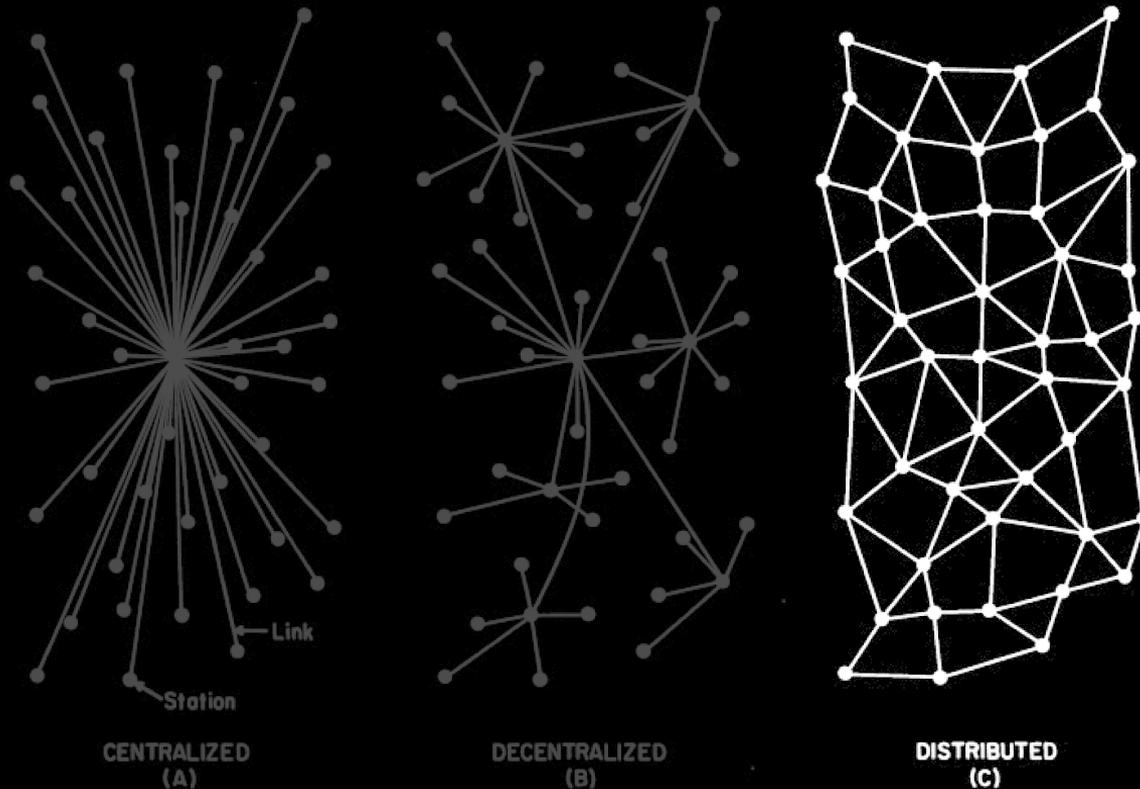




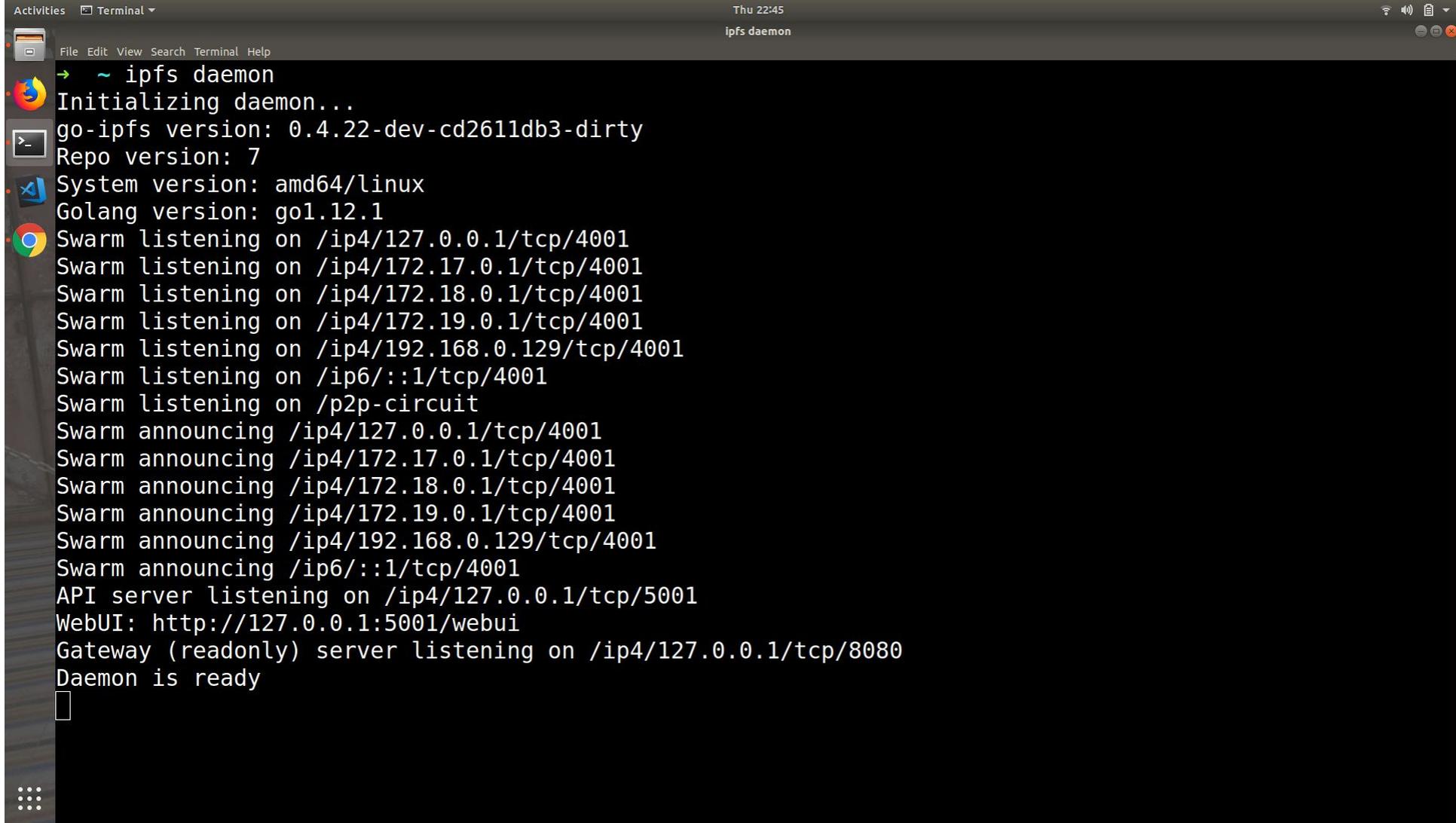
## Global peer to peer merkle dag file system

