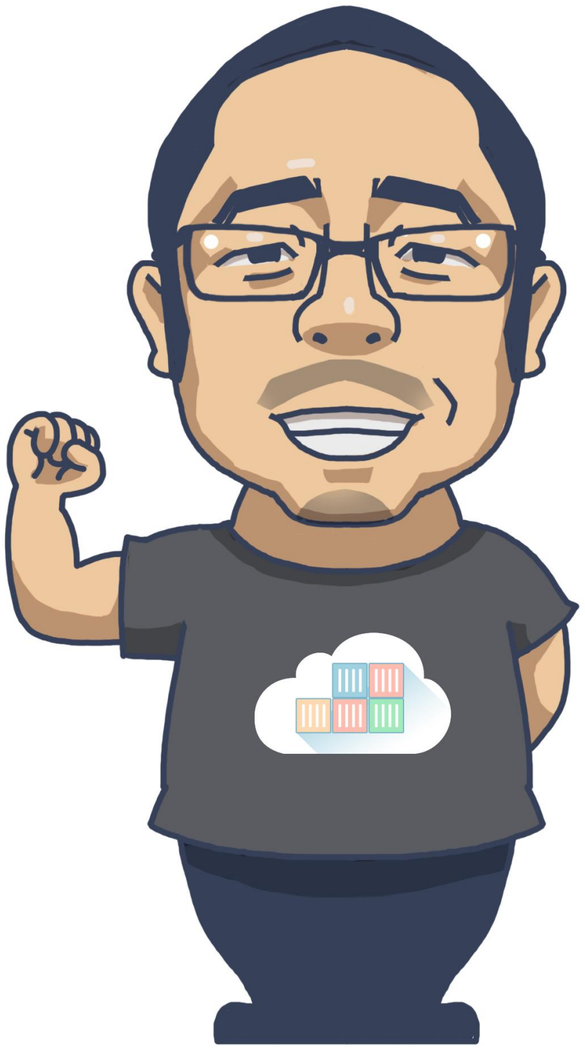
MEGA - DECENTRALIZED OPEN SOURCE COLLABORATION FOR SOURCE CODE & LLM

May 6th, 2024



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GitHub/Twitter/Gmail - genedna

Open Source Collaboration with Git and GitHub

Git - Distributed Version Control

- **No Central Repository Dependency** - Every developer has complete copy of repository and work independently
- **Offline Work and Flexibility** - Each developer can work offline and perform any version control operations without an internet connection
- **Flexibility in Workflow** - Teams can choose to have a central repository for coordination, or share changes with a subset of collaborators, or contribute to multiple repositories.

https://github.com/web3infra-foundation/mega

GitHub - Centralized Open Source Collaboration

- **Central Repository Hosting Service** - GitHub acts as a central hub for store repositories and collaboration. It provides a web interface and tools built around Git, making it easier for developers to share, discover, and contribute to projects
- **Collaboration Features** - GitHub provides fork, pull request, issues, discussion, wiki, project board and action

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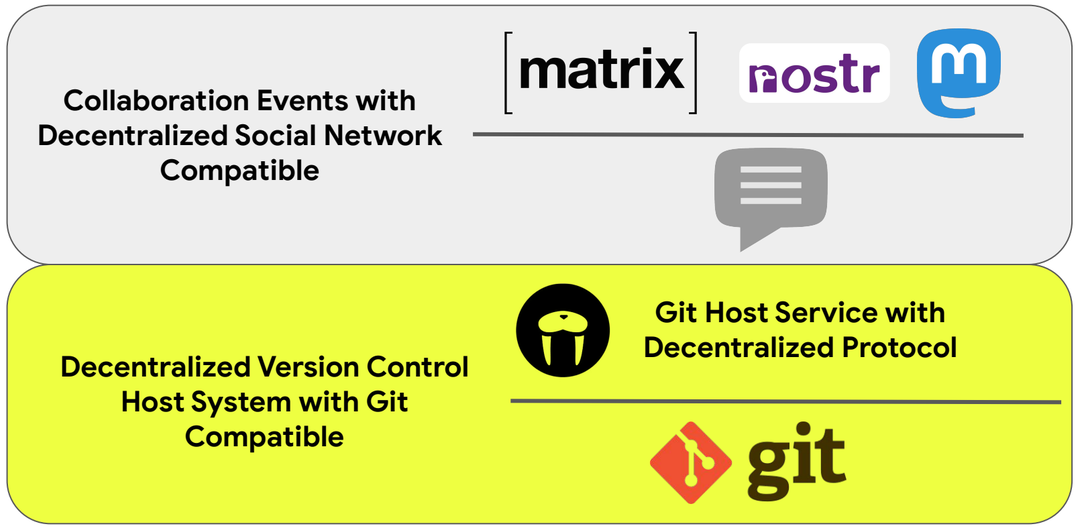
How Decentralized Open Source Collaboration?



