GenesisX Decentralisation Storage Disk
Initial proposal

Why Decentralised Storage?

The current solutions of Google Drive and Dropbox still work great there is no reason to change something if it works just fine. However there have been growing concerns as to why users want to switch from these systems due to the restrictive nature of some services as well as the more commonly understood reports of recent company data leaks. Examples include:

Equifax (Data costs of up to $400M)

Facebook Cambridge Analytica (Up to 87M user data leaked)

Dropbox hack leads to leaking of 68m user passwords on the internet

There were of course several factors that contributed to the data breach regarding the security measures, however one major factor revolves around the central server storage of such information. Data breaches have been happening since the Internet started and companies have learned to deal with them but it also comes to attention that new infrastructures might help fix parts of the solution (i.e. decentralised storage).

Decentralised storage is a potential solution that Blockchain companies are researching and implementing. It is a system of being able to store your files without having to reply on large, centralized silos of data that don't undermine important values such as privacy and freedom of your information.

Back in the day of P2P file sharing, torrenting and services such as Limewire were popular in downloading music and video files. It worked as a system where many users maintain copies of the file and *seed* (send fragments of the file) to participants on the network. However there were no mass-scale consumer [1] incentive mechanisms for the network participants to stay online. Decentralised storage networks operate in a similar manner with further advanced cryptography and encryption as well as the added incentive mechanism.

Since then, methods of penetration of decentralized systems have been discussed, and it has been concluded that the best solution is to deceive the victim herself, not the system !!

==*Anonymous quote: Do not expect that you will catch water.*==

So what we can do ?

we will use IPFS it's mean **InterPlanetary File System** is a protocol and network designed to create a content-addressable, peer-to-peer method of storing and sharing hypermedia in a distributed file system. *(wikipedia)*

The system will be rebuilt with Java programming, the stability of this technology make it easy to develop and easy to install on any operating system.

So , Let us learn more about how the system works!

GenesisX Storage at its core, is a versioned file system which can store files and track versions over time, very much like Git. It also defines how files move across a network, making it a distributed file system, much like BitTorrent. In combining these two properties, IPFS enables a new permanent web and augments the way we use existing internet protocols like HTTP.

Simply put, the internet is a collection of protocols that describe how data moves around a network. Developers adopted these protocols over time and built their applications on top of this infrastructure.

How does IPFS work?

IPFS seeks to create a permanent and distributed web. It does this by using a content-addressed system instead of HTTP's location-based system.

An HTTP request would look like **http://10.20.30.40/folder/file.txt**

An IPFS request would look like **/ipfs/QmT5NvUtoM5n/folder/file.txt**

Instead of using an location address, IPFS uses a representation of the content itself to address the content. This is done using a cryptographic hash on a file and that is used as the address. The hash represents a root object and other objects can be found in its path. Instead of talking to a server, you gain access to this "starting point" of data. This way the system leverages physical proximity. If someone very close to me has what I want, I'll get it directly from them instead of connecting to a central server. In the lecture example from earlier, the students in the classroom can pull the data from each other without all having to establish their own communication with the a server. With HTTP you are asking what is at a certain location whereas with IPFS you are asking where a certain file is. In order to accomplish this, IPFS synthesizes a few successful ideas from other peer-to-peer systems.