- Kishan Sagathiya (@kishansagathiya)

(Member of IPFS, Software Engineer at Protocol Labs)



**FIG. 1 – Centralized, Decentralized and Distributed Networks**



File Edit View Search Terminal Help

→ ~ ipfs daemon

Initializing daemon...

go-ipfs version: 0.4.22-dev-cd2611db3-dirty

Repo version: 7

System version: amd64/linux

Golang version: go1.12.1

Swarm listening on /ip4/127.0.0.1/tcp/4001

Swarm listening on /ip4/172.17.0.1/tcp/4001

Swarm listening on /ip4/172.18.0.1/tcp/4001

Swarm listening on /ip4/172.19.0.1/tcp/4001

Swarm listening on /ip4/192.168.0.129/tcp/4001

Swarm listening on /ip6>:::1/tcp/4001

Swarm listening on /p2p-circuit

Swarm announcing /ip4/127.0.0.1/tcp/4001

Swarm announcing /ip4/172.17.0.1/tcp/4001

Swarm announcing /ip4/172.18.0.1/tcp/4001

Swarm announcing /ip4/172.19.0.1/tcp/4001

Swarm announcing /ip4/192.168.0.129/tcp/4001

Swarm announcing /ip6>:::1/tcp/4001

API server listening on /ip4/127.0.0.1/tcp/5001

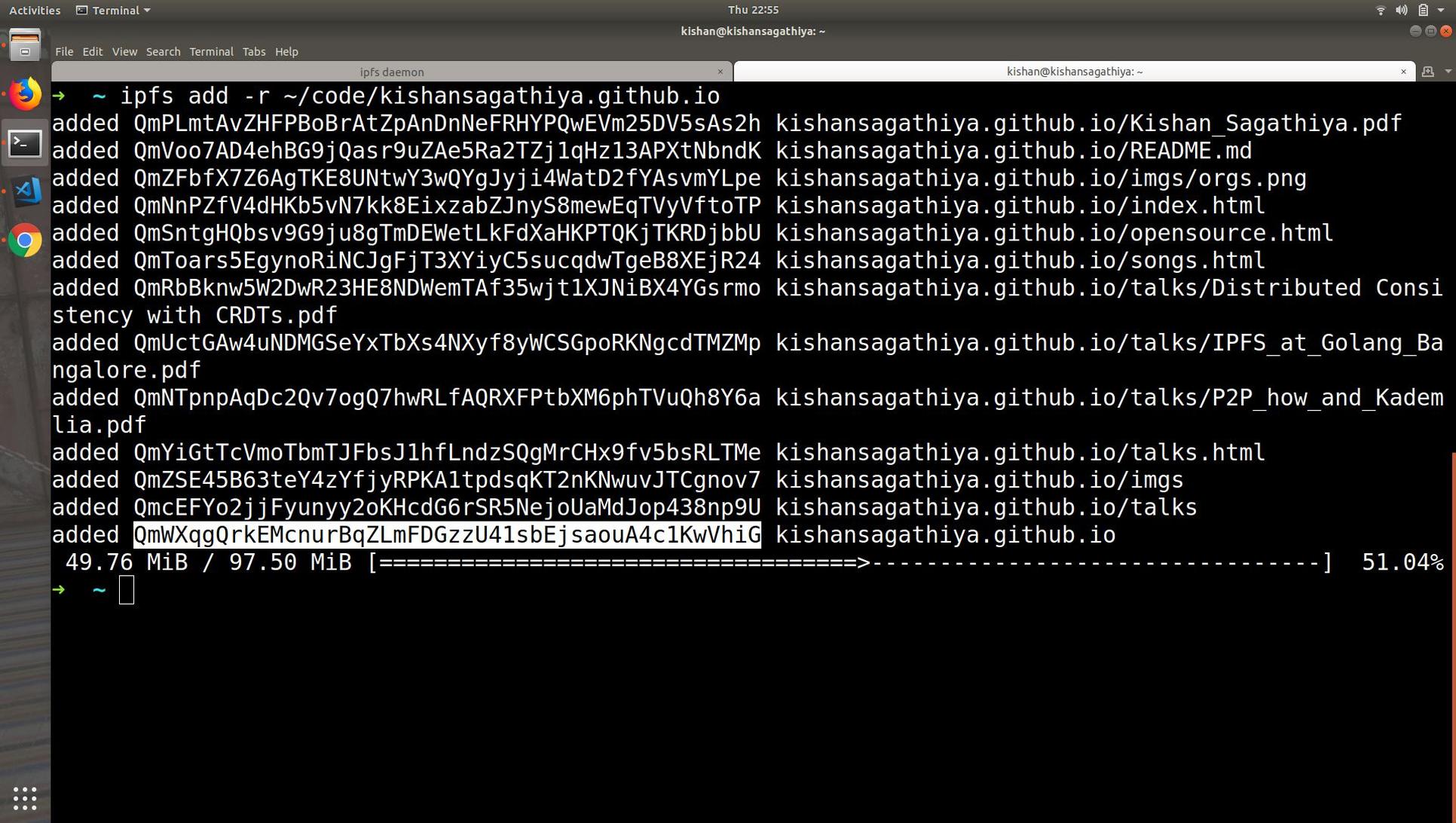
WebUI: http://127.0.0.1:5001/webui

Gateway (readonly) server listening on /ip4/127.0.0.1/tcp/8080

Daemon is ready

□





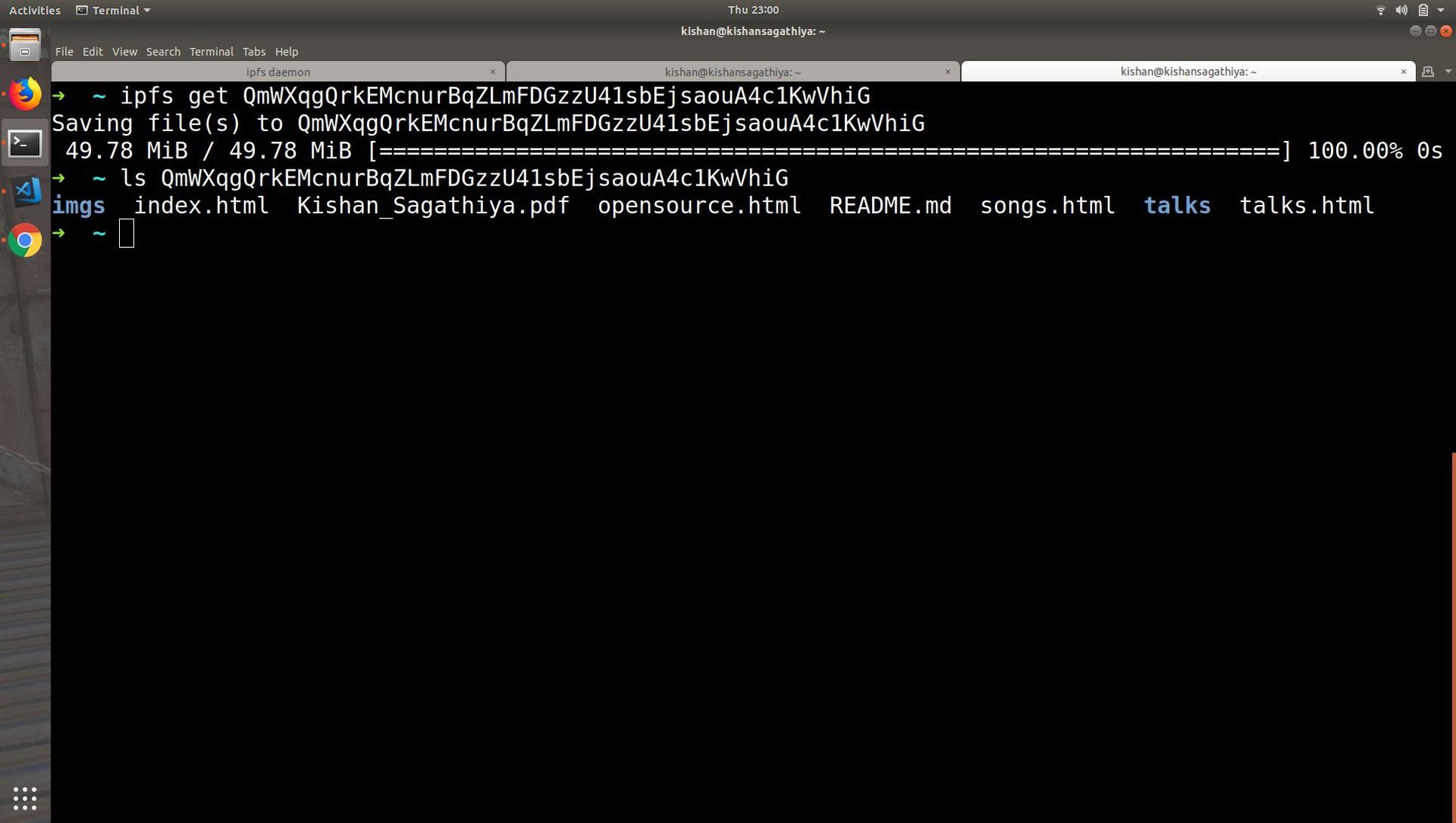
```

→ ~ ipfs add -r ~/code/kishansagathiya.github.io