Collaboration Layer

Data Layer

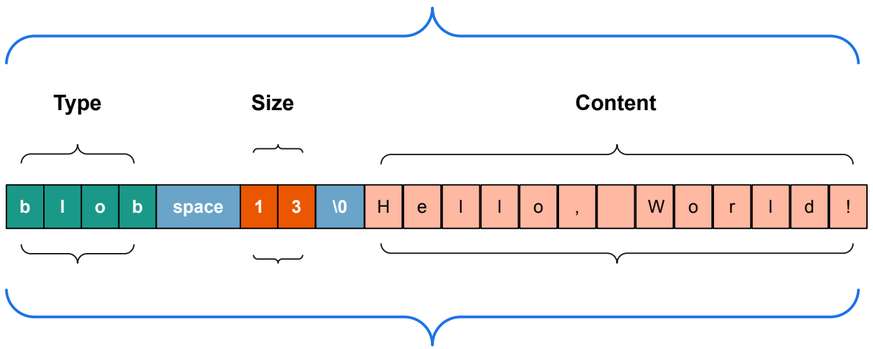
Open Source Collaboration

https://github.com/web3infra-foundation/mega

Rewrite the Git for Decentralized Service with Rust

Git - Addressable File System for Local

SHA-1: 8ab686eafeb1f44702738c8b0f24f2567c36da6d



Object URI

GET https://<domain>/v1/object/<sha-1>

```
$ echo Hello, World! | git hash-object
--stdin

8ab686eafeb1f44702738c8b0f24f2567c36da6d
```