To store data, IPFS uses a Distributed Hash Table, or DHT. Once we have a hash, we ask the peer network who has the content located at that hash and we download the content directly from the node that has the data I want. Data is transferred between the nodes in the network using mechanisms similar to BitTorrent. A user looking for some content on the IPFS web finds neighbors who have access to that content. They then download small bits of the content from those neighbors. On top of the DHT and the BitTorrent protocols, IPFS uses a Merkle Tree. This is a data structure similar to the one Git uses as a version control system and the protocol used in the bitcoin blockchain. In Git, its used to track versions of source code, whereas in IPFS it's used to track content across the entire web.
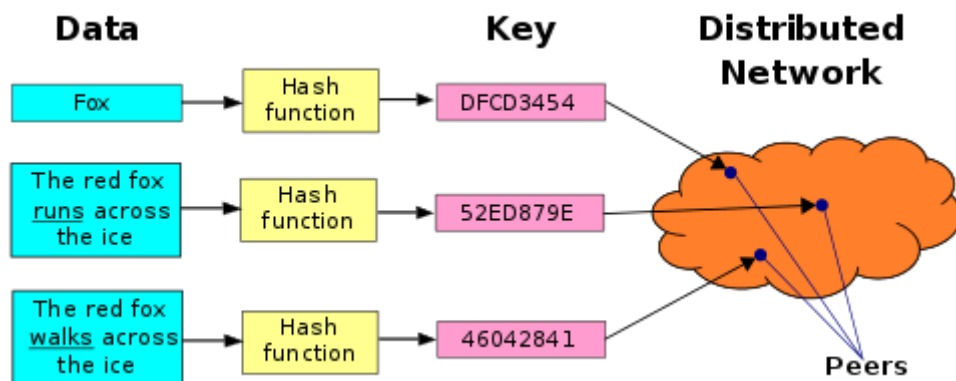
IPFS and Blockchains

Because of the similarity in their structure, IPFS and blockchains can work well together. In fact, Juan Benet, the inventor of IPFS calls this a "great marriage." IPFS is one of a few projects that are part of a group called Protocol Labs, which was also founded by Benet. Some projects from Protocol Labs closely related to IPFS are IPLD (Inter-Planetary Linked Data) and Filecoin. IPLD is a data model for distributed data structures like blockchains. This model allows for easy storage and access of blockchain data through IPFS. Users willing to store IPFS data will be rewarded with Filecoin. IPLD allows users to seamlessly interact with multiple blockchains and has been integrated with Ethereum and Bitcoin.

> IPFS connects all these different blockchains in a way that's similar to how the web connects all these websites together. The same way that you can drop a link on one page that links to another page, you can drop a link in ethereum [for example] that links to zcash and IPFS can resolve all of that. — Juan Benet

IPFS and other projects from Protocol Labs are ambitious by nature. The idea of a permanent web that is resilient and efficient were no doubt also the goals of the original inventors of our internet protocols. However, over time as our usage of the web changed, weaknesses in these protocols became evident. Although it is in its early stages, IPFS shows promise in being a crucial piece of a new decentralized technology stack.

So how we will design it ?

GenesisX Storage is a distributed file system which synthesizes successful ideas from previous peer-to-peer systems, including DHTs, BitTorrent, Git, and SFS. The contribution of DS.XGS is simplifying, evolving, and connecting proven techniques into a single cohesive system, greater than the sum of its parts.

DS.XGS is peer-to-peer Storage no nodes are privileged.
DS.XGS nodes store IPFS objects in local storage. Nodes connect to each other and transfer objects. These objects represent files and other data structures.

The DS.XGS Protocol is divided into a stack of sub-protocols responsible for different functionality:

1. Identities - manage node identity generation and verification.

2. Network - manages connections to other peers, uses various underlying network protocols.

3. Routing - maintains information to locate specific peers and objects. Responds to both local and remote queries. Defaults to a DHT, but is swappable.

4. Exchange - a novel block exchange protocol (BitSwap) that governs efficient block distribution. Modelled as a market, weakly incentivizes data replication. Trade Strategies swappable.

5. Objects - a Merkle DAG of content-addressed immutable objects with links. Used to represent arbitrary data structures, e.g. file hierarchies and communication systems.

6. Files - versioned file system hierarchy inspired by Git.

7. Naming - A self-certifying mutable name system.

Widgets and other features

1. Current price and trading widget to create current price awareness when buying/selling files

2. Discord chat widget linked to channel #buy/sell

3. Shared control feature for some files

4. Content Verification Protocol - To Be Confirmed
Being the creator of content and being recognised as the original creator of that content can be a challenge. It is important to honour the creator of the content and make sure people know they are getting what they pay for.

5. Auto Sync Feature