Raum Network
A Web3 Based Object Storage Solution

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Abstract

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. [1] Here the authors introduce Raum Network, a web3.0 based Object Storage Solution for large enterprise and individual end-users. Decentralization also reduces the dependency on the third party, decreasing the risk of failure.

For the enterprise level, Raum Network provides the extreme functionality of assigning roles as per the hierarchy. This means every enterprise can manage the roles.

1 Introduction

Raum Network is a Web3.0 based Object Storage Solution that intends to compete and provide better service with the existing storage solutions at both peer to peer and enterprise level.

The Contract for the Project is completely stored in Blockchain making it auditable and transparent for the end Users.
Raum Network Opted for Polygon as its inaugural project to launch on the Platform. Polygon provides many facilities and Raum Network will be working on using Zero Knowledge Consensus for maintaining user credentials.

2 Problem Statement

Currently Data that is being stored and used in Web 2.0 has many problems such as User Tracking and Profiling, Large Scale Hacks and many more that have been from section 2.1 to 2.4

2.1 Internet Privacy

Currently one of the problems that the end users face for the Data they provide in Web 2.0 is User Profiling. Previous researches have shown that user-generated content can be analyzed to extract information. Researchers have also shown that it is possible to build individual user profiles automatically by tracking the User Data (in many ways).

2.2 Controllable Data

Large Scale Entities that provide multiple storage solutions currently can access the user data as the data is being stored in their stacks that are being used to provide the Storage Solutions.

2.3 Data Breach

The Data Storage Solutions provided by the Entities are currently extremely vulnerable to the Data Breaching attacks that have led to billions of compromised accounts and their data stored in it.

2.4 Connectivity Issues

Since the Data is Stored on multiple Servers all across the Globe, the failure of even one of the Specific Geolocated Servers may lead to the obstructed services provided from that particular server.

3 Solutions

3.1 Object Storage Solution

Object Storage solution(S3) for large enterprise as well as Independent end user - Raum Network will be providing Object Storage Solutions better known as S3 Storage for both the Independent User or Large or Medium Scale Enterprises in terms of providing a significant better scalability, security and Cost Management Solution.

3.2 Different Tiers for Different Cases

Different Tiers for different use cases (Concurrent Addition, backup, Archival Storage) - Raum Network will be providing Different Tiers of Storage as per the needs of the Client. Currently we are working on providing Archival Storage, Concurrent Addition and backup Storage as per the end user require.

3.3 Ease of Integration

All the Services provided by Raum Network can easily be integrated with Web 2.0 as well as Web 3.0 providing Users with Control over their data, Better connectivity, Ubiquity and many other features bundled with Web 3.0

3.4 Role Management and Control

Raum Network will be Providing Role Based Access Control (RBAC) where the Main Administrator Can Provide one or multiple Access Roles as per the Requirement as well as provide and manage Different Data Access Point for the Sub Users for Easy Access to The Shared Data.

3.5 Scalable Infrastructure

Raum Network will be Built Upon an Scalable Infrastructure model so that it will always have the required Data Nodes as the Users Availability as well as the Data Nodes will be Dynamic in Nature i.e. The Size of the Data Node can be Increased or Decreased as per the User Requirement.

3.6 Vast Storage

Raum Network Will be providing Data Storage on the Network Varying from 0 Bytes Up to 5 Tebibytes so that anyone can have their data stored without facing any storage issues.

3.7 Multiple Gateway Implementation

Raum Network will be implementing Connection through Multiple Gateway which in terms will be providing Better and Faster Connectivity throughout the Globe along with Less Chances of Eavesdropping on a Particular Gateway.

4 Features

4.1 Wallet Connect Access

Raum Network will provide the user to login in the system from any provided list of wallets. This feature will work as a Single Sign off system to facilitate a faster and secure login for the users. The combination of public key and private key will be used as a digital signature to allow user login.

4.2 Role Based Access Control (RBAC)

Raum Network will provide extreme functionality only for the enterprise level to assign the roles as per the hierarchy. There can be one or multiple managers who can provide or revoke access from the people.

4.3 Multiple Gateways for Storage Access

Raum Network will have multiple gateways. These will be divided into quorum (1 main node, 2 failover nodes) to access our storage so that even one node goes down next nearest available gateway node will always be available to access the storage without any downtime.

4.4 Storage Tiers

Raum Network will provide storage so that it suffices every end-user use case. It will be divided into three storage classes (Standard Class, Cold Class, Archival Class). Where the user can decide which type of data they want to store in the storage class category.

5 Technical Aspects

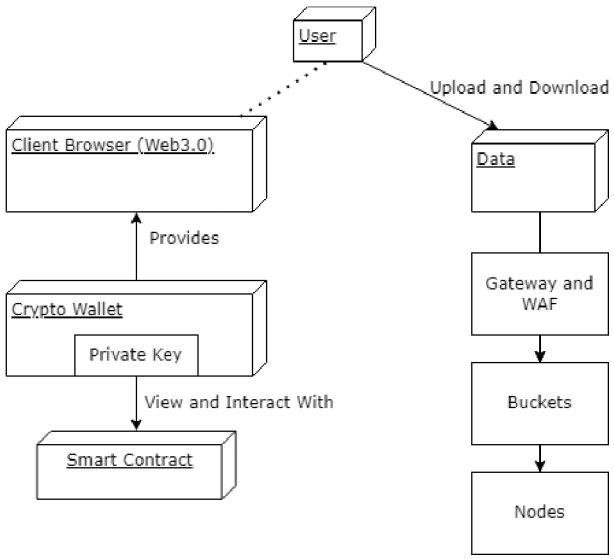
- Raum Network has a straight forward decentralized Infrastructure.

- Flow 1 shows the authentication of the user using some crypto wallet. Let's say metamask.
- Flow 2 starts, once the user authenticates and log in the system. They can upload and download the data

- WAF working as a reverse proxy provides storage nodes from getting directly interacted with client end and providing security with incoming traffic.

- The complete chunks(Buckets) are stored in multiple decentralized nodes, with a complete backup mechanism using RAID.

Here is a Minimal Flow Diagram for the Technical Architecture.



6 Consensus

6.1 Proof of Authority (PoA)

Raum Network uses POA Consensus to authenticate the User. Here identity-as-a-stake mechanism is used for verification. The Process is automated and does not require validators' is suitable for both Private and Public Networks including POA Network, where trust is distributed.

7 Conclusion

Raum Network is a competitor in the web3.0 based storage solution. It will be growing as the timeline goes by implementing all the concepts and logics to provide the best Solution for the Storage Requirement in the Web3.0 based Solutions.