Validating Ethereum With a Portal Client

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Context: The Portal Network

Current Options

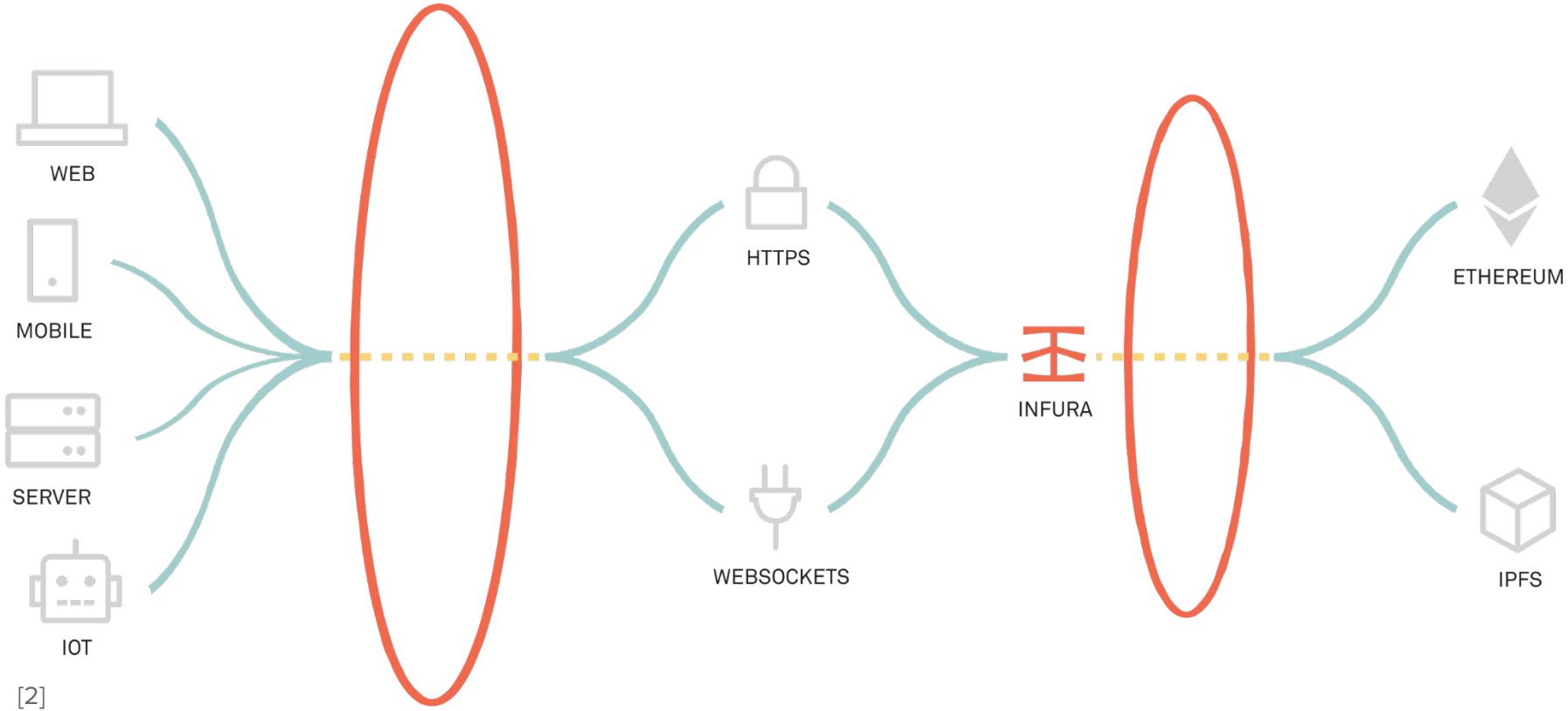
Running a Full Node

Client	Version	Date	DB Size	RAM	CPU
Teku	22.1.1	Jan 2022	~30 GiB	~9 GiB	100-300%
Lighthouse	2.1.1	Jan 2022	~90 GiB	~1.7 GiB	50-200%
Nimbus	1.6.0	Jan 2022	~40 GiB	~2.3 GiB	50-200%
Prysm	2.1.3	Jul 2022	~100 GiB	~4 GiB	100-300%
Lodestar	1.3.0	Jan 2023	~30 GiB	~4 GiB	50-150%

[1]

