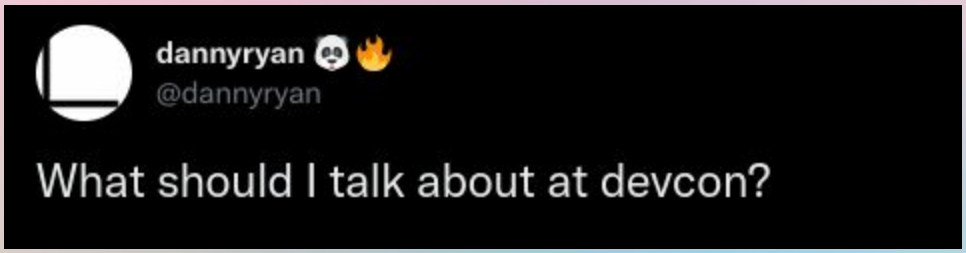
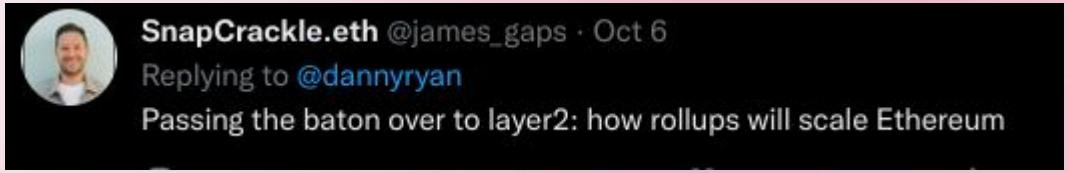
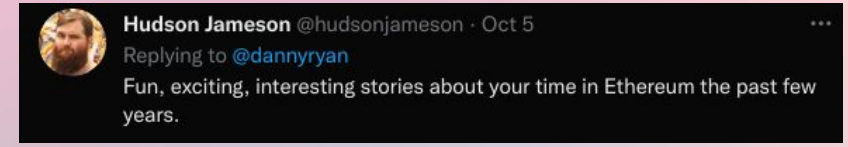
Resilience

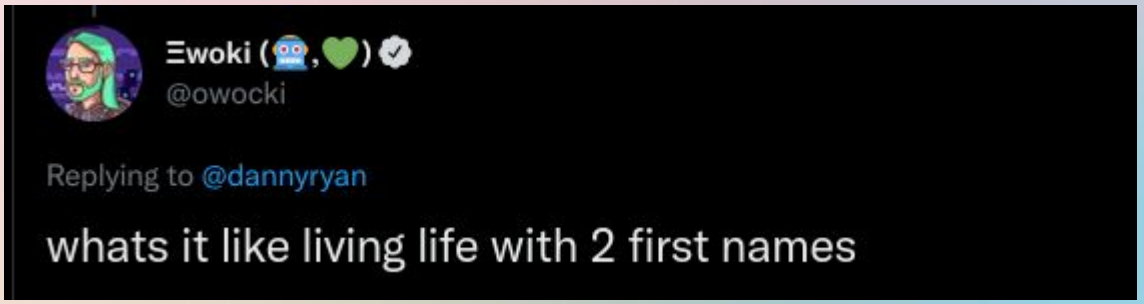
The meta-game of Ethereum L1

danny ryan
Research, EF


dannyryan
@dannyryan
What should I talk about at devcon?


SnapCrackle.eth @james_gaps · Oct 6
Replying to @dannyryan
Passing the baton over to layer2: how rollups will scale Ethereum


Hudson Jameson @hudsonjameson · Oct 5
Replying to @dannyryan
Fun, exciting, interesting stories about your time in Ethereum the past few years.

