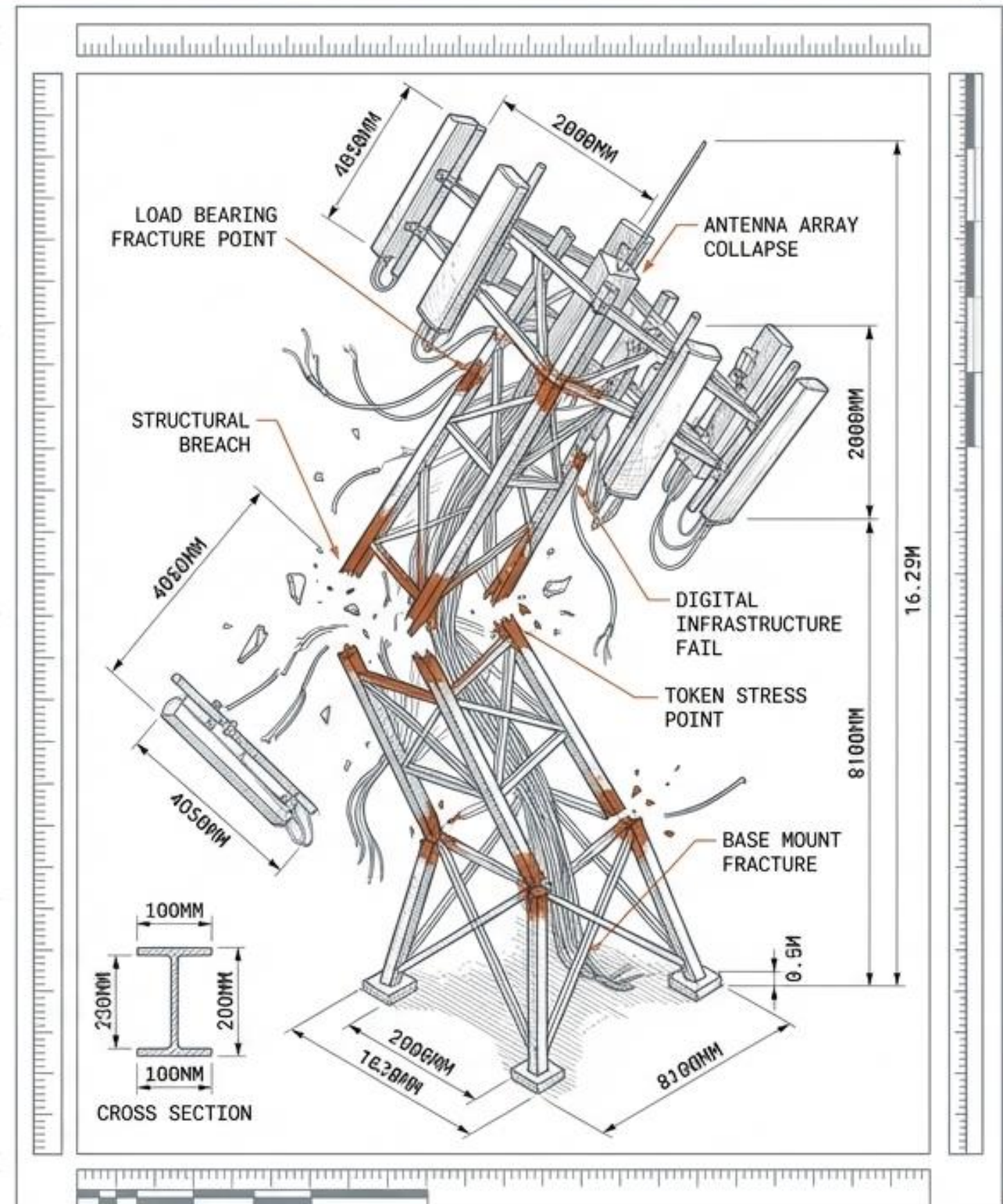


DePIN Tokenomics Under Stress

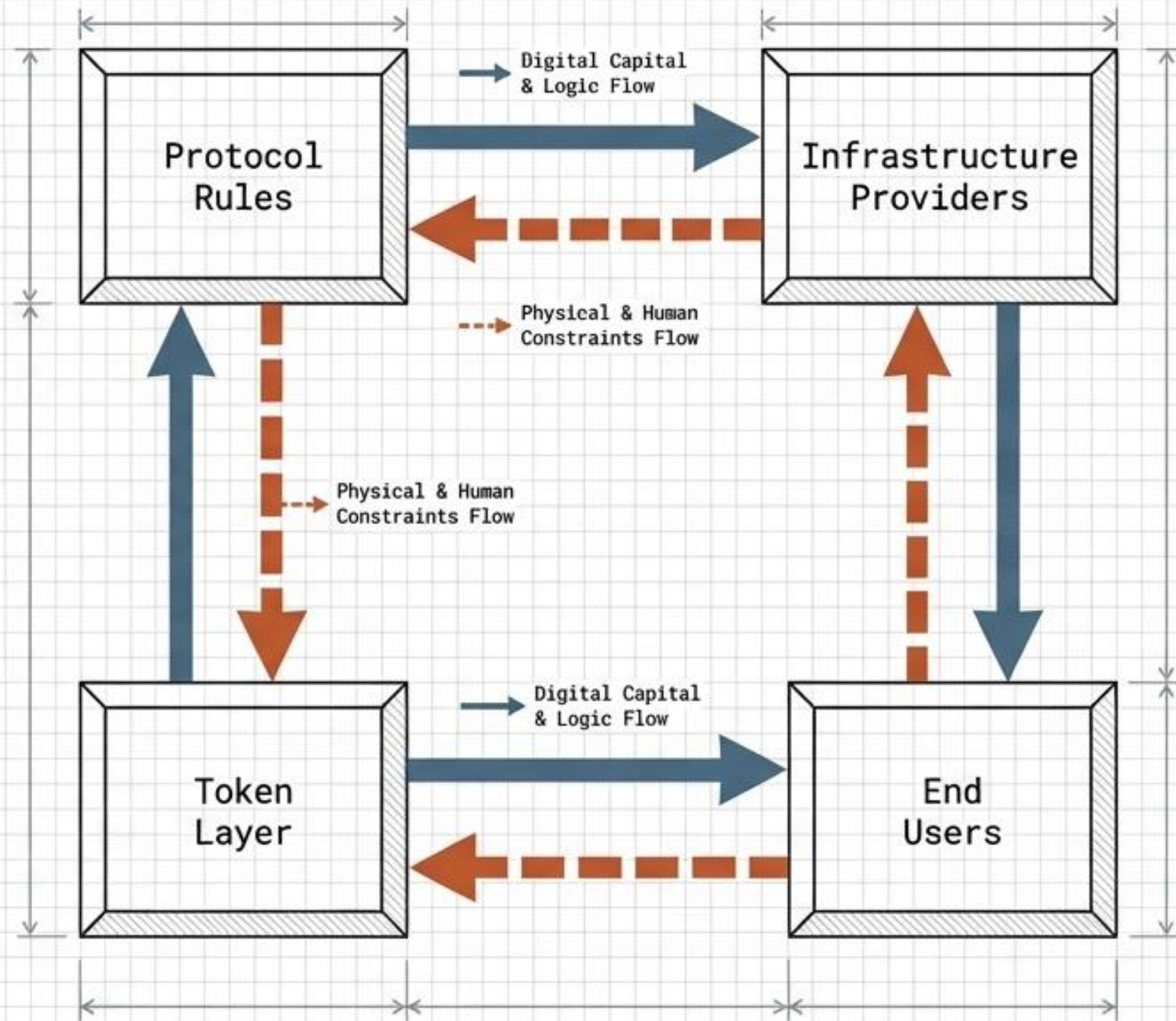
A Comparative Stress Evaluation Using the Onocoy Network as an Anchor Case

