Marathwada Shikshan Prasarak Mandal's
Deogiri Institute of Engineering and Management Studies, Aurangabad

SRS Report on

on

DC storage (DAPP)

Submitted By

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Abstract

The blockchain is an innovative technology which opened doors to new applications for solving numerous problems in distributed environments. In this work, we design a blockchain based data storage and access framework worldwide end-to-end Internet performance measurement project to remove its total dependence on a centralized repository.

DC Storage is a DAPP (Decentralized Application). It is cloud-like storage where one can access/retrieve, upload data or applications over the internet. Blockchain storage costs can reduce the price of cloud computing. It not only handles storage but also protects and recovers and is transparent to users and also gives high security and privacy to data.

As no central entity or organization can control this so no one can dominate and act as a gatekeeper. Anyone can upload any type of data like docs, images and also one can upload uncensored data because no government or organization can handle it/ control it. Example original news can never be tempered.

To develop a prototype of the proposed architecture we make use of Ethereum, MetaMask, Web3.js, react.js and IPFS

 Keywords: Storage, Decentralize, Blockchain, Etherum, Ganache, Solidity, Smart contracts.

INDEX

Chapter No. : 01

Introduction

Decentralization refers to the transfer of control and decision-making from a centralized entity (individual, organization, or group thereof) to a distributed network. Unlike a centralized server operated by a single company or organization, decentralized storage systems consist of a peer-to-peer network of user-operators who hold a portion of the overall data, creating a resilient file storage sharing system.

Blockchain strorage is a way of saving data in a decentralized network, which utilizes the unused hard disk space of users across the world to store files. The decentralized infrastructure is an alternative to centralized cloud storage and can solve many problems found in a centralized system.

A blockchain is essentially a distributed database of records or public ledger of all transactions or digital events that have been executed and shared among participating parties. Each transaction in the public ledger is verified by consensus of a majority of the participants in the system. And, once entered, information can never be erased. The blockchain contains a certain and verifiable record of every single transaction ever made. Bitcoin, the decentralized peer-to-peer digital currency, is the most popular example that uses blockchain technology. The digital currency bitcoin itself is highly controversial but the underlying blockchain technology has worked flawlessly and found a wide range of applications in both the financial and non-financial world.

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The advantages of Blockchain technology outweigh the regulatory issues and technical challenges. One key emerging use case of blockchain technology involves "smart contracts". Smart contracts are basically computer programs that can automatically execute the terms of a contract. When a pre-configured condition in a smart contract among participating entities is met then the parties involved in a contractual agreement can be automatically made payments as per the contract in a transparent manner.

Description of Project

So to create DAPP with the help of solidity which is an object-oriented, HLL (High-Level Language) on the Ethereum network for implementing smart contracts. Now Ganache is in the role where it is used to test DAPP in a safe environment means to add a smart contract on blockchain first it will go through ganache. Ganache is a tool used to set up an Ethereum network in this case DC storage is for testing solidity contracts.

To access DC storage through web browsers Reactjs is used, as react will communicate with blockchain through web3js.

In this report, we focus on the disruption that every industry in today's digital economy is facing today due to the emergence of blockchain technology. Blockchain technology has potential to become the new engine of growth in digital economy where we are increasingly using Internet to conduct digital commerce and share our personal data and life events.

Chapter No. : 02

Literature Review

Blockchain platforms and languages for writing smart contracts are becoming increasingly popular. However, smart contracts and blockchain applications are developed through non-standard software life-cycles, in which, for instance, delivered applications can hardly be updated or bugs resolved by releasing a new version of the software. Therefore, this systematic literature review oriented to software engineering aims at highlighting current problems and possible solutions concerning smart contracts and blockchain applications development.

Cloud storage is one of the leading options to store massive data, however, the centralized storage approach of cloud computing is not secure. On the other hand, Blockchain is a decentralized cloud storage system that ensures data security. Any computing node connected to the internet can join and form peers network thereby maximizing resource utilization. Blockchain is a distributed peer to peer system where each node in the network stores a copy of blockchain thus making it immutable. In the proposed system, the user's file is encrypted and stored across multiple peers in the network using the IPFS (InterPlanetary File System) protocol. IPFS creates hash value. The hash value indicates the path of the file and is stored in the blockchain. This paper focuses on decentralized secure data storage, high availability of data, and efficient utilization of storage resources.