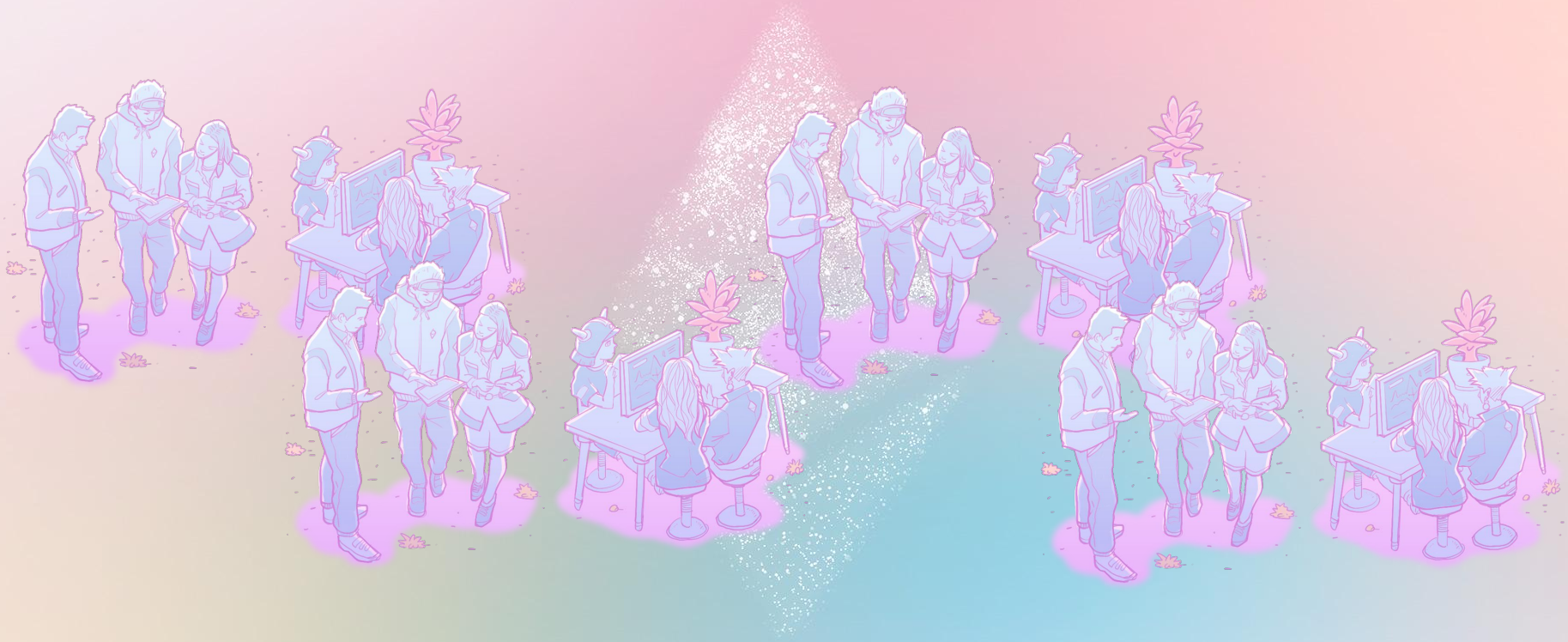

Ξwoki (🤖,💚)
@owocki
Replying to @dannyryan
whats it like living life with 2 first names

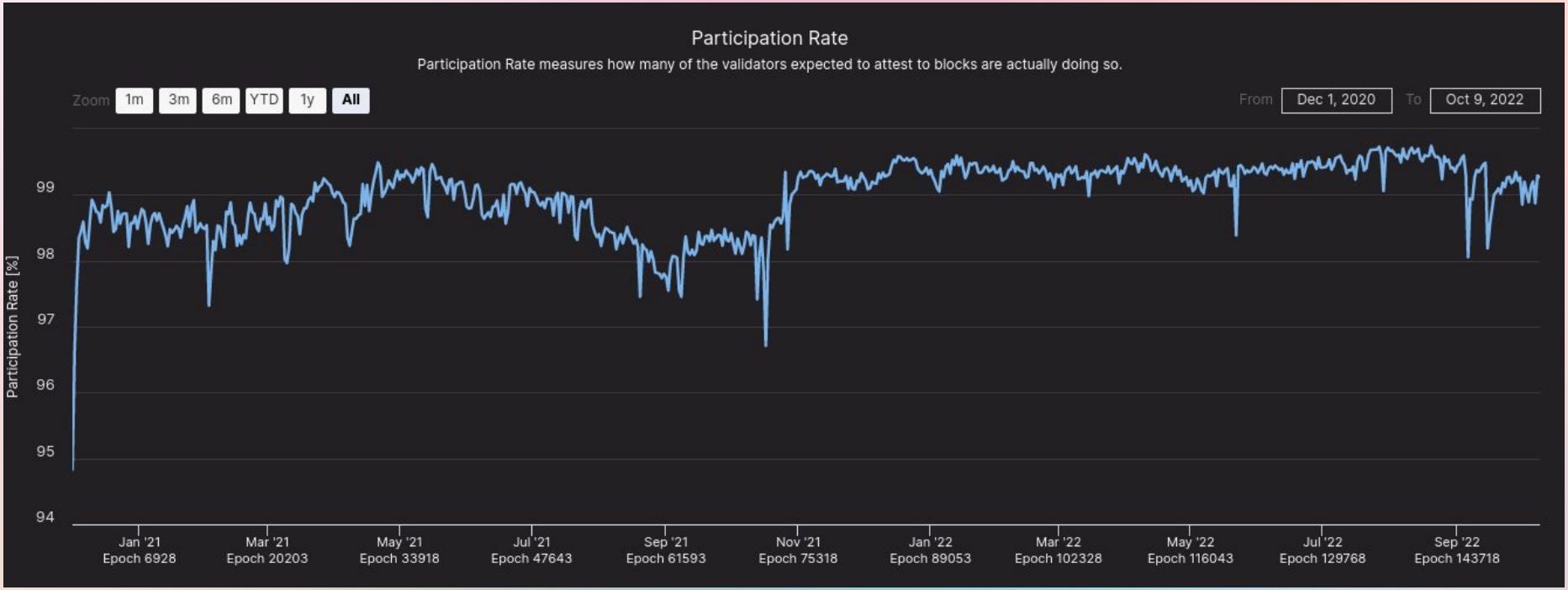

jonny ray @JonnyRhea · Oct 6
Replying to @dannyryan
the health benefits of handstands

The Merge happened.