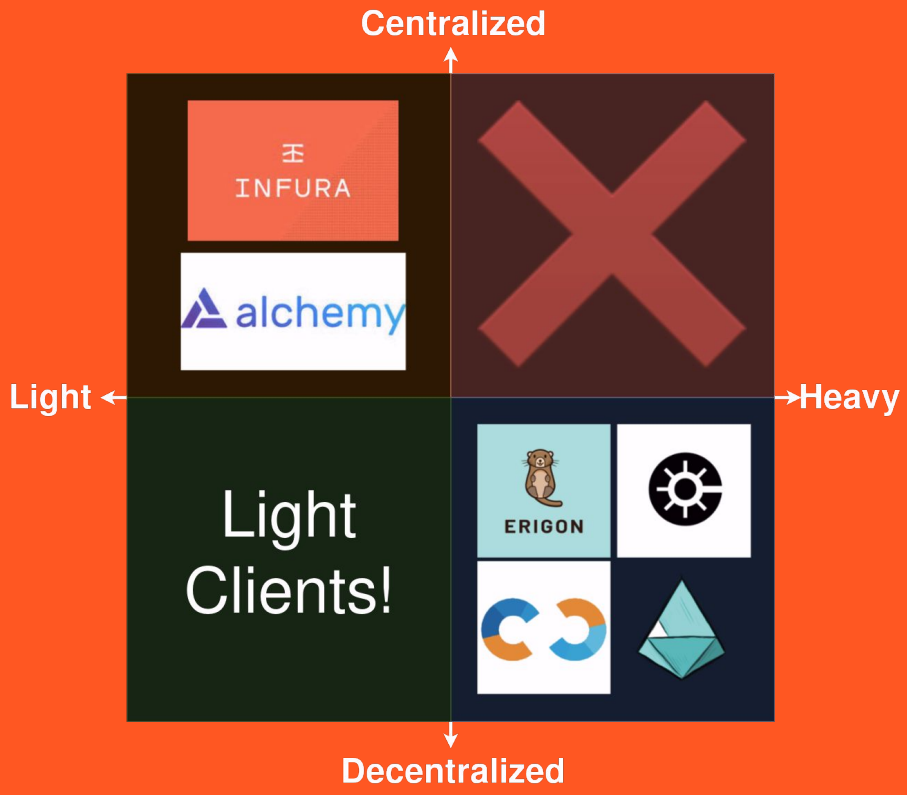
Client	Version	Date	DB Size	DB Growth	RAM	CPU
Geth	1.10.18	Jun 2022	~560 GiB	~13.5 GiB / week	8 GiB	100-400%
Geth	1.10.18	Jun 2022	~560 GiB	~12 GiB / week	9-10 GiB	100-400%
Geth	1.10.18	Jun 2022	~560 GiB	~8 GiB / week	16-19 GiB	100-400%
Nethermind	1.16.1	Jan 2023	~860 GiB	~30 GiB / week	15-16 GiB	50-200%
Besu	v23.4.1	June 2023	~845 GiB	~9 GiB / week	8 - 9 GiB	50-100%
Erigon	2.28.1	Oct 2022	~913 GiB	~18 GiB / week	See comment	50-100%

Relying on a Centralized Provider



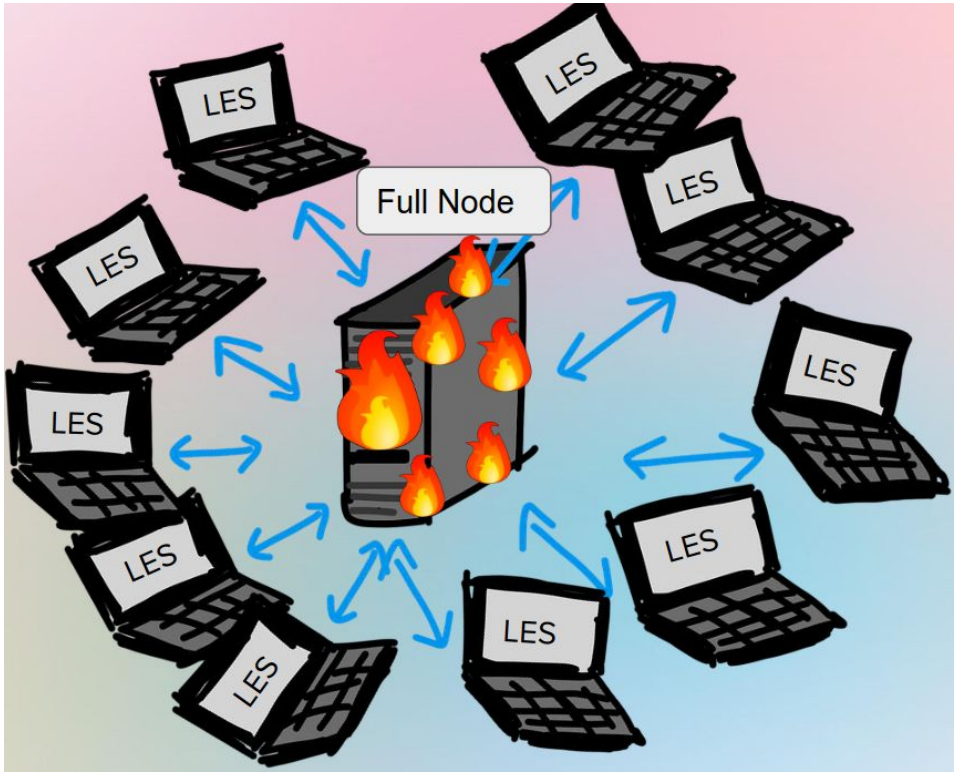
[2]