added QmPLmtAvZHFPBoBrAtZpAnDnNeFRHYPQwEVm25DV5sAs2h kishansagathiya.github.io/Kishan_Sagathiya.pdf
added QmVoo7AD4ehBG9jQasr9uZAe5Ra2TZj1qHz13APXtNbnDK kishansagathiya.github.io/README.md
added QmZfbfX7Z6AgTKE8UNtwY3wQYgJyji4WatD2fYAsvmYLpe kishansagathiya.github.io/imgs/orgs.png
added QmNnPZfV4dHKb5vN7kk8EixzabZJnyS8mewEqTVyVftoTP kishansagathiya.github.io/index.html
added QmSntgHQbsv9G9ju8gTmDEwetLkFdXaHKPTQKjTKRDjbbU kishansagathiya.github.io/opensource.html
added QmToars5EgynoRiNCJgFjT3XYiyC5sucqdwTgeB8XEjR24 kishansagathiya.github.io/songs.html
added QmRbBknw5W2DwR23HE8NDWemTAf35wjt1XJNiBX4YGsrmo kishansagathiya.github.io/talks/Distributed Consistency with CRDTs.pdf
added QmUctGAw4uNDMGSeYxTbXs4NXyf8yWCSGpoRKNgcdTMZMp kishansagathiya.github.io/talks/IPFS_at_Golang_Bangalore.pdf
added QmNTpnpAqDc2Qv7ogQ7hwRLfAQRXFPTbXM6phTVuQh8Y6a kishansagathiya.github.io/talks/P2P_how_and_Kademlia.pdf
added QmYiGtTcVmoTbmTJFbsJ1hfLndzS0gMrCHx9fv5bsRLTME kishansagathiya.github.io/talks.html
added QmZSE45B63teY4zYfjyRPKA1tpdsqKT2nKNwuvJTCgnov7 kishansagathiya.github.io/imgs
added QmceFYo2jjFyunyy2oKHcdG6rSR5NejoUaMdJop438np9U kishansagathiya.github.io/talks
added QmWXqgQrKEMcnurBqZLmFDGzzU41sbEjsaouA4c1KwVhiG kishansagathiya.github.io