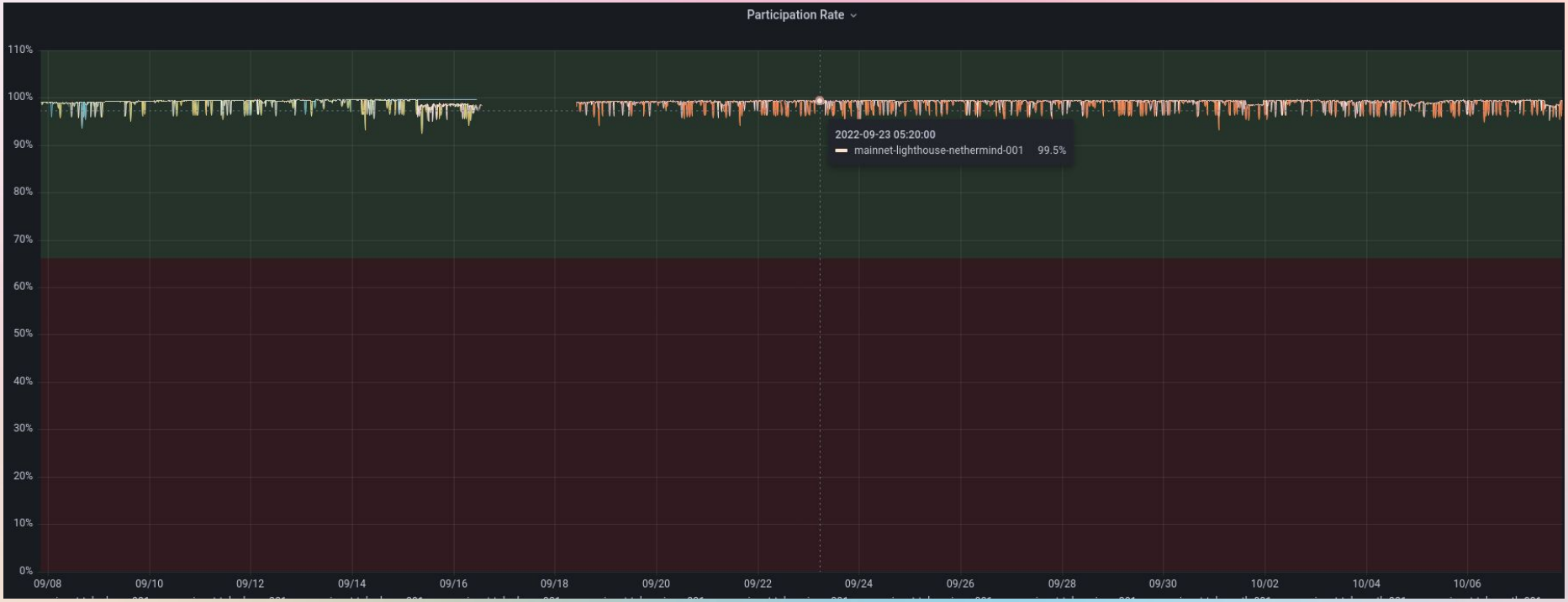
finally

A Village

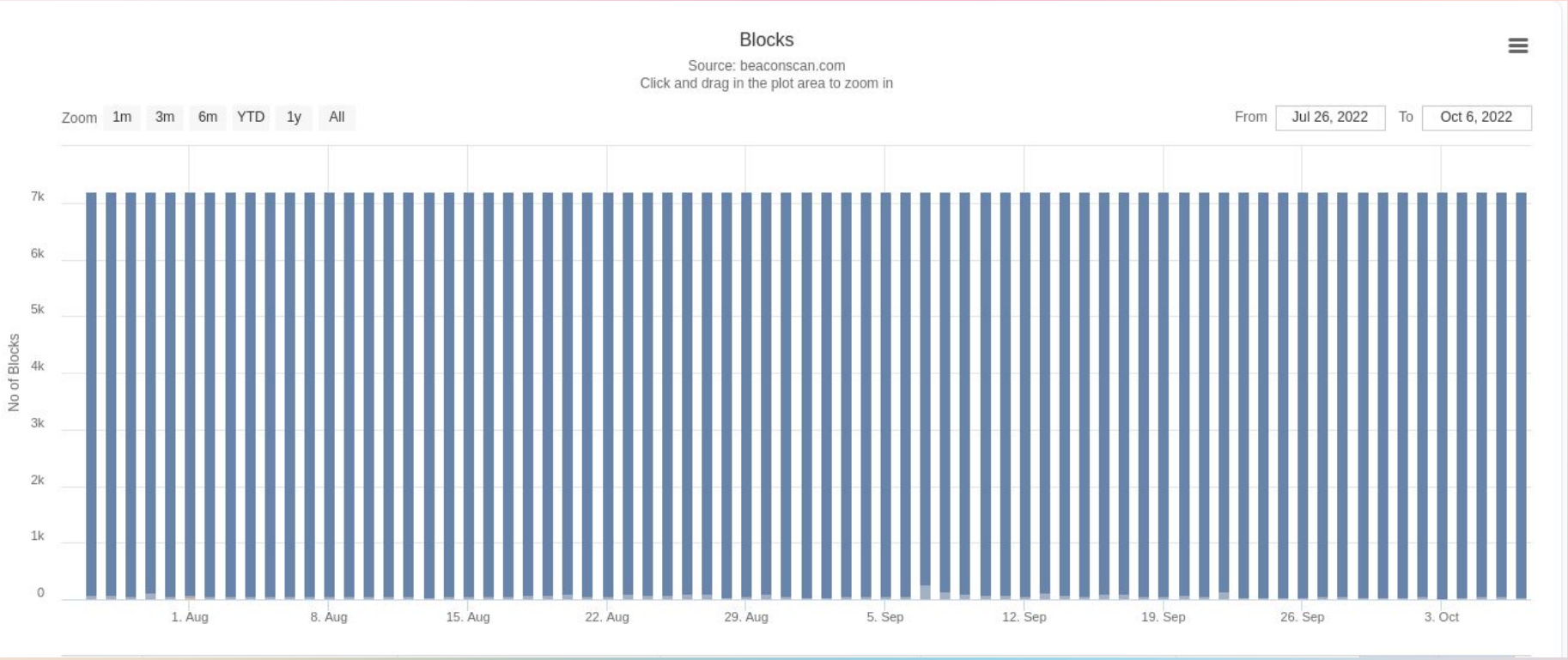




