

Hash Repo

Smart Contract Essentials

Adam Koza, Ronnie Wong

Problem

Current Github Infrastructure

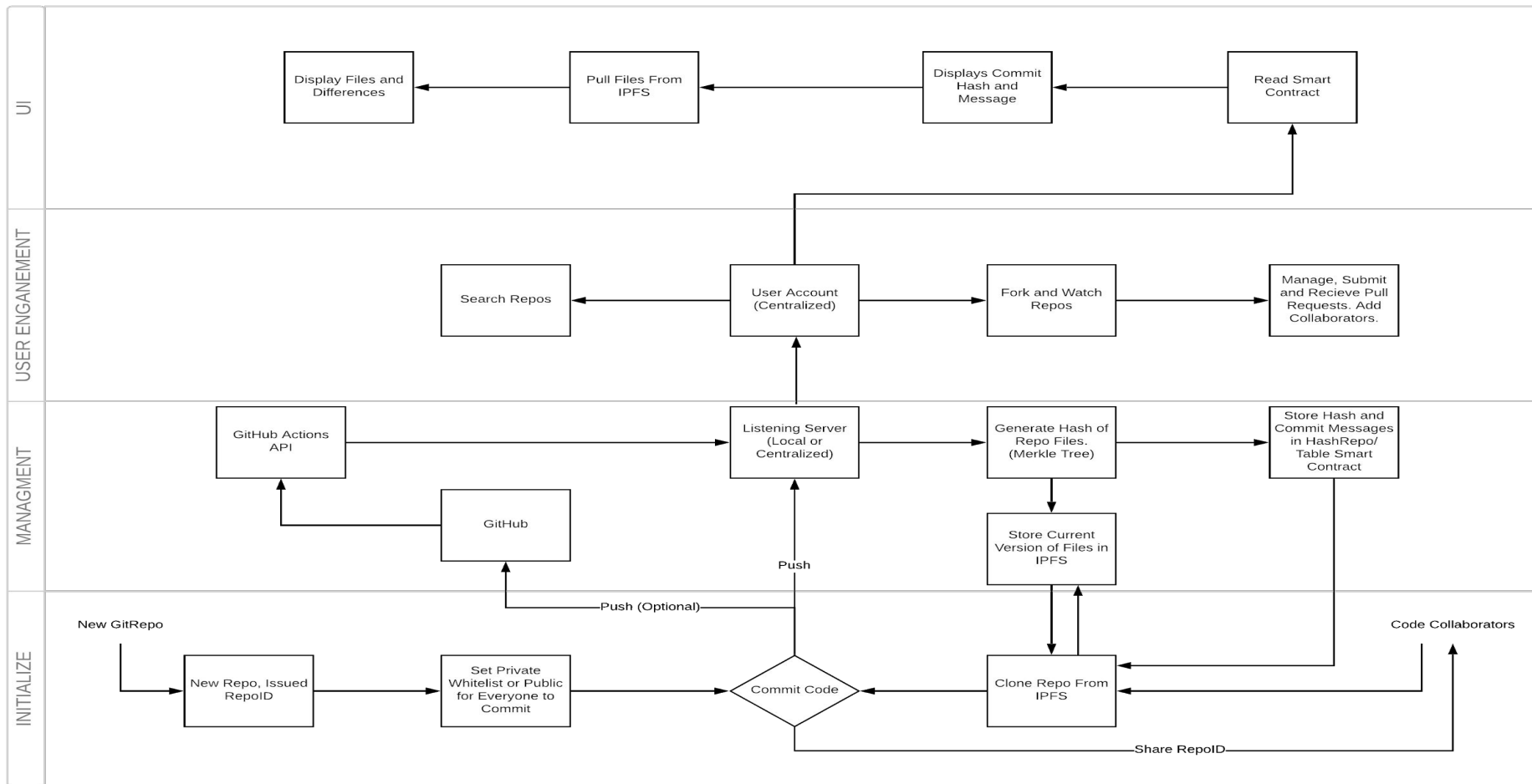
- Commits Dates/ Time Manipulation
- Centralized System
- Browsers
 - Security, cookies
 - Downtime

Concept

- Sustainability
- Built on top of Github using IPFS
 - Certify as Witness
- Merkle Dag
 - New Hashes
 - Hash Table
- One Time Verification
 - Repo Id, Name

WireFrame Architecture





Optimizations

Events vs Structs Storage

Store only Hash

Gas Usage

Unnecessary Storage

```
struct Commit {  
    address commiter;  
    string commitHash;  
    string commitMessage;  
    uint commitBlock;  
}
```

```
repoInfo[_repoID].commitLog[repoInfo[_repoID].commitCount].commiter = msg.sender;  
repoInfo[_repoID].commitLog[repoInfo[_repoID].commitCount].commitHash = _commitHash;  
repoInfo[_repoID].commitLog[repoInfo[_repoID].commitCount].commitMessage = _commitMessage;  
repoInfo[_repoID].commitLog[repoInfo[_repoID].commitCount].commitBlock = block.number;
```

Old Code

Events

event NewRepo

(uint indexed repo, address indexed owner, string name, bool isPublic, uint forkOf);

emit NewRepo

(repoID, msg.sender, _name, _isPublic, _repoID);

event AddCommit

(uint indexed repo, uint commitCount, address indexed commiter, string IPFS, string message, uint timestamp);

emit AddCommit

(_repoID, repoInfo[_repoID].commitCount, msg.sender, _commitHash, _commitMessage, now);

Optimized Code

Old Contract:

Deploy: tx - 1247349, ex - 906549

New Repo: tx - 130958, ex - 108790

New Repo2: tx - 115958, ex - 93790

New Commit: tx - 127883, ex - 105075

New Commit 2: tx - 112883, ex - 90075

New Contract:

Deploy: tx - 1313970, ex - 955794

New Repo: tx - 98780, ex - 76676

New Repo2: tx - 83780, ex - 61676

New Commit: tx - 70830, ex - 47958

New Commit 2: tx - 55830, ex - 32958

(Added function, costs more.)

(~25% - ~30% improvement)

(~28% - ~34% improvement)

(~45% - ~55% improvement)

(~51% - ~64% improvement)

IPFS

- Push new commits
- Read Files
- Commit Log
- Hash from repoID and Data

Features

- Retrieve Hash
 - Tx_id
- Timestamp
 - Block #
- WhiteList
- Unique Repo Id

Meeseek App Experimentation

- Static file
- CDN compatible
- Base32 hash

Access IPFS using base32 hash

- Convert domain name to ENS or multihash
- Fetch node from IPFS api gateway
- Verifies and displays content

Source: <https://github.com/ricmoo/meeseeks-app>

Incentives

Standard Accounts:

- Group Commits into Single Hash
 - Covers low gas fee
- Hash value stored on blockchain
- One time Certification
- Single file

Paid Premium:

- Commit and hash anytime
- Individual Certification
- Multiple Personal Repos
- Full git repos