```

49.76 MiB / 97.50 MiB [=====>-----] 51.04%

→ ~



```
→ ~ ipfs get QmWXqgQrkEMcnurBqZLmFDGzzU41sbEjsaouA4c1KwVhiG
Saving file(s) to QmWXqgQrkEMcnurBqZLmFDGzzU41sbEjsaouA4c1KwVhiG
49.78 MiB / 49.78 MiB [=====] 100.00% 0s
→ ~ ls QmWXqgQrkEMcnurBqZLmFDGzzU41sbEjsaouA4c1KwVhiG
imgs index.html Kishan_Sagathiya.pdf opensource.html README.md songs.html talks talks.html
→ ~
```

So many new songs come out every year. Overtime some amazing songs get lost.

I enjoy discovering them through music or songs used in shows and movies or whatever way I can.

- [Billy Joel - The Longest Time](#)
- [Plain White T's - Rhythm Of Love](#)
- [Frankie Valli & The Four Seasons - December, 1963 \(Oh What A Night!\)](#)
- [Bryan Adams - Summer of 69](#)
- [Ben E King - Stand by me](#)

Suggest me songs by leaving comments on this [GH issue](#) !

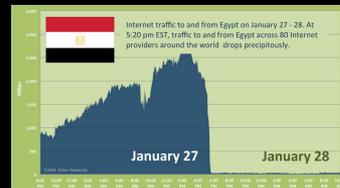


IPFS aims to replace HTTP and  
build a better web for all of us.

# the web has problems



bad in mobile and IoT





**web**



**SFS**



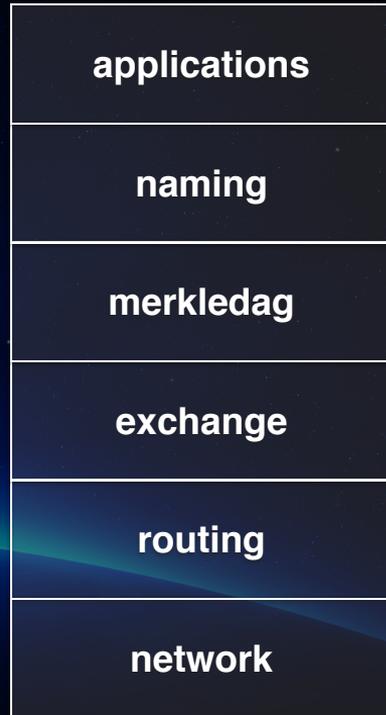
**git**



**BitTorrent®**



**DHT**



**applications**

**naming**

**merkledag**

**exchange**

**routing**

**network**

Hash(



)

