IPFS-tiny

Enabling new concepts

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First things first

1. IPFS Inter Planetary File System
2. IPLD Inter Planetary Linked Data

IPFS

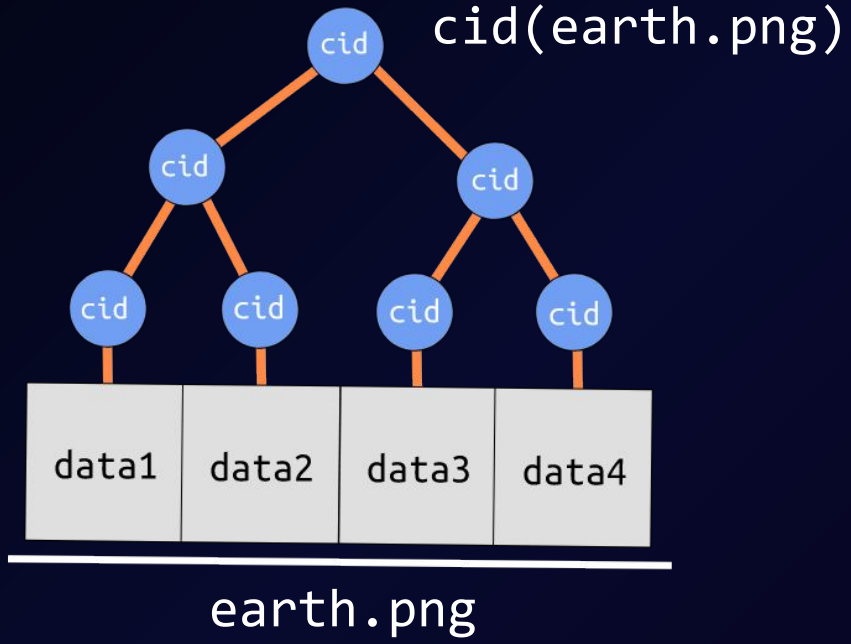
- Distributed File System
- P2P network / DHT
- Content Addressing

  CID - Content IDentifier

IPLD

- Merkle DAG
- Self-descriptiveness
- Backwards/Forwards compatible
- Self-verifiability

IPLD


cid(earth.png)
cid
cid
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cid
cid
data1
data2
data3
data4
earth.png

IPFS-tiny

- C++ tiny version of IPFS
- Embedded friendly (mem alloc)
- Works on all architectures
- File system agnostic
- OS independent

If it runs C++, it can run IPFS-tiny

IPFS-tiny

- Few embedded-friendly libraries
- Can’t deal with network stack
- Simplified protocol
- No incentive to store data

IPFS-tiny≠IPFS – How to integrate?

