance on central authorities, mitigating risks associated with single points of failure and reducing vulnerabilities to censorship or data manipulation. Furthermore, block chain-based hosting solutions provide opportunities for improved scalability, reliability, and cost-effectiveness by distributing hosting resources across a network of nodes. However, challenges such as scalability limitations, user adoption, and regulatory concerns remain to be addressed. Despite these challenges, the potential benefits of decentralization in web hosting,including enhanced privacy, data sovereignty, and community-driven governance, make it a compelling area for further exploration and innovation. In summary, while decentralization of web hosting using block chain technology is still in its nascent stages, its promise to revolutionize the way websites and applications are hosted and accessed holds significant potential for shaping the future of the internet

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