Presenters: Devinson Peña, Florian Baumann,
Cristian Carvalho



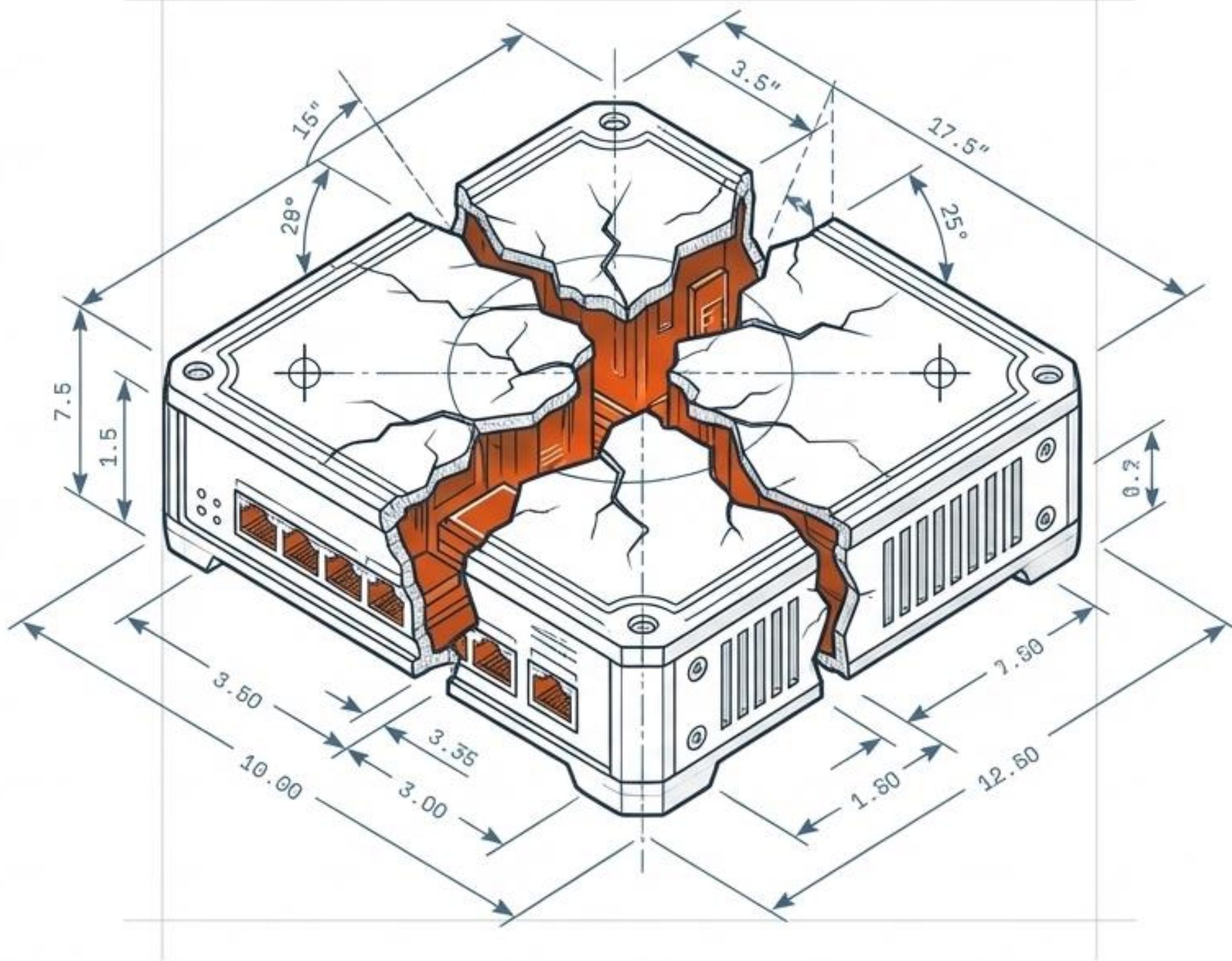
The Cyber-Physical Loop.

Humans, hardware,
and tokens.



The DePIN Illusion.

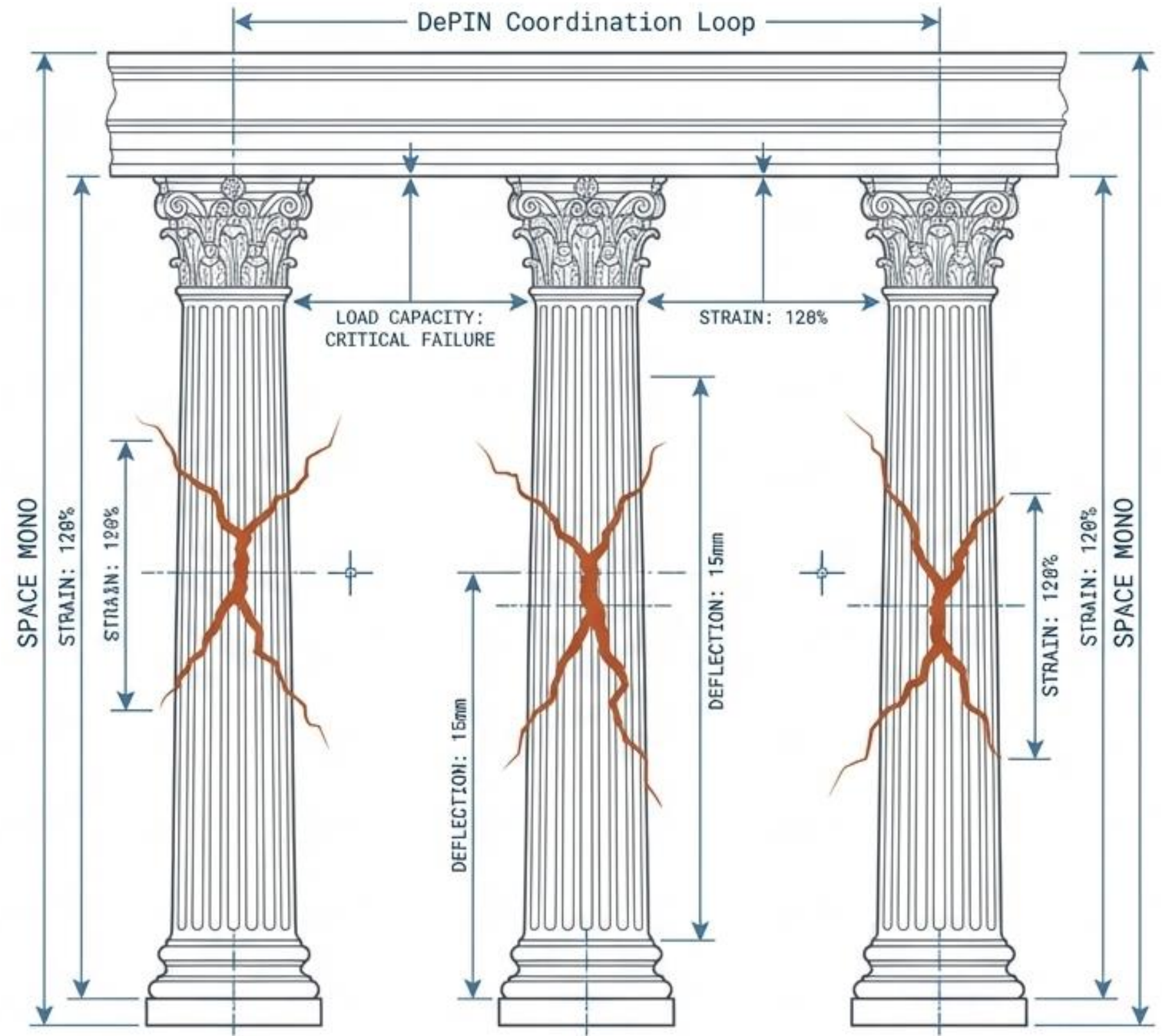
Equilibrium models fail hardware networks.