=

QmSAoxMPj7R6Roy5s  
3fG2QZ5USYhZK8EvP  
xu7P2a4WC2R1

`http://10.20.30.40/foo/bar/baz.png`

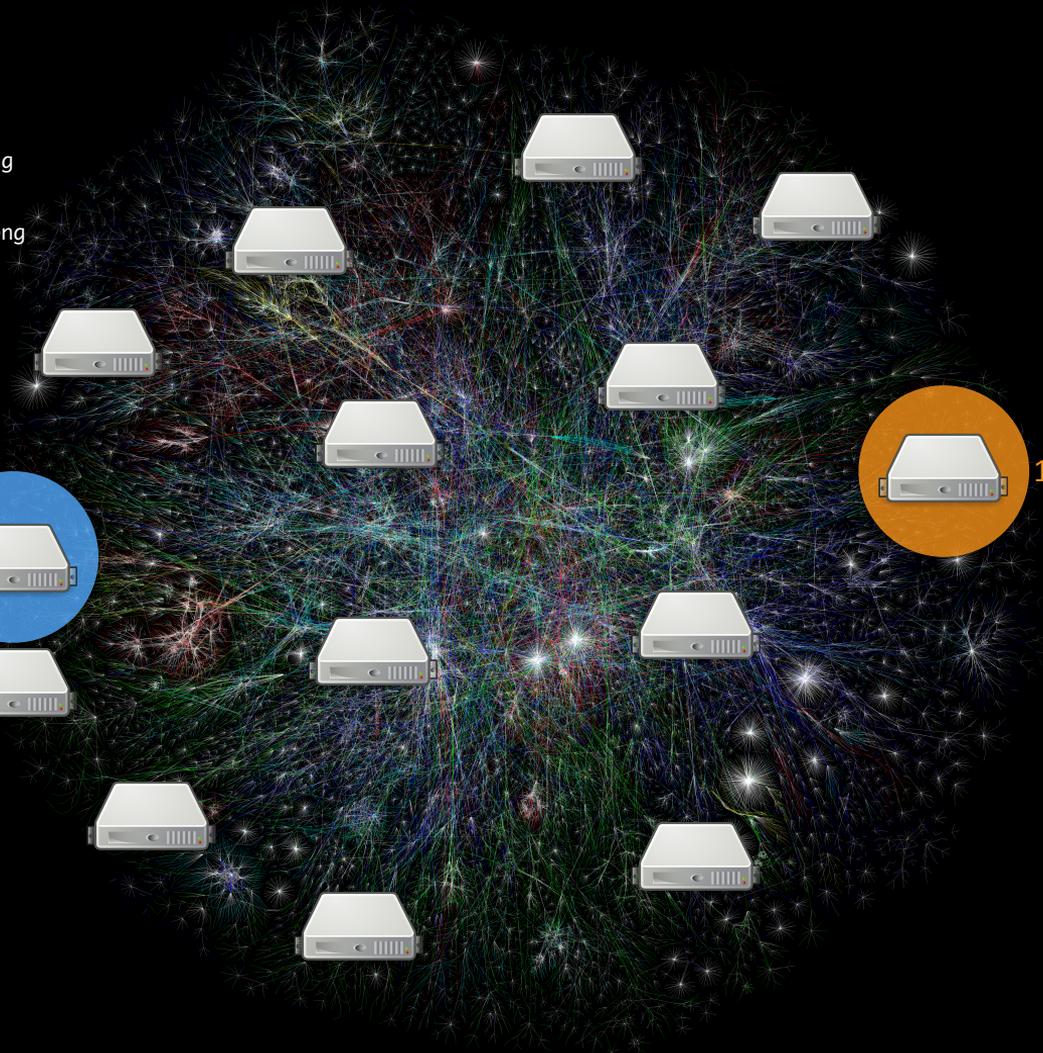
`/ipfs/QmW98pJrc6FZ6/foo/bar/baz.png`

you



10.20.30.40

HTTP

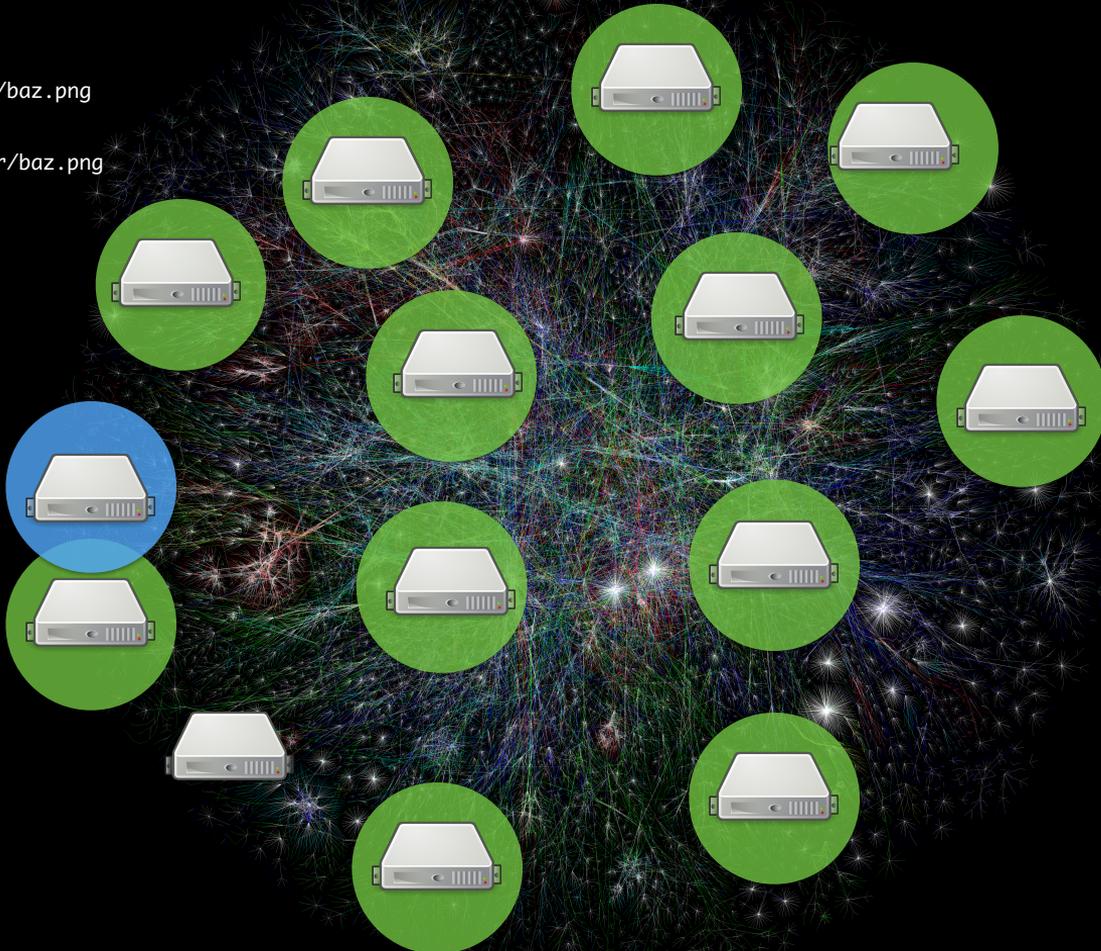


`http://10.20.30.40/foo/bar/baz.png`

`/ipfs/QmW98pJrc6FZ6/foo/bar/baz.png`

you

10.20.30.40



IPFS

# Merkle Tree

a **tree** structure in which

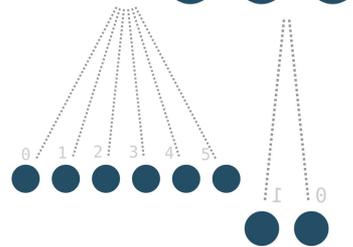
- each leaf node is a hash of a block of data, and
- each non-leaf node is a hash of its children.

QmWXqgQrkEMcnurBqZLmFDGzzU41sbEjsaouA4c1KwVhiG

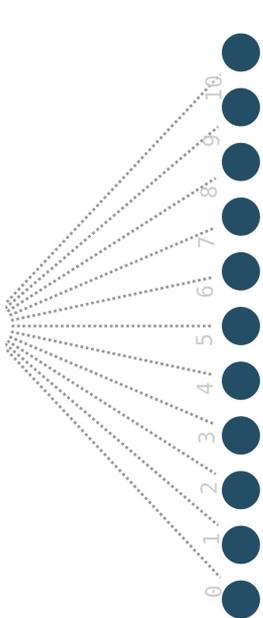
kishansagathiya.github.io (root dir)



pdf slides



blocks (~256kb)