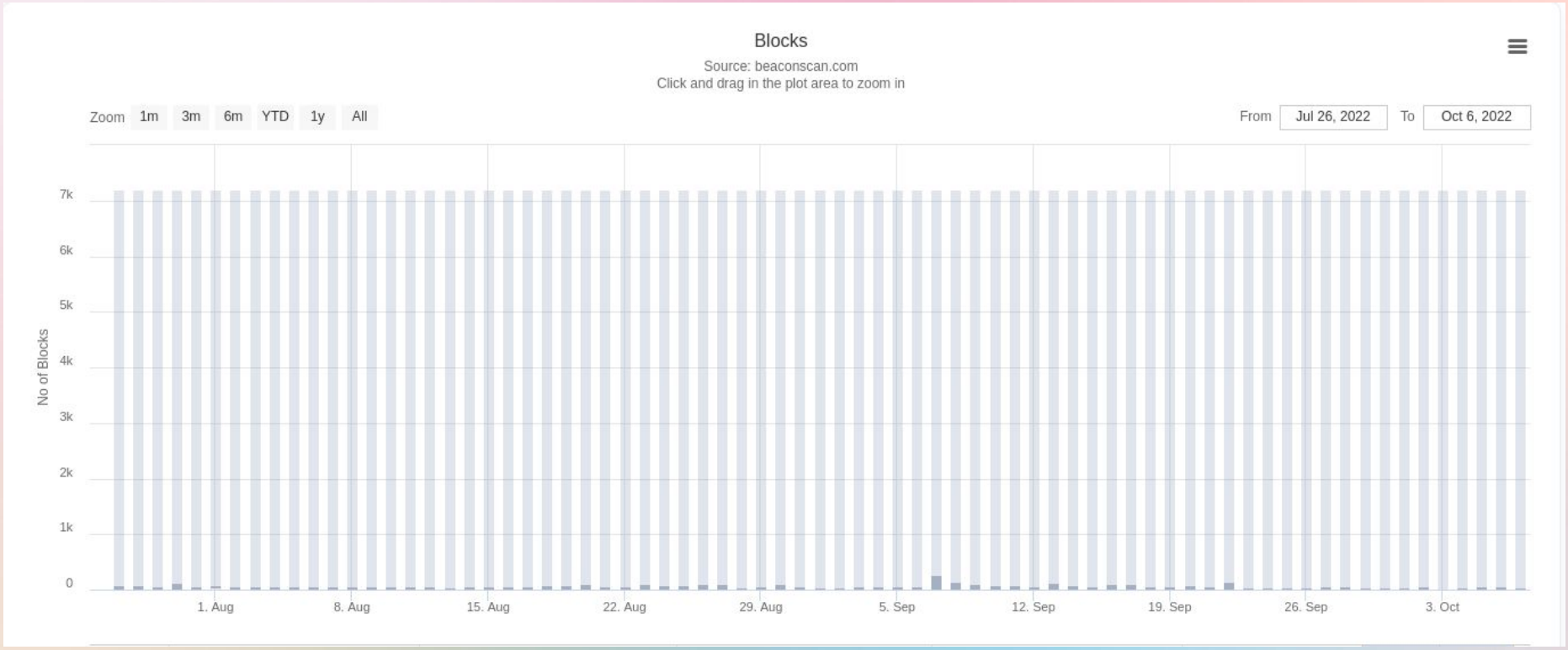
Attestation Participation



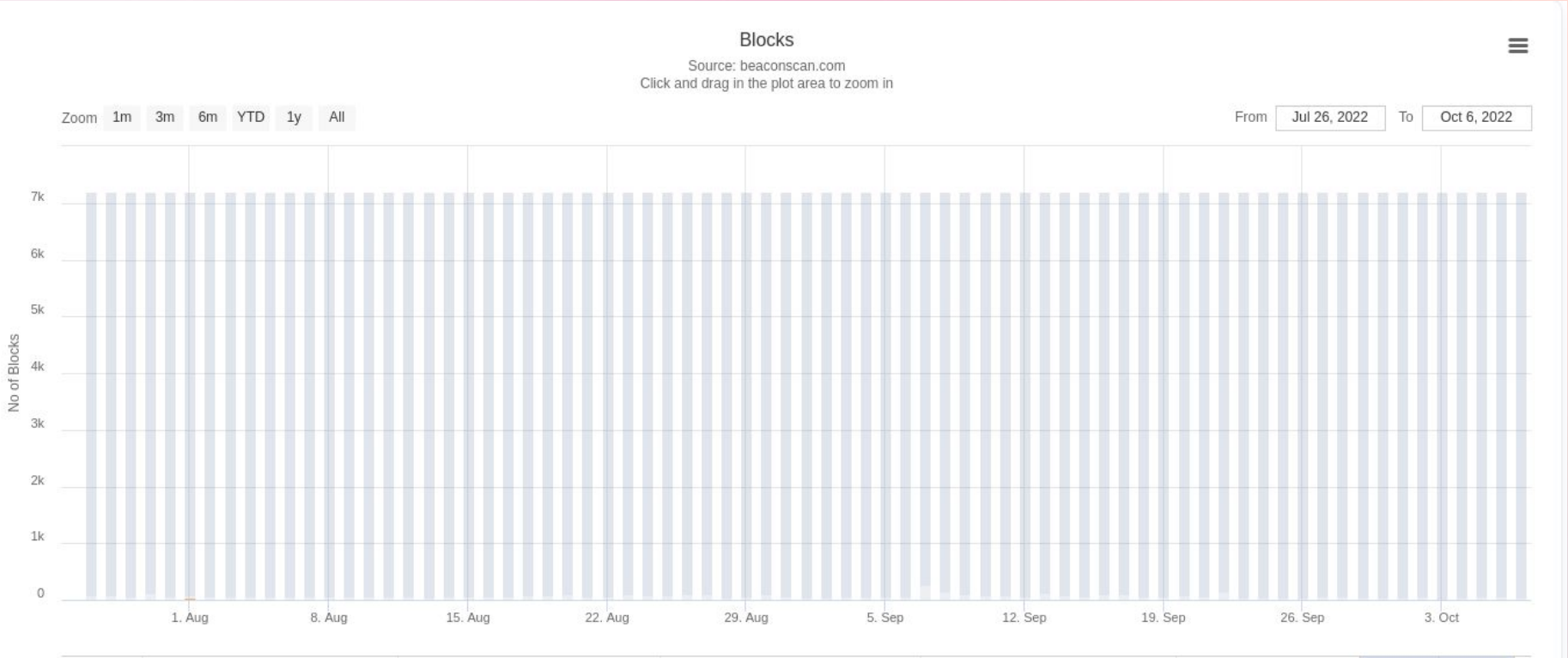
Zoom out a bit.