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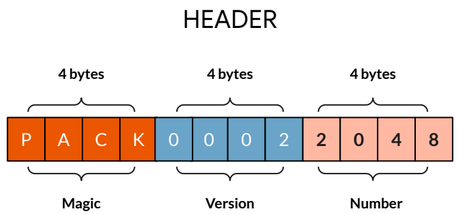
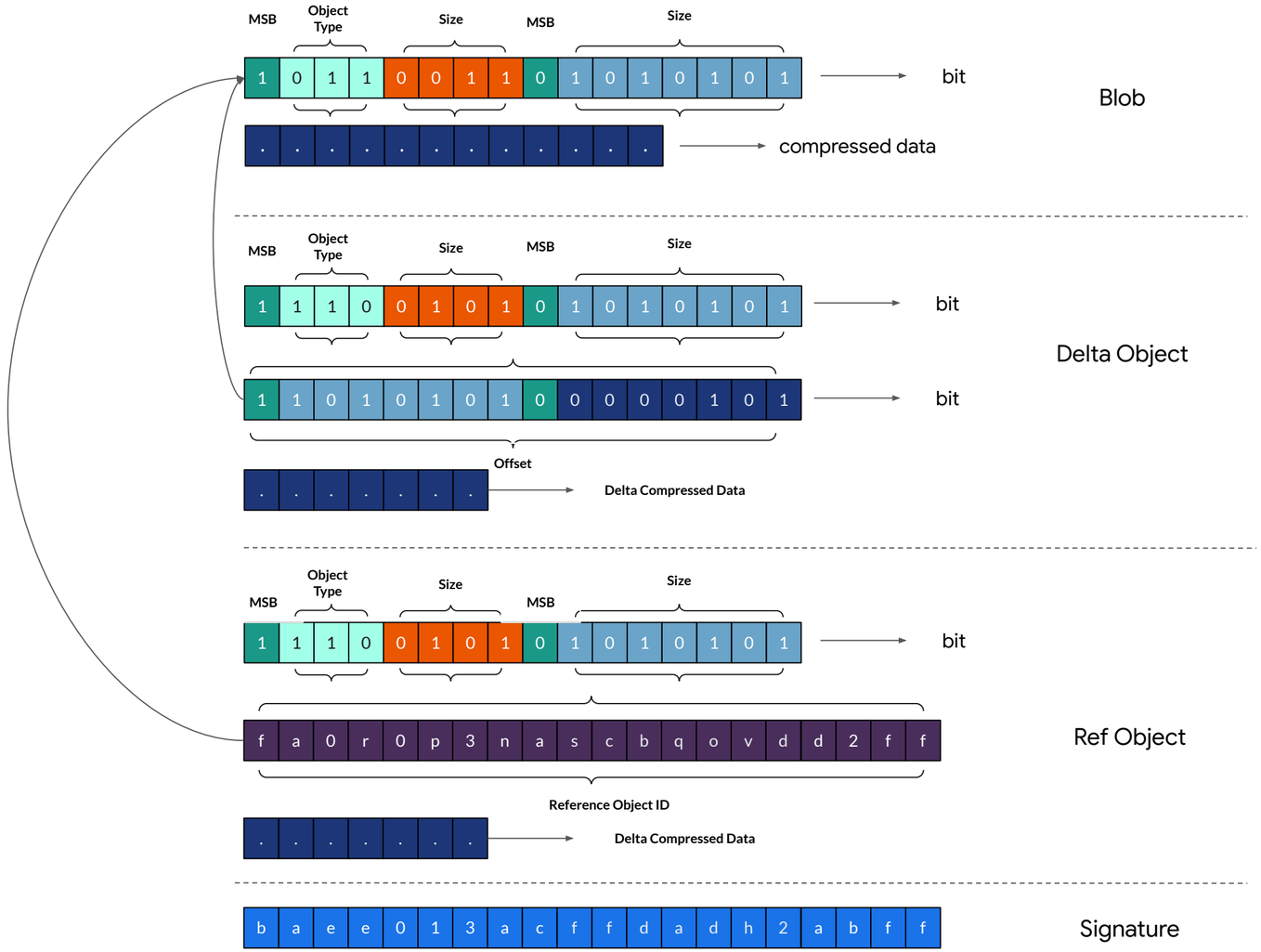
Git Pack File - Objects