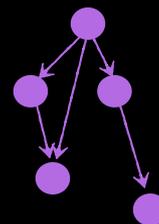
Merkle DAGs help in

- De-duplication
- Data Integrity

# an IPFS node



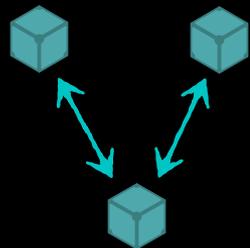
has pki based identity



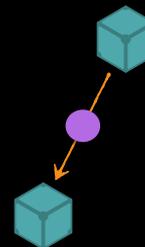
can store part of the dag



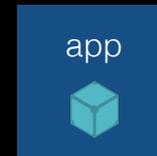
can be run as a server



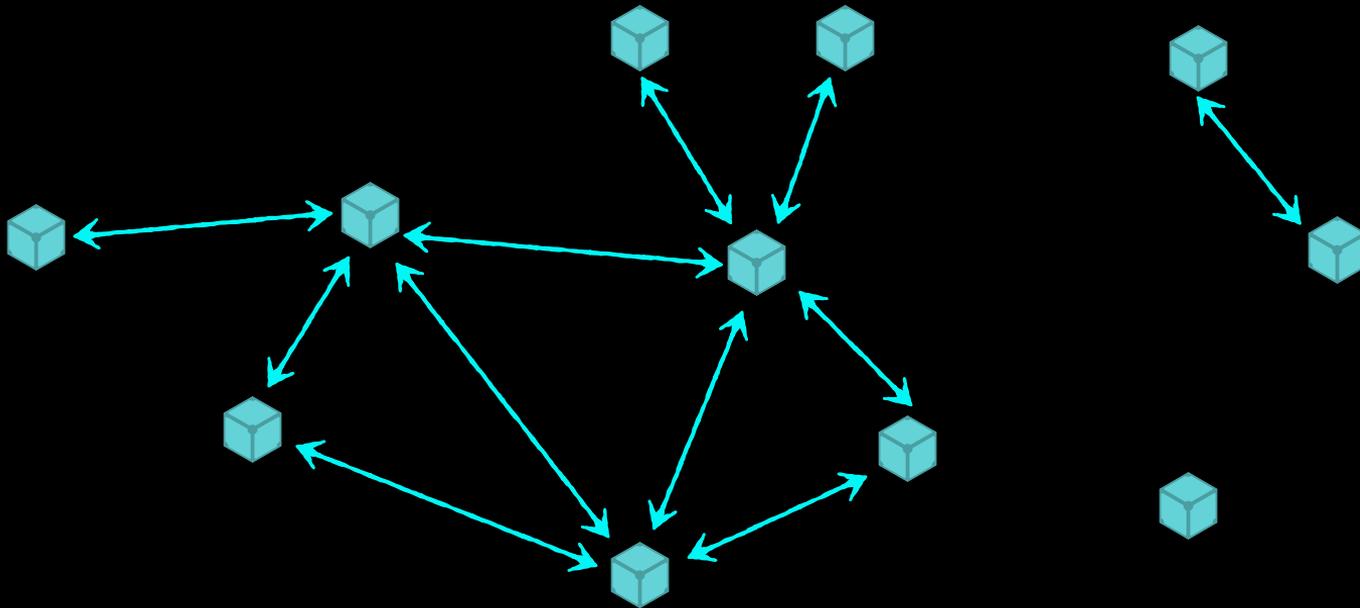
connects to others



can get more from peers

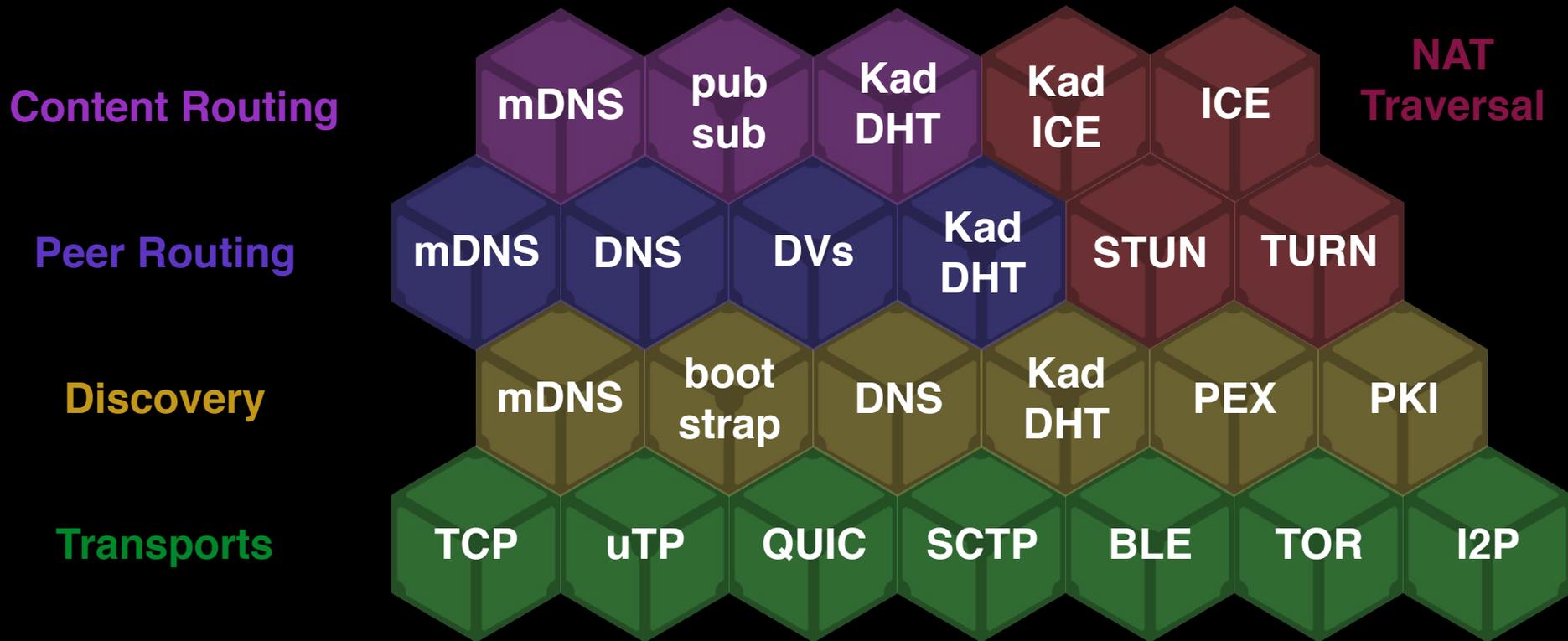


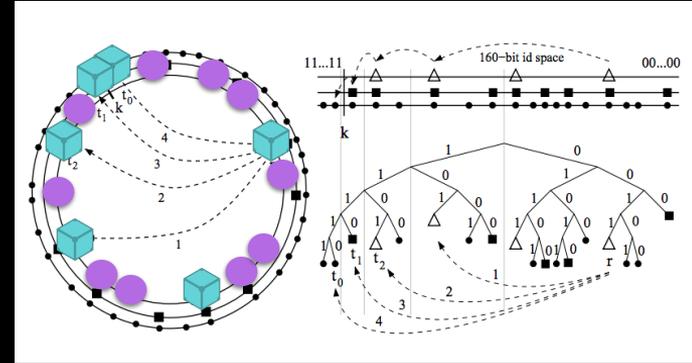
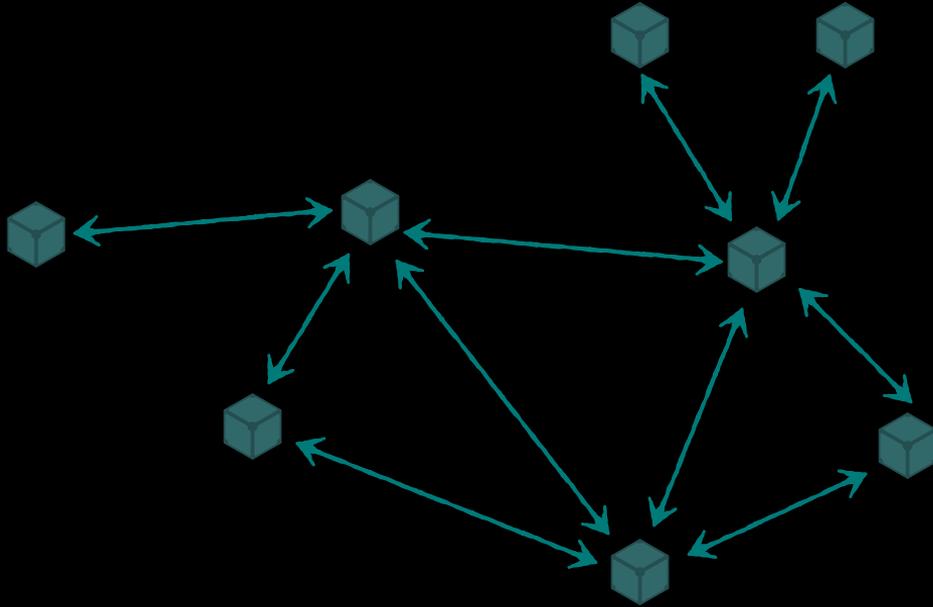
or embedded in apps



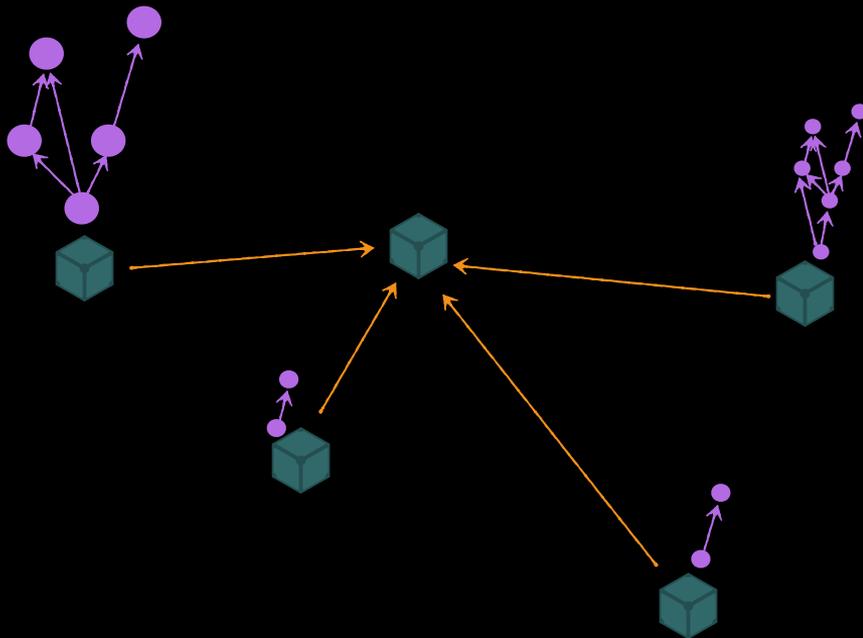
IPFS nodes form p2p networks  
transport **agnostic** and with NAT traversal