DC storage is about cloud like storage using blockchain which will create block as every time file gets uploaded on it.

when one will pay gas fee for this using wallet block will created at that time and will be added to the blockchain. That's how DC storage can achieve the decentralised cloud storage.

Chapter No. : 03

System Features and Requirements

System Features:

Payment processing: no need to integrate with a fiat payment provider to accept funds from users, as users can transact directly using cryptocurrencies,

- User credentials: using a system of public and private keys, users can transact and bind their user sessions and metadata easily and with varying degrees of anonymity, negating the need for lengthy sign-up or registration processes

- Trust and auditability: open-source DAPP code is accessible and understandable to savvy users. This transparency and the inherent security of the inclosed data generates confidence in the applications. A public record on the blockchain also makes transaction information easy to audit by users or third-parties

Requirements:

Ganache :Ganache is an Ethereum simulator that makes developing Ethereum applications faster, easier, and safer. It includes all popular RPC functions and features (like events) and can be run deterministically to make development a breeze. Fork any Ethereum network without waiting to sync Ethereum json-rpc support

Metamask: MetaMask is a software cryptocurrency wallet used to interact with the Ethereum blockchain. It allows users to access their Ethereum wallet through a browser extension or mobile app, which can then be used to interact with decentralized applications.

IPFS: The InterPlanetary File System is a protocol and peer-to-peer network for storing and sharing data in a distributed file system. IPFS uses content-addressing to uniquely identify each file in a global namespace connecting all computing devices

Truffle: A world class development environment, testing framework and asset pipeline for blockchains using the Ethereum Virtual Machine (EVM),

web3js: web3.js is a collection of libraries that allow you to interact with a local or remote ethereum node using HTTP, IPC or WebSocket.

React: React is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta and a community of individual developers and companies. React can be used as a base in the development of single-page or mobile applications.

Chapter No. : 04

UML Diagram And Architechture

- ## UML Diagram
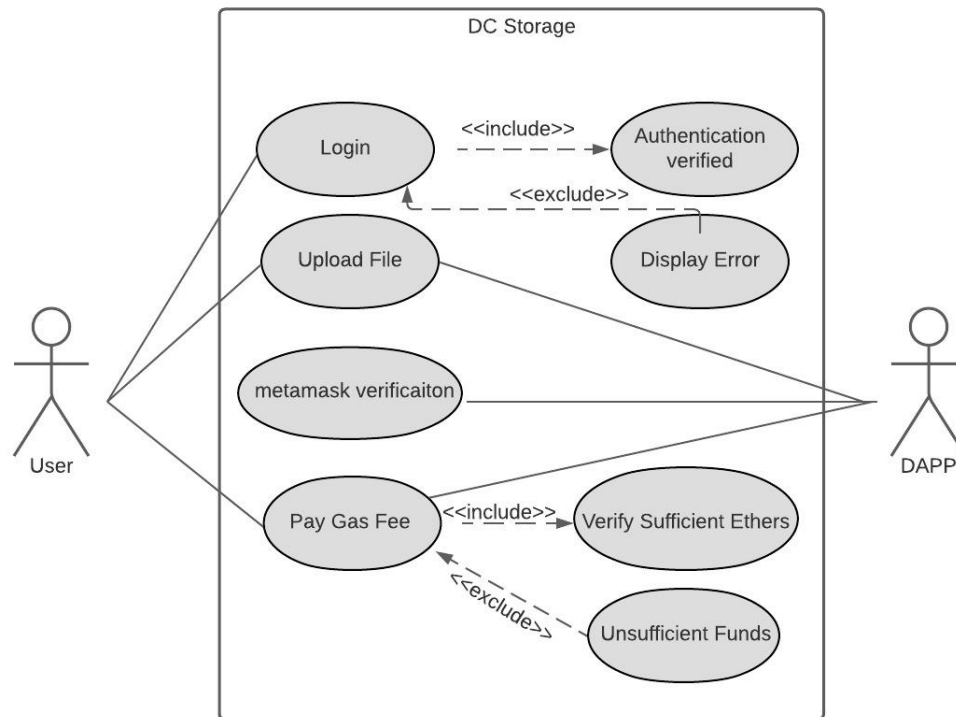
Image No.: 01 UML-Used Cased diagram

The UML Class diagram is a graphical notation used to construct and visualize object-oriented systems. A class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's: classes, and the relationships among objects.

Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally.

- **Architechture**
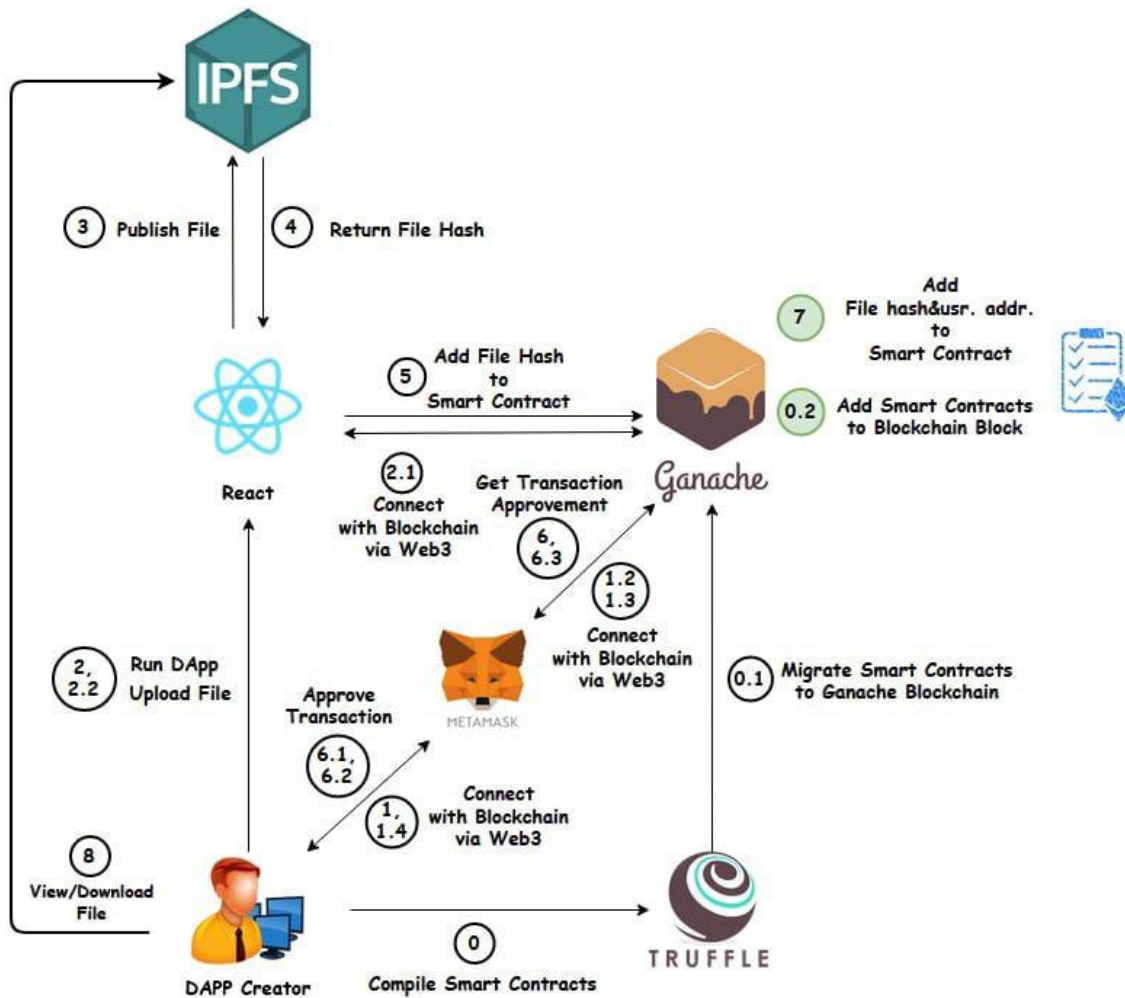
Image No.: 02 Architecture of DC-Storage

Here's the application that will work, Instead of talking to a web server, a centralized version of Cloud Storage. We're going to build a decentralized version where you use your web browser and you connect with a blockchain wallet to the blockchain. And this is where we will store all the code for our application inside of Smart contracts. We're going to use a ethereum. So we'll write Ethereum Smart contracts to store the location of the files, and then we'll store these files on the interplanetary file (IPFS system).

