



# IPNI & Double Hashing



Dante Cullari

CEO – Konvergence Inc.

Web3 Architect, Full Stack Developer,  
UI/UX Designer, Web Researcher

[dante@raincloud.earth](mailto:dante@raincloud.earth)

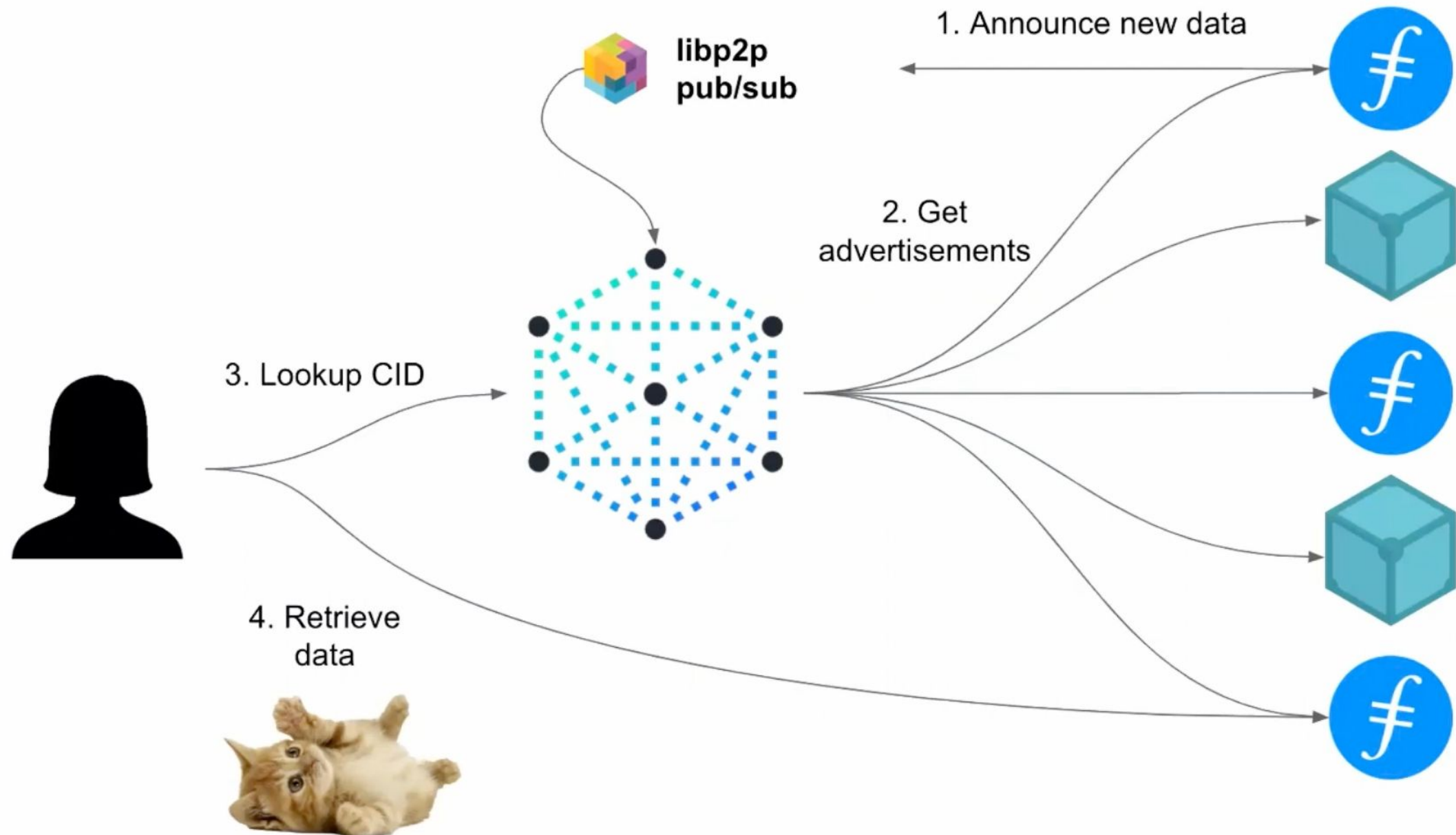
<https://raincloud.earth>



Konvergence



# Inter-Planetary Network Indexer (IPNI)



<https://www.youtube.com/watch?v=cqDkNF6agPo>

# Necessity & Benefits

## How IPNI benefits IPFS

The indexer offers several benefits to IPFS, including:

- **Faster data retrieval:** By maintaining an additional layer of information on top of the DHT, the indexer can help speed up data location and retrieval in IPFS.
- **Reduced resource consumption:** The indexer can help reduce the amount of bandwidth and processing power needed to locate and retrieve data, improving the performance of individual nodes and the overall network.
- **Improved scalability:** With the indexer, IPFS can better handle growth in user base and data volume, allowing it to scale more effectively and support larger networks.

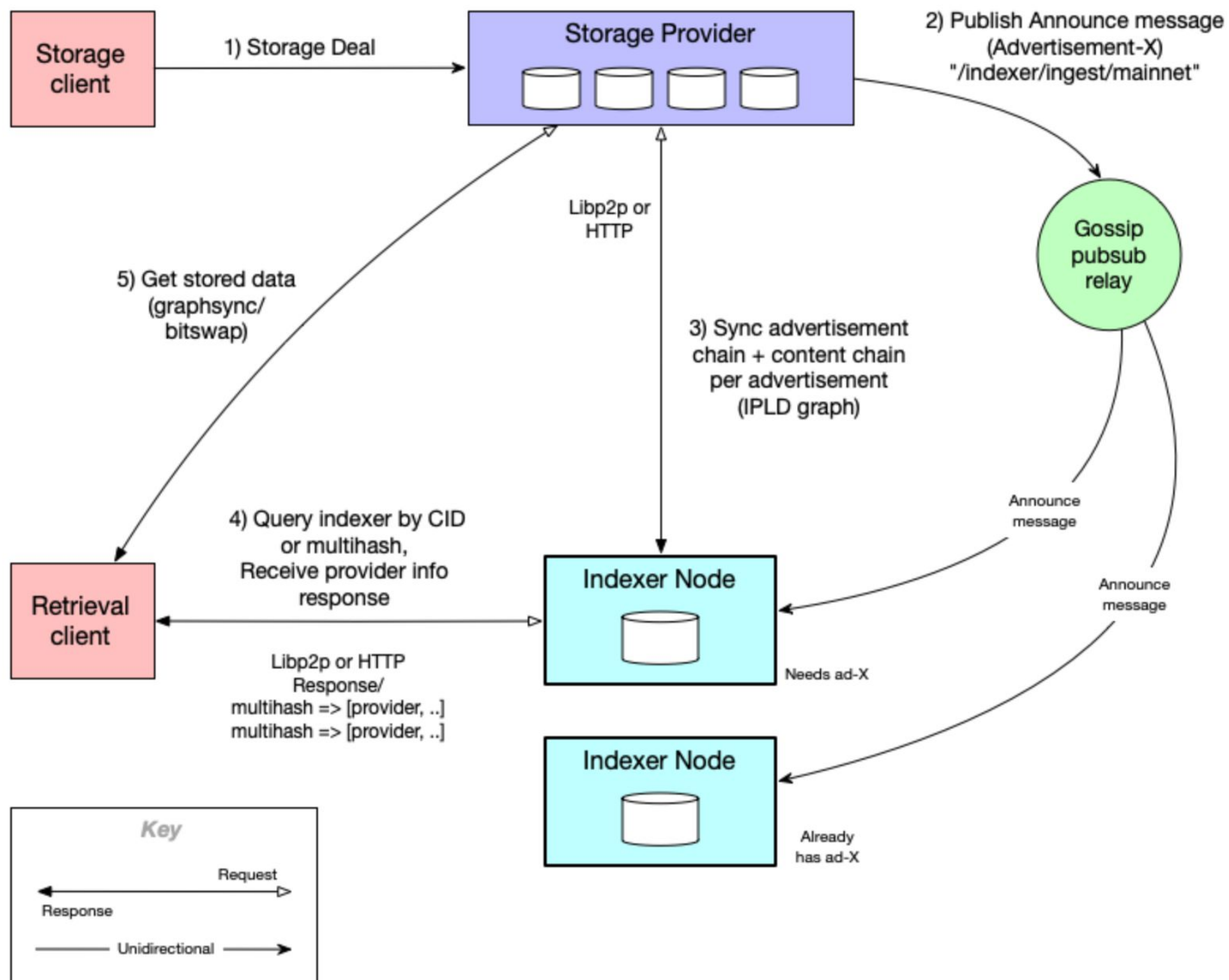
<https://filecoin.io/blog/posts/introducing-the-network-indexer/>