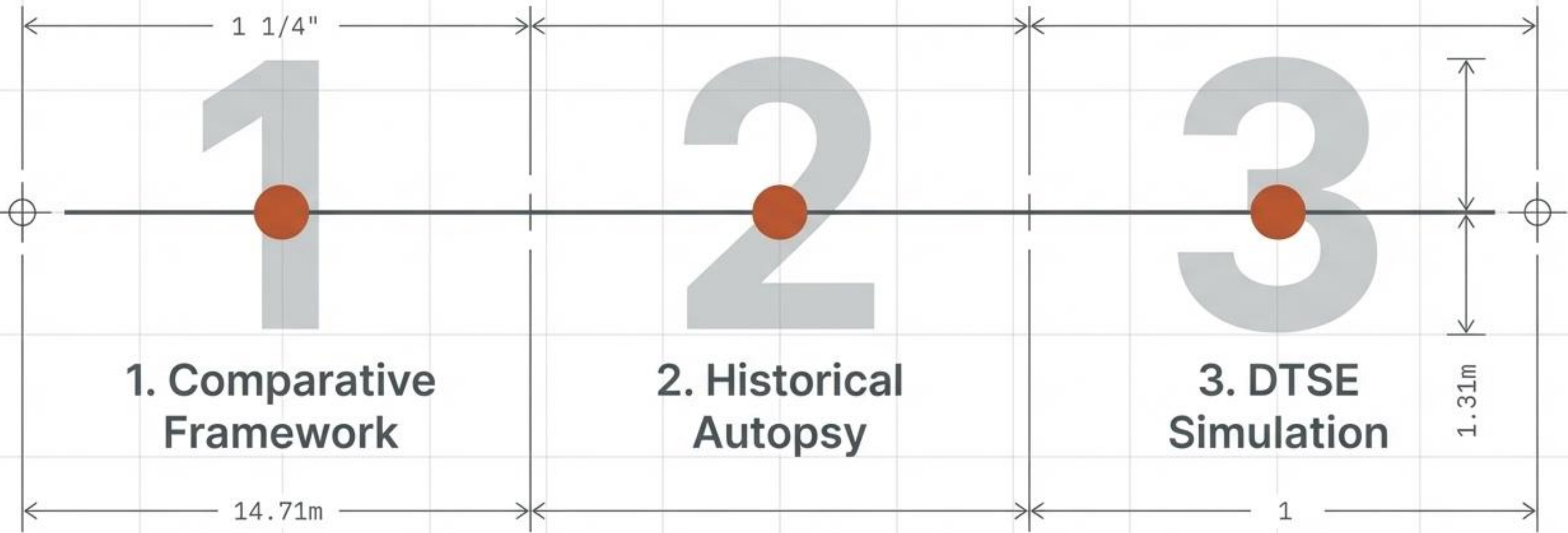
How do DePINs behave under **stress, and how do we evaluate them before failure becomes visible?**

Three Ways to Die.

- Reward Addiction
- The Subsidy Gap
- Speculative Fragility



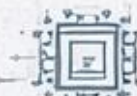
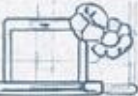





The Investigation Path



Sample Overview: Solana DePIN Projects (n=9)

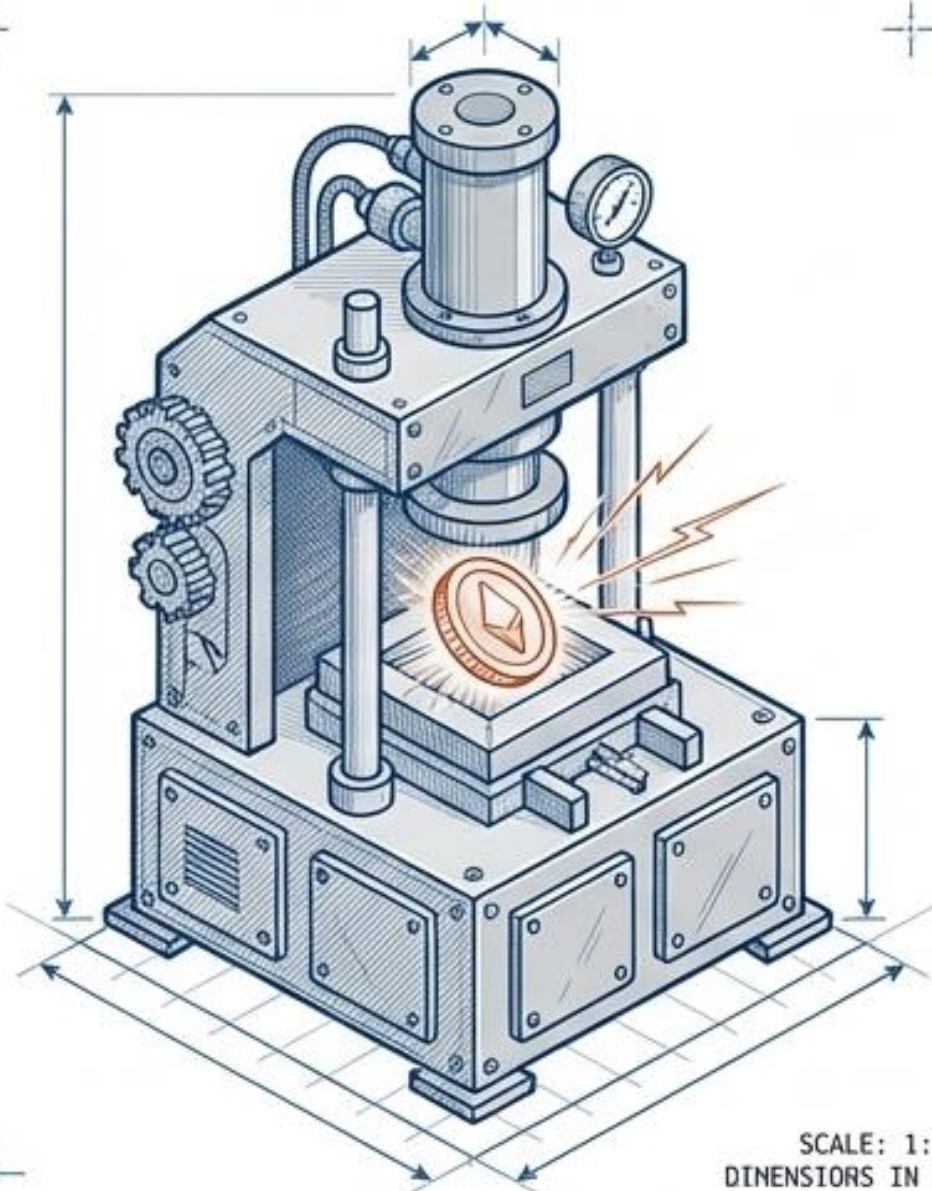
Method section — projects selected for comparative tokenomics analysis

Emission/ Rewards	Helium IOT / MOBILE <ul style="list-style-type: none"> > Wireless coverage > Rewarded provisioning + usage 	Hivemapper MAPPING <ul style="list-style-type: none"> > Street-level mapping > Rewarded data supply 	GEODNET GNSS  <ul style="list-style-type: none"> > RTK/GNSS correction > Incentivized station ops 	← Verification
Category	XNET WIRELESS  <ul style="list-style-type: none"> > 5G/Wi-Fi offload > Rewards tied to traffic/coverage 	io.net COMPUTE  <ul style="list-style-type: none"> > Distributed GPU compute > Supply elasticity high 	Nosana COMPUTE  <ul style="list-style-type: none"> > Decentralized compute/jobs > Job-based payments 	← Monetization
Monetization	Grass DATA  <ul style="list-style-type: none"> > Bandwidth/data contribution > Demand signal uncertain/variable 	Aleph.im STORAGE / COMPUTE  <ul style="list-style-type: none"> > Decentralized cloud primitives > Multi-service token utility 	Onocoy ANCHOR CASE  <ul style="list-style-type: none"> > Service price decoupled from token > Data Credits mechanism 	← Value Accrual

Selection logic: Top projects on/over Solana + anchor case (Onocoy).