Blocks
Source: beaconscan.com
Click and drag in the plot area to zoom in
Zoom 1m 3m 6m YTD 1y All
From Jul 26, 2022 To Oct 6, 2022
No of Blocks
7k
6k
5k
4k
3k
2k
1k
0
1. Aug
8. Aug
15. Aug
22. Aug
29. Aug
5. Sep
12. Sep
19. Sep
26. Sep
3. Oct

Blocks



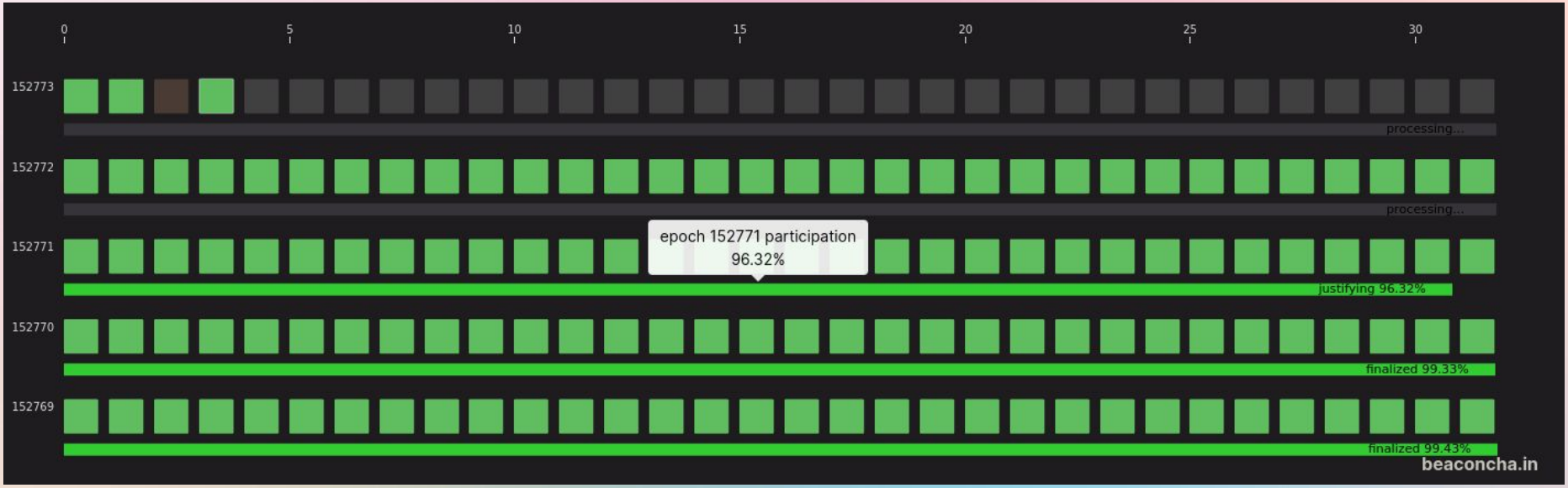
Skipped slots



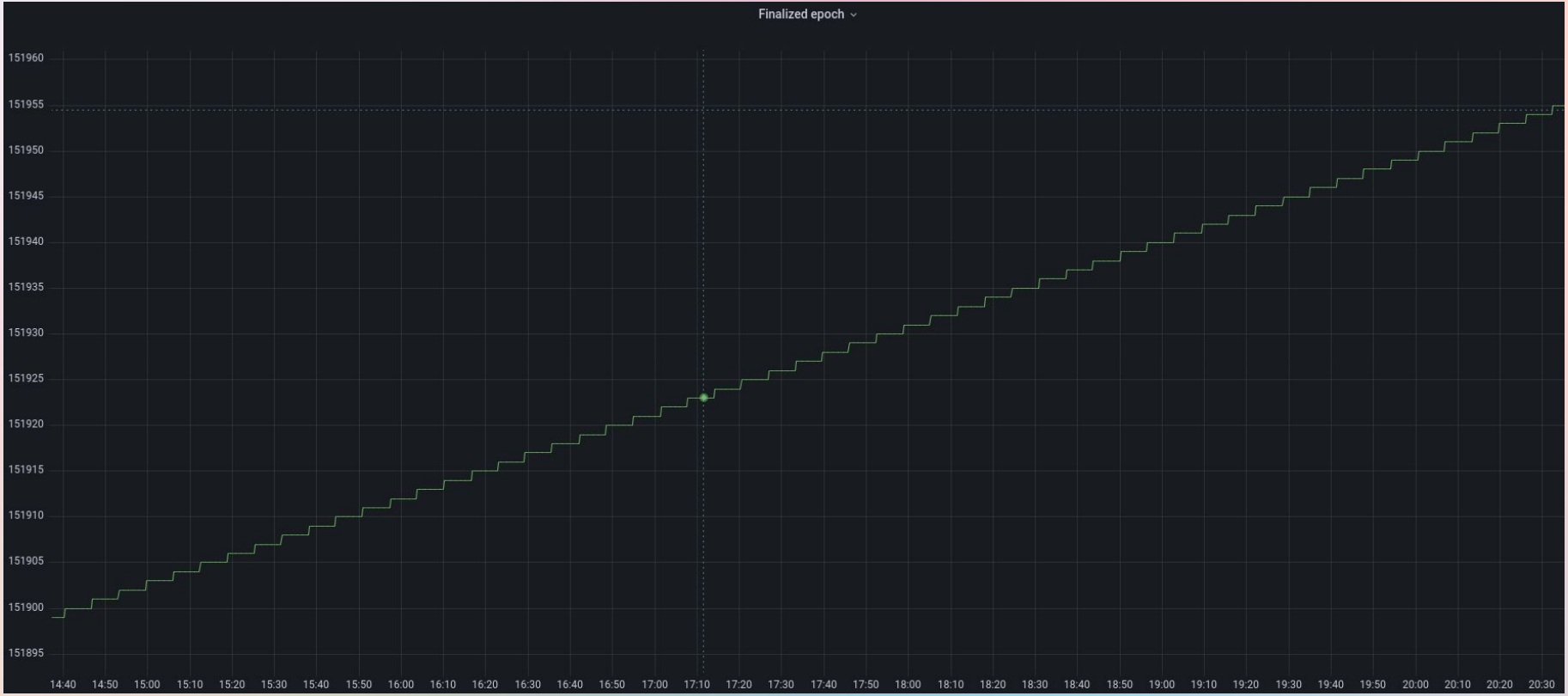
What about re-orgs?