So IPFS this will work a lot like a blockchain, but it's a different way of storing files. Also decentralized. And this will allow us to store these files here for free for the long term, and then also there'll be censorship resistant.

No central party can take them down. And here is a technical diagram of how this application will work.

So these are all the technologies that we'll use to build this application. So we'll see this here in a minute. We install the dependencies and also as we build the project. But basically a user will interact with the application that we build and react JS and this application will talk to the blockchain. So we're going to talk to Ethereum in this tutorial, and we'll use a blockchain called the Ganache, which is a development version of Ethereum.

Our React application will also talk to IPFS, the interplanetary file system whenever we upload these files. So we'll upload to IPFS. We'll develop Smart contracts that store the location of these files. We'll put them on Ganache, and then this will allow the user to view and download files from this React application as well as upload and store them.
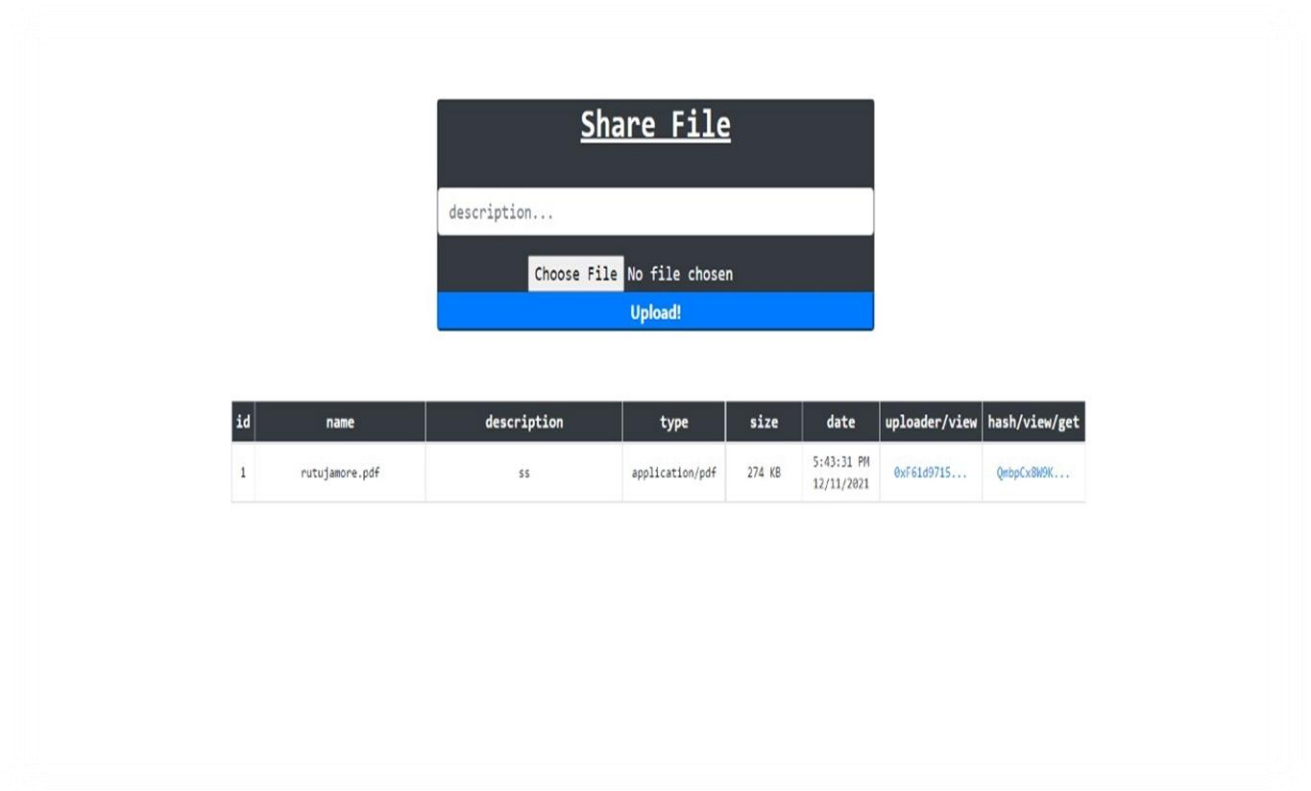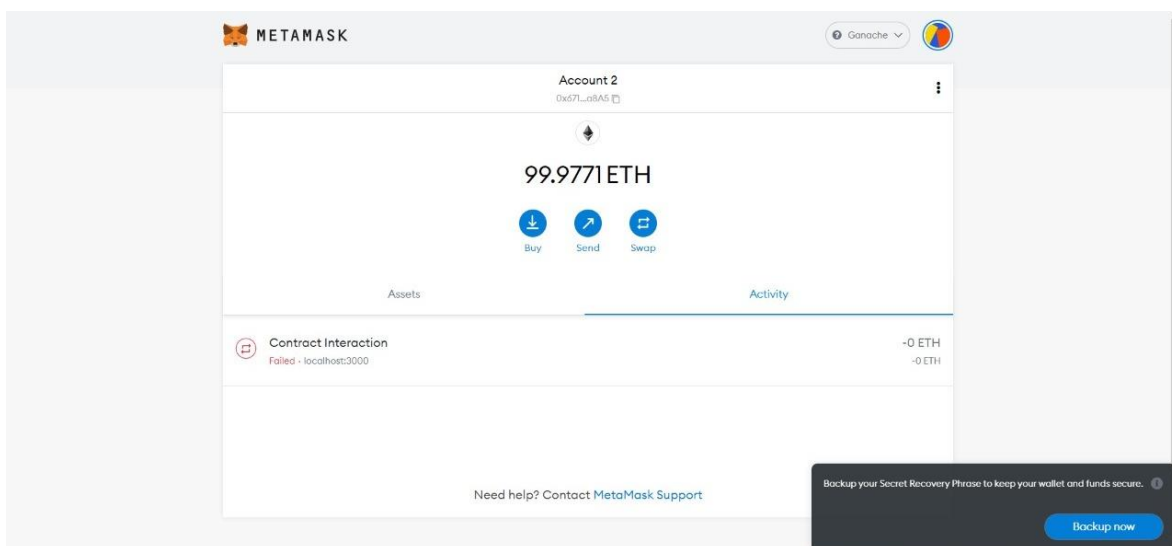
Chapter No. : 05