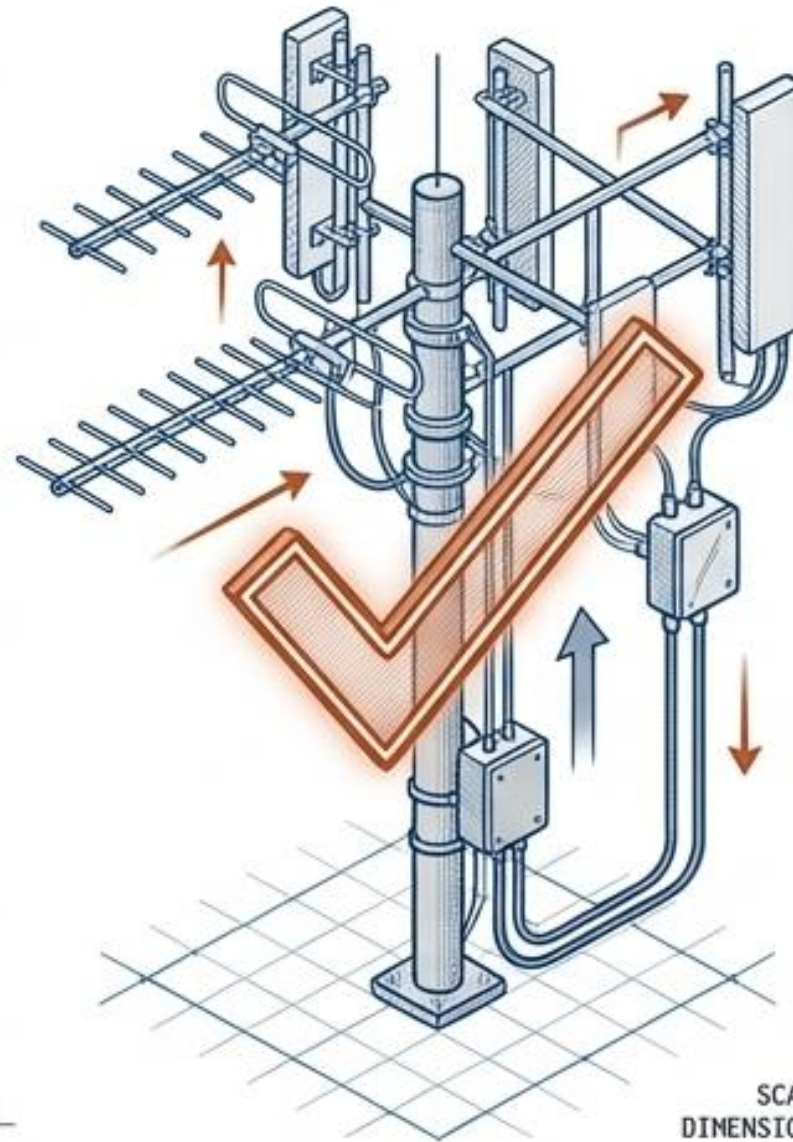
Comparative dimensions: emission/rewards, verification, monetization, value accrual, market regime.

Evaluating Mechanism Profiles.



Emission.

TOKEN GENERATION UNIT (TGU-2A)



Verification.

SIGNAL VALIDATION NODE (SVN-B1)

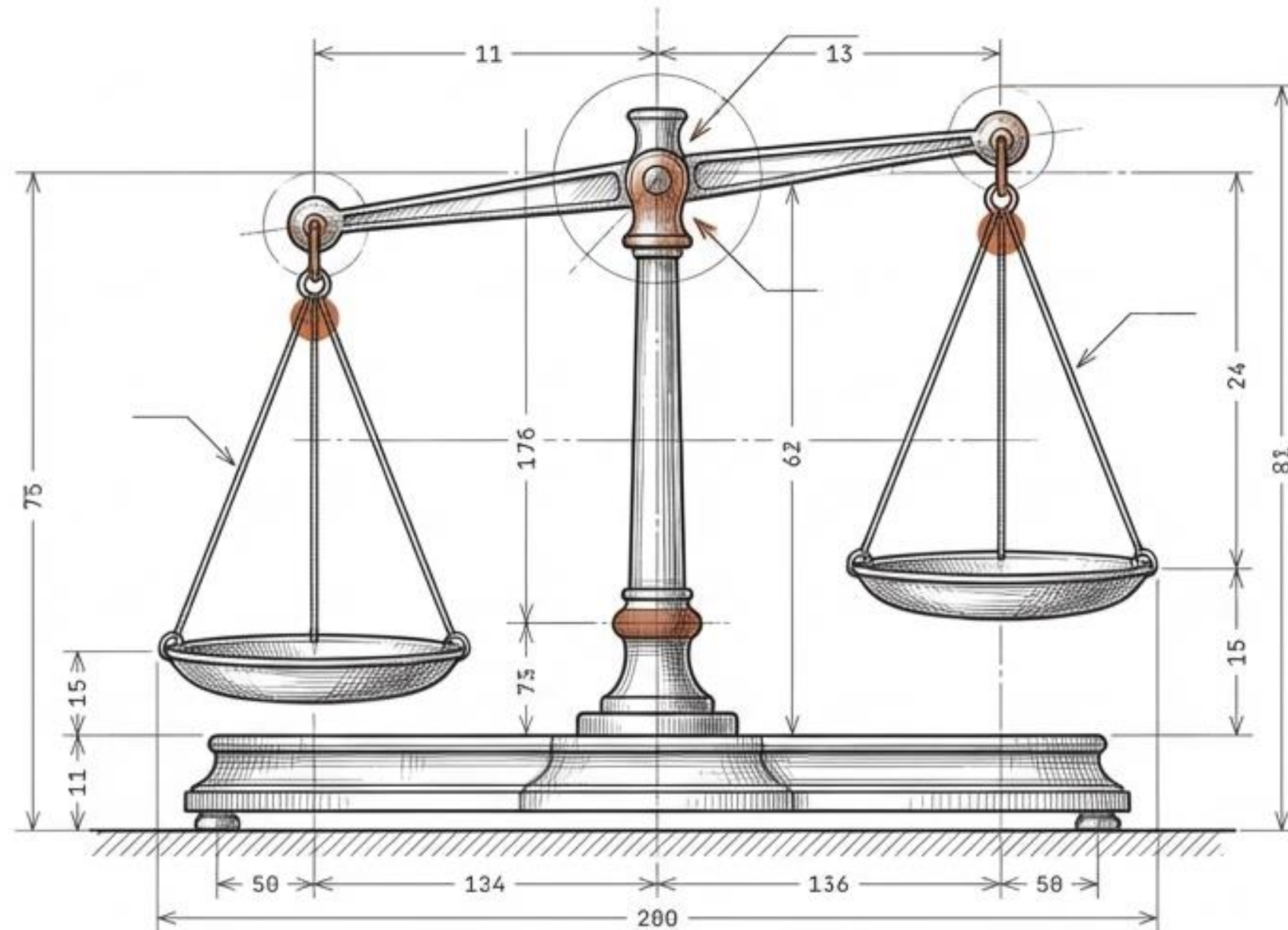


Monetization.

DIGITAL ASSET BRIDGE (DAB-X3)

Distributing the Damage.

Burn-and-Mint Equilibrium vs. Capped-Supply



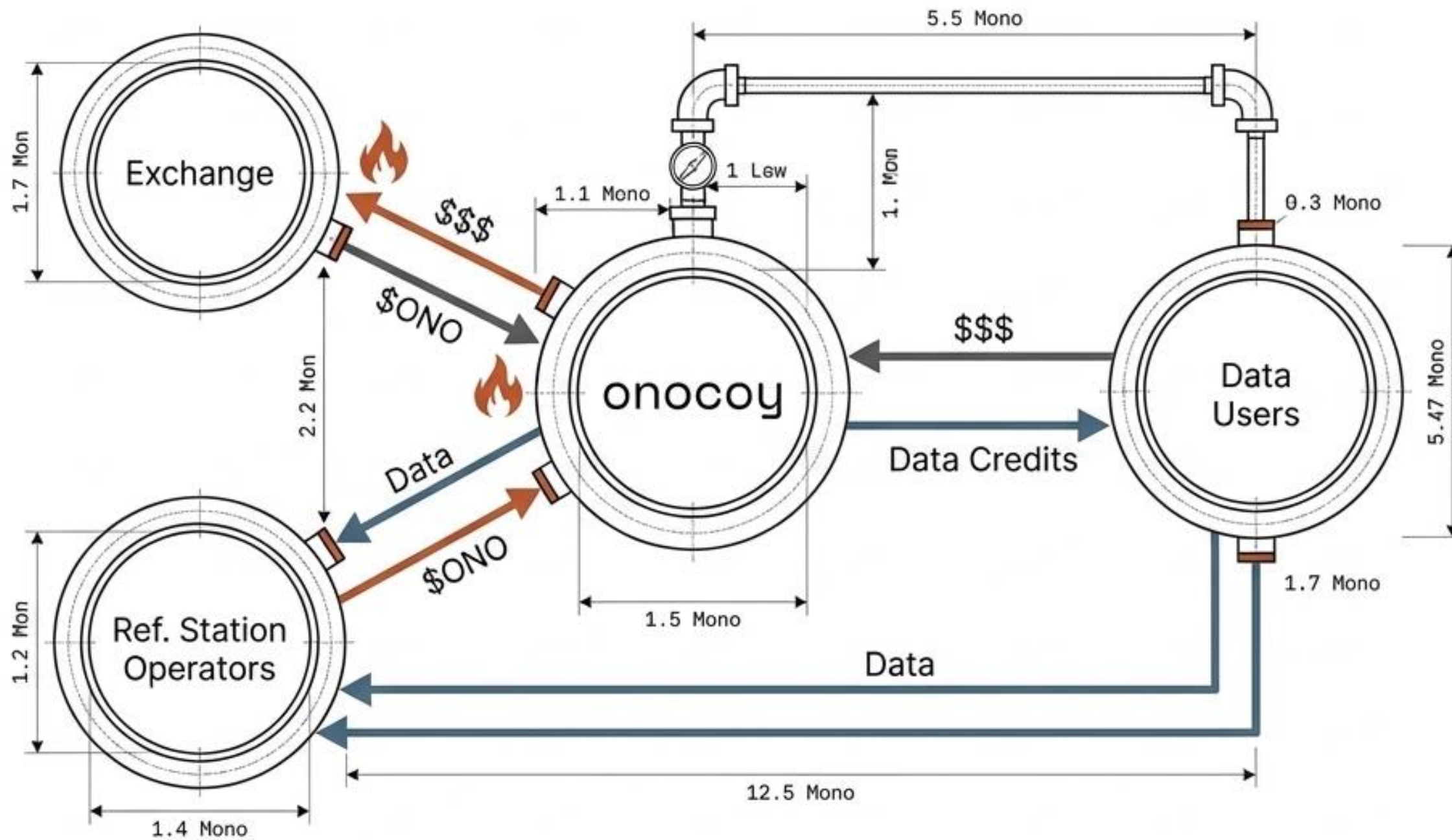
History Shows Friction.