Orphans and re-orgs, oh my!

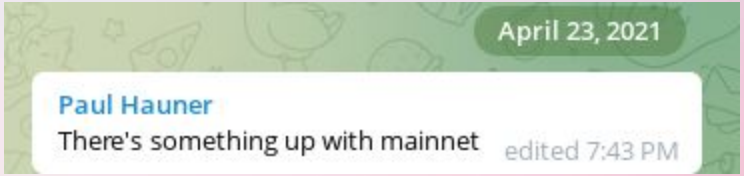
- 26 re-orgs and 85 orphaned
- All show very late properties
  - Delivery time distribution lies on or later than the slot boundary
- ~50% orphans come from mev-boost relays
  - check out Terence's talk
- And it depends on your perspective

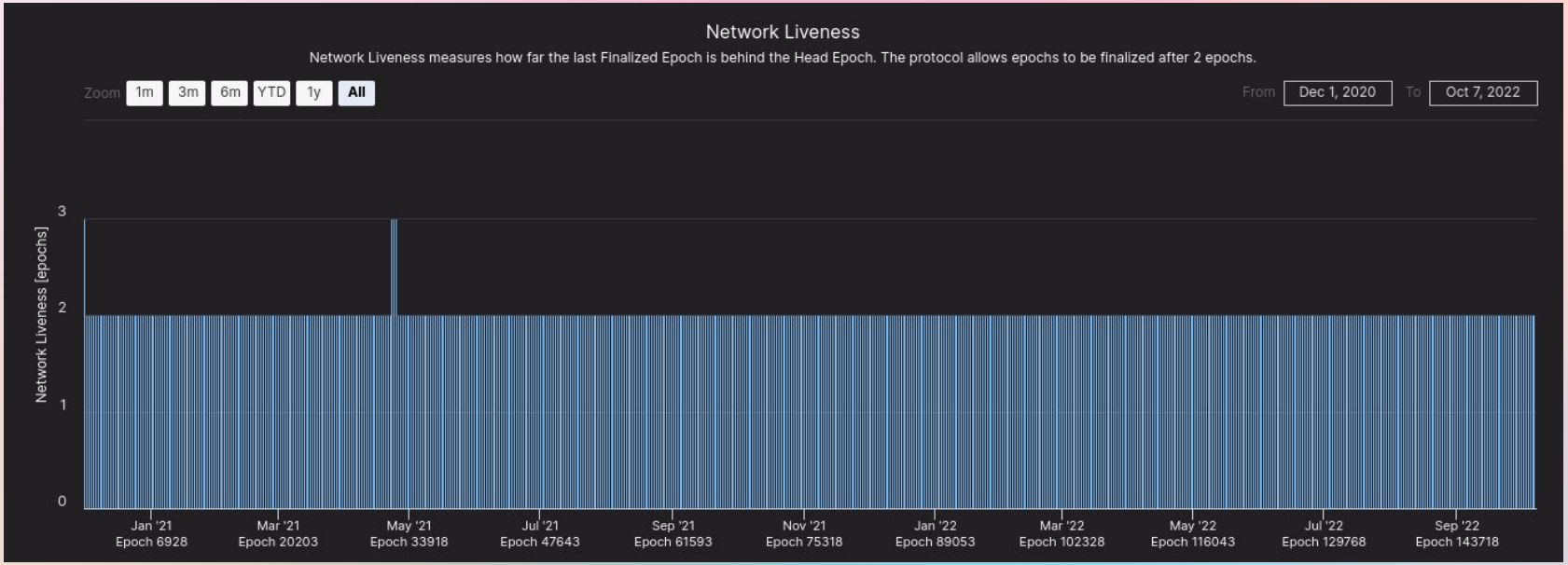

0
5
10
15
20
25
30
152773
processing...
152772
processing...
152771
epoch 152771 participation
96.32%
justifying 96.32%
152770
finalized 99.33%
152769
finalized 99.43%
beaconcha.in

Healthy.



Perfect Rhythm of Finality





Except that one time

Ultrasound Ansgar

Merge Data Challenge

But shipping is slow

Why?!!


Elly Angelina
@EllyzaAngelina
Replying to @dannyryan
How we ship faster

Much is fundamental

Shipping what has never been done before

- New research
- New mechanisms
- New networking
- New cryptography
- Backward compatibility
- Distributed systems in general are complex.

And much has improved

It maybe not be obvious but

- Sophisticated and specialized client devs
- More non-client teams on testing
- Devops wizards driving testnets
- Dedicated security analysts
- Increased academic collaborations
- In person development retreats
- Refined process, well oiled machine

There are considerations at odds with speed.