# IPNI Filecoin Retrieval

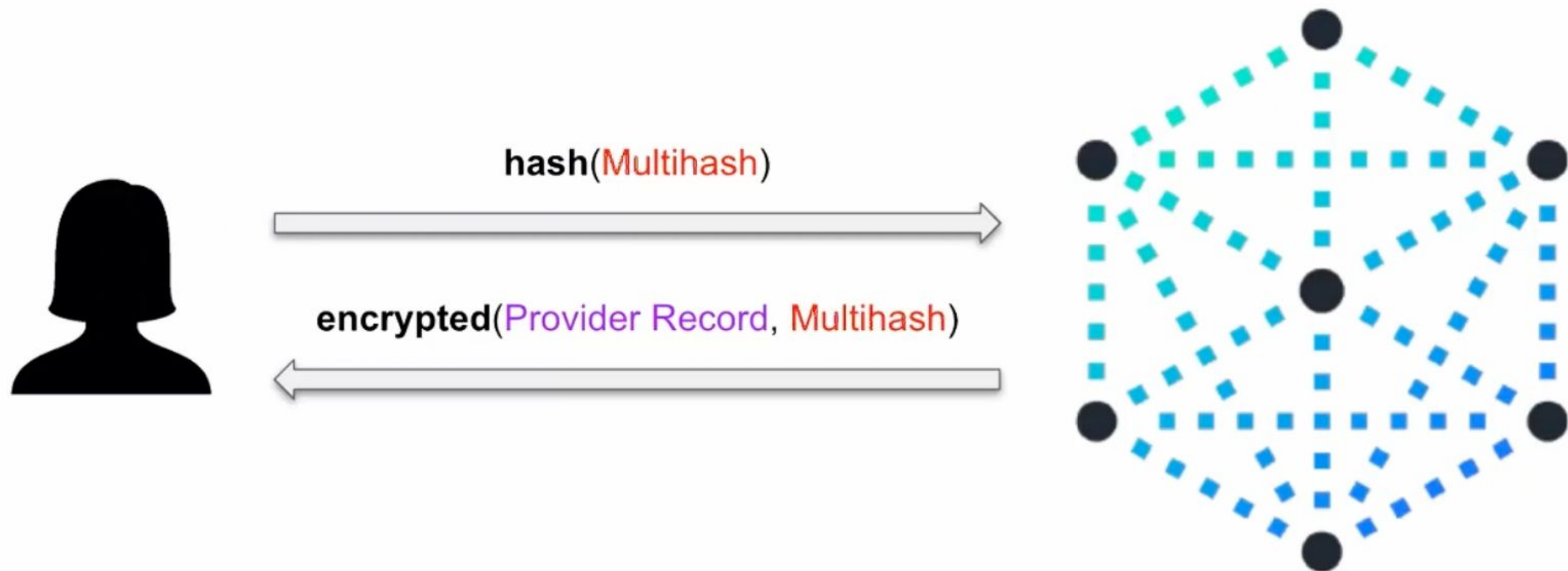


<https://filecoin.io/blog/posts/introducing-the-network-indexer/>



# Privacy == Double Hashing

## Double Hashing



<https://www.youtube.com/watch?v=cqDkNF6agPo>



# Sample IPNI Response



**CID Contact**

IPFS

ƒ

Home

About

Docs

Status

## Look up your CID

bafybeigvgzoolc3drupxhlevdp2ugqcrbcsqfmcek2zxiw5wctk3xjpjv

CID Contact ▶

CONTACT

### Results

FOUND AT

Peer Id:  
QmQzqxhK82kAmKvARFZSkUVS6fo9sySaiogAnx5EnZ6ZmC

Multiaddress:  
/dns4/elastic.dag.house/tcp/443/wss

Protocol:  
Bitswap

Try it Here: <https://cid.contact/>

Sample CID: bafybeigvgzoolc3drupxhlevdp2ugqcrbcsqfmcek2zxiw5wctk3xjpjwy



# Running your own Indexer



## Creating an Index Provider

### An Overview of the Indexer system

There are a couple players here. I'll use specific examples to make it clearer, but note that some of these can be generalized.