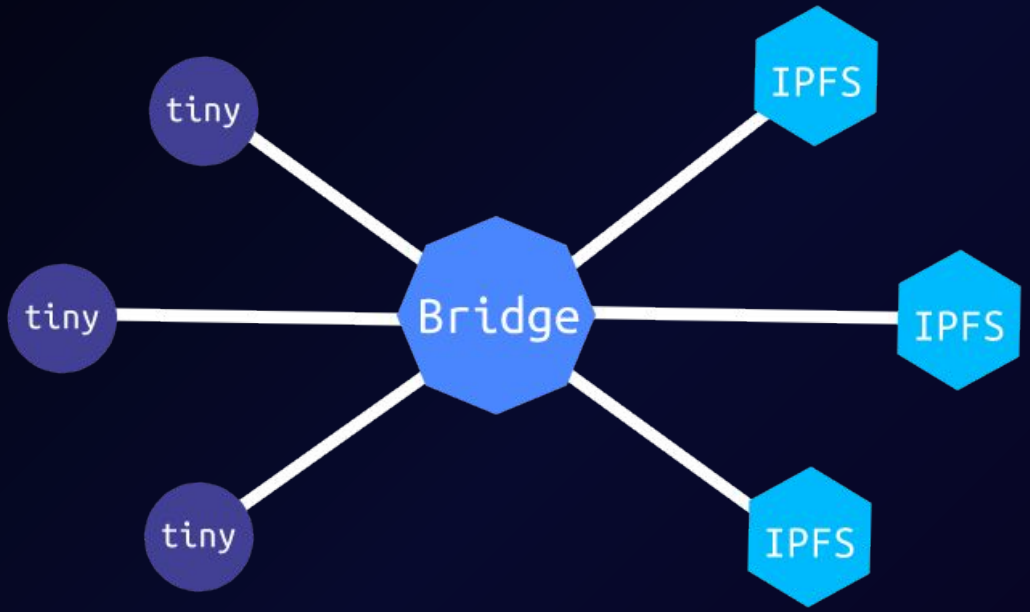
IPFS-tiny

Bridge

- Runs IPFS-tiny and IPFS
- IPFS can access IPFS-tiny data
- IPFS-tiny can access IPFS data
- IPLD makes this easy

IPFS-tiny

Bridge



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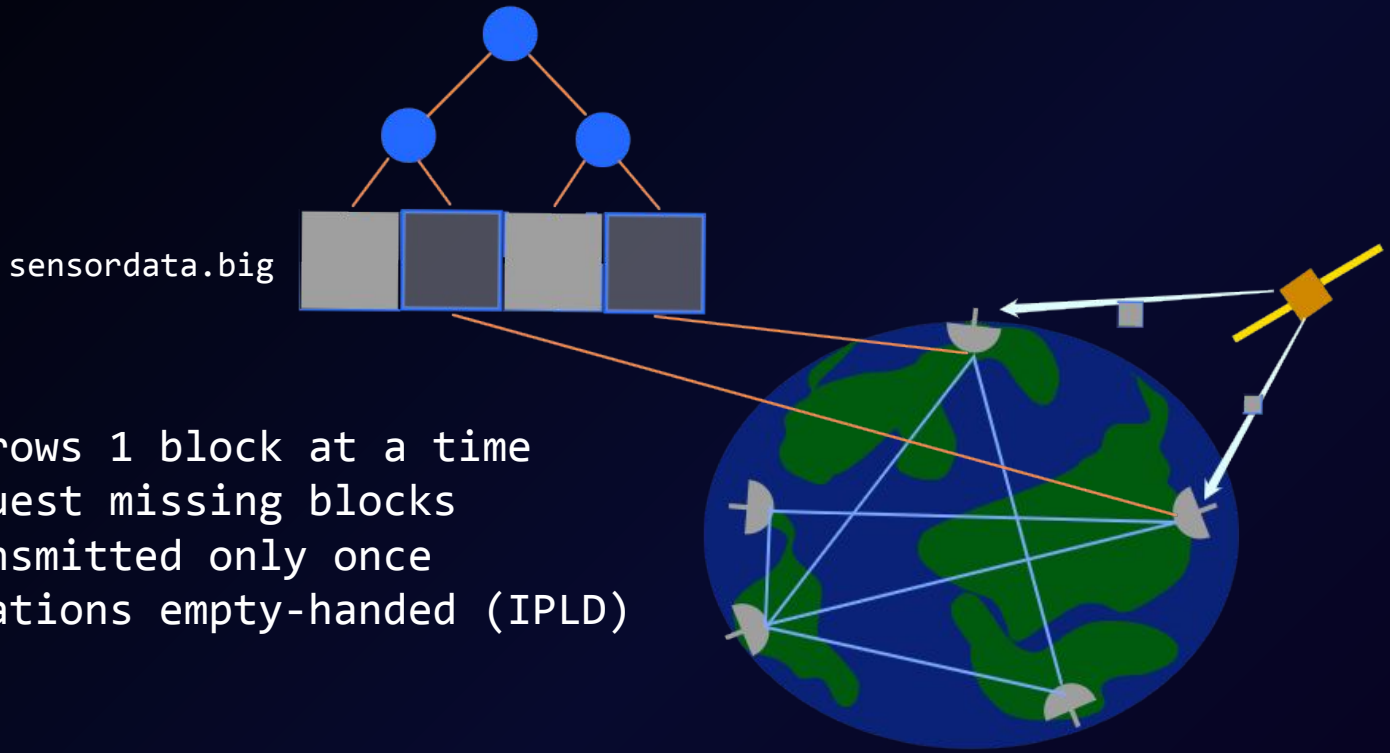
Concept 1