Meta-game of Ethereum Resilience

Optimizing for an infinite game

- Ability to continue to play the game
- Redundancy built into the players of the game
- Ability to recover when the game fails
- Hardening after adversity
- Tuning for ossification and avoidance of capture

Meta-game of Ethereum Resilience

Protocol

Network

Social

Shortcuts are available

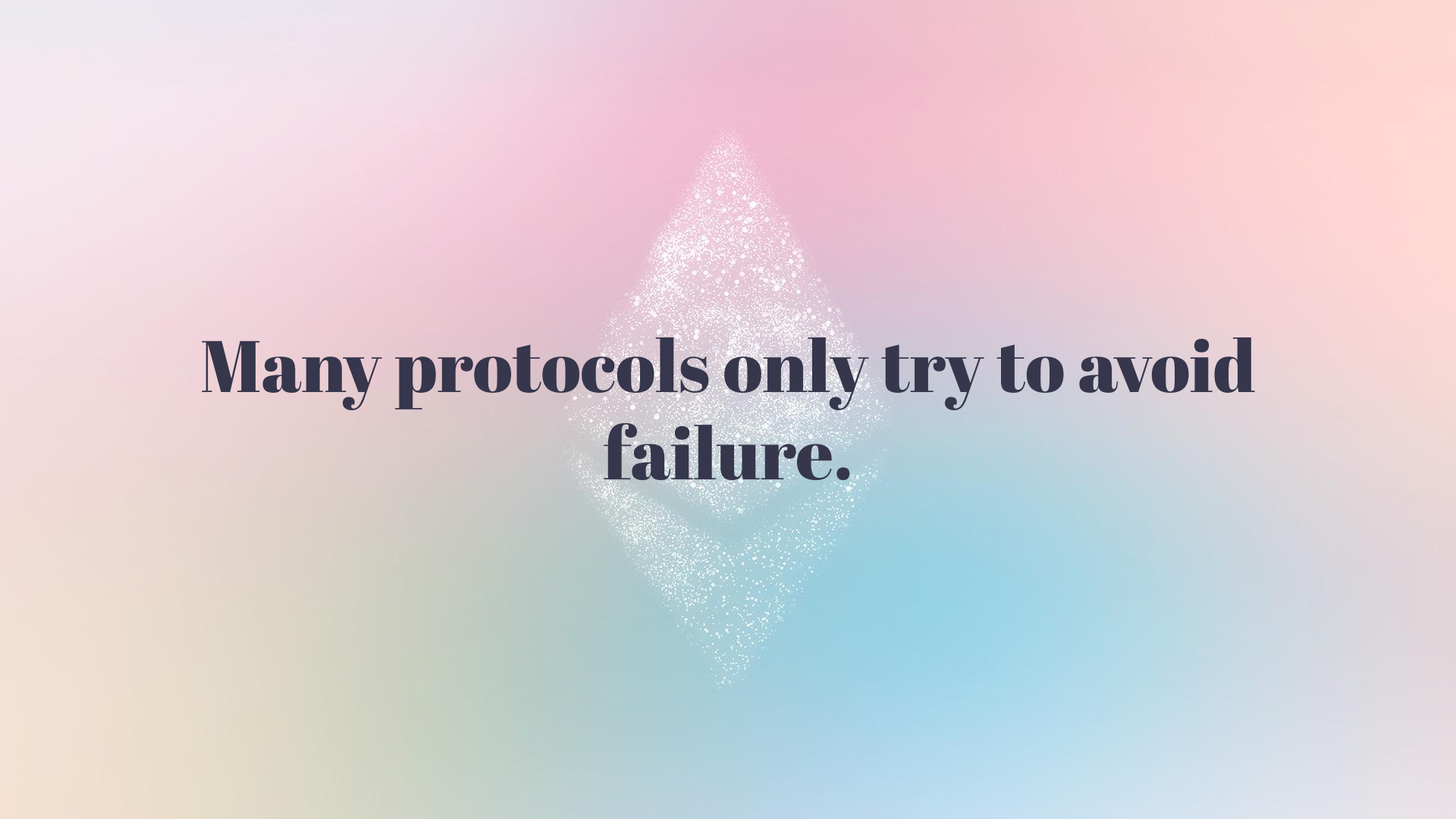
- Single client
- Single dictator
- Truncated R&D
- Centralizing solutions
- Willingness for downtime
- Processes ripe for capture

Protocol Resilience.

A protocol that thrives

- Research and design
- Security and testing
- Simplicity and extensibility
- Operation under adverse conditions
- Recovery under failure modes

Functional escape velocity 🚀


Many protocols only try to avoid failure.

A heterogeneous network

- Multi-client
- Multi-layered
- Hobbyist stakers
- Home nodes
- Regional diversity

Network Resilience.

Continuity vs Recovery.