Add a router for getting objects list

GET https://<domain>/v1/<repo>/objects

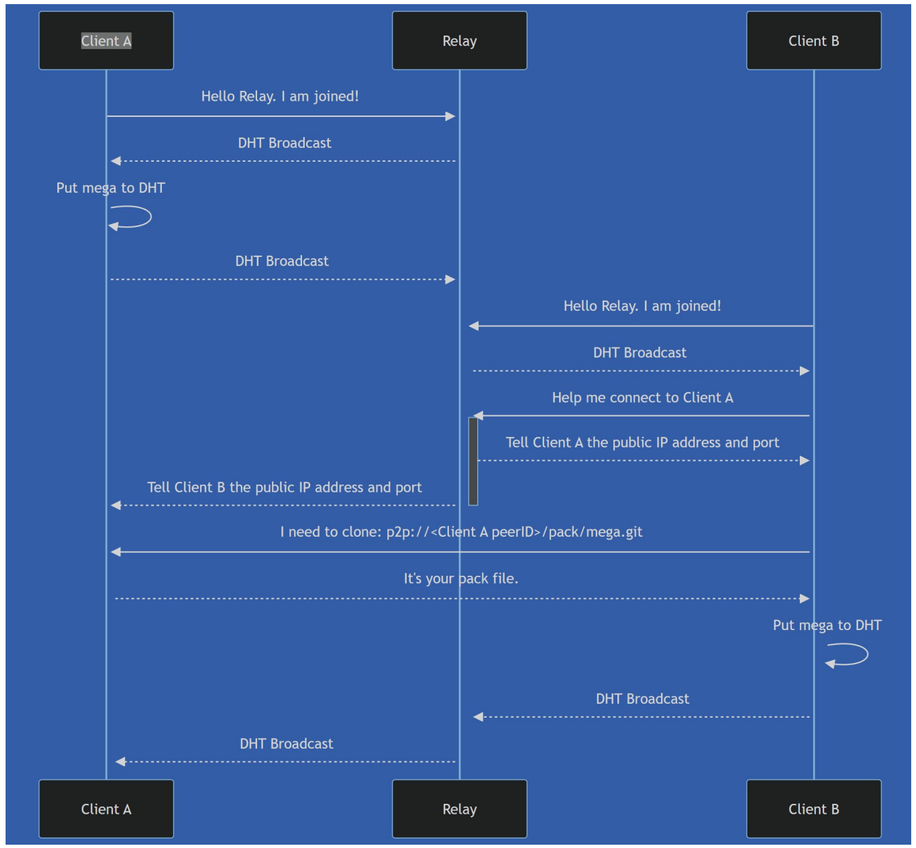


https://github.com/web3infra-foundation/mega

Decentralized and Discovery - libp2p & DHT

p2p://<peer Id>/<type>/<repo>


```
{
        "origin": "12D3KooWFgpUQa9WnTztcvs5LLMJmwsMoGZcrTHdt9LKYKpM4MiK",
        “name”: “mega”,
        "latest": "1de1c6f",
        "forks": [
            {
                “peer”: "456DFooWFgpUQa9WnTztcvs5LLMJmwsMoGZccdw3Ddf3DTH23",
                “latest”: "1de1c6f",
                "timestamp": 1629827281
            },
            {
                “peer”: "799DFoodjsfhuedDFEDSFesDFwefSDfwsefEWFweSDFWEfweS",
                “latest”: "be04428"
                "timestamp": 1629827281
            },
        ],
        "timestamp": 1629827281
}
```

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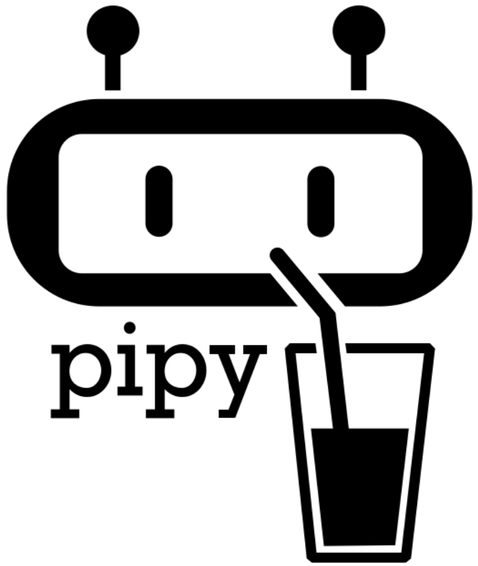
Reimplementing Decentralized Protocol with ZTM



https://github.com/flomesh-io/ztm

ZTM is an open source network infrastructure software for running a decentralized network. It is built upon HTTP/2 tunnels and can run on any sort of IP networks such as LANs, containerized networks and the Internet, etc.

ZTM lays the foundation for building decentralized applications by providing a set of core capabilities including:

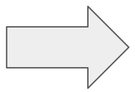
- Network connectivity across Internet gateways and firewalls
- TLS-encrypted communication channels
- Certificate-based authentication and access control
- Service discovery and load balancing