Physical capacity persists even when economics die.



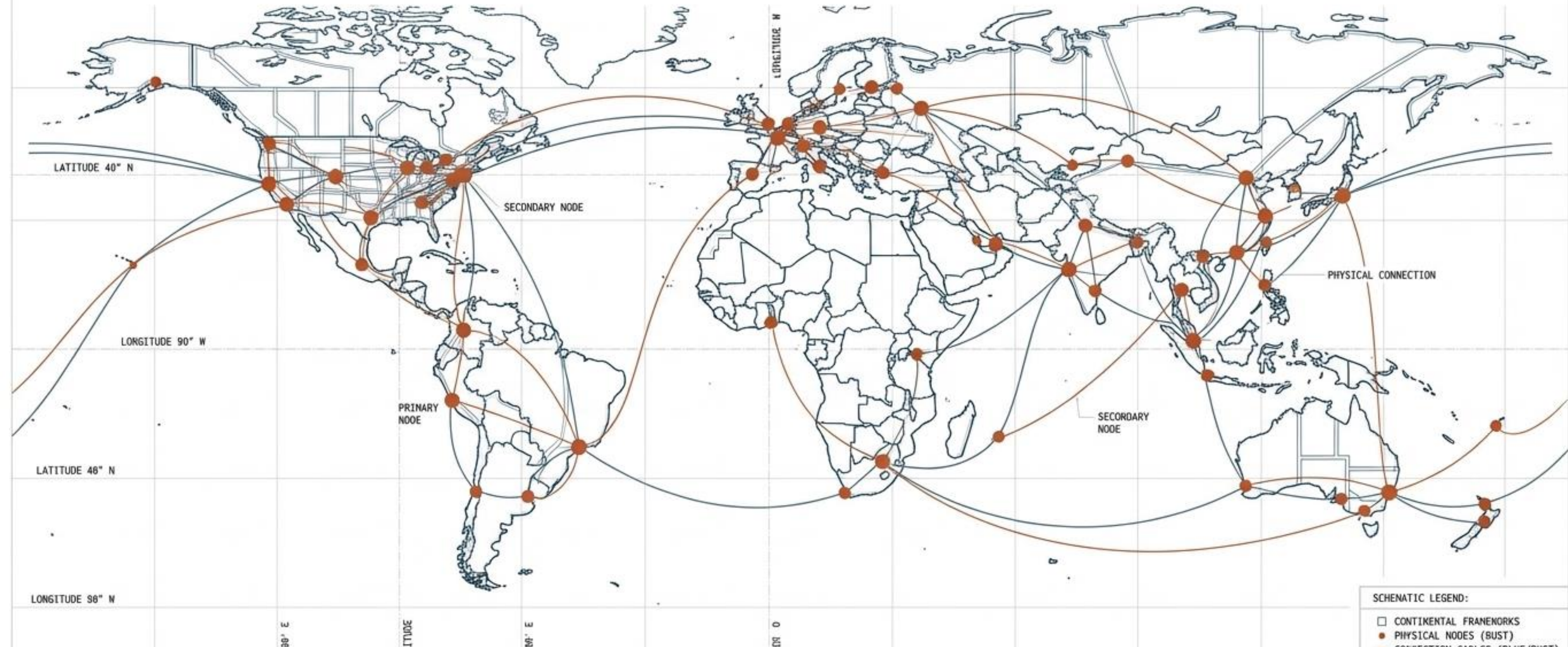
The Anchor Case: Onocoy

Separating service price from token volatility.



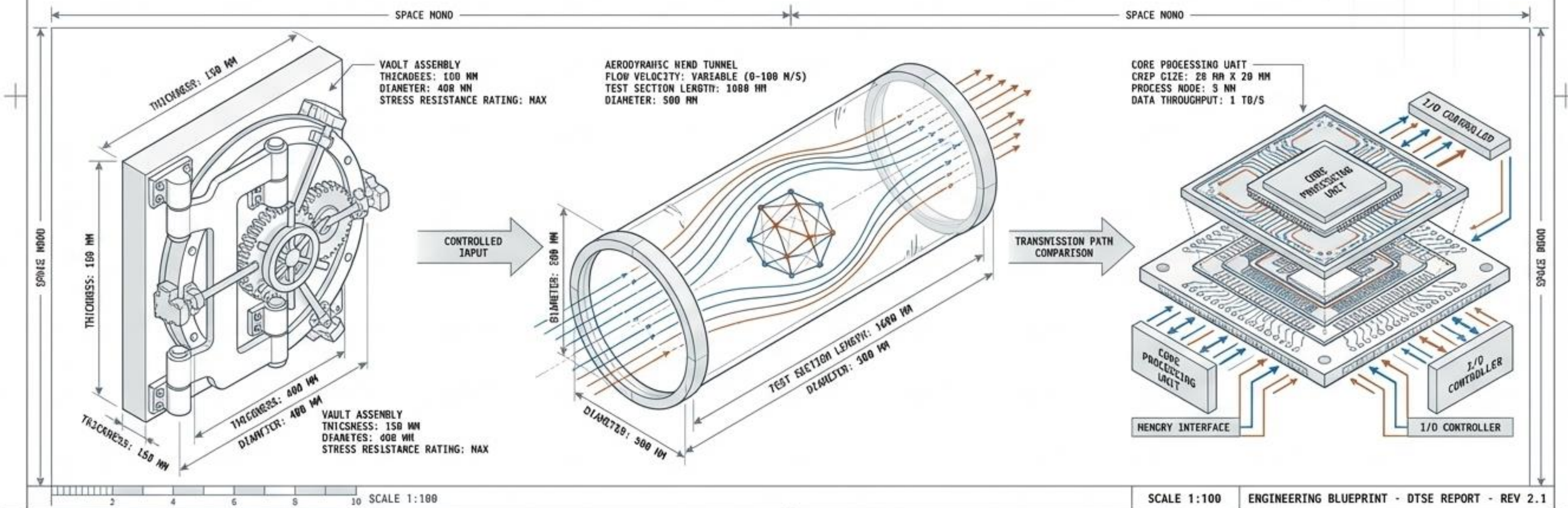
The Physical Reality.

Real hardware. Real locations. Real constraints.