SCREENSHOTS
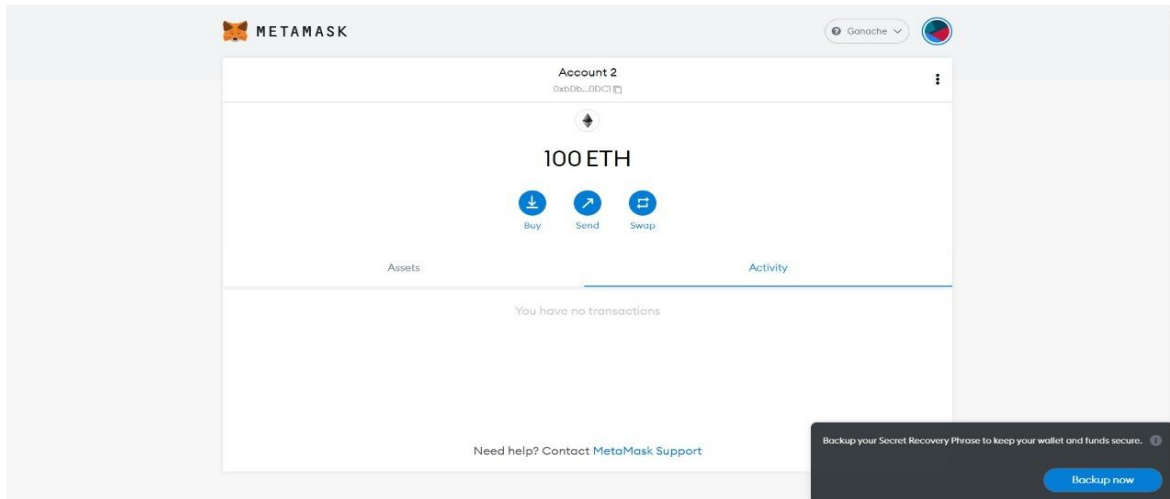
Screenshot No.01: Ethers Added to metamask Wallet

Screenshot No.02: Blocks (Ganache)

Screenshot No. 03: UI of Dc- Storage

Screenshot No. 04: MetaMask Wallet where Transaction is done