Progress Report: Decentralized Cloud Storage System Using Blockchain

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1. Introduction

The **Decentralized Cloud Storage System** is a blockchain-based solution designed to enable secure, decentralized file storage. The key goals are to ensure data **privacy**, **integrity**, and **availability**, while decentralizing the file storage process. This project primarily leverages blockchain smart contracts and **IPFS** for decentralized storage. As of now, we have completed the majority of the blockchain functionalities, and our current focus is on developing the frontend user interface.

2. Progress so far

- **Smart Contracts**: The core smart contracts have been successfully developed. These smart contracts handle:
  - **File Ownership**: Users can register and claim ownership of files.
  - **Access Control**: Permissions to access files are managed via smart contracts, ensuring transparency.
  - **Transactions**: File sharing, uploading, and retrieval are securely processed using blockchain, ensuring tamper-proof logs.

3. Current Work: Frontend Development

We are now focusing on the development of a **user-friendly interface** that will allow users to:

- **Upload files**: A simple file upload form that encrypts files before uploading them to IPFS and the blockchain.
- **Manage files**: Users can view their uploaded files, check ownership details, and set access permissions for other users.
- **Download and decrypt files**: Authorized users can retrieve and decrypt files, provided they have the necessary permissions as stored on the blockchain.
- **Share the Files**: User can share the file to any other user with a transaction fee.

The main thing remaining is the integration of **Web3** and **Web2** functionalities.

The frontend is being developed using:

- **React.js**: For building an intuitive and responsive interface.
- **Web3.js**: For handling interactions between the frontend and blockchain (e.g., uploading files, setting permissions, and retrieving files).

4. Changes Since the Ideation Phase

Initially, we focused solely on decentralizing file storage through IPFS. However, to address concerns about file availability in decentralized networks, we added a **Master Location Backup** as a safety measure. This ensures that users can always access their files, regardless of IPFS node availability.