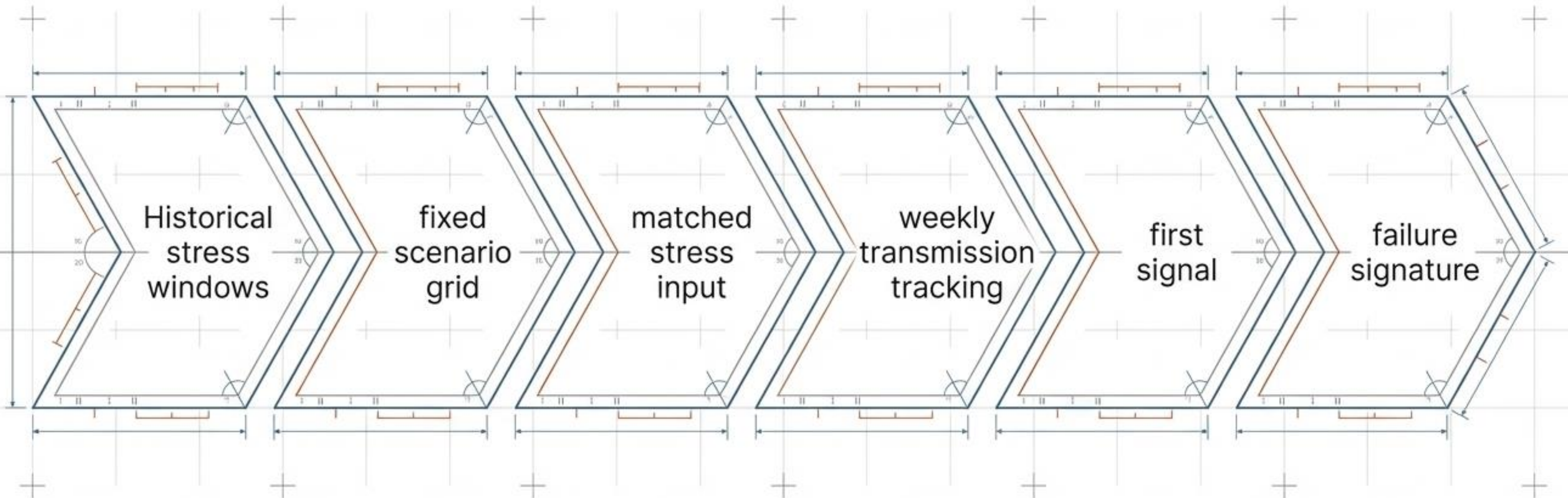


Why we needed DTSE

- History showed real DePIN stress events
- But history did not let us test all models under the same shock
- DTSE gave us a controlled comparison of stress transmission paths





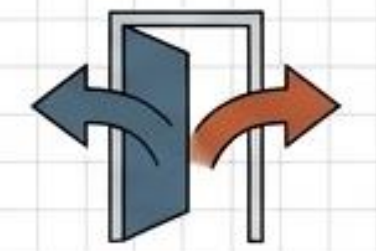

How DTSE works in 30 seconds



The 4 stress channels

SCALE 1:58

0-8904

	Scenario	Stress enters through	What moves first
 <p>LIQUIDITY SHOCK ICON - REF. LS-001</p>	Liquidity shock	token market	reward value / provider economics
 <p>DENAND CONTRACTION ICON - REF. DC-002</p>	Demand contraction	service usage	utilization / usage-linked support
 <p>COMPETITIVE YIELD ICON - REF. CY-003</p>	Competitive yield	outside option	churn / participation
 <p>PROVIDER COST INFLATION ICON - REF. PCI-004</p>	Provider cost inflation	provider economics	margins / viability

SCALE 1:50

DJM: 120MM

SCALE 1:50

UNIT: DIAGNOSTIC MATRIX - REV A



Test Chamber 1: Liquidity Shock

The Stress Scenario

Liquidity-Driven Compression

Stress Enters Through:

The Token Market

What Moves First:
Reward value & provider economics collapse simultaneously.

Key Insight

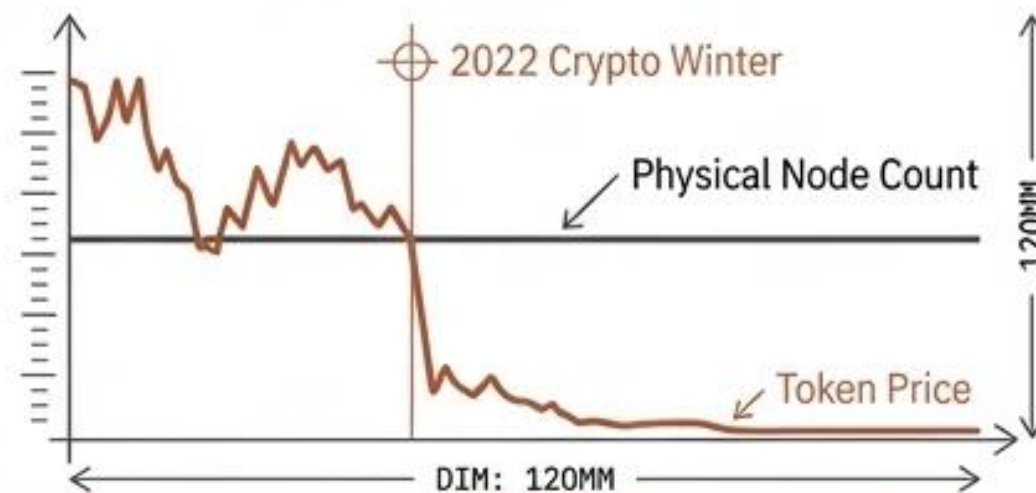
External market panic instantly crushes the fiat-equivalent value of token rewards.

The Real-World Case

Historical Anchor: Helium (2022)

Observation: Fast price compression wiped out fiat-equivalent rewards instantly. However, physical hardware counts remained sticky due to sunk costs.

Verdict: Visible node counts lied about the immediate health of the network. Hardware doesn't unplug the moment the market crashes.



The Comparative Result

DTSE: BME vs. Onocoy

BME Models: Experience an unbounded blowout in the incentive-solvency

Market panic directly spirals into the token issuance layer.

Onocoy (Capped Supply): The solvency proxy remains strictly bounded. However, the system does not escape the pain; the shock is absorbed entirely via **Provider Margin Compression**.



SCALE 1:50

REV
A

UNIT: TELEMETRY DASHBOARD



Takeaway: Stress enters through the market, but hardware doesn't unplug instantly. Onocoy bounds systemic token risk, but the physical providers take the hit in their margins.



Test Chamber 2: Demand Contraction

The Stress Scenario

Reward-Demand Decoupling

**Stress Enters Through:
Service Usage**

What Moves First: Network utilization and usage-linked support break before physical participation drops.

Key Insight

The system keeps paying for supply while the demand side absorbs progressively less value.

The Real-World Case

Historical Anchor: Reward Addiction

Observation: Real-world usage falls, but rewards keep flowing on autopilot. The network subsidizes empty capacity, creating an unsustainable fiat-equivalent subsidy gap.

Verdict: The network looks functionally active, but it is surviving entirely on speculative life support rather than utility.

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-
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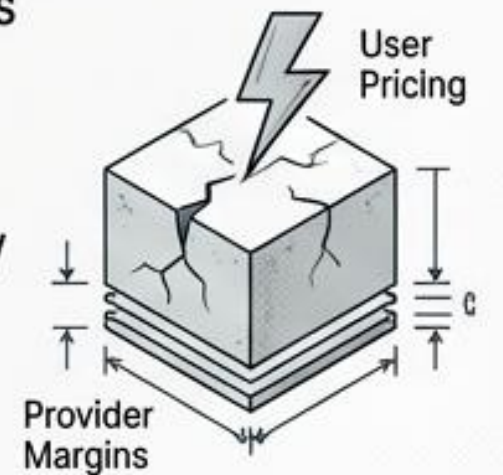
The Comparative Result

DTSE: BME vs. Onocoy

BME Models: Highly sensitive to utilization drops. If the usage-linked burn stops, uncapped minting creates massive relative dilution, risking a death spiral.

Onocoy (Capped Supply): The Data Credit mechanism acts as a buffer, shielding direct user-price exposure. Scheduled token distribution delays immediate panic.

The Catch: Underlying provider margins quietly thin out as the subsidy gap widens over time.



Takeaway: Onocoy buys time by buffering direct user-price exposure, but it does not eliminate provider-side stress.

Test Chamber 3: Competitive Yield Pressure

The Stress Scenario

Elastic Provider Exit.

Stress Enters Through:
An Outside Option

What Moves First: Provider churn spikes before demand or token price breaks.

Key Insight

Stress does not come from an internal protocol failure, but from the sudden attractiveness of external competition.

The Real-World Case

Historical Anchor:
Geodnet (2024-2025)

Observation: Adjacent networks with better yields poach hardware. Supply mobility outpaces demand.

Verdict: Operators reallocate antennas and sensors simply because the grass is greener. Hardware compatibility creates a frictionless exit door.