# libp2p a collection of peer-to-peer protocols





they find each other and content  
with routing systems, like DHTs



and **exchange** dag nodes  
like files in **http** or **bittorrent**

in go-ipfs:



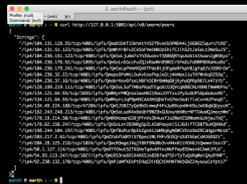
ipfs node



cli



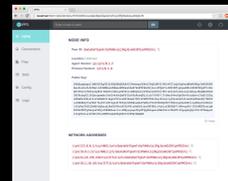
library



http api



http/ipfs  
gateway

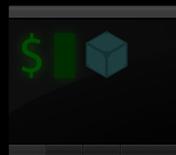


webui

in go-ipfs:



ipfs node



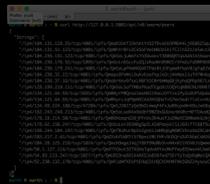
cli



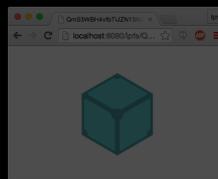
library



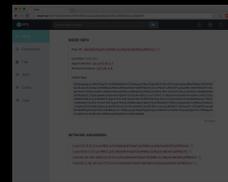
DEMO



http api



http/ipfs  
gateway



webui



IPFS  contributors

<https://github.com/ipfs/go-ipfs>

<https://github.com/ipfs/js-ipfs>