We want lightweight decentralized access to the Ethereum network



Light Clients

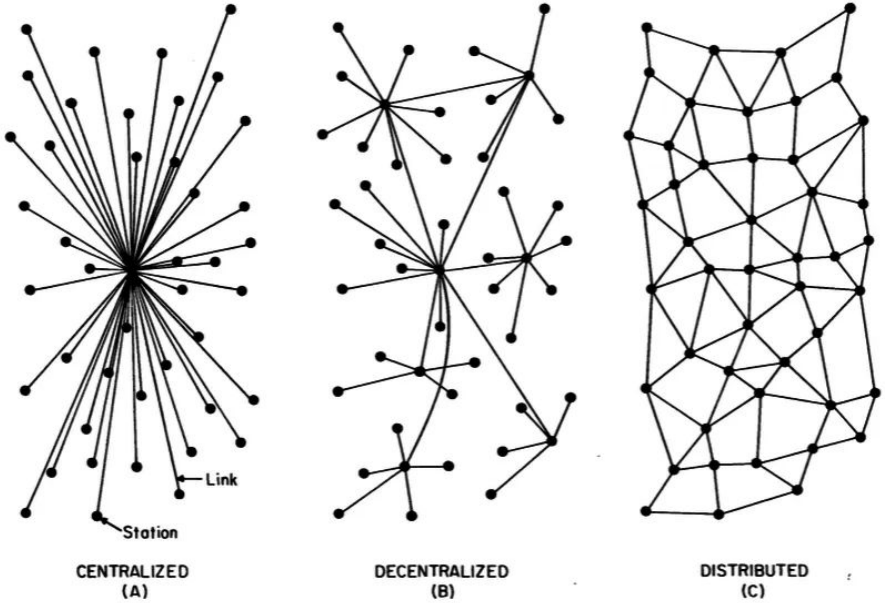
Light Ethereum Subprotocol (LES)



- Built on devp2p.
- Server-client architecture.
- Decentralized but not distributed.
- Doesn’t scale.

[3]

The Portal Network



- Built on Discovery V5.
- All nodes are equal.
- Distributed.
- Gets better with more nodes.

[4]

The Portal Clients

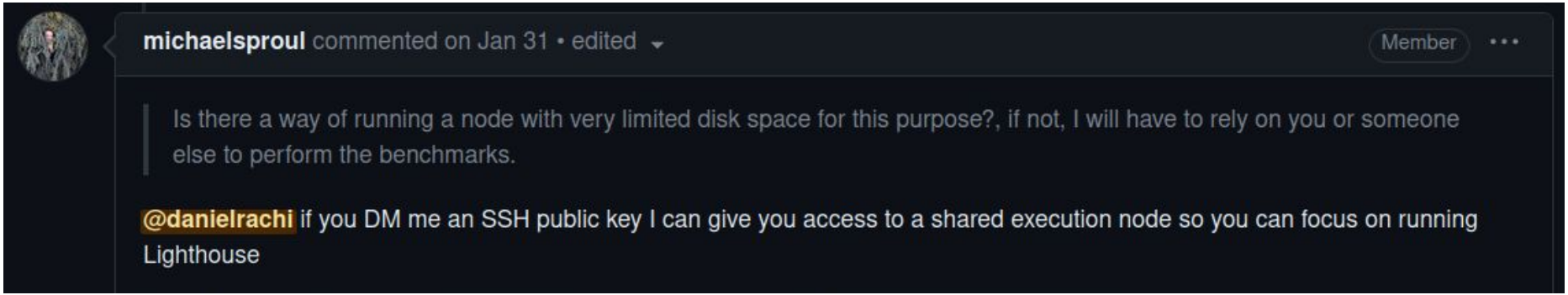
Trin	Rust
Ultralight	Typescript
Fluffy	Nim