Design Events for Decentralized Collaboration

Collaboration Events Extend Nostr

Update a Repo Status Event

```
{
        "kind": 111,
        "id": <32-bytes lowercase hex-encoded sha256 of the serialized event data>,
        "peer": <32-bytes lowercase hex-encoded public key of the event creator>,
        "timestamp": <unix timestamp in seconds>,
        "tags": [
                [“p”, “12D3KooWFgpUQa9WnTztcvs5LLMJmwsMoGZcrTHdt9LKYKpM4MiK”],
                [“n”, “mega”],
                [“t”, “origin”],
                [“a”, “update”],
                ["u", "p2p://12D3KooWFgpUQa9WnTztcvs5LLMJmwsMoGZcrTHdt9LKYKpM4MiK/pack/mega.git"],
                ["c", "1de1c6f"],
        ],
        "content": <arbitrary string>,
        "sig": < 64-byte lowercase hex of the signature of the sha256 hash of the serialized event data, which is the same as the "id" field>
}
```



p: The peer id of the node
n: The name of the repo
t: The type of repo - origin or fork
a: The action of event - update/request/issue
u: The p2p URL of the repo
c: The latest commit of the repo

Create an Issue

```
{
        "kind": 111,
        "id": <32-bytes lowercase hex-encoded sha256 of the serialized event data>,
        "peer": <32-bytes lowercase hex-encoded public key of the event creator>,
        "timestamp": <unix timestamp in seconds>,
        "tags": [
                [“p”, “12D3KooWFgpUQa9WnTztcvs5LLMJmwsMoGZcrTHdt9LKYKpM4MiK”],
                [“k”, “mega”],
                ["t", “fork”],
                ["a", “issue”],
                ["u", "p2p://12D3KooWFgpUQa9WnTztcvs5LLMJmwsMoGZcrTHdt9LKYKpM4MiK/pack/mega.git"],
                ["c", "1de1c6f"],
                ["i", “Issue Content”]
        ],
        "content": <arbitrary string>,
        "sig": < 64-byte lowercase hex of the signature of the sha256 hash of the serialized event data, which is the same as the "id" field>
}
```

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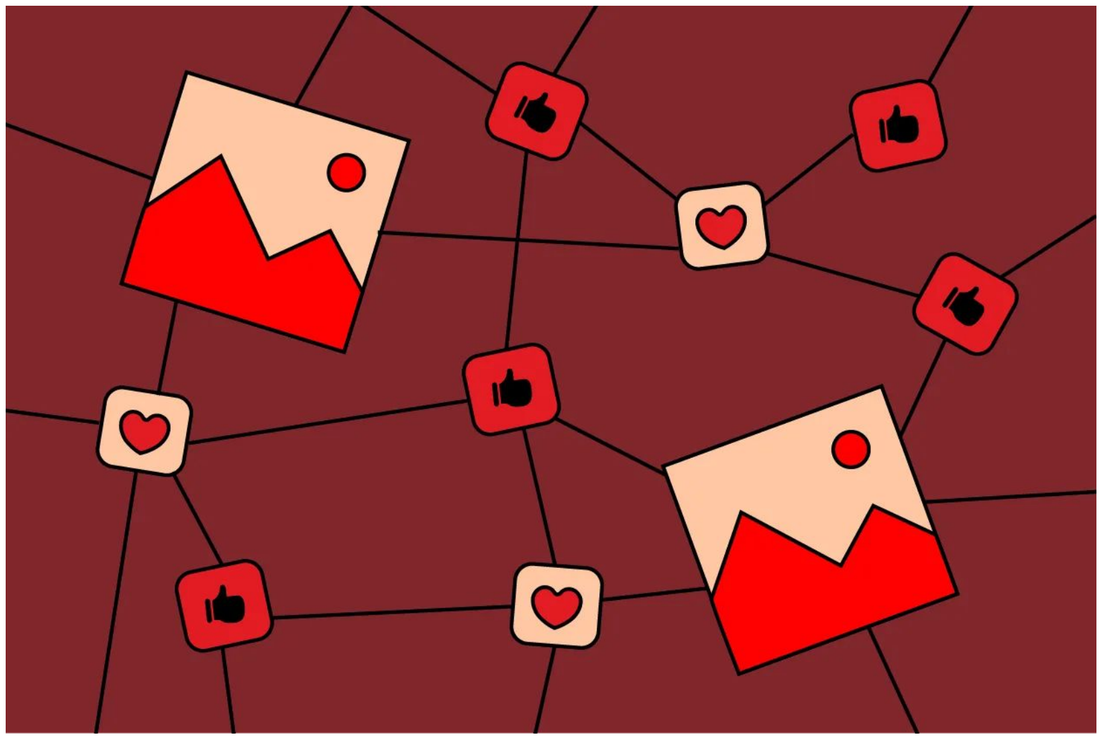
Nostr -> Matrix & Mastodon