1. Filecoin Storage Provider – Hosts data for folks and proves it via the Filecoin Network Chain. Aka Storage Provider.
2. Indexer (aka [storetheindex](#)) – A service that can answer the question: "Given this CID, who has a copy?". This is little more than a lookup table.
3. Index Provider – A service that runs alongside a Storage Provider and tells the Indexer what content this storage provider has.

The Index Provider serves as the interface between the storage provider and the indexer. It can be used from within `Lotus` so that the publishing of new data happens automatically. But it can also happen separately.

The Index Provider serves advertisements [Advertisement](#) for the indexer to fetch using a "sync" operation. Each advertisement references the previous advertisement so that they forms an advertisement chain. The state of the indexer is basically a function of consuming this chain from the initial Advertisement to the latest one.

<https://github.com/ipni/storetheindex/blob/main/doc/creating-an-index-provider.md>





# Further Reading

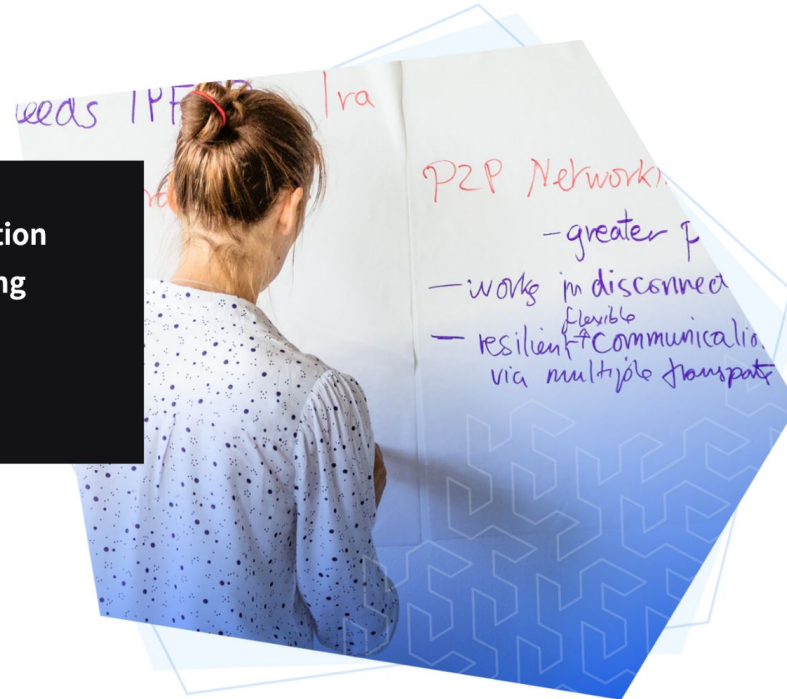


Protocol Labs  
Research

About People Research ▾ Outreach Blog Q

We explore the future of decentralization and examine the infrastructure limiting what you can do with technology.

Our research philosophy >



<https://research.protocol.ai/>



LASSIE

<https://blog.ipfs.tech/2023-introducing-lassie/>





Join us on Slack!  
Continue Discussions online  
Get Event updates  
Reach out to Organizers

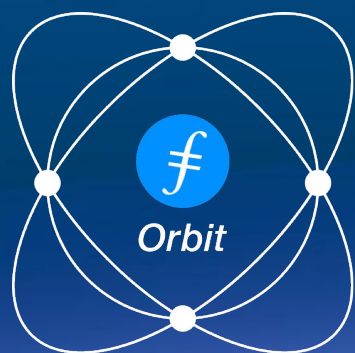




# Survey

- Filecoin Orbit Community Program  
Survey





# Thank You



[dante@raincloud.earth](mailto:dante@raincloud.earth)

<https://raincloud.earth>

<https://twitter.com/KonvergenceInc>