The Portal Sub-Protocols

Network	Data	Status (Trin)
History Network	Headers, block bodies, receipts	Almost ready
Beacon light client	Beacon chain light protocol data	Implementing
State network	Account and contract storage	Re-started
Canonical txn index	Transaction data	Spec ready
Transaction Gossip	Lightweight mempool	WIP spec

Using the Portal Network to help validators

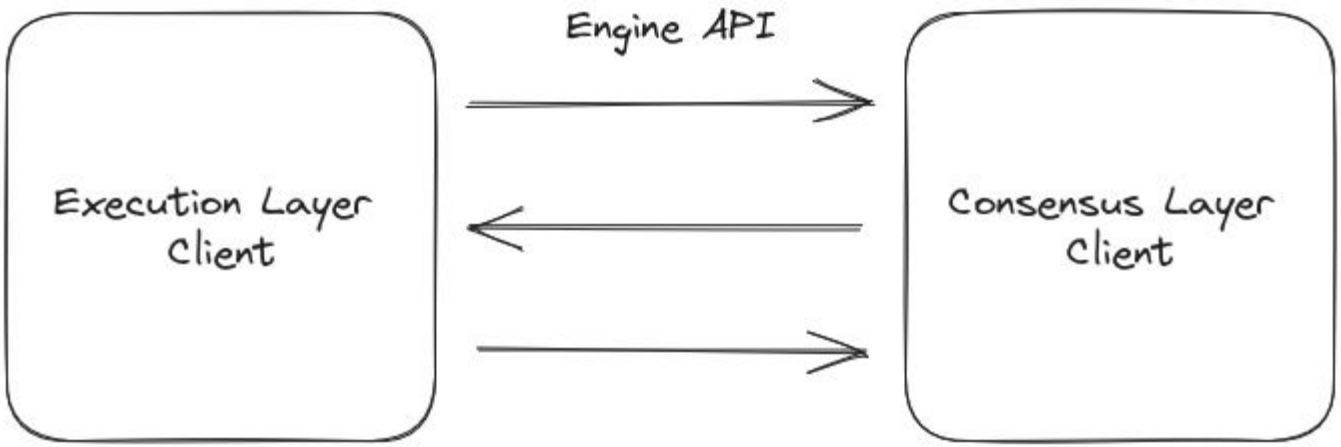
Motivation: A story about running a CL client



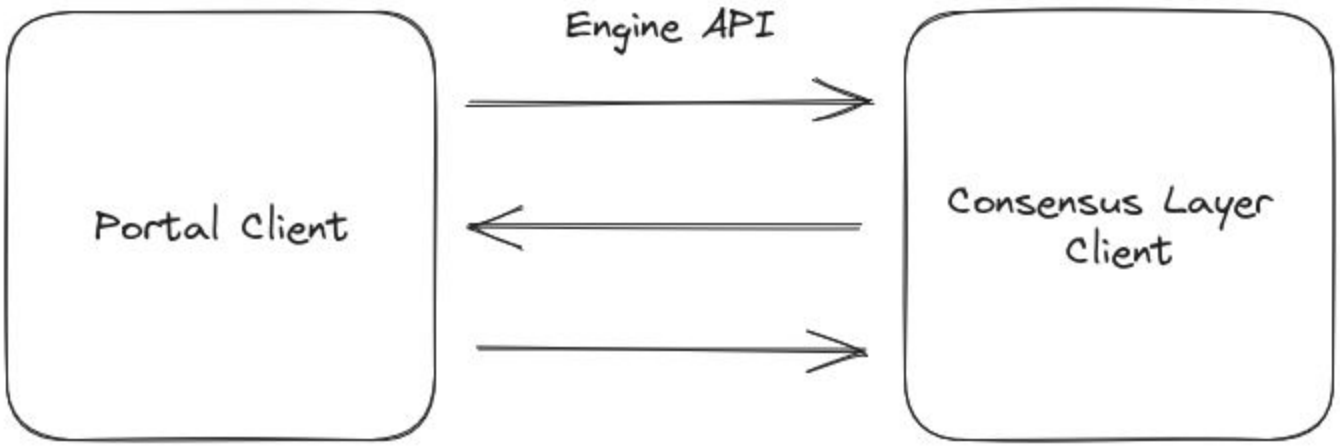
[5]