matrix + nostr +

Mega as client connect different decentralized social network



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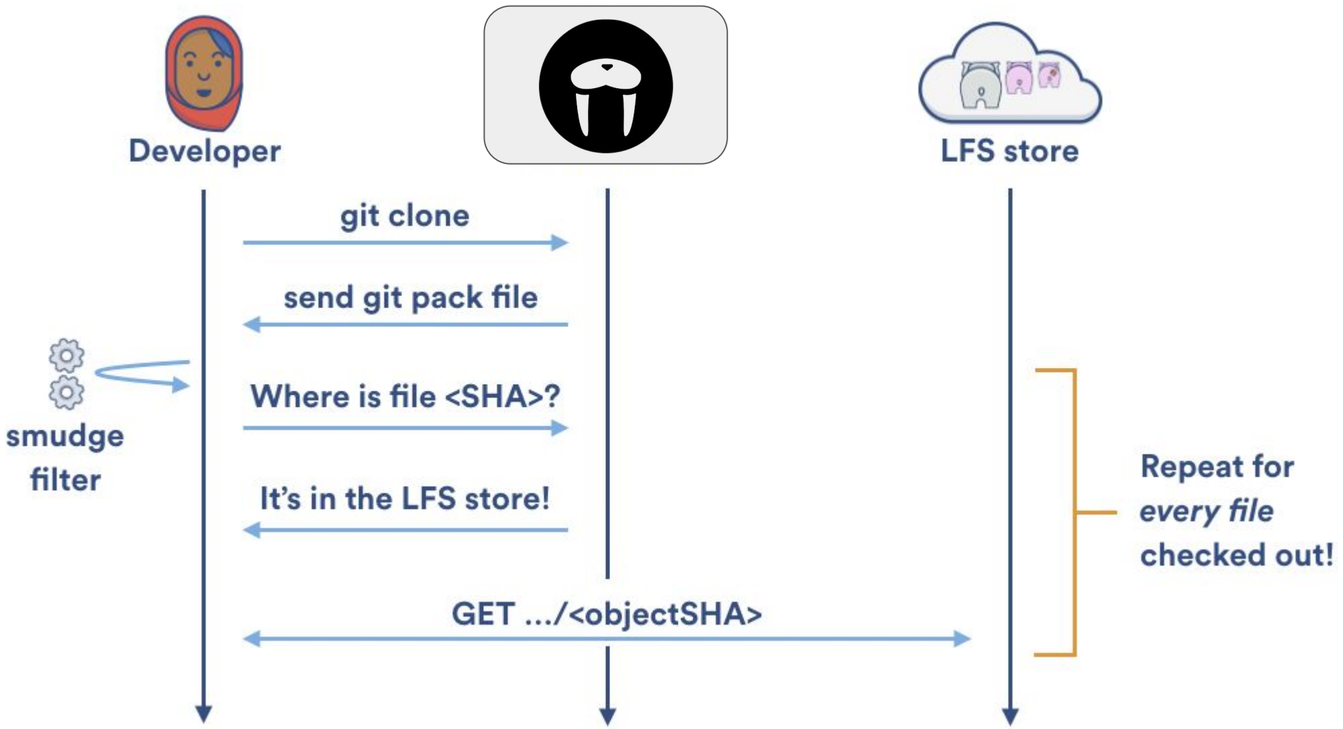
Rewrite the Git LFS for the LLM

Rewrite the LFS Client and Server for Large File



Git LFS is not enough to solve the LLM crisis, Mega working on split the large file to pieces and deliver with decentralized network.