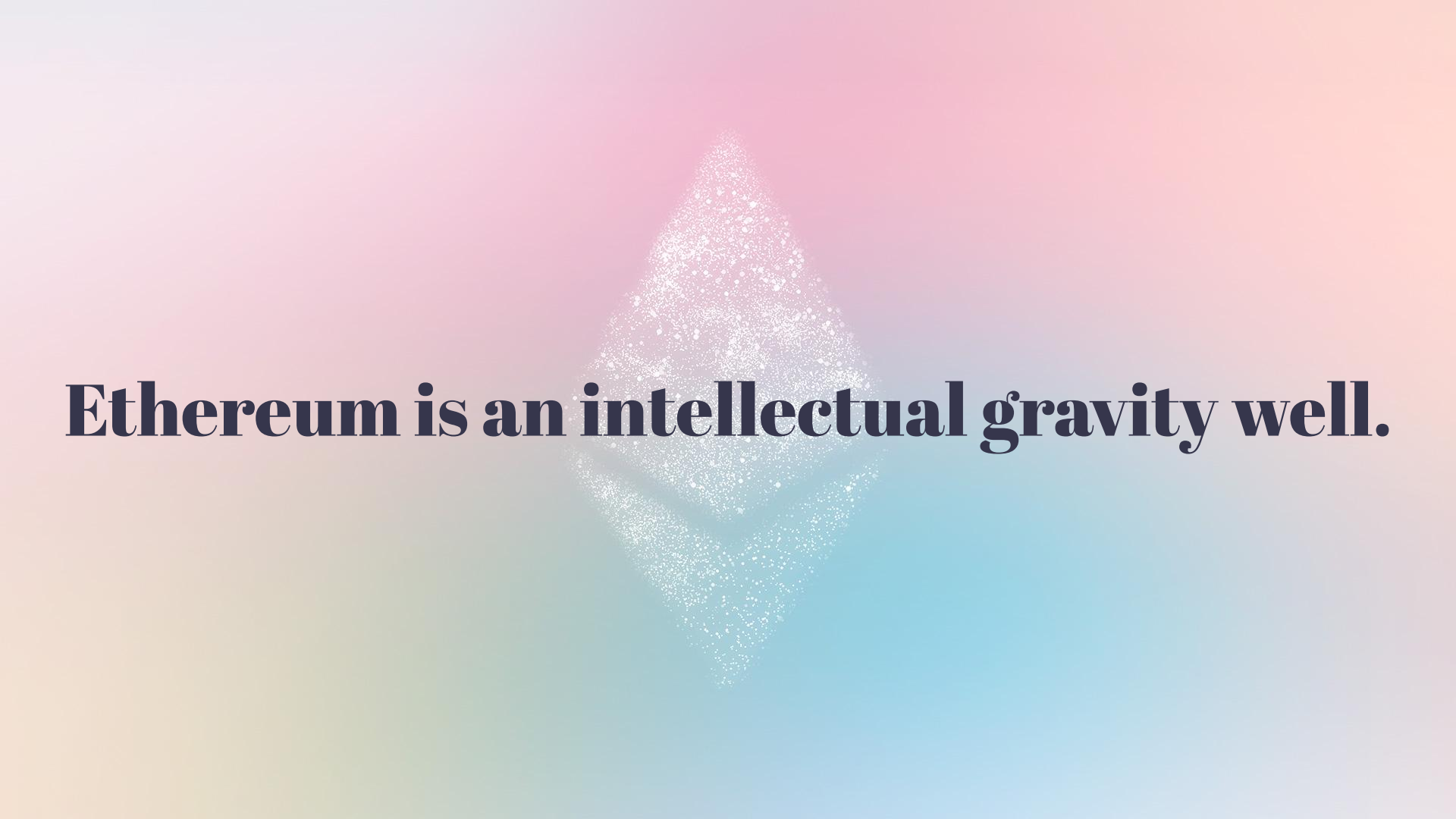
Continuity

Recovery

Social Resilience.

A multitude of perspectives

- Multi-client/layered
- Diverse staking set
- Global
- Incredibly open research
- Deliberate processes yet open governance
- Open door

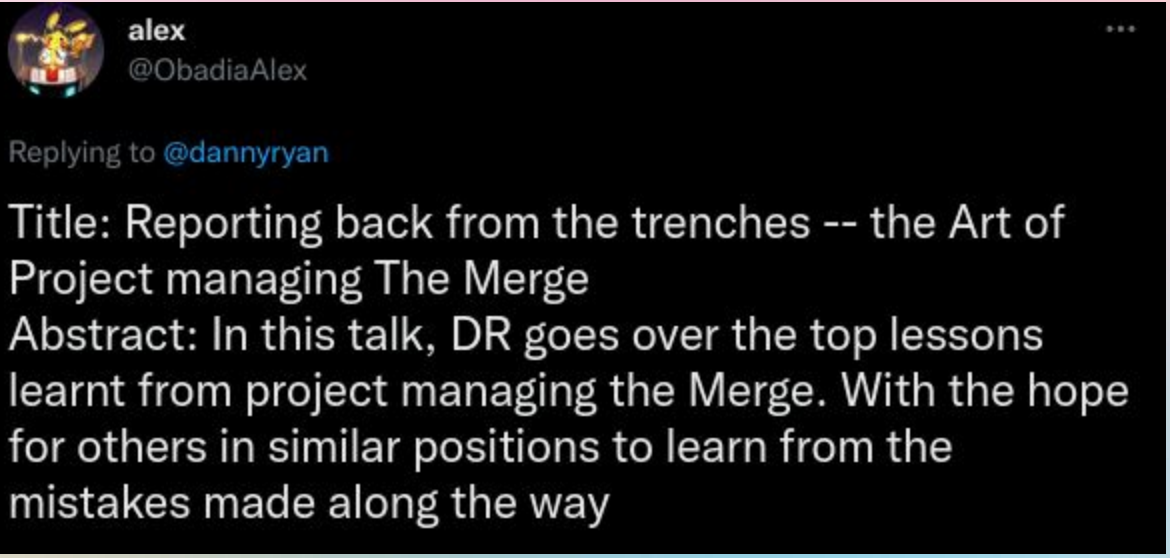

Ethereum is an intellectual gravity well.


Ethereum is a bazaar.

Ethereum's Layer-1 social structures tend toward a multitude.

Ethereum's Layer-1 social structures tend toward ossification.

Where does the EF fit in?


alex
@ObadiaAlex
Replying to @dannyryan
Title: Reporting back from the trenches -- the Art of Project managing The Merge
Abstract: In this talk, DR goes over the top lessons learnt from project managing the Merge. With the hope for others in similar positions to learn from the mistakes made along the way

Ethereum Application Resilience

It’s time to think long-term

Application Layer Liabilities.

Avoid unnecessary debt

- Complexity (doing too much)
- Governance
- Upgradability
- Bad token distributions


More Unix Philosophy.


Minimize or eliminate governance.

Tend toward ossification

Explore value generation models.

Explore the non-financial.

Oh and – fraud-proofs and decentralized sequencers

Play the meta-game of resilience across the stack.


And a quick happy birthday.


Thank you!