Inter	1000
Scale	

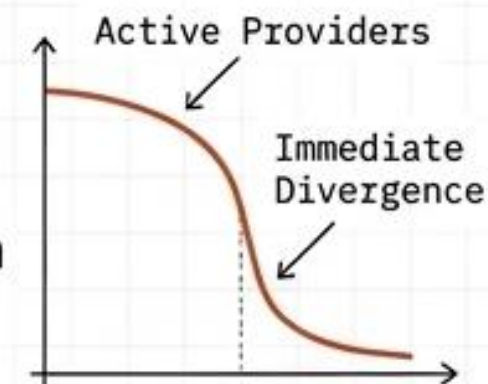
The Comparative Result

DTSE: BME vs. Onocoy

BME Models: Show high volatility in retention. As providers leave, utilization metrics skew, putting secondary pressure on the burn/mint equilibrium.

Onocoy (Capped Supply): The solvency proxy remains numerically stable, but the network suffers immediate physical attrition.

The Catch: Active provider counts drop sharply before any service-side degradation becomes visible to the end user.



Takeaway: What breaks first matters more than the final number. Because Onocoy providers share hardware profiles with other networks, yield shopping is an immediate threat.

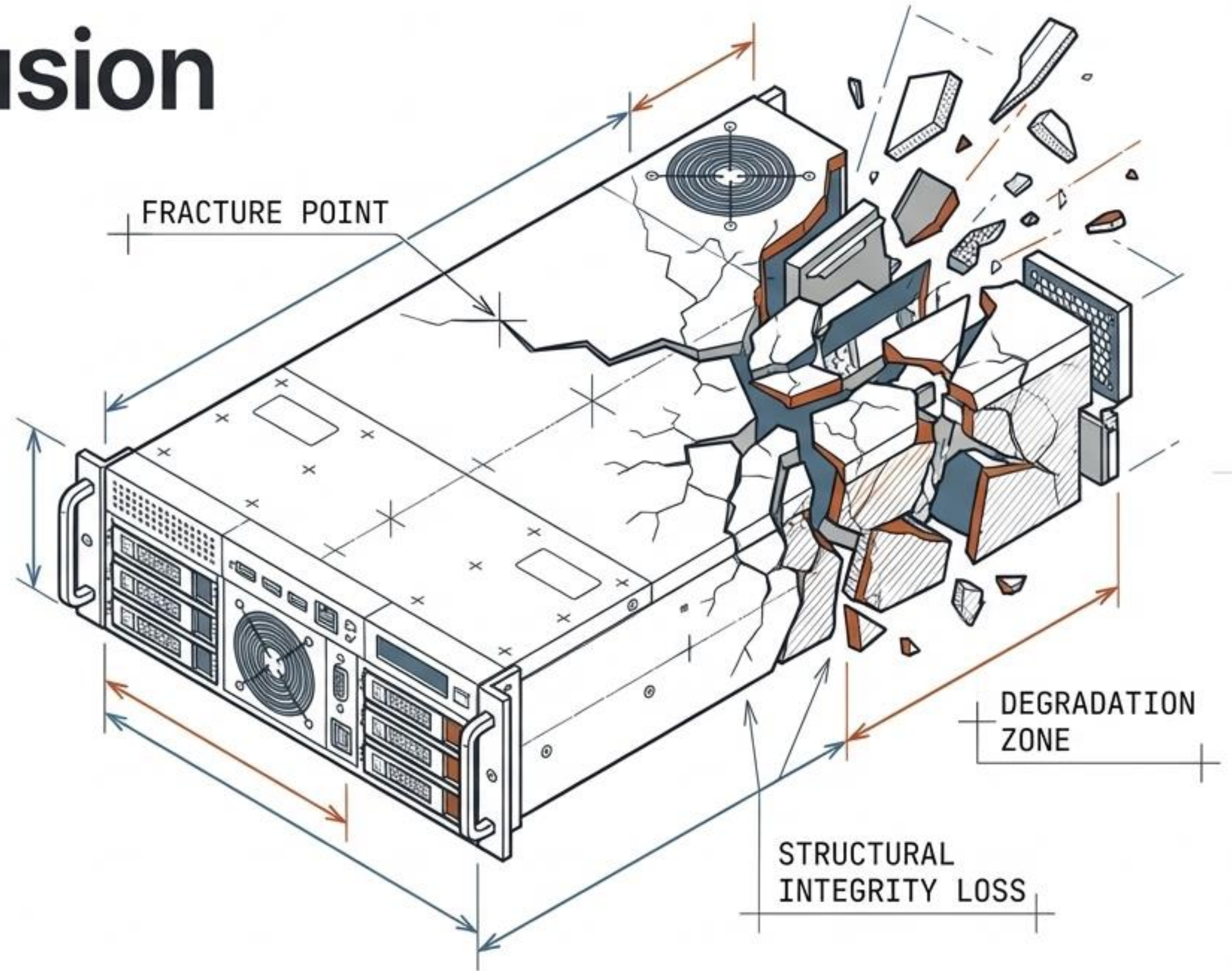
Test Chamber 4: Provider Cost Inflation



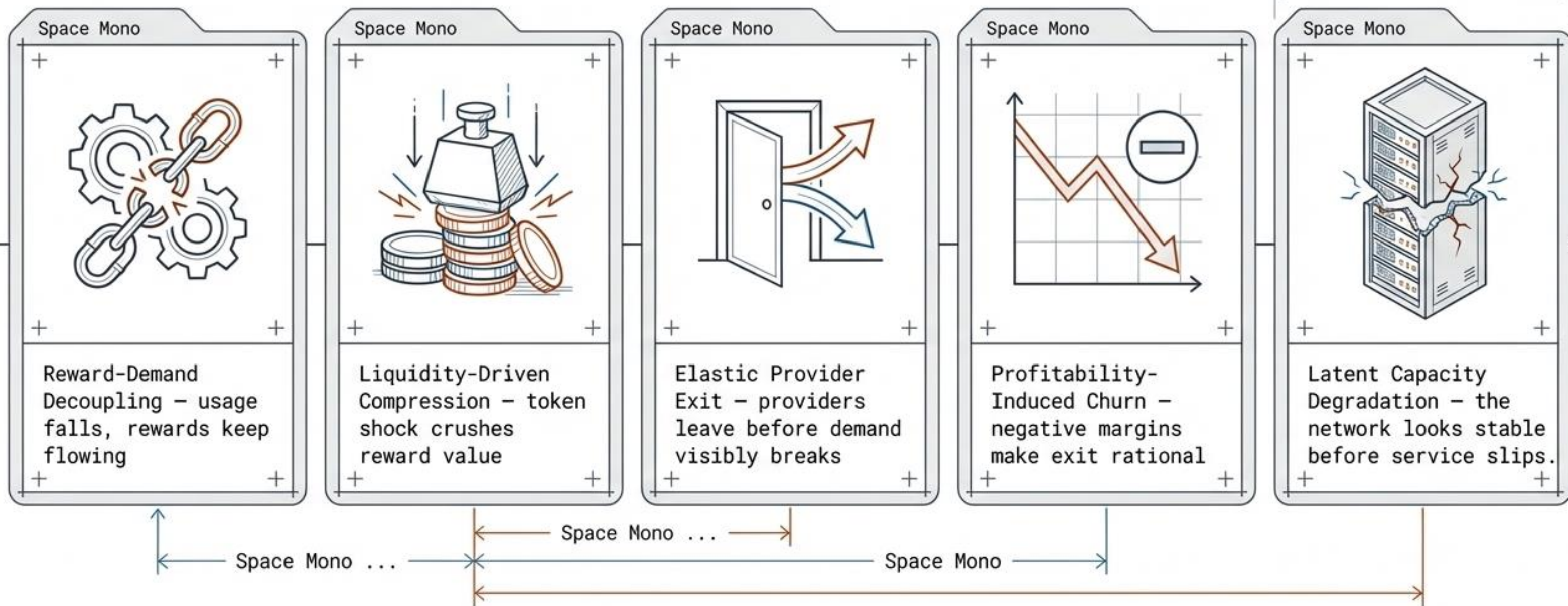
The DePIN Illusion: Hardware networks lie to you. Different designs fail through different transmission paths—Onocoy simply shifts the timing of the fracture.