GET https://<domain>/v1/file/<sha-256>
GET https://<domain>/v1/file/<sha-256>/chunks
GET https://<domain>/v1/file/chunks/<sha-256>

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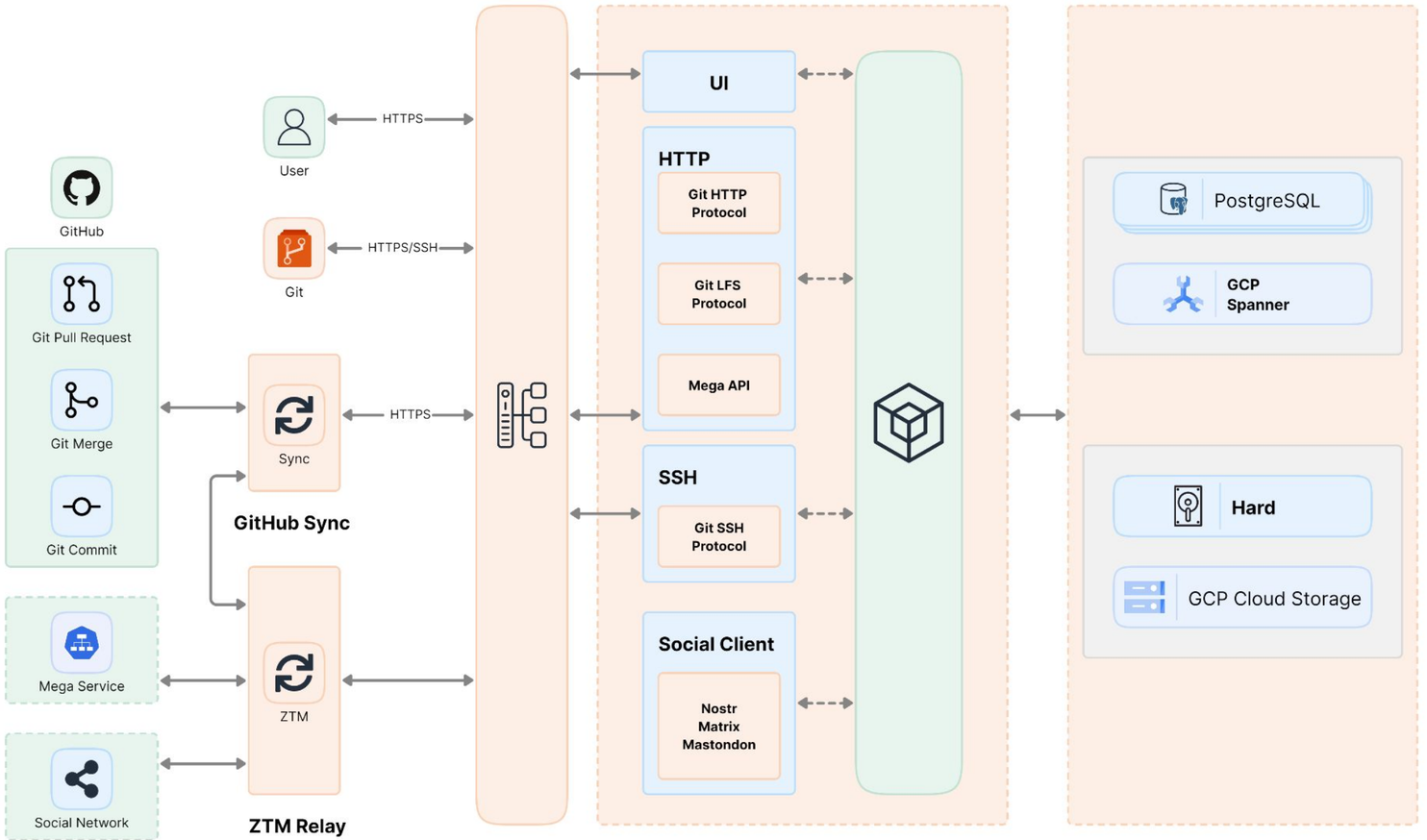
Mega Architect

Mega Architect Overview



made with onemodel.app

https://github.com/web3infra-foundation/mega

THANK YOU

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