Running a PN+CL combo instead of the classic EL+CL combo

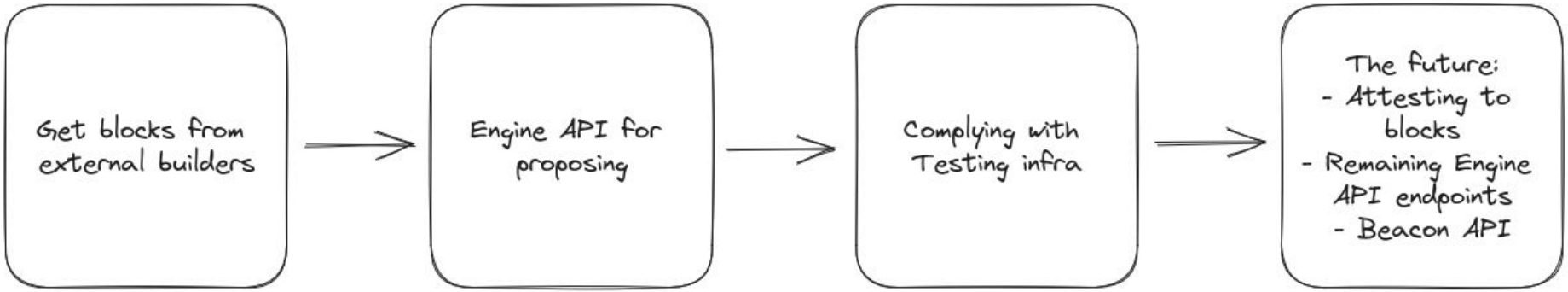
Current state



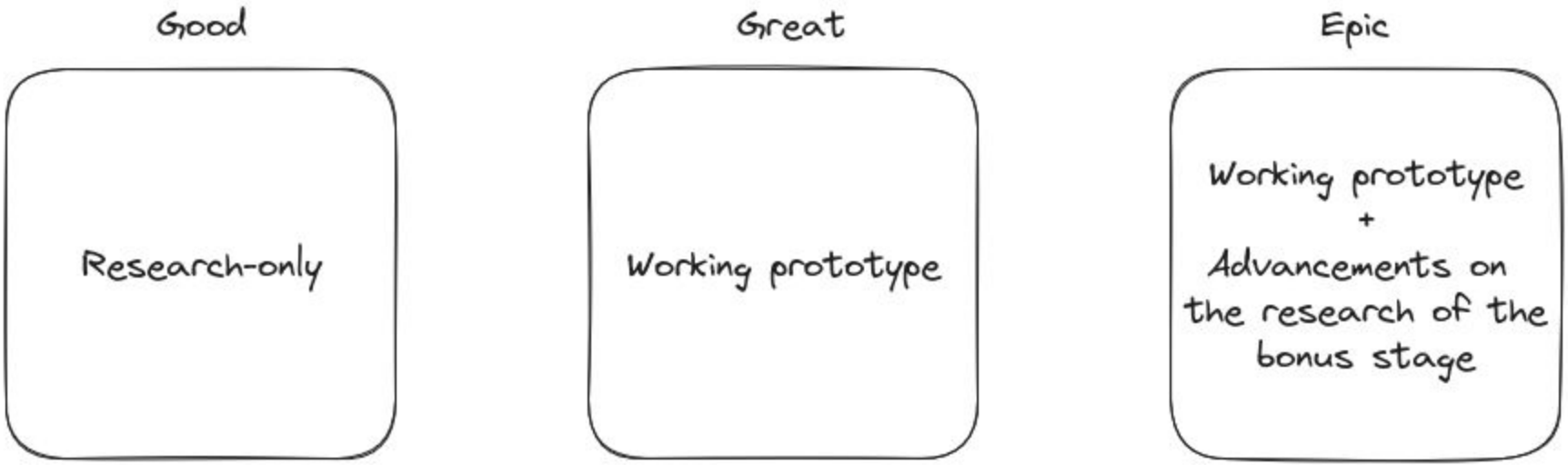
What if...



Roadmap: focus on proposing blocks



Goal


Good
Research-only
Great
Working prototype
Epic
Working prototype
+
Advancements on the research of the bonus stage

Sources

[1] https://eth-docker.net/Usage/ResourceUsage/

[2] https://consensys.net/blog/news/why-infura-is-the-secret-weapon-of-ethereum-infrastructure/

[3] https://archive.devcon.org/resources/6/the-portal-network.pdf

[4] https://berty.tech/blog/decentralized-distributed-centralized

[5] https://github.com/sigp/lighthouse/pull/3753

Thanks!