- Distributed ground station network as bridge-layer (SatNOGS)
- Satellite running IPFS-tiny

Concept 1



- Satellite throws 1 block at a time
- Stations request missing blocks
- Big file transmitted only once
- Malicious stations empty-handed (IPLD)

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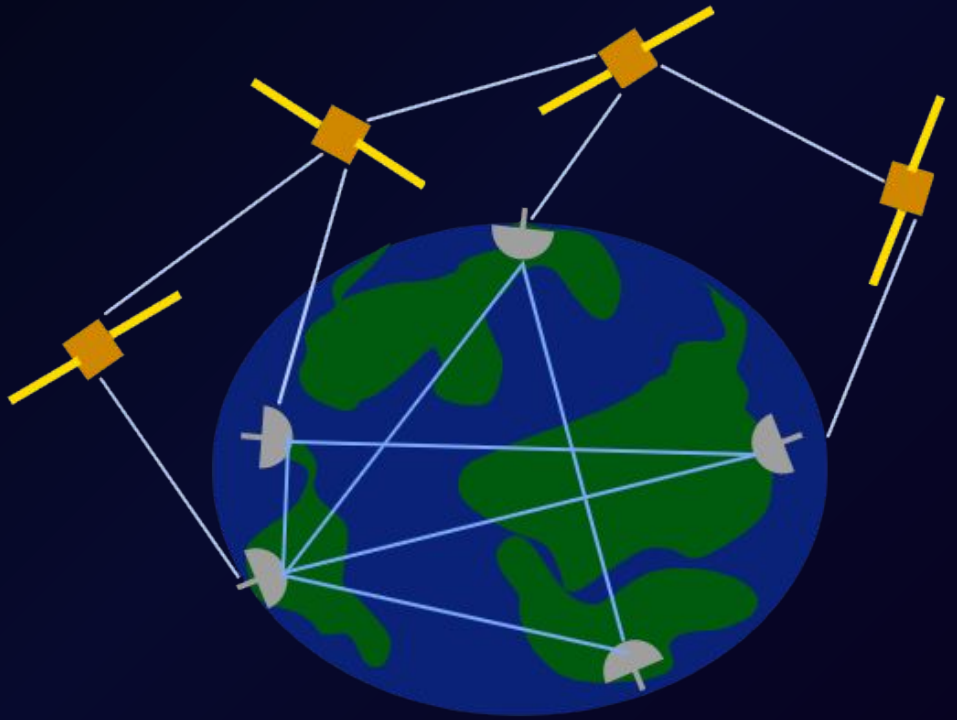
Concept 2

- Same as #1
- More satellites

Concept 2

- Satellites also share blocks
- Orbit gossip
- Cross-sat block availability



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Concept 3

- Based on #2
- Even more satellites
- IPFS itself is the mission

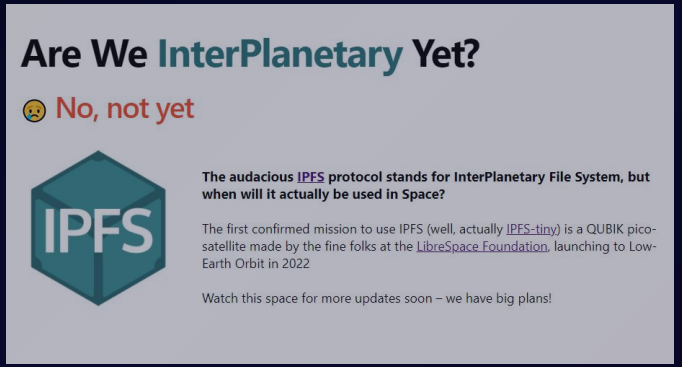
Concept 3

- Space-layer of IPFS
- Interplanetary: ON
- Satellite incentive to store?
  (Filecoin “to the moon”..?!)
- Efficient Routing?
  No DHT – Dynamic Topology

IPFS-tiny

gitlab.com/librespacefoundation/ipfs-tiny

areweinterplanetaryyet.org



Possible demo of concept #1 with next batch of QUBIKs and SatNOGS

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Thank you!