The DePIN illusion

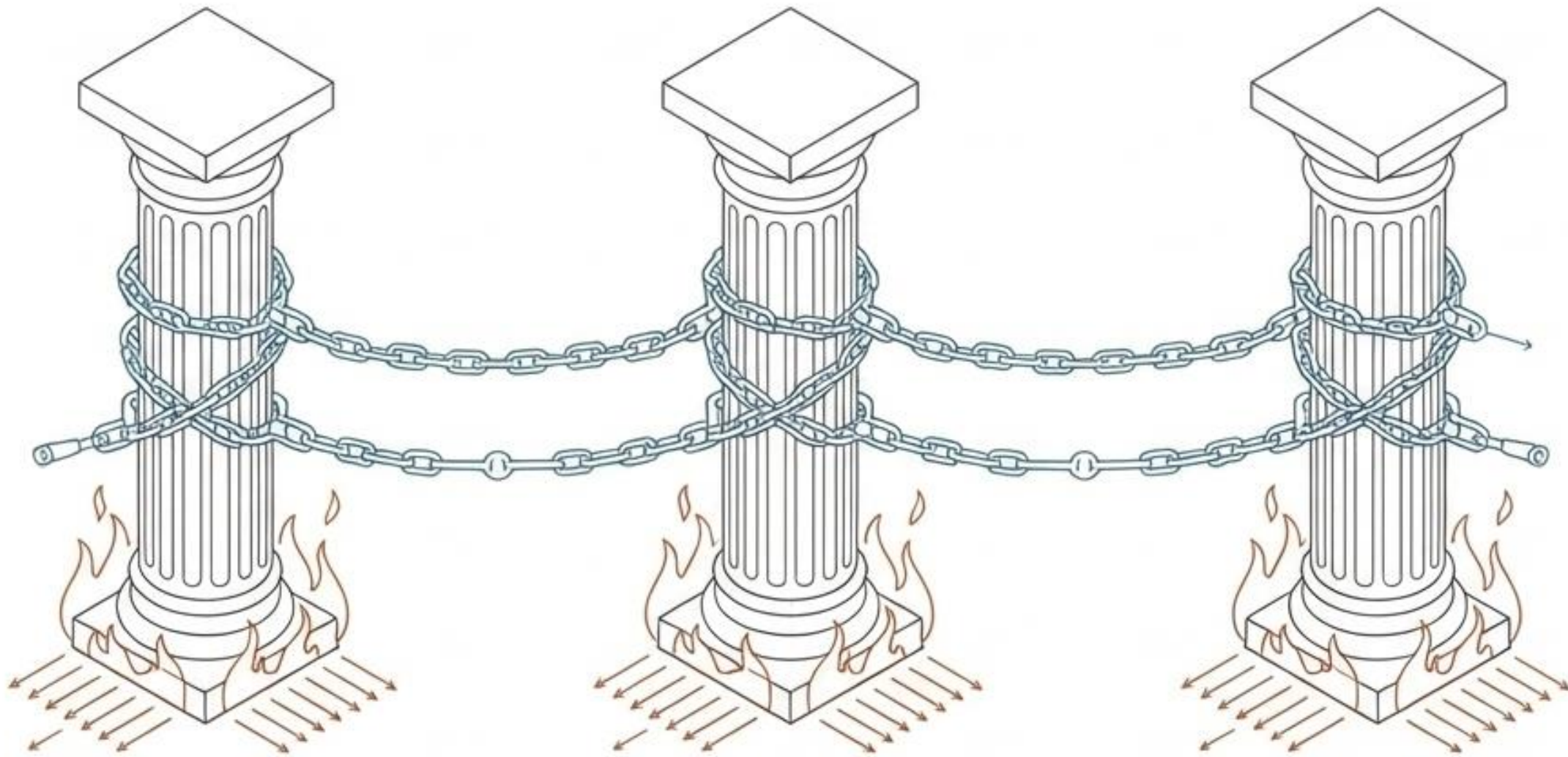
- Hardware does not leave instantly
- Provider economics can weaken before node counts fall
- Waiting for visible node decline means reacting late



The 5 failure signatures



What to monitor early



Provider retention

- profitability
- churn pressure

Service continuity

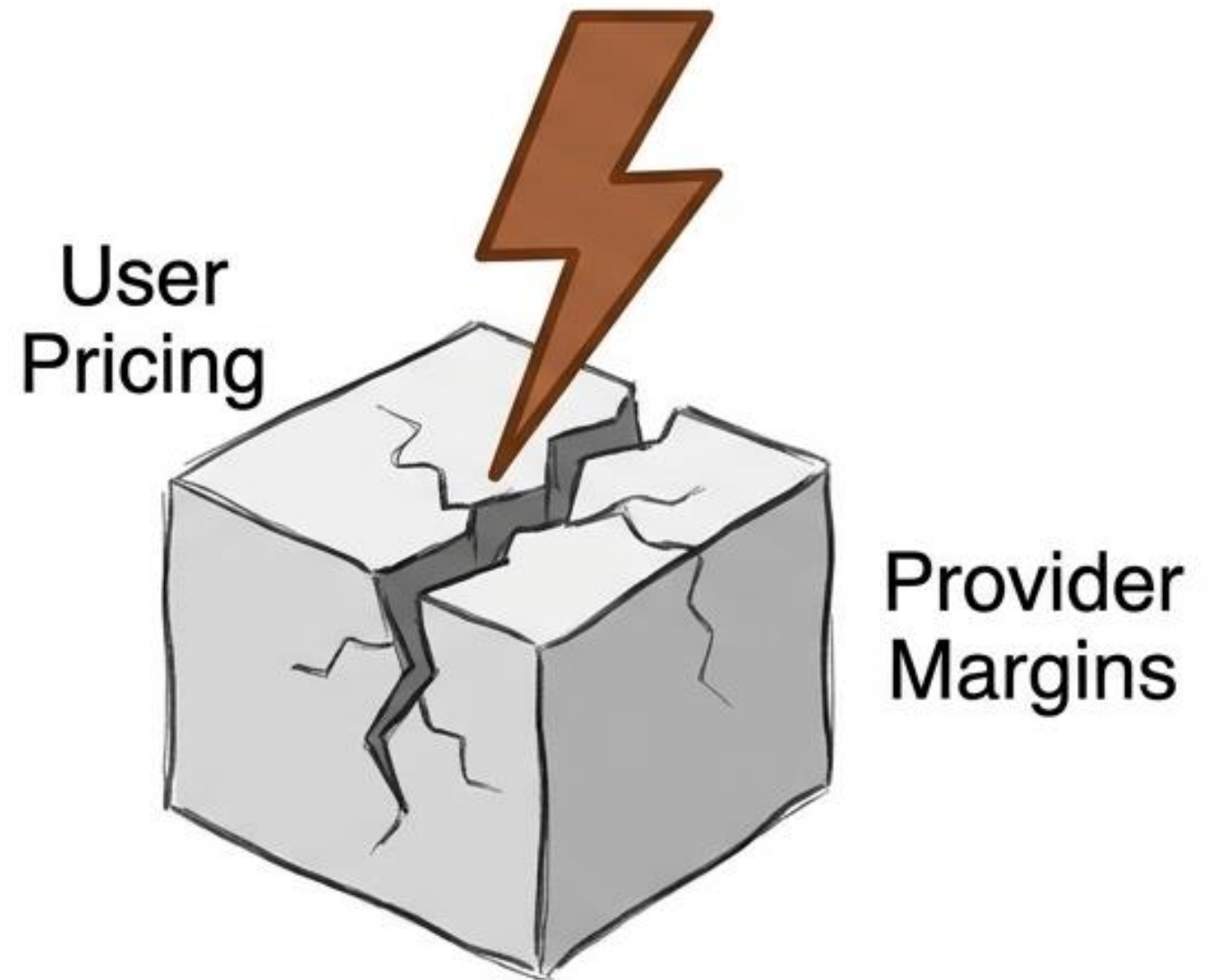
- utilization
- quality deterioration

Incentive alignment

- usage-linked support
- burn/mint or equivalent sink strength
- incentive efficiency

Oncoy's trade-off under stress

- Data Credits buffer direct user-price exposure
- Scheduled distribution avoids immediate reactive stress at the user layer
- But provider-margin pressure can still build before visible participation falls



Final takeaway for DePIN

- Robustness is not binary
- Different designs fail through different transmission paths
- Top-line participation is often a lagging indicator
- For hardware DePINs, early-warning monitoring matters more